Education-to-Workforce Indicator Framework
Chapter II. Indicators and metrics

Framework excerpt

This file contains Chapter II of the Education-to-Workforce Indicator Framework. This chapter provides definitions and ways to measure key indicators associated with economic mobility and security, including individual outcomes and milestones, education-to-workforce system conditions, and adjacent system conditions. The full framework includes five chapters:

I.   Introduction and approach
II.   Indicators and metrics
III.   Disaggregates
IV.   Evidence-based practices
V.   Data equity principles

A. Overview

In this chapter, we describe the evidence base and measurement guidance for the 99 indicators selected for inclusion in the Education-to-Workforce Indicator Framework (E-W Framework). The indicators included in this framework were selected because research and input from our partners support their power to inform local, state, and federal policy and practice to promote equity and enable individuals to achieve economic mobility and security. As illustrated in Exhibit II.1, the indicators are organized into the following three categories:

1. **Outcomes and milestones.** Key outcomes and milestones along the E-W continuum strongly associated with individuals achieving economic mobility and security. There are 55 indicators in this category.

2. **E-W system conditions.** Key institutional or systemic environments, policies, and practices within E-W systems that support positive E-W outcomes. There are 34 indicators in this category.

3. **Adjacent system conditions.** Key experiences, situations, and circumstances outside of E-W systems that support positive E-W outcomes. There are 10 indicators in this category.

Within each category, the indicators are organized according to three interrelated domains that shape individuals' progression toward economic mobility and security: **academic progress and completion**; **physical, mental, and social well-being**; and **career readiness and economic success**.

Framework users can adapt their use of indicators based on their local policy priorities and top essential questions, but we encourage them to examine all three types of indicators together because data on system conditions—both within and adjacent to E-W systems—are essential for understanding and acting on data on student outcomes and milestones. The reverse is also true: data on outcomes and milestones shed light on the performance of these systems and inform where users should intervene to better support individuals along their journeys from pre-K to the workforce. When we collect and disaggregate both types of data, we can help ensure organizations and institutions are creating the conditions in which everyone can thrive, no matter their race, ethnicity, income, or other characteristics.

For each indicator, we provide the following information:

- **Sectors.** The sectors that should prioritize measuring an indicator (pre-K, K–12, postsecondary, and workforce). Although some indicators are most relevant to just one sector, many apply to multiple sectors.

- **Definition.** A suggested definition for the indicator that can be applied across contexts.

- **Why it matters.** A summary of the evidence of an indicator's predictive value and opportunities to address known disparities among priority groups.

- **Recommended metric(s).** Recommendations for operationalizing the measurement of an indicator in each sector. For indicators requiring survey data, we suggest instruments with an evidence base, though users may consider different instruments, depending on their context.

- **Data source.** The likely source for the data needed to measure the indicator, including administrative data regularly collected as part of institutions' general operations (for example, in student information systems and employee performance management systems), and data from assessments, transcripts, and surveys (which can be loaded into data systems).

- **What to know about measurement.** Considerations about measurement of the indicator, including feasibility, comparability, and risks for unintended consequences. We also note when there is limited consensus on measurement and opportunities to advance the field.

- **Source frameworks.** The number of sources (including indicator frameworks, program reporting guidelines, and data system elements) consulted that include the indicator or a version of it. We also note frameworks that we closely followed to develop the indicator's recommended definition and metrics to leverage best practices from the field.

Exhibit II.1. Indicator overview

Outcomes and milestones
Key positive education-to-workforce outcomes and milestones strongly associated with economic mobility and security

Enrollment in quality public pre-K	Kindergarten readiness: language and literacy	Kindergarten readiness: cognition	Early grades on track	Consistent attendance	Positive behavior	Math and reading proficiency in grade 3	6th grade on track
8th grade on track	Math and reading proficiency in grade 8	Successful completion of Algebra 1 by 9th grade	9th grade on track	Grade point average	Math and reading proficiency in high school	College preparatory coursework completion	Early college coursework completion
SAT/ACT participation and performance	FAFSA completion	College applications	High school graduation	Selection of a well-matched postsecondary institution	Senior summer on track	Postsecondary enrollment directly after high school graduation	First-year credit accumulation
First-year program of study concentration	Gateway course completion	Postsecondary persistence	Transfer (if applicable)	Postsecondary certificate or degree completion	Enrollment in graduate education	Graduate degree completion	Kindergarten readiness: social-emotional development
Kindergarten readiness: approaches to learning	Kindergarten readiness: perceptual, motor, and physical development	Self-management	Growth mindset	Self-efficacy	Social awareness	Cultural competency	Civic engagement
Social capital	Mental and emotional well-being	Physical development and well-being	Successful career transition after high school	CTE pathway concentration	Industry-recognized credential	Participation in work-based learning	Digital skills
Communication skills	Higher-order thinking skills	Minimum economic return	Student loan repayment	Employment in a quality job	Economic mobility	Economic security	

E-W system conditions
Key institutional or system environments, policies, and practices that help or hinder education-to-workforce outcomes

Access to quality public pre-K	Access to full-day pre-K	Access to child care subsidies	School-family engagement	Equitable discipline practices	Access to full-day kindergarten
English learner progress	Teacher credentials	Teacher experience	Educator retention	Classroom observations of instructional practice	Student perceptions of teaching
Teachers' contributions to student learning growth	Effective program and school leadership	Institutions' contributions to student outcomes	Access to college preparatory coursework	Access to early college coursework	Equitable placement in rigorous coursework
Access to quality, culturally responsive curricula	Expenditures per student	Access to early intervention screening	School safety	Inclusive environments	Representational racial and ethnic diversity of educators
School and workplace racial and ethnic diversity	School and workplace socioeconomic diversity	Access to health, mental health, and social supports	Access to college and career advising	Access to in-demand CTE pathways	Unmet financial need
Cumulative student debt	Expenditures on workforce development programs	Access to jobs paying a living wage	Access to ongoing career skills development		

Adjacent system conditions
Key experiences, situations, and circumstances outside of E-W systems that help or hinder education-to-workforce outcomes

Childhood experiences	Health insurance coverage
Food security	Access to affordable housing
Access to technology	Access to transportation
Exposure to neighborhood crime	Neighborhood economic diversity
Neighborhood racial diversity	Neighborhood juvenile arrests

Domains: Academic progress and completion | Social, emotional, and physical well-being | Career readiness and economic success | Cross-domain

Indicator review process

Mathematica took a multistep approach to reviewing and prioritizing indicators for the framework. We began by conducting a crosswalk of more than 40 existing frameworks, from which we identified nearly 200 candidate indicators for initial review. To guide the review process, we identified and prioritized a set of review criteria with input from the advisory boards. Exhibit II.2 defines each criterion used to review the indicators during two rounds of review. (The complete review rubric appears in Appendix C.)

In Round 1, Mathematica subject matter experts in the areas of pre-K education, K–12 education, postsecondary education, and workforce used evidence to review, rate, and prioritize indicators based on the three top criteria that our partners prioritized: (1) actionable for addressing inequities; (2) predictive of economic mobility and security; and (3) meaningful to community groups, including parents, students, practitioners, and advocates. To make these assessments, we reviewed existing research studies (including past work summarizing parent, student, and community priorities around E-W data). We also noted which source frameworks had gathered input from community members in their development and mapped that back to the indicators under review. (Of the 41 source frameworks consulted, 11 gathered input from community members.) Finally, we spoke to members of five select collective impact initiatives to gauge the types of information most actionable and meaningful to their work.

Having identified a set of the most actionable, predictive, and meaningful indicators, our next step was to review the indicators that advanced to Round 2 with a focus on measurement. The Round 2 criteria included whether an indicator can be measured feasibly, comparably, and reliably for priority groups, allowing for disaggregation, and whether its measurement minimizes unintended consequences. To make these assessments, Mathematica subject matter experts reviewed available data sources, technical documentation, and other research that documented approaches and limitations to measuring the indicators. During and after each round of the review process, we gathered input from the advisory groups, which helped us identify potential gaps in the source frameworks and research consulted, prioritize indicators to include or exclude, and refine the measurement guidance for each indicator.

In particular, we weighed trade-offs between what researchers and communities say is most critical to measure to support equity goals and what can currently be measured feasibly, comparably, and reliably. The latter criteria reflect what is possible today, and therefore risk reinforcing the status quo. Based on input from our collaborators, we placed less weight on the Round 2 measurement criteria compared to Round 1 criteria, placing comparatively *more* emphasis on whether indicators are actionable, predictive, and meaningful. Thus, we acknowledge that some indicators are more "aspirational" in their measurement, as noted in the measurement guidance for each indicator. Some indicators are already collected regularly through administrative data systems, whereas others require safely and securely linking individual-level records from multiple sectors. Other indicators may not yet be collected systematically and might require administering a new assessment or survey tool. And for a small number of indicators, measurement is still being refined and tested in the field. However, an important goal for the framework is to recognize the innovative work happening across the country and encourage greater field coordination as we strive to measure what matters most.
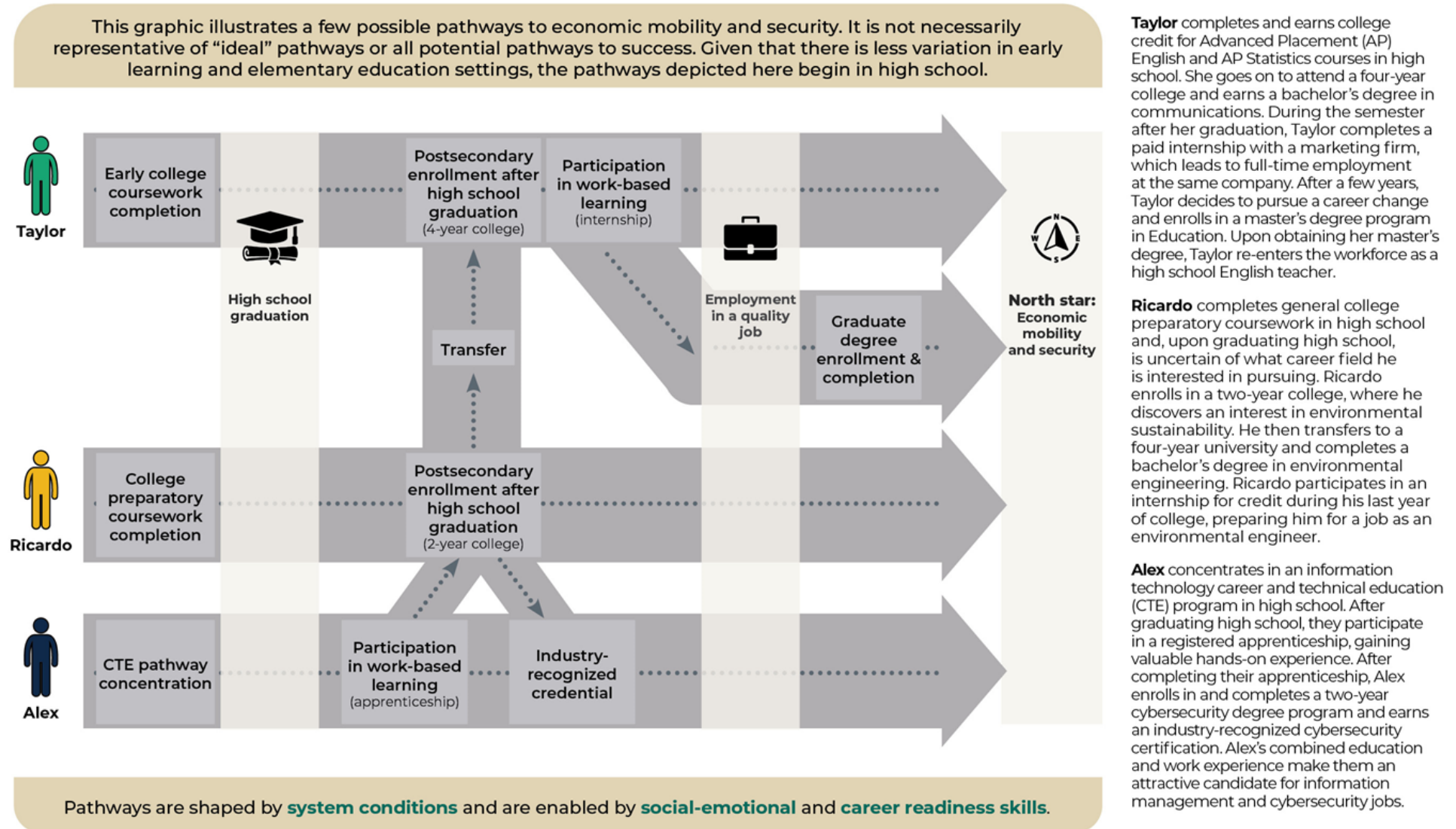
Exhibit II.2. Criteria used to assess indicators

	Criterion	Definition
Round 1 review	**Actionable**	There is significant potential for improvement in addressing disparities, and data for the indicator can be available on a regular, frequent basis—at least annually.
	Predictive	Theory, research, or both suggest a strong association between the indicator and economic mobility and security (or milestones along the way) for priority groups.
	Meaningful	The indicator is considered meaningful by priority communities.
Round 2 review	**Feasible**	Data to measure the indicator are widely available or feasible to collect at reasonable cost in relation to the indicator's value for addressing inequities.
	Valid for disaggregation	There is credible evidence about the validity and reliability of data to measure the indicator for priority groups, allowing for disaggregation.
	Comparable	Data for the indicator can be measured comparably across time and place.
	Minimizes unintended consequences	The indicator is difficult to manipulate to make a district, school, university, or similar entity appear more equitable and is not likely to create perverse incentives.

Pathways to economic mobility and security

As discussed in the introductory section of this report, we are committed to ensuring the framework values and reflects *multiple* pathways to success. Our recommended indicators capture diverse experiences, reflecting the reality that—especially in high school and beyond—individuals can take varied and non-linear pathways to achieve economic mobility and security. E-W data systems must ensure they capture multiple pathways from K–12 to the workforce, such as those illustrated in Exhibit II.3, to fully understand individuals' experiences and how best to support them. Taylor, Alex, and Ricardo each take different pathways through postsecondary and career training to secure employment in a quality job. Despite the variation in their pathways and chosen professions, each of their jobs offers fair pay and benefits, opportunities for advancement, and support for ongoing career skills development—ultimately enabling each of them to achieve economic mobility and security.

Exhibit II.3. Illustrative E-W pathways

This graphic illustrates a few possible pathways to economic mobility and security. It is not necessarily representative of "ideal" pathways or all potential pathways to success. Given that there is less variation in early learning and elementary education settings, the pathways depicted here begin in high school.

Taylor

Early college coursework completion

High school graduation

Postsecondary enrollment after high school graduation (4-year college)

Participation in work-based learning (internship)

Transfer

Employment in a quality job

Graduate degree enrollment & completion

North star: Economic mobility and security

Ricardo

College preparatory coursework completion

Postsecondary enrollment after high school graduation (2-year college)

Alex

CTE pathway concentration

Participation in work-based learning (apprenticeship)

Industry-recognized credential

Pathways are shaped by **system conditions** and are enabled by **social-emotional** and **career readiness skills**.

Taylor completes and earns college credit for Advanced Placement (AP) English and AP Statistics courses in high school. She goes on to attend a four-year college and earns a bachelor's degree in communications. During the semester after her graduation, Taylor completes a paid internship with a marketing firm, which leads to full-time employment at the same company. After a few years, Taylor decides to pursue a career change and enrolls in a master's degree program in Education. Upon obtaining her master's degree, Taylor re-enters the workforce as a high school English teacher.

Ricardo completes general college preparatory coursework in high school and, upon graduating high school, is uncertain of what career field he is interested in pursuing. Ricardo enrolls in a two-year college, where he discovers an interest in environmental sustainability. He then transfers to a four-year university and completes a bachelor's degree in environmental engineering. Ricardo participates in an internship for credit during his last year of college, preparing him for a job as an environmental engineer.

Alex concentrates in an information technology career and technical education (CTE) program in high school. After graduating high school, they participate in a registered apprenticeship, gaining valuable hands-on experience. After completing their apprenticeship, Alex enrolls in and completes a two-year cybersecurity degree program and earns an industry-recognized cybersecurity certification. Alex's combined education and work experience make them an attractive candidate for information management and cybersecurity jobs.

B. Outcomes and milestones

Outcomes and milestones include key student outcomes and milestones along the E-W continuum that are strongly related to achieving economic mobility and security. Exhibit II.4 presents a summary view of the outcomes and milestones indicators in each domain and sector.

Exhibit II.4. Outcomes and milestones indicators

Domain	Pre-K	K–12	Postsecondary	Workforce
Academic progress and completion	Enrollment in quality public pre-K			
	K readiness: language and literacy			
	K readiness: cognition	Early grades on track		
		Consistent attendance		
	Positive behavior			
		Math/reading proficiency, gr. 3		
		6th grade on track		
		8th grade on track		
		Math/reading proficiency, gr. 8		
		Algebra 1 by 9th grade		
		9th grade on track		
		Grade point average		
		Math/reading proficiency, HS		
		College prep coursework		
		Early college coursework completion		
		SAT/ACT participation		
		FAFSA completion		
		College applications		
		High school graduation		
		Selection of a well-matched postsecondary institution		
		Senior summer on track		
		Postsecondary enrollment directly after high school graduation		
			1st-year credit accumulation	
			1st-year program concentration	
			Gateway course completion	
			Postsecondary persistence	
			Transfer (if applicable)	
			Postsecondary cert. or degree	
			Enrollment in grad. education	
			Graduate degree completion	
Social, emotional, and physical well-being	K readiness: social-emotional	Self-management		
	K readiness: learning approaches	Growth mindset		
	K readiness: physical development	Self-efficacy		
		Social awareness		
		Cultural competency		
		Civic engagement		
		Social capital		
	Mental and emotional well-being			
		Physical development and well-being		
Career readiness and economic success		Successful career transition		
		CTE pathway concentration		
		Industry-recognized credential		
		Participation in work-based learning		
		Digital skills		
		Communication skills		
		Higher-order thinking skills		
		Minimum economic return		
			Student loan repayment	
		Employment in a quality job		
		Economic mobility		
		Economic security		

Cert. = certificate; CTE = career and technical education; gr. = grade; grad. = graduate; K = kindergarten.

DOMAIN: Academic progress and completion

Enrollment in quality public pre-K

PK (K12) (PS) (WF)

Definition: Eligible children are enrolled in a publicly funded pre-K program, which can be administered through mixed delivery systems that include Head Start, pre-K classrooms in public schools, and licensed family-based child care programs and community-based organizations.

Why it matters: Pre-K is a first step into K–12 education and establishes an enduring base for future learning. Attending pre-K can boost children's school readiness, start them on trajectories of academic and life success, and produce a return on investment over time, particularly for children from low-income families and children of color.[16, 17, 18] Lifelong benefits of participating in high-quality early learning include higher earnings, improved health, lower participation in social services programs, and lower chances of involvement with the criminal justice system. However, pre-K enrollment patterns vary by race and ethnicity.[19, 20, 21] As of 2017, enrollment rates among Latino children were lower (30 percent) than those among Black children (34 percent) in publicly funded pre-K programs in their neighborhood.[22] In an analysis of Head Start participation, the participation rate among Latino children was 38 percent, compared with 54 percent for Black children and 43 percent for all eligible children.[23]

Recommended metric(s): Percentage of eligible 3- and 4-year-olds enrolled in public pre-K

Data source(s): Administrative data

What to know about measurement: This indicator focuses on public pre-K given that a growing proportion of children of color and those experiencing poverty attend these programs.[24] However, these populations also attend pre-K programs that are not publicly funded,[i] so systems may also consider broadening data collection efforts. State-by-state data on public pre-K enrollment are generally available and are more feasible to collect than data on other programs, because publicly funded programs are subject to regulatory standards and quality monitoring that require data tracking.

Drawing on individual-level records across state systems, aggregate data on pre-K enrollment are reported in different public sources. The National Institute of Early Education Research (NIEER) publishes an annual State of the Preschool Yearbook with statewide enrollment numbers. NIEER reports the number of children of all ages in state pre-K programs, in addition to federally funded Head Start and state-funded Head Start enrollment numbers for 3- and 4-year-old children. However, it does not report enrollment data for 3- and 4-year-old children in other publicly funded programs, such as licensed family-based child care programs and community-based organizations. The Civil Rights Data Collection (CRDC) publishes the number of pre-K students served in local education agency facilities only,[25] and the National Center for Education Statistics (NCES) annually collects school enrollment rates of all 3- to 5-year-olds.

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[i] Children might also attend programs that do not receive public funds. These programs vary in their data collection, including private community-based centers that may offer scholarships (such as a local YMCA or community center), classrooms in religious institutions (such as a church preschool), or other out-of-market options that are financially accessible to families with low incomes, but are not publicly funded.

Source frameworks: Enrollment in pre-K appeared in 12 source frameworks reviewed for this report. Our recommendation to emphasize *public* pre-K aligns with recommendations put forth by the Center on Enhancing Early Learning Outcomes (CEELO) and the Council of Chief State School Officers (CCSSO).[26]

Kindergarten readiness: language and literacy

(PK) (K12) (PS) (WF)

Definition: Children develop and demonstrate foundational language and literacy skills.

Why it matters: Children's early language and literacy skills are key areas of development underlying their later academic success.[27, 28, 29, 30] However, disparities in language and literacy skills and knowledge between White and Black children and White and Latino children appear as early as age 3.[31, 32] Compared with their White peers, Black and Latino children enter kindergarten 7 to 12 months behind in literacy and language skills, on average.[33] As noted in the E-W system conditions section of this report, there is inequitable access to quality pre-K education that promotes positive outcomes for all children.

Recommended metric(s):

- Percentage of children meeting benchmarks on a teacher-reported kindergarten readiness assessment, such as:
    - Desired Results Developmental Profile (DRDP) Language and Literacy Development domain[34]
    - Ready 4 Kindergarten Early Learning Assessment (R4K ELA) Language and Literacy domain[35]
    - Teaching Strategies GOLD (TS GOLD) Language and Literacy subscales[36]
- Or, percentage of children meeting benchmarks on direct child assessments administered by trained assessors, such as:
    - Woodcock-Johnson IV Tests of Early Cognition and Academic Development (ECAD) Letter-Word and Writing subtests[37]
    - Individual Growth and Development Indicators (IGDIs) Early Literacy assessment[38]

Data source(s): Assessments

> ### Hamilton County's Camp K
>
> Camp Kindergarten, or Camp K, is a free kindergarten readiness program serving children and families in Hamilton County, Tennessee. Hamilton County launched a pilot of Camp K in 2018, enrolling 211 children and using kindergarten readiness data to monitor their progress. Fifty percent of Camp K children scored "on target" on their kindergarten screening, higher than the district average of 21 percent for children from low-income communities and 42 percent overall. As of 2019, 400 kindergarten-age children across 15 schools in Hamilton County enrolled.
>
> Camp K's curriculum focuses on foundational English and literacy skills, as well as social and emotional development. A head teacher leads a class of 15 children with assistance from a preservice teacher. Parents of children enrolled in Camp K attend weekly sessions hosted by community partners that offer resources to advocate for their child's learning and development.
>
> Camp K was the result of a collective impact initiative around early learning between Hamilton County Schools and community partners.

What to know about measurement: Kindergarten readiness assessments, which teachers complete, are an increasingly popular option for assessing a broad range of school readiness skills, including language and literacy. An estimated 43 states have or are developing kindergarten readiness assessments.[39] These measures are mostly used as formative, not summative, assessments, and are not designed for accountability or high-stakes testing.[40] For example, the past use of these assessments for accountability in Florida faced pushback and eventually was discontinued.[41]

Teacher-reported kindergarten readiness assessments are generally more feasible to conduct at scale than standardized direct child assessments, which have greater reliability and validity[42] and thus allow for comparison across children, classrooms, and pre-K programs.[43] However, direct child assessments may be burdensome to administer or may not be completed for every child. Direct child assessments such as the ECAD or IGDIs must be administered by trained assessors.

Current research is limited on whether kindergarten readiness assessments are reliable and valid for children who speak a language other than English at home.[44] However, the DRDP has specific items for teachers to report on English language development for children who speak a non-English language at home and is a promising measure.[45] Some research indicates that the TS GOLD functions well with children whose home language is not English.[46]

Source frameworks: Kindergarten readiness appeared in 10 source frameworks reviewed for this report. Our proposed definition and measures align with the five domains of kindergarten readiness summarized in the Getting Ready framework, prepared by Rhode Island KIDS COUNT,[47] which are also included in the Head Start Early Learning Outcomes Framework.[48]

Kindergarten readiness: cognition

(PK) (K12) (PS) (WF)

Definition: Children develop and demonstrate foundational math and scientific reasoning skills.

Why it matters: Children's cognition, including math and scientific reading skills, is essential for a growing number of tasks.[49] Children's early skills in this domain set the course for their later achievement, with the skills that children demonstrate at an early age being the strongest predictors of their later school achievement.[50, 51, 52, 53] For math skills in particular, disparities by race, ethnicity, and income appear early and widen during early childhood.[54, 55] Compared with White children, Black and Latino children enter kindergarten 9 to 10 months behind in math skills, on average.[56] As noted in the E-W system conditions section of this report, there is inequitable access to quality pre-K education that promotes positive outcomes for all children.

Recommended metric(s):

- Percentage of children meeting benchmarks on teacher-reported kindergarten readiness assessment, such as:
  - Desired Results Developmental Profile (DRDP) Cognition domain[57]
  - Ready 4 Kindergarten Early Learning Assessment (R4K ELA) Mathematics and Science domains[58]
  - Teaching Strategies GOLD (TS GOLD) Cognitive and Mathematics subscales[59]

- Or, percentage of children meeting benchmarks on direct child assessments, such as:
  – Woodcock-Johnson IV Tests of Early Cognition and Academic Development (ECAD) Number Sense subtest[60]
  – Individual Growth and Development Indicators (IGDIs) Early Numeracy assessment[61]
  – Research Based Early Mathematics Assessment (REMA)[62]

Data source(s): Assessments

What to know about measurement: This indicator's measurement considerations are similar to those noted above under the *kindergarten readiness: language and literacy* indicator. Children's cognition skills can be measured through direct child assessments, but kindergarten readiness assessments, which ask teachers to report and rate children's skill development, are increasingly common and less burdensome to implement at scale. For example, the DRDP has one subscale that measures cognition, including math and science skills. These items ask teachers to rate children's development of number sense, measurement, patterning, shape recognition, cause and effect, inquiry through observation and investigation, and understanding of objects and their characteristics. As noted in the *kindergarten readiness: language and literacy* indicator discussion, these assessments should only be used for formative purposes.

Source frameworks: Kindergarten readiness appeared in 10 source frameworks reviewed for this report. Our proposed definition and measures align with the five domains of kindergarten readiness summarized in the Getting Ready framework, prepared by Rhode Island KIDS COUNT,[63] which are also included in the Head Start Early Learning Outcomes Framework.[64]

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Early grades on track

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(PK) (**K12**) (PS) (WF)

Definition: Students in grades 1 and 2 are on track to achieve academic proficiency in grade 3.

Why it matters: An on-track measure before grade 3 can help schools target additional support to students at risk of not meeting grade-level proficiency standards in grade 3, which is a strong predictor of later outcomes. For example, a study in three diverse urban districts found that math and reading benchmark performance and growth and chronic absenteeism in grades K−2 were important and consistent predictors for reading success in grade 3.[65] Early on-track measures are relatively newer than those used in middle and high school, but have been implemented in some contexts, such as Montgomery County Public Schools,[66] to identify students who need support as early as grade 1. Disparities in children's early-grade outcomes along income and race are evident, pointing to the need for early intervention.[67, 68] For instance, a study of nationally representative data found that at the start of grade 1, Black children's reading proficiency was three months behind that of White children, and math proficiency was almost five months behind; these disparities were only slightly smaller for Latino children.

Recommended metric(s): Percentage of students in grades 1 and 2 meeting grade-level math and reading benchmarks, with an attendance rate of 90 percent or higher, and no in- or out-of-school suspensions or expulsions

Data source(s): Assessments; administrative data

What to know about measurement: Each on-track indicator in the E-W Framework is supported by research conducted in specific district contexts; therefore, the specific criteria used to define whether a student is on track might not predict long-run outcomes equally well in all settings. To define this indicator, we drew on research in Montgomery County Public Schools,[69] which found that grade 1 students well below grade level in reading, math, or both; absent nine or more days; or suspended one or more times were significantly more likely to drop out of high school. If possible, research based on local data should be conducted to validate this measure of students' on-track status in other settings.

Although attendance and suspension data are generally available to measure this indicator, benchmark tests in early grades are not universally administered and can vary across states and districts. Math and reading proficiency are measured in kindergarten through grade 2 in 37 states (as well as the District of Columbia). Assessments range from screeners and diagnostic assessments to formative and summative assessments.[70] Thus, this indicator might not be fully comparable across contexts and might not be feasible in districts that do not currently give early-grades assessments. Emerging multilingual students should be tested in their home language, though not all assessments make this possible. Additional considerations for attendance and discipline data are discussed in the next two indicators (*consistent attendance* and *positive behavior*).

Montgomery County's early warning sign system

Montgomery County Public Schools, located in a Maryland suburb of Washington, DC, developed an early warning data system to measure whether students are on track to graduate high school and intervene early to better support their future learning. The system uses attendance, behavior, and coursework indicators to assess a student's likelihood of future school dropout. For students in grade 1, key predictors of dropping out of high school included receiving grades equivalent to a grade point average below 1.2, not meeting grade-level math and reading benchmarks, being absent more than nine days, and receiving at least one suspension. Based on the results of a longitudinal analysis, other predictors and thresholds were used to identify students at risk of falling behind in other grades.

Teachers use the early warning data system to create personalized learning plans to address each student's needs. These learning plans also account for circumstances outside of the classroom that may affect a student's ability to stay on track, such as experiences related to poverty or complex family dynamics. The Montgomery County superintendent, Joshua P. Starr, acknowledges that early on-track indicators can be misused to stigmatize or label students early on as high school dropouts. Instead, he encourages districts to use the tool and measures as a pulse check for educators and district leaders to adjust their supports based on individual students' needs and circumstances.

Source frameworks: Although general "academic proficiency" or "academic progress" in K–12 appeared in four source frameworks reviewed for this report, none of the source frameworks specifically included an early grades on track indicator. As discussed above, our proposed definition and measure draw on research in Montgomery County Public Schools.[71]

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Consistent attendance
....

PK **K12** **PS** **WF**

Definition: Students are present for more than 90 percent of enrolled days.

Why it matters: Students must be consistently present to learn and succeed in school. Consistent attendance (attending 90 percent or more of school days) is a positive reframing of chronic absenteeism (missing 10 percent or more of school days), a metric which is widely used in the field and is negatively correlated with other measures of school performance. Research shows that absenteeism is related to reduced math and reading achievement outcomes, reduced educational engagement, and reduced social engagement.[72, 73, 74, 75] Chronic absenteeism in middle school and high school is also related to lower rates of on-time graduation.[76] As one specific example, Allensworth and Easton[77] found that course attendance was eight times more predictive of failing a 9th-grade course than were 8th-grade test scores, and that attendance was the strongest predictor of overall grades. At the postsecondary level, attendance has a strong positive relationship with course grades and college grade point average (GPA).[78] Attendance is also commonly used in college early warning systems to help identify students at risk of falling behind and improve retention and graduation rates.[79, 80]

Despite issues with tracking attendance during the COVID-19 pandemic, the available data show significant increases in chronic absenteeism during this period.[81, 82] For instance, in Connecticut—one state that required regular attendance taking during the pandemic and standardized attendance tracking across learning modes—rates of absenteeism increased from 12 to 20 percent from 2020 to 2021; however, students from low-income households and Black and Latino students were two to three times more likely to be chronically absent than students from higher-income households and of other races and ethnicities.[83]

Recommended metric(s): Percentage of students who are present for more than 90 percent of their enrolled days, excluding students enrolled for fewer than 90 days

Data source: Administrative data

What to know about measurement: Pre-K and K–12 schools regularly collect attendance data as part of their normal operations. However, the COVID-19 pandemic has raised the importance of establishing a common definition of what constitutes a full day of attendance across all modes of instruction, including in-person, remote, asynchronous, and hybrid. At the postsecondary level, colleges with early warning systems often track student attendance,[84] though the extent to which they track attendance and methods for doing so vary widely across institutions, making this indicator more challenging to measure at scale in postsecondary contexts.[85, 86]

We selected an attendance rate of 90 percent as a minimum recommendation to align with the most commonly reported measure of chronic absenteeism, used by Attendance Works and the Civil Rights Data Collection (CRDC). However, data users might conduct further analyses of attendance data. For example, Attendance Works recommends examining satisfactory attendance (missing less than 5 percent of school days), at-risk attendance (missing 6 to 10 percent of school days), moderate chronic absence (missing 10 to 19 percent of school days), and severe chronic absence (missing 20 percent or more of school days).[87] Although these thresholds are commonly used to determine whether students are chronically absent across grade levels, we encourage framework users to examine attendance by
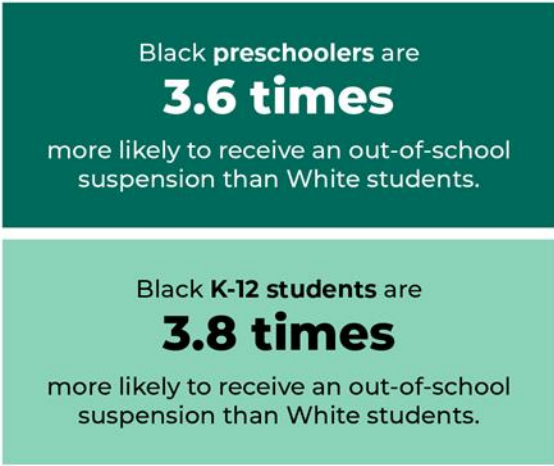
grade level, as students in later grades tend to have lower attendance rates, on average, than students in early grades.[88]

Source frameworks: This indicator appeared in 12 source frameworks reviewed for this report. As discussed above, our proposed measure aligns with the commonly accepted definition of chronic absenteeism put forth by the P-16 Framework,[89] Center on Enhancing Early Learning Outcomes (CEELO) and the Council of Chief State School Officers (CCSSO) Birth to Grade 3 Framework,[90] and the CORE Districts' Improvement Measures.[91]

Positive behavior

PK **K12** PS WF

Definition: Students are not suspended or expelled from school and do not experience other types of exclusionary discipline, such as restraint and seclusion.

Black **preschoolers** are
3.6 times
more likely to receive an out-of-school suspension than White students.

Black **K-12 students** are
3.8 times
more likely to receive an out-of-school suspension than White students.

Source: U.S. Department of Education, Office of Civil Rights (2016).

Why it matters: Being subjected to disciplinary action in school is negatively related to a host of academic outcomes that are key to student success, including attendance, course passing, standardized test achievement, high school graduation, and college enrollment.[92, 93, 94] Because it is a strong predictor of later outcomes, student behavior—as measured by disciplinary actions—is a component of many early warning indicators, along with attendance and course grades (these three primary predictors are known as the ABCs of early warning).[95] However, disciplinary actions are a flawed measure of student behavior as they also reflect bias in disciplinary practices. Black and Latino students, students experiencing poverty, and students with disabilities experience suspensions at disproportionate rates.[96]

For instance, Black students are nearly four times as likely to receive an out-of-school suspension than White students. Black and Latino students are also more likely than White students to be expelled for similar behavior.[97] There is evidence that racial disparities in suspension rates are larger in counties with higher racial bias, as measured by data on implicit and explicit bias from 1.6 million respondents across the country.[98] Racial disparities in exposure to exclusionary discipline start early on: Black preschoolers are 3.6 times as likely to receive one or more suspensions as White preschoolers.[99]

Recommended metric(s): Percentage of children who do not experience any of the following: in-school suspensions, out-of-school suspensions, disciplinary use of restraint and seclusion, or expulsions

Data source: Administrative data

What to know about measurement: Although the absence of exclusionary discipline is not a perfect measure of positive behavior, we recommend using the proposed metric as the most feasible proxy given the widespread availability of discipline data and their value in predicting future academic outcomes. As a system condition, we also recommend monitoring disproportionality in suspensions

and other disciplinary actions (see the indicator on *equitable discipline practices* in the next section of this chapter) to address bias.

Schools regularly collect discipline data as part of their normal operations. Although suspensions and expulsions are generally defined and tracked comparably, there are opportunities for states to apply more consistent definitions in determining what counts as physical restraint and seclusion. They can do so by adopting the revised federal definitions proposed by the Office of Civil Rights (see Arundel[100] for a discussion of the challenges in defining and reporting restraint and seclusion in schools).

Source frameworks: This indicator appeared in eight source frameworks reviewed for this report. Several frameworks mention "disciplinary action," including the P-16 Framework,[101] the Center on Enhancing Early Learning Outcomes (CEELO) and the Council of Chief State School Officers (CCSSO) Birth to Grade 3 framework,[102] and the National Education Association's (NEA) Great Public Schools Indicators Framework.[103] Research by CORE Districts,[104] Council of the Great City Schools,[105] and the Urban Institute[106] also include measures of suspension and/or expulsion rates.

Math and reading proficiency in grade 3

(PK) (**K12**) (PS) (WF)

Definition: Students demonstrate proficiency in math and reading/English language arts according to high-quality state standards.

Why it matters: Math and reading proficiency are highly predictive of later outcomes, including high school graduation and college enrollment.[107, 108, 109] This indicator focuses on grade 3 (rather than grades 4 or 5), reflecting the consensus that a strong early start and early intervention are crucial for success.[110, 111] Reflecting disparities in access to strong systems and supports for learning, there are large and persistent gaps between the test scores of students who are Black, Latino, and from low-income households and their White, Asian, and more economically advantaged counterparts.[112, 113, 114] For example, among 4th graders, 45 percent of White students were proficient on the National Assessment of Educational Progress (NAEP) in 2019, compared to 18 percent of Black students and 23 percent of Latino students.[115]

Recommended metric(s): Percentage of students in grade 3 who meet grade-level standards in reading/English language arts and math as measured by state standardized tests

Data source: Assessments

What to know about measurement: Under the Every Student Succeeds Act (ESSA), schools must collect and report test scores for students in grades 3–8, making data for this indicator broadly available. However, states use different assessments that vary in both content and proficiency standards, as shown by analyses that map proficiency cut scores on state tests to NAEP-equivalent scores.[116] As a result, proficiency rates should not be compared across states, except when using NAEP data, which are available for grades 4, 8, and 12.

This indicator may also measure students' writing proficiency in states where a writing component is included within the English language arts assessment. As of 2019, one-third of states use either the Partnership for Assessment of Readiness for College and Careers (PARCC)[117] or Smarter Balanced[118] tests, both of which include a writing component.[119]

We acknowledge limitations of test-based measures of proficiency, such as the potential for unintended consequences when used for accountability purposes (for example, teaching to the test, incentives for cheating) and limited accessibility of non-English testing for emerging multilingual students.[120, 121, 122] Evidence also shows that when students are encouraged to perform better on standardized tests through a financial reward, their performance improves, sometimes substantially, suggesting that test scores may not fully capture students' true academic proficiency.[123, 124] Despite these concerns, we recommend these indicators because of the demonstrated predictive value of measures of math and reading proficiency, and their potential to be used for intervention purposes.

Source frameworks: A total of 15 source frameworks reviewed for this report included math or reading proficiency in grade 3, grade 4, or both. Our definition aligns with the CORE Districts' definition of academic performance in grades 3–8.[125]

6th grade on track

PK **K12** PS WF

Definition: Grade 6 students are on track to graduate high school on time.

Why it matters: Research on early warning indicators shows that measures of academics, behavior, and course performance in middle school can predict whether students are on track to graduate from high school, and schools can use this information to provide individualized support to students at risk of falling behind.[126, 127] For example, a study of 6th graders in Philadelphia found that 60 percent of the students demonstrating any of the following warning signs eventually left school: attendance below 80 percent, one or more out-of-school suspensions, and failing either math or English.[128] Research also points to the importance of a successful transition from elementary school to middle school for later academic and social-emotional outcomes,[129, 130, 131] perhaps especially so for Black boys.[132]

Recommended metric(s): Percentage of students in grade 6 with passing grades in English language arts and math, attendance of 90 percent or higher, and no in- or out-of-school suspensions or expulsions

Data source: Administrative data; student transcripts

What to know about measurement: Each on-track indicator in the E-W Framework is supported by research conducted in specific district contexts; therefore, the specific criteria used to define whether a student is on track may not predict long-run outcomes equally well in all settings. To define this indicator, we drew on research in the School District of Philadelphia by Balfanz et al. to identify students at risk of not graduating high school.[133] The metrics and thresholds may be different if predicting other outcomes, such as success in college. For example, in addition to the metrics listed here, grantees in the Bill & Melinda Gates Foundation's Network for School Improvement are also measuring whether students have a grade point average (GPA) of 3.0 or higher to determine whether they are on track to graduate high school *and* be academically prepared for college. Research on middle school on-track indicators is ongoing,[134] and multiple approaches exist to identifying students' on-track status.[135] If possible, research based on local data could help validate this measure of students' on-track status in other settings. Three states currently include a middle school on-track indicator as part of their school accountability plan under the Every Student Succeeds Act (ESSA).[136]

Schools record student course grades, attendance, and suspensions data as part of their regular operations, making this indicator feasible to measure. However, reporting of these administrative data to higher levels (district, state, federal) varies, and the underlying data are not necessarily comparable across localities. Because teachers subjectively determine students' grades, a teacher in another school or district might grade a student's performance differently and may be subject to grader bias. An analysis of 20 research studies found consistent evidence of grader bias by students' race, ethnicity, and past poor performance,[137] from elementary school through college. However, grades are consistently very strong predictors of later outcomes across contexts.[138] We note additional considerations about attendance and discipline data under the indicators for *consistent attendance* and *positive behavior*.

Source frameworks: This indicator appeared in recommended K–12 student outcomes and indicators from the Bill & Melinda Gates Foundation as "middle school on track."[139] To define this indicator, we drew on research in the School District of Philadelphia by Balfanz et al.[140]

8th grade on track

PK **K12** PS WF

Definition: Grade 8 students are prepared to transition to high school and are on track to graduate on time.

Why it matters: The transition from middle to high school is one of the most difficult turning points on students' K–12 pathways, especially for Black boys,[141] who experience the greatest drops in grade point average (GPA) from grades 8 to 9. According to research by the UChicago Consortium on School Research,[142] students' attendance, GPA, and course failures in the middle grades are the most accurate indicators of how they will perform in their high school classes, compared to other potential indicators, such as test scores. To provide early targeted support as students enter high school, some local education agencies, such as the CORE Districts, have developed 8th-grade on-track early warning indicators to measure students' high school readiness. Across all states and districts, the most common components of early warning indicators are attendance, behavior, and course grades (the ABCs). (See Balfanz and Byrnes[143] for a state-of-the-field summary of early warning indicators.) Early analyses of the CORE Districts' indicator found that it correctly predicts high school graduation for 9 out of 10 students.[144]

Recommended metric(s): Percentage of students in grade 8 with a GPA of 2.5 or higher, no Ds or Fs in English language arts or math, attendance of 96 percent or higher, and no in- or out-of-school suspensions or expulsions.

Data source: Administrative data; student transcripts

What to know about measurement: Each on-track indicator in the E-W Framework is supported by research conducted in specific district contexts; therefore, the specific criteria used to define whether a student is on track may not predict long-run outcomes equally well in all settings. To define this indicator, we drew on research in California's CORE Districts to identify students at risk of not graduating high school. However, as noted previously, research on middle school on-track indicators is ongoing,[145] and other approaches exist to identifying students' on-track status.[146, 147] As one example, grantees in the Bill & Melinda Gates Foundation's Network for School Improvement use a higher GPA

threshold of 3.0 to determine whether students are on track to graduate high school *and* be academically prepared for college. Research based on local data could help validate this measure of students' on-track status in other settings. Three states currently include a middle school on-track indicator as part of their school accountability plan under the Every Student Succeeds Act (ESSA).

Schools record student GPA, course grades, attendance, and suspensions data as part of their regular operations, making this indicator feasible to measure. However, reporting of these administrative data to higher levels (district, state, federal) varies, and the underlying data are not necessarily comparable across localities. As noted in the discussion of a *6th grade on track* indicator, a teacher in another school or district might grade a student's performance differently and might be subject to grader bias, which can affect the comparability of data on course failures. GPA, which aggregates course grades into a single value, can be more reliable than a single course grade,[148] though GPA calculations (for instance, how courses are weighted) can also differ across contexts. Nevertheless, course grades are highly predictive of later academic success. We note additional considerations about attendance and discipline data under the indicators for *consistent attendance* and *positive behavior*.

Source frameworks: This indicator appeared in two source frameworks reviewed for this report. Our proposed measure aligns with the CORE Districts' indicator of high school readiness.[149]

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Math and reading proficiency in grade 8

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(PK) **K12** (PS) (WF)

Definition: Students demonstrate proficiency in math and reading/English language arts according to high-quality state standards.

Why it matters: Math and reading proficiency are highly predictive of later outcomes, including high school graduation and college enrollment.[150, 151, 152] Reflecting disparities in certain populations' access to strong systems and supports for learning, there are large and persistent gaps between the test scores of students who are Black, Latino, and from low-income households and their White, Asian, and more economically advantaged counterparts.[153, 154, 155] For example, among 8th graders, 44 percent of White students were proficient on the National Assessment of Educational Progress (NAEP) in 2019, compared to 14 percent of Black students and 20 percent of Latino students.[156]

Recommended metric(s): Percentage of students in grade 8 who meet grade-level standards in reading/English language arts and math as measured by state standardized tests

Data source: Assessments

What to know about measurement: Under the Every Student Succeeds Act (ESSA), schools must collect and report test scores for students in grades 3–8,

Percentage of 8th graders proficient on the National Assessment of Educational Progress in 2019

	Math	Reading
American Indian/Alaska Native	15%	19%
Asian/Pacific Islander	62%	54%
Black	14%	15%
Latino	20%	22%
White	44%	42%
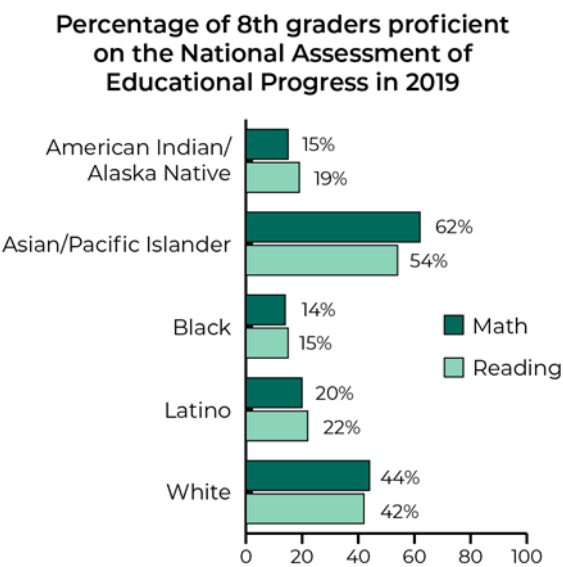
Data source: National Center for Education Statistics (2022).

making data for this indicator broadly available. However, states use different assessments that vary in both content and proficiency standards, as shown by analyses that map proficiency cut scores on state tests to NAEP-equivalent scores.[157] As a result, proficiency rates should not be compared across states, except when using NAEP data, which are available for grades 4, 8, and 12.

This indicator may also measure students' writing proficiency in states where a writing component is included within the English language arts assessment. As of 2019, one-third of states use either the Partnership for Assessment of Readiness for College and Careers (PARCC)[158] or Smarter Balanced[159] tests, both of which include a writing component.[160]

We acknowledge limitations of test-based measures of proficiency, such as the potential for unintended consequences when used for accountability purposes (for example, teaching to the test, incentives for cheating) and limited accessibility of non-English testing for emerging multilingual students.[161, 162, 163] Evidence also shows that when students are encouraged to perform better on standardized tests through a financial reward, their performance improves, sometimes substantially, suggesting that test scores may not fully capture students' true academic proficiency.[164, 165] Despite these concerns, we recommend these indicators because of the demonstrated predictive value of measures of math and reading proficiency, and their potential to be used for intervention purposes.

Source frameworks: This indicator appeared in 12 source frameworks reviewed for this report. For example, our definition aligns with the CORE Districts' definition of academic performance in grades 3–8.[166]

Successful completion of Algebra I by 9th grade

Definition: Students successfully complete Algebra I or an equivalent course before or during grade 9.

Why it matters: Completion of Algebra I by grade 9 is highly predictive of later outcomes, including high school graduation and success in college, and proficiency in algebra is linked to job readiness and higher earnings once students enter the workforce.[167] In addition, Algebra I can act as a "gatekeeper" for access to upper-level math courses that are drivers of college readiness and college completion.[168] White students are more likely than Black and Latino students to take Algebra I earlier and pass the course.[169] Of students who took Algebra I in grade 8, for example, 64 percent of Black students and 72 percent of Latino students received a passing grade, compared to 85 percent of White students. Preparing students for rigorous math coursework in middle school and early high school has been shown to help close racial, ethnic, and socioeconomic achievement gaps.[170]

Recommended metric(s): Percentage of first-time grade 9 students who complete Algebra I or an equivalent course by the end of their 9th-grade year

Data source: Student transcripts

What to know about measurement: Schools record student grade data as part of their regular operations, making this indicator feasible to measure. Calculating this rate would require data from both middle school and high school transcripts, as almost a quarter of students take Algebra I in 7th or 8th grade.[171] We recommend measuring this indicator among first-time 9th-grade students (and not students who repeat 9th grade) to capture whether students are completing Algebra I on time.

Source frameworks: This indicator appeared in five source frameworks reviewed for this report. For example, Algebra I completion by grade 9 appears in the Council of the Great City Schools' Academic Key Performance Indicators.[172]

....

9th grade on track

....

(PK)(**K12**)(PS)(WF)

Definition: Grade 9 students are on track to graduate high school in four years, enroll in postsecondary education, and succeed in their first year of postsecondary education.

Why it matters: Grade 9 is a foundational year on students' paths to on-time high school graduation and postsecondary education. For example, grade point average (GPA) in grade 9 predicts GPA in grade 11, which plays a role in college admissions and predicts students' postsecondary enrollment and first-year postsecondary retention.[173] Research demonstrates the predictive value of other measures of 9th-grade performance as well and the additional benefit of considering multiple measures in grade 9 — rather than a single one—to identify whether students are on track to graduate high school on time.[174] Research on 9th-grade on-track indicators shows they can highlight disparate needs for support for students from different racial, gender, and economic backgrounds.[175] For instance, Black and Latino 9th graders tend to have lower GPAs than their peers.[176] Moreover, 9th-grade on-track indicators can play a critical role in dropout prevention efforts, as highlighted by their use in settings like Chicago Public Schools.[177]

Recommended metric(s): Percentage of students in grade 9 with a GPA of 3.0 or higher, no Ds or Fs in English language arts or math, attendance of 96 percent or higher, and no in- or out-of-school suspensions or expulsions

Data source: Administrative data; student transcripts

What to know about measurement: Each on-track indicator in the E-W Framework is supported by research conducted in specific district contexts; therefore, the specific criteria used to define whether a student is on track may not predict long-run outcomes equally well in all settings. To define this indicator, we drew on recommendations from the Bill & Melinda Gates Foundation and work by the UChicago Consortium on School Research, CORE Districts, and Balfanz and Byrnes.[178] Relative to the early and middle grades, research and measurement of on-track indicators in grade 9 have been more common, though the field has largely focused on dropout prevention rather than college readiness. For example, the metrics and thresholds recommended by Balfanz and Byrnes (such as attendance of 90 percent or higher and no more than one suspension) predict whether students are likely to graduate high school. We suggest raising these thresholds to emphasize readiness to enroll and succeed in postsecondary education. However, research based on local data should validate the criteria used to measure students' on-track status for college.

Schools record student course grades, attendance, and suspensions data as part of their regular operations, making this indicator theoretically feasible to measure. However, reporting of these administrative data to higher levels (district, state, federal) varies, and the underlying data are not necessarily comparable across localities. Currently, 14 states include 9th-grade on-track measures in their Every Student Succeeds Act (ESSA) accountability plans or publicly report this information, but the metrics used vary. For instance, some states focus only on credit accumulation, whereas others

consider course performance in particular core subject areas.[179, 180] We note that relative to data on course grades, which are updated after every marking period, data on credits earned are updated at most twice a year, which make course grades more actionable information for intervention purposes (though both course grades and credits are predictive of later academic outcomes).

Source frameworks: This indicator appeared in two source frameworks reviewed for this report by the Council of the Great City Schools[181] and the Bill & Melinda Gates Foundation.[182]

Grade point average

(PK) (**K12**) (**PS**) (WF)

Definition: Middle school students earn course grades that demonstrate high school readiness; high school students earn course grades necessary to gain admission to college; and college students earn grades high enough to graduate and obtain jobs.

Why it matters: Students' course performance is highly predictive of later outcomes. For example, high school grade point average (GPA) predicts success in college, even more so than test scores.[183] College GPA is also associated with a greater likelihood of graduating. One study found that college students with a one-point higher GPA are 24 percentage points more likely to graduate.[184] College GPA also affects students' eligibility for financial aid and their employment prospects. According to the Job Outlook 2019 survey, 73 percent of employers used college GPA as a screening tool, with a GPA of 3.0 used as the most common threshold.[185]

A national analysis of high school students' GPAs revealed disparities by race and ethnicity, with Asian and Pacific Islander students earning a 3.1 GPA and White students earning a 2.9 GPA, on average, compared to 2.6 for Latino students and 2.5 for Black students.[186] Disparities persist in college, where Black students nationwide are nearly three times as likely as White students to graduate with a GPA below 2.5.[187] Course grades reflect a student's effort and skills[188] as well as grader bias—an analysis of 20 research studies found consistent evidence of grader bias by students' race, ethnicity, and past poor performance, from elementary school through college.[189]

Recommended metric(s):

- Percentage of students in grades 6–8 with a GPA of 3.0 or higher
- Percentage of students in grades 9–12 with a GPA of 3.0 or higher
- Percentage of college students with a GPA of 3.0 or higher

Data source: Student transcripts

What to know about measurement: Schools and colleges record student GPAs as part of their regular operations, making this indicator feasible to measure, although reporting of student transcript data to higher levels (district, state, federal) varies. In addition to the risk of grading subjectivity and bias noted earlier, there is evidence of different grading criteria across postsecondary institution types[190] and of grade inflation at the postsecondary level.[191] GPA, which aggregates course grades into a single value, can be more reliable than a single course grade,[192] though GPA calculations can differ across localities. In addition, a student's GPA may be related to their *relative* performance among other students at their

school or college, a phenomenon sometimes called "the frog pond effect." Therefore, although GPA is a highly predictive measure, care should be taken in comparing GPA values across contexts.

Source frameworks: This indicator appeared in 10 source frameworks reviewed for this report. The suggested thresholds draw on studies by the UChicago Consortium on School Research showing that a high school GPA of 3.0 is the threshold above which students' probability of graduating college becomes greater than 50 percent.[193, 194] The suggested thresholds also draw on survey research by the National Association of Colleges and Employers[195] revealing that employers most commonly use a 3.0 threshold as a screening tool for job applicants.

Math and reading proficiency in high school

(PK) (**K12**) (PS) (WF)

Definition: Students demonstrate proficiency in math and reading/English language arts according to high-quality state standards.

Why it matters: Math and reading proficiency are highly predictive of later outcomes.[196, 197, 198, 199] In high school, measures of students' academic proficiency can be used to identify high-achieving students from marginalized backgrounds for the purposes of college access and outreach initiatives.[200, 201] Researchers have also identified a possible role for test scores as part of on-track indicator systems.[202] Reflecting disparities in access to strong systems and supports for learning, there are large and persistent gaps between the test scores of Black, Latino, and low-income students, and the scores of their White, Asian, and economically advantaged counterparts.[203]

Recommended metric(s): Percentage of tested students who meet grade-level standards in reading/English language arts and math, as measured by state standardized tests

Data source: Assessments

What to know about measurement: Under the Every Student Succeeds Act (ESSA), schools are required to collect and report test scores for students in one grade level in high school. However, testing for a specific high school grade level is not required, so tested grade levels vary widely in practice, as do the types of assessments used across states (including state proficiency tests, end-of-course tests, and college readiness tests such as the Preliminary SAT [PSAT], ACT, and SAT). This variation severely limits the comparability of this indicator. Proficiency rates should not be compared across states except when using National Assessment of Educational Progress (NAEP) data, which are available for grades 4, 8, and 12. Despite this and other concerns, including those discussed under the indicators of proficiency in grades 3 and 8, we recommend measuring high school math and reading proficiency because of the predictive value of this information and its potential to be used for intervention purposes. We encourage the field to converge on tested grades and approaches to assessment that best support high school students' learning.

Source frameworks: This indicator appeared in seven source frameworks reviewed for this report, including the Urban Institute's Robust and Equitable Measures to Identify Quality Schools (REMIQS) framework,[204] CORE Districts Improvement Measures, [205] and the National Academies Framework for Monitoring Educational Equity.[206]

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College preparatory coursework completion

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(PK) (**K12**) (PS) (WF)

Definition: High school students meet typical coursework requirements for admission to a four-year college.

Why it matters: A high school education should ensure that students are eligible to pursue their chosen pathway after graduation. In many states, however, the requirements for a high school diploma fall short of the admissions criteria at many four-year colleges and universities.[207] Thus, completing a full set of college preparatory coursework is a key milestone on students' pathways to higher education. Moreover, when students enter postsecondary education without first completing the necessary courses, they may be placed in remedial or developmental courses, and thus spend time and financial resources without advancing toward a degree.[208] Many high school graduates do not meet the eligibility requirements for four-year colleges. For example, 52 percent of all California high school graduates in 2020–2021 met course requirements for admission into the University of California and California State University systems (that is, passed college preparatory courses, known as A-G courses, with a grade C or higher).[209] These rates differed by race, ethnicity, and household income. Seventy-seven percent of Asian students and 57 percent of White students met the California A-G course requirements, compared to 45 percent of Latino students, 43 percent of Black students, and 33 percent of American Indian and Alaska Native students.

Recommended metric(s):

- Percentage of high school graduates who successfully complete the coursework required for admission to a four-year college or university, which includes:

    – Four years of English classes

    – Four years of math classes (including at least four of the following: pre-algebra, algebra, geometry, Algebra II or trigonometry, precalculus, calculus, statistics, quantitative reasoning, and data science)

    – Three years of laboratory science (including biology, chemistry, and physics)

    – Two years of social sciences

    – Two years of foreign language

    – One year of visual or performing arts

Percentage of students meeting California A-G course requirements by race/ethnicity in 2021

Race/Ethnicity	Percentage
American Indian/Alaska Native	33%
Asian/Pacific Islander	77%
Black	43%
Latino	45%
White	57%
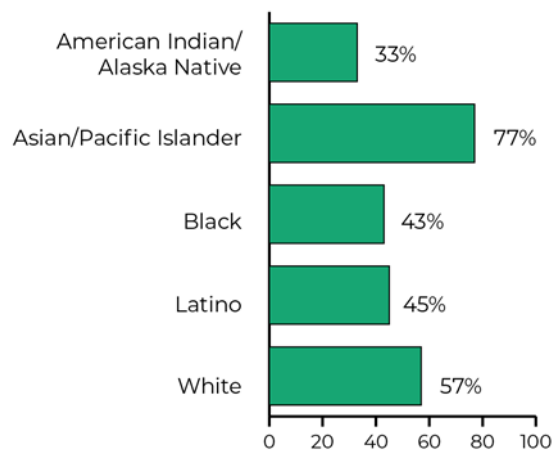
Data source: California Department of Education (2021).

Data source(s): Student transcripts

What to know about measurement: As part of their operations, schools regularly record student course enrollment and grade data, making this indicator feasible to measure if courses that meet these requirements are consistently defined and identified in data systems. Although reporting of student transcript data to higher levels (district, state, federal) varies, as do course names and definitions,

reporting data on whether students are meeting course requirements would be feasible at different levels. Our recommended metric follows recommendations by the National Association for College Admission and Counseling (NACAC).[210] Some of these recommendations are also aligned to states' high school graduation requirements—for example, 45 states require four years of English.[211] High school graduation requirements in other subjects, however, often fall short, particularly in math where the requirements in nearly one in five states are misaligned to the admissions criteria at their respective flagship university.[212]

Source frameworks: Several frameworks reviewed for this report discussed the importance of academic rigor in high school; however, only two source frameworks, the Urban Institute's Robust and Equitable Measures to Identify Quality Schools (REMIQS)[213] and the National Education Association's (NEA) Great Public Schools Indicators Framework,[214] specifically referenced completion of college preparatory courses. As discussed above, our recommended metric draws on recommendations by the NACAC.

Early college coursework completion

PK **K12** **PS** WF

Definition: High school students successfully complete early college coursework (Advanced Placement [AP], International Baccalaureate [IB], or dual credit).

Why it matters: There is growing evidence that participation in accelerated postsecondary pathways (such as early college high schools and dual enrollment) has a positive impact on students' high school graduation and postsecondary enrollment and completion.[215, 216, 217, 218] For example, Texas high school graduates who took more than one AP/IB course were more likely to enroll in a four-year college.[219] Engaging in early college coursework has been shown to predict future success in college,[220, 221] and earning early college credit by passing an AP exam also has a positive impact on college admissions scores and on-time postsecondary degree completion.[222, 223] According to an analysis of national data, even in schools that offer similar availability to AP courses, Black, Latino, and Indigenous students are less likely to be enrolled and earn college credit if they do enroll compared to other student groups.[224] For instance, for every 1,000 Asian students in public high schools, 375 take an AP course and 215 pass an AP test, whereas for every 1,000 Black students, 105 take an AP course and 21 pass an AP test. There is also evidence of inequitable participation in dual enrollment courses.[225]

Recommended metric(s):

- Percentage of high school students who enroll in and pass at least one early college course (AP, IB, or dual credit)
- Percentage of students enrolled in early college coursework who earn credit-bearing scores on end-of-course tests (for example, a score of 3 or higher on AP tests or 5 or higher on IB tests) or earn postsecondary credit within their dual enrollment courses

Data source(s): Student transcripts; assessments

What to know about measurement: As part of their regular operations, schools record student course enrollment and grade data, from which course completion can be determined. Schools also receive data on students' AP and IB exam scores. In the case of dual enrollment, however, K–12 districts must have

formal agreements with nearby participating colleges where students enroll to ensure data are being shared (and that course offerings allow students to earn transferrable college credit). Although reporting of student transcript data and exam scores to higher levels (district, state, federal) varies, it would be feasible to report course completion and exam-passing data at different levels.

Although course participation and AP/IB scores are comparable across contexts, not all students have equal access to these courses or exams, which affects interpretation of our suggested metrics, particularly when comparing them across localities. For instance, exam pass rates may be higher in districts where fewer students are given the opportunity to take the exams. Therefore, we provide additional information on measuring access under the E-W system indicator on *access to early college coursework.* Twenty-five states require districts to offer AP, IB, dual enrollment, or other similarly rigorous courses,[226] and many also mention the following early college coursework options for meeting college and career readiness requirements in their Every Student Succeeds Act (ESSA) plans: AP (22 states), dual credit/dual enrollment (18 states), advanced courses or accelerated learning (15 states), and IB (12 states).[227, 228]

Source frameworks: Ten source frameworks reviewed for this report discussed the importance of early college course completion, AP, IB, and dual enrollment, or both. For example, our choice to include both enrollment in and completion of AP, IB, or dual enrollment courses aligns with the recommendations of the National Academies' Educational Equity Indicator Systems.[229]

SAT and ACT participation and performance

PK **K12** PS WF

Definition: High school students take and earn a "college-ready" score on the ACT or SAT before graduating high school.

Why it matters: Although test-optional and test-blind college application policies are on the rise, college entrance tests like the ACT and SAT have long played a gatekeeping role in students' college prospects and may still play a role in determining college course placement. According to the National Association for College Admission Counseling (NACAC), 55 percent of all four-year colleges and universities nationwide (nearly 1,600 institutions) waived standardized testing requirements for 2020–2021,[230] a trend that continued in 2021–2022, when more than 1,800 four-year institutions were test optional.[231] Nevertheless, evidence suggests that such tests can be a useful and cost-effective approach for identifying high-achieving students from marginalized backgrounds for the purposes of college access and outreach initiatives.[232] There is also evidence that universal testing mandates requiring all students to take the ACT or SAT raise college enrollment rates among students from low-income households.[233] However, there are persistent disparities in the test scores of Black, Latino, and students from low-income households, and their White, Asian, and economically advantaged counterparts.[234, 235, 236] In addition, the disparity between White and Black students' SAT scores remains virtually unchanged at .92 standard deviations over the past 15 years, which is a considered a large magnitude of difference.[237]

Recommended metric(s):

- Percentage of grade 11–12 students who take the SAT/ACT

- Percentage of grade 11–12 students who earn a "college-ready" score, based on the benchmarks set by the SAT and ACT

Data source(s): Assessments

What to know about measurement: Amidst ongoing changes in college admissions policies[238] and concerns about the fairness of admissions tests,[239, 240] framework users should be aware of evolving considerations when implementing this indicator. Although differences in educational opportunities can account for some of the disparities in scores among groups of students, and these tests have been validated[241] for use with diverse populations, there is also some evidence of racial and cultural biases within the test questions themselves.[242, 243] Research also shows that test scores are manipulable through test prep; thus, the tests may conflate students' college-ready skills and knowledge with their access to test prep resources.[244] Disparities in test scores may also be attributable to stereotype threat.[245] Due at least in part to these concerns, some university systems have eliminated their use in admissions policies.[246, ii] On the other hand, expanding access to college admissions tests has been shown to help low-income students who otherwise might not take the tests enroll in college at higher rates,[247] leading to questions about the extent to which these measures bar or promote equitable access to higher education.[248]

Although many colleges and universities have recently adopted test-optional admissions policies, a trend which the COVID-19 pandemic has accelerated,[249] we recommend that educational entities continue to track the rate at which students both take and earn college-ready scores on the SAT and ACT, given the gatekeeping role these tests have historically played in access to higher education. Our first recommended metric—participation rate—can shed light on whether students have access to college admissions tests. As of 2018, 25 states required high school students to take the ACT or SAT (which the state paid for).[250] Our second metric uses benchmarks set by the ACT and SAT for the minimum scores associated with "a high probability of success in credit-bearing first-year college courses."[251] In 2022, the SAT benchmarks were 480 for evidence-based reading and writing and 530 for math. For the ACT, the benchmarks were 18 for English, 22 for math and reading, and 23 for science. As of 2018, at least 11 states included the ACT/SAT college-ready benchmarks as an option for students to meet college and career readiness requirements in their Every Student Succeeds Act (ESSA) plans.[252] We encourage framework users to stay abreast of further changes in policies and evidence regarding use of the ACT and SAT.

Source frameworks: SAT participation and/or performance was included in six sources reviewed for this report. For example, the College Readiness Indicator Systems (CRIS)[253] menu of college readiness indicators includes both SAT/ACT score and SAT/ACT participation.

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ii For example, following a 2019 lawsuit filed on behalf of the Compton Unified School District, the University of California Board of Regents voted unanimously in May 2020 to stop requiring the ACT and SAT as part of admissions applications. The state plans to introduce a new assessment in their place.

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FAFSA completion
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(PK) (**K12**) (**PS**) (WF)

Definition: Grade 12 students eligible for federal financial aid complete the Free Application for Federal Student Aid (FAFSA) by June 30.

Percentage of high school seniors who did **not** complete the FAFSA in 2013, by socioeconomic status
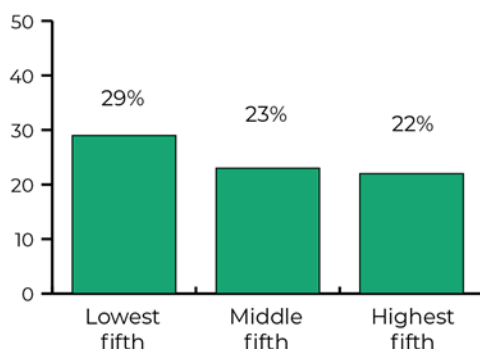
Data source: National Center for Education Statistics (2018).

Why it matters: Students who report completing a FAFSA are more likely to enroll in college, enroll in a four-year rather than a two-year college, and enroll full time rather than part time compared to students who do not complete an application.[254, 255, 256] For example, students from low-income households who complete a FAFSA are 127 percent more likely to enroll in college in the fall after graduating high school than their peers who do not.[257] One study found that, among students who applied and were admitted to college, there was a 29 percent difference in enrollment—84 percent of students who were admitted and completed the FAFSA enrolled in a four-year college, compared with 55 percent enrollment by students who were admitted but did not complete the FAFSA.[258] Among the high school class of 2015, students from low-income households were less likely to submit the FAFSA (71 percent) compared to students from middle-income households (77 percent), despite having greater financial need. In addition, Latino students were less likely to complete the FAFSA (75 percent) compared to Black students (81 percent) or Asian students (84 percent).[259] Being flagged for FAFSA verification increases the likelihood that a college-intending student will delay enrollment, and students of color are more likely to be flagged for FAFSA verification than White students.[260]

Students who are eligible for financial aid but do not apply forgo a total of $24 billion in aid, adding to their student debt.[261] Recognizing the importance of FAFSA completion, at least six states have made it a requirement for high school graduation; several more are considering following suit.[262]

Recommended metric(s): Percentage of grade 12 students who complete the FAFSA by June 30

Data source(s): Administrative data

What to know about measurement: Records of FAFSA completion are federally collected and reported at aggregate levels by high school and district by the office of Federal Student Aid (FSA).[iii] At least 49 states have access to student-level data from FSA through the Student Aid Internet Gateway agreement, but only 38 states have established a data-sharing process for making student-level FAFSA completion data available to schools, as summarized by the National College Attainment Network.[263]

The FAFSA does not currently collect information on applicants' race/ethnicity; therefore, it is not currently possible to disaggregate federal FAFSA completion data (current research on differences in completion rates by subgroup typically includes survey data). The FAFSA Simplification Act contains several provisions that will modify current application and eligibility determination processes beginning in the 2023–2024 school year, including a provision that will require race/ethnicity data to be collected.[264]

To be eligible to submit a FAFSA, students must be U.S. citizens or eligible noncitizens, so care should be taken in interpreting completion rates in schools with immigrant populations. Undocumented students are eligible for state financial aid in at least seven states,[265] and E-W systems should also track whether students are completing state aid applications in addition to FAFSA.

Source frameworks: This indicator appeared in five source frameworks reviewed for this report. Our proposed measure aligns with work by the Education Strategy Group on the From Tails to Heads framework.[266]

> ### Access to student-level FAFSA completion data in Iowa
>
> As of 2019, all public high schools in Iowa receive student-level FAFSA completion data. An ambitious effort to overhaul the process of student-level data sharing was accomplished by Iowa College Aid in coordination with the Area Education Agencies' Postsecondary Readiness and Equity Partnership (AEA PREP). All schools now receive weekly FAFSA reports from their regional AEA PREP, which has data-sharing agreements with local schools. These reports are stored in a Google Drive folder where the school's local access manager, usually a school counselor, can access the data via the Iowa College Aid Processing System (ICAPS). Reports include information such as whether each student has completed the FAFSA, is missing signatures, or has been selected for verification.
>
> In the past, high schools relied on students' self-reports to estimate their FAFSA completion rates in a timely way. Thanks to the Student Aid Internet Gateway (SAIG), hosted by the office of Federal Student Aid (FSA), states now have access to student-level data. However, although states can now access FAFSA data, some still face challenges getting the data from FSA into the hands of districts, schools, and community-based organizations, underscoring the importance of learning from states like Iowa. According to the National College Attainment Network, other states with exemplary FAFSA data-sharing procedures include California, Arizona, and Rhode Island.

[iii] To report the number of students who submitted the FAFSA by high school, the office of FSA uses an automated process to aggregate counts based on the school names students enter on their applications. Because these names are not standardized, FSA cautions that the reported data "may not represent an exact count." This limitation and others of the aggregate FAFSA completion data reported by FSA are summarized here.

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College applications
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(PK) (**K12**) (PS) (WF)

Definition: Grade 12 students submit a well-balanced portfolio of at least three college applications.

Why it matters: Before students can attend college, they must first apply. Research shows that students who apply to at least two colleges are more than 40 percent more likely to enroll in a four-year college than those who apply to only one.[267] There are disparities by race, ethnicity, and income in the rates at which students apply to college. One study found, for instance, that students from low-income households were less likely to apply to college and less likely to apply to multiple colleges than their peers.[268] As another example, among Chicago Public School (CPS) students who aimed to achieve a four-year degree, Black and Latino students were least likely to apply to and enroll in college.[269]

Recommended metric(s): Percentage of grade 12 students who submitted at least three college applications

Data source(s): Administrative data or surveys

What to know about measurement: For schools that do not already systematically record if or where students apply to college, this metric will require a new system for tracking the number of applications each grade 12 student submits or linking to existing data. Currently, about 40 percent of high schools use Naviance, an online tool that allows schools to track and manage students' college application and admission processes.[270] In 2020, almost one million students submitted college applications through the Common App, which serves more than 900 colleges and universities.[271] Linking to existing administrative data sources such as Naviance and Common App is likely to result in more accurate data and be less burdensome to school staff than collecting data through student self-reported surveys.

To define this indicator, we drew on recommendations from the Bill & Melinda Gates Foundation. We see submitting three applications to a well-balanced portfolio of postsecondary institutions as a foundational goal and encourage schools and districts to consider setting more ambitious goals. In particular, we note examples such as OneGoal, a nonprofit organization that encourages students to apply to at least seven colleges or similar postsecondary programs, and the Knowledge Is Power Program's (KIPP) College Match Framework,[272] which tracks the percentage of students who apply to at least six "likely/target/reach" colleges and nine total colleges, but allows regions to set different targets for students with a grade point average (GPA) below 2.0 or ACT score below 16. A well-balanced portfolio includes postsecondary institutions of varying selectivity levels, where students face different likelihoods of admission based on their academic profile, and should also reflect students' needs, interests, and aspirations.

Source frameworks: This indicator appeared in four source frameworks reviewed for this report, including Education Strategy Group's From Tails to Heads framework.[273] Our proposed measure draws on work by the Bill & Melinda Gates Foundation.[274]

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High school graduation

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(PK) (**K12**) (PS) (WF)

Definition: Students graduate from high school with a regular diploma within four, five, and six years of entering high school.

Adjusted cohort graduation rates by race/ethnicity in 2015 and 2019
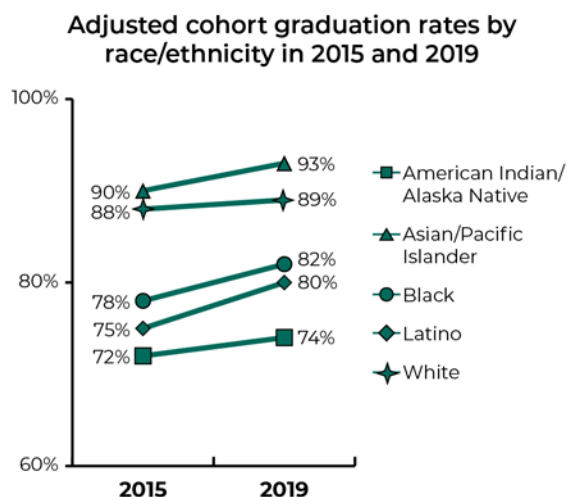
Data source: National Center for Education Statistics (2016, 2021).

Why it matters: High school graduation is a critical milestone along the pathway to a multitude of better life outcomes, including the likelihood of attending college.[275, 276, 277, 278, 279] In contrast, individuals who leave school before earning a high school diploma face bleak economic, social, and health prospects.[280,281, 282] There are narrowing but persistent gaps in graduation rates for students from low-income households; Black, Latino, and Indigenous students; and emerging multilingual students.[283] For example, in 2019, 93 percent of Asian/Pacific Islander students and 89 percent of White students graduated on time, compared to 82 percent of Latino students, 80 percent of Black students, and 74 percent of Indigenous students.[284]

Recommended metric(s): Adjusted cohort graduation rate (the percentage of first-time 9th graders who graduate with a regular diploma within four, five, and six years of entering high school, regardless of whether they transferred schools)

Data source(s): Administrative data

What to know about measurement: High school completion is regularly reported in administrative data systems, and the metric definition (adjusted cohort graduation rate) has been adopted across the country. However, states (and in some cases, districts) have leeway to set graduation requirements. For example, 17 states specify non-course requirements in addition to course requirements, which also vary.[285] Given significant increases in graduation rates over time and their use for school accountability, there has been some concern that localities are incentivized to "lower the bar" or "game" the calculation of the adjusted cohort rates (for example, by removing certain students from the cohort count). Although some instances of problematic practices have been documented, research suggests standards for graduations have not been lowered and the observed improvements in the data are largely substantiated.[286, 287]

On-time graduation in four years is most commonly reported, as it is the time to graduation that most students should aim to achieve. As such, it is important to ensure equitable outcomes in four-year rates. However, examining four-year graduation rates only can mask the achievements of students who may need more time to graduate (for example, special education students), so we recommend measuring five- and six-year graduation rates as well. Data systems should also collect information on whether students complete a high school equivalency credential.

Source frameworks: This indicator appeared in 13 source frameworks reviewed for this report. Our proposed measure aligns with the CORE Districts' Improvement Measures, which include four-, five-, and six-year cohort graduation rates.[288]

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Selection of a well-matched postsecondary institution

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(PK) (**K12**) (**PS**) (WF)

Definition: High school graduates select the best "match" college among the institutions to which they were admitted, based on the institutional graduation rate of similar students.[iv]

Why it matters: Nationwide, 50 percent of students from low-income families attend a less selective college than those to which they have access, even though attending a more selective college can lead to higher graduation rates and future income.[289, 290] For Black and Latino students and students whose parents have lower education levels, the economic returns of attending more selective colleges are large.[291] However, most high-achieving students from low-income households do not apply to any selective postsecondary institutions.[292]

Recommended metric(s): Percentage of high school seniors who select a college within 10 percentage points of the best matched postsecondary institution to which they were admitted, based on the institution's graduation rate for similar students by race, ethnicity, or income status (as measured by Pell Grant receipt).

Data source(s): Administrative data

What to know about measurement: This indicator requires linking K–12 and postsecondary records to determine where a student enrolled in college. Individual-level data on high school students' postsecondary enrollment can be obtained through state longitudinal data systems and the National Student Clearinghouse (NSC). The NSC receives

> **KIPP's [College Match Strategies Framework](#)**
>
> Each fall, Knowledge Is Power Program (KIPP) counselors work with high school seniors to create a college "wish list" based on their academic achievement, financial needs, and personal interests. Students and families are given access to a match tool that provides personalized information about "likely," "match," and "reach" colleges for that student, based on grade point average (GPA) and ACT/SAT scores, along with data on the graduation rate and net price of each college. Counselors offer guidance on how to select a good mix of schools to which to apply, develop strong applications, request application waivers from colleges, and apply for financial aid.
>
> Using a centralized data system, counselors track students' wish lists—and later, their applications, admissions, and enrollment— which they use to follow up with students at key points in their senior year. Supporting this process is a set of key performance indicators that KIPP monitors; they include the share of seniors who apply to at least nine colleges by December, submit financial aid applications by February, and enroll in college by the following October. KIPP then determines which students did not enroll or enrolled in a college with a much lower underrepresented minority (URM) graduation rate (10 percentage points or lower) than the college with the highest URM graduation rate to which they were admitted. Each year, staff analyze the data to measure progress over time in helping students attend not just any college but one that is a good match.

[iv] As an alternate definition, we define "undermatch" as enrolling at an institution with a lower level of success for underrepresented minority (URM) students than those to which the student had access.

student-level postsecondary enrollment records from participating institutions on a regular basis and links high school and postsecondary records for districts or states that participate in its High School Tracker service.[293] In 2020, 14 percent of all high schools in the U.S., representing about 24 percent of high school graduates, participated in the High School Tracker service.[294] Postsecondary institutions reporting to the NSC capture approximately 97 percent of all postsecondary enrollment in Title IV degree-granting institutions; however, some types of institutions are less likely to report to the NSC, especially private two-year colleges and for-profit institutions.[295, v] State higher education departments may have direct access to enrollment records for in-state colleges and may supplement these data with records from the NSC to capture out-of-state enrollment. Currently, 33 states link K–12 and postsecondary records as part of their state longitudinal data systems.[296]

To determine whether the institution where a student enrolled is a "match," we recommend using institutional-level graduation rates reported in the Integrated Postsecondary Education Data System (IPEDS) for all Title IV degree-granting institutions. These data can be used to compare the graduation rates of the institution where the student enrolled to the graduation rates of the other institutions where the student was admitted. Because several factors should inform whether a college is a good "match" for a student—not just the institution's graduation rate—we recommend allowing for a 10-percentage-point difference between the graduation rate of the institution where the student enrolled and the highest graduation rate among the institutions where the student was admitted. This threshold is used by Knowledge Is Power Program (KIPP) schools (see the callout box above for more information on the KIPP approach).

We recommend basing match on institutional graduation rates for students with background characteristics similar to the student in question (for example, students of color or those from low-income households). IPEDS reports institutional graduation rates by gender, race and ethnicity, and Pell Grant receipt. However, it is worth noting that graduation rates in IPEDS are based on full-time, first-time, degree- or certificate-seeking students, and therefore do not include part-time and transfer students. Although the NSC collects individual-level completion records, it does not report institutional-level graduation rates publicly, so IPEDS is still the best source of graduation rates for all postsecondary institutions in the country.[vi] Schools and states should use the more accurate rates from their state longitudinal data system if available.

We acknowledge that there are several emerging definitions of "college match" in the field that have varying benefits and limitations. Our recommended definition and measure leverage those used by KIPP, which are not based on students' academic qualifications, but rely instead on the colleges where the student was admitted. Another approach that is not based on students' academic qualifications, used by the Vela Institute, determines students' choice set based on nearby colleges with similar selectivity levels as the college where the student enrolled. An advantage of our recommended metric is that it is relatively straightforward to operationalize compared to definitions researchers have used, which require statistical or geospatial analysis. A disadvantage is that it can be applied only at the enrollment stage, whereas more complex calculations allow match to be assessed at the earlier application and admission stages, when it is also possible for students to undermatch. However,

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[v] For additional caveats about NSC data, see Dynarski, S. M., Hemelt, S. W., & Hyman, J. M. (2015). The missing manual: Using national student clearinghouse data to track postsecondary outcomes. *Educational Evaluation and Policy Analysis, 37*(1S), 53S-79S. https://doi.org/10.3102/0162373715576078

[vi] Some K–12 districts calculate institutional graduation rates based only on their students. For example, the District of Columbia Public Schools (DCPS) calculates a district-specific rate for postsecondary institutions that have had at least 20 DCPS high school graduates attend across two cohorts.

research with KIPP Northern California found that high rates of undermatch in enrollment can occur among students from low-income households and students of color even when there is limited undermatch in their applications and admissions—namely, although 97 percent of recent graduates applied to at least one well-matched postsecondary institution and 94 percent were admitted to least one well-matched postsecondary institution, only 60 percent eventually enrolled in a well-matched postsecondary institution.[297]

Source frameworks: This indicator appeared in four source frameworks reviewed for this report. As discussed above, our proposed measure aligns with the KIPP College Match Strategies framework.

Senior summer on track

PK **K12** **PS** WF

Definition: High school graduates intending to enroll in postsecondary education in the fall after high school graduation complete the registration, financial, and logistic deadlines over the summer necessary to successfully enroll in the fall.

Why it matters: Disparities in college enrollment are compounded by the period of transition from high school to college: between 10 and 40 percent of graduating high school seniors who intend to attend college do not matriculate in the fall, with rates of "summer melt" especially high among college-intending students from low-income households.[298, 299] For example, an analysis of Chicago Public Schools graduates found that 20 percent of students who planned to attend a four-year college in the fall and had been accepted into one did not enroll in the fall.[300] One reason for the summer melt phenomenon is the number and complexity of tasks students must complete before they can successfully enroll in college. For students from low-income or first-generation households in particular, these tasks create an additional barrier during the time when they are out of high school, but not yet in college and therefore may have limited access to supports. Studies show that text messaging interventions that remind students about pre-matriculation tasks and connect them to support from counselors or peers can reduce summer melt and raise enrollment among low-income students.[301, 302, 303]

Recommended metric(s): Percentage of high school graduates reporting intentions to enroll in postsecondary education in the fall who successfully enroll in a postsecondary institution by October 31 following their high school graduation

Data source(s): Administrative data; surveys

What to know about measurement: This indicator can and should be measured by both K–12 and postsecondary institutions. In its summer melt handbook, the Strategic Data Project at Harvard University's Center for Education Policy Research recommends (1) determining which students intend to enroll in college in the fall after high school graduation (for example, through an exit survey fielded in the last month of high school or through administrative records), (2) determining which students actually enroll in college in the fall, and (3) determining the rate of summer melt using the information gathered in Steps 1 and 2.[304] The handbook includes other guidance on measurement and intervention. For example, as part of Step 1, it recommends asking students to provide updated contact information, including their cell phone number and email address, to allow schools to conduct outreach during the summer. For Step 2, institutions may use enrollment data from the National Student Clearinghouse

(NSC) and/or state longitudinal data systems. Postsecondary institutions reporting to the NSC capture approximately 97 percent of all postsecondary enrollment in Title IV degree-granting institutions; however, some types of institutions are less likely to report to the NSC, especially private two-year colleges and for-profit institutions.[305]

Source frameworks: The Bill & Melinda Gates Foundation K–12 Student Outcomes and Indicators include a measure of senior summer on track, which aligns with this indicator.

Postsecondary enrollment directly after high school graduation

PK **K12** **PS** WF

Definition: High school graduates enroll in a postsecondary institution by October 31 following their high school graduation.

Why it matters: College attainment is consistently associated with higher lifetime earnings, and greater benefits accrue with each additional year of education completed.[306, 307, 308, 309] However, there are persistent disparities in postsecondary enrollment for students from low-income households and students of color.[310] Among the high school class of 2019, 66 percent of students enrolled in college in October. Rates of immediate enrollment after high school were lower among Black students (57 percent) and Latino students (64 percent) than White students (69 percent) and Asian students (82 percent).[311] Postsecondary enrollment has continued to fall for each year of the COVID-19 pandemic, dropping 6.5 percent from fall 2019 to fall 2021, with larger decreases among Black, Indigenous, and White students compared to other racial and ethnic groups.

Disparities in rates of college enrollment are primarily driven by enrollment in four-year colleges. For example, in Chicago Public Schools (CPS), Black, White, and Asian high school graduates enrolled in two-year colleges at similar rates, whereas Latino students enrolled in two-year colleges at higher rates than all other groups; conversely, Latino students had the lowest rates of four-year college enrollment, followed by Black students.[312] Thirty-three percent of Latino male students and 40 percent of Black male students enrolled in a four-year college, compared to 57 percent of White male students and 59 percent of Asian male students. Although female students were more likely to enroll in a four-year college than male students, the disparities across race and ethnicity were similar among female students.

Recommended metric(s): Percentage of high school graduates who enroll in a postsecondary institution by October 31 following their high school graduation[vii]

Data source(s): Administrative data

What to know about measurement: This indicator requires linking K–12 and postsecondary records. The National Student Clearinghouse (NSC) receives student-level postsecondary enrollment records from participating institutions on a regular basis and links high school and postsecondary records for districts or states that participate in its High School Tracker service.[313] In 2020, 14 percent of all high schools in the U.S. (representing about 24 percent of high school graduates) participated in the High

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[vii] This indicator captures enrollment in all for-credit postsecondary education, including credit-bearing career and technical education (CTE) courses. Enrollment in non-credit CTE coursework is captured in the *successful career transition after high school* indicator.

School Tracker service.[314] It is critical to understand not only whether students enroll in postsecondary education directly after high school, but also the type of institution where they first enroll. Postsecondary institutions reporting to the NSC capture approximately 97 percent of all postsecondary enrollment in Title IV degree-granting institutions; however, some types of institutions are less likely to report to the NSC, especially private two-year colleges and for-profit institutions.[315, viii] State higher education departments may have direct access to enrollment records for in-state colleges and may supplement these data with records from the NSC to capture out-of-state enrollment. Currently, 33 states link K–12 and postsecondary records as part of their state longitudinal data systems.[316]

Source frameworks: This indicator appeared in 17 source frameworks reviewed for this report. Our proposed measure aligns with work by Education Strategy Group on the From Tails to Heads framework.[317]

First-year credit accumulation

PK K12 **PS** WF

Definition: Students attempt and complete sufficient credits during their first undergraduate year to be on track for on-time degree completion.

Why it matters: On-track credit accumulation is positively associated with degree completion.[318, 319, 320] One study found that students who complete more than 20 credits in their first year are nearly three times as likely to complete a degree, certificate, or transfer than students who earn less than 20 credits in their first year.[321] Research also suggests disparities in credit accumulation, with students from low-income households, first-generation students, Black students, and Latino students accumulating credits less quickly relative to others.[322, 323, 324]

Recommended metric(s): Percentage of students attempting and completing sufficient credits toward on-time completion in their first year: 30 credits for full-time and 15 credits for part-time students

Data source(s): Administrative data; student transcripts

What to know about measurement: Data on first-year credit accumulation currently are not widely available to the public because they are not included in the Integrated Postsecondary Education Data System (IPEDS). However, colleges collect these measures, and the National Student Clearinghouse (NSC) offers the Postsecondary Data Partnership service to help them track and analyze these data, including benchmarking against other institutions. Credit accumulation is generally comparable across institutions, though there may be some institution-specific differences in how credits are assigned to classes.

Source frameworks: This indicator appeared in five source frameworks reviewed for this report. Our proposed measure aligns with work by the Institute for Higher Education Policy.[325]

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viii For additional caveats about NSC data, see Dynarski, S. M., Hemelt, S. W., & Hyman, J. M. (2015). The missing manual: Using national student clearinghouse data to track postsecondary outcomes. *Educational Evaluation and Policy Analysis,* 37(1S), 53S-79S. https://doi.org/10.3102/0162373715576078

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First-year program of study concentration

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(PK) (K12) **PS** (WF)

Definition: Postsecondary students demonstrate selection of a program of study by completing nine credits or three courses in a meta-major[ix] during their first year.

Why it matters: Community college students are often presented with a "menu" of course-taking options and receive little guidance on which courses to take, and in which order.[326, 327] Students who do not concentrate in a program of study within their first year at a community college are less likely to earn a credential (with "concentrate" defined as accumulating nine credits within a meta-major). Jenkins and Cho showed that 40 to 50 percent of students who concentrated in a program area had earned a certificate or associate's degree, transferred to a four-year institution, or earned a bachelor's degree within five years, compared to less than 15 percent of students who did not concentrate within their first year.[328]

Recommended metric(s): Percentage of students completing at least nine credits (or three courses) within a meta-major during their first year in postsecondary education

Data source(s): Administrative data; student transcripts

What to know about measurement: Course-taking patterns of first-year students can be measured using student transcript data tracked in postsecondary institutions' data systems, but these data typically are not publicly available and reported. Nguyen et al.[329] provide guidance for using course data and degree requirements to consistently classify meta-majors, and the National Student Clearinghouse (NSC) Postsecondary Data Partnership tracks this measure. Jenkins and Cho[330] note that whether students declare a major in their first year does not adequately capture the program of study selection, given that declaring a major does not necessarily mean students have completed multiple courses in that meta-major. Therefore, we recommend using course data rather than information on student major for this indicator.

Source frameworks: This indicator appeared in four source frameworks reviewed for this report. Our proposed measure aligns with work by the Institute for Higher Education Policy.[331]

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Gateway course completion

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(PK) (K12) **PS** (WF)

Definition: Completion of college-level introductory math and English courses, as defined by each postsecondary institution, during the first year of college.

Why it matters: Early completion of college-level math and English is positively associated with degree completion. Students who complete college-level math within their first two years of enrollment are nearly three times as likely to complete a certificate, degree, or transfer as students who did not, and

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[ix] Meta-majors included in IHEP's Postsecondary Metrics framework: education; arts and humanities; social and behavioral sciences and human services; science, technology, engineering, and math; business and communications; health; trades.

those who complete college-level English are more than twice as likely to complete a certificate, degree, or transfer as those who do not.[332] These courses are known as "gateway" courses because they are often a graduation requirement and can serve as a leading indicator of postsecondary success, yet some students do not pass these classes on their first try. Black students are 5 percentage points less likely to complete gateway courses than Latino or White students also enrolled in four-year institutions, and 10 percentage points less likely than Latino or White students also enrolled at two-year institutions.[333]

Recommended metric(s): Percentage of first-year college students who complete college-level introductory math and English courses within their first year

Data source(s): Administrative data; student transcripts

What to know about measurement: Course taking and performance patterns of first-year students can be measured using student transcript data tracked in postsecondary institutions' data systems, but these data typically are not publicly available and reported. Furthermore, no standard definition of a "gateway course" exists, leaving institutions to define which ones are considered gateway courses. They generally include "nonremedial entry-level or introductory courses in the subject area."[334] The National Student Clearinghouse's (NSC) Postsecondary Data Partnership is contributing to standardization in this area by helping colleges track gateway course data and benchmarking their performance against other institutions.

Source frameworks: This indicator appeared in nine source frameworks reviewed for this report. Our proposed measure aligns with work by the Institute for Higher Education Policy.[335]

Postsecondary persistence

PK K12 **PS** WF

Definition: Students continue enrolling in college in subsequent years, including transfers to other colleges.

First-year postsecondary persistence of the fall 2019 cohort by race/ethnicity

87% Asian students

65% Black students

69% Latino students

79% White students

Data source: National Student Clearinghouse (2021).
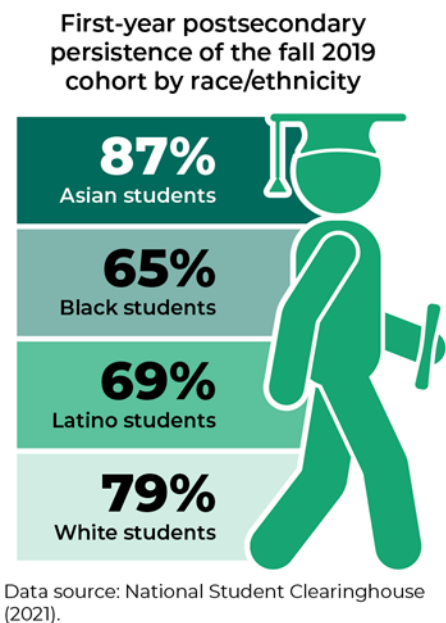
Why it matters: Continued enrollment in college is a prerequisite for degree completion. However, first-year persistence rates of Black and Latino students (approximately 65 and 69 percent, respectively) are lower than those of White and Asian students (approximately 79 and 87 percent, respectively). Overall persistence rates dropped by approximately 2 percentage points from 2019 to 2020 after remaining fairly steady for several years, which may be attributable to the disruptive impact of the COVID-19 pandemic. During this time, persistence rates declined more significantly in community colleges (-3.5 percentage points) than any other type of institution.[336]

Recommended metric(s): Percentage of students who continue enrolling in college (including transfers to other colleges) or complete a credential the following year,

captured for up to 150 percent of program length. Other time frames, such as 100 and 200 percent of program length, should also be reported for this measure.

Data source(s): Administrative data

What to know about measurement: Though institutions can measure their annual retention of students, measuring persistence in any college requires linking student records to data from other institutions. National Student Clearinghouse (NSC) data can be used to calculate both retention and persistence rates, though the NSC does not report this information publicly at the institution level (it does report aggregate analyses in its annual Persistence and Retention report series, and institutions that participate in their Student Tracker for Colleges and Universities or the Postsecondary Data Partnership service can access these data). The Integrated Postsecondary Education Data System (IPEDS) publicly reports data on retention at individual institutions but does not report a persistence measure that accounts for transfers to other institutions.

We suggest measuring both retention at the initial institution as well as persistence in any institution because the former helps institutions understand which students may be leaving and why, whereas the latter offers a systemwide view that captures transfers to other institutions.

Source frameworks: This indicator appeared in nine source frameworks reviewed for this report. Our proposed measure aligns with work by the Institute for Higher Education Policy.[337]

NSC Postsecondary Data Partnership

National Student Clearinghouse (NSC) launched the Postsecondary Data Partnership to improve institutional decision making by equipping postsecondary institutions with more timely access to effective data. Using the current data infrastructure, obtaining actionable data on postsecondary student outcomes can be costly, delayed, and incomplete. For example, publicly available data through Integrated Postsecondary Education Data System (IPEDS) do not allow for effective disaggregation on all outcomes, such as by race and ethnicity, first-generation status, and Pell Grant status. Without this information, policy and program change often falls short of addressing the structural cause of disparities in outcomes. Through joining the Postsecondary Data Partnership, system leaders commit to improving and sharing data to identify and advance strategies that ensure every student can achieve a college degree or credential of value. The Postsecondary Data Partnership tracks data on all students, including transfer and part-time students, students who transferred out, and those who enrolled in a four-year institution from a two-year program. Leading Postsecondary Data Partnership metrics include enrollment, credit accumulation, gateway course completion, two-year retention, term-to-term retention, transfer rates, and transfer completions, and credential completion rates. Participating states and institutions also have access to a collaborative dynamic set of dashboards, enabling timely analysis, cross-institution comparison, and state-level comparison. These tools provide institution and system leaders with the information they need to make informed decisions to improve student outcomes.

Transfer (if applicable)

PK K12 **PS** WF

Definition: Postsecondary students transfer to a longer program (from certificate to associate's degree, or from associate's to bachelor's degree).

Why it matters: Transferring to a four-year college is a necessary step for community college students to earn bachelor's degrees. Students who transfer after earning associate's degrees are 12 percentage points more likely to graduate with bachelor's degrees than students who transfer before earning an associate's degree (53 versus 41 percent).[338, 339] There is also evidence that students with a bachelor's degree earn nearly 40 percent more annually than those with an associate's degree only, and are also less likely to face unemployment.[340] However, transfer rates tend to be lower for Black and Latino students,[341, 342] as well as for students from low-income households, than their peers.[343]

Recommended metric(s): Percentage of students in a certificate or associate's degree program who transfer to a longer degree program within 150 percent of the original program's intended length. Other time frames, such as 100 percent and 200 percent of program length, are also useful to track.

Data source(s): Administrative data

What to know about measurement: Students may transfer to longer degree programs both within their current institutions and by enrolling in a different institution, so this indicator requires linking student data from multiple institutions. National Student Clearinghouse (NSC) enrollment records can be used to calculate transfers from two-year to four-year institutions, though the NSC does not report this information publicly at the institution level. (It does report aggregate analyses in its annual Tracking Transfer report series, and institutions that participate in their Student Tracker for Colleges and Universities or Postsecondary Data Partnership service can access data on transfer rates and transfer completions.) Detailed transfer rates for two-year institutions (whether public, private, or for-profit) currently are not publicly available. Though Integrated Postsecondary Education Data System (IPEDS) reports overall transfer outs, it does not track where students subsequently enroll nor whether students who complete a certificate or associate's degree subsequently enroll in a longer degree program. It is also important to measure the extent to which students' credits are transferring between institutions, with credit loss negatively impacting affordability and completion.[344]

Source frameworks: This indicator appeared in eight source frameworks reviewed for this report. Our proposed measure aligns with work by the Institute for Higher Education Policy.[345]

Postsecondary certificate or degree completion

PK K12 **PS** WF

Definition: Students complete a certificate, associate's, or bachelor's degree within a specified time frame after entering college.

Why it matters: A large body of research consistently demonstrates that students receive substantial economic returns on certificate completion,[346, 347, 348] associate's degree completion,[349, 350] and bachelor's

degree completion.[351, 352, 353, 354] In 2020, for example, workers with an associate's degree earned 20 percent higher wages than those with a high school diploma only.[355] However, there are persistent disparities in degree completion by race/ethnicity and income.[356, 357] For instance, among students who enrolled in a four-year college in 2010, 74 percent of Asian students and 64 percent of White students graduated within six years, compared to 54 percent of Latino students and 40 percent of Black students.[358]

Recommended metric(s): Percentage of students completing a certificate, associate's, or bachelor's degree within 150 percent of the program's intended length. Other time frames, such as 100 percent and 200 percent of program length, should also be reported for this measure.

Data source(s): Administrative data

What to know about measurement: Institutions regularly track and report certificate and degree completion for their students and can disaggregate this information by field of study, which can reveal disparities in access to certain fields like science, technology, engineering, or mathematics (STEM). State longitudinal data systems that include postsecondary data contain individual-level completion data from in-state institutions, making it possible to measure completion more broadly, but can obtain completion data from out-of-state institutions only through the National Student Clearinghouse (NSC), which collects individual records provided by participating institutions.[x] Although NSC collects and reports data on program of study (such as Psychology) and degree title (such as Bachelor of Arts), completion records sometimes omit these data due to issues with data coverage or underreporting.[359, 360, 361] Improved standardization of data collection and sharing in this area could help data users gain important insights into matriculation patterns and degree attainment.

At the institutional level, aggregate completion data are available annually through Integrated Postsecondary Education Data System (IPEDS) for all Title IV-eligible universities, colleges, and technical and vocational education providers. Based on aggregate data reported by institutions, IPEDS publishes three related but distinct measures of degree completion, which are measured at different time points and cover different student populations:

1. The IPEDS graduation rate assesses whether students complete their intended degree within 100, 150, or 200 percent of the normal time for that degree type. The graduation measure is calculated only for full-time, first-time degree-seeking students.

2. The IPEDS Outcome Measures survey tracks whether students complete a certificate, associate's, or bachelor's degree four, six, and eight years after entering the institution. This measure captures degree completion outcomes for more students than the graduation rate measure because it is calculated separately for part-time and non-first-time degree-seeking students in addition to full-time, first-time degree-seeking students. However, the Outcome Measures survey does not track the type of program in which students are enrolled, and so does not provide a measure of the timing of degree completion relative to normal program length.

3. IPEDS also separately tracks the total number and type of degrees awarded at each institution, as well as the number of students completing a degree each year. However, these completion

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[x] For additional technical details regarding institutions' reporting of completion data to NSC, see Causey, J., Pevitz, A., Ryu, M., Scheetz, A., & Shapiro, D. (2022). *Completing college: National and state report on six-year completion rates for fall 2015 beginning cohort.* National Student Clearinghouse Research Center. https://nscresearchcenter.org/completing-college/#:~:text=Highlights,colleges%20starters%20(%2B1.5%20pp)

measures are not tied to specific cohorts of students and do not capture how long it took for the degrees to be completed.

Source frameworks: This indicator appeared in 15 source frameworks reviewed for this report. Our proposed measure aligns with work by the Institute for Higher Education Policy.[362]

Enrollment in graduate education

PK K12 **PS** WF

Definition: Students enroll in a graduate education program after completing an undergraduate degree.

Why it matters: Graduate education represents one of many pathways to economic mobility and success along the pre-K-to-workforce continuum. Graduate degree holders earn substantially more during their lifetimes than people who hold only a bachelor's or high school degree,[363, 364] and enrollment in a graduate program is a necessary first step before degree completion. However, Black and Latino students are underrepresented in graduate school relative to students from other racial and ethnic backgrounds,[365] though research indicates that these disparities disappear when comparing only students with a bachelor's degree.[366, 367] This finding suggests that higher education indicators measured *before* graduate school enrollment are critical for addressing inequities in educational attainment.

Among students who hold a bachelor's degree and pursue graduate school, disparities by race, ethnicity, and income emerge along institution type and field of study. For example, 24 percent of Black graduate students and 12 percent of Latino graduate students enroll in for-profit institutions, compared with 8 percent of White graduate students and 7 percent of Asian graduate students.[368] Among students who enroll in doctoral programs, Black students (14 percent) and Latino students (18 percent) were less likely to pursue a science, technology, engineering, or mathematics (STEM) degree than White students (27 percent) and Asian students (29 percent). These results underscore the importance of examining enrollment patterns by institutional sector and field.

Recommended metric(s): Percentage of bachelor's degree recipients enrolling in post-baccalaureate or graduate programs within one to five years of completion. Other time frames, such as within 10 years of completion, should also be reported for this measure.

Data source(s): Administrative data

What to know about measurement: Because students can pursue graduation education in a different institution than where they completed an undergraduate degree, this indicator requires linking student data from multiple institutions. Currently, 35 state longitudinal data systems include data from postsecondary institutions. As noted earlier, state longitudinal data systems sometimes draw on enrollment records from National Student Clearinghouse (NSC) to track enrollment in institutions outside of the state. NSC enrollment data coverage is highest (almost 98 percent) for students in four-year colleges but varies by type of institution: for instance, NSC covers only 80 percent of students in four-year for-profit institutions,[369] where students of color are more likely to enroll. In addition, 12 percent of enrollment records reported to NSC do not include information on whether the student is

enrolled at the undergraduate, master's, or doctoral level.[370] This area is also one in which data collection and sharing can be improved, both with the NSC and within states.

Aggregate data on graduate enrollment are collected regularly and reported via the Integrated Postsecondary Education Data Systems (IPEDS), though these data report only the number of students enrolled in graduate education and cannot be used to measure the share of college graduates from a given cohort who go on to enroll in graduate education.

Source frameworks: This indicator appeared in three source frameworks reviewed for this report. Our proposed measure aligns with work by the Institute for Higher Education Policy.[371]

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Graduate degree completion

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(PK) (K12) **PS** (WF)

Definition: Students complete a graduate degree (master's degree or higher) within a specified time frame after entering graduate school.

Why it matters: A graduate degree represents one of many pathways to economic mobility and success along the pre-K-to-workforce continuum. Graduate degree holders earn substantially more during their lifetimes than people who hold only bachelor's or high school degrees.[372, 373] For instance, in 2020, workers with a master's degree earned 18 percent more than those with a bachelor's degree only, whereas those with a professional degree earned 45 percent more, on average. About 14 percent of adults in the United States age 25 and older have completed a master's degree or higher, though only 11 percent of Black adults and 6 percent of Latino adults hold a graduate degree.[374] Disparities in graduate degree completion are particularly large in certain fields of study, with Black and Latino students less likely to complete a graduate degree in a science, technology, engineering, or mathematics (STEM) field compared to students of other racial and ethnic backgrounds.[375]

Recommended metric(s): Percentage of graduate students completing a graduate degree within 150 percent of their current program's length. Other time frames, such as 100 percent and 200 percent of program length, should also be reported for this measure.

Data source(s): Administrative data

What to know about measurement: Institutions regularly track and report certificate and degree completion for their students. State longitudinal data systems that incorporate the postsecondary sector include individual-level completion data from in-state institutions (making it possible to measure completion more broadly), but can only obtain completion data from other institutions through National Student Clearinghouse (NSC), which collects individual records provided by participating institutions. However, as noted earlier, NSC's completion records are sometimes missing information on the type of degree earned, and 12 percent of enrollment records reported to NSC do not include information on whether the student was enrolled at the undergraduate, master's, or doctoral level.[376]

Aggregate data on graduate degree completion are collected regularly and reported via the Integrated Postsecondary Education Data Systems (IPEDS), though these data report only the number of students earning a degree. They do not track cohorts of students and cannot be used to calculate graduation rates.

Source frameworks: This indicator appeared in two source frameworks reviewed for this report. The Institute for Higher Education Policy's metrics framework does not explicitly measure graduate degree completion, though the data are captured in its general graduation rate metric.[377]

DOMAIN: Social, emotional, and physical well-being

Kindergarten readiness: social-emotional development

PK **K12** **PS** **WF**

Definition: Children develop and demonstrate the skills to form positive relationships with adults and peers, emotional functioning, and a sense of identity and belonging.

Why it matters: Children with positive social and emotional development tend to be happier, show greater motivation to learn, have a more positive attitude toward school, more eagerly participate in class activities, and demonstrate higher academic performance than peers with social and emotional behavior issues.[378, 379] Positive social and emotional development is also related to completing a college degree, likelihood of being employed, and less likelihood of involvement with the justice system at age 25.[380] However, children from low-income households and children of color are more likely to experience behavioral issues that affect their educational experiences and outcomes.[381, 382] For example, children in the bottom three income quintiles score between 0.15 and 0.23 standard deviations higher on behavior problems compared with children in the top two income quintiles at kindergarten entry, which are considered small- to medium-sized differences.[383] As noted under E-W system conditions, there is inequitable access to quality pre-K education that promotes positive outcomes for all children.

Recommended metric(s):

- Percentage of students meeting benchmarks on teacher-reported kindergarten readiness assessment, such as the following:
  - The Desired Results Developmental Profile (DRDP) Social and Emotional Development domain[384]

Elevating social-emotional learning in CORE Districts

The CORE Districts—a collaborative of eight school districts in California serving more than 1 million students in total—serve as an exemplar for education agencies seeking to elevate the importance of social-emotional learning (SEL). In 2013, the CORE Districts were granted a No Child Left Behind waiver, permitting them to use a rigorous accountability system developed by the districts themselves rather than adhere to the state of California's requirements. "Non-academic indicators," including social-emotional indicators, comprise 40 percent of the index used to assess school quality in the CORE Districts accountability system. CORE Districts engaged school administrators, educators, and data leads, as well as SEL experts from outside the CORE Districts, to help determine what social-emotional competencies should be included in the index. Competencies were also evaluated against the research base to determine whether they were meaningful, measurable, and malleable (that is, could be influenced by school systems). The districts developed student surveys for the four selected competencies—growth mindset, self-efficacy, self-management, and social awareness—which have been tested for validity and reliability and are currently administered annually to students in grades 5–12.

- – Ready 4 Kindergarten (R4K) English language arts (ELA) Social Foundations domain[385]
- – Teaching Strategies (TS) GOLD Social-Emotional subscale[386]
- Or, percentage of students meeting benchmarks on teacher reports, such as the following:
  - – The Child Behavior Rating Scale (CBRS)[387]
  - – Devereaux Early Childhood Assessment Preschool Program (DECA-P2)[388]

Data source(s): Assessments

What to know about measurement: Measurement of social-emotional development typically relies on teacher or parent reports. However, children's skills in this domain likely vary by context, so teachers and parents might rate children's social and emotional development differently based on their experiences and perspectives. Additionally, the evidence is not clear as to whether many of the commonly used measures of social and emotional development are culturally and linguistically appropriate for young children. Specifically, there is the potential for bias in these assessments for children of color and those who speak a language other than English at home.[389, 390, 391] Therefore, it may be useful to gather data on children's social-emotional development from multiple sources and to use the information with caution to avoid bias.

Source frameworks: Kindergarten readiness appeared in seven source frameworks reviewed for this report. Our proposed definition and measures align with the five domains of kindergarten readiness summarized in the Getting Ready framework, prepared by Rhode Island KIDS COUNT;[392] they are also included in the Head Start Early Learning Outcomes Framework.[393]

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Kindergarten readiness: approaches to learning

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PK (K12) (PS) (WF)

Definition: Children develop and demonstrate emotional and behavioral self-regulation, cognitive self-regulation (executive functioning), initiative and curiosity, and creativity.

Why it matters: Children with positive approaches to learning have higher school readiness and achievement outcomes than those with less developed approaches to learning.[394, 395, 396] Studies have also consistently found positive associations between measures of children's ability to control and sustain attention, and academic gains in the preschool and early elementary school years.[397, 398, 399] However, studies have documented disparities related to income, race, and ethnicity in children's approaches to learning in preschool.[400, 401] At kindergarten entry, children in the bottom fifth of the income distribution score 0.40 standard deviations lower on approaches to learning relative to the top fifth of the income distribution, and Black children are rated 0.20 standard deviations lower compared with White children.[402] As noted in the E-W system conditions section of this report, there is inequitable access to quality pre-K education that promotes positive outcomes for all children.

Recommended metric(s):

- Percentage of students meeting benchmarks on teacher-reported kindergarten readiness assessment, such as the following:
    - The Desired Results Developmental Profile (DRDP) Approaches to Learning – Self-Regulation domain[403]
    - Teaching Strategies (TS) GOLD Cognitive subscale[404]
- Or, percentage of students meeting benchmarks on teacher reports of children's executive function, such as the Child Behavior Rating Scale (CBRS)[405]
- Or, percentage of students meeting benchmarks on a direct child assessment, such as the following:
    - The Heads Toes Knees Shoulders (HTKS) task, administered by teachers[406]
    - The Minnesota Executive Function Scale (MEFS), self-administered on a tablet[407]

Data source(s): Assessments

What to know about measurement: Individual instruments for this indicator do not comprehensively capture children's approaches to learning. It is recommended that this indicator be measured with multiple assessments to capture different components of children's approaches to learning. For example, children's initiative, curiosity, and creativity typically are measured through teacher reports, whereas executive functioning is typically measured using direct child assessments, teacher reports, or sometimes both.[408] Collecting data through these multiple approaches may prove to be a significant effort. Measuring children's approaches to learning is also commonly done through standardized kindergarten readiness assessments that have been adopted by 13 states as of 2017.[409] For example, California and Illinois use the DRDP as their kindergarten readiness assessment, which has a subscale focused on children's approaches to learning and self-regulation skills.

Source frameworks: Kindergarten readiness appeared in eight source frameworks reviewed for this report. Our proposed definition and measures align with the five domains of kindergarten readiness summarized in the Getting Ready framework, prepared by Rhode Island KIDS COUNT;[410] they also are included in the Head Start Early Learning Outcomes Framework.[411]

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Kindergarten readiness: perceptual, motor, and physical development

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PK **K12** **PS** **WF**

Definition: Children develop and demonstrate gross and fine motor skills, and an understanding of health, safety, and nutrition.

Why it matters: Gross motor skills predict children's social competencies and physical well-being,[412, 413, 414] and are a gateway to engagement in learning and social activities, including sports and games, throughout the school years.[415, 416] Fine motor skills are associated more robustly with academic achievement.[417, 418] Preschool children from families with low incomes score significantly lower on direct assessments of visual and motor skills compared with children from families with higher incomes.[419, 420, 421] As noted in the E-W system conditions section of this report, there is inequitable access to quality pre-K education that promotes positive outcomes for all children.

Recommended metric(s):

- Percentage of children meeting benchmarks on teacher-reported kindergarten readiness assessment, such as the following:
    – The Desired Results Developmental Profile (DRDP) Physical Development – Health domain[422]
    – Ready 4 Kindergarten (R4K) English language arts (ELA) Physical Well-Being and Motor Development domain[423]
    – Teaching Strategies (TS) GOLD Physical subscale[424]
- Or, percentage of students meeting benchmarks on direct child assessment administered by teachers, healthcare professionals, or other qualified adults, such as the Peabody Developmental Motor Scale[425]

Data source(s): Assessments

What to know about measurement: Children's perceptual, motor, and physical development can be measured with direct child assessments. However, they may be burdensome to assess for all children. For example, the Peabody Developmental Motor Scale comprehensively assesses these interrelated motor abilities, but is composed of six subtests that measure reflexes, ability to control one's body, ability to move from one place to another, ability to manipulate objects such as balls (for example, catching, throwing, kicking), ability to use one's hands, and visual-motor integration. An increasingly common option to measure this indicator is through kindergarten readiness assessments that teachers can complete. These teacher-reported assessments, which include domains such as Physical Development – Health on the DRDP, ask teachers to rate children's awareness of their own physical effort, body awareness, spatial awareness, and directional awareness.

Source frameworks: Kindergarten readiness appeared in five source frameworks reviewed for this report. Our proposed definition and measures align with the five domains of kindergarten readiness summarized in the Getting Ready framework, prepared by Rhode Island KIDS COUNT;[426] they also are included in the Head Start Early Learning Outcomes Framework.[427]

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Self-management

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(PK)(**K12**)(**PS**)(**WF**)

Definition: Students are able to regulate their emotions, thoughts, and behaviors effectively in different situations.

Why it matters: Stronger self-management skills[xi] during childhood are predictive of numerous positive outcomes, including high school graduation, better physical health, more stable personal finances, decreased substance dependence, and lower chances of criminal offenses in adulthood, even after accounting for personal and family characteristics.[428] Compared to other social-emotional learning (SEL) competencies (including self-efficacy and social awareness), self-management is most strongly related to multiple later academic outcomes, even after accounting for previous achievement. Studies from multiple large school districts find that Black and Latino students self-report lower self-

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[xi] These skills are commonly referred to as executive functioning and/or self-regulation skills in the early childhood sector and are discussed under the *kindergarten readiness: approaches to learning* indicator.

management skills than White students.[429, 430] Research has also identified a negative correlation between self-management scores and the following student characteristics: families experiencing poverty, emerging multilingual learners, and students receiving special education services.[431] However, studies show that students of all ages and backgrounds can be taught self-management skills.[432]

Recommended metric(s):

- Pre-K: See *kindergarten readiness: approaches to learning* indicator

- K–12: Percentage of students reporting a high level of self-management on surveys such as the CORE Districts SEL Survey self-management scale (grades 5–12)[433] or Shift and Persist scale for children[434]

- Postsecondary and workforce: Percentage of individuals reporting a high level of self-management on surveys such as the Shift and Persist scale for teens and adults[435]

Data source(s): Surveys

What to know about measurement: Several survey tools exist to measure this indicator and related constructs. We have identified and suggested some tools with an evidence base; however, other instruments may also be appropriate to measure this indicator. We acknowledge there is limited consensus on measuring social-emotional skills, given its relatively recent emergence in the field, and that the use of different instruments across contexts would reduce the comparability of this indicator. Institutions that do not already collect survey data may need to develop a new data management infrastructure.

Competencies like self-management can be measured in different ways, including individual self-reports, teacher or parent reports, and performance tasks, that can be more or less predictive of future outcomes, depending on the particular instruments used and skills being measured. Here we recommend approaches relying on validated self-reported surveys, which are more feasible to collect at scale. Although teacher reports of students' social-emotional skills were found to be more predictive of student performance than student self-reports, CORE Districts made teacher reports optional, due in part to concerns about burden.[436, 437] Teacher reports of students' social-emotional skills can also be more predictive of student outcomes than performance tasks, which are not always any more predictive than student self-reports.[438] On the other hand, teacher reports may not be appropriate if the data are used for school accountability and, like grading practices, are subject to the rater's implicit or explicit bias.

Source frameworks: This indicator appeared in five source frameworks reviewed for this report. Our proposed definition and measure align with the CORE Districts definition of self-management. Broadly, we have opted to align with—and build on—their SEL indicators, given the evidence base for their predictive power and instrumentation.[439]

Growth mindset

Definition: Students believe that their abilities can grow with effort.

Why it matters: A growth mindset has been linked to better attendance, behavior, and math and English language arts test scores.[440] In particular, the belief that math ability is fixed or innate is especially common, and may limit learning in math.[441] Research shows that traditionally underserved students—including students experiencing poverty, emerging multilingual learners, and Latino and Black students—are less likely to hold a growth mindset than their peers.[442] Some interventions with K–12 and college students that foster a growth mindset have been shown to improve students' grade point averages (GPAs), reduce course failures, and support academic effort.[443, 444, 445, 446, 447] However, a recent meta-analysis of 29 mindset interventions found that, on average, they had limited effects on student outcomes.[448] Growth mindset interventions may help narrow differences in academic achievement between students of color and White students;[449, 450] however, research findings are inconsistent—for example, one study found that growth mindset interventions significantly improved the academic performance of Latino students, but not Black students,[451] and other studies have not been able to replicate positive impacts among diverse populations of students.[452]

Recommended metric(s):

- K–12: Percentage of students reporting a high level of growth mindset on surveys such as the CORE Districts SEL Survey Growth Mindset Scale (grades 5–12)[453] or the Growth Mindset Scale developed by Carol Dweck,[454] which may be used with children, teens, and adults

- Postsecondary and workforce: Percentage of students reporting a high level of growth mindset on surveys such as the Growth Mindset Scale developed by Carol Dweck[455]

Data source(s): Surveys

What to know about measurement: As indicated above, several survey tools exist to measure this indicator and related constructs. We have identified and suggested tools with an evidence base; however, other instruments may also be appropriate to measure this indicator, though the use of different instruments across contexts would reduce comparability of this indicator. Please see information on the *self-management* indicator for additional considerations regarding the measurement of social-emotional skills.

Source frameworks: This indicator appeared in three source frameworks reviewed for this report. Our proposed definition and measure align with the CORE Districts definition of growth mindset. Broadly, we have opted to align with—and build on—CORE Districts SEL indicators,[456] given the evidence base for their predictive power and instrumentation.

Self-efficacy

PK K12 PS WF

Definition: Students believe in their ability to achieve an outcome or reach a goal.

Why it matters: Self-efficacy is a strong predictor of college grade point average (GPA) and persistence, with additional predictive power beyond socioeconomic status and prior achievement.[457] Students who report higher self-efficacy earn higher GPAs and score higher on math and English language arts tests.[458, 459] Higher levels of self-efficacy in math—students' belief in their capacity to successfully execute math-related tasks—have also been linked to the likelihood of attending college and choosing a science, technology, engineering, or mathematics (STEM) field.[460, 461] Self-efficacy tends to decline over

time for students of all racial and socioeconomic backgrounds, but economically disadvantaged students consistently report lower rates of self-efficacy than more economically advantaged students, as do students of color compared to White students.[462] Like other social-emotional skills, self-efficacy can be fostered in classrooms and through interventions.

Recommended metric(s):

- K–12: Percentage of students reporting a high level of self-efficacy on surveys such as the CORE Districts Social-Emotional Learning (SEL) Survey self-efficacy scale[463]

- Postsecondary and workforce: Percentage of individuals reporting a high level of self-efficacy on surveys such as the New General Self-Efficacy Scale[464] or Ascend survey's Self-Efficacy Scale[465]

Data source(s): Surveys

What to know about measurement: As indicated above, several survey tools exist to measure this indicator and related constructs. We have identified and suggested tools with an evidence base; however, other instruments may also be appropriate to measure this indicator, though the use of different instruments across contexts would reduce comparability of this indicator. Please see information on the *self-management* indicator for additional considerations regarding the measurement of social-emotional skills.

Source frameworks: This indicator appeared in five source frameworks reviewed for this report. Our proposed definition and measure align with the CORE Districts definition of self-efficacy. Broadly, we have opted to align with—and build on—CORE Districts SEL indicators,[466] given the evidence base for their predictive power and instrumentation.

Social awareness

PK K12 PS WF

Definition: Students are able understand others' perspectives; understand social and ethical norms for behavior; and recognize family, school, and community resources and supports.

Why it matters: Some research has found that higher social awareness in early grades is correlated with a greater likelihood of graduating from high school and college, and more stable employment at age 25, controlling for family socioeconomic status (SES) and prior achievement.[467] Other evidence, however, shows that social awareness has limited predictive power for later academic outcomes after accounting for other social emotional learning (SEL) skills, such as self-management and self-efficacy.[468] Research from the CORE Districts shows that White students consistently rate themselves more favorably than other racial groups regarding social awareness.[469] Research on soft skills required for workplace success shows that social skills—including whether individuals respect differences and use appropriate behavior and conflict-resolution methods—are predictive of employment, job performance, income, and entrepreneurial success.[470]

Recommended metric(s):

- K–12: Percentage of students reporting a high level of social awareness on surveys such as the CORE Districts SEL Survey[471] social awareness scale, or percentage of students meeting

benchmarks on teacher ratings of social skills drawn from Elliott and Gresham's Social Skills Rating Scale[472]

- Postsecondary and workforce: Percentage of individuals demonstrating social proficiency on a performance assessment, such as the National Work Readiness Credential Essential Soft Skills assessment[473]

Data source(s): Surveys or assessments

What to know about measurement: As indicated above, several survey tools exist to measure this indicator and related constructs. We have identified and suggested tools with an evidence base; however, other instruments may also be appropriate to measure this indicator, though the use of different instruments across contexts would reduce comparability of this indicator. Please see information on the *self-management* indicator for additional considerations regarding the measurement of social-emotional skills.

Source frameworks: This indicator appeared in five source frameworks reviewed for this report. Our proposed definition and measure are adapted from the CORE Districts definition of social awareness. Broadly, we have opted to align with—and build on—CORE Districts SEL indicators,[474] given the evidence base for their predictive power and instrumentation.

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Cultural competency

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(PK) (**K12**) (**PS**) (**WF**)

Cultural competency: Individuals are able to understand the perspectives of and empathize with others from diverse backgrounds and cultures.

Why it matters: Projections by the National Skills Coalition[475] show that, by 2040, people of color will comprise more than half of the working-age population in the United States. Increased racial and socioeconomic diversity in schools and workplaces is associated with improved outcomes for individuals and businesses (see the E-W System Conditions section of this report for more on the benefits of diverse institutions). For students and employees to succeed in an increasingly diverse, globalized economy, it is important that they demonstrate an ability to empathize with and work effectively with others of diverse backgrounds. As discussed above, social skills—including whether individuals respect differences and use appropriate behavior and conflict-resolution methods—are predictive of employment, job performance, income, and entrepreneurial success.[476] At the same time, polling shows that racial divides persist regarding both lived experience and perceptions of discrimination in the workplace. About half of Black individuals and a third of Asian and Latino individuals report having been treated unfairly in hiring, pay, or promotion. Poll data show that just over half of White adults perceive race relations in the United States as "generally bad," compared to 71 percent of Black adults.[477]

Recommended metric(s):

- K–12: Reflecting the lack of developed tools in the field, we are unable to recommend a specific measurement tool. In some contexts, it might be possible to adapt an existing measure for adults for use with youth. For examples, we refer to the tools recommended for postsecondary and workforce contexts.

- Postsecondary: Percentage of students demonstrating proficiency on an assessment of cultural competency, such as the HEIghten Outcomes Assessment for Intercultural Competency & Diversity[478] or The Intercultural Development Inventory®[479]

- Workforce: Percentage of individuals demonstrating proficiency on an assessment of cultural competency, such as The Intercultural Development Inventory®[480]

Data source(s): Surveys or assessments

What to know about measurement: Intercultural knowledge and competence is deemed an "essential learning outcome" by the American Association of Colleges and Universities, which has published a rubric for evaluating students' cultural competence based on a work sample.[481] However, given that scoring students' work is subjective and difficult to compare across contexts, we propose using performance assessments (or survey-based measures, although such measures could be subject to social desirability bias), which could more feasibly be administered at scale.

Source frameworks: This indicator appeared in four source frameworks reviewed for this report. Our proposed definition and measure are adapted from the CORE Districts definition of social awareness. However, although the CORE Districts *definition* of social awareness includes cultural awareness, the CORE Districts Social-Emotional Learning (SEL) Survey instrument does not sufficiently capture intercultural competency.[482] Other source frameworks, including the National Research Council's Key National Education Indicators[483] framework and the Urban Institute's Robust and Equitable Measures to Identify Quality Schools (REMIQS),[484] include sets of "learning outcomes" or "deeper learning skills," which include social and intercultural skills.

Civic engagement

(PK) **K12** **PS** **WF**
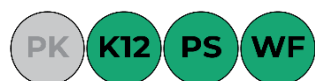
Definition: Individuals exhibit the knowledge, skills, values, motivation, and activities that promote quality of life within a community and society at large through political and nonpolitical processes.

Why it matters: Participating in civic work can help develop transferrable career skills, such as coalition-building, communication, project development and implementation, meeting facilitation, and problem solving. Community engagement activities, including volunteerism and participation in community decision making, are associated with improved well-being among both youth and adults.[485, 486, 487] Acknowledging its importance, the American Association of Colleges and Universities deems civic engagement an "essential learning outcome," and at least two states require community service as part of their high school graduation requirements.

A study of civic participation by the Center for Information & Research on Civic Learning & Engagement (CIRCLE)[488] shows that White survey respondents tend to be civically engaged at higher rates than Black, Latino, and Asian respondents, regardless of socioeconomic status (SES). However, it acknowledges two important limitations of the analysis: (1) potential bias in what survey-based measures capture (that is, they often do not capture informal civic activity), and (2) potential barriers to participation in civic activities for communities of color.

Recommended metric(s):

- K–12: Percentage of students reporting a high level of civic engagement on surveys such as the Youth Civic and Character Measures Toolkit Survey[489] and Youth Civic Engagement Indicators Project Survey[490]
- Postsecondary and workforce: Percentage of individuals reporting a high level of civic engagement on surveys such as the Index of Civic and Political Engagement[491]

Data source(s): Surveys

What to know about measurement: We propose using a survey-based measure of civic engagement. Several survey tools exist to measure this indicator and related constructs, though the use of different instruments across contexts would reduce comparability of this indicator. We have identified and suggested survey tools with an evidence base; however, other instruments may also be appropriate or are under development. For example, the Postsecondary Value Commission[492] describes ongoing work by the Next Generation Undergraduate Student Success Measurement Project to measure civic engagement, which it defines as "community participation that facilitates the development of democratic skills, media literacy that supports political knowledge, and values that promote equity, diversity, and justice."[493]

> ### Next Generation Undergraduate Success Measurement Project at UC Irvine
>
> In collaboration with the Postsecondary Value Commission and the Andrew W. Mellon Foundation, in 2018 the University of California Irvine (UCI) launched the [Next Generation Undergraduate Success Measurement Project](#), which aims to identify key benefits of postsecondary education while driving systematic improvement across universities to ensure these benefits are equitably distributed to all students. Using performance assessments, administrative records, and learning management system data for a cohort of 1,200 UCI students, the project tracks six dimensions of student outcomes: cognitive ability and intellectual dispositions, life-course agency, self-regulation skills, social capital, civic engagement, and psychological flourishing and mental health. The initiative also aims to promote evidence-based models for institutions to advance life-course outcomes, including postgraduate education; employment; and health, social, and psychological outcomes (for example, social connectedness, improved well-being), and civic outcomes (for example, participation in elections and political processes, involvement in community organizations).

Voter registration rates and voting rates offer a more comparable and less burdensome alternative to survey-based measures because individual records can be linked to administrative voter data and are often used as proxies for civic engagement among adults. However, voter registration and participation are impacted by voter disenfranchisement policies, and noncitizens cannot vote in elections. If feasible, a survey-based, multidimensional measure provides a more inclusive view of civic engagement.

Source frameworks: This indicator appeared in nine source frameworks reviewed for this report. Many source frameworks, including the Urban Institute's Metrics for Boosting Economic Mobility[494] and Race Count's Education and Economic Opportunity indicators,[495] focus on participation in political processes (for example, voting). Our definition draws from this work as well as the National Research Council's Key National Education Indicators[496] which includes cognitive skills, as well as activities such as volunteerism and community engagement in its definition for civic engagement.

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Social capital

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PK K12 PS WF

Definition: Individuals have access to and are able to mobilize relationships that help them further their goals.

Why it matters: Social network connections are important for accessing social, educational, and employment-related opportunities. Studies looking at employment outcomes have noted that social contacts are important for providing job referrals, and evidence suggests that candidates who have been referred to jobs are more likely to be hired and retained in their positions.[497] One study demonstrates that social cohesion (defined as "trusting neighbors, talking to and helping neighbors, and socializing with family and friends") is correlated with lower unemployment: states with high social cohesion had approximately 2 percent lower unemployment than those with lower social cohesion, controlling for other demographic and economic factors.[498] Some studies have indicated that Black Americans and Latinos have less access to social capital, controlling for other demographic factors.[499, 500] Schools and nonprofit organizations can help cultivate social capital among young people through educational and non-educational programming; therefore, we suggest measuring social capital starting in K–12, using a survey instrument that has been developed for use with youth and young adults.

Recommended metric(s):

- K–12 and postsecondary: Percentage of students or individuals reporting a high level of social capital on surveys such as the Social Capital Assessment + Learning for Equity (SCALE) Social Capital, Network Diversity, and Network Strength scales[501]

- Workforce: Percentage of individuals reporting a high level of social capital on surveys such as the Social Capital Community Benchmark Survey[502]

Data source(s): Surveys

What to know about measurement: Several survey tools and approaches exist to measure this indicator and related constructs. We have identified and suggested examples of tools with an evidence base; however, other instruments may also be appropriate, and the measurement field continues to evolve. Framework users should also consult guidance by the Christensen Institute that describes emerging practices for measuring students' social capital using a four-dimensional framework based on quantity of relationships, quality of relationships, structure of networks, and ability to mobilize relationships.[503]

Most measures of social capital at the individual level can be organized into two types. Most studies use a measurement of cognitive social capital, which focuses on the perception of interpersonal connections. In contrast, other studies have focused on structural social capital by measuring the density of social networks. Operationalizing structural social capital is methodologically more difficult, as it requires sophisticated network analysis techniques.

An alternative to measuring social capital at the individual level is measuring it at the systems level by measuring the concentration of social capital in an area. Chetty et al.[504] found that the concentration of social capital in a neighborhood has a strong positive correlation with upward mobility. Social capital

can be influenced by social and economic factors, and therefore can be unevenly distributed or concentrated across local, regional, or institutional contexts. To measure concentration of social capital, users could consider an index (adapted from Rupasingha and Goetz),[505] including the following:

- The number of all associations per 10,000 population, including religious organizations, civic and social associations, political organizations, professional organizations, labor organizations, bowling centers, physical fitness facilities, public golf courses, and sports clubs. The measure also includes commercial and nonprofit associations drawn from Census Bureau County Business Patterns data.

- The percentage of voters who participated in a presidential, state, or county election.

- The county-level census response rate in the person's county.

- The number of charitable, nonprofit organizations with an office in the county.

Source frameworks: This indicator appeared in three source frameworks reviewed for this report. Our proposed definition most closely draws from the Key National Education Indicators.[506]

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Mental and emotional well-being

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(PK) (K12) (PS) (WF)

Definition: Individuals possess mental and emotional well-being.

Why it matters: In 2019, just before the COVID-19 pandemic, roughly one in five U.S. adults—nearly 50 million people—experienced a mental illness.[507] Rates are even higher for youth and young adults who experienced record levels of depression and anxiety, alongside multiple forms of trauma.[508, 509] In today's political, economic, social, and health contexts, students

> **The [California Healthy Kids Survey](#)**
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> Since 2003, every school district in California has been required to administer the California Healthy Kids Survey (CHKS) at least once every two years and make the results publicly available. CHKS is an anonymous, confidential survey for students in grades 5 and above designed to help school communities identify students' needs. It is based on a strengths-based framework drawn from resilience and youth development research. CHKS covers several dimensions of school climate and student well-being, including physical and mental well-being and safety. Although there is a core survey that must be administered, school districts can select supplementary modules for more in-depth questions on different topics or add a custom module to measure other topics relevant to their community. For example, the Oakland Unified School District has administered additional questions on topics such as access to health care, exposure to community violence, and social-emotional learning (SEL). Members of the community can explore the data through [query tools](#) and [dashboards](#), which allow users to disaggregate data and compare trends over time. In 2021, prompted in part by the strains the pandemic has placed on children's emotional and mental well-being, the California state legislature passed a bill to place CHKS data alongside data on academic proficiency on the state's [School Dashboard](#).

of color and students from lower-income backgrounds face even greater mental and emotional well-being concerns because they are bearing burdens of family bereavement, economic uncertainty, housing instability, racial injustices, and trauma. Identifying individuals in need of mental and emotional health care is critical. Research shows that childhood depression, for instance, is more likely to persist into adulthood if left untreated, but only half of children with pediatric major depression are diagnosed before adulthood.[510] This indicator thus aims to increase the identification of individuals experiencing mental and emotional well-being concerns.

Recommended metric(s):

- Pre-K: Percentage of children with identified health or developmental concerns as identified by a developmental screening tool. For a list of screening tools that may be appropriate for children younger than age 5, see the following guide from the Head Start Early Childhood Learning and Knowledge Center: "Birth to 5: Watch Me Thrive! A Compendium of Screening Measures for Young Children."[511]

- K–12: Percentage of youth with mental or emotional health needs as identified by a universal screening tool. For a list of mental health screening tools that may be appropriate for school-based use, see the following guide from the National Center on Safe Supportive Learning Environments: "Mental Health Screening Tools for Grades K–12."[512]

- Postsecondary and workforce: Psychological well-being scale[513]

Data source(s): Surveys

What to know about measurement: In its guidance to schools for selecting a universal screening tool, the National Center on Safe Supportive Learning Environments states the following:

> "Prior to using a screening tool, it is essential that schools have (a) properly trained staff who can safely and effectively screen children and adolescents (i.e., at a minimum, staff who have been trained on how to administer a given screening tool and interpret the results); (b) a system for referral and follow-up when screening identifies a problem that requires further attention; and (c) access to school-based and community resources to adequately address the student's mental health needs. If schools lack these capacities, then the utility of screening will be questionable. Many experts consider it unethical, for example, to screen students if appropriate referral, diagnostic or treatment resources are not available".[514]

We also note that this information should be voluntary and confidential.

Several survey tools exist to measure this indicator and related constructs through self-reports, as recommended for postsecondary and workforce populations. We have identified and suggested tools with an evidence base; however, other instruments may also be appropriate to measure this indicator.

Source frameworks: This indicator appeared in three source frameworks reviewed for this report. Our proposed metric most closely aligns with StriveTogether's[515] proposed measure for health care access and utilization, neonatal/maternal health, and mental health indicator.

Physical development and well-being

PK K12 PS WF

Definition: Individuals exhibit positive physical development and health.

Why it matters: Physical development and well-being is both an outcome in itself and an important contributor to economic mobility and security. Research links healthy behaviors like physical activity to higher academic achievement.[516] At the same time, education affects health outcomes: in the United States, individuals with college degrees have longer life expectancies than those with lower levels of education (for example, one study shows that men with a graduate degree have a life expectancy

approximately 16 years longer than those with less than a high school degree).[517] Racial disparities in health outcomes among both children and adults are well documented. For example, Black Americans have a lower life expectancy at birth than White Americans by approximately six years.[518] Data also suggest that racial disparities in life expectancy have been exacerbated by the COVID-19 pandemic, with communities of color experiencing higher rates of hospitalization and death.[519]

Life expectancy at birth by race/ethnicity in 2019

American Indian or Alaska Native **72**

Asian **86**

Black **75**

Latino **79**

White **79**

Data source: National Center for Health Statistics (2022).

Recommended metric(s):

- Pre-K: See *kindergarten readiness: perceptual, motor, and physical development* indicator

- K−12: Percentage of students meeting benchmarks on self-rated surveys of physical health, such as the California Healthy Kids Survey Physical Health & Nutrition module[520]

- Postsecondary and workforce: Percentage of adults who rate their own health as good, very good, or excellent on the Self-Rated Health scale,[521] or percentage of individuals meeting benchmarks on the Health-Related Quality of Life Scale[522]

Data source(s): Surveys

What to know about measurement: We recommend measuring physical development and well-being using self-reports on surveys. Although physical fitness tests and activity trackers are viable alternatives to self-reports,[523] survey data may be more feasible to collect at scale while mitigating potential concerns about shaming and privacy. As one example, California administers both a survey and a physical fitness test to K−12 students. However, it recently eliminated the Body Composition component of the test amid concerns about its value and risk for unintended consequences and is reassessing whether to continue with the test at all.[524]

Source frameworks: This indicator appeared in seven source frameworks reviewed for this report. Our proposed approach to measuring well-being using self-reports aligns with recommendations by the Urban Institute for how to measure "overall health."[525]
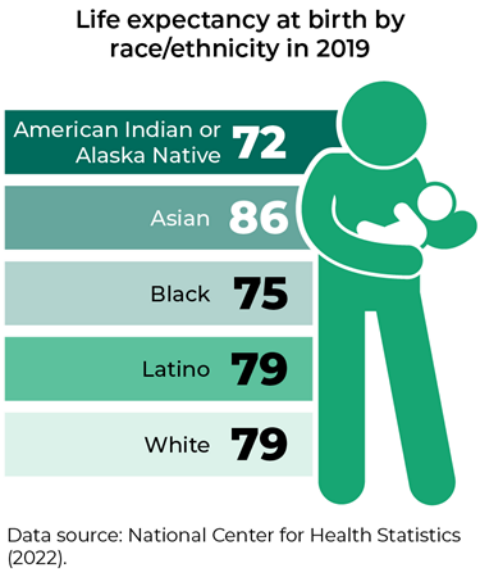
DOMAIN: Career readiness and economic success

Successful career transition after high school

(PK) (**K12**) (PS) (WF)

Definition: High school graduates transition to training, military service, or employment in the fall after graduating high school (if they do not matriculate to credit-bearing postsecondary education programs).

Why it matters: Students can follow multiple pathways after high school on a course to economic and social mobility, including apprenticeships or job training, military service, or employment. To present a

complete picture of where students transition after high school, this indicator tracks data on alternatives to immediate enrollment in postsecondary education—an approach increasingly being adopted. For example, students in Chicago Public Schools are now required to have a "postsecondary plan" that can include college admission, acceptance into an apprenticeship or job training program, military enlistment, or employment. Of the 98 percent of seniors who submitted a plan in 2020, 17 percent were pursuing pathways outside of college.[526] As noted earlier, Black and Latino students and those from low-income households are less likely to enroll in college immediately following high school.

Recommended metric(s): Percentage of high school graduates enlisted in the military, enrolled in an apprenticeship program, enrolled in noncredit career and technical education (CTE) courses, or employed and earning at least the median annual full-time earnings for high school graduates ($35,000 per year) before October 31 following graduation

Data source(s): Administrative data or surveys

What to know about measurement: Measuring this indicator would require either collecting self-reported data from students following their high school graduation or linking individual-level data across multiple systems, including K–12 graduation records, noncredit CTE enrollment records from postsecondary and vocational institutions, employment and earnings records and records of participation in state apprenticeship programs from labor and workforce development departments, and national military enlistment records from the Defense Manpower Data Center.[527] Currently, 24 state longitudinal data systems link records from the K–12, postsecondary, and workforce sectors, and at least one state (Pennsylvania) has signed a memorandum of understanding with the U.S. Department of Defense to receive enlistment data for its students. Without these linkages, schools may have to rely on students' self-reports, which may be burdensome to collect and less accurate than data from administrative records.

Source frameworks: This indicator appeared in eight source frameworks reviewed for this report. Our proposed measure draws on work by Education Strategy Group on the From Tails to Heads framework.[528]

CTE pathway concentration

Definition: Students participating in career and technical education (CTE) concentrate in a single chosen pathway or program of study.

Why it matters: Students who complete CTE concentrations in pathways aligned to top occupations—particularly those from low-income households and male students—are more likely to graduate from high school, attend a two- or four-year postsecondary institution, be employed, and receive higher compensation after high school.[529, 530, 531] The benefits of CTE enrollment are driven entirely by upper-level coursework, particularly in highly technical fields or those aligned with occupations in demand by employers.[532] Exposure to CTE coursework differs slightly by race, disability status, income, and gender. For instance, White students are more likely to "concentrate" (complete three or more courses in a formal, coordinated program of study at the high school level, or 12 or more credits at the postsecondary level) than Black and Latino students,[533] even though the benefits of CTE accrue to those who concentrate in a given field.

Recommended metric(s):

- K–12: Percentage of 12th-grade students enrolled in CTE who complete two or more CTE courses in a single pathway

- Postsecondary: Percentage of CTE students who earn at least 12 credits within a CTE program, or complete such a program if it encompasses fewer than 12 credits in total

Data source(s): Student transcripts

What to know about measurement: Schools regularly record student-level course completion, including CTE courses, as part of their regular operations. However, students can enroll in CTE courses either at their local high school or regional high school vocational school, or through postsecondary programs (credit or non-credit), including community colleges and vocational schools. Therefore, student records need to be linked across sectors. Our recommended metrics are aligned with federal guidance on defining "CTE concentrator" in K–12 and postsecondary contexts under the Perkins Career and Technical Education Act of 2006 (Perkins IV).[534] However, in practice, states vary somewhat in their definitions of "CTE concentrators."[535] An alternative metric would be to calculate the percentage of CTE students who meet their state's criteria for CTE pathway concentration, which could include completion of a non-credit CTE program. For example, at the postsecondary level, Maryland also considers students to be CTE concentrators if they complete a state-approved non-credit program that includes a sequence of two or more CTE non-credit courses leading to a postsecondary credential.[536]

Source frameworks: This indicator appeared in five source frameworks reviewed for this report. Our proposed definition and metric align with work done by the Urban Institute[537] and the Education Strategy Group.[538]

Industry-recognized credential

PK **K12** **PS** **WF**

Definition: Individuals complete at least one industry-recognized credential, as defined by each state.

Why it matters: About 30 million "good jobs" in the United States are held by workers with less than a four-year degree and more than a high school diploma.[539, xii] In response to industry demand for qualified "middle skill" workers, at least 26 states have included industry-recognized credentials as part of their Every Students Succeeds Act (ESSA) accountability or reporting plans.[540] (A similar number also include career and technical education [CTE] concentration, and about half of these states include work-based learning.) An industry-recognized credential is typically defined as being exam-based, administered by third parties, supplemental to traditional postsecondary credentials, and sought or accepted by employers in an industry. Examples of industry-recognized credentials include Certified Information Systems Security Professional, Certified Welder, Certified Medical Laboratory Assistant, and Certified Foodservice Management Professional. Individuals can receive these nationally recognized verifications of skill independent of being enrolled in a degree-granting institution. Research suggests that earning an industry-recognized credential can increase the earnings of low-

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[xii] This analysis, conducted by the Georgetown University Center on Education and the Workforce in 2017, defined a "good job" as one paying at least $35,000 per year for workers under age 45 and at least $45,000 per year for workers age 45 and older.

income job seekers by more than $10,000 over the first two years after enrollment in a training program.[541] However, it is worth noting that credentials can vary widely in value.[542] For example, an analysis of credentials earned by K–12 students found that only 19 percent of those credentials were in demand by employers.[543]

Recommended metric(s):

- K–12: Percentage of 12th-grade students enrolled in CTE who earn at least one industry-recognized credential

- Postsecondary: Percentage of students enrolled in a credit or non-credit CTE program who earn at least one industry-recognized credential

- Workforce: Percentage of program participants who have completed at least one industry-recognized credential

Data source(s): Administrative data

What to know about measurement: Just over half of states collect data on industry credential attainment, and most rely on self-reported data,[544] given the larger number of credentialing bodies that exist outside of state purview. Furthermore, secondary, postsecondary, and workforce systems in the same state often use inconsistent data collection processes and fail to link individual-level credential attainment data across systems. Recognizing these challenges, a 2018 report by Education Strategy Group, Advance CTE, and Council of Chief State School Officers (CCSSO) provides detailed recommendations for creating more standardized reporting systems to track high-value industry credential attainment and points to promising developments.[545] For example, the National Manufacturing Institute and National Student Clearinghouse (NSC) have partnered to pilot a process for collecting industry credential attainment data for postsecondary students by matching individual-level records from community colleges and third-party credentialing bodies.

With more than 4,000 credentialing bodies offering thousands of different credentials across sectors, credentialing requirements can differ widely and, in many cases, state education agencies count exams and credentials not valued by employers.[546] Some states are working to apply standard definitions. In Texas, for example, recent legislation requires the Texas Workforce Commission, the Texas Higher Education Coordinating Board, and the Texas Education Agency to jointly develop a validated list of industry-recognized credentials.[547] Care should be taken in comparing rates across localities.

> **The Credential Engine data initiative**
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> The Credential Engine initiative is building a public Credential Registry of credentials across the country in a linked, standardized, open-data format that allows users to search and compare information about different credentials, including requirements, costs, quality, and value. This information is being published in an interactive tool called Credential Finder. So far, the tool includes information on more than 30,000 credentials (spanning degrees, certificates, licenses, certifications, apprenticeships, badges, and more). In 2017, Indiana became the first state in the nation to begin working with Credential Engine. To date, the state has added data on more than 3,000 credentials, including all certificates and degree programs offered by public postsecondary institutions, Next Level Jobs certificates and their connected certifications, apprenticeship programs, and programs that recognize credit for military training. It is now working to add data on secondary school credentials to understand how they are linked to other education and training opportunities, and has other planned enhancements, including adding data on median wages and employment rates associated with each credential. The data infrastructure generated by the Credential Registry can also help states standardize their collection of individual-level credential attainment data.

Source frameworks: This indicator appeared in two source frameworks reviewed for this report. Our definition and suggested metrics draw from the Workforce Innovation and Opportunity Act (WIOA) Performance Indicators and Measures[548] which includes secondary students enrolled in CTE, as well as postsecondary credential earners, in its definition of industry-recognized credential.

Participation in work-based learning

PK **K12** **PS** **WF**

Definition: Credential seekers participate in an internship, work study, cooperative education, apprenticeship program, or other work-based learning opportunities.

Why it matters: Work-based learning opportunities are a key component of effective career pathways, offering individuals practical experiences to develop the skills they need to be successful in the workplace.[549] Internship and cooperative education programs have been identified as a high-impact practice for bolstering college students' success.[550] In addition, work-based learning programs that provide occupational skills training aligned to industry demands can lead to improved employment and earnings outcomes for individuals from low-income households.[551] For example, a 2012 study of the Registered Apprenticeship program, which offers structured on-the-job training combined with technical instruction tailored to meet industry needs, found significant positive impacts on lifetime earnings.[552] For participants who completed the program, average career earnings were estimated to be $240,037 higher than for similar nonparticipants.

There are disparities in who benefits from work-based learning programs. Black and Latino workers are proportionally represented in Registered Apprenticeship programs, but Black workers typically make significantly less than other groups upon completing the program (approximately $14 per hour compared to $26 for White workers and $31 for Latino and Asian workers).[553] Among college students, Black, Latino, and first-generation students, and those from low-income households, are less likely to participate in internships; if participating, they also are less likely to be paid relative to their peers.[554] The 2021 National Survey of College Internships found that 16 percent of first-generation college students participated in an internship, compared to 23 percent of other college students. Among those who participated, 54 percent of first-generation college students received compensation, compared to 62 percent of their peers.

Recommended metric(s):

- K–12: Percentage of students who participate in a work-based learning opportunity before graduation
- Postsecondary: Percentage of students who participate in a work-based learning opportunity before graduation
- Workforce: Percentage of workforce training program participants who participate in a work-based learning opportunity before program completion

Data source(s): Administrative data; student transcripts; surveys

What to know about measurement: Federal data on participation in registered apprenticeships is gathered and reported annually by the U.S. Department of Labor. Federal Student Aid also records data

on participation in the federal work-study program. Data on unregistered apprenticeships, internships, and other work-based learning opportunities are not currently reported systematically, making measurement at scale more challenging. Some K–12 schools and postsecondary institutions may track participation in for-credit work-based learning in their administrative and course data systems, whereas others may rely on self-reported student surveys to track participation in work-based learning more broadly.

Source frameworks: This indicator appeared in four source frameworks reviewed for this report. Our proposed definition draws from work from the Center for Postsecondary and Economic Success' Framework for Measuring Career Pathways Innovation[555] and the Bill & Melinda Gates Foundation.[556]

Digital skills

PK **K12** **PS** **WF**

Definition: Students and workers can use digital technology tools effectively to access, manage, evaluate, and communicate information.[xiii]

Why it matters: Digital skills and online literacy are increasingly critical for academic and workforce success, as well as for informed participation in civic life. One state (Delaware) now requires students to demonstrate performance-based competency in technology as part of its high school graduation requirements. A meta-analysis of more than two decades of research shows a positive relationship between information and communication technology skills and academic achievement.[557] Although some research points to disparities in digital literacy across socioeconomic and race and ethnicity groups,[558] further research is needed to develop the field's understanding of disparities in digital skills and media use.[559] Digital skills are closely linked with access to technology, which is inequitable by race, ethnicity, and income, and is discussed in the Adjacent Systems Conditions section of this report.

Recommended metric(s):

- K–12: Reflecting the lack of developed tools in the field, we are unable to recommend a specific measurement tool for K–12 students. Two validated instruments discussed in previous literature—the Instant Digital Competence Assessment (iDCA),[560] and the Student Tool for Technology Literacy (ST²L)[561]—do not appear to be available at this time.

- Postsecondary and workforce: Percentage of individuals demonstrating proficiency on a performance assessment that measures digital skills required for workforce success, such as the Problem Solving in Technology-Rich Environments assessment within the Education & Skills Online assessment suite, which can be used by researchers and institutions to gather individual-level results based on Organisation for Economic Co-operation and Development (OECD) Survey of Adult Skills (Programme for the International Assessment of Adult Competencies [PIAAC]) domains.[562]

Data source(s): Assessments

[xiii] Adapted from Katz, I. R., & Smith Macklin, A. (2007). Information and communication technology (ICT) literacy: Integration and assessment in higher education. *Systemics, Cybernetics, and Informative, 5*(4), 50-55.

What to know about measurement: The field currently lacks consensus around a definition of "digital skills" (alternatively referred to as digital literacy, Internet skills, computer literacy, and so on, each with slight nuance). However, the *quality* of engagement with technology is paramount in building digital literacy that supports academic achievement,[563] and users should be careful not to conflate use of technology alone with digital skills. Research suggests that higher levels of media use among youth can be associated with lower academic achievement and lower feelings of personal contentment.[564, 565, 566]

There is not a "best-in-class" tool that is widely used to measure this concept. We see this recommendation as an area where the suggested indicator is aspirational, guiding the field toward a more widely validated and used measure. Users should seek to measure high-quality, productive engagement with technology to cultivate skills that benefit students in school, and eventually in the workforce.

Source frameworks: The P-16 Framework[567] includes an indicator of Use of Digital Tools and Resources. Additionally, information and technology resourcefulness is included in the Urban Institute's Robust and Equitable Measures to Identify Quality Schools (REMIQS)[568] definition of "deeper learning skills."

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Communication skills

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PK K12 PS WF

Definition: Individuals have the oral, written, nonverbal, and listening skills required for success in school and at work.

Why it matters: Effective written and verbal communication skills can lay the foundation for other valuable workplace and life skills, such as collaboration and negotiation. Employers consistently rank communication skills among the most important—if not the most important—skills to support strong workplace performance across industries,[569, 570, 571] and research suggests communication skills are predictive of employment and workplace performance.[572] In a comprehensive review of soft skills literature, researchers found that communication skills are predictive of workforce outcomes for youth ages 15–29, as well as for the general adult population.[573] Reflecting the importance of communication skills, four states include communication skills among their high school graduation requirements,[574] and the American Association of Colleges and Universities (AAC&U) includes written communication and oral communication among 16 "essential learning outcomes."[575]

Recommended metric(s):

- K–12: Percentage of students demonstrating proficiency on assessments such as the College and Career Readiness Assessment (CCRA+),[576] an assessment for grades 6–12 that measures critical thinking, problem solving, and written communications

- Postsecondary: Percentage of students demonstrating proficiency on assessments such as the following:
  - The Collegiate Learning Assessment (CLA+)[577] or Success Skills Assessment (SSA+)[578] for postsecondary students that measure critical thinking, problem solving, and written communications

- The HEIghten Outcomes Assessment for Written Communication[579]

- Workforce: Percentage of individuals demonstrating proficiency on a performance assessment, such as the National Work Readiness Credential Essential Soft Skills assessment[580]

Data source(s): Assessments

What to know about measurement: Although there is broad consensus on the importance of communication skills, communication performance assessments are not currently administered and reported at scale. We propose using a performance-based test rather than a self-reported or instructor- or employer-reported measure to mitigate the risk of bias; however, the performance tests described above only measure *written* communication skills, not verbal communication skills. As alternatives to the performance test measures suggested above, the AAC&U has published scoring rubrics for both written communication and oral communication that could be used to assess students' skills in postsecondary contexts, though they have not been validated and should be used only for formative purposes.[581] We suggest communication skills could be measured starting in middle or high school and have suggested potential performance-based measures that can be used with youth.

We acknowledge that measuring "soft skills," including communication skills, carries with it a risk of perpetuating White, Eurocentric communication norms as the standard. There is evidence of linguistic discrimination against nonnative and Black workers based on their speech—for instance, one national study found that Black workers who were perceived to "sound Black" earned 12 percent less than otherwise similar Black workers who were perceived to "sound White."[582] Data users should examine potential unintended consequences of soft skills assessments and proactively mitigate risks related to bias (see the Data Equity Principles section of this report for further guidance).

Source frameworks: This indicator appeared in the Urban Institute's Robust and Equitable Measures to Identify Quality Schools (REMIQS) framework as part of the definition of "deeper learning skills." A report on student learning outcomes by the Postsecondary Value Commission[583] references both the CLA+ instrument and the HEIghten Outcomes Assessment recommended here. Our proposed definition is adapted from a report by Child Trends, which describes key soft skills required for workforce success.[584]

Higher-order thinking skills

Definition: Individuals have the problem solving, critical thinking, and decision-making skills needed in the workplace.

Why it matters: Higher-order thinking (also referred to as critical thinking, problem solving, or decision making) is consistently ranked as one of the most in-demand workforce readiness competencies by employers across industries.[585, 586] According to a survey by the National Association of Colleges and Employers (NACE), nearly all employers consider critical thinking to be very or extremely important for workforce success—however, only 56 percent rate recent graduates as very or extremely proficient.[587] Research suggests that higher-order thinking skills are predictive of employment and workplace performance.[588, 589] Recognizing their importance, three states mention higher-order thinking skills in their high school graduation requirements,[590] and American Association

of Colleges and Universities (AAC&U) includes creative thinking, critical thinking, ethical reasoning, problem solving, and inquiry and analysis among 16 "essential learning outcomes."[591] In a comprehensive review of soft skills literature, researchers found that higher-order thinking skills are predictive of workforce outcomes for youth ages 15–29, as well as for the general adult population.[592]

Recommended metric(s):

- K–12: Percentage of students demonstrating proficiency on assessments such as the College and Career Readiness Assessment (CLA+),[593] an assessment for grades 6–12 that measures critical thinking, problem solving, and written communications

- Postsecondary: Percentage of students demonstrating proficiency on assessments such as the following:
  - The CLA+ or Success Skills Assessment (SSA+),[594] assessments for postsecondary students that measure critical thinking, problem solving, and written communications
  - The HEIghten Outcomes Assessment for Critical Thinking[595]

- Workforce: Percentage of individuals demonstrating proficiency on assessments such as the Watson Glaser Critical Thinking Appraisal,[596] a scenario-based assessment used by employers to evaluate candidates or identify areas of opportunity for growth

Data source(s): Assessments

What to know about measurement: Although there is broad consensus on the importance of critical thinking skills, currently there are not any critical thinking assessments that are administered and reported at scale. The Postsecondary Value Commission describes a variety of ways in which "cognitive ability and intellectual dispositions," a family of skills that includes critical thinking, could be measured. [597] The HEIghten assessment, suggested above as a potential instrument for measuring critical thinking skills in postsecondary contexts, has not been validated in large-scale evaluations, but is currently being evaluated in the Next Generation Undergraduate Success Measurement Project, a rigorous study of various methods to measure undergraduate experiences and outcomes.[598] Given the research evidence, we suggest higher-order thinking skills could be measured starting in middle or high school and have suggested potential performance-based measures that can be used with youth. We propose using a performance-based test to mitigate the risk of bias in self-reported or instructor- or employer-reported measures.

As noted above, we acknowledge that measuring soft skills, including critical thinking and problem-solving skills, carries with it a risk of cultural and racial bias, depending on how they are measured. Data users should examine potential unintended consequences of soft skills assessments and proactively mitigate risks related to bias (see the Data Equity Principles section of this report for further guidance).

Source frameworks: This indicator appeared in six source frameworks reviewed for this report. A report on student learning outcomes by the Postsecondary Value Commission[599] references both the CLA+ instrument and the HEIghten Outcomes Assessment recommended in this report. Our proposed definition is adapted from a report by Child Trends that describes key soft skills required for workforce success.[600]

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Minimum economic return

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(PK) (**K12**) (**PS**) (**WF**)

Definition: Individuals earn enough after completing their education to recover the costs of their investment.

Why it matters: Although postsecondary education represents an important pathway to economic mobility, it requires a significant financial investment. If institutions fail to deliver a minimum economic return to students, individuals are at higher risk for defaulting on loans, which has meaningful consequences and creates barriers to wealth building that are difficult to overcome.[601] Analyses by the Postsecondary Value Commission show that a number of institutions do *not* equitably deliver economic value.[602] For example, private for-profit institutions, which disproportionately serve students from low-income households, are less likely to deliver a minimum economic return than their public and private nonprofit counterparts. Furthermore, institutions with higher shares of White students are more likely to deliver a minimum economic return, whereas the opposite is true for institutions with higher shares of Black and Indigenous students and Pell Grant recipients. However, disaggregated thresholds should be used when assessing these populations' earnings to account for labor market discrimination.[603]

> **Postsecondary Value Commission Exploring Equitable Value Data Tool**
>
> The Equitable Value Explorer is an interactive data dashboard that allows users to analyze institution-level data against the Postsecondary Value Commission framework. The tool is meant to inform institutional improvement efforts around the Postsecondary Value Commission's metrics, including minimum economic return and economic mobility. The Equitable Value Explorer leverages publicly available data from the College Scorecard, the Integrated Postsecondary Education Data System, and the Census Bureau's American Community Survey. The data can be filtered to customize the dashboard view. Users can click on specific institution profiles to view how an institution's data compare to the earnings thresholds established by the Postsecondary Value Commission. This approach allows institutional leaders and students to better assess how their colleges and universities add value to all students, regardless of their background.

Recommended metric(s): Percentage of individuals that earn at least as much as the median high school graduate in their state plus enough to recoup their total net price plus interest within 10 years of completing their highest degree or leaving education (high school, postsecondary education, or workforce training)

Data source(s): Administrative data

What to know about measurement: This metric can be estimated at the institutional level for postsecondary institutions using College Scorecard data. Both secondary and postsecondary institutions can measure it at the individual level if they collect or can link necessary earnings data for their graduates. For example, the University of Texas system publishes median loan debt and median earnings at 1, 5, and 10 years after graduation by degree level, linking student records to earnings data from the Texas Workforce Commission. Measuring this indicator at the individual level requires linking data from the K–12, postsecondary, and workforce sectors, which states can do through their

longitudinal data systems. We recommend this indicator be measured among high school graduates and workforce training completers as well because not all individuals pursue or complete postsecondary education. Further, this indicator should be measured among non-completers, as some students may enroll in a training or postsecondary program but not graduate and still carry student debt with them.

Source frameworks: This indicator appeared in two source frameworks reviewed for this report. Our proposed measure draws on work by the Postsecondary Value Commission.[604] In the Postsecondary Value Framework, this measure is described as "Threshold 0," indicating the minimum economic return individuals should obtain from their postsecondary education to enable future economic mobility and security.

Student loan repayment

(PK)(K12)(**PS**)(**WF**)

Definition: Individuals pay student loans on time and make progress toward paying down their debt.

Why it matters: Student loan default has serious negative consequences, including restricted access to other loans, increased repayment amounts due to collection costs, and damaged credit.[605] Compared to other racial and ethnic groups, Black college students are the most likely to borrow to pay for college: 50 percent of Black college students have student loans, compared to 26 percent of Asian students, 29 percent of Latino students, and 38 percent of White students.[606] In addition, Black borrowers are the most likely to struggle financially due to student loan debt, with almost a third having payments of $350 or more per month.[607] Among borrowers, loan delinquency and default disproportionately impact Black and Latino students.[608, 609] Within six years of starting college, 32 percent of Black borrowers who had begun repayment defaulted on their loans, compared to 20 percent of Latino borrowers and 13 percent of White borrowers. First-generation college students are also more than twice as likely to experience delinquency than students with at least one parent who has earned a bachelor's degree.[610]

First-generation college students are more than

2x as likely

to experience **student loan delinquency** than students with at least one parent with a bachelor's degree.

Source: U.S. Federal Reserve (2015).

Recommended metric(s): Percentage of student borrowers in the following repayment categories, as defined on the College Scorecard[611]—making progress, paid in full, and deferment—1, 2, 3, 5, and 10 years into the repayment phase of the loans

"Making progress" refers to making regular payments such that the total of outstanding loan balances is less than the total of the original loan balances. "Paid in full" means the outstanding loan balance is $0 and the loan has not been discharged through bankruptcy or other means. "Deferment" refers to a postponement of the loan obligations, which is common for students re-enrolling in school. Borrowers who do not meet these milestones may fall in other categories, such as delinquency, default, and not making progress, that indicate they are unable to make timely progress toward their student debt.

Data source(s): Administrative data

What to know about measurement: The College Scorecard publicly reports student loan repayment data at the institutional level two years after students enter the repayment phase of their loans.[612] These data are based on individual records from the National Student Loan Data System (NSLDS), the U.S. Department of Education's central database for federal student aid loans and grants. College administrators have access to individual-level NSLDS records; students have access to their own information.

Source frameworks: This indicator appeared in the Institute for Higher Education Policy's Postsecondary Metrics Framework.[613] Our definition and proposed metric more closely draw from the categories defined by the College Scorecard,[614] as noted above.

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Employment in a quality job

. . . .

PK **K12** **PS** **WF**

Definition: Individuals are employed in a position that offers a living wage, benefits, stable and predictable schedules, clear and fair advancement to higher pay, safe conditions, and job security.

Why it matters: According to the Organisation for Economic Co-operation and Development (OECD),[615] job quality is a key determinant of individual well-being. Higher wages and benefits are associated with multiple aspects of worker well-being, including life satisfaction, mortality, wealth accumulation, and mental health.[616, 617, 618, 619] A living wage is defined as "the minimum economic standard that, if met, draws a very fine line between the financial independence of the working poor and the need to seek out public assistance or suffer consistent and severe housing and food insecurity."[620] As this definition by the Massachusetts Institute of Technology (MIT) Living Wage Calculator indicates, a living wage is a minimum threshold, yet it typically exceeds the minimum wage. For instance, the living wage for a single mother with one child in the Atlanta metropolitan area is $30.74 per hour—more than four times higher than the local minimum wage of $7.25.[621] For those who pursue postsecondary education, it is also important to consider whether they are earning what they expect to earn in their field beyond the living wage threshold.[xiv]

Flexibility at work

Percentage of low-wage workers indicating their supervisor or mentor *"allows me the flexibility I need to balance life demands outside of work"*
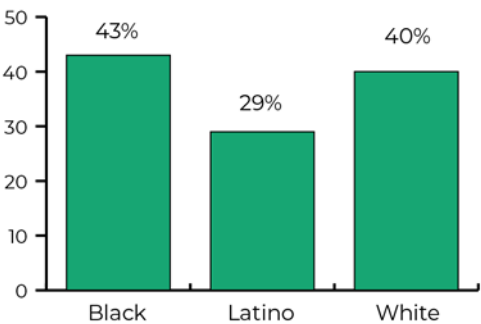
Source: Fuller and Raman (2022).

Non-economic aspects of job quality also matter for workers' well-being and success. A recent study shows that aspects of job quality, such as stable and predictable scheduling and room for upward growth within a company, are meaningful to low-wage workers, defined as those earning less than approximately $40,000 per year.[622] As with wages, there are disparities in other aspects of job quality. For instance, less than half of low-wage workers report

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xiv This is what the Postsecondary Value Commission calls "earnings premium."

having a supervisor who offers them flexibility regarding work-life balance, with only 29 percent of Latino respondents reporting sufficient flexibility compared with 40 percent of White workers and 43 percent of Black workers.

Recommended metric(s): Percentage of individuals employed in a quality job, as defined by scores on an indexed measure, such as the Good Jobs Scorecard,[623] which assesses pay and benefits, scheduling, potential career paths, safety, and security

Data source(s): Surveys

What to know about measurement: There are a variety of definitions and frameworks related to job quality, and despite agreement on the value of higher wages and other job characteristics, such as benefits and scheduling flexibility, there is no field-wide consensus definition of a "quality job." Differences in the nature of work across industries and geographies also pose challenges to establishing a standard measure of job quality that applies across contexts, as does the availability of job data beyond wages. We see this indicator as an area where the framework can promote a more widely validated and used measure. E-W institutions, such as school districts and colleges, may measure this indicator among their graduates by linking K–12, postsecondary, and workforce data.

Source frameworks: This indicator appeared in 10 source frameworks reviewed for this report. Our proposed definition and measure draw on work by the MIT Good Jobs Institute.[624]

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Economic mobility

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(PK) (K12) (PS) (WF)

Definition: Individuals reach the level of earnings needed to enter the fourth income quintile or above, regardless of field of study.

Why it matters: Upward mobility is an important dimension of equitable opportunity and a central feature of an inclusive economy. In an equitable society, individuals should be able to access opportunities that allow them to be economically mobile despite their social class of origin. Students at approximately two-thirds of four-year institutions—both public and private—achieve economic mobility as defined by our proposed metric.[625] However, students who attended public two-year institutions are significantly less likely to meet economic mobility thresholds than those who attended four-year colleges. Much of the research on economic mobility focuses on *intergenerational* mobility, comparing household income levels during childhood to income levels in adulthood.[626, 627, 628] Rates of intergenerational upward mobility are lower for Black and Indigenous individuals compared to White and Latino individuals.[629]

Recommended metric(s): Percentage of individuals who reach the level of earnings needed to enter the fourth (60th to 80th percentile) income quintile in their state or above 1, 3, 5, 10, and 15 years after completing their highest degree or leaving education (high school or postsecondary)

Data source(s): Administrative data

What to know about measurement: Measuring this indicator at the individual level requires linking data from the K–12, postsecondary, and workforce sectors or surveying graduates about their earnings, which states can do with their state longitudinal data systems. To calculate this metric, institutions

would need to track the earnings of their students and determine whether those earnings fall above the appropriate threshold. To determine this threshold, institutions can use the 60th percentile of earnings in the state where the individual resides. An alternative and more feasible approach is to base the threshold on the state where the institution is located; however, this approach may be less relevant in locations where a high share of graduates move out of the state.

We acknowledge that much of the literature on "economic mobility" defines it as intergenerational. For example, Chetty et al. define it as "the fraction of students who come from families in the bottom income quintile and reach the top quintile."[630] However, measuring mobility in this way requires comprehensive longitudinal data sets. Our proposed indicator of mobility focuses on whether individuals reach certain earnings thresholds, regardless of their parents' economic status, drawing on work by the Postsecondary Value Commission. A measure of whether individuals reach a certain level of earnings can be collected more feasibly at scale. In addition, even among families that were not low income a generation ago, there are barriers to achieving a high level of earnings today, especially for people of color. For example, Black Americans are more likely to experience downward mobility than White Americans.[631]

Source frameworks: This indicator appeared in three source frameworks reviewed for this report. Our proposed measure aligns with work by the Postsecondary Value Commission.[632] The metric proposed by the Postsecondary Value Commission builds on a measure included in Opportunity Insights Mobility Report Cards, which define economic mobility as whether students in the bottom quintile reach the top earnings quintile.[633]

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Economic security

- -

(PK) (**K12**) (**PS**) (**WF**)

Definition: Individuals reach median levels of wealth (net worth).

Why it matters: Although minimum economic return and high earnings are important stepping stones, establishing financial security and building meaningful savings require individuals to accumulate wealth (that is, build net worth). Wealth allows individuals and families to withstand serious financial hardships, such as illness, unemployment, or divorce. Personal wealth is also associated with a variety of positive outcomes, including home ownership, health, and intergenerational educational attainment.[634] Wealthier families can save more for their children's postsecondary education, establishing an intergenerational foundation for economic mobility and security. However, there are significant racial disparities in wealth accumulation: one analysis finds that the gap in median wealth between Black and White college-educated adults is more than $150,000 and widens to more than $200,000 for those with a post-college degree.[635]

Recommended metric(s): Percentage of individuals who reach median levels of wealth 10, 15, 20, and 30 years after completing their highest degree or leaving education (high school, workforce training, or postsecondary education)

Data source(s): Administrative data or surveys

What to know about measurement: Our proposed measure is aspirational in nature, given a lack of quality administrative data to measure wealth at scale. Killewald et al. describes a variety of challenges

related to measuring net worth, including that there is no consensus on how best to operationalize it, and that the distribution of wealth is highly skewed.[636] However, the authors also note advances in the availability of net worth data and describe nationally representative surveys that measure net worth on a regular basis at aggregate levels, including two that measure wealth annually: the Consumer Expenditure Survey and the Survey of Income and Program Participation. However, these sample only a small percentage of the U.S. population.

We also note an alternative definition of "security" frequently used in the field. Since 2013, the Federal Reserve Board has conducted the Survey of Household Economics and Decisionmaking (SHED), which asks about risks to households' financial stability.[637] The survey asks respondents to indicate (1) whether they have set aside emergency funds to cover expenses for three months and (2) whether they would be able to cover an immediate emergency cost of $400. The field often thinks of "financial security" in this way—as a more near-term measure of resilience against financial shocks. However, this definition is a lower bar than our proposed measure of median wealth, estimated to be above $100,000.[638]

Source frameworks: This indicator appeared in four source frameworks reviewed for this report. Our proposed indicator name and measure align with work by the Postsecondary Value Commission.[639]

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C. E-W system conditions

E-W system conditions include institutional or systemic environments, policies, and practices that help or hinder the ability to achieve positive E-W outcomes. Exhibit II.5 presents a summary view of the E-W system conditions indicators in each domain and sector.

Exhibit II.5. E-W system conditions indicators

	Pre-K	K–12	Postsecondary	Workforce
Academic progress and completion	Access to quality public pre-K			
	Access to full-day pre-K			
	Access to child care subsidies			
	School-family engagement			
	Equitable discipline practices			
		Access to full-day kindergarten		
		English learner progress		
	Teacher credentials			
	Teacher experience			
	Educator retention			
	Classroom observations of instructional practice			
		Student perceptions of teaching		
		Teachers' contributions to student learning growth		
	Effective program and school leadership			
		Institutions' contributions to student outcomes		
		Access to college preparatory coursework		
		Access to early college coursework		
		Equitable placement in rigorous coursework		
	Access to quality, culturally responsive curricula			
	Expenditures per student			
Social, emotional, and physical well-being	Access to early intervention screening			
		School safety		
	Inclusive environments			
	Representational racial and ethnic diversity of educators			
	School and workplace racial and ethnic diversity			
	School and workplace socioeconomic diversity			
	Access to health, mental health, and social supports			
Career readiness and economic success		Access to college and career advising		
		Access to in-demand CTE pathways		
			Unmet financial need	
			Cumulative student debt	
				Expenditures on workforce development programs
				Access to jobs paying a living wage
				Access to ongoing career skills development

CTE = career and technical education; K = kindergarten.

DOMAIN: Academic progress and completion

Access to quality public pre-K

PK K12 PS WF

Definition: Children have access to a high-quality public pre-K program.

Why it matters: A high-quality pre-K program can meaningfully enhance children's early learning and development, thereby producing long-term improvements in school success and generating benefits to both individuals and society that far exceed the costs.[640, 641] The positive effects of access to quality pre-K on children's math and reading achievement are even larger in districts with a majority of Black students.[642] Although Black children enroll in pre-K at rates roughly similar to their White peers (and have higher rates of enrollment in publicly funded programs), the quality of their experiences differ. On average, Black children attend programs rated as lower quality than White children.[643, 644, 645] For instance, a study of New York City's universal pre-K program found that Black children attended programs with quality scores about 0.5 standard deviations lower than White children; put differently, more than two-thirds of Black children attended pre-K programs of lower quality than White children.[646]

Recommended metric(s): Percentage of public pre-K programs that meet Quality Rating and Improvement Systems (QRIS) state benchmarks of quality

Data source(s): Administrative data; classroom observations

What to know about measurement: QRIS has been implemented in all or part of 38 states and is based on quality standards determined by each state.[647] Each state uses QRIS to collect data on the quality of pre-K program sites. Because states may use some of the same QRIS indicators and measure them in the same ways, it is possible to compare ratings across most states. Framework users can consult the QRIS Compendium[648] to examine which indicators and metrics used to define quality align across states. QRIS capture mandatory requirements that must be met to legally operate, funding standards to be eligible for specific funding sources, and voluntary quality standards and best practices. Many of the elements—particularly mandatory requirements and funding standards—captured in these systems are the minimal standards that support pre-K program quality. QRIS data are also limited in that most states do not include additional criteria for effectively serving children with disabilities, although some states are working on or considering inclusion in their QRIS designs.[649] The measurement tools often used in QRIS currently (such as the Early Childhood Environment Rating Scales) may not fully capture whether programs are meeting the needs of all students.

To measure the quality of state pre-K *policies*, National Institute of Early Education Research (NIEER) publishes the State of Preschool Yearbook, which annually tracks states' minimum policies in place to support public pre-K quality according to a set of quality standards. Information on the quality of states' pre-K policies can supplement the program-level quality data provided by QRIS.

Source frameworks: Eleven source frameworks reviewed for this report include a measure of access to Pre-K. Our approach to measuring quality using QRIS benchmarks aligns with recommendations put forth by the Center on Enhancing Early Learning outcomes (CEELO) and the Council of Chief State School Officers (CCSSO).[650]

Access to full-day pre-K

PK **K12** **PS** **WF**

Definition: Children have access to full-day, publicly funded pre-K programs.

Why it matters: Attending a full-day pre-K program is linked to improved outcomes for students, including greater school readiness in language development, math, and reading.[651, 652] Expanding access to full-day pre-K programs increases children's enrollment in these programs. For example, after Chicago Public Schools expanded full-day pre-K, Black students' enrollment these programs more than quadrupled. Expanding access to full-day pre-K can also raise mothers' participation in the workforce. In Washington, DC, introducing universal access to full-day pre-K[653] led to a 10-percentage point increase in mothers' workforce participation rates, with even larger increases for Black mothers and those with low incomes.[654] Although more White children are enrolled in preschool than any other group (43 percent, compared to 38 percent of Black children and 34 percent of Latino children), they are the least likely group to be enrolled in full-day programs.[655] Enrollment in full-day (versus half-day) programs is more common in households where the mother works outside the home. However, access to affordable, full-day pre-K is still limited: among districts that offer publicly funded pre-K, less than half offer full-day programs.[656]

Recommended metric(s): Percentage of public pre-K programs that are six hours per day for five days per week

Data source(s): Administrative data

What to know about measurement: Information on the duration of pre-K programs could be collected and compared across states. We recommend collecting this information to measure this indicator instead of relying on "full-day" versus "half-day" designations used by states and districts, which are based on varying definitions and are therefore less comparable.[657] Our recommended metric is based on the definition used by Civil Rights Data Collection (CDRC), which gathers data from all public districts on whether they offer full-day or half-day pre-K programs.

The CRDC publishes information at the district level, which is not sufficient to assess equitable access to full-day pre-K. Because many school districts offer both full-day and half-day programs, not all families necessarily have equitable access to full-day pre-K, even in districts that offer full-day programs (for example, if they do not live close to any of the schools that offer full-day pre-K). For this reason, it is important to collect information on duration at the program level.

Source frameworks: Three source frameworks reviewed for this report included a measure of access to pre-K. Our proposed approach to measuring both program quality *and* length of school day aligns with the approach taken in the P-16 framework, which notes that "students who attend high-quality full-day pre-kindergarten are better prepared for kindergarten." [658]

Access to child care subsidies

PK **K12** **PS** **WF**
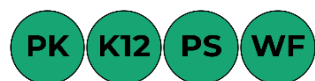
Definition: Eligible families have access to child care by using subsidies to pay for care.

Why it matters: Child care subsidies can help improve the economic well-being of families with low incomes by allowing them to afford child care, find employment, or pursue further education.[659, 660, 661, 662] These subsidies also allow families to choose higher-quality child care than they could afford without the subsidy, which in turn is linked with optimal child outcomes.[663, 664, 665] An analysis from the Center for Law and Social Policy found that in 2019, "just 8 percent of potentially eligible children received subsidies based on federal income eligibility limits and 12 percent of potentially eligible children received subsidies based on state income eligibility limits." Black children had the highest rates of access, and Asian and Latino children had the lowest rates of access nationally. Barriers to child care subsidy receipt for eligible families include lack of knowledge of the availability of subsidies, lack of a perceived need for help, and challenges in navigating and coordinating services from multiple agencies to apply for and continue receiving the subsidy.[666, 667]

Recommended metric(s): Percentage of eligible families receiving assistance to pay for child care through subsidies[xv]

Data source(s): Administrative data

What to know about measurement: Each state receives resources from the federal Child Care and Development Fund (CCDF) program, which is the primary federal funding source for child care subsidies to help eligible families access child care. Federal reporting requirements for the CCDF block grant ask states to provide case-level data on a monthly or quarterly basis about children and families receiving child care subsidies.[668] However, because state data systems differ, and many agencies issue subsidy authorizations or payments on different schedules, it may be difficult to make comparisons across states. For example, the time unit of data collection for child care subsidy services may differ because it is determined by the state's payment policies.[669]

Source frameworks: This indicator appeared in three source frameworks reviewed for this report. Our proposed definition draws from the National School Readiness Indicators framework prepared by Rhode Island KIDS COUNT.[670] Our recommendation to focus on eligible families, rather than eligible children, draws from the CCDF federal reporting requirements outlined above.

[xv] Child care subsidies are funded by the CCDF, a block grant in which states have the flexibility to decide how to use the funds to help children in need. In general, the federal eligibility guidelines state that the subsidy is for parents or primary caregivers with children 13 or younger, or younger than 19 if they are incapable of self-care or under court supervision, and must be from low-income or very low-income households. The parents or primary caregivers must also be either employed or, in some states, enrolled in a training or education program.

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School-family engagement[xvi]

....

PK K12 PS WF

Definition: There are effective partnerships between schools and families, such that parents have access to school systems and are meaningfully included in school processes and student learning.

Why it matters: School outreach to and engagement with families provides benefits to students academically and socially, both in short-term school success and long-term outcomes, such as high school graduation and college enrollment.[671, 672] Although family engagement is widely understood to be key to students' educational success, not all schools successfully build a culture that welcomes and engages all families, and especially families of color. For example, an analysis of parent survey data in California found that perceptions of how well the school encouraged parental involvement were significantly lower among Indigenous parents compared to other groups.[673] Research suggests that school-family engagement is influenced by factors that disproportionately affect families of color, such as parents' work schedules, transportation, child care needs, and differences in cultural norms.[674, 675, 676, 677]

Recommended metric(s):

- Pre-K: Percentage of families and percentage of teachers or caregivers reporting positive relationship quality with one another, using a tool such as the Family and Provider/Teacher Relationship Quality (FPTRQ) parent survey[678]

- K–12: Mean scores on family surveys, such as the Panorama Family-School Relationships Survey[679] or CORE Districts School Culture & Climate Survey parent assessment of school-community engagement[680]

Data source(s): Surveys

What to know about measurement: We recommend surveying families to measure their perceptions of school-family engagement. Several survey tools exist to measure this indicator and related constructs. We have identified and suggested tools with an evidence base; however, others may also be appropriate. For example, the Early Childhood Learning & Knowledge Center offers a database of standardized measures related to family engagement efforts and effects and the National Center on Safe Supportive Learning Environments offers a survey item bank to measure various aspects of school climate, including parent engagement. Although family engagement can also be measured using teacher surveys—for example, using the Involved Families component of the UChicago 5Essentials Survey—we emphasize the importance of elevating families' voices in measuring this indicator. School climate surveys, which at least 13 states implement, typically include instruments for students, staff, and families.[681]

As with all surveys, data users should pay attention to response rates in interpreting and reporting school climate survey data. For instance, the California Department of Education recommends a minimum response rate of 70 percent for students and staff and 25 percent for parents.[682] The Georgia

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[xvi] This indicator is one of several that, together, signal school climate. The full set of school climate indicators includes *school-family engagement*, *equitable discipline practices*, *student perceptions of teaching*, *school safety*, and *inclusive environments*.

Department of Education requires a 75 percent response rate for students and staff, and at least 15 parent surveys for reporting purposes.[683] The thresholds used are lower for parent surveys because response rates among parents tend to be significantly lower than for students and staff, who take the surveys during school hours.[684] However, efforts to boost parent response rates would help ensure the resulting data are valid and representative of all families. (For best practices to boost school survey response rates, see Panorama Education.)[685]

Source frameworks: This indicator appeared in 10 source frameworks reviewed for this report. Our proposed approach to measuring family engagement is consistent with recommendations by StriveTogether,[686] CORE Districts,[687] and the National Research Council.[688]

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Equitable discipline practices[xvii]
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PK **K12** PS WF

Definition: Schools treat students similarly and appropriately for disciplinary infractions.

Why it matters: School practices play a key role in determining students' disciplinary outcomes,[689] and different approaches to discipline, such as restorative justice and positive behavioral interventions and supports (PBIS), may be related to improvements in school culture and climate.[690, 691] Research documents large and persistent disparities in exclusionary discipline—that is, disciplinary actions that remove students from their usual educational setting, such as an in- or out-of-school suspension—along race, socioeconomic background, and disability status.[692] (See the indicator on *positive behavior* for additional information on patterns of disproportionality in suspension and expulsion rates.) There are also disparities in the types of discipline practices implemented in schools.[693] For instance, schools with more Black students are less likely to use restorative disciplinary practices as an alternative to punitive discipline.[694]

> **Identifying and addressing disproportionate discipline in Maryland**
>
> In partnership with the Regional Education Laboratory (REL) Mid Atlantic, the Maryland State Department of Education (MSDE) is systematically identifying and addressing disproportionality in exclusionary discipline. All local school systems in the State of Maryland have discipline review teams tasked with examining removals from the classroom and increasing the use of non-exclusionary discipline practices.
>
> Discipline data are disaggregated by race and ethnicity and disability status, allowing practitioners and researchers to understand disciplinary trends and examine school characteristics related to disproportionate discipline. MSDE is using data to identify resources and interventions that can promote preventive strategies and non-exclusionary behavioral supports, such as restorative justice practices and positive behavioral interventions and supports.

[xvii] This indicator is one of several that, together, signal school climate. The full set of school climate indicators includes *school-family engagement*, *equitable discipline practices*, *student perceptions of teaching*, *school safety*, and *inclusive environments*.

Recommended metric(s):

- Differences in the rates at which students from key demographic subgroups ever experience different forms of school discipline (office referrals, suspensions, expulsions, restraint, and exclusion) relative to those students' representation in their school population as a whole
- Disproportionalities along the lines of key demographic characteristics in the level of school discipline experienced (for example, number of days suspended).

Data source(s): Administrative data

What to know about measurement: Schools regularly collect discipline data as part of their normal operations and report aggregate data by subgroups to the Civil Rights Data Collection (CRDC). Although suspensions and expulsions generally are defined and tracked comparably, there are opportunities for states to apply more consistent definitions in determining what counts as physical restraint and seclusion by adopting the revised federal definitions proposed by the Office of Civil Rights. (See Arundel[695] for a discussion of challenges in defining and reporting restraint and seclusion in schools.)

We acknowledge that there are multiple methods for determining disproportionality. (See Bollmer et al.[696] for guidance on approaches to measuring disproportionality.) In addition, proportionate outcomes do not imply that effective disciplinary practices are in place, especially in schools where most students are students of color. For instance, it is possible for expulsion rates to be proportionate but high. We encourage systems to closely monitor absolute rates as well as the number of days students experience exclusionary discipline and consider alternative discipline practices such as PBIS and restorative justice.

Source frameworks: Disciplinary measures appeared in nine source frameworks reviewed for this report. Our proposed approach to measuring disciplinary practices at the systems level is consistent with recommendations by the CORE Districts[697] and the National Research Council.[698]

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Access to full-day kindergarten

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(PK) (**K12**) (PS) (WF)

Definition: Children have access to full-day kindergarten programs taught by the same certificated staff member in a day.

Why it matters: Full-day kindergarten is an increasingly popular option for families due to dual parental workforce participation and has been shown to narrow achievement disparities for children of color.[699, 700] Latino students enrolled in full-day kindergarten have been shown to have particularly large gains relative to their peers in half-day kindergarten: the disparity in literacy scores between Latino and non-Latino children attending full-day kindergarten is 0.3 standard deviations, compared to 0.9 standard deviations for children in half-day programs.[701] As of 2020, 18 states required districts to offer full-day kindergarten,[702] and more than 80 percent of kindergarteners attended a full-day program.[703] Full-day programs are more prevalent in schools with higher shares of students from low-income households and students of color; however, enrollment in full-day kindergarten is significantly lower for Latino students than for Black students.[704]

It is worth noting that only 20 states require children to attend kindergarten, and overall enrollment fell sharply during the COVID-19 pandemic.[705] Nationwide, kindergarten enrollment declined by 9 percent between the 2019–2020 and 2020–2021 school years, with larger decreases for Black students (10 percent), White students (11 percent), and Indigenous students (13 percent).[706]

Recommended metric(s): Percentage of schools and districts offering kindergarten programs that are six hours per day for five days per week

Data source(s): Administrative data

What to know about measurement: In states that do not require districts to offer full-day kindergarten, provision can vary widely. As one example, in California, where full-day kindergarten is not required, 19 percent of districts offered only half-day programs.[707] Given that participation is not required in many states, systems should also monitor enrollment in these programs.

We note that this indicator does not encompass quality because there is less consensus in the field as to how to define and measure quality kindergarten. For example, some have used Classroom Assessment Scoring System (CLASS®) scores to measure classroom quality, with kindergarten CLASS scores predicting higher test scores in language, math, and executive function skills at the end of kindergarten.[708] Others have measured kindergarten quality based on measures of teacher experience and small class sizes, and found these elements were related to higher scores on standardized academic cognitive assessments and higher salaries in adulthood.[709] To assess quality in kindergarten, we encourage framework users to measure multiple K–12 system indicators that appear in the framework, such as *teacher experience* and *classroom observations of instructional practice*, for all relevant grades, including kindergarten.

Source frameworks: This indicator appeared in three source frameworks reviewed for this report. Our proposed approach builds on work by the Center on Enhancing Early Learning outcomes (CEELO) in collaboration with the Council of Chief State School Officers (CCSSO), which recommends measuring the "percent of schools and/or districts offering full day kindergarten."[710]

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English learner progress

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(PK) (**K12**) (PS) (WF)

Definition: Emerging multilingual students achieve English proficiency within five years of being classified as English learners.

Why it matters: There are widely documented disparities in the outcomes of English learner students and non-English learner students, which are especially pronounced for students who do not achieve English proficiency within five years. Long-term English learners tend to have a grade point average (GPA) below a 2.0 and to be two to three years below grade level in English language arts and math.[711] The longer a student remains classified as an English learner, their risk of dropping out of school[712] and having other adverse academic outcomes increases.[713] In Arizona, for example, only 49 percent of long-term English learners graduated high school on time, compared to 81 percent of long-term proficient former English learners and 85 percent of never English learners.[714] Long-term placement in English learner education can limit students' opportunity to take college preparatory and early college courses.[715, 716]

Rates of economic disadvantage or disability status are generally higher for long-term English learners than English learner students reclassified earlier. For example, more than 50 percent of long-term English learner students in secondary grades in Arizona were eligible to receive individualized education program (IEP) services, compared to less than 15 percent of former English learners who had been reclassified as English proficient.[717]

Recommended metric(s): Percentage of English learner students who are reclassified in five years or less, based on local reclassification criteria

Data source(s): Administrative data

What to know about measurement: Data on English learner students' reclassification status is widely collected because the Every Student Succeeds Act (ESSA) requires districts to track students' English language proficiency annually.[718] States and districts vary in the assessments and criteria they use to test and reclassify English learner students.[719] Although not perfectly comparable, this metric conveys a similar meaning across most contexts. In addition to tracking reclassification rates, which can be impacted by multiple criteria, systems should also monitor student performance on the required assessments of English proficiency.

Source frameworks: Four source frameworks reviewed for this report include a measure of English language learner progress or reclassification. Our proposed definition and measure draw on work by the CORE Districts.[720]

Teacher credentials

PK K12 PS WF

Definition: Students have access to teachers who have earned credentials demonstrating their knowledge and preparation for teaching.

Why it matters: During the COVID-19 pandemic, many schools have struggled to fully staff classrooms, and more students than before are being taught by substitute teachers or those with emergency certificates.[721] Research is divided on the importance of teacher credentials. In pre-K, some analyses find that teachers' levels of education are related to higher-quality early childhood learning environments,[722] whereas other analyses show no relationship to classroom quality or children's academic gains.[723] In K–12, there is some evidence that being taught by a K–12 teacher with a regular or full certificate, as opposed to an emergency or provisional license, benefits students' math and English language arts achievement,[724] but many other studies conclude that teacher credentials, such as National Board certification or graduate degrees, are not a meaningful signal of teaching quality.[725, 726] Nevertheless, the current challenges of staffing schools raise concerns about increasing inequities, as there was already evidence of disparate access to teachers with higher-level credentials.[727, 728, 729] For example, in 2016, schools enrolling a high proportion of students of color were four times more likely to employ uncertified teachers than those with a low share of students of color (4.8 versus 1.2 percent), although it was an uncommon practice.[730]

Recommended metric(s):[xviii]

- Pre-K:
  - Percentage of lead teachers with at least a bachelor's degree
  - Percentage of lead teachers with specialized training in pre-K
- K–12:
  - Percentage of courses taught by full-time equivalent (FTE) teachers (that is, teachers other than substitutes or those with emergency or provisional licenses)
  - Percentage of courses taught by teachers certified to teach the given subject or grade level

Data source(s): Administrative data

What to know about measurement: Data on teacher credentials can be tracked as part of districts' or states' staff data management systems. Virtually all states with a Quality Rating and Improvement System (QRIS) for their pre-K programs include staff education and training as part of their program quality rating indicators.[731] K–12 districts must report school-level data to the Civil Rights Data Collection (CRDC) on the number of math and science courses taught by certified teachers.

Source frameworks: This indicator appeared in 11 source frameworks reviewed for this report. Our recommendations for the pre-K sector align with the National Institute of Early Education Research (NIEER) national standards for high-quality pre-K[732] as well as the definition of Early Education Teacher Credentials put forth by Rhode Island KIDS COUNT.[733] Our proposed metric in the K–12 sector is adapted from the definition for "teacher qualifications" in StriveTogether's Guide to Racial and Ethnic Equity.[734]

Teacher experience

PK **K12** PS WF

Definition: Students have equitable access to experienced teachers.

Why it matters: Research consistently shows that more experienced teachers make greater contributions to student achievement, especially compared to teachers who are early in their careers.[735, 736, 737, 738] After teachers gain about five years of experience, however, the difference between a more or less experienced teacher (that is, one with 10 versus 5 years of experience) is not significant.[739] Students do not have equal access to experienced teachers; Black and Latino students, and those from low-income households, are more likely than their peers to be taught by teachers who are newest to the profession.[740, 741] In 2016, 9 percent of teachers in schools with a low share of students

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[xviii] In the postsecondary context, we explored whether to include a measure of the percentage of courses taught by tenured professors, which we ultimately do *not* recommend. Research has produced mixed findings about the extent to which having more classes with adjunct professors matters for student outcomes. For example, Bettinger and Long find a small positive impact of having adjuncts on students' likelihood of taking additional courses in the same subject. Hoffmann and Oreopoulos find no average differences in dropout patterns, grades, or future course selection based on whether students have more classes with adjunct professors. Ran and Xu find that adjuncts have a positive impact on course grades, but a negative impact on future course outcomes. Figlio et al. find that non-tenure track faculty in the bottom quarter of the value-added distribution produce better student outcomes than tenure-track faculty.

of color were in their first or second year of teaching, compared with 17 percent of teachers in schools with a high proportion of students of color.[742]

Recommended metric(s):

- Pre-K: Percentage of teachers with less than one year, one to five years, and more than five years of experience

- K−12: Percentage of teachers with less than one year, one to five years, and more than five years of experience

Data source(s): Administrative data

What to know about measurement: Data on teacher experience can be tracked as part of districts' or states' staff data management systems. About one-third of states with a Quality Rating and Improvement System (QRIS) for their pre-K programs include experience indicators as part of their program quality ratings.[743] K−12 districts must report school-level data to the Civil Rights Data Collection (CRDC) on the number of teachers in their first and second years of teaching, and commonly base salaries on teachers' years of experience.

Percentage of inexperienced teachers in schools
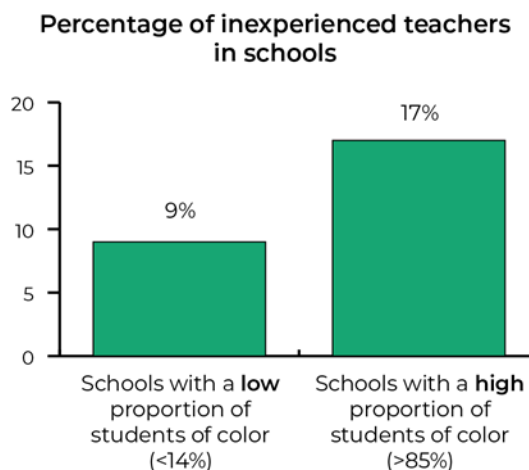
Data source: U.S. Department of Education, Civil Rights Data Collection (2016).

Source frameworks: This indicator appeared in three source frameworks reviewed for this report. Our recommendations draw from a definition put forth by the National Academies[744] which focuses on group differences in access to novice, experienced, and certified teachers. The thresholds selected in our proposed metric align with research by Kraft and Papay[745] mentioned above.

Educator retention

Definition: Teachers and school leaders return to the same school in consecutive years.

Why it matters: Retaining effective educators is linked with improved school climate[746] and better outcomes for students. Research in early learning settings shows that having the same teacher throughout an academic year is linked to higher rates of school readiness,[747] and that teachers who leave their program tend to receive lower ratings in teacher−child interaction quality.[748] Studies in K−12 settings have produced mixed findings on the impact of teacher turnover. However, one study involving more than 850,000 students in New York City found that teacher turnover results in lower performance in English language arts and math, with especially negative impacts on Black students and students who struggle academically.[749] This study suggests that turnover impacts student outcomes by affecting students' access to experienced, effective teachers, but also by having a disruptive effect on schools. Educator turnover tends to be more common in schools that serve a higher share of disadvantaged students; for example, in 2017, 21 percent of school leaders in high-poverty schools left their positions, compared to 15 percent of school leaders in low-poverty schools.[750]

Recommended metric(s): We recommend two measures for this indicator:

- Teacher retention: Percentage of teachers who return to teaching in the same school from year to year

- School leader tenure: Percentage of school leaders who have served in their current positions for less than two years, two to three years, and four or more years

Data source(s): Educator administrative data

What to know about measurement: Educator retention can be computed using administrative records from districts' or states' staff data management systems linking teachers and principals to schools from one year to the next. For school leaders, we recommend examining their tenure in the same school. In 2017, the national average tenure of principals at their current schools was four years, with 35 percent of principals staying at their school for less than two years.[751] A recommended best practice is also to disaggregate retention by measures of educator effectiveness, such as those based on teacher performance ratings or value-added scores, to better assess the impact of staff turnover.[752] Currently, 20 states publicly report data on teacher retention.[753]

Source frameworks: This indicator appeared in two source frameworks reviewed for this report: the Urban Institute's Robust and Equitable Measures to Identify Quality Schools (REMIQS) framework[754] and National Education Association's Great Public Schools Indicator Framework.[755]

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Classroom observations of instructional practice[xix]

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PK **K12** **PS** **WF**

Definition: Teachers demonstrate high-quality instructional practices and interactions with students.

Why it matters: Teachers are viewed as one of the most important contributors to student learning and social-emotional development.[756, 757, 758, 759, 760, 761, 762, 763] Although research on teaching effectiveness defines and measures this construct in various ways, with each approach demonstrating different benefits and limitations, most studies conclude that teachers play a key role in shaping student outcomes. One measurement approach is to conduct classroom observations of instructional practice, such as those that measure the quality of teacher–child interactions. Children with higher-quality interactions with their teachers enjoy greater learning gains in reading and math achievement, social skills, and executive functioning in pre-K[764, 765, 766] and K–12.[767, 768, 769] There is also evidence that using observations as a formative tool can result in improvements in teaching effectiveness, from pre-K to the postsecondary level.[770]

Some studies find that students from underserved backgrounds have less access to effective teachers, though results vary depending on the measures used and the study context.[771, 772] As one illustration, a study of teacher effectiveness (as measured by both classroom observation ratings and value-added to student achievement) in the School District of Philadelphia found that smaller percentages of economically disadvantaged (92 percent), Black (92 percent), and Latino (90 percent) students were

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[xix] This indicator is one of several that, together, signal teaching effectiveness. The full set of teaching effectiveness indicators includes *classroom observations of instructional practice*, *student perceptions of teaching*, and *teachers' contributions to student learning growth*.

taught by teachers rated proficient or distinguished than non-economically disadvantaged (94 percent) and White students (97 percent).[773]

Recommended metric(s):

- Pre-K: Scores on measures of teacher–child interactions, such as the Classroom Assessment Scoring System (CLASS),[774] the Early Childhood Environment Rating Scale (ECERS) Interactions subscale,[775] or the Assessing Classroom Sociocultural Equity Scale (ACSES)[776] (which assesses equitable classroom interactions)

- K–12: Teachers' overall and subscale scores on an observation rubric associated with an educator observation system; examples of common frameworks include the Danielson's Framework for Teaching[777, 778] and the Marzano Causal Teacher Evaluation Model[779]

- Postsecondary: There are currently no widely used standardized rubrics for peer observations of college teaching, though multiple researchers and universities have produced guidance surrounding the peer observation process[780, 781, 782, 783]

Data source(s): Classroom observation

> ## Classroom Assessment Scoring System (CLASS)
>
> **Observations of teacher–child interactions in Louisiana.** In 2012, Louisiana began a set of reforms to create a unified early childhood system for publicly funded centers, including Head Start, state pre-kindergarten, and subsidized child care. A major part of these reforms included conducting annual observations using CLASS, which provides ratings of the quality of teacher–child interactions, for every classroom in centers receiving public funds. CLASS observations are the only quality measure currently used to calculate program ratings for the state's early childhood accountability system. The rating process was piloted in the 2015–2016 school year, and ratings from the 2016–2017 school year were the first to factor into licensing and funding decisions. The first accountability ratings were released in 2017; subsequent annual ratings are published online in centers' Performance Profiles, which also include other information about the center. Classrooms are observed by local community networks; these observations are audited by a third-party contractor. Observations from both are used to generate the rating that goes into the Performance Profile.

What to know about measurement: Given the widespread use of classroom observations, this measure should be relatively feasible to collect. In early childhood, most states have a Quality Rating and Improvement System (QRIS) for publicly funded pre-K programs that includes structured classroom observations to measure the quality of teacher–child interactions using tools such as the CLASS or ECERS.[784] Head Start also collects CLASS observations, although not for every classroom.[785] Newer assessments focused on improving measurement of equitable pre-K classroom practices, such as the ACSES (noted above), are increasingly being used.

In K–12, classroom observations frequently form part of educator evaluation systems. Almost three-quarters of states plus the District of Columbia (36 out of 51) report using teacher observations as part of their evaluation systems, with another five states reporting local control over teacher observations. Only six states report that teacher observations are not included in their educator evaluation systems. At the postsecondary level, peer observation of a college instructor's teaching commonly is used for formative and summative evaluation purposes. [786] However, observation tools and practices can vary widely across institutions. Users should take care in comparing classroom observation data across contexts.

We caution against using teacher observations as a singular measure of teaching effectiveness (our recommendations also include measures based on student survey and student outcome data—see student perceptions of teaching and teachers' contributions to student learning growth). Research documents that observation ratings among Black teachers; male teachers; and those in classrooms with higher concentrations of Black, Latino, male, and low-performing students tend to be systematically lower than those of their colleagues.[787, 788, 789] Observations conducted by trained observers from outside of the school who are not familiar with the instructor tend to be more valid than those conducted by school administrators.[790]

Source frameworks: This specific indicator appeared in three source frameworks, while a version of this indicator, most commonly as a measure of effective teaching, appeared in five other source frameworks. Our recommendation to include quality student interactions in the indicator's definition is supported by work from the Center on Enhancing Early Learning outcomes (CEELO) and the Council of Chief State School Officers (CCSSO)[791] and the Center for Collaborative Education.[792] Our inclusion and focus on teacher observations for the proposed metric aligns with recommendations from the National Education Association,[793] the National Research Council,[794] and the CEELO & CCSSO.[795]

Student perceptions of teaching[xx, xxi]

PK **K12** **PS** **WF**

Definition: Students report having a supportive, engaging teacher who sets clear, fair, and high expectations, and helps them learn.

Why it matters: Measures of teaching effectiveness do not always incorporate student voice, even though students spend more time with their instructors than any other observer. Although there are important drawbacks to relying only on student perceptions to measure teaching effectiveness (for example, multiple studies have shown that student evaluations of their college instructors can be biased based on the gender, race, and ethnicity of the instructor),[796, 797] research suggests that student perception data from well-constructed and administered surveys can differentiate between effective and ineffective teachers.[798] For instance, a study in seven urban school districts found that students taught by a teacher in the top 25th percentile, according to student responses on the Tripod Student Survey, learned the equivalent of almost five additional months of instruction in math in a year than students taught by a teacher who ranked in the bottom 25th percentile.[799] Many K–12 school climate surveys also include questions about students' perceptions of teachers as an important dimension of school climate.[800] In California, for example, 40 percent of Latino and Indigenous students reported high expectations from adults at school, compared to almost half of Asian, Black, and White students.[801]

Recommended metric(s):

- K–12: Students' perceptions of their teacher's effectiveness, using a survey instrument such as the Pedagogical Effectiveness subscale of the Panorama Student Survey[802] the Tripod Student

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[xx] This indicator is one of several that, together, signal teaching effectiveness. The full set of teaching effectiveness indicators includes *student perceptions of teaching*, *classroom observations of instructional practice*, and *teachers' contributions to student learning growth*.

[xxi] This indicator is one of several that, together, signal school climate. The full set of school climate indicators includes *school-family engagement*, *equitable discipline practices*, *student perceptions of teaching*, *school safety*, and *inclusive environments*.

Survey,[803] the Ambitious Instruction and Supportive Environment domains of the 5Essentials Survey,[804] or the Elevate survey's Feedback for Growth, Meaningful Work, Student Voice, Teacher Caring, Learning Goals, Supportive Teaching, and Well-organized Class scales[805]

- Postsecondary: Students' perceptions of whether college instructors implement effective teaching practices, using a survey instrument such as the National Survey of Student Engagement[806] or the Ascend survey's Institutional Growth Mindset and Trust and Fairness scales[807]

Data source(s): Classroom observations; surveys

What to know about measurement:
Measuring students' perceptions of their instructors requires institutions to administer annual student-level survey s, which is increasingly common. As of 2020, 14 states reported using or encouraging the use of student surveys to evaluate K–12 teachers.[808] In addition, 16 states were administering or piloting school climate or engagement student surveys.[809] At the postsecondary level, student evaluations of college instructors are often used by administrators as a measure of teaching effectiveness (though as noted above, these data can be biased).[810] As an alternative to these course evaluations of individual instructors, surveys such as the National Survey of Student Engagement ask questions about students' overall experiences with instructors and whether instructors have exhibited effective teaching practices during the course of the school year.[811]

> ### The 5Essentials System (5Es)
>
> The 5Es is an evidence-based school climate survey used to measure five essential factors for school improvement: effective leaders, collaborative teachers, involved families, supportive environment, and ambitious instruction. The survey is based on research by the UChicago Consortium on School Research, which has shown that the 5Es predict student outcomes such as academic proficiency, attendance, GPA, 9th grade on track status, and postsecondary enrollment. In CPS, students in grades 4–12 and teachers in grades pre-K–12 take the survey each year. The 5Es includes several student-reported measures of teacher-student interaction, including "academic press" (the degree to which teachers expect their students to succeed) under the ambitious instruction domain and "student-teacher trust" under the supportive environment domain. The 5Es survey has been validated in both elementary and secondary school contexts, and has been used by over 6,000 schools. It is currently part of the Illinois Every Student Succeeds Act (ESSA) school accountability plan, and is also used by the Network for School Improvement. Survey results are integrated into a reporting site, where schools can identify and target measures for improvement based on the survey's findings.

It is important to select a survey instrument with proven validity and reliability—that is, one that predicts student outcomes and demonstrates relative consistency. In addition, as with all surveys, data users must pay attention to response rates and gauge how well respondents represent the students taught by the instructor. We have identified and suggested a sampling of tools with an evidence base, though other instruments may also be appropriate to measure this indicator. Because survey tools (and response rates) are likely to vary across states and localities, users should take care in comparing perceptions data across contexts.

We caution against using student perceptions data as a singular measure of teaching effectiveness. (Our recommendations also include measures based on classroom observation data and student outcome data—see *classroom observations of instructional practice* and *teachers' contributions to student learning growth*.) Experts tend to agree that student ratings should not be the sole or primary method of evaluating teachers, but rather one component of a comprehensive teacher evaluation system.[812, 813, 814]

Source frameworks: This indicator appeared in eight source frameworks. Our proposed definition aligns with the P-16 framework.[815]

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Teachers' contributions to student learning growth[xxii]

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(PK) (**K12**) (**PS**) (WF)

Definition: Teachers contribute to students' learning growth.

Why it matters: As noted earlier, teachers are viewed as one of the most important contributors to student learning and social-emotional development.[816, 817, 818, 819, 820, 821, 822, 823] One approach to measuring their contributions to student learning relies on measuring their students' growth on learning outcomes (sometimes called "value-added"). Relative to status measures like proficiency rates, which conflate *who* instructors teach with *how well* they teach them, value-added models measure contributions to student outcomes by considering students' initial performance levels (for example, using prior test scores) or other background characteristics.

When teaching effectiveness is measured as instructors' contributions to student learning, evidence of disparities in access to highly effective instructors is mixed. Some studies find no differences in the average value-added of teachers of students from low- versus high-income households.[824, 825] Others do find disparities along student household income, race, and ethnicity, though they are usually small.[826, 827, 828, 829, 830] One study of more than 11,000 teachers in 10 school districts found that the highest performing teachers (in value-added to student achievement) were underrepresented in the most disadvantaged middle schools, but not in elementary schools, though these patterns varied across districts.[831] At the postsecondary level, less research has been done on college instructors' contributions to student learning, though existing studies have found substantial differences in instructors' value-added on student outcomes such as course grades and subsequent course-taking patterns.[832, 833, 834] However, these studies have not examined whether students from low-income households and students of color have equal access to effective college instructors.

Recommended metric(s): Percentage of instructors demonstrating above average contributions to student learning, as measured by student growth on state standardized tests or other outcomes (for example, using value-added models or student growth percentiles)

Data source(s): Administrative data; assessment data

What to know about measurement: Value-added and other growth models require linking instructors to student outcome data (such as test scores from two or more academic years, so growth can be measured). As of 2019, 15 states use value-added or other growth models in a formal capacity to measure teacher effectiveness in K–12, with another two states using them formatively, and 10 states reporting local control over the decision to use value-added.[835] At the postsecondary level, measurement of college instructor value-added is challenging because instructors often design and administer their own assessments. One way to address this shortcoming is to measure instructor impacts on subsequent grades and student course-taking patterns, though this method would not produce effectiveness measures for instructors who teach advanced-level courses.[836] In places that do

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[xxii] This indicator is one of several that, together, signal teaching effectiveness. The full set of teaching effectiveness indicators includes *student perceptions of teaching*, *classroom observations of instructional practice*, and *teachers' contributions to student learning growth*.

not already calculate value-added or similar measures, framework users should consult with experts to implement this indicator, as there are different approaches to computing value-added having different technical and practical considerations. (For a review of research on measuring value-added, see Koedel et al.)[837] These approaches may result in differences in measures of instructors' effectiveness. For example, using student growth percentiles instead of value-added scores would have resulted in 14 percent of teachers in one district being placed in a different performance category.[838]

We caution against using value-added data as the only measure of teaching effectiveness (our recommendations also include measures based on classroom observation and student survey data — see *classroom observations of instructional practice* and *student perceptions of teaching*). When used for high-stakes accountability, measures of teachers' contributions to student learning may have unintended consequences (for example, leading to practices such as "teaching to the test"). These three measures have been shown to be valid and complementary measures of teaching effectiveness.[839] Evaluation systems based on multiple measures may be more reliable than those based on a single measure.

Under the Every Student Succeeds Act (ESSA), some states have moved away from value-added models as an approach to teacher evaluation and toward a measure of student growth based on student learning objectives. This change resulted in part from concerns (including lawsuits and protests) regarding the uses of test scores for teacher evaluation purposes. Student learning objectives are included in teacher evaluation plans in 28 states.[840] Accepted measures of student learning objectives can include state tests, district benchmarks, school-based assessments, and teacher and classroom-based measures. These differences would make it difficult to compare data across contexts on whether students are meeting student learning objectives. In addition, there is limited evidence on the validity or reliability of student learning objectives.[841]

Source frameworks: This indicator, or a version of measuring teacher effectiveness, appeared in five source frameworks reviewed for this report. Our recommendation to measure teacher effectiveness through student growth on standardized assessments draws from the National Research Council's Key National Education Indicators.[842]

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Effective program and school leadership

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PK K12 PS WF

 Definition: Schools are led by effective principals and school leaders.

Why it matters: Pre-K and K–12 school leaders play a key role in student learning, school discipline and culture, and teacher professional growth.[843, 844] For instance, a study of principals' value-added to student achievement—one approach to assessing school leader effectiveness—found evidence of meaningful variation across principals. [845] In that study, highly effective principals raised achievement by the equivalent of two to seven months of additional learning in a given school year, whereas ineffective principals lowered achievement by the same amount.[846] Principals also impact the degree to which teachers collaborate and grow professionally,[847] as well as hiring and retention of more effective teachers.[848, 849] According to research by the Consortium on Chicago School Research, effective school leadership is characterized as being inclusive and focused on instruction.[850] For example, effective

principals set high standards for teaching, encourage teachers to take risks and try new approaches, and offer regular feedback on classroom instruction.

Research on principal value-added suggests that principal effectiveness tends to vary more widely in schools that serve a high share of students from low-income households.[851] In addition, multiple studies show that the likelihood of attending a school led by a first-year principal, one with less experience, or one without a master's degree is higher for students from low-income households, students of color, and those with low performance.[852, 853]

Recommended metric(s):

- Percentage of school leaders rated as effective, using an evaluation system that includes multiple measures, such as the Administrator Evaluation component of the Tennessee Educator Acceleration Model (TEAM)[854]

Data source(s): Assessment data; surveys; observations; rubrics

What to know about measurement: There is no clear consensus in the field about the best way to measure principal effectiveness, though emerging evidence suggests that approaches relying on multiple measures hold promise, including schoolwide growth data, scores on an evaluation rubric, and staff perception surveys.[855, 856, 857] Examples of staff surveys that can be used to measure effective school leadership include the Effective Leaders sub-component of the UChicago 5E's survey instrument,[858] Panorama Teacher and Staff Survey,[859] or The New Teacher Project's (TNTP) Instructional Culture Insight Survey.[860]

> **New York City's Framework for Great Schools**
>
> The New York City Department of Education's Framework for Great Schools draws on research from the Consortium of Chicago School Research, which identified key "essential supports" for school improvement, including effective school leadership, strong family-community ties, supportive environments, collaborative teachers, and rigorous instruction.
>
> New York City's Department of Education collects data on each of these elements and reports the data in annual School Quality Snapshots available to the public through online dashboards. Schools receive a rating (excellent, good, fair, or needs improvement) for each element based on (1) parent and teacher surveys, and (2) quality reviews conducted by experienced educators who visit and evaluate the school. To evaluate school leadership, for example, reviewers determine how well school resources are aligned to instructional goals, how well the school meets its goals, and how well leaders make decisions. This qualitative assessment is complemented with data from a parent and teacher survey that asks questions about effective school leadership (for example, whether teachers say the principal communicates a clear vision for the school). The two data sources combine into an overall rating of the school's leadership.
>
> Dashboard users can drill down to view the detailed survey responses, scores on the Quality Review, and qualitative data behind these scores. In an article by The Hechinger Report, Daniel Russo, a principal in the Bronx who oversaw the dramatic transformation of one of the city's most troubled schools, attributed this success to the school's concerted application of the framework.

However, no research has emerged at this point to show that staff surveys are valid and reliable measures of school leader effectiveness, and survey measures run the risk of offering a biased or potentially politicized rating of a leader, underscoring the importance of examining multiple measures. We have identified sample tools with an emerging evidence base; however, other instruments may also be appropriate to measure this indicator. We also note that a school's value-added score is not an

appropriate proxy for measuring the effectiveness of a principal, as it can reflect both the principal's effectiveness and other school-level factors that influence students' growth on learning outcomes.[861, 862]

Source frameworks: This indicator appears in seven source frameworks reviewed for this report. Our recommendation to rely on multiple measures of performance to assess school leadership quality is consistent with the recommendations of several source frameworks, including the Great Public Schools Indicators Framework.[863]

- -

Institutions' contributions to student outcomes

- -

(PK) (**K12**) (**PS**) (WF)

Definition: Schools and colleges contribute to students' short- and long-term outcomes.

Why it matters: School effectiveness measures aim to capture schools' impacts on student achievement on test scores,[864] as well as more long-term outcomes, such as high school graduation, college access and success, and eventual earnings.[865] Relative to status measures such as college enrollment or completion rates, which conflate *who* institutions serve with *how well* they serve them, approaches to measuring institutions' contributions to student outcomes consider students' initial performance levels (for example, using prior test scores) or other background characteristics. These analyses can paint a different picture of institutional effectiveness than status measures. For instance, analyses of nationwide data by the Educational Opportunity Project at Stanford University showed that, although test scores are higher, on average, in more affluent school districts, the relationship between school affluence and student outcomes does not hold when examining student learning growth.[866,867] Measures of institutional effectiveness can thus help E-W systems identify the institutions that exceed (or fail to meet) expected outcomes for students *given their prior performance.*

Evidence of disparate access to effective schools is mixed across studies, which are based on different measures, outcomes, and settings. For example, one large-scale study of schools' contributions to students' performance on the ACT found that schools with greater shares of students from low-income households or Black, Indigenous, or Latino students tended to have lower value-added scores.[868] On the other hand, a study that measured Louisiana high schools' contributions to students' high school graduation, college enrollment and persistence, and earnings found little or no relationship between schools' contributions to these outcomes and the share of students from low-income households in the school. At the postsecondary level, researchers who have measured colleges' contributions to student outcomes have found variation across institutions, but they have not examined how they relate to students' demographic characteristics. [869, 870, 871, 872] However, although college selectivity has little or no relationship to value-added, inputs such as instructional expenditures per student and faculty-to-student ratio are significantly positively related to colleges' value-added. [873]

Recommended metric(s):

- K–12: Schools' contributions to student outcomes, including achievement, attendance, social-emotional learning, college enrollment, and earnings, using value-added models

- Postsecondary: Colleges' contributions to student outcomes, including graduation rates, earnings, and student loan repayment, using value-added models

Data source(s): Administrative data; assessment data; student transcript data; surveys

What to know about measurement: Value-added and other growth models require linking schools or colleges to student outcome data (such as test scores from two or more academic years, so growth can be measured). As of 2021, all states included at least one approach to measuring growth on standardized tests in their school accountability plans under the Every Student Succeeds Act (ESSA). The most popular approach was student growth percentiles (used by 24 states as of 2019); eight states implemented value-added measures.[874, 875] One appeal of value-added models relative to other approaches is that schools' contributions to multiple student outcomes can be examined. Using K–12 records, value-added models have been used to measure schools' contributions to student attendance, course completion rates, social-emotional learning, and high school graduation, in addition to test scores.[876, 877] Recent work also has linked K–12, postsecondary, and wage records to measure schools' contributions to longer-term outcomes.[878] In places that do not already calculate value-added or similar measures, framework users should consult with experts to implement this indicator, as there are different approaches to computing value-added that have different technical and practical considerations. In practice, many states use other approaches to incorporating student growth data as part of their school accountability systems, which vary in validity and comparability as measures of schools' *contributions* to student outcomes. Users should also carefully consider the results of value-added measures so as not to reinforce existing inequalities by "explaining away" inter-group differences that might be addressed by system conditions or interventions.

Measuring "Promotion Power" in Louisiana and Washington, DC

In recent years, the Office of the State Superintendent of Education (OSSE) in the District of Columbia (DC) and the Louisiana Department of Education (LDOE) developed new measures to understand each high school's impact on the higher education and workforce prospects of its students. These measures are known as "promotion power" because they use statistical methods to measure each school's power to improve students' long-term outcomes separately from the characteristics of the students it serves.

DC and LDOE developed promotion power measures on multiple long-term outcomes. Although college or career readiness in high school, high school graduation, and college enrollment were key outcomes for both agencies, LDOE also measured promotion power for two longer-term outcomes: college persistence and earnings at age 26. Both entities relied on administrative data from the lead education agency (OSSE or LDOE) and the National Student Clearinghouse. Louisiana, which examined earnings, also linked individual-level data from the Louisiana Workforce Commission.

Analyses of the promotion power measures in DC and LDOE found that high schools vary widely in their power to promote long-term student outcomes. Although schools effective in promoting one long-term outcome (like high school graduation) were also more likely to be effective at promoting other long-term outcomes (like college enrollment), many schools varied in their effectiveness for different outcomes. LDOE high schools that are especially good at promoting college enrollment and persistence, for example, do not necessarily promote strong earnings for their students at age 26. This finding highlights how assessing school effectiveness on multiple dimensions of long-term success is important to help systems more accurately assess both school effectiveness and equity of access to effective schools.

Source frameworks: This indicator appeared in three source framework reviewed for this report. Our recommendation to use value-added models to measure an institution's contributions to student

growth draws from the National Academies[879] research to define quality in higher education. We also draw from Deutsch et al.'s discussion of promotion power.[880]

Access to college preparatory coursework

PK **K12** PS WF

Definition: Students have access to the full set of courses needed to meet the requirements for admission at most colleges.

Why it matters: Most four-year colleges and universities require students to have completed a core set of college preparatory high school coursework to be eligible for admission.[881] In many states, however, the requirements for a high school diploma fall short of these admissions criteria.[882] For example, almost half of states require less than college expectations when it comes to foreign language coursework. Moreover, students sometimes lack access to certain required courses in their high schools. In California, for example, the University of California (UC) and California State University systems require students to complete a set of courses in seven areas, from history ("A") to a college preparatory elective ("G"). An analysis from 2017 found that not all high schools offered the full A–G sequence, with small and rural schools, in particular, being much less likely to do so.[883] Uneven access to college preparatory coursework can start as early as middle school, particularly in access to advanced math courses such as Algebra I that enable students to complete higher-level math before they graduate high school.[884, 885] Nationwide, only 59 percent of middle schools offer Algebra I.[886]

Recommended metric(s):

- Percentage of high schools offering each of the following sets of college preparatory courses:
  - Four years of English
  - Four years of math (including at least four of the following: pre-algebra, algebra, geometry, Algebra II or trigonometry, precalculus, calculus, statistics, quantitative reasoning, and data science)
  - Three years of laboratory science (including biology, chemistry, physics)
  - Two years of social science
  - Two years of foreign language
  - One year of visual or performing arts
- Percentage of middle schools offering Algebra I

Data source(s): Administrative data

What to know about measurement: Districts record information about the courses and programs offered in schools as part of their regular operations, and report school-level data to Civil Rights Data Collection (CRDC) on the number of Advanced Placement (AP), science, and math courses offered at each high school. Districts also report data to the CRDC on the number of Algebra I courses offered in middle schools.

Source frameworks: Several frameworks reviewed for this report discussed the importance of academic rigor in high school. Our definition draws from the Center for Collaborative Education's

criteria for student-centered learning.[887] Our recommended metric draws on college preparatory course recommendations by the National Association for College Admissions Counseling.[888]

Access to early college coursework

(PK) **K12** **PS** (WF)

Definition: Students have access to Advanced Placement (AP), International Baccalaureate (IB), and dual enrollment courses.

Why it matters: Many students lack access to early college coursework in high school, despite its importance for college admissions and success.[889, 890, 891] A nationwide analysis found that Black and Latino students are not equitably represented in advanced courses, and that these disparities relate to whether schools offer these courses and the number of seats available in them.[892] Another nationwide study found that Black and Indigenous students had significantly less access to AP coursework than their peers, based on the number of AP courses offered and the size of the student body in their schools. Inequitable access to early college courses is compounded by inequitable access to the end-of-course tests students need to pass to earn college credit.[893] According to the College Board, a typical AP exam fee in 2022 was $96, or $62 for eligible students from low-income households.[894] Just 29 states provide additional support to cover these costs.[895] For every 1,000 White students in the United States, 185 enroll in an AP course and 139 take an AP test. In contrast, for every 1,000 Black students, 105 take an AP course and 73 take an AP test.[896]
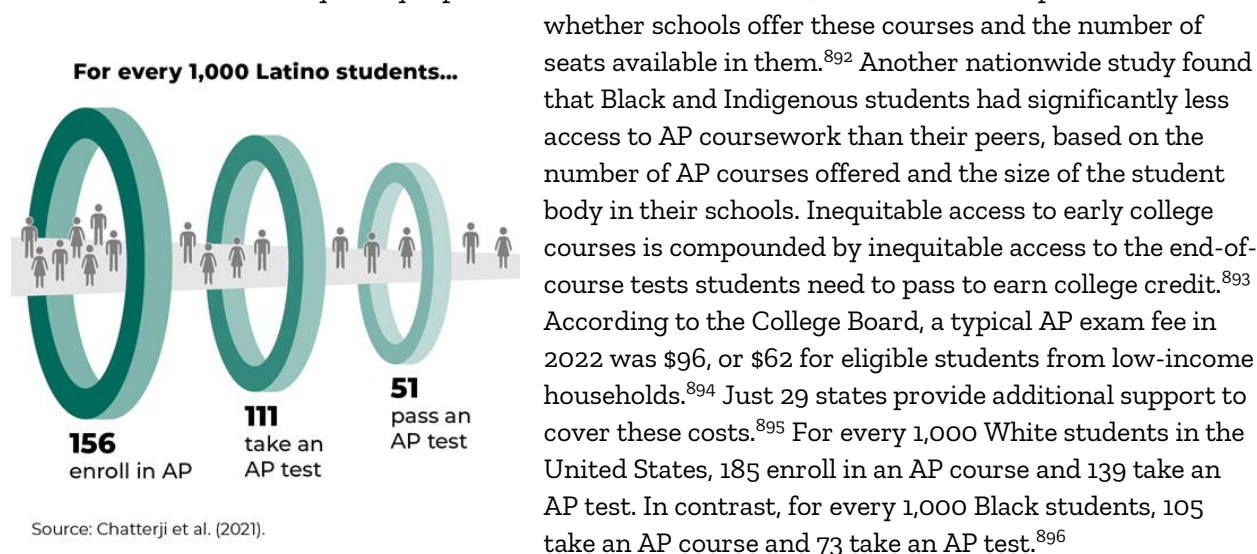
For every 1,000 Latino students…

156 enroll in AP

111 take an AP test

51 pass an AP test

Source: Chatterji et al. (2021).

Recommended metric(s):

- Number of AP, IB, and dual enrollment courses offered, overall and by subject
- Percentage of students in an early college course who take the relevant end-of-course test needed to earn credit (for example, AP or IB test), overall and by subject

Data source(s): Administrative data

What to know about measurement: Districts record information about the courses and programs offered in schools as part of their regular operations, and report school-level data to Civil Rights Data Collection (CRDC) on the number of AP courses offered at each high school. For students who take AP and IB tests, high schools receive reports of their students' exam scores and can use this information to calculate the percentage of students in early college courses who take the tests.[897, 898]

To better assess whether students have equitable access to these opportunities, we recommend measuring the number of courses offered and the share of students taking the tests overall and by subject (rather than measuring only whether a school offers any early college courses). These school-level data should be disaggregated by schools' demographic characteristics and examined alongside

data on course participation captured in early college coursework completion in the Outcomes and Milestones section of this chapter.

Source frameworks: Six source frameworks reviewed for this report, including the Urban Institute's Robust and Equitable Measures to Identify Quality Schools (REMIQS) framework[899] and National Education Association's Great Public Schools Indicators Framework,[900] discussed the importance of early college course access and completion, including access to and enrollment in AP, IB, and dual enrollment courses.

Equitable placement in rigorous coursework

(PK) (**K12**) (PS) (WF)

Definition: Students from various demographic subgroups are proportionally represented in rigorous courses and programs.

Why it matters: Even when schools offer rigorous coursework and other programs, students are not always equitably selected or encouraged to participate. For example, even among students with high standardized test scores, Black students are referred less often to gifted programs than other students, particularly when they are taught by non-Black teachers.[901] Concerns about inequitable placement extend into middle school and high school. As another example, although 80 percent of students nationwide have access to Algebra I in middle school—a gateway to higher-level math coursework in high school—just 13 percent of Latino students and 12 percent of Black students take Algebra I as 8th graders.[902] However, when placement policies in one district shifted from using subjective criteria to using student test scores, disparities in participation in Algebra I in 8th grade by income, race, and ethnicity were greatly reduced.[903] Disparities in participation in early college coursework can also reflect inequitable placement. Even in high schools that offer 18 or more Advanced Placement (AP) courses, enrollment in AP courses is significantly lower among Black, Latino, and Indigenous students than their White and Asian peers.[904]

Recommended metric(s): Differences in the participation rates for students from key demographic subgroups in rigorous courses and programs relative to those students' representation in their school population as a whole, including opportunities, such as the following:

- Gifted and talented programs
- Algebra I in middle school
- Higher-level math courses in high school (that is, Algebra II, calculus)
- Early college courses (AP, International Baccalaureate [IB], and dual enrollment)

Data source(s): Administrative data; student transcript data

What to know about measurement: Schools regularly record student-level course and program enrollment as part of their regular operations. Additionally, districts report school-level data to Civil Rights Data Collection (CRDC) on multiple measures of student course enrollment, including the number of students enrolled in at least one dual enrollment program, the IB program, at least one AP course (including at least one science, technology, engineering, or mathematics [STEM] course), Algebra I, geometry, and computer science. We encourage framework users to examine data on

equitable participation alongside data on access to college preparatory coursework and access to early college coursework, as the availability of coursework is an important driver of participation, along with inequitable placement.

Source frameworks: Access to or participation in rigorous coursework appeared in three frameworks reviewed for this report. Our recommendation to emphasize equitable access is consistent with work by the National Research Council,[905] which recommends measuring "disparities in access to and enrollment in rigorous coursework."

Access to quality, culturally responsive curricula

PK **K12** **PS** **WF**
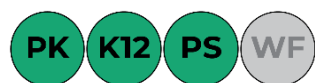
Definition: Schools and instructors use a standards-aligned core course curriculum that meets quality standards (as defined by EdReports) and is culturally relevant, centering the lived experiences and heritage of students' ethnic or racial backgrounds.

Why it matters: A high-quality curriculum can shape instruction and student learning. For example, there is evidence that using skill-based curricula in early childhood education is linked to large improvements in children's cognitive abilities,[906] and in K–12, a growing body of experimental research shows that different curricula can lead to better academic achievement outcomes for students.[907] At the postsecondary level, curricula typically are not standardized, though there is some movement toward redesign and standardization of gateway courses to better promote student success.[908] However, there is limited information on what makes curricula effective, largely because curriculum information is not collected systematically. Available evidence suggests that content richness and standards alignment are common qualities of effective curricula, and that curricula prioritizing student engagement may have positive effects on student achievement. In particular, students may benefit from seeing their culture represented positively within the curriculum.[909, 910, 911] Research emphasizes the importance of "culturally relevant"[912] and "culturally sustaining"[913] curricula for students of color.

Recommended metric(s): No specific measures or tools identified

Data source(s): Curriculum materials

What to know about measurement: We were unable to identify standardized approaches to measuring access to quality, culturally responsive curricula, although there are ongoing advances in the field. Of note, EdReports[914] rates K–12 curricula based on coherence, standards alignment, and usability. Also useful are review rubrics, such as those published by Louisiana Department of Education,[915] and Culturally Responsive Curriculum Scorecards were developed recently through a collaboration between researchers, parents, students, and educators in New York City.[916] Generally, there are no applicable rubrics to rate the quality of college curricula, although Courseware in Context provides a framework for assessing the quality of digital courseware in higher education.[917] However, these tools do not assess cultural responsiveness or relevance.

Data on which curricula are in use in pre-K programs, K–12 schools, and postsecondary institutions currently are not collected systematically. Chingos and Whitehurst[918] suggest that foundations could play a role in providing start-up funding to establish systemic data collection mechanisms in K–12 settings, and Polikoff[919] summarizes challenges to collecting and analyzing curriculum adoption data at

scale. We encourage systems to begin systematically tracking which curricula are in use as an important first step toward measuring this indicator.

Source frameworks: Ten source frameworks reviewed for this report include a measure of access to quality, culturally responsive curricula for instruction. Our recommendation to emphasize cultural relevance as a critical component of curriculum quality is consistent with recommendations put forth by StriveTogether,[920] the National Research Council,[921] the Alliance for Resource Equity,[922] and Center on Enhancing Early Learning Outcomes in collaboration with the Council of Chief State School Officers (CCSSO).[923]

Expenditures per student

PK **K12** **PS** **WF**
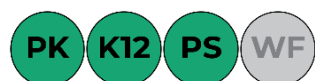
Definition: The amount of education and related expenditures per student.

Why it matters: School funding has been shown to contribute to better outcomes for students. Using national data, one study found that reading and vocabulary scores among Head Start children are higher where Head Start spending is higher.[924] In K–12, causal studies consistently find that increases in per-pupil spending lead to higher test scores, high school graduation, college enrollment, and earnings, particularly for children from low-income households.[925, 926, 927, 928] In the postsecondary context, increases in per-student spending result in increased persistence and degree completion in both two- and four-year colleges.[929] Increases in state appropriations for higher education spending also have been shown to result in increased educational attainment and shorter time to degree completion.[930] In addition to instructional expenditures per student, increases in student service expenditures can also lead to increases in persistence and graduation rates, particularly for students from low-income households.[931, 932]

The **highest-poverty districts** in the U.S. receive **approximately $1,000 less per student** than the lowest-poverty districts.

Source: Morgan and Amerikaner (2018).

Yet funding is neither equal nor equitable. The highest-poverty districts in the United States receive approximately $1,000 less per student than the lowest-poverty districts[933]—even states that have implemented progressive funding policies based on student need have not all been successful in ensuring funding for students from low-income households exceeds funding levels for more advantaged students.[934] At the postsecondary level, colleges with more students of color and students from low-income households have lower expenditures per student.[935, 936] Attendance at for-profit colleges, which have lower instructional expenditures per student[937, 938] and spend more on advertising[939] than nonprofit colleges, is higher among students of color and those from low-income households.

Recommended metric(s):

- Pre-K: State expenditures per child enrolled
- K–12:
  – Per pupil expenditures

- Equity Factor, a measure that indicates variance in per-pupil funding within a state (see this brief by New America for more information)[940]

- Postsecondary: Total instruction and student service expenditures per full-time equivalent (FTE) student based on 12-month enrollment

Data source(s): Administrative data

What to know about measurement: Data on expenditures are widely available. The National Institute for Early Education Research (NIEER) reports annual state spending in public pre-K programs. For elementary and secondary schools, data are reported annually at the state, district, and school levels through the U.S. Department of Education's Office of Elementary and Secondary Education (OESE) Per Pupil Expenditure Transparency website. At the postsecondary level, data on instructional expenditures per student and student service expenditures are available annually through the Integrated Postsecondary Education Data System (IPEDS). Disparities in funding can be assessed vertically at the federal, state, and local levels, as well as horizontally between schools within the same district or postsecondary institutions within the same state.

Source frameworks: This indicator appeared in seven source frameworks reviewed for this report. Our recommendations for measuring elementary and secondary funding draws on work by StriveTogether.[941]

DOMAIN: Social, emotional, and physical well-being

Access to early intervention screening

PK K12 PS WF

Definition: Children receive early intervention screening for any developmental, sensory, and behavioral concerns to determine whether services are needed.

Why it matters: Screening children for developmental, sensory, and behavioral concerns may allow for early intervention, which is one reason why one of the Healthy People 2030 objectives established by the U.S. Department of Health and Human Services is to "increase the proportion of children who receive a developmental screening." Data collected via the National Survey of Children's Health indicate that only 31 percent of children ages 9–35 months received developmental screenings in 2016–2017.[942] Further, White children and children from economically advantaged backgrounds receive early screening and intervention services more often than children of color.[943, 944]

Recommended metric(s):

- Percentage of children with identified concerns who are connected to services
- Percentage of children needing selected special education services in kindergarten who were not identified and connected to services before kindergarten

Data source(s): Administrative data; survey data

What to know about measurement: Children may receive screening through different mechanisms, and no single system currently captures the necessary information to measure this indicator. State

Pre-K programs are required to conduct vision, hearing, and developmental screenings, and provide referrals when needed. Head Start also requires the use of screeners. Although not required, pediatricians can also conduct screenings and other developmental assessments during an office visit. At the national and state levels, this information is currently collected and reported annually through the National Survey of Children's Health. Survey items could be adapted by local educational agencies or institutions to better understand the experiences of the individual students they serve.

Source frameworks: This indicator appeared in two source frameworks reviewed for this report. Our recommended measures draw on those proposed in the Center for the Study of Social Policy's Early Childhood System Performance Assessment Toolkit.[945]

School safety[xxiii]

PK **K12** **PS** WF

Definition: Students feel physically, mentally, and emotionally safe at school or campus (that is, safe from both physical threats and violence, as well as bullying and cyberbullying).

Why it matters: School safety is a core component of school and campus climate, both of which are linked to higher attendance and academic achievement.[946, 947, 948, 949, 950, 951, 952] Yet research demonstrates disparities in students' feelings of safety according to their race and ethnicity. For example, one study found that students in schools serving predominantly Black and Latino populations report feeling less safe and having less positive peer interactions than those at schools with predominantly White and Asian populations, on average.[953] Even within the same schools and homerooms, Black and Latino students report feeling less safe than their White and Asian peers.[954, 955] According to the National Survey of Student Engagement, 1 in 7 Black students and 1 in 10 Indigenous students feel physically unsafe on college campuses, compared to 1 in 17 Asian students and 1 in 20 White or Latino students.[956]

Recommended metric(s):

- K–12**:** Percentage of students reporting high levels of physical, mental, and emotional safety in school climate surveys, such as the U.S. Department of Education ED School Climate Surveys (EDSCLS),[957] the Sense of Safety subscale within the CORE Districts school culture and climate survey,[958] or the School Safety subscale within the Panorama Student Survey[959]

- Postsecondary: Percentage of students reporting physical safety and freedom from harassment and discrimination in campus surveys, such as the National Survey of Student Engagement[960]

Data source(s): Administrative data; surveys

What to know about measurement: Measuring students' feelings about school or campus safety requires administering student surveys, and a growing number of schools and colleges do so. In a 2020 review of states' Every Student Succeeds Act (ESSA) plans, 16 states were administering or piloting school climate or engagement student surveys.[961] At the postsecondary level, 601 colleges and

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[xxiii] This indicator is one of several that, together, signal school climate. The full set of school climate indicators includes *school-family engagement*, *equitable discipline practices*, *student perceptions of teaching*, *school safety*, and *inclusive environments*.

Black and American Indian/Alaska Native students **feel unsafe on campus** at higher rates than Asian, White, and Latino Students

Group	Rate	%
American Indian/Alaska Native	**1 in 10**	10%
Asian/Pacific Islander	**1 in 17**	6%
Black	**1 in 7**	14%
Latino	**1 in 20**	5%
White	**1 in 20**	5%
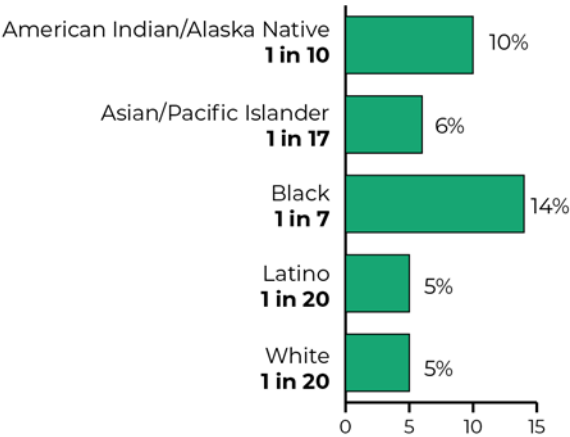
Data source: National Survey of Student Engagement (2016).

universities participated in the National Survey of Student Engagement in 2020.[962] Both school and campus climate surveys typically include questions related to students' feelings of safety. However, different survey instruments may be used. We have identified and suggested tools with an evidence base; however, other instruments may also be appropriate.

The use of different instruments and surveyed grades in K–12 can reduce the comparability of this indicator across contexts. For example, California surveys students in grades 5, 7, 9, and 11, whereas South Carolina surveys students in grades 3–12. More than half of the states using surveys for ESSA administer them to students as early as grade 3, although some researchers caution against surveying young children who may not understand the meaning of the questions. [xxiv, 963] Care should be taken to ensure the instruments used are reliable, valid, and developmentally appropriate.[xxv] Finally, as with all surveys, data users should pay attention to response rates in interpreting and reporting school or campus climate survey data to ensure respondents are representative of the population of students.

At the postsecondary level, campus safety can be measured more feasibly using data on the number of reported on-campus crimes per 1,000 students, which are publicly available through the U.S. Department of Education's Campus Safety and Security Reporting System. [964] However, administrative records often underreport instances of victimization, so anonymous surveys can be a useful complement to measure perceptions of safety and experiences that students may not have reported to the police.

Source frameworks: This indicator appeared in nine source frameworks reviewed for this report. Our emphasis on physical, mental, and emotional safety is consistent with recommendations from the Alliance for Resource Equity,[965] the National Education Association,[966] and the Massachusetts Consortium for Innovative Education Assessment (MCIEA).[967] Although source frameworks focused primarily on school safety in K–12 contexts, we recommend broadening this measure to include postsecondary settings as well.

[xxiv] For example, an analysis of survey data in the CORE Districts found that students in grades 3–5 were more likely to be confused by negatively worded items, leading to lower reliability and higher variance in students' responses. For this reason, CORE Districts survey students only in grades 5–12.

[xxv] Instruments used to measure inclusive environments can also encompass students' feeling of safety in school or campus. For example, the "How I Feel About My School" questionnaire for pre-K students includes a question on how safe a child feels at school. However, after consulting with early learning experts, we determined it was not appropriate to measure children's perceptions of school safety as a separate construct in pre-K. However, data users should examine school safety for pre-K programs located in K-12 school sites based on school climate data.

....

Inclusive environments[xxvi]

....

PK K12 PS WF

Definition: Individuals feel they belong and feel connected to their peers in their schools, postsecondary institutions, and workplaces.

Why it matters: When individuals feel they belong, they experience higher levels of motivation, engagement, and tenacity.[968] As a result, a sense of belonging in school, campus, or work contributes to improved achievement as well as health and well-being.[969, 970, 971, 972] Whether individuals feel they belong varies across contexts. A national survey of middle school students found limited differences in feelings of belonging across demographic groups.[973] At the postsecondary level, a national survey found that students of color and first-generation students reported a lower sense of belonging than continuing-generation or White students at four-year (but not two-year) colleges, though the differences were small.[974] In the workplace, women and people of color are more likely to experience bullying and less likely to receive social support from their peers.[975]

Recommended metric(s):

- Pre-K: Percentage of children reporting positive feelings toward their school, as measured by questionnaires such as the Collaborative for Academic, Social, and Emotional Learning's (CASEL) How I Feel About My School questionnaire, or percentage of

National Assessment of Collegiate Campus Climates and the California Community College Equity Leadership Alliance

The Race and Equity Center at the University of Southern California created the [California Community College Equity Leadership Alliance](#) to assess and improve campus climates and address systemic racism on community college campuses. The alliance, which includes more than half of California's 115 community colleges, uses the Center's National Assessment of Collegiate Campus Climates (NACC) survey to assess students' perspectives on inclusion, belonging, institutional commitment to diversity, and depth of cross-cultural interactions. The Center is also developing a workplace climate survey for faculty and staff that focuses on topics of equitable advancement opportunities; sense of belonging; workplace environment; and employee encounters with racism, sexism, homophobia, and transphobia.

Participating campuses will administer the student climate survey in the first year, followed by the faculty survey, and then the staff survey. Results of student, faculty, and staff climate surveys will be compiled into a written report with practical recommendations and de-identified responses for data disaggregation. Surveys will be readministered on a three-year cyclical basis to assess improvements and efforts toward addressing systemic racism and campus climate.

The Alliance also supports participating leaders through an annual series of professional trainings focusing on research-based strategies and practical approaches to issues of racial inequity on campuses and in the workplace. The trainings are supplemented with an online repository of resources and tools for Alliance members to continue their learning through equity-related rubrics, readings, and case studies. The Alliance offers an example of how to use campus and workplace climate surveys to drive systemic change.

[xxvi] This indicator is one of several that, together, signal school climate. The full set of school climate indicators includes *school-family engagement, equitable discipline practices, student perceptions of teaching, school safety,* and *inclusive environments.*

classrooms demonstrating equitable sociocultural interactions, as measured by observational assessments, such as Assessing Classroom Sociocultural Equity Scale (ACSES)

- K–12: Percentage of students reporting belonging in school, as measured by surveys such as the Sense of Belonging subscale of the CORE Districts school culture and climate survey,[976] the Classroom Belonging subscale of the Panorama Student Survey,[977] or the Elevate survey's Affirming Identities and Classroom Community scales[978]

- Postsecondary: Percentage of students reporting belonging on campus, as measured by surveys such as the Higher Education Research Institute (HERI) Diverse Learning Environments Survey,[979] the National Institute for Transformation and Equity (NITE) Culturally Engaging Campus Environments (CECE) Survey,[980] or the Ascend survey's Belonging Certainty, Identity Safety, Social Belonging, and Social Connectedness scales[981]

- Workforce: Percentage of employees reporting belonging at work, as measured by surveys such as the Association of American Medical Colleges (AAMC) Diversity Engagement Survey

Data source(s): Surveys

What to know about measurement: Measuring individuals' sense of belonging and their perceptions of the level of inclusiveness of their environments requires administering surveys, and a growing number of schools, colleges, and employers are doing so. We have identified and suggested a sampling of widely used tools with an evidence base; however, other instruments may also be appropriate to measure this indicator. For example, the Inclusion of Other in Self scale, a one-item instrument, is recommended by the Urban Institute's Boosting Upward Mobility framework to measure "belongingness." We have suggested instruments that are more comprehensive, but the Inclusion of Other in Self scale could be used as a viable alternative across age ranges. In practice, a number of survey tools are used by institutions to gather data on school and campus climate and employee engagement.

As noted earlier, data users should determine whether measurement tools are reliable, valid, and developmentally appropriate, and use them accordingly. For example, in early childhood, the How I Feel About my School questionnaire is designed "as an informal measure for individual classroom teachers to invite feedback from students and reflect on areas for growth, and has not been validated as a formal evaluation tool." The ACSES measure is relatively new and has been validated with other widely used observational assessments, including the Classroom Assessment Scoring System (CLASS), but has not been linked to child outcomes. At the postsecondary level, the CECE survey includes a sense of belonging scale, which has been shown to be significantly related to measures of culturally engaging campus environments.[982] Finally, data users should pay attention to response rates in interpreting and reporting the resulting data.

Source frameworks: As noted above, we believe that sense of belonging is linked closely to inclusive environments, and eight source frameworks reviewed for this report included sense of belonging, inclusive environments, or both. Our proposed approach to treat this indicator as a system condition is consistent with the approach taken by the Urban Institute in the Boosting Upward Mobility framework.[983]

Representational racial and ethnic diversity of educators

PK **K12** **PS** WF

Definition: Educators reflect the racial and ethnic diversity of the student body.

Why it matters: Students benefit from being taught by a racially and ethnically diverse teaching staff, with students of color in particular benefiting from having teachers of their own race or ethnicity. Research links student-teacher race match to positive outcomes for students of color, including higher achievement;[984] reduced experiences of exclusionary discipline;[985] increased referrals for gifted and talented programs;[986] decreased likelihood of dropping out of school;[987] increased parental engagement;[988] and better school adjustment.[989] As just one example, when Black boys have a Black teacher, they are 15 to 18 percent less likely to be subjected to exclusionary discipline.[990] However, Black and Latino teachers are underrepresented in the teaching force relative to the population of students. Whereas only 47 percent of U.S. elementary and secondary students in 2017 were White, 79 percent of teachers were White. Meanwhile, only 6 percent of teachers were Black, compared to 15 percent of students, and 9 percent of teachers were Latino, compared to 27 percent of students.[991] At the postsecondary level, Black and Latino instructors are also underrepresented relative to the population of students attending college.[992, 993, 994]

Bright Futures Education Partnership's Systems-Level Indicators

The Bright Futures Education Partnership models are a data-driven approach to addressing racial equity. Located in Monterey County, California, the Bright Futures Education Partnership was founded in 2014 to connect and support community organizations focused on fostering progress in education outcomes.

In 2021, the organization adopted seven systems-level indicators on which it will collect data and report results. They are in addition to 21 indicators that Bright Futures already tracks across seven community goal areas: early care and education; kinder-ready; language and literacy; critical thinking; youth connectedness; college or job training ready; and career pathway. The seven new systems-level indicators focus specifically on identifying systemic racial disparities, and include indicators of school funding, same-race teachers, bilingual teachers, teacher credentials, teacher experience, school discipline, and the digital gap.

Michael Applegate, Bright Future's data and research partnership manager, noted that much of the partnership's work leverages publicly available data. In California, information about teachers' gender, race, education, experience, and credentials can be matched to the demographics of their classrooms. Bright Futures staff can gain access to multiple large-scale data sets, linking to them to conduct their analyses through a partnership with California State University (CSU) Monterey Bay, which is responsible for a large portion of the local teacher pipeline. The organization recently hired an analyst to explore equity questions, such as whether students of color have equal access to fully credentialed and highly experienced teachers.

Recommended metric(s): Educational staff composition by race and ethnicity (%) compared to student composition by race and ethnicity (%)

- Additional possible measure: Same-race student–teacher ratio by race and ethnicity

Racial/ethnic diversity of the teaching force compared to the student population in 2018

Black: Students 15%, Teachers 6%

Latino: Students 27%, Teachers 9%

White: Students 47%, Teachers 79%

Data source: National Center for Education Statistics (2020).

Data source(s): Administrative data

What to know about measurement: Administrative data systems regularly record the race and ethnicity of students and staff, though these data might be maintained in separate systems. Staff includes administrators, teachers and faculty, and support staff. For example, institution-level data on educator and student diversity are available publicly on a regular basis through the Common Core of Data for K–12 and Integrated Postsecondary Education Data System (IPEDS) for postsecondary. Although these data are generally comparable, different systems do not always use the same race and ethnicity reporting categories. For example, IPEDS does not collect race and ethnicity for students who are "nonresident aliens," who are placed into a mutually exclusive group.[995]

Source frameworks: This indicator appeared in 12 source frameworks reviewed for this report. Our recommended approach aligns with work by StriveTogether,[996] the National Research Council,[997] and the Alliance for Resource Equity.[998]

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School and workplace racial and ethnic diversity

- -

PK **K12** **PS** **WF**

Definition: Individuals are exposed to racial and ethnic diversity within their schools, postsecondary institutions, and workplaces.

Why it matters: In both schools and the workplace, greater diversity is shown to reduce intergroup prejudice[999] and improve intelligence and innovation.[1000] In early learning settings, racial and ethnic diversity is positively associated with children's language development.[1001] Racially integrated elementary and secondary schools are associated with improved life outcomes for all students, including higher college enrollment and success, higher lifetime earnings, more diverse social circles, and better social skills in adulthood.[1002, 1003] In postsecondary settings, frequent interracial interactions and more diverse campuses are related to positive student outcomes, such as growth in leadership skills, psychological well-being, and intellectual engagement.[1004, 1005, 1006, 1007] Diverse workplaces are related to improved employee interpersonal skills and innovation, financial performance, and less conflict.[1008] However, high levels of racial segregation persist in many settings. For example, in 2018, 13 percent of Black students, 16 percent of Latino students, and 18 percent of White students attended schools where at least 90 percent of their classmates shared their racial and ethnic background.[1009]

Recommended metric(s):

- Pre-K, K-12, and workforce: Student body composition by race and ethnicity (%)
- Workforce: Employee composition by race and ethnicity (%)

Data source(s): Administrative data

What to know about measurement: Student and employee demographics are reported regularly in administrative data systems. Unlike postsecondary institutions and employers, however, pre-K and K–12 institutions have less direct control over the demographics of their populations. Thus, this indicator should be used to identify policy solutions to address ongoing segregation rather than penalize institutions.

Note that we suggest capturing the diversity of school leadership in the *representational racial and ethnic diversity of educators* indicator. For a workforce-level correlate, employee composition data could be disaggregated by management level to assess the extent to which workers of color (or any other demographic group) are represented in management positions.

Source frameworks: This indicator appeared in four source frameworks reviewed for this report. Our recommendations align with Alliance for Resource Equity's[1010] definition for "diverse classrooms and schools." We expanded the definition and metric to include workplace racial and ethnic diversity as well.

School and workplace socioeconomic diversity

PK **K12** **PS** **WF**

Definition: Individuals are exposed to socioeconomic diversity within their schools, postsecondary institutions, and workplaces.

Why it matters: The disparity in average school poverty rates between White and Black students is the single most important predictor of differences between their academic achievement.[1011] Schools generally reflect the socioeconomic composition of the neighborhoods within which they operate; attendance in schools with a high concentration of poverty is higher among children of color than White children.[1012] The relationship between economic segregation and outcomes begins in early childhood, where children's academic achievement and social-emotional development have been linked to the average socioeconomic status of their classroom, regardless of a child's own economic or demographic background.[1013, 1014] The benefits of socioeconomic integration may extend into the workplace.[1015, 1016, 1017]

Recommended metric(s):

- Pre-K, K-12, and postsecondary: Student body composition by income
- Workforce: Employee composition by income

Data source(s): Administrative data

What to know about measurement: In early childhood and K–12, this indicator may be difficult to measure based on family income, as household income is not systematically collected and reported in these sectors.[1018] Eligibility for free or reduced-price lunch eligibility is often used as a proxy for low income, although this metric has several limitations, as discussed in greater detail under the guidance for measuring income status in the chapter on disaggregates. At the postsecondary level, the Free Application for Federal Student Aid (FAFSA) collects information on adjusted gross income, though not all students fill out the FAFSA. Workforce systems capture individuals' earnings.

As noted under the school and workplace racial and ethnic diversity indicator, pre-K and K–12 institutions have less direct control over demographics than postsecondary institutions and workplaces. This indicator should be used to identify policy solutions rather than penalize these institutions.

Source frameworks: This indicator appeared in five source frameworks reviewed for this report, most commonly through measures of economic segregation. Our definition aligns with the Alliance for Resource Equity's Dimensions of Equity,[1019] which acknowledges the benefit of socioeconomic diversity in classrooms and schools. Our measure draws from the Urban Institute's[1020] metric for student poverty concentration. We expanded the definition and metric to include workplace socioeconomic diversity as well.

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Access to health, mental health, and social supports

- -

PK **K12** **PS** **WF**

Definition: Individuals have access to health, mental health, and social services provided by educational institutions and employers.

3 out of 4 students who ever access mental health services do so through their school

Source: District Leadership Forum (2020).

Why it matters: Schools can be a critical source of support for students' physical, mental, and social-emotional health. For example, three out of four students who ever access mental health services do so through their school.[1021, 1022] Schools that provide access to nurses, school psychologists, and social workers tend to see improved learning outcomes, school climate, and student well-being.[1023, 1024, 1025] For example, schools with higher nurse-to-student ratios appear to improve attendance by preventing unnecessary release from school.[1026, 1027] Yet health programs and services are distributed inequitably—that is, schools that serve higher shares of students from low-income households and students of color tend to have fewer and lower-quality resources available.[1028] Following the COVID-19 pandemic, the need for mental health and social supports has grown. For example, in recent national surveys, 14 percent of teens and 40 percent of college students reported feeling depression.[1029, 1030] Data from several employer surveys also show that behavioral health is increasingly important to workers in the wake of the pandemic.[1031, 1032, 1033]

Recommended metric(s):

- Pre-K: Percentage of programs offering health, mental health, and social services, or staff or consultants providing infant and early childhood mental health consultation (IECMHC) services

- K–12: Ratio of number of students to number of health, mental health, and social services full-time equivalent (FTE) staff (for example, school nurses, psychologists, and social workers)

- Postsecondary: Ratio of number of students to number of health, mental health, and social services FTE staff (for example, school nurses, psychologists, and social workers)

- Workforce: Percentage of employers offering an employee assistance program or mental health access through health care plans or other services, as measured by employer surveys

Data source(s): Administrative data; survey data

What to know about measurement: Standardized measurement of this indicator is likely to vary across sectors. In the K–12 and postsecondary sectors, the number of FTE staff in various student support roles can be measured consistently using administrative data. For example, the U.S. Department of Education's National Teacher and Principal Survey collects data on the number of FTE nurses, psychologists, and social workers among a sample of schools.[1034] In pre-K, metrics to measure access to services are still evolving, and access to on-site staff may vary according to program size. Some early childhood education programs have early childhood mental health specialists who work with children and teachers; to measure this feature, we propose assessing the availability of early childhood mental health consultation (ECMHC) services.[1035] In workplace settings, we recommend that employers report information on their benefits programs—for example, through the Kaiser Family Foundation Employer Health Benefits Survey,[1036] which asks about mental and behavioral health benefits and wellness programs.

Source frameworks: Nine source frameworks reviewed for this report emphasized the need for access to health and mental health services throughout the E-W continuum. Our metric for pre-K draws from the National for Children in Poverty's State Indicators for Early Childhood.[1037] The recommendation to measure the ratio of students to health professionals in K–12 and postsecondary aligns with work by StriveTogether[1038] and the National Education Association.[1039] We expanded the definition and measures to include employer health and mental health services to align with current workplace best practices.[1040]

DOMAIN: Career readiness and economic success

Access to college and career advising

Definition: College and career counseling services are available in high schools and college campuses.

Why it matters: Having access to effective college and career advising can help students navigate transitions between high school, college, and the workplace. A small but growing body of evidence shows that counselors vary in their effectiveness at boosting high school students' graduation rates, college attendance, selectivity, and persistence; moreover, students from low-income households benefit most from being assigned to an effective counselor.[1041, 1042] The American School Counselor Association recommends a counselor caseload of 250 students, yet many counselors manage double or triple that recommended caseload, with the national average caseload at 471 students.[1043] Many studies have shown that counselors in schools serving underrepresented students are often unable to advise students effectively because their caseloads are too large.[1044, 1045] One study estimates that adding an additional high school counselor improves four-year college enrollment rates by 10 percentage points.[1046]

In a postsecondary context, comprehensive, integrated support programs (including advising, tutoring, and career services, among other supports) have produced higher academic achievement and degree

attainment for students from low-income households.[1047] Research has also identified specific characteristics of effective advising—specifically, *humanized*, *holistic*, and *proactive* advising—that contribute to the success of students of color at predominantly White institutions.[1048, 1049] Yet use of college career counseling services is lowest among Latino college students nationwide (46 percent), followed by White students (48 percent) and Black and Asian students (53 percent). Students age 26 and older also used career counseling services significantly less than students younger than age 26 (57 versus 39 percent, respectively).[1050]

Recommended metric(s):

- K–12: Ratio of number of students to number of full-time equivalent (FTE) counselors

- Postsecondary: Percentage of students using academic advising and career counseling services

Data source(s): Administrative data (educator administrative data; student administrative data); surveys

What to know about measurement: The recommended metric for the K–12 sector should be considered a minimum benchmark for measurement, as the ratio of students to FTE counselors does not provide insight into the quality or effectiveness of advising services. For a fuller picture, data users might be interested in additional information, such as the percentage of time that counselors dedicate to advising, how many students within the school they serve, the amount of time that other staff dedicate to advising (such as school-based administrators, third-party nonprofit program staff, and part-time or full-time volunteers), and/or the degree to which counselors or other staff leverage data to understand matriculation patterns of their school's graduates and help students make informed decisions based on the likelihood of completion (a practice that research links to the effectiveness of advising services).[1051]

Currently, the field lacks feasible ways to measure the quality and effectiveness of K–12 advising services at scale, but the number of FTE staff in various student support roles can be measured consistently using administrative data. For example, the U.S. Department of Education's National Teacher and Principal Survey collects data on the number of FTE counselors among a sample of schools. Therefore, we suggest tracking the ratio of students to FTE counselors *at minimum*, and strongly recommend that K–12 systems assess the quality of advising services by disaggregating data on key indicators of successful student transitions, such as *early college coursework completion*, SAT/ACT *participation*, *FAFSA completion*, *selection of a well-matched postsecondary institution*, *senior summer on track*, *postsecondary enrollment directly after high school graduation*, and/or *successful career transition after high school*.

At the postsecondary level, data on student utilization of college career counseling services may not be systematically collected everywhere. However, items from the Strada-Gallup College Experiences Survey[1052] could be used to measure utilization of academic advising and career services among college students. Similar to the K–12 sector, we recommend that postsecondary systems also disaggregate data on key indicators of successful student transitions through postsecondary education, such as *first-year credit accumulation*, *first-year program concentration*, and *gateway course completion* to understand whether advising services are effective and for whom. Also see the chapter on evidence-based practices for summaries of effective advising approaches.

Source frameworks: This indicator appeared in four source frameworks reviewed for this report, such as the Urban Institute's Robust and Equitable Measures to Identify Quality Schools (REMIQS) framework.[1053] Our recommendation to expand this indicator to include access to advising at the postsecondary level aligns with recommendations from the P-16 framework.[1054]

Access to in-demand CTE pathways

PK **K12** **PS** **WF**

Definition: Career and technical education (CTE) pathway offerings are aligned to in-demand occupations, as defined by regional labor market data.

Why it matters: Recent studies of CTE offerings indicate that CTE programs are frequently misaligned with projected job openings in local regions. For example, one study of CTE programs in high schools in West Virginia found that only about half of the state's CTE programs were aligned to at least one occupation in high demand among employers in the region.[1055]An earlier study in Tennessee found that only 18 percent of graduates concentrated in program areas aligned to high-demand occupations.[1056] Research shows that the benefits of CTE vary widely across fields, with certain high-demand fields such as health yielding greater economic returns to participants.[1057]

Recommended metric(s):

- K–12: Number and percentage of CTE program offerings considered "in demand"
- Postsecondary: Number and percentage of CTE program offerings considered "in demand"

Data source(s): Administrative data

What to know about measurement: High schools and community colleges record program offerings as part of their regular operations, but to identify whether these offerings are aligned to occupations in demand by employers in the region, they must link such programs to labor market data. The meaning of what counts as an in-demand occupation or CTE pathway can vary

> ### Nebraska's High Skill, High Wage, and High Demand Occupations data
>
> The Strengthening Career and Technical Education for the 21st Century Act (known as Perkins V) went into effect in July 2019, introducing a new requirement: states and local education agencies would need to use data to assess and demonstrate alignment between their program offerings and labor market needs.
>
> As described in this brief by Advance CTE, states have operationalized this requirement in different ways, developing their own definitions for what occupations count as high skill, high wage, or in demand based on labor market data and making that data more or less available to the public. In Nebraska, the state's H3 website provides detailed information on occupations that are high skill, high wage, and high demand (H3) at state or regional levels. For example, across the state, the number one H3 occupation based on the number of annual openings, net change in employment, and growth rate is currently heavy and tractor-trailer truck driver.
>
> Users can easily explore H3 occupations by career cluster, accessing data on average wages; number of annual openings; and required education, job training, and work experience. Data are updated weekly to reflect new or rapidly growing industries. As part of its Perkins V state plan, Nebraska requires that all secondary and postsecondary CTE programs use the data tool to demonstrate alignment to H3 occupations.

across contexts.[1058] However, CTE programs can be classified as in demand if they are related to an occupation that meets one or more of the following criteria established by the U.S. Department of Labor's Occupational Information Network (O*NET): projected to have rapid growth or a large number of openings in the student's state or region based on short-term occupational projections data, or considered to be a new and emerging occupation. These criteria have been established by O*NET for "Bright Outlook" occupations.[1059]

Source frameworks: This indicator appeared in four source frameworks reviewed for this report. Our emphasis on in-demand, quality career pathways aligns with work by the Alliance for Quality Career Pathways, a project of the Center for Law and Social Policy (CLASP).[1060] Definitions of in-demand vary state to state, therefore our suggested metric relies on regional labor market data.

Unmet financial need

PK **K12** **PS** **WF**

Definition: The cost of college attendance students must pay out of pocket or finance through loans.

Why it matters: Higher levels of unmet financial need are likely to lead to more student loan debt or require students to work while enrolled in college, thus affecting their progression through college. In fact, students with more unmet need are less likely to graduate.[1061] At least in some states, it is the students with the lowest incomes who tend to have the highest levels of unmet financial need.[1062] In addition, Black students are less likely to receive nonfederal grant aid and receive lower average amounts than their peers.[1063] The Postsecondary Value Commission shows that Black students are, on average, burdened with approximately $8,300 in unmet financial need, whereas the average unmet need of White students is approximately $1,500 per year of attendance.

Unmet financial need by race/ethnicity in 2015-2016
(in thousands of dollars)

American Indian/Alaska Native	Asian/Pacific Islander	Black	Latino	White
$4.3K	$6.0K	$8.3K	$5.8K	$1.5K
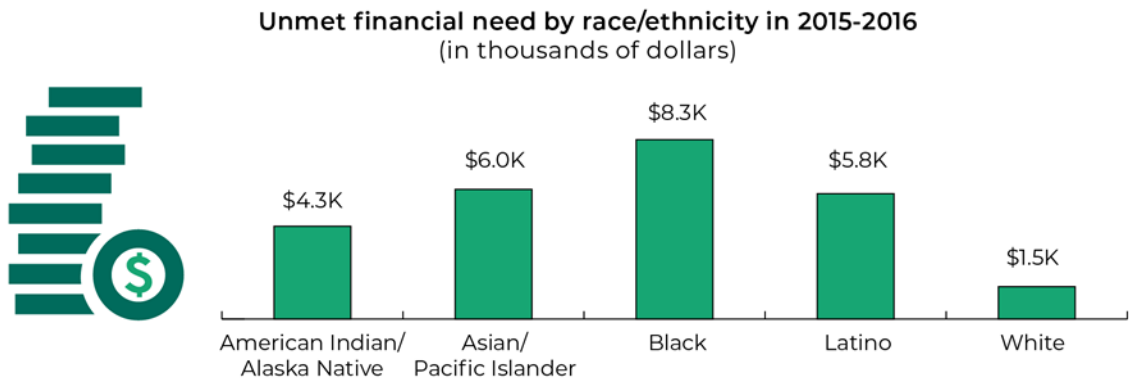
Source: Postsecondary Value Commission (2022).

Recommended metric(s): Average net price (cost of attendance minus grants, scholarships, or tuition waivers from all sources) minus average expected family contribution (EFC), as calculated by Free Application for Federal Student Aid (FAFSA)

Data source(s): Administrative data

What to know about measurement: Unmet financial need provides a more accurate representation of the out-of-pocket expenses a student is expected to pay than net attendance price, because unmet financial need considers each student's EFC, as calculated by students' FAFSA. (Note that as of the 2024-2025 school term, the EFC will be known as the Student Aid Index [SAI]). Although EFC data are tracked in administrative data systems and each college has this information available for the purposes of awarding federal financial aid, they are not reported publicly annually. Information on race and ethnicity is not collected on the FAFSA form currently, limiting regular disaggregation of unmet financial aid by race and ethnicity unless the data are linked to institutional or state records.

Source frameworks: This indicator appeared in five source frameworks reviewed for this report. Our proposed definition and measure align with work by the Institute for Higher Education Policy.[1064]

Cumulative student debt

PK K12 **PS** **WF**

Definition: The total amount of student loans individuals take out while enrolled in college.

Why it matters: Higher student loan debt is associated with decreased rates of home ownership[1065] and worse mental health outcomes.[1066, 1067] Compared to their peers, Black students take out loans more often than other racial and ethnic groups,[1068] and have more debt on average.[1069] Though the amount of debt students accumulate during college is affected by student-level factors such as their expected family contribution (EFC), system-level factors such as the tuition and fees charged by institutions and the amount of grant aid made available to students are the largest contributors to rising student debt.[1070, 1071] Several factors, including the sector of the institution the student attended, the student's grade point average (GPA) in college, whether the student attained a degree, and their labor market outcomes, also predict the probability of loan default. In particular, students attending for-profit institutions, who tend to be Black at disproportionately high rates, are at especially high risk for loan default.[1072]

Recommended metric(s): Median student debt

Data source(s): Administrative data

What to know about measurement: The College Scorecard[1073] publicly reports institution-level median student loan debt, drawing on individual-level data in the National Student Loan Data System (NSLDS). However, because information on race and ethnicity is not yet collected on the Free Application for Federal Student Aid (FAFSA) form, regular disaggregation of student debt by race and ethnicity requires NSLDS data to be linked to institutional or state records.

Source frameworks: This indicator appeared in two source frameworks reviewed for this report. Our proposed definition and measure align with work by the Institute for Higher Education Policy.[1074]

Expenditures on workforce development programs

(PK) (K12) (PS) (**WF**)
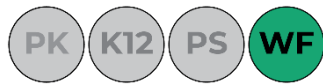
Definition: The amount of government funding dedicated to workforce development programs, including apprenticeships and job training programs, in a state.

Why it matters: Workforce development programs, such as apprenticeships and job training programs, benefit both job seekers and employers. For instance, apprenticeship programs offer valuable training and skills development for participants while providing employers with a reliable talent pipeline.[1075] However, workers of color and women historically have received lower-quality training and had insufficient connections to the labor market.[1076] Information on the level of government expenditures is critical to assessing whether states can provide high-quality workforce development programs for those who need it. The amount of state funding allocated to workforce development more than doubled between 2011 and 2020, though federal spending to support employment and training declined during this time.[1077]

Recommended metric(s): The amount of funding dedicated to workforce development programs as a percentage of total educational funding in a state

Data source(s): Administrative data

What to know about measurement: There is no central source of data for federal expenditures on workforce development. The Urban Institute provides a list of federal workforce funding streams,[1078] including Workforce Innovation and Opportunity Act (WIOA)—which distributes funding for six core workforce programs, including training, employment, basic skills, and rehabilitation services—and Perkins V, which funds high school and college career and technical education (CTE) programs. State-level data on federal funding can be obtained from the corresponding federal agencies. For example, the National Center for Education Statistics (NCES) reports state-level allocations of federal Perkins V funds for CTE. [1079]

At the state level, funding streams vary. However, as part of its State Economic Development Expenditures Database, the Council for Community and Economic Research collects data annually on state investments in workforce preparation and development, which it defines as "the amount states spent on education, training, and recruitment of workers with programs concentrating on improving the skills base and job placement of a state and/or community's labor base" (this includes training, apprenticeships, and "other" workforce development programs).[1080] States may provide workforce development funding through multiple agencies, including the state department of labor and/or economic development, state education agency, state higher education office, and community and/or technical college system. [1081]

Source frameworks: This indicator appeared in three source frameworks reviewed for this report, including the Center for Law and Social Policy (CLASP) Framework for Career Pathways Innovation,[1082] which recommends measuring the "funding level for career pathways or bridge programs."

Access to jobs paying a living wage

(PK) (K12) (PS) (**WF**)

Definition: Jobs that pay enough to meet basic family needs are available in a community.

Why it matters: A minimum wage is typically insufficient for individuals and families to meet basic needs, much less achieve economic mobility and security. According to calculations by researchers at Massachusetts Institute of Technology (MIT), under the current federal minimum wage ($7.25 per hour at the time of publication), two working adults would each need to work approximately 75 hours per week to meet the basic needs of a typical family of four.[1083] Although a growing number of states and municipalities are adopting minimum wages above the federal standard, earning more than minimum wage typically is required to establish economic resilience and build savings. In 2016, 58 percent of White workers were employed in a job that paid at least $35,000 ($17 per hour for full-time jobs) for workers between the ages of 25 and 44, and at least $45,000 ($22 per hour) for workers between the ages of 45 and 64.[1084] This share was 41 percent for Black workers and 37 percent for Latino workers nationwide.

41% of Black
37% of Latino
58% of White
workers are employed in **good paying jobs***

* Defined as >$35K for ages 25-44 and >$45K for ages 45-64.
Source: Carnevale et al. (2019).

Recommended metric(s): Percentage of jobs in a county or metropolitan statistical area (MSA) for which the ratio of average pay to the location-adjusted cost of living is greater than one

Data source(s): Administrative data

What to know about measurement: This indicator requires a calculation based on the local cost of living and average wages in a local area. The Bureau of Labor Statistics publishes quarterly wage data at county, MSA, and state levels through the Quarterly Census of Employment and Wages. Cost of living data by county and MSA are published annually through MIT's Living Wage Calculator.

Source frameworks: This indicator appeared in five source frameworks reviewed for this report. Our proposed measure builds on work by the Urban Institute,[1085] which also includes a measure of access to jobs paying a living wage, defined as "ratio of pay on the average job to the cost of living."

Access to ongoing career skills development

(PK) (K12) (PS) (**WF**)

Definition: Workers are employed in jobs that provide on-the-job training or a professional learning and development path.

Why it matters: Opportunities for "reskilling" and "upskilling" can help workers obtain new skills to meet evolving labor market demands. An analysis by the National Skills Coalition suggests that 53 percent of all U.S. jobs require "middle-level" skills, whereas only 43 percent of U.S. workers are trained at the middle skill level.[1086] On-the-job training may contribute as much to workers' earnings as formal schooling, and a decline in employer-provided training may be a contributing factor to rising inequality in the United States.[1087, 1088] Continuous professional development can help employers develop and retain skilled workers while helping employees develop skills that allow them to succeed at work and earn progressively higher wages.

Recommended metric(s): Percentage of employees who have access to on-the-job training or a professional learning and development plan directly from their employer

Data source(s): Surveys

What to know about measurement: This indicator is likely to require surveying employees or employers. The International Social Survey Programme (ISSP), a cross-national survey collaboration, collects data on whether respondents have had the opportunity to improve their job skills during the past 12 months, as well as on other non-economic job characteristics as part of its Work Orientations module. (However, the ISSP Work Orientations module series is administered at inconsistent intervals—the most recent data available are from 2015.) Alternatively, employers participating in the Workforce Innovation and Opportunity Act (WIOA) are required to report whether program participants achieve "measurable skills gains" within a program year, defined as whether participants are "in an education or training program that leads to a recognized postsecondary credential or employment and who are achieving measurable skill gains, defined as documented academic, technical, occupational, or other forms of progress, towards such a credential or employment."[1089] Although this measure applies only to WIOA provisions, a similar measure could be adapted for other surveys of employers.

Source frameworks: This indicator appeared in three frameworks reviewed for this report. Our proposed measure aligns with recommendations put forth by the National Research Council,[1090] which suggests using employer surveys to collect data on types of on-the-job training provided by employers.

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D. Adjacent system conditions

Adjacent system conditions include experiences, situations, and circumstances outside of E-W systems that help or hinder positive E-W outcomes. Exhibit II.6 presents a summary view of the adjacent system conditions indicators, which span all domains and sectors.

Exhibit II.6. Adjacent system conditions indicators

	Pre-K	K–12	Postsecondary	Workforce
Adjacent system conditions	Childhood experiences			
	Access to full-day pre-K			
	Health insurance coverage			
	Food security			
	Access to affordable housing			
	Access to technology			
	Access to transportation			
	Exposure to neighborhood crime			
	Neighborhood economic diversity			
	Neighborhood racial diversity			
	Neighborhood juvenile arrests			

....

Childhood experiences

....

PK **K12** **PS** **WF**

Definition: Individuals have not experienced repeated traumatic events within home environments.

Why it matters: Childhood experiences such as maltreatment, interparental violence, family disruption, poverty, and stress all have a negative impact on children's development and lifelong outcomes.[1091, 1092] The Adverse Childhood Experiences (ACEs) scale is a widely used, evidence-based tool that measures exposure to 10 potentially traumatic events that have been linked to short- and long-term well-being. High scores on the ACEs scale are positively related to chronic disease; suicide attempts; obesity; and leading causes of death, such as heart disease, stroke, and cancer.[1093] High scores are also negatively related to educational attainment, employment, and income,[1094, 1095] and research shows that the percentage of single-family households in an area is negatively correlated with upward mobility.[1096] Nationally, 61 percent of Black children and 51 percent of Latino children have experienced at least one ACE, compared with 40 percent of White children and 23 percent of Asian children.[1097] On average, Black and Latino children, and children from low-income households, are also exposed to a higher number of adversities than their peers.[1098, 1099, 1100] Overall, 1 in 10 children in the United States have experienced three or more ACEs.[1101]

> ## Building Strong Brains Tennessee
>
> Building Strong Brains Tennessee is a statewide public-private awareness initiative on adverse childhood experiences (ACEs). The initiative is led by the executive, legislative, and judicial branches of Tennessee, and motivated by research from the sciences of brain development and communication.
>
> In the executive branch, multiple state agencies have adopted trauma-informed policies and practices. In the judicial branch, juvenile court judges in the state, their magistrates, and staff all receive training on ACEs and the initiative's principles and practices. In the legislative branch, four laws were enacted as of 2017 that focus on different elements of ACEs, including establishing Safe Baby Courts, developing ACEs training for the state's Department of Education, trauma-informed discipline policies in schools, and requiring ACEs training for parents who are divorcing.
>
> The initiative also aims to raise public knowledge about ACEs and inform public policy in the state to support their prevention and reduce community conditions that contribute to them, as well as support local and state projects on how to measure the impact of ACEs on children. The initiative annually funds projects that focus on preventing and mitigating ACEs and their impacts.

Recommended metric(s): Percentage of individuals with fewer than three ACEs

Data source(s): Survey data

What to know about measurement: Because of the sensitive nature of ACEs, data are collected only at scale through anonymous surveys, such as the Center for Disease Control and Prevention's national Behavioral Risk Factor Surveillance System (BRFSS).[1102] Several states include ACEs questions in statewide youth risk behavior surveys. (For example, the Connecticut and Georgia Youth Risk Behavior Surveys each include questions related to ACEs.) All these surveys are anonymous and based on a random sample of respondents. For example, Connecticut and Georgia randomly select classrooms in public middle and high schools to field the surveys.

Prevalence of Adverse Childhood Experiences (ACEs) by race/ethnicity

Percentage of children experiencing at least one ACE

Race/Ethnicity	Percentage
Asian	23%
Black	61%
Latino	51%
White	40%
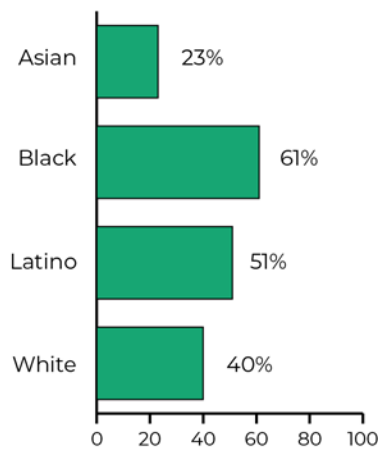
Source: ChildTrends (2018).

Individual ACEs screenings are often administered in clinical settings. Although school systems can administer these screenings, screeners should have training in mandated reporting requirements and expertise in trauma-informed care. Screeners should also have well-developed referral networks to help students connect with behavioral or trauma supports.[1103, 1104] Some ACEs might be more difficult for respondents to disclose, leading to their underestimation.[1105, 1106] Some research has found that respondents prefer reporting the number of ACEs rather than the specific experiences[1107] and that this may be an appropriate format for collecting sensitive information at the individual level. [1108, 1109, 1110]

Several alternatives to the ACEs survey exist that could be used to measure experiences within the home, such as the Family Support and Strain Scale (see Stanford University's SPARQtools).[1111] Other alternatives are a measure of Family Structure and Stability (see Turner et al.)[1112] or the Conflict Tactics Scale to measure emotional and physical abuse.[1113] However, we recommend the ACEs scale because of its strong research base, which provides evidence for the scale's predictive power; also, resources are widely available to support ACEs prevention and interventions.

Source frameworks: This indicator appeared in five source frameworks reviewed for this report. Our proposed definition and measure align with the Urban Institute's Boosting Upward Mobility framework, which uses the ACEs scale to measure exposure to trauma.[1114]

Health insurance coverage

PK K12 PS WF

Definition: Individuals have health insurance coverage for preventative and emergency care.

Why it matters: Uninsured children have limited contact with health care services and more serious health problems, and forgo or do not receive essential health care or use more expensive medical services more often than those with insurance.[1115, 1116] These issues influence attendance, concentration, and participation in school, as well as future educational and labor market outcomes.[1117, 1118] Health insurance coverage is also important for adults and is tied to improved health care quality and access, as well as satisfaction with one's health.[1119] Although programs like the Children's Health Insurance Program (CHIP) and Medicaid can help families with low incomes obtain low- or no-cost health insurance coverage, not all eligible individuals enroll, due to both real and perceived procedural barriers.[1120,1121] In fact, more than one-quarter of uninsured people in 2020 were eligible for Medicaid or CHIP, and nearly two-thirds of these eligible uninsured individuals were people of color. [1122]
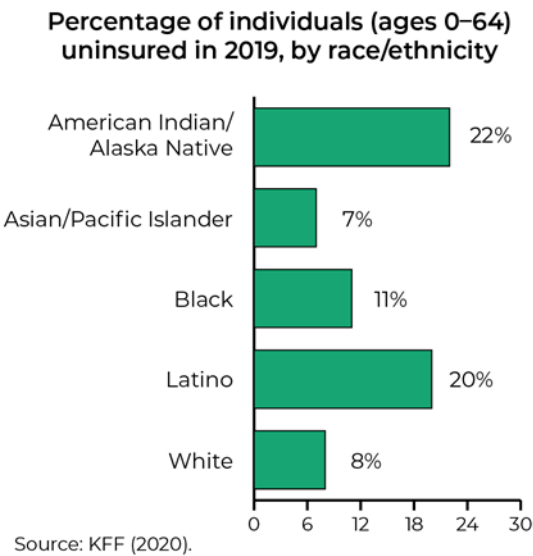
Although insurance coverage has increased over time, and disparities in coverage fell after the Affordable Care Act went into effect, the likelihood of insurance coverage among Indigenous and Latino children and adults remains significantly lower than other groups.[1123] In 2019, 22 percent of American Indian and Alaska Native adults and 20 percent of Latino adults were uninsured, compared to 11 percent of Black adults, 8 percent of White adults, and 7 percent of Asian adults.[1124] Coverage rates are higher among children than adults, but disparities are similar. In 2018, American Indian and Alaska Native children were three times more likely to be uninsured than Asian, Black, and White children (13 versus 4 percent), and Latino children were twice as likely to be uninsured than their Asian, Black, and White peers (8 versus 4 percent).[1125]

Recommended metric(s):

- Percentage of individuals with health insurance
- Percentage of eligible individuals (children or adults) enrolled in Medicaid or CHIP

Data source(s): Administrative data; survey data

What to know about measurement: The first recommended metric captures participation in any insurance program, including those offered by the government (such as CHIP and Medicaid), employers, or community clinics, as well as those that individuals purchase (for example, through Health Insurance Marketplaces). Multiple surveys measure health insurance coverage and can be adapted for use by educational institutions or employers. At the national level, they include the Current Population Survey,[1126] Medical Expenditure Panel Survey,[1127] National Health Interview Survey,[1128] and Survey of Income and Program Participation.[1129] We also recommend that E-W systems capture participation in CHIP and Medicaid among eligible individuals, either as part of a survey (as above) or by linking administrative records from state systems. This information can be used to support families with low incomes in enrolling in these programs.

Percentage of individuals (ages 0–64) uninsured in 2019, by race/ethnicity

Race/ethnicity	Percentage
American Indian/Alaska Native	22%
Asian/Pacific Islander	7%
Black	11%
Latino	20%
White	8%

Source: KFF (2020).

Source frameworks: This indicator appeared in five source frameworks reviewed for this report, several of which recommended measuring whether individuals are insured (or uninsured). Our proposed approach to measuring the percentage of eligible individuals enrolled in Medicaid or CHIP aligns with the National Education Association's Great Public Schools indicator framework,[1130] which recommends measuring the percentage of eligible children enrolled in CHIP or Medicaid.

Food security

PK **K12** **PS** **WF**

Definition: Individuals have access to enough affordable, nutritious food.

Why it matters: Food security and access to healthy food are related to improved health, emotional well-being, and social functioning.[1131] Conversely, food insecurity is correlated with a host of negative outcomes, including deficits in children's development[1132] and college students' lower academic

success.[1133, 1134] Yet marginalized populations are more likely to experience food insecurity. For example, food insecurity in Black and Latino households is twice the rate as that in White households.[1135] Families with lower incomes are also more likely to be food insecure[1136] and have access to less nutritious food.[1137] Although participation in the federal Supplemental Nutrition Assistance Program (SNAP)[1138] reduces the prevalence of very low food insecurity by about one-third, not all eligible individuals enroll in this program. Participation in SNAP is particularly low among college students: less than one-third of eligible college students enroll in SNAP, compared to 85 percent of all eligible individuals.[1139]

Recommended metric(s):

- Percentage of individuals with high or marginal food security, as measured by the U.S. Department of Agriculture's (USDA) Food Security Survey Module[1140]

- Percentage of eligible individuals participating in SNAP

- Percentage of individuals living in a census track with low access to healthy food, as defined by the USDA's Food Access Research Atlas[1141]

Data source(s): Survey data; administrative data

What to know about measurement: The USDA has developed survey modules to measure food security that can be used across settings. Varying survey lengths (in 18-, 10-, and 6-item modules) are available, with versions for children and youth, as well as translations into Spanish and Chinese. Starting in 2022, the National Postsecondary Student Aid Survey by the National Center for Education Statistics (NCES) will ask about food security among college students using the USDA items.

In addition to measuring food security through the USDA survey, we recommend that E-W systems track participation in SNAP among eligible individuals. This information can be used to support families with low incomes in enrolling in these programs. However, we caution that participation in nutrition assistance programs such as Free and Reduced-Price Meals (FARMS) and SNAP are considered weak measures of food security.[1142] For example, more than 1 in 10 households receiving SNAP benefits still experience very low levels of food security.[1143]

California's Student Expenses and Resource Survey

The California Student Aid Commission periodically surveys college students in the state to learn about their experiences with college affordability.

Because the Free Application for Federal Student Aid (FAFSA) currently does not ask students to report their race/ethnicity, the Student Expenses and Resource Survey (SEARS) provides a key opportunity to understand how students' financial needs, including their ability to pay for expenses beyond tuition (such as housing, food, and transportation) vary across racial and ethnic groups. In 2019, survey data revealed that more than one-third of college students in California experienced food and housing insecurity. Students of color reported the highest levels of both food and housing insecurity, regardless of whether they were receiving financial aid through scholarships or grants. For example, about half of Black college students with scholarships or grants reported experiencing food insecurity (54 percent) and housing insecurity (47 percent), the highest rates among any group.

SEARS data inform the Commission's estimates of the true annual cost of college for students, which in turn guides how the state determines eligibility for need-based financial aid awards. The data are also shared with institutions to inform the estimated costs of attendance they publish, as well as their plans for institutional policies and programs to help meet their students' needs.

Participation in SNAP is particularly low among college students: **less than five percent of eligible college students** enroll in SNAP, compared to **85 percent of all eligible individuals.**

Source: Allison (2018).

Finally, we recommend measuring neighborhood access to nutritious food sources through the Food Access Research Atlas, which accounts for the presence and distance of healthy food sources in an area, family income, vehicle availability, and transportation.

Source frameworks: This indicator appears in three source frameworks reviewed for this report. Our proposed measure builds on a measure of food security proposed by StriveTogether,[1144] which includes the "proportion of households experiencing food insecurity" and "proportion of eligible students participating in the School Breakfast Program."

Access to affordable housing

PK **K12** **PS** **WF**

Definition: There is sufficient availability of affordable housing for the number of families with low incomes in an area (city or county).

Why it matters: A lack of affordable housing leaves families with less money for food, clothing, medicine, and transportation. Aside from causing material hardship, this lack has consequences for individuals' mental and physical health; for example, tenants who fall behind on their rent are more likely to experience depression,[1145] and children who live in unstable or poor housing conditions are more likely to experience developmental delays.[1146] Lack of affordable housing may be linked to higher rates of eviction, with families having low incomes, women, and people of color being most likely to be evicted from their homes.[1147]

Recommended metric(s):

- Ratio of (1) the number of affordable housing units to (2) the number of households with low and very low incomes in an area (city or county). Housing units are defined as affordable if the monthly costs do not exceed 30 percent of a household's income. Households with low incomes are defined as those earning below 80 percent of area median income (AMI), and very low-income households are defined as those earning below 50 percent of AMI.

- Percentage of eligible households receiving federal rental assistance

Data source(s): Administrative data

What to know about measurement: The first recommended metric can be calculated at the city and county level using public data from the American Community Survey (ACS)[1148] and the U.S. Department of Housing and Urban Development; however, a framework user would need to calculate the ratio. An advantage of this metric is that it captures the supply of affordable housing relative to demand for it, and therefore reflects whether there are shortages of such housing for those who need it. However, we note that the available data do not consider the features or quality of available affordable housing; for example, many large families have difficulty finding affordable housing with enough bedrooms. We also

note that this metric does not capture *an individual*'s ability to pay for housing. An alternative metric would be to measure the percentage of households that spend more than 30 percent of their income on housing costs. At an aggregate level, this percentage can be calculated using ACS data.
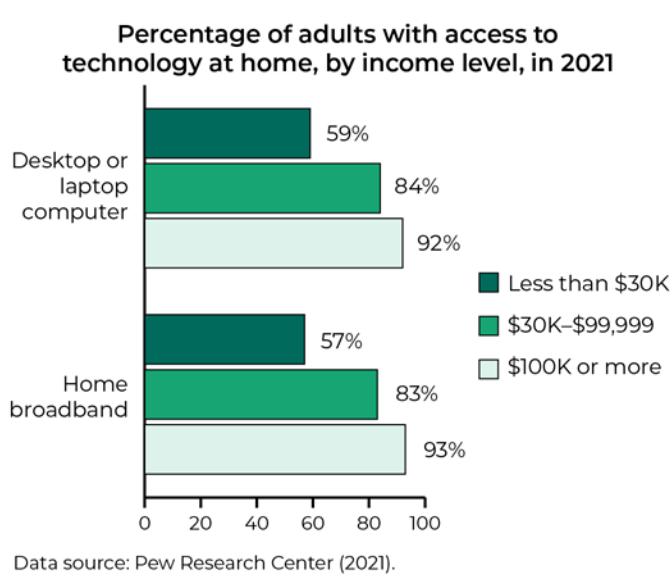
As a second metric, we recommend systems track the percentage of eligible families receiving federal rental assistance, which includes programs administered by the U.S. Department of Housing and Urban Development, such as public housing, Section 8 Housing Choice Vouchers, and Section 8 Project-Based Rental Assistance, among others. This information can be used to support low-income families in enrolling in these programs. National and state-level data are available from the Center on Budget and Policy Priorities, but may require administering a survey to obtain information at the individual level.[1149]

Source frameworks: This indicator appears in four source frameworks reviewed for this report. Our proposed measure draws on the Affordable Housing metric in the Urban Institute's Boosting Upward Mobility framework.[1150]

Access to technology

PK **K12** **PS** **WF**

Definition: Individuals have access to a reliable Internet connection and a personal desktop or laptop computer.

Percentage of adults with access to technology at home, by income level, in 2021

Desktop or laptop computer
- Less than $30K: 59%
- $30K–$99,999: 84%
- $100K or more: 92%

Home broadband
- Less than $30K: 57%
- $30K–$99,999: 83%
- $100K or more: 93%

Legend:
- Less than $30K
- $30K–$99,999
- $100K or more

Data source: Pew Research Center (2021).

Why it matters: Access to technology is increasingly critical for participation in education and workforce systems. Although device ownership and connectivity have increased in recent years, research shows that both racial and socioeconomic digital divides persist.[1151] For example, 80 percent of White adults in the U.S. reported owning a desktop or laptop computer in 2021, compared to 69 percent of Black adults and 67 percent of Latino adults.[1152] Fifty-seven percent of adults from low-income households had access to home broadband in 2021, compared to 93 percent of adults with high incomes.[1153] Access to a personal computer with a high-quality Internet connection (rather than just a mobile device) is especially critical for conducting complex tasks, such as schoolwork and job applications.[1154] During the COVID-19 pandemic, 36 percent of parents from low-income households whose children's schools were closed reported that it was somewhat or very likely that their children would not be able to complete their schoolwork because of lack of access to a computer at home, compared to 4 percent of parents with high incomes.[1155]

Recommended metric(s): Percentage of individuals who have both (1) access to at least one desktop or laptop computer owned by someone in the home and (2) reliable broadband Internet

Data source(s): Survey data

What to know about measurement: The American Community Survey (ACS)[1156] asks three questions that cover type of computer device used, availability of Internet access, and type of Internet access (the survey does *not* capture whether the device is owned by someone in the home). ACS data can be viewed at the state, county, zip code, and/or school district levels. Alternatively, E-W systems could capture data on this indicator through surveys by adapting questions from the ACS for local use. Although schools and workplaces increasingly provide devices for temporary or conditional use, our definition suggests the device should ideally be owned by someone in the home to ensure consistent, reliable access. We also note that the Civil Rights Data Collection (CRDC) initiative collects information on whether schools allow students to "take home school-issued devices that can be used to access the Internet for student learning." However, it does not assess whether students have access to a reliable Internet connection at home.[1157]

Source frameworks: This indicator appeared in five source frameworks reviewed for this report. The StriveTogether Guide to Racial and Ethnic Equity Systems Indicators cites the importance of both access to devices (including mobile, desktop, or laptop) and reliable broadband Internet. As noted above, we suggest refining the measure to specifically track access to a *computer* to support users' ability to perform complex tasks.

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Access to transportation

- -

(PK) (K12) (PS) (WF)

Definition: Individuals have access to low-cost and timely transportation to commute to school or work.

Why it matters: Unequal access to transportation contributes to racial and socioeconomic disparities in employment and earnings;[1158] also, neighborhoods where residents have longer commute times have lower levels of upward economic mobility.[1159] Workers of color are more likely to lack a vehicle and commute by public transit, and they are overrepresented among workers with one-way commutes of 60 minutes or more.[1160] For example, White workers are twice as likely as Asian and Latino workers to have a car at home, and three times more likely than Black workers. Unequal access to transportation also affects students. Nationwide, Black students spend more time traveling to school, on average, compared to other racial and ethnic groups, and are more likely to use public transportation to get to school: 40 percent of Black students take public transportation to school, compared to 32 percent of White students and 23 percent of Latino students.[1161] At the postsecondary level, transportation costs represent about 17 percent of the costs of attending college[1162] and have been linked to disparities in college completion.[1163]

Recommended metric(s):

- Average commute time to work, school, or college
- The Low Transportation Cost Index, from the U.S. Department of Housing and Urban Development[1164]

Data source(s): Survey data; administrative data

What to know about measurement: We recommend measuring average commute time and transportation costs, as both reflect individuals' access to transportation in a locality. The American Community Survey (ACS) asks the number of minutes it usually takes a person to get from home to work and reports these data annually by region.[1165] A similar survey question could be adapted locally by schools and colleges. Data on local costs are available through the U.S. Department of Housing and Urban Development's Low Transportation Cost Index, which estimates the average transportation cost for a three-person, single-parent family earning 50 percent of the median income for renters in a region. Institutions that provide subsidized public transportation passes (which includes some K–12 districts and postsecondary institutions) should also track the share of eligible students receiving these benefits.

Source frameworks: This indicator appeared in four source frameworks reviewed for this report. Our proposed measures align with the Urban Institute's recommendation in the Boosting Upward Mobility framework to measure the Low Transportation Cost Index, [1166] as well as recommendations from StriveTogether[1167] to measure average commute time to work or school.

Exposure to neighborhood crime

PK K12 PS WF

Definition: The rate of violent and property crimes in a city or county.

Why it matters: Neighborhood rates of violent crime are negatively associated with rates of upward economic mobility.[1168] At the individual level, exposure to neighborhood crime leads to lower academic performance[1169, 1170] and higher levels of stress and trauma.[1171, 1172] In addition, adolescents exposed to violence in their communities are more likely to engage in externalizing behaviors, including engaging in violent crimes themselves.[1173, 1174, 1175] Black and Latino individuals are more likely to be exposed to neighborhood violence than other racial and ethnic groups.[1176, 1177, 1178]

Recommended metric(s): Rate of violent felonies and property felonies by city or county (number of incidents per 100,000 residents)

Data source(s): Administrative data

What to know about measurement: Law enforcement agencies across the country submit data on both violent crimes and property crimes to the Federal Bureau of Investigation's (FBI) Uniform Crime Reporting (UCR) program via the National Incident-Based Reporting System (NIBRS).[1179] Data are released publicly on a quarterly basis through the FBI UCR Crime Data Explorer (CDE). UCR data are available at the city and county level for most jurisdictions in the United States. It is worth noting that many crimes are underreported to police; thus, these data may not capture all instances of violence experienced in a neighborhood. In particular, domestic violence and sexual violence are among the most underreported violent crimes.[1180, 1181]

Source frameworks: This indicator appeared in four source frameworks reviewed for this report. Our proposed definition and measure align with the Urban Institute's Boosting Upward Mobility framework.[1182]

Neighborhood economic diversity

PK **K12** **PS** **WF**

Definition: The concentration of poverty within a city or county

Why it matters: Students and families in lower-income neighborhoods tend to have less access to educational resources, support networks, and job opportunities that promote economic mobility.[1183, 1184] The size of the middle class in an area is highly correlated with levels of upward mobility,[1185] and moving to a lower-poverty area before age 13 improves the likelihood of students eventually attending college and earning more in adulthood.[1186] Yet economic segregation varies by race—for example, 80 percent of Black people from low-income households and 75 percent of Latino people from low-income households live in communities the federal government considers to be "low income," based on the concentration of poverty in the neighborhood. In contrast, about half of White people from low-income households live in a low-income community.[1187]

Recommended metric(s): Percentage of city or county residents experiencing poverty who live in a high-poverty neighborhood (defined as a neighborhood in which more than 40 percent of residents experience poverty)

Data source(s): Survey data

What to know about measurement: The data required to compute the proposed metric are available annually from the American Community Survey.[1188] An alternative metric is the share of middle-class households in a locality, defined as the percentage of families between the 25th and 75th percentiles of income.

Source frameworks: This indicator appeared in five source frameworks reviewed for this report. Our proposed metric aligns with the Urban Institute's Boosting Upward Mobility Framework's indicator of economic inclusion.[1189]

ImpactTulsa's Child Equity Index

ImpactTulsa is a collective impact organization in the StriveTogether Cradle to Career Network that works with local partners in the Tulsa, Oklahoma area to advance more equitable outcomes.

The Child Equity Index, a data tool developed by ImpactTulsa in partnership with Tulsa Public Schools, aims to help partners better understand the landscape of opportunity and systemic inequities in the Tulsa area. The index uses more than 40 indicators to measure environmental conditions across six domains of influence: (1) student-level factors, (2) neighborhood health, (3) neighborhood socioeconomic status, (4) neighborhood safety, (5) neighborhood pride and custodianship, and (6) neighborhood access. The index uses student addresses to attach "place-based" measures to neighborhood environments, defined using census tract and zip code geographic boundaries. The index also uses a Neighborhood Model to measure the relationship between environmental conditions and students' academic outcomes.

Findings from the Child Equity Index have sparked conversation about systemic inequities in Tulsa and have translated into action for students and families. For example, when Internet access maps by census tract revealed inequities in access for low-income communities and communities of color, local school districts adjusted their remote learning strategies, and their partners launched a City of Tulsa Internet Access Taskforce.

Neighborhood racial diversity

PK K12 PS WF

Definition: The share of an individual's neighbors who are people of other races and ethnicities.

Why it matters: Neighborhoods with higher levels of racial segregation tend to have lower levels of upward economic mobility.[1190] Furthermore, disparities in the academic achievement of students of color and those from low-income households, and White and more affluent students are more pronounced in more racially and economically segregated schools and neighborhoods.[1191, 1192, 1193]

Despite progress in racial integration over time, many neighborhoods remain segregated. In the period 2014–2018, the average White resident in a metropolitan area lived in a neighborhood where 71 percent of residents were also White, though only 55 percent of the population in metropolitan areas was White.[1194] Similarly, the average Black and Latino person lived in neighborhoods where most residents were people of color. Increased contact between racial groups is consistently linked with lower levels of prejudice.[1195]

Recommended metric(s): Percentage of an individual's neighbors who are members of other racial or ethnic groups, calculated as a Neighborhood Exposure Index

Data source(s): Survey data

What to know about measurement: The data required to compute this metric are available annually from the American Community Survey (ACS).[1196] We note that racial and ethnic diversity within schools and institutions should also be measured, as described in the school and workplace diversity indicator under E-W system conditions.

Source frameworks: This indicator appeared in four source frameworks reviewed for this report. Our proposed approach to measuring racial diversity aligns with the work by the Urban Institute[1197] and StriveTogether.[1198]

Neighborhood juvenile arrests

PK K12 PS WF

Definition: The rate of juveniles arrested in a city or county.

Why it matters: Juvenile arrest is linked with an increased likelihood of high school dropout and adult incarceration.[1199] Although juvenile arrest rates dropped by almost 70 percent between 1999 and 2019, arrest rates among Black youth were still 2.4 times higher than among White youth.[1200] At a systems level, juvenile arrests can provide an indicator of overly punitive policing.[1201] Aggressive neighborhood policing tactics have been shown to reduce test scores for Black boys, even when police contact is indirect.[1202] Black people are five times more likely to report being unfairly stopped by police because of their race or ethnicity than White people, with 59 percent of Black men reporting this experience.[1203]

Recommended metric(s): Rate of juvenile arrests by city or county (number of arrests per 100,000 residents)

Data source(s): Administrative data

What to know about measurement: Juvenile arrest data from the Federal Bureau of Investigation's (FBI) Uniform Crime Reporting (UCR) program[1204] are publicly available and regularly reported. Examining juvenile arrest rates by type of offense (for example, drug abuse violation, curfew and loitering, disorderly conduct, etc.) can also help data users better understand community dynamics and inequities in policing. To assess inequities in the juvenile justice system, data users may also consider examining data on post-arrest handling of juvenile cases. (For example, users could examine whether youth are referred to juvenile court after arrest or diverted from formal court processing. Alternatively, they can look at whether youth are adjudicated delinquent and, if so, the type of dispositions they receive.)

Source frameworks: This indicator appeared in three source frameworks reviewed for this report. Our proposed definition and measure align with the Urban Institute's Boosting Upward Mobility framework, which suggests using this metric as a proxy for overly punitive policing.[1205]

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