

**COLLEGE  
READINESS**

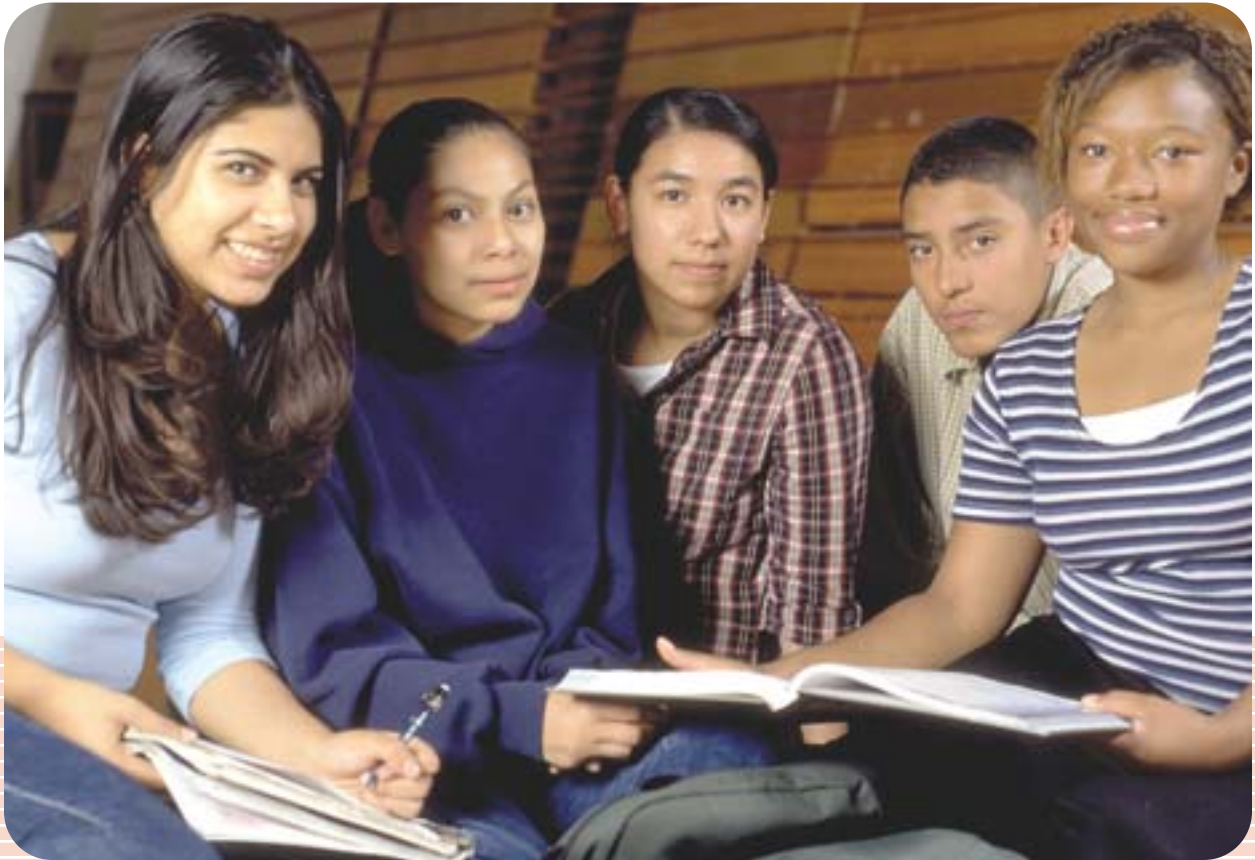


# Ready to Succeed

All Students Prepared  
for College and Work



**ACT**<sup>®</sup>



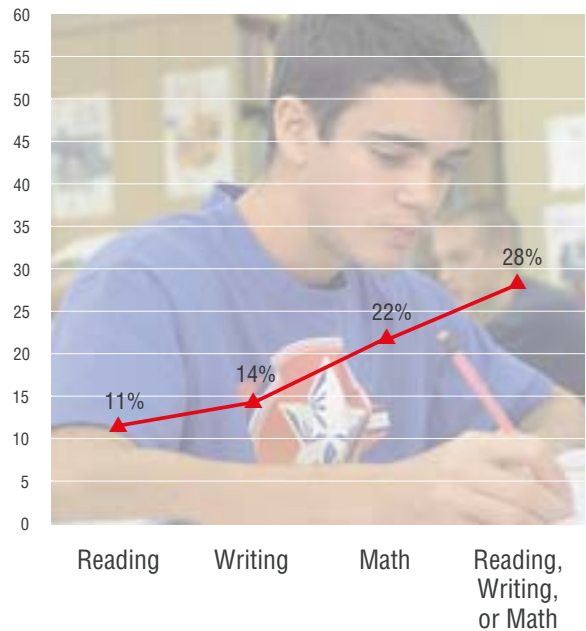
## Ticket to the Future

Our nation's social and economic future depends on our ability to increase the percentage of students who leave high school ready for college and work. The workplace is changing and demanding a higher level of skills than ever before. Though more and more of our young adults realize the importance of higher education and aspire to continue their education after high school, many of them are not prepared to do so.

Nearly 75 percent of U.S. high school graduates enroll in college within two years of graduation,<sup>1</sup> yet only 56 percent of 2005 high school graduates who took the ACT® test took a core preparatory curriculum in high school.<sup>2</sup> And even among those who report taking a core high school curriculum—four or more years of English and three or more years each of math, social sciences, and natural sciences—a significant number are still not prepared to succeed in credit-bearing first-year courses. Not only is taking the right *number* of courses important, the right *kind* of courses, and the rigor of these courses, is critical to student readiness for college-level work.

Nearly one-third of students entering some type of postsecondary education need to take remedial courses in one or more subjects because they lack the skills to take standard credit-bearing courses.<sup>3</sup> This figure balloons to 43 percent for students entering predominantly minority colleges. Research has also shown that students who required extensive remediation graduated from college at significantly lower rates.<sup>4</sup> More than one-quarter of first-year students at four-year colleges and close to half of those in community colleges do not return for a second year.<sup>5</sup> These students end up unprepared for the future, especially for the lifelong learning required for high performance, high-wage jobs. Addressing this readiness crisis has become a national priority, as evidenced by the passage of the No Child Left Behind legislation.

**Percentages of Students Taking One or More Remedial Courses**



*Every student should leave high school with a ticket to the future.*

<sup>1</sup> NCES. *Condition of Education*. Washington, D.C.: US Department of Education, 1997.

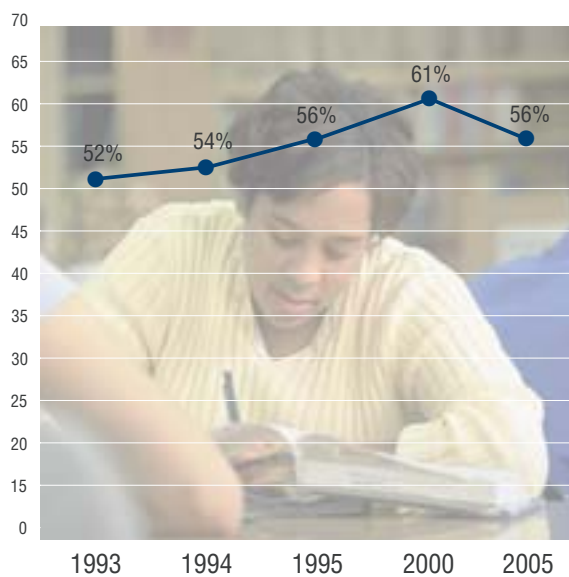
<sup>2</sup> ACT. *ACT National Data Release*. Iowa City, IA 2005.

<sup>3</sup> National Center for Education Statistics. *The Condition of Education 2004*. Retrieved on March 6, 2006, from <http://nces.ed.gov/programs/coe/2004/section5/indicator31.asp>

<sup>4</sup> National Center for Education Statistics. *The Condition of Education 2004*. Retrieved on March 6, 2006, from <http://nces.ed.gov/programs/coe/2004/section3/indicator18.asp>

<sup>5</sup> Cambiano, R., Denny, G., Devore, J. College Student Retention at a Midwestern University: A Six-Year Study. *Journal of College Admission*, No. 166, Winter 2000.

## Percentage of ACT-tested Graduates Reporting Taking Core Curriculum



*Even though the number of college-bound students taking a college-preparatory program has increased nearly 4 percent in the last 12 years, over 40 percent of today's college-bound students are still not taking the right courses in high school.*

ACT research confirms the results and benefits of a rigorous core preparatory curriculum for all students, whether they plan to go on to college or to work after high school. Students enrolled in such a curriculum earn higher scores on the ACT, are better prepared to enter the workplace and/or credit-bearing college courses, show increased persistence in postsecondary education, and have significantly greater chances of earning college degrees and succeeding in the workplace.

### **We are convinced that college readiness for all students is an achievable national goal.**

“In the business world, there is little doubt that the skills needed for success in work and in college are now converging.”<sup>6</sup> We are preparing a nation of citizens, and they all need to have the opportunity to be educated to a standard that prepares them to succeed in college and in the workplace.

A central goal of American public high schools must be to prepare all young people to standards of readiness for both postsecondary education and workforce training, standards that our research shows are comparable.

We conducted a statistical concordance between the respective college and workforce training readiness levels in reading and mathematics from both the ACT test and the ACT WorkKeys<sup>®</sup> program and found that the levels of readiness in reading and mathematics are comparable. It is reasonable to conclude from this

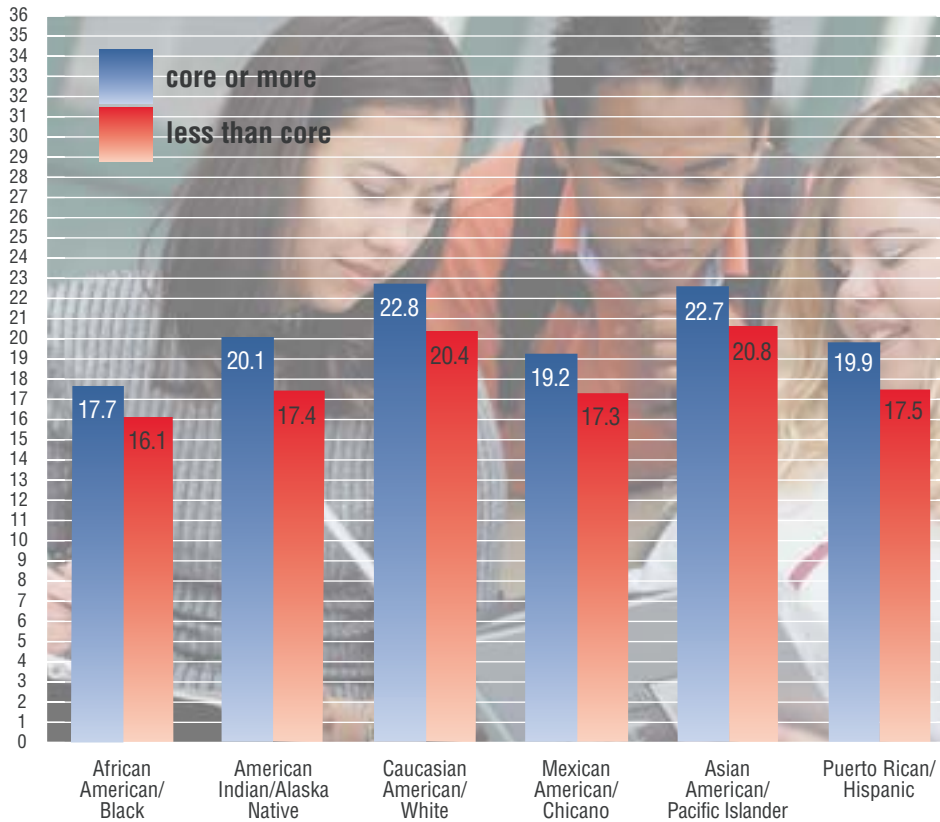
that the expectations of students who choose to enter workforce training programs for jobs that are likely to offer both a wage that is sufficient to support a family of four and potential career advancement should be no different from the expectations of students who choose to enter college after high school graduation.<sup>7</sup>

Even if not all high school graduates go on to college or workforce training, every student should be prepared to pursue that option with a reasonable chance of success. No student's choices should be restricted because of lack of readiness. Every student should leave high school with a ticket to the future.

<sup>6</sup> A New Core Curriculum for All, *Thinking K-16*, Vol. 7, Issue 1, The Education Trust. Winter 2003.

<sup>7</sup> ACT, Inc. *Ready for College and Ready for Work: Same or Different?* Iowa City, IA: Author.

## Average ACT Composite Scores of 2005 ACT-tested Students by Race/Ethnicity and Core vs. Less Than Core Curriculum



*Regardless of ethnicity or gender, students who take a core curriculum in high school attain higher scores on the ACT than those who do not, and are better prepared to succeed after high school.*

## College Readiness—A New Vision

The readiness crisis can be solved. We can help all students prepare for the future if we start early, helping students set goals for what they want to do after high school and clearly communicating what they must know and be able to do to achieve their goals. We must encourage students to take rigorous high school courses, monitor their academic progress, make timely interventions, and communicate early and often how well they are progressing toward their goals.

Preparing students for college and careers doesn't occur at a single point in time. Instead, readiness is a process that needs to occur over a number of years—a process that must be well under way by the middle school years, if not earlier. For every student to be prepared for the future, students, parents, teachers, and administrators must:

- Begin planning high school courses in middle school
- Systematically monitor student progress in those courses
- Make timely interventions when students fall behind
- Measure student progress regularly to ensure each student will meet or exceed college readiness standards

## College Readiness Standards Are Needed

The curriculum in the majority of school systems across the nation is driven by state standards. But many of today's state standards do not reflect the skills necessary for college, particularly higher-order problem-solving skills. Before the goal of every high school graduate being prepared for college-level work can be realized, we must connect college expectations to the high school curriculum. And we must place primary emphasis in high school classrooms on the knowledge and skills required to succeed at the postsecondary level.

Existing standards in many states are not rigorous enough to ensure that students will be ready for either credit-bearing college-level work or workforce training programs. Based on comparisons completed so far of standards in 39 states to the ACT College Readiness Standards™, which describe what students need to know and be able to do to be ready for college, we have identified some striking disparities between state standards and college readiness standards.

### State Standards Fall Short of College Readiness Standards

Comparisons of state standards to the ACT College Readiness Standards reveal gaps in state standards of higher-level, more sophisticated knowledge and skills required in postsecondary education and in workforce training programs. Some specific examples of college readiness standards that often are missing from state standards are:

#### English

- Use a colon to introduce an example as an elaboration
- Add a phrase or sentence to accomplish a complex purpose, often expressed in terms of the main focus of an essay

#### Mathematics

- Evaluate composite functions at integer values
- Apply basic trigonometric ratios to solve right-triangle problems
- Demonstrate knowledge of unit circle trigonometry
- Demonstrate knowledge of the complex numbers
- Apply properties of complex numbers

#### Reading

- Summarize events and ideas in virtually any passage
- Determine the appropriate meanings of words, phrases, or statements from figurative and/or technical contexts
- Make comparisons, conclusions, and generalizations that reveal a feeling for the subtleties in relationships between people and ideas in virtually any passage
- Identify implied, subtle, or complex cause-effect relationships

#### Science

- Compare or combine data from two complex data sets
- Combine new, complex information (data or text) with given information
- Understand precision and accuracy concepts
- Predict how modifying an experiment will affect results
- Select a set of data or a viewpoint that supports or contradicts a hypothesis, prediction, or conclusion

To properly prepare students for college, secondary and postsecondary educators must have a common understanding about what students need to know and be able to do to succeed in college-level work and the workplace.

**A national college and work readiness standard must be established.**

## College Readiness Standards—A Definition

What does it mean to be ready for college? Certainly, we want all students to be ready to make a successful transition to college or the workplace without the need for remediation. Our research has documented levels of proficiency on the EXPLORE®, PLAN®, and ACT score scales that are associated with success in college—defined as a 50/50 chance of earning a course grade of B or better or a 75 percent chance of earning a C or better—in typical entry-level college courses. Based on years of course placement research with postsecondary institutions, we have identified four College Readiness Benchmarks that represent the level of knowledge and skills students need to acquire to be prepared for most credit-bearing college-entry courses in English composition, algebra, social sciences, and biology. These benchmarks also reflect the level of proficiency needed for entry-level work-readiness programs that require at least a high school diploma.



Because the ACT College Readiness Benchmarks were derived from a variety of institutions in numerous districts, colleges, and states nationwide, they represent a *typical* set of expectations. These benchmarks may vary among individual districts, colleges, and states.

### ACT Readiness Benchmarks for Entry-level College Courses

College Course	EXPLORE College Readiness Benchmarks	PLAN College Readiness Benchmarks	ACT College Readiness Benchmarks
English Composition	EXPLORE English 13	PLAN English 15	ACT English 18
Algebra	EXPLORE Math 17	PLAN Math 19	ACT Math 22
Social Sciences	EXPLORE Reading 15	PLAN Reading 17	ACT Reading 21
Biology	EXPLORE Science 20	PLAN Science 21	ACT Science 24

These benchmarks can be directly translated into the ACT College Readiness Standards, which describe the knowledge and skills associated with the scores on our longitudinal assessment system consisting of EXPLORE, PLAN, and the ACT. The Standards describe in detail the level of knowledge and skills students need to have to be ready for credit-bearing college-entry classes.

The Standards associated with each of the College Readiness Benchmarks are shown on pages 8 through 14. For more information on the ACT College Readiness Standards, visit [www.act.org/standard/index.html](http://www.act.org/standard/index.html).



For example, what students need to know and be able to do to be ready for a typical college English composition course is described on pages 8–9 by the College Readiness Standards in English, through and including the score range 16–19.

The College Readiness Standards in Math (pp.10-11), through and including the 20–23 score range, describe specific skills and knowledge needed in typical college algebra courses offered by postsecondary institutions across the nation. The College Readiness Standards in Reading (pp.12-13), through and including the 20-23 score range, describe specific skills and knowledge needed in typical college social science courses. Likewise, the College Readiness Standards in Science (p.14), through and including the 24–27 score range, describe specific skills and knowledge needed in college biology courses. By using these standards to define college readiness, colleges, high schools, parents, and students can speak a common language.

*Education and business need a common language to define what students need to know to be ready to go to college or work.*

The ACT College Readiness Benchmarks and their descriptive standards can be used by secondary and postsecondary educators to define what students need to know and be able to do to be ready to enter college or a career. The benchmarks can be used by states to define expectations for *all* students, regardless of whether they are going on to postsecondary education or workforce training programs after high school. These benchmarks also can be used by colleges to communicate the expectations they have of their entering students. The readiness benchmarks can be used by secondary educators to evaluate their curricular alignment and course content to ensure their high school courses are emphasizing the type and sequence of rigorous skills students need to have learned by the time they graduate from high school.

**Clearer articulation of these expectations is sorely needed.**



## Action Plan

Every student should be prepared to a standard of readiness for postsecondary education and work. It will take a coordinated effort by both secondary and postsecondary educators, but the College Readiness Benchmarks and the College Readiness Standards offer a common language that defines the rigorous knowledge and skills students need to learn in their high school courses. We consider the following action steps vital to achieving the college readiness goal:

- **Create a Common Focus.** Establish collaborative partnerships between secondary and postsecondary educators to come to a shared understanding of what students need to know for college and workplace readiness. Use the College Readiness Standards and the ACT as a common language to define readiness.
- **Establish High Expectations.** Identify and communicate the need for students to meet College Readiness Benchmarks so that all high school graduates are prepared for the workplace and college-entry courses without remediation.
- **Require a Rigorous Curriculum.** Review and evaluate the rigor and alignment of instruction in English, mathematics, science, and social studies to ensure that the foundational skills leading to readiness for college-level work are taught, reaffirmed, and articulated across high school courses. Increase core course requirements to ensure that all students take a rigorous core preparatory program.
- **Provide Student Guidance.** Engage students in early college and career awareness; help them to set high aspirations; and ensure they plan a rigorous high school core coursework program that consists minimally of four years of English and three years each of math, social science, and natural science, all of which are important for post-high school success.
- **Measure and Evaluate Progress.** Monitor and measure student progress early and often using college readiness assessments. Student achievement in meeting college readiness standards should begin—at the latest—in the eighth grade and continue throughout high school. Make timely interventions with those students who are not making adequate progress in meeting college readiness standards.



ACT can help schools, teachers, and students achieve the goal of all students prepared for college and work. Positive results have already been achieved by schools and districts across the country. Our nation reveres the idea of equal access and opportunity. Yet equal access and opportunity for all students will not exist until we are able to prepare each and every one for college and work. If all of our students are to leave high school with a ticket to the future, we need to start now. Please contact us for assistance.

## Standards Reflected in the College Readiness Benchmark in English

College English Composition Course (ACT English Test Score=18)			
English	<i>Topic Development in Terms of Purpose and Focus</i>	<i>Organization, Unity, and Coherence</i>	<i>Word Choice in Terms of Style, Tone, Clarity, and Economy</i>
<b>College Readiness Standards</b> Score Range 16–19	<ul style="list-style-type: none"> <li>■ Identify the basic purpose or role of a specified phrase or sentence</li> <li>■ Delete a clause or sentence because it is obviously irrelevant to the essay</li> </ul>	<ul style="list-style-type: none"> <li>■ Select the most logical place to add a sentence in a paragraph</li> </ul>	<ul style="list-style-type: none"> <li>■ Delete obviously synonymous and wordy material in a sentence</li> <li>■ Revise expressions that deviate from the style of an essay</li> </ul>
<b>College Readiness Standards</b> Score Range 13–15		<ul style="list-style-type: none"> <li>■ Use conjunctive adverbs or phrases to show time relationships in simple narrative essays (e.g., <i>then, this time</i>)</li> </ul>	<ul style="list-style-type: none"> <li>■ Revise sentences to correct awkward and confusing arrangements of sentence elements</li> <li>■ Revise vague nouns and pronouns that create obvious logic problems</li> </ul>
<b>College Readiness Standards</b> Score Range 1–12	<ul style="list-style-type: none"> <li>■ Students who score in the 1–12 range are most likely beginning to develop the knowledge and skills assessed in the other score ranges.</li> </ul>		

<b><i>Sentence Structure and Formation</i></b>	<b><i>Conventions of Usage</i></b>	<b><i>Conventions of Punctuation</i></b>
<ul style="list-style-type: none"> <li>■ Determine the need for punctuation and conjunctions to avoid awkward-sounding sentence fragments and fused sentences</li> <li>■ Decide the appropriate verb tense and voice by considering the meaning of the entire sentence</li> </ul>	<ul style="list-style-type: none"> <li>■ Solve such grammatical problems as whether to use an adverb or adjective form, how to ensure straightforward subject-verb and pronoun-antecedent agreement, and which preposition to use in simple contexts</li> <li>■ Recognize and use the appropriate word in frequently confused pairs such as <i>there</i> and <i>their</i>, <i>past</i> and <i>passed</i>, and <i>led</i> and <i>lead</i></li> </ul>	<ul style="list-style-type: none"> <li>■ Provide appropriate punctuation in straightforward situations (e.g., items in a series)</li> <li>■ Delete commas that disturb the sentence flow (e.g., between modifier and modified element)</li> </ul>
<ul style="list-style-type: none"> <li>■ Use conjunctions or punctuation to join simple clauses</li> <li>■ Revise shifts in verb tense between simple clauses in a sentence or between simple adjoining sentences</li> </ul>	<ul style="list-style-type: none"> <li>■ Solve such basic grammatical problems as how to form the past and past participle of irregular but commonly used verbs and how to form comparative and superlative adjectives</li> </ul>	<ul style="list-style-type: none"> <li>■ Delete commas that create basic sense problems (e.g., between verb and direct object)</li> </ul>
<ul style="list-style-type: none"> <li>■ Students who score in the 1–12 range are most likely beginning to develop the knowledge and skills assessed in the other score ranges.</li> </ul>		

## Standards Reflected in the College Readiness Benchmark in Mathematics

College Algebra Course (ACT Mathematics Test Score=22)			
Math	Basic Operations & Applications	Probability, Statistics, & Data Analysis	Numbers: Concepts & Properties
<b>College Readiness Standards</b> Score Range 20–23	<ul style="list-style-type: none"> <li>Solve routine two-step or three-step arithmetic problems involving concepts such as rate and proportion, tax added, percentage off, and computing with a given average</li> </ul>	<ul style="list-style-type: none"> <li>Calculate the missing data value, given the average and all data values but one</li> <li>Translate from one representation of data to another (e.g., a bar graph to a circle graph)</li> <li>Determine the probability of a simple event</li> <li>Exhibit knowledge of simple counting techniques</li> </ul>	<ul style="list-style-type: none"> <li>Exhibit knowledge of elementary number concepts including rounding, the ordering of decimals, pattern identification, absolute value, primes, and greatest common factor</li> </ul>
<b>College Readiness Standards</b> Score Range 16–19	<ul style="list-style-type: none"> <li>Solve routine one-step arithmetic problems (using whole numbers, fractions, and decimals) such as single-step percent</li> <li>Solve some routine two-step arithmetic problems</li> </ul>	<ul style="list-style-type: none"> <li>Calculate the average of a list of numbers</li> <li>Calculate the average, given the number of data values and the sum of the data values</li> <li>Read tables and graphs</li> <li>Perform computations on data from tables and graphs</li> <li>Use the relationship between the probability of an event and the probability of its complement</li> </ul>	<ul style="list-style-type: none"> <li>Recognize one-digit factors of a number</li> <li>Identify a digit's place value</li> </ul>
<b>College Readiness Standards</b> Score Range 13–15	<ul style="list-style-type: none"> <li>Perform one-operation computation with whole numbers and decimals</li> <li>Solve problems in one or two steps using whole numbers</li> <li>Perform common conversions (e.g., inches to feet or hours to minutes)</li> </ul>	<ul style="list-style-type: none"> <li>Calculate the average of a list of positive whole numbers</li> <li>Perform a single computation using information from a table or chart</li> </ul>	<ul style="list-style-type: none"> <li>Recognize equivalent fractions and fractions in lowest terms</li> </ul>
<b>College Readiness Standards</b> Score Range 1–12	<ul style="list-style-type: none"> <li>Students who score in the 1–12 range are most likely beginning to develop the knowledge and skills assessed in the other score ranges.</li> </ul>		

<b>Expressions, Equations, &amp; Inequalities</b>	<b>Graphical Representations</b>	<b>Properties of Plane Figures</b>	<b>Measurement</b>	<b>Functions</b>
<ul style="list-style-type: none"> <li>■ Evaluate algebraic expressions by substituting integers for unknown quantities</li> <li>■ Add and subtract simple algebraic expressions</li> <li>■ Solve routine first-degree equations</li> <li>■ Perform straightforward word-to-symbol translations</li> <li>■ Multiply two binomials</li> </ul>	<ul style="list-style-type: none"> <li>■ Locate points in the coordinate plane</li> <li>■ Comprehend the concept of length on the number line</li> <li>■ Exhibit knowledge of slope</li> </ul>	<ul style="list-style-type: none"> <li>■ Find the measure of an angle using properties of parallel lines</li> <li>■ Exhibit knowledge of basic angle properties and special sums of angle measures (e.g., 90°, 180°, and 360°)</li> </ul>	<ul style="list-style-type: none"> <li>■ Compute the area and perimeter of triangles and rectangles in simple problems</li> <li>■ Use geometric formulas when all necessary information is given</li> </ul>	<ul style="list-style-type: none"> <li>■ Evaluate quadratic functions, expressed in function notation, at integer values</li> </ul>
<ul style="list-style-type: none"> <li>■ Substitute whole numbers for unknown quantities to evaluate expressions</li> <li>■ Solve one-step equations having integer or decimal answers</li> <li>■ Combine like terms (e.g., <math>2x + 5x</math>)</li> </ul>	<ul style="list-style-type: none"> <li>■ Locate points on the number line and in the first quadrant</li> </ul>	<ul style="list-style-type: none"> <li>■ Exhibit some knowledge of the angles associated with parallel lines</li> </ul>	<ul style="list-style-type: none"> <li>■ Compute the perimeter of polygons when all side lengths are given</li> <li>■ Compute the area of rectangles when whole number dimensions are given</li> </ul>	
<ul style="list-style-type: none"> <li>■ Exhibit knowledge of basic expressions (e.g., identify an expression for a total as <math>b + g</math>)</li> <li>■ Solve equations in the form <math>x + a = b</math>, where <math>a</math> and <math>b</math> are whole numbers or decimals</li> </ul>	<ul style="list-style-type: none"> <li>■ Identify the location of a point with a positive coordinate on the number line</li> </ul>		<ul style="list-style-type: none"> <li>■ Estimate or calculate the length of a line segment based on other lengths given on a geometric figure</li> </ul>	
<ul style="list-style-type: none"> <li>■ Students who score in the 1–12 range are most likely beginning to develop the knowledge and skills assessed in the other score ranges.</li> </ul>				

## Standards Reflected in the College Readiness Benchmark in Reading

College Social Sciences Course (ACT Reading Test Score=21)		
Reading	Main Ideas and Author's Approach	Supporting Details
<b>College Readiness Standards</b> Score Range 20–23	<ul style="list-style-type: none"> <li>■ Infer the main idea or purpose of straightforward paragraphs in uncomplicated literary narratives</li> <li>■ Understand the overall approach taken by an author or narrator (e.g., point of view, kinds of evidence used) in uncomplicated passages</li> </ul>	<ul style="list-style-type: none"> <li>■ Locate important details in uncomplicated passages</li> <li>■ Make simple inferences about how details are used in passages</li> </ul>
<b>College Readiness Standards</b> Score Range 16–19	<ul style="list-style-type: none"> <li>■ Identify a clear main idea or purpose of straightforward paragraphs in uncomplicated literary narratives</li> </ul>	<ul style="list-style-type: none"> <li>■ Locate simple details at the sentence and paragraph level in uncomplicated passages</li> <li>■ Recognize a clear function of a part of an uncomplicated passage</li> </ul>
<b>College Readiness Standards</b> Score Range 13–15	<ul style="list-style-type: none"> <li>■ Recognize a clear intent of an author or narrator in uncomplicated literary narratives</li> </ul>	<ul style="list-style-type: none"> <li>■ Locate basic facts (e.g., names, dates, events) clearly stated in a passage</li> </ul>
<b>College Readiness Standards</b> Score Range 1–12	<ul style="list-style-type: none"> <li>■ Students who score in the 1–12 range are most likely beginning to develop the knowledge and skills assessed in the other score ranges.</li> </ul>	

<b><i>Sequential, Comparative, and Cause-Effect Relationships</i></b>	<b><i>Meanings of Words</i></b>	<b><i>Generalizations and Conclusions</i></b>
<ul style="list-style-type: none"> <li>■ Order simple sequences of events in uncomplicated literary narratives</li> <li>■ Identify clear relationships between people, ideas, and so on in uncomplicated passages</li> <li>■ Identify clear cause-effect relationships in uncomplicated passages</li> </ul>	<ul style="list-style-type: none"> <li>■ Use context to determine the appropriate meaning of some figurative and nonfigurative words, phrases, and statements in uncomplicated passages</li> </ul>	<ul style="list-style-type: none"> <li>■ Draw generalizations and conclusions about people, ideas, and so on in uncomplicated passages</li> <li>■ Draw simple generalizations and conclusions using details that support the main points of more challenging passages</li> </ul>
<ul style="list-style-type: none"> <li>■ Identify relationships between main characters in uncomplicated literary narratives</li> <li>■ Recognize clear cause-effect relationships within a single paragraph in uncomplicated literary narratives</li> </ul>	<ul style="list-style-type: none"> <li>■ Use context to understand basic figurative language</li> </ul>	<ul style="list-style-type: none"> <li>■ Draw simple generalizations and conclusions about people, ideas, and so on in uncomplicated passages</li> </ul>
<ul style="list-style-type: none"> <li>■ Determine when (e.g., first, last, before, after) or if an event occurred in uncomplicated passages</li> <li>■ Recognize clear cause-effect relationships described within a single sentence in a passage</li> </ul>	<ul style="list-style-type: none"> <li>■ Understand the implication of a familiar word or phrase and of simple descriptive language</li> </ul>	<ul style="list-style-type: none"> <li>■ Draw simple generalizations and conclusions about the main characters in uncomplicated literary narratives</li> </ul>
<ul style="list-style-type: none"> <li>■ Students who score in the 1–12 range are most likely beginning to develop the knowledge and skills assessed in the other score ranges.</li> </ul>		

## Standards Reflected in the College Readiness Benchmark in Science

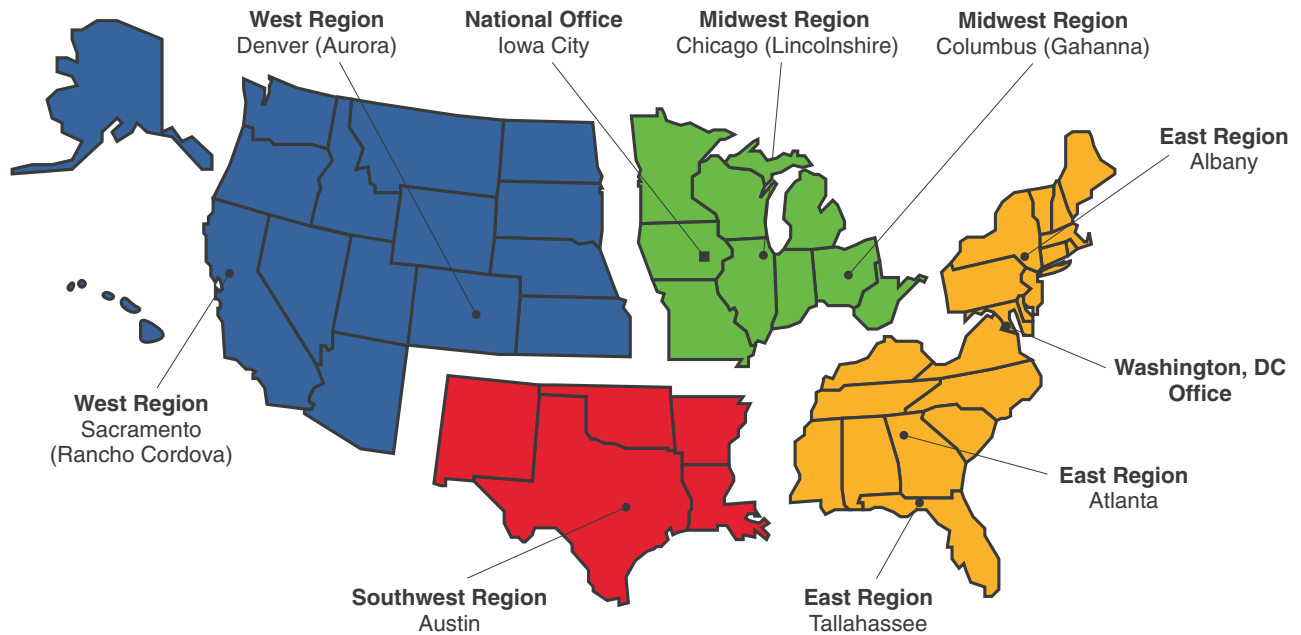
College Biology Course (ACT Science Test Score=24)			
Science	Interpretation of Data	Scientific Investigation	Evaluation of Models, Inferences, and Experimental Results
<b>College Readiness Standards</b> Score Range 24–27	<ul style="list-style-type: none"> <li>■ Compare or combine data from two or more simple data presentations (e.g., categorize data from a table using a scale from another table)</li> <li>■ Compare or combine data from a complex data presentation</li> <li>■ Interpolate between data points in a table or graph</li> <li>■ Determine how the value of one variable changes as the value of another variable changes in a complex data presentation</li> <li>■ Identify and/or use a simple (e.g., linear) mathematical relationship between data</li> <li>■ Analyze given information when presented with new, simple information</li> </ul>	<ul style="list-style-type: none"> <li>■ Understand the methods and tools used in a complex experiment</li> <li>■ Understand a complex experimental design</li> <li>■ Predict the results of an additional trial or measurement in an experiment</li> <li>■ Determine the experimental conditions that would produce specified results</li> </ul>	<ul style="list-style-type: none"> <li>■ Select a simple hypothesis, prediction, or conclusion that is supported by two or more data presentations or models</li> <li>■ Determine whether given information supports or contradicts a simple hypothesis or conclusion, and why</li> <li>■ Identify strengths and weaknesses in one or more models</li> <li>■ Identify similarities and differences between models</li> <li>■ Determine which model(s) is(are) supported or weakened by new information</li> <li>■ Select a data presentation or a model that supports or contradicts a hypothesis, prediction, or conclusion</li> </ul>
<b>College Readiness Standards</b> Score Range 20–23	<ul style="list-style-type: none"> <li>■ Select data from a complex data presentation (e.g., a table or graph with more than three variables; a phase diagram)</li> <li>■ Compare or combine data from a simple data presentation (e.g., order or sum data from a table)</li> <li>■ Translate information into a table, graph, or diagram</li> </ul>	<ul style="list-style-type: none"> <li>■ Understand the methods and tools used in a moderately complex experiment</li> <li>■ Understand a simple experimental design</li> <li>■ Identify a control in an experiment</li> <li>■ Identify similarities and differences between experiments</li> </ul>	<ul style="list-style-type: none"> <li>■ Select a simple hypothesis, prediction, or conclusion that is supported by a data presentation or a model</li> <li>■ Identify key issues or assumptions in a model</li> </ul>
<b>College Readiness Standards</b> Score Range 16–19	<ul style="list-style-type: none"> <li>■ Select two or more pieces of data from a simple data presentation</li> <li>■ Understand basic scientific terminology</li> <li>■ Find basic information in a brief body of text</li> <li>■ Determine how the value of one variable changes as the value of another variable changes in a simple data presentation</li> </ul>	<ul style="list-style-type: none"> <li>■ Understand the methods and tools used in a simple experiment</li> </ul>	
<b>College Readiness Standards</b> Score Range 13–15	<ul style="list-style-type: none"> <li>■ Select a single piece of data (numerical or nonnumerical) from a simple data presentation (e.g., a table or graph with two or three variables; a food web diagram)</li> <li>■ Identify basic features of a table, graph, or diagram (e.g., headings, units of measurement, axis labels)</li> </ul>		
<b>College Readiness Standards</b> Score Range 1–12	<ul style="list-style-type: none"> <li>■ Students who score in the 1–12 range are most likely beginning to develop the knowledge and skills assessed in the other score ranges.</li> </ul>		







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