

CREATING A P-20 CONTINUUM OF ACTIONABLE ACADEMIC INDICATORS OF STUDENT READINESS

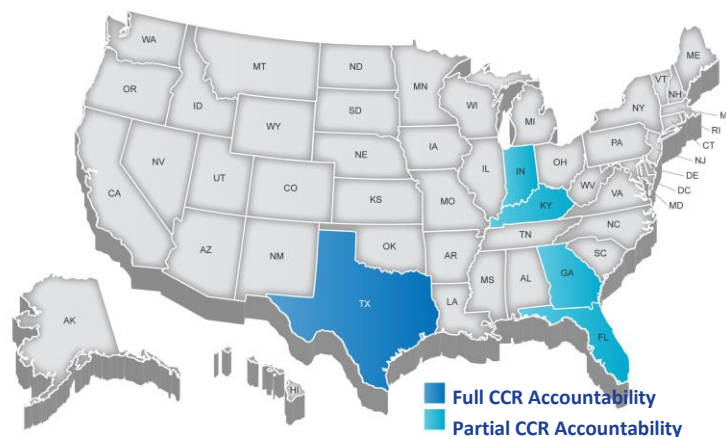
States are making great strides in advancing policies to support college and career readiness through adoption and early stage implementation of college- and career-ready standards, delineation of graduation requirements and alignment of assessments to college- and career-ready performance. Too little progress has been

made, however, in reinforcing these policies' coherence by building accountability systems to inform policy leaders, educators, parents and students and encourage, incentivize and hold schools and districts accountable for helping more students graduate college- and career- ready.ⁱ Few states fully leverage college- and career-ready indicators in their

accountability systems (see Figure 1), and still

fewer back these indicators up into elementary and middle school to focus the system on lifting and supporting students on a path to college and career readiness throughout their education. By focusing on these indicators, states will improve students' overall college and career readiness, particularly in confronting the persistent disparity in college- and career-ready outcomes among students based on income and race/ethnicity.

Figure 1: States with Full or Partial College- and Career Ready Accountability Systems



Source: Achieve. *Closing the Expectations Gap*, www.achieve.org/ClosingtheExpectationsGap2012

This policy brief is a guide for state education policy leaders to use in selecting and prioritizing college- and career-ready student performance indicators. These indicators can be built into the state's accountability system through public reporting, statewide performance goals, school-level incentives and accountability formulas used to differentiate and classify schools and districts. Many of these indicators, along with critical non-academic indicators such as attendance, are also valuable for "early warning" systems to identify students in need of extra support. As each of these uses will drive actions in districts, schools and communities, the indicators must provide meaningful, actionable information to the right people at the right time to improve student outcomes. Teachers and administrators need these data in real time to take action – to change, adjust or fine-tune systemic approaches to specific practices to support individual students, to identify emerging successes and to benchmark best practices. Students

and their parents need timely and clear data to understand where they are on the trajectory to college and career – not just in high school but all along their academic path. Finally, policymakers and the public need access to these data to align resources, evaluate impacts from specific strategies and inform a wide range of strategic decisions to improve outcomes and opportunities for all students.

The brief focuses on *academic* performance indicators that illuminate student readiness for college and career across the P-20 spectrum.ⁱⁱ It makes the case for why each of these indicators matters to students – and what actions each calls for educators, policymakers, parents and community members to take. The brief also illuminates critical decision points and trade-offs that states should consider for each indicator. The list of potential indicators is not meant to be exhaustive, as states may determine that others would be more strategic given their context. States should also not feel as though they need to use all of these indicators – in fact, states that carefully select a smaller set of indicators that will have the strongest impact could benefit by clearly focusing the right people, at the right time, on the indicators that matter most. The guiding questions below are designed to help states in making these decisions.

GUIDING QUESTIONS

The following questions are designed to help states make decisions about which indicators will matter most and to identify ways they can be used to reinforce the state's policy priorities.

State policy priorities

- What are the state's top policy priorities for improving student outcomes (e.g., is the state focusing its efforts on college completion, on meeting workforce/economic needs, on improving student performance in the early years, on closing achievement gaps, or other priorities)?
- Has the state established clear and measurable goals to increase the percentage of students graduating from high school ready for college and career, earning a postsecondary degree or certification, and/or meeting the skills and job demands of the state economy or employers?
- Has the state established clear and measurable goals for improving performance in earlier grades?

Stakeholder engagement

- Will the state engage stakeholders, such as parents, educators and the public, in the selection of the initial indicators? If so, how? When?

- What priority questions do parents and the public have about student performance outcomes in schools and districts? What information do they need to be effective advocates to improve outcomes?
- What priority questions do policymakers have about student performance? What data do they need to make informed decisions?
- What results do teachers and administrators most need to take action to improve outcomes?

Coherence and Alignment

- Do the state's indicators reflect a continuum of readiness that incentivizes schools and districts to move students *toward* and *beyond* college and career readiness? Do the data used for these indicators capture the performance of all students?
- Do the indicators capture a variety of critical elements for readiness, such as course-taking, attainment and achievement?
- Do the indicators begin in elementary school and reflect student progress towards college and career readiness? Do the high school indicators present a clear picture of how well students are meeting and exceeding readiness? Do earlier indicators predict success on future indicators?

Pieces of the Pipeline

States have many student performance indicators across the P-20 pipeline from which to choose – and in the interest of coherence, alignment and efficacy, their choices should be singularly driven by overarching student performance goals. These goals should drive toward college and career readiness for all students, require higher rates of progress for the students who are farthest behind and should be widely known and understood across the state. All of the indicators should then relate in some way to the overall goals, so that improvement on one indicator would predict improvement on another indicator further down the pipeline. For example, in Senate Bill 1 from 2009, the **KENTUCKY** General Assembly challenged the state to cut in half the rate of students requiring remediation in college by 2013-14. This goal then strongly influenced the state's subsequent selection of performance indicators for its new accountability system.

KENTUCKY SENATE BILL 1 (2009)

"... the General Assembly finds the continuing high rates of high school students who require remediation at the postsecondary education level totally unacceptable .. the Council on Postsecondary Education, the Kentucky Board of Education and the Kentucky Department of Education are hereby directed to develop a unified strategy to reduce college remediation rates by at least fifty percent (50%) by 2014 from what they are in 2010 and increase the college completion rates of students enrolled in one (1) or more remedial classes by three percent (3%) annually from 2009 to 2014."

As states select indicators, they should draw on an array that captures students' *course completion and success*, *achievement* and *attainment* through PK-12 and postsecondary education.ⁱⁱⁱ Indicators in each of these categories are critical determinants of students' later likelihood of success. Information along each dimension is also critical for students, parents, educators and the public. For example, students, parents and counselors need to closely track student *success* in courses to keep students on the path to graduation and readiness for college and career. *Achievement*, as measured by student assessment scores, is critical for educators to inform systemic approaches to improving student outcomes as well as to inform individual decisions about supports and interventions. Finally, keeping track of students' *attainment* of a high school diploma and postsecondary degrees or credentials is essential for policymakers to assess progress toward state goals and for school leaders to adjust strategies for helping students succeed.

These indicators should reflect a continuum that incentivizes schools and districts to move students toward and beyond college and career readiness. As such, this continuum should include indicators that reflect when students are on-track *towards* readiness, when they have *met* readiness and when they have *exceeded* readiness. This incentivizes schools and districts to provide the necessary attention and support to students who are identified as off-track so that they can get back on-track. It also provides incentives for schools and districts to support students who achieve readiness earlier than others to continue to strive for more.

Finally, states should take care to select indicators that span from early childhood through postsecondary education. Ultimately increasing rates of students who graduate college- and career-ready and go on to success in postsecondary pursuits is not the responsibility of high schools alone; rather, educators must take action to improve students' academic performance all along the way. In particular, this "pipeline" strategy is critical to lift the performance of students in poverty and students of color, who too often experience cascading impacts from limited access to rigorous curriculum, multiple years of exposure to less experienced and/or effective teachers, and untimely and inadequate supports and interventions. The pipeline strategy becomes even more essential as states transition to the Common Core State Standards (CCSS), where knowledge, skills and practices in each grade clearly build on the grades before.

A P-20 CONTINUUM OF ACADEMIC READINESS

I. School Readiness	II. High School Readiness	III. College and Career Readiness (CCR)	IV. Postsecondary Success
<ul style="list-style-type: none"> a. Kindergarten Readiness b. Reading in Grades K-2 c. Reading in Grade 3 d. Mathematics in Grade 3 	<ul style="list-style-type: none"> a. Mathematics in Grade 5 b. Course Failure in Mathematics or English/language arts in grade 6 c. Completion of 8th Grade Mathematics or Algebra I with a "C" or Higher by the End of the 8th grade 	<ul style="list-style-type: none"> a. Cohort Graduation Rate b. CCR Diploma c. CCR Assessments d. Earning College Credit in High School e. Career Readiness 	<ul style="list-style-type: none"> a. Remediation b. Early Postsecondary Success c. Postsecondary Completion

This brief categorizes these indicators into four pieces of the pipeline:

- **School readiness**, indicators from early childhood through grade 3
- **High school readiness**, indicators from grades 4 through 8
- **College and career readiness**, indicators from high school
- **Postsecondary success**, indicators of postsecondary enrollment and completion

It focuses primarily on *academic* readiness indicators that states can utilize in their accountability systems – but states should not overlook the importance of identifying readiness in other areas, from social-

emotional skills in the early years to employability skills in high school and postsecondary, or “early warning” indicators that are critical from the early years through high school graduation such as attendance and behavior. The brief provides a rationale for each indicator’s inclusion, decision trade-offs for state leaders to consider and examples of states and districts who have built these (or similar) indicators into their accountability systems.

I. School Readiness (early childhood to grade 3)

The National Early Childhood Accountability Task Force has called on states to develop coherent accountability systems for prekindergarten through grade 3, including sharing public “report cards” to draw attention to children’s needs for school readiness.^{iv} Readiness performance indicators are critical for two reasons: first, a student’s academic performance in the early years is associated with (but not determinant of) later outcomes in schooling; and second, using these indicators to inform strategy and implementation can lead to significant improvements in performance from the individual student to state levels. States may also consider how to build in non-academic indicators that have been shown to affect later outcomes, such as chronic absenteeism in kindergarten. In this brief, we propose that states consider the following three indicators: kindergarten readiness; reading in K-2; and reading and math in grade 3. Each of these indicators builds upon each other, with kindergarten readiness included to drive goals and strategies for early childhood programs and the reading indicators included to drive schools and districts to ensuring far more students have the essential foundation of knowledge and skills for later learning in all disciplines, including mathematics.

<i>School Readiness Indicator</i>	<i>Definition</i>
I-a. Kindergarten Readiness	The percentage of students who enter kindergarten with kindergarten readiness assessment scores associated with academic readiness for kindergarten-level CCSS in ELA/literacy and mathematics.

Rationale: Although definitions, assessments and measures of kindergarten readiness vary widely across states, districts and schools, many state and local leaders use or plan to use one or more indicators of readiness to set goals, guide program improvement and specifically guide strategies to close early achievement gaps based on income and race/ethnicity. Assessing children at the beginning of kindergarten has been found to be advantageous for several reasons; the most critical of which is that kindergarten entrance is a pivotal transition point for children into formal schooling. The National Early Childhood Accountability Task Force notes that reporting such readiness data can be instrumental for elementary school educators to focus on children’s strengths and needs immediately upon the beginning of schooling, while early childhood educators benefit from the feedback on how children responded to their programs.^v Currently, 25 states require all entering kindergarten students to take some form of a readiness assessment.^{vi} It is important to note, however, that kindergarten readiness assessments have

not been designed for predictive validity purposes, so a strong link cannot be made between scores and later outcomes. With this caveat in mind, states with agreed-upon definitions of kindergarten readiness and accepted assessments and measures can use this indicator to broadly rally policymakers, educators and the public to **support efforts to improve early learning access and programs, to track progress**

OHIO KINDERGARTEN READINESS

The state of Ohio has required all entering kindergarten students to be assessed on the state-developed Kindergarten Readiness Assessment – Literacy since 2004-05. It is a quick screening assessment of skills deemed essential for success in learning to read. The state reports results of the assessment to the public by district and disaggregated by student characteristics such as economically disadvantaged.¹

toward state goals and to identify needed course adjustments along the way. It can **open up a dialogue** between elementary school teachers and early childhood educators to align expectations and curriculum. Primarily, given the wide variation in students' levels of kindergarten readiness, states should use the indicator in ways that will concretely **lead to more effective instruction and targeting of supports** and interventions for kindergarten students, paving the way for their learning both within and beyond the kindergarten year.

Decision Trade-Offs: States need to weigh multiple factors in deciding if and how to include kindergarten readiness in any kind of accountability use, such as statewide performance goals and public reporting. It is almost certain that kindergarten readiness would not be an appropriate indicator for high-stakes use – first, because it is not a valid purpose for the available instruments, and second, because it could potentially trigger harmful unintended consequences for students, such as inappropriate use to deny eligibility for kindergarten. Some states may decide to publicly report the indicator only at the state level but not report results by schools and districts; others may aim to design policies and

procedures to mitigate the risks of unintended consequences of such finer-grained reporting. Additionally, by adopting one or more assessments with very specific purposes (e.g., screening for needs for more in-depth assessment to determine supports and interventions), states will need to consider carefully how they communicate results so as to not skew understanding.

<i>School Readiness Indicator</i>	<i>Definition</i>
I-b. Reading in Grades K-2	The percentage of students in grades K-2 scoring at a level associated with readiness/proficiency in reading.

Rationale: The need to set goals and continuously monitor student outcomes in these grades is critical to put and keep students on the path toward stronger performance, particularly in the area of reading. Many states and districts offer assessments such as DIBELS and/or norm-referenced standardized assessments such as the Stanford 10 or Terra Nova to assess students' reading skills, and can conduct

research to pinpoint the score on these assessments that are associated with strong reading performance in future grades. Indicators based on this score can be used by state and district leaders to **monitor progress toward goals** and identify areas that need to be adjusted to improve outcomes. Parents can also access this information to **advocate for a stronger focus on these grades** that are critical, but often overlooked in accountability systems.

Decision Trade-Offs: States, again, have numerous decisions about the choice of one or more assessments, data collection, reporting and follow-up on results. States also need to be very thoughtful about the cut scores (or norm-referenced percentiles) for each grade that they choose for the indicator, and may decide to use more than one score for each grade. For example, research might suggest that a minimum level of performance is associated with future outcomes such as high school graduation, while a higher level of performance is associated with 11th grade students' academic preparation for college and careers. For example, **MONTGOMERY COUNTY PUBLIC SCHOOLS** in **MARYLAND** included an indicator of reading performance at the 70th percentile in grade 2 in its "Keys to College Readiness" strategy.^{vii} The district's longitudinal research concluded that advanced levels of performance were necessary for CCR^{viii}, particularly in order to address persistent performance gaps based on race/ethnicity.

<i>School Readiness Indicator</i>	<i>Definition</i>
I-c. Reading/literacy in Grade 3	The percentage of students scoring at the readiness/proficient level on an assessment covering 3 rd grade English language arts/literacy CCSS or other CCR standards by the end of the 3 rd grade.

Rationale: Using an indicator that focuses on grade 3 reading performance positions states to drive attention and action toward a milestone with tremendous meaning to students and their ultimate success. The National Research Council has concluded that students who are not "moderately skilled" readers by the end of the 3rd grade are unlikely to graduate from high school.^{ix} Research from the Annie E. Casey Foundation found that 16 percent of students who do not read proficiently by the end of the 3rd grade do not graduate from high school, compared to 4 percent of students who do read proficiently.^x As this research report noted, beginning in grade 4, students need strong reading skills to master content across subject areas; through grade 3, students are learning to read, but in grade 4, they begin reading to learn. Results that reflect trends and variation in 3rd grade students' reading performance by school, district and student subgroup can be extremely powerful tools for state and local leaders, parents and community partners to **advocate for more coordinated, aligned, and effective systems of early learning**. For example, **FLORIDA's** pioneering work on statewide accountability and supports for 3rd grade reading performance has had a strong effect on improving rates of student proficiency in reading and math at least through the 7th grade.^{xi}

Decision Trade-Offs: As many states use their statewide assessment data for this indicator, the primary decision for state leaders rests on what level of performance to use, and for which accountability

purposes. A more basic level of performance may be associated with students' graduation outcomes, while a higher performance level may reflect meeting or exceeding college and career readiness outcomes. This decision should primarily be driven by the state's overarching student performance goals and the precise needs of communities within the state. The decision will in turn inform how the state uses the indicator. These decisions should also be made with acute awareness about the state's overall plans to transition to the CCSS or other CCR state-developed standards and aligned assessments. These transitions will likely have deep implications for how results should be interpreted, as well as how drivers of student performance may shift over time.

<i>School Readiness Indicator</i>	<i>Definition</i>
I-d. Mathematics in Grade 3	The percentage of students scoring at the readiness/proficient level in 3 rd grade mathematics on an assessment covering the 3 rd grade CCSS (or other CCR standards) by the end of the 3 rd grade.

Rationale: According to a recent analysis of longitudinal data sets from the United States and the United Kingdom, elementary school mathematics knowledge, particularly knowledge of fractions and whole number division, was found to be the strongest predictor of high school algebra and overall mathematics achievement.^{xii} Including an indicator of math performance at the 3rd grade, where such knowledge is being built, can assist states in **improving preparation for teachers** in these areas.

Decision Trade-Offs: States need to ensure that the methods of assessment and threshold level of performance used for this indicator illuminate the extent to which students have developed deep mathematical knowledge, particularly of fractions and whole number division. If the statewide assessment cannot make such claims, the state may wish to provide, or support districts in providing additional, focused assessments of deeper understanding that can provide this meaningful information to educators, students, parents and policymakers.

II. High School Readiness (Grades 4-8)

Students stand a far greater chance of successfully tackling challenging course content in high school and being college- and career-ready if they leave 8th grade with solid academic preparation in mathematics and English/language arts. At a minimum, to keep students on the path to high school graduation, indicators should be set up to monitor student course completion and success in these subjects, beginning in grade 6. For parents and students, it should be clear that students who fail one or more courses early in middle school need to make substantial progress – and especially need to be present and engaged in school to get caught up. These data can also be helpful to community partners who support middle schools in learning where students are getting tripped up along the way. To keep the system focused on preparing students to reach college and career readiness, mathematics indicators at the end of elementary school (grade 5) and end of middle school (grade 8) play an important role in ensuring that students stay on track for higher-level mathematics content in high school – as well as in alerting

policymakers, parents and educators when students need to accelerate their progress. The focus on math is warranted because positioning students to take advanced math in high school, particularly low-income and students of color, is one of the best ways to position them to enroll and succeed in college^{xiii}. Given the state of longitudinal data systems today, many states are well positioned to conduct research into the levels of performance associated with college and career readiness, and thus inform the details of the indicators selected.

High School Readiness Indicator	Definition
II-a. Mathematics in Grade 5	The percentage of students scoring at the readiness/proficient level in 5 th grade mathematics on an assessment covering the 5 th grade CCSS (or other CCR standards) by the end of the 5 th grade.

Rationale: By the end of elementary school, students should be ready to enter middle school ready to succeed in grade-level mathematics content. Focusing the system through a mathematics performance indicator in grade 5 can pay large returns in helping state and local leaders **shape policies and practices** to improve elementary school teachers' preparation, tools and supports to advance student mastery of mathematics knowledge, skills and practices. In addition, this performance indicator is critical to monitor in systemic efforts to erase achievement gaps. **MONTGOMERY COUNTY PUBLIC SCHOOLS** in **MARYLAND** included mathematics performance in grade 5 as one of its seven "Keys to College Readiness" to accelerate progress among low-income students and students of color. It also provides clear information and suggests questions for parents to track their child's schools performance on the keys.^{xiv}

Decision Trade-Offs: States should conduct longitudinal research or other efforts to determine the threshold level of performance on 5th grade mathematics assessment that is associated with success in 8th grade and ultimately in college- and career-ready performance in mathematics by the end of high school. As states move forward in adopting assessments aligned to the CCSS or other state-developed CCR standards, they should ensure that this level of performance is clearly articulated across grade levels.

High School Readiness Indicator	Definition
II-b. Course Failure in 6th Grade	The percentage of students failing mathematics or English/language arts, or both, in the 6 th grade.

Rationale: According to research from the Baltimore Education Research Consortium, students who receive "F" grades in mathematics or English/language arts in 6th grade, or particularly both, are far less likely to graduate from high school, and the likelihood is further decreased when they also experience behavioral problems and chronic absenteeism.^{xv} States can use this 6th grade course failure performance indicator to focus middle schools and community partners on **strategies to improve student course success** in this pivotal transition year, particularly strategies to improve student attendance, behavior and

engagement.

Decision Trade-Offs: This indicator has a clear role in early warning data systems, but states need to carefully weigh its use in accountability – balancing its validity as a predictor of high school graduation against the possibility of unintended consequences through grade inflation. States that intend to use the indicator for more medium- or high-stakes accountability purposes should take steps to mitigate grade inflation risks through monitoring protocols such as comparing student grades and assessment scores. In addition, given the current variability in grading policies and practices across districts, states should either develop a system to standardize the measure across districts or develop guidance for local districts to utilize to mitigate concerns about variability.

<i>High School Readiness Indicator</i>	<i>Definition</i>
II-C. Mathematics in Grade 8	The percentage of students completing an 8 th grade mathematics course covering the CCSS or other CCR standards, or Algebra I, with a “C” or higher by the end of the 8 th grade.

NEW YORK CITY 8TH GRADE MATH INDICATOR

The New York City Department of Education includes an 8th grade math indicator in its [Middle School Progress Reports](#). The reports include an indicator of the percentage of 8th grade students who take and complete accelerated courses in mathematics.

Rationale: Students will have a far more difficult time meeting or exceeding college and career readiness by the end of high school if they enter high school without the mathematics preparation needed to succeed in higher-level mathematics courses. States need to take action to make sure that 8th grade math courses are aligned with the Common Core State Standards or other CCR standards – then monitor fidelity of implementation and provide districts with the necessary support to create and maintain alignment. These steps ensure that all students have access to appropriately rigorous content. Parents and community leaders should be especially concerned about

how well their child’s middle school is preparing students for high school mathematics content. This information can help parents **better advocate** for stronger instruction, and student intervention and supports. This is also a key indicator to monitor along the path to **reducing disparities** in college and career readiness according to income and race/ethnicity, as students’ scores in 8th grade mathematics often inform their placement and access to rigorous course content in high school. For example, **THE NEW YORK CITY DEPARTMENT OF EDUCATION** in **NEW YORK** includes the percentage of 8th grade students who take and complete accelerated courses in mathematics in its accountability progress reports as a measure of high school readiness.^{xvi}

Decision Trade-Offs: States need to construct this indicator in such a way as to incentivize districts and schools to make sure students have access to challenging mathematics content in 8th grade, with supports the students need to succeed. They should carefully weigh how different local policies and practices about student placement into mathematics courses in the 8th grade will impact results, and

heavily involve local educators in the indicator development process.

III. College and Career Readiness (High School)

Because the mission of high school is to graduate all students ready for college and careers, states must include measures in their accountability systems that reflect this aspiration. This also signals to students, teachers, parents and the public what matters most – and where they need to place emphasis. States should consider student progress along a continuum from when students enter high school in 9th grade to when they exit to postsecondary education and careers. The indicators along this continuum should be integrated with one another and build toward the ultimate outcome of college and career readiness. As such, states should consider ways to factor in student achievement on assessments valued by postsecondary institutions and employers, taking a rigorous course of study in high school aligned to college and career expectations, earning college credit in high school, high school cohort graduation rate, measures of students' career readiness and postsecondary remediation rates.

<i>College and Career Readiness Indicator</i>	<i>Definition</i>
III-a. Cohort Graduation Rate	The percentage of 9 th graders who graduate from high school in four years calculated using a four-year adjusted cohort graduation rate as defined by either the U.S. Department of Education or the National Governors Association Compact.

Rationale: Beginning with the class of 2010-11, the U.S. Department of Education required that all states publicly report the four-year adjusted cohort rates of students who earn a standard diploma. This rate does not include students who earn a GED, special education diploma or who require more than four years to graduate. Also, rather than rely on estimated graduation rates, a cohort rate tracks the progress of each student, measures the percentage of students who graduate within four years of entering 9th grade and measures the percentage of dropouts. States have traditionally included graduation rates in their accountability systems, but it is critical that those rates accurately capture which 9th graders actually graduate on time and report this data disaggregated by student subgroups, both in a way that is consistent and comparable to other states.

Decision Trade-Offs: While USED requires public reporting of the cohort four-year graduation rates, states have flexibility as to how to include the cohort graduation rate in their accountability system. For example, states that received ESEA flexibility waivers varied in the weights attached to graduation rates; some weighted graduation rate as less than 10 percent of a school's accountability formula while other states count graduation rates at 50 percent of the formula. States also have the decision of whether and how to include subgroup graduation rates. Additionally, states may decide to create a graduation index that includes broader measures of earning a high school diploma, including GED, special education diplomas and extended graduation rates. While state accountability systems should give primary weight

to the four-year graduation rate, credit to extended-year rates (e.g., 5- year cohort graduation rates) creates an incentive for schools to help those students who may need more time. To ensure that sub-groups of students are not disproportionately represented in the extended-year rates, states need to publicly report, closely monitor and hold schools accountable for both four-year and extended-year rates for all groups. Finally, states must also determine how to balance weighting the graduation rate with other meaningful indicators of readiness for life after high school.

<i>College and Career Readiness Indicator</i>	<i>Definition</i>
III-b. CCR Diploma	The percentage of students graduating with a college- and career-ready diploma, whether in the form of a mandatory diploma, default diploma or opt-in diploma. ^{xvii} For any use of this indicator, the denominator should include all students in a graduating cohort.

Rationale: Graduation rate alone is not a sufficient indicator of students’ readiness for life after high school in most states since the course sequences and thresholds states have set that comprise what it takes to graduate are so disparate from state to state and within the specific units, and since years and level of rigor within subject areas are equally variable.

In a pair of landmark federal studies that followed high school students through their postsecondary years, Clifford Adelman found that the highest level of mathematics taken in high school has the most powerful relationship to earning a bachelor’s degree, regardless of student ethnicity, family income or parents’ education levels. Students who complete Algebra II in high school more than double their chances of earning a four-year college degree. Those who do not take challenging mathematics courses are much more likely to end up in remedial courses and are more likely to drop out. Research by Achieve, ACT and others suggests that for high school graduates to be prepared for success in a wide range of postsecondary settings, they need to take four years of challenging mathematics — covering advanced algebra; geometry; and data, probability and statistics content — and four years of rigorous English aligned with the CCSS or college- and career-ready standards.

Establishing mandatory or default statewide CCR graduation requirements is a critical lever for state leaders to address the long-standing inequities in which low-income students and students of color are systemically given a less challenging set of requirements. Among students whose parents lack higher education, taking advanced math courses in high school more than doubles their own chances of attending college.^{xviii} Taking advanced math has a greater influence on whether students will graduate from college than any other factor—including family background. For those who go straight to college, taking advanced math in high school boosts college completion rates from 36 to 59 percent among low-income students and from 45 to 69 percent among Latino students.^{xix} All students deserve access to the academic skills they need so that they make their own postsecondary and career decisions – as opposed to having those decisions *made for them* because they did not have access to the academic preparation

they needed.

Most states allow students to opt out of taking a CCR course of study; the onus is on these states to carefully monitor how many and which students move into the less rigorous curriculum to ensure that the provision is not abused at the district or school level. This information can also inform decisions about teacher assignment and resource allocation and identify areas of challenge and intervention for students.

States that offer an optional CCR-level diploma can **incentivize schools to move the needle on the number of students graduating from high school having completed a course of study aligned to college and career expectations**. For example, **VIRGINIA** has set a goal to increase percentage of graduates earning a CCR-level “Advanced Studies Diploma” to 60 percent. Schools can earn up to one bonus point if they increase the percent of students who earn advanced studies diplomas or meet or exceed the state goal of 60 percent.^{xx} This is one example of a lower-stakes way to bring CCR indicators into accountability formulas.

For states that do not currently offer or require a CCR Diploma, the state can **monitor course-taking patterns, publicly report this data and set statewide performance goals and incentives around improving this measure**.

Decision Trade-Offs: States that offer more than one diploma option with varying levels of rigor must determine how to weight indicators of students’ meeting college and career readiness, and whether it leads to consequences, rewards, interventions or supports – inside or outside of their school accountability formulas. For example, states can more heavily weight CCR-level diplomas compared to their minimum diploma requirements. Alternatively, a state could award bonus points for schools that increase the numbers or percentages of students who graduate having completed a CCR-level course of study. At the very least, the courses students take – and where they end in their sequence – must be monitored and reported, or else critical course-taking completion data are lost, along with the opportunity to identify course patterns that best prepare students for college success and workforce opportunities.

<i>College and Career Readiness Indicator</i>	<i>Definition</i>
III-c. CCR Assessments	The percentage of students who score at the college- and career-ready level on statewide high school assessments anchored to CCR standards. The state assessment might include a “CCR” or “on-track to CCR performance level/cut score” utilized by the postsecondary community for placement into first-year credit-bearing courses or by the business community for hiring.

Rationale: Too often the accountability formulas that are used to differentiate and classify school and

district performance and that school leaders and educators use to target their work have not included indicators of students' college and career readiness. Instead, the formulas focus on achieving minimum proficiency levels on standardized assessments – assessments that are not indicative of students' readiness for life after high school. According to the National Center for Education Statistics, 36 percent of college-bound students are told they are not ready for college-level work in Math and/or English after taking placement tests once they arrive at college, despite “demonstrating proficiency” on the tests they were given in high school.^{xxi}

KENTUCKY CCR ASSESSMENTS

Kentucky's accountability system includes a metric for the percentage of students meeting ACT benchmarks of 20 in reading, 18 in English, and 19 in mathematics – the very same scores Kentucky higher education institutions use for placement into first-year credit-bearing courses. All students take the ACT in high school, and Kentucky reports the percentages of students by individual school who meet these benchmarks in English, mathematics, reading and science. Finally, students who score below the readiness benchmarks on the ACT in Kentucky are provided transitional bridge interventions as a strategy to promote college and career readiness and degree completion.

States must build measures of college and career readiness into their high school assessment and accountability systems to determine whether students are on track for credit-bearing postsecondary courses and careers *before* their senior year. With assessments that produce results actually used by colleges, state assessment systems can be truly anchored to college- and career-ready expectations and state tests can then be powerful tools to improve instruction and strengthen student preparation. Such assessments will signal which students are prepared for postsecondary success, high schools will be able to work with students who require additional support to close learning gaps before graduation (ideally reducing the number of students who require remediation upon commencing college) and postsecondary institutions will be able to confidently use these results for placement decisions. There is also an inherent incentive for students to perform on these assessments, absent from most statewide assessments today.

Strong alignment between high school assessments and postsecondary and employer expectations clearly communicates expectations and creates incentives for students, schools and districts – and give parents the information they need on how their children are progressing on the continuum towards college

and career readiness. **CALIFORNIA** includes voluntary items from the California State University (CSU) system on the statewide 11th grade standards-based tests. Students who score high enough on these tests and continue to take challenging courses during their senior year of high school have their placement exam waived when they enter CSU and most of California's community colleges. Policymakers should focus on the goal of testing that is more streamlined — more testing is not the goal, smarter testing is.

Decision Trade-Offs: States should administer to all students an assessment of CCR knowledge and skills capable of producing a readiness score that postsecondary institutions use to make placement decisions

or that the state’s business community uses for hiring or placement decisions. All states must determine the appropriate balance between status and growth measures on a CCR assessment (which may change in weight over time) and should consider a range of stakes and incentives for student performance on CCR assessments. For growth metrics, you may decide to hold lower-performing subgroups to higher growth scores on an assessment to close gaps in the short term, but greater emphasis on attainment of a CCR readiness score in the long term. For public reporting purposes, the state may decide to include multiple years of data to demonstrate student achievement trends and growth in college readiness.

Currently, the majority of states do not administer a CCR assessment to all students, thus denominators are not comparable across schools, districts and/or states. If a state does not administer a CCR assessment to all students in a cohort, at a minimum the student results should be reported by the percentage of test takers meeting college-ready benchmarks by subject area (e.g., Wisconsin ACT example); and be used as an equation tool to ascertain the total percent of the cohort meeting college-ready benchmarks. If a state administers a college admissions assessment such as the ACT or SAT to students, the state needs to carefully consider how to augment these assessments with additional questions or performance measures to ensure stronger alignment with the state’s academic standards (especially important if the state wishes to include this measure as part of the state’s accountability system) and to assess the more advanced concepts and skills that college faculty say are important. Finally, there exists the issue of who determines what score is indicative of readiness for first-year credit-bearing course work and where that score is set. In some states, postsecondary institutions independently establish placement policies; in others there are commonly shared placement scores across public institutions in the state. This impacts what the college-ready benchmark states should be reporting student results against. It also raises the issue that what is accepted as “college-ready” in one state university system may not be “college-ready” in another state’s university system.

<i>College and Career Readiness Indicator</i>	<i>Definition</i>
III-d. Earning College Credit in High School	The percentage of high school graduates who earned college credit while still enrolled in high school through Advanced Placement (AP), International Baccalaureate (IB), dual enrollment and/or early college.

Rationale: This indicator matters to students and parents. Students who earn college credits while in high school are more likely to enter college and succeed when they do. Through these experiences, students become familiar with college expectations, academic behaviors and habits of mind; get a head start on postsecondary education and gain academic momentum toward a degree or credential; and begin to develop a college identity. Additionally, the promise of college credit for low-income students is motivational. Taking these courses in high school is associated with a range of positive outcomes, including: higher rates of high school completion, direct enrollment in college after high school, higher college GPAs, persistence through the first two years of college and an improved likelihood of completing

a postsecondary degree program.^{xxii} A recent Jobs for the Future report found that taking just one college-level course in high school is associated with increased likelihood of success in postsecondary education.^{xxiii} Just as states must know whether students are progressing toward and reaching certain benchmarks of college and career readiness, they also need to know whether high school students are exceeding those goals by taking the advanced courses that further solidify their transition to college and put them a step ahead once they arrive.

Policymakers and educators who focus on this indicator can drive improvements in outcomes among low-income and minority students. In several states such as **MARYLAND**, [understanding the disparities](#) in AP access and success rates among low-income students and students of color, and executing data-driven solutions to address those disparities, has led to dramatic increases in not only AP outcomes among these groups but in overall access to the rigorous coursework needed to ultimately succeed in college-level coursework.

Policymakers who have created incentives and opportunities for more students to complete AP, IB and dual enrollment courses can use this indicator to evaluate if and how policies are having an impact and where adjustments should be made. In states such as **ALABAMA** that have prioritized AP access and success through the National Math and Science Initiative's AP Training and Incentive Program, and states such as **TENNESSEE** that provide dual enrollment scholarships, this indicator would allow them to [clearly analyze results across schools and districts and follow up to learn how they differ in implementation](#).

Decision trade-offs: Given the value of participation in AP/IB and dual enrollment, states may wish to include separate indicators for participation and for success in order to ensure that schools are motivated to increase student access to these experiences. Frequently states publicly report the number of tests scored at 3 or above, but do not present the data as the percentage of the cohort of students earning credit for their college- and career-ready performance in AP, IB or dual enrollment. In other words, one or two students might be responsible for scoring 4s and 5s on 20 AP exams – but this data is masked. To ensure that the indicator also values student success in career and technical education (CTE), some states also provide incentives or goals around the number or percentage of graduates who have attained industry-based certifications. There are a number of decision points states will need to make when setting student eligibility criteria: Often, states include students who have achieved a certain score on an AP exam (typically a “3” or higher) or IB exam (typically a “4” or higher) that typically translates into college credit. The state may require that students also complete the corresponding AP or IB course to appear in the numerator, which may limit the range of AP or IB courses that qualify (e.g., those that correspond to core academic courses in college).

As states set their indicators for dual enrollment, they may limit it to those students who have successfully completed a credit-bearing dual enrollment course, or they may specify a certain grade that needs to be attained (e.g., “C”). The state may also limit the range of dual enrollment courses that qualify, such as those in core academic or technical subjects. It may also require that credit is earned in

certain postsecondary institutions such public technical, community colleges and universities, or accredited institutions. The criteria may also require that students attain certain number of credits (e.g., six or more credits or hours).

<i>College and Career Readiness Indicator</i>	<i>Definition</i>
III-e. Career Readiness	The percentage of students who engage in a meaningful career preparatory activity, including completing a CTE program of study and a college- and career-ready diploma, earning an industry-based credential, and/or earning a CTE endorsement on a college- and career-ready diploma.

Rationale: Students should leave high school with the academic, technical and employability skills needed to enter careers with a family-sustaining wage and pathways to advancement. Parents can use this indicator to **inform decisions** about enrolling children in schools that provide opportunities for students to build toward career readiness. Local business groups can use results on this indicator to **evaluate schools** in their progress on improving career readiness outcomes for students over time. States already collect data on their CTE concentrators and completers through the federal Perkins requirements, yet these data do not often get included in statewide public reporting or as part of the broader statewide accountability system. Industry-based certifications often provide an anchor for CTE pathways or programs of study and are valued and used by employers across the nation in their hiring decisions. **LOUISIANA** has included earning an industry-based credential approved by the Board of Elementary and Secondary Education in its graduation index.^{xxiv} **INDIANA** offers an advanced technical diploma that requires students to have completed the Indiana Core 40 graduation requirements, a career technical program and either state-approved, industry-recognized certification or dual credit in a technical area, along with other requirements.^{xxv}

Decision Trade-Offs: States need to clearly define this indicator to ensure that it encourages student access to rigorous CTE courses of study and meaningful credentials that align well with the state's economic and workforce needs. States also need to clearly determine which industry-recognized certifications will be counted, as well the courses that will count for dual credit. It is likely that states may need to balance a push to include numerous options for this indicator with limitations in obtaining valid information for all graduates, particularly from workforce development agencies. Finally, states need to ensure this indicator aligns with their reporting requirements under the federal Perkins grant.

IV. Postsecondary Success (Indicators of postsecondary going and completion)

To fully inform policy and practice from the state to schools, states should stretch the boundaries of accountability indicators to illuminate student outcomes in postsecondary education and careers by high school and district. Such indicators can catalyze critical conversations about how well students are being

prepared for postsecondary life, and help uncover patterns and trends that can help educators, communities and parents adjust policies and practices to help more students reach success.

<i>Postsecondary Success Indicator</i>	<i>Definition</i>
IV-a. Remediation	The percentage of high school graduates who, upon entrance to a postsecondary institution, are placed into a remedial course in reading, writing or mathematics (courses that do not count as English or mathematics credit).

Rationale: Students who must take remedial classes are less likely to achieve their goals, including earning a degree. While 55 percent of students who take no remedial education courses earn a Bachelor’s degree within six years, only 35 percent of students who enroll in a remedial course receive a BA or BS within the same time period.^{xxvi}

INDIANA HIGH SCHOOL FEEDBACK REPORTS

The Indiana Commission for Higher Education releases high school feedback reports that include the number of students matriculating to an Indiana public institution by the type of high school diploma earned (e.g., the CCR-level Core 40 and Honors diplomas vs. opt-out General diploma) and the numbers of students requiring remediation in math, language or both math and language by high school diploma type.

With the vast majority of high school students intending to pursue a college degree and with so many of those students entering college unprepared for college-level work, states need to know whether high schools are preparing students to achieve their goals. Just as important, without a feedback loop in place from postsecondary to high schools, teachers (and the students themselves!) are unaware that their graduating students are unprepared for first-year credit-bearing courses; withholding this valuable information from high schools prevents changes from occurring that could better position students for success after high school.

Joint groups that include stakeholders across early childhood to K-12 to higher education, policymakers and business/community leaders enable a united voice for performance across the cradle to career pipeline. In **HAWAII**, the P-20 Partnership, the Department of Education and the University of Hawaii publish an annual College and Career Readiness Indicator Report for each high school that includes indicators across the K-12 to higher education systems, including remediation rates.

States that track student-level course-taking data know which students in which schools are completing the courses that prepare them for the postsecondary environment — and how students with and without certain courses are faring after high school (e.g., remediation rates for recent graduates at two- and four-year postsecondary institutions, persistence to sophomore year, attainment of degrees, etc.). Policymakers with access to this data are in a position to **use it as proof points and case-making** for why

all students deserve access to a core set of courses. Understanding the relationship between students' course-taking patterns in high school and need for remedial coursework at the postsecondary level is critical for states, districts and schools to better understand whether they are adequately preparing students to achieve their postsecondary goals.

Decision Trade-Offs: States that choose to include the postsecondary remediation indicator need to consider data limitations (e.g., data sharing agreements between K-12 and postsecondary, in-state vs. out-of-state attendance, first-time freshmen vs. older returning students). This is a complex metric that often falls under the postsecondary umbrella but that K-12 systems have a chance of impacting greatly, as the content in remedial courses was most likely already taught once in high school.

<i>Postsecondary Success Indicator</i>	<i>Definition</i>
IV-b. Early Postsecondary Success	The percentage of students who graduate from high school and enroll in a postsecondary institution within 16 months of high school graduation, and complete one full year of credit within 24 months of enrollment.

Rationale: The intensity with which students accumulate credits in their first year of postsecondary education is strongly correlated with their chances of ultimately completing a degree.^{xxvii} Parents who focus on this indicator better understand how their children's high schools and partner organizations are preparing students not just to enroll, but to engage successfully in postsecondary coursework and life. Armed with this information, parents can **ask good questions** to school leaders about the academic and extracurricular experiences that are available to students and can help **rally support** for effective approaches. For example, **CHICAGO PUBLIC SCHOOLS** in **ILLINOIS** publishes each school's college enrollment as well as college retention rate - the percentage of students who stay enrolled through the sophomore year.^{xxviii} **FLORIDA's** annual high school feedback reports feature both pre-graduation indicators (cohort graduation rate, percentage of students completing a college-prep curriculum, percentage of students scoring at or above college-level cut scores on SAT/ACT/Florida College Placement Test, percentage of students completing at least one dual enrollment course) and post-graduation indicators (postsecondary enrollment by type of institution and the percentage of graduates who successfully complete entry-level courses in math and reading at the postsecondary level), making them readily accessible and user-friendly.

Decision Trade-Offs: States face many decisions in constructing and interpreting this indicator, primarily due to challenges in securing comprehensive and consistent data on all students who graduate from high school. In many states, data availability may lead them to limit the scope of the indicator to high school graduates who enroll in in-state public universities and colleges. These states need to be clear that the indicator does not capture the full range of postsecondary education experiences, and may have limited value for states with high out-of-state and/or private school enrollments. In addition, states need to be precise about their meaning of "success" – clearly specifying the number of credit hours, courses, (or

other definition of success) and span of time. In some cases, states may need to do crosswalks to translate some programs, such as technical programs, into the credit hour or other framework which underlies the indicator. Finally, states may further specify the indicator as success in entry-level, credit-bearing courses in math and English – another critical driver on the path to completion.

<i>Postsecondary Success Indicator</i>	<i>Definition</i>
IV-c. Postsecondary Completion	The percentage of students who graduate from high school and enroll in public postsecondary institutions who complete a postsecondary credential or degree within 150 percent of degree time.

Rationale: According to a recent survey by Achieve and the Society for Human Resource Management (SHRM), the vast majority of new jobs will be middle-skilled jobs, and increasingly these jobs will require a postsecondary credential such as an occupational certificate, associates, bachelor’s or more advanced degree.^{xxix} It is critical for states to reinforce accountability for students ultimately completing a degree or credential, the indicator with the greatest meaning for students’ ultimate job prospects and earning potential. The meaning behind this indicator gives it great power in communicating about how students are positioned for success throughout life. School and community leaders can work together with postsecondary institutions to examine rates of postsecondary completion by high school. With these data, they can make decisions about **targeting resources** for ongoing support and guidance to students and families.

Decision Trade-Offs: States face similar trade-offs vis-à-vis the above in regards to responding to data availability limitations, particularly for institutions that are not in-state public colleges and universities, and, in addition, face trade-offs regarding the timeliness and quality of the results. For instance, capturing the students who complete a bachelor’s degree within 150 percent of degree time means that the data will not be available for six years following high school graduation, introducing significant challenges in tracking students who transfer between different institutions over time. This definition, however, benefits by capturing students who are part-time or otherwise need more time to complete their degree. In fact, it tracks with the indicator used by Complete College America, which captures students who receive a 1-year certificate within 1.5 years, a 2-year associates’ degree within 3 years, or a 4 year bachelor’s degree within 6 years. Regardless, given these data and time limitations, states should strongly narrow uses of this indicator to those with low stakes for schools and districts.

Conclusion and Recommendations

State leadership is essential to harness early childhood, K-12, higher education, workforce and community partners together to achieve robust goals for improving educational outcomes for all students, particularly students in poverty and students of color. As states move forward on reforms to support college and career readiness, such as implementing CCSS or other CCR-aligned standards,

common assessments and graduation requirements aligned to a college- and career-ready course of study, it will be critical that accountability and public reporting systems include indicators that align to these reforms. States should build a continuum of indicators across the P-20 pipeline, and use these indicators to communicate goals, monitor progress and reinforce accountability for results through public reporting, incentives and accountability formulas. They should also ensure that these indicators keep students on track toward and beyond college and career readiness, so that the system is focused on helping each student get the support he or she needs to stay on a path to graduate from high school, and do so ready to take on challenging academic content in postsecondary pursuits.

There are some specific actions that states can take now to build toward use of a continuum of accountability indicators:

- **Set statewide performance goals on key indicators:** States can leverage their leadership tools to drive accountability for CCR results by establishing clear performance goals that leaders communicate broadly to educators and the public. Leaders can also use the goals to drive a performance management process to ensure that individual districts and schools are making progress toward the goals. For example, **KENTUCKY** has set a statewide CCR goal for the percentage of students who graduate college- and career-ready from 34 percent in 2009 to 67 percent in 2015. To support the state's goal, it has secured from all districts a "[Commonwealth Commitment](#)" to move 50 percent of their high school graduates who are not college- and/or career-ready to college- and/or career-ready. If each district meets its individual goal, the state will meet its goal in the aggregate.
- **Report results to the public:** States can push the envelope in making CCR data transparent and understandable to those who can influence student performance. They can incorporate the measures into the school and district report cards that parents, and even educators and policymakers, rely on to learn about performance in their community's schools. For example, **INDIANA** includes indicators of Advanced Placement (AP) exam performance, attainment of the Core40 high school diploma that is aligned to CCR expectations, and other CCR measures in an easy to understand graphical format in its annual [COMPASS](#) reports. See Achieve's policy brief and guidance to states on public reporting at: www.achieve.org/public-reporting.
- **Incentivize progress:** States can use incentives and rewards to drive progress on CCR goals – offering districts that meet performance goals flexibility from state regulations, providing a forum for schools that have made great progress to share their strategies with other schools, or recognizing success through the media, banners or other recognition. For example, **VIRGINIA** offers a [Governor's Excellence in Education](#) award to schools and school divisions that meet several criteria, including that the percentage of graduates that attain an Advanced Studies diploma exceeds the state's goal of 57 percent and that the percentage of students earning college credit in high school exceeds 25 percent.
- **Use to differentiate and classify schools and districts for support and intervention:** States can also incorporate CCR indicators into formulas used to differentiate and classify schools. There is

a growing interest in states to move toward accountability formulas based on an index model, where scores on multiple indicators can be combined to reach an overall school or district rating. For example, **COLORADO** has included [several indices](#) within its accountability formula – using indicators of academic achievement, growth, growth gaps and postsecondary readiness.

FLORIDA's [A-F accountability model for high schools](#) includes an index that gives strong weight to CCR indicators, including assessment performance (ACT, SAT) and earning college credit in high school (AP, IB, industry certification, dual enrollment). **NEW YORK** has weighted the college- and career-ready level of performance on state high school Regents assessments more heavily within its accountability [Performance Index](#).

- **Continuously improve the quality of indicators:** As states put new P-20 longitudinal data systems to use to calculate performance indicators for use in goals, incentives, public reporting and accountability determinations, they should ask questions about how early academic indicators in elementary and middle school predict college- and career-ready outcomes, such as reaching the CCR level on an assessment or enrollment and success in first-year, entry-level, credit-bearing courses in college. Far too little research exists that ties early indicators to future academic success beyond high school graduation. States can also partner with larger school systems with the capacity to conduct such research, and in the process help inform the development and adjustment of early warning data systems. The indicators that are found to tie to future CCR outcomes can then be weighted most heavily in public reporting, statewide goals set on these indicators, incentives given for schools that make progress against them, and state formulas that differentiate and classify schools and districts for support and intervention.
- **Partner to improve accessibility and coherence of reporting:** In some states that do use a continuum of readiness indicators, tracking them requires looking at websites and reports from numerous agencies. For example, some indicators might be reported by state education agencies, while others are reported from higher education in high school feedback reports. States should work together across early childhood, K-12, and higher education, as well as workforce and community partners where appropriate, to analyze and report these indicators in a [shared space](#) so that parents and the public can more easily access the information, see how the indicators flow together and more clearly track progress over time.

ⁱ Achieve. (2012). *Closing the Expectations Gap*. www.achievethe.org/ClosingtheExpectationsGap2012

ⁱⁱ While the brief does not highlight critical indicators, such as early social-emotional skills and attendance and behavior from K-12, that deeply affect student outcomes, states should not discount their use in data-driven strategies to improve student performance from the individual student to state levels.

ⁱⁱⁱ Achieve and The Education Trust. (2008). *Measures that Matter: Making College and Career Readiness the Mission of High Schools: A Guide for State Policymakers*. www.achievethe.org/files/MakingCollegeandCareerReadinesstheMissionforHighSchool.pdf

- ^{iv} National Early Childhood Accountability Task Force. (2007). *Taking Stock: Assessing Early Childhood Learning and Program Quality*. fcd-us.org/sites/default/files/Accountability_Task_Force_Final_Report1.pdf
- ^v Ibid.
- ^{vi} Council of Chief State School Officers. (2011). *Moving Forward with Kindergarten Assessment Efforts*. www.ccsso.org/Documents/CCSSO_K-Assessment_Final_7-12-11.pdf
- ^{vii} Marietta, G. (2010). *Lessons on PreK-3 from Montgomery County Schools*. Foundation for Child Development. fcd-us.org/resources/lessons-prek-3rd-montgomery-county-public-schools
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- ^{xii} Siegler, R. S., Duncan, G., et al. 2012. "Early Predictors of High School Math Achievement." *Psychological Science* 23:691.
- ^{xiii} Horn, L. & Nuñez, A. M. (2000). *Mapping the Road to College: First-Generation Students' Math Track Planning Strategies, and Context of Support*. Washington, DC: U.S. Department of Education, National Center for Education Statistics.
- ^{xiv} See www.montgomeryschoolsmd.org/info/keys/parents.shtml
- ^{xv} Balfantz, R. et al. (2011). *On Track for Success: Use of Early Warning Indicator and Intervention Systems to Build a Grad Nation*. Civic Enterprises and the Everyone Graduates Center. new.every1graduates.org/wp-content/uploads/2012/03/on_track_for_success.pdf
- ^{xvi} New York City Progress Reports for Middle Schools/K-8 schools at schools.nyc.gov/Accountability/tools/report/default.htm
- ^{xvii} States raising their course requirements in English and mathematics to the CCR level have structured the requirements in one of two ways: Mandatory requirements that result in students earning a high school diploma only if they complete the required courses or automatically enroll all students in the "default" CCR curriculum but allow students to opt out of the requirements if their parents sign a waiver.
- ^{xviii} Horn, L. & Nuñez, A. M. (2000). *Mapping the Road to College: First-Generation Students' Math Track, Planning Strategies, and Context of Support*. Washington, DC: U.S. Department of Education, National Center for Education Statistics.
- ^{xix} Adelman, C. (2006). *The Toolbox Revisited: Paths to Degree Completion from High School through College*. Washington, DC: U.S. Department of Education. (p. xxvi)
- ^{xx} Virginia Index of Performance (VIP) Program www.doe.virginia.gov/statistics_reports/va_index_performance_awards/criteria_2011.shtml

^{xxi} National Center for Education Statistics. (2012). *The Condition of Education 2012*.

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^{xxiv} See www.louisianabelieves.com/accountability/school-performance-scores

^{xxv} See diploma requirements at: www.doe.in.gov/sites/default/files/curriculum/core-40-and-honors-rule-summary-12-7-12.pdf

^{xxvi} Complete College America. (2012.) *Remediation: Higher Education's Bridge to*

Nowhere. www.completecollege.org/docs/CCA-Remediation-final.pdf

^{xxvii} Complete College America. *Essential Steps for States: Uniformly Measure Progress and Success*.

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^{xxviii} Chicago Public Schools Progress Report Cards at:

www.cps.edu/Schools/Pages/2012SchoolProgressReportCards.aspx

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