What are the ACT® College Readiness Benchmarks?

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The ACT College Readiness Benchmarks are the minimum ACT test scores required for students to have a reasonable chance of success in first-year credit-bearing college courses at the typical college. There are Benchmarks for six ACT test scores, and each Benchmark is linked to success in a different college course or set of courses (Table 1). This brief answers six frequently asked questions about the Benchmarks.

1. *Why these college courses?*

The Benchmarks are based on credit-bearing courses from core subject areas that are most commonly taken by first-year college students. Each ACT test score was linked to performance in a course or courses from the same subject area. For example, the ACT Mathematics Benchmark was derived based on the relationship between ACT mathematics scores

and course grades in College Algebra; for the English and science tests, the courses examined were English Composition I and Biology, respectively. While reading skills are important for success in most college courses, they are particularly important in social science courses, which tend to be reading-intensive. Therefore, a set of social science courses commonly taken by first-year students was used for the Reading Benchmark.

The ACT STEM Benchmark was derived using first-year college courses in mathematics and science most commonly taken by students in science, technology, engineering, and mathematics (STEM)-related majors; the courses included Calculus, Biology, Chemistry, Physics, and Engineering. The courses used for the ELA (English/Language Arts) Benchmark were the same courses used to

Table 1. ACT College Readiness Benchmarks

ACT test score	College courses	Benchmark
English	English Composition I	18
Mathematics	College Algebra	22
Reading	American History, Other History, Psychology, Sociology, Political Science, Economics	22
Science	Biology	23
STEM[1]	Calculus, Chemistry, Biology, Physics, Engineering	26
ELA[2]	English Composition I, American History, Other History, Psychology, Sociology, Political Science, Economics	20

develop the English and Reading Benchmarks. These six courses were some of the most commonly taken courses in the first year for all students, as well as for students in specific major categories, including ELA-related majors (Radunzel et al. 2017).

2.   *What do we mean by "a reasonable chance of success"?*

The ACT College Readiness Benchmarks use a B or higher grade as the indicator of success in the course. Students who earn first-year grades of B or higher, on average, are much more likely to complete a postsecondary degree. Among students who began at a four-year institution and earned a first-year grade point average (FYGPA) of 3.00 or higher (i.e., B or higher grades, on average), 64% earned a bachelor's degree within six years as compared to only 27% for those who earned a FYGPA less than 3.00. Similarly, among students who began at a two-year institution and earned a FYGPA of 3.00 or higher, 51% earned an associate's or bachelor's degree within six years as compared to only 19% for those who earned a FYGPA less than 3.00 (Radunzel and Noble 2012a).

Students who meet an ACT Benchmark have at least a 50% chance of earning a B or higher grade and approximately a 75-80% chance of earning a C or higher grade in the corresponding college course or courses. The 50% chance threshold is used because 1) course placement accuracy rates are maximized at the score associated with a 50% chance of success (Sawyer 1996), and 2) if used as a course placement cutoff score, the 50% chance criterion would lead to the least-qualified student in the course having a 50% chance of earning a C or lower grade, which is a reasonable degree of confidence in success.

Additional tables are provided to help users understand how the probability of success in the Benchmark courses varies across the full range of ACT test scores and for other success criteria ("C or higher" and "A" grades) (Allen, Radunzel, and Moore 2017).

3.   *What data were used to establish the ACT College Readiness Benchmarks?*

The ACT College Readiness Benchmarks are empirically derived based on the actual performance of college students. ACT has compiled an extensive database of course grade data from a large number of first-year students across a wide range of postsecondary institutions. The data were provided through ACT's research services and other postsecondary research partnerships.

The Benchmarks for English, mathematics, reading, and science were first established in 2005 and were updated in 2013 using data from more recent high school graduates (Allen and Sconing 2005; Allen 2013). The STEM (Mattern, Radunzel, and Westrick 2015; Radunzel, Mattern, Crouse, and Westrick 2015) and ELA (Radunzel et al. 2017) Benchmarks were established more recently. The data were weighted to be representative of ACT-tested high school students and two- and four- year colleges nationwide.[3] Table 2 provides the number of institutions and number of students included in the samples used to establish the Benchmarks.

4.   *How should the Benchmarks be used?*

We recommend that the Benchmarks are used for one of three general purposes:

- *For identifying college students who are ready for credit-bearing courses (e.g., course placement), or identifying students who need additional academic support (e.g., early identification for intervention).* Because success in college courses depends on more than just the knowledge and skills measured by the ACT test, the best course placement and early identification systems use multiple measures, such as high school GPA, ACT test scores, high school courses taken, and measures of social and emotional learning. The ACT College Readiness Benchmarks can be used to identify students who have the requisite knowledge and skills targeted by the ACT test. Because performance expectations and grading standards vary across colleges, the ACT College Readiness Benchmarks represent a standard for the *typical* postsecondary institution.

- *As a performance standard for K-12 students.* The ACT College Readiness Benchmarks can help states, districts, and schools identify the level of performance on academic achievement tests needed for a student to be college-ready. The Benchmarks help articulate college expectations not only to students in high school, but to

Table 2. Sample Sizes Used for ACT College Readiness Benchmarks

Benchmark	Number of institutions		Number of students
	2-year	**4-year**	
English	68	68	96,583
Mathematics	53	72	70,461
Reading	54	75	130,954
Science	40	50	41,651
STEM	0	78	84,919
ELA	94	139	198,275

students in lower grades as well. ACT assessments designed for grades 3-10 treat the ACT test as the anchor of the assessment system and use the ACT College Readiness Benchmarks as the end target. More details on this use are provided in #6 below.

• *For monitoring educational improvement and achievement gaps over time*. Educational stakeholders at all levels (school, district, state, nation) are interested in how well their institutions are improving, and the extent that gaps between student subgroups are changing over time. The percentage of students meeting the ACT College Readiness Benchmarks can be used as one of the metrics for monitoring progress and setting goals and is most relevant when the ACT test is administered to all students. One advantage of using the Benchmarks for

this purpose is that they are indicators of readiness for college coursework, and so have relevance to students, educators, and policymakers.

5. *What other evidence exists to support the ACT College Readiness Benchmarks?*

ACT Benchmarks have been validated using other college outcomes. Students who meet the ACT Benchmarks are less likely to take remedial courses and are more likely to enroll immediately in college after high school, persist in college, earn a college GPA of 3.0 or higher, and complete a college degree as compared to students who do not meet the ACT Benchmarks (ACT 2010; Radunzel and Noble 2012b). Additionally, as the number of ACT College Readiness Benchmarks met in English, mathematics, reading, and science increase, students' chances of persisting and completing a

degree within six years increase. This is illustrated in Figure 1 for a nationally representative sample of ACT-tested high school graduates who immediately enrolled in either a two- or four-year postsecondary institution after high school. Among students who met all four of the original ACT Benchmarks and enrolled at a 4-year college, 74% completed a bachelor's degree within six years. The corresponding percentage was 44% for those who met none of the Benchmarks.

Students who meet the ACT STEM Benchmark of 26 are more likely than those who do not to succeed in a variety of STEM-related college outcomes that include cumulative grade point average over time, persistence in a STEM major, and ultimately completing a STEM degree (Radunzel et al. 2015). This finding is observed even after accounting for other student characteristics such as their high
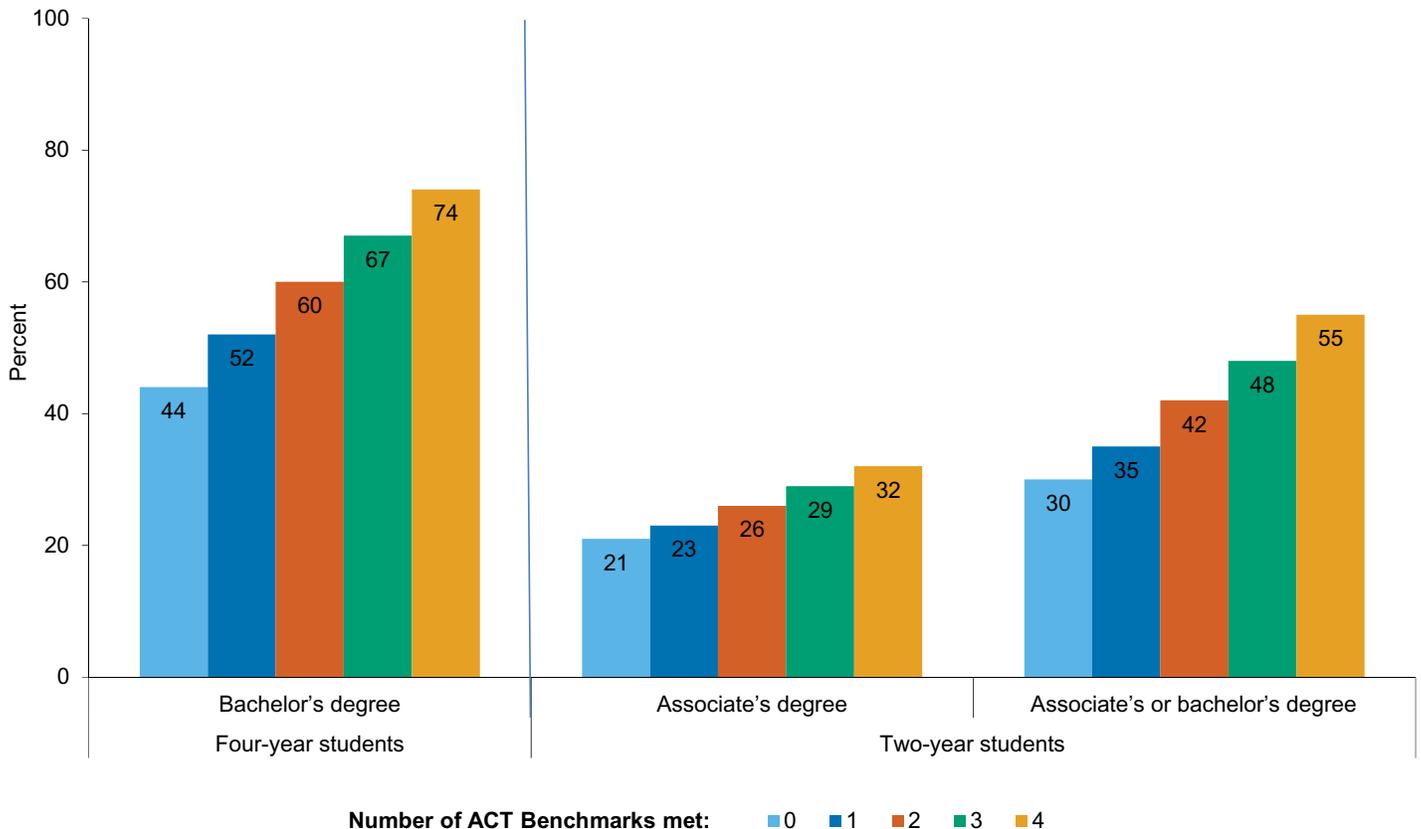

Figure 1. Six-year degree completion rates by number of ACT Benchmarks met and institution type.[4]

school coursework and grades and interest in STEM (Radunzel, Mattern, and Westrick 2016).

6. *Do Benchmarks exist for earlier grade levels?*

In addition to the Benchmarks for the ACT, there are corresponding Benchmarks for the ACT Aspire® Summative tests for grades 3-10 (ACT 2017a), ACT Aspire Interim tests for grades 3-10, and the PreACT® test (ACT 2017b). Benchmarks for grades 3-10 indicate whether students are on target to meet the ACT Benchmark in grade 11 and are specific to grade level and subject area. The Benchmarks for ACT Aspire Summative and Interim tests assume spring testing; students who test earlier in the year have additional time for growth to meet the Benchmark. ACT uses different names to distinguish the Benchmarks used by each test (Table 3), and the derivation of the Benchmarks varies by test.

Because the ACT Aspire Summative tests use vertical score scales, the Benchmarks increase by grade level.[7] Beginning in 2018, ACT Aspire Interim scores will be reported on a scale specific to each subject and grade level. Because ACT Aspire Interim scores are not reported on a vertical scale, the Benchmarks may increase or decrease by grade level. Because the PreACT test is on the same scale as the ACT test and closely aligns in content, the PreACT test also references

Table 3. Names and Derivations of ACT Benchmarks

Test	Name	Grade levels	Derivation
ACT Aspire Summative	ACT Readiness Benchmark	3-7	The score with the same distance from the mean as the 8th grade Benchmark's distance from the mean, in standard deviation units.
		8-10	The score associated with a 50% chance of meeting the ACT Benchmark in grade 11.
ACT Aspire Interim	ACT Interim Readiness Benchmark	3-10	The interim score corresponding[5] to the ACT Readiness Benchmark.
PreACT	PreACT College Readiness Indicator	10	The score associated with a 50% chance of meeting the ACT Benchmark in grade 11.[6]
The ACT	ACT College Readiness Benchmark	11/12	The score associated with a 50% chance of earning a B or higher grade in corresponding college course.

Table 4. ACT Benchmarks for Grade 3 Through the ACT Test

Test	Grade level	Subject area/test score					
		English	Mathematics	Reading	Science	ELA	STEM
ACT Aspire Summative	3	413	413	415	418	419	420
	4	417	416	417	420	422	422
	5	419	418	420	422	424	425
	6	420	420	421	423	426	428
	7	421	422	423	425	426	430
	8	422	425	424	427	427	433
	9	426	428	425	430	428	435
	10	428	432	428	432	430	437
ACT Aspire Interim	3	158	160	160	164		
	4	157	160	160	164		
	5	159	157	162	167		
	6	160	158	159	163		
	7	160	160	161	166		
	8	159	162	159	161		
	9	169	159	159	164		
	10	171	162	160	164		
PreACT	10	15	19	20	21		24
The ACT	11/12	18	22	22	23	20	26

Note: ACT Benchmarks are subject to change. Table 4 contains the ACT Benchmarks as of fall 2017.

the ACT College Readiness Benchmarks. All ACT Benchmarks, as of fall 2017, are listed in Table 4.

Conclusion

Many students are entering college unprepared for the rigorous demands of college-level coursework as evidenced by a significant percentage of incoming college students needing to take remedial coursework. Based on actual course transcripts, it has been estimated that 39% of students who initially enrolled at four-year public institutions and 68% who initially enrolled at two-year public institutions take at least one remedial course (Radford and Horn 2012). Because remedial courses are often not credit-bearing, they can delay students' degree completion and increase the cost of their education (e.g., Attewell, Lavin, Domina, and Levey 2006). Moreover, the importance of students being academically prepared and performing well during their first year of college and how this contributes to students' likelihood of persisting and completing a degree has been well documented (e.g., Allen and Robbins 2010).

To provide students with information about their readiness for first-year college courses at a typical college, the ACT College Readiness Benchmarks were developed. Having been informed by empirical data, the ACT Benchmarks provide actionable information, linking content-area knowledge and skills to expectations of success in corresponding college courses. They are anchored to a tangible criterion—a 50% chance of earning a B or higher grade in credit-bearing courses—and as such are useful indicators of readiness. The Benchmarks from earlier grades can be used to help identify at-risk students early on while there is still time for them to develop the knowledge and skills needed to get back

on track before they graduate from high school. ■

Notes

1. The ACT STEM score is the rounded average of the ACT mathematics and science scale scores.

2. The ACT ELA score is the rounded average of the ACT English, reading, and writing scale scores.

3. The ACT STEM Benchmark was derived using STEM-related courses typically taken at four-year institutions. Therefore, for this Benchmark the data were weighted to be representative of four-year colleges nationwide.

4. Based on data from an ACT published study (Radunzel and Noble 2012b).

5. The correspondence of ACT Aspire Interim and Summative scores is based on equipercentile concordance.

6. PreACT College Readiness Indicators assume that students will take the ACT test 12-18 months after taking the PreACT test in grade 10.

7. ACT Aspire ELA scores are not vertically-scaled, and the Benchmarks do not increase from grade 6 to grade 7.

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