

THE ACT

SAMPLE  
TEST QUESTIONS  
MATCHED TO  
ACT  
COLLEGE READINESS  
STANDARDS

**Contents**

This booklet provides a match between the College Readiness Standards and each test question from all four content areas of the Abbreviated Test Booklet for the ACT:

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ACT endorses the *Code of Fair Testing Practices in Education*, a statement of guidelines for those who develop, administer, and use educational tests and data. The *Code* sets forth criteria for fairness in four areas: developing and selecting appropriate tests, administering and scoring tests, reporting and interpreting test results, and informing test takers. ACT is committed to ensuring that each of its testing programs upholds the *Code's* standards for appropriate test development practice and use.

A copy of the full *Code* may be obtained free of charge from ACT Customer Services (68), P.O. Box 1008, Iowa City, IA 52243-1008, 319/337-1429.

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# Introduction

This booklet—called *Sample Test Questions Matched to ACT College Readiness Standards*—has been provided to show you how all of the questions in the ACT Abbreviated Test Booklet are matched to ACT’s College Readiness Standards.

The College Readiness Standards that you see on the left-hand side of each page of this booklet are numbered so that you can find them on the College Readiness Standards table provided. The test questions that appear on the right-hand side of the page can be found, with complete passages for English, Reading, and Science, in the ACT Abbreviated Test Booklet.

The College Readiness Standards communicate educational expectations. Each Standard describes what students who score in the designated range are *likely* to be able to do with what they know. The College Readiness Standards Information Services provide information for each testing program: EXPLORE®, PLAN®, and the ACT. Each basic Information Services report package includes:

- Five reports—one each for English, Mathematics, Reading, and Science, plus a summary profile
- Four content-specific guides, designed for teachers

- An administrator’s guide that includes test descriptions, score interpretation information, a curriculum review activity, and information about college readiness

Customized reports are also available and include separate reporting categories such as gender or ethnicity.

The College Readiness Standards Information Services report packages help answer questions like:

- How can instruction be modified to improve test results?
- What additional steps can be taken to increase learning?
- What are the gaps in your curriculum, if any?

To learn more about the College Readiness Standards Information Services, or to order a report packet, contact:

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**ACT English:**  
Match Between College Readiness Standards and Test Questions

ACT English College Readiness Standards	ACT Sample Test Question
<p><b>Word Choice in Terms of Style, Tone, Clarity, and Economy (WCH), 16–19</b></p> <p>301. Delete obviously synonymous and wordy material in a sentence</p>	<p><i>Sandra Cisneros, perhaps the best known Latina <u>author</u> in the United States, writes poems and stories . . .</i></p> <p>1.*A. NO CHANGE B. author and writer C. author and novelist D. wordsmith and author</p>
<p><b>Conventions of Punctuation (COP), 16–19</b></p> <p>302. Delete commas that disturb the sentence flow (e.g., between modifier and modified element)</p>	<p><i>. . . whose titles alone—“Barbie-Q,” “My Lucy Friend Who Smells Like Corn,” “Woman Hollering Creek”—engage <u>potential readers’</u> curiosity.</i></p> <p>2.*F. NO CHANGE G. potential, reader’s H. potential, readers J. potential readers</p>
<p><b>Topic Development in Terms of Purpose and Focus (TOD), 20–23</b></p> <p>402. Determine relevancy when presented with a variety of sentence-level details</p>	<p><i><u>Ironically, this renowned writer, whose books are printed on recycled paper, did not do well in school.</u></i></p> <p>3. A. NO CHANGE B. writer, who is recognized by her orange and black eyeglasses, C. writer, who likes to write at night, *D. writer</p>
<p><b>Sentence Structure and Formation (SST), 28–32</b></p> <p>601. Use sentence-combining techniques, effectively avoiding problematic comma splices, run-on sentences, and sentence fragments, especially in sentences containing compound subjects or verbs</p>	<p><i>When she lectures at schools and public libraries, Cisneros presents the <u>evidence</u>. An elementary school report card containing Cs, Ds, and a solitary B (for conduct).</i></p> <p>4. F. NO CHANGE *G. evidence: an H. evidence; an J. evidence an</p>
<p><b>Sentence Structure and Formation (SST), 20–23</b></p> <p>401. Recognize and correct marked disturbances of sentence flow and structure (e.g., participial phrase fragments, missing or incorrect relative pronouns, dangling or misplaced modifiers)</p>	<p><i>Her persistence paid off in her twenties, when Cisneros was admitted <u>prestigious</u> to the Writers’ Workshop at the University of Iowa.</i></p> <p>5. The best placement for the underlined portion would be: A. where it is now. B. before the word <i>admitted</i>. *C. before the word <i>Writers’</i>. D. before the word <i>Workshop</i>.</p>
<p><b>Organization, Unity, and Coherence (OUC), 24–27</b></p> <p>501. Determine the need for conjunctive adverbs or phrases to create subtle logical connections between sentences (e.g., <i>therefore, however, in addition</i>)</p>	<p><i>Cisneros <u>soon</u> observed that most of her classmates at the university seemed to have a common set of memories, based on middle-class childhoods, from which to draw in their writing.</i></p> <p>6.*F. NO CHANGE G. furthermore H. nevertheless J. therefore</p>
<p><b>Conventions of Punctuation (COP), 20–23</b></p> <p>402. Delete unnecessary commas when an incorrect reading of the sentence suggests a pause that should be punctuated (e.g., between verb and direct object clause)</p>	<p><i><u>Cisneros felt</u> decided out of place.</i></p> <p>7.*A. NO CHANGE B. Cisneros herself, C. Cisneros, herself D. Cisneros,</p>

ACT English College Readiness Standards	ACT Sample Test Question
<p><b>Conventions of Usage (COU), 16–19</b></p> <p>301. 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</p>	<p><i>Cisneros felt <u>decided</u> out of place.</i></p> <p>8. F. NO CHANGE G. deciding *H. decidedly J. decidedly and</p>
<p><b>Organization, Unity, and Coherence (OUC), 24–27</b></p> <p>503. Add a sentence to introduce or conclude the essay or to provide a transition between paragraphs when the essay is fairly straightforward</p>	<p>9. Which of the following true statements, if added here, would best serve as a transition between the challenges Cisneros faced as an aspiring writer and her success in meeting those challenges?</p> <p>A. She did not know what to do. *B. Then she had a breakthrough. C. At that point she almost went home to Chicago. D. She wondered whether she was in the right field.</p>
<p><b>Sentence Structure and Formation (SST), 20–23</b></p> <p>401. Recognize and correct marked disturbances of sentence flow and structure (e.g., participial phrase fragments, missing or incorrect relative pronouns, dangling or misplaced modifiers)</p>	<p><i>Her <u>voice, which by being one of a Latina living outside the mainstream, found a large and attentive audience . . .</u></i></p> <p>10. F. NO CHANGE *G. voice—that of a Latina living outside the mainstream— H. voice, being one of a Latina living outside the mainstream, it J. voice—in which it was a Latina living outside the mainstream—</p>
<p><b>Sentence Structure and Formation (SST), 28–32</b></p> <p>601. Use sentence-combining techniques, effectively avoiding problematic comma splices, run-on sentences, and sentence fragments, especially in sentences containing compound subjects or verbs</p>	<p><i>. . . found a large and attentive audience in <u>1984 with the publication of her first short story collection, The House on Mango Street.</u></i></p> <p>11.*A. NO CHANGE B. 1984. With C. 1984; with D. 1984, with,</p>
<p><b>Organization, Unity, and Coherence (OUC), 13–15</b></p> <p>201. Use conjunctive adverbs or phrases to show time relationships in simple narrative essays (e.g., <i>then, this time</i>)</p>	<p><i><u>Today, this book is read by middle school, high school, and college students across the United States.</u></i></p> <p>12.*F. NO CHANGE G. In the future, H. Meanwhile, J. At the same time,</p>
<p><b>Sentence Structure and Formation (SST), 24–27</b></p> <p>501. Revise to avoid faulty placement of phrases and faulty coordination and subordination of clauses in sentences with subtle structural problems</p>	<p><i><u>But having made the argument that, in order for large numbers of young Latinos to achieve literary success, the educational system itself must change.</u></i></p> <p>13. A. NO CHANGE *B. she argues that, C. arguing that, D. she argues that, when</p>

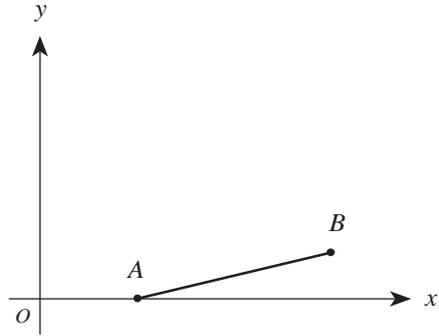


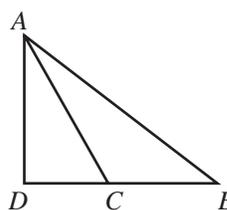
<b>ACT English College Readiness Standards</b>	<b>ACT Sample Test Question</b>
<p><b>Word Choice in Terms of Style, Tone, Clarity, and Economy (WCH), 24–27</b></p> <p>503. Use the word or phrase most appropriate in terms of the content of the sentence and tone of the essay</p>	<p><i>Cisneros <u>hints</u> that she succeeded in spite of the educational system. “I’m the exception,” she insists, “not the rule.”</i></p> <p>14. Which choice best shows that Cisneros is emphatic about expressing the belief stated in this sentence?</p> <p>F. NO CHANGE G. says H. supposes *J. asserts</p>
<p><b>Topic Development in Terms of Purpose and Focus (TOD), 28–32</b></p> <p>601. Apply an awareness of the focus and purpose of a fairly involved essay to determine the rhetorical effect and suitability of an existing phrase or sentence, or to determine the need to delete plausible but irrelevant material</p>	<p>15. The writer is considering deleting the preceding sentence. If the writer decided to delete this sentence, the paragraph would primarily lose a statement that:</p> <p>A. enhances the subject and the setting. *B. provides support for a point previously made. C. humorously digresses from the main topic of the paragraph. D. contradicts Cisneros’s claim made earlier in the essay.</p>

**ACT Mathematics:**  
Match Between College Readiness Standards and Test Questions

ACT Mathematics College Readiness Standards	ACT Sample Test Question												
<p><b>Basic Operations &amp; Applications (BOA), 13–15<sup>†</sup></b> 202. Solve problems in one or two steps using whole numbers</p>	<p>1. Ten boxes of books were delivered to the school library. There were 50 books in each box, except for the last box, which contained only 40 books. How many books did the library receive in this delivery?</p> <p>A. 50 B. 450 *C. 490 D. 500 E. 540</p>												
<p><b>Expressions, Equations, &amp; Inequalities (XEI), 13–15</b> 202. Solve equations in the form <math>x + a = b</math>, where <math>a</math> and <math>b</math> are whole numbers or decimals</p>	<p>2. What is the solution of <math>x + 3.4 = 20.91</math> ?</p> <p>F. 24.31 G. 23.95 H. 17.87 *J. 17.51 K. 6.15</p>												
<p><b>Probability, Statistics, &amp; Data Analysis (PSD), 16–19</b> 304. Perform computations on data from tables and graphs</p>	<p>3. Anton went to Mexico during summer vacation with his Spanish class. He recorded the number of pesos he spent each day in a table, as shown below. What was the mean number of pesos he spent per day?</p> <table border="1" data-bbox="943 919 1414 1014"> <tr> <td>July</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> <tr> <td>Pesos spent</td> <td>250</td> <td>100</td> <td>150</td> <td>100</td> <td>400</td> </tr> </table> <p>A. 100 B. 150 *C. 200 D. 220 E. 300</p>	July	1	2	3	4	5	Pesos spent	250	100	150	100	400
July	1	2	3	4	5								
Pesos spent	250	100	150	100	400								
<p><b>Expressions, Equations, &amp; Inequalities (XEI), 16–19</b> 301. Substitute whole numbers for unknown quantities to evaluate expressions</p>	<p>4. If <math>a = 10</math>, then which of the following represents 8,003 ?</p> <p>F. <math>8a + 3</math> G. <math>80a + 3</math> H. <math>8a^2 + 3</math> *J. <math>8a^3 + 3</math> K. <math>8a^4 + 3</math></p>												
<p><b>Probability, Statistics, &amp; Data Analysis (PSD), 20–23</b> 403. Determine the probability of a simple event</p>	<p>5. A bag contains 4 red jelly beans, 5 green jelly beans, and 3 white jelly beans. If a jelly bean is selected at random from the bag, what is the probability that the jelly bean selected is green?</p> <p>A. <math>\frac{1}{12}</math> B. <math>\frac{1}{5}</math> C. <math>\frac{5}{23}</math> *D. <math>\frac{5}{12}</math> E. <math>\frac{5}{7}</math></p>												

<sup>†</sup>The sample test question in the 13–15 range is an example of an item answered correctly by 80% of the PLAN examinees who obtained scores in this score range. A PLAN test question is given because it was not possible, using the 80% criterion, to identify an ACT sample test question for this score range.

ACT Mathematics College Readiness Standards	ACT Sample Test Question
<p><b>Expressions, Equations, &amp; Inequalities (XEI), 20–23</b> 404. Perform straightforward word-to-symbol translations</p>	<p>6. An earring manufacturing company has fixed costs of \$10,000 per month and production costs of \$0.60 for each pair of earrings it makes. If the company produces <math>x</math> pairs of earrings in a month, which of the following expressions represents the total of the company's monthly costs?</p> <p>F. <math>10,000x</math>  G. <math>10,000 + x</math>  H. <math>10,000x + 0.60</math>  *J. <math>10,000 + 0.60x</math>  K. <math>(10,000 + 0.60)x</math></p>
<p><b>Expressions, Equations, &amp; Inequalities (XEI), 20–23</b> 403. Solve routine first-degree equations</p>	<p>7. For what value of <math>a</math> is <math>x = 3</math> a solution to the equation <math>x + 3 = ax + 9</math>?</p> <p>A. 1.5  B. 1  *C. -1  D. -1.5  E. -3</p>
<p><b>Graphical Representations (GRE), 20–23</b> 401. Locate points in the coordinate plane</p>	<p>8. Quadrilateral <math>ABCD</math> has vertices <math>(-2,-1)</math>, <math>(4,-3)</math>, <math>(5,2)</math>, and <math>(-1,3)</math> in the standard <math>(x,y)</math> coordinate plane. Suppose <math>ABCD</math> is translated 2 units to the left and 1 unit down, forming quadrilateral <math>A'B'C'D'</math>. Which of the following shows the coordinates of the vertices of <math>A'B'C'D'</math>?</p> <p>*F. <math>(-4,-2)</math>, <math>(2,-4)</math>, <math>(3,1)</math>, <math>(-3,2)</math>  G. <math>(-3,-3)</math>, <math>(3,-5)</math>, <math>(4,0)</math>, <math>(-2,1)</math>  H. <math>(-2,-2)</math>, <math>(4,-4)</math>, <math>(5,1)</math>, <math>(-1,2)</math>  J. <math>(0,0)</math>, <math>(6,-2)</math>, <math>(7,3)</math>, <math>(1,4)</math>  K. <math>(4,2)</math>, <math>(-8,6)</math>, <math>(-10,-4)</math>, <math>(2,-6)</math></p>
<p><b>Graphical Representations (GRE), 24–27</b> 502. Determine the slope of a line from points or equations</p>	<p>9. The scales on both axes of the standard <math>(x,y)</math> coordinate plane below are the same. Of the following, which is the best estimate for the slope of <math>\overline{AB}</math>?</p>  <p>A. 4  B. <math>\frac{3}{4}</math>  *C. <math>\frac{1}{4}</math>  D. <math>-\frac{1}{4}</math>  E. -4</p>

ACT Mathematics College Readiness Standards	ACT Sample Test Question
<p><b>Basic Operations &amp; Applications (BOA), 24–27</b></p> <p>501. Solve multistep arithmetic problems that involve planning or converting units of measure (e.g., feet per second to miles per hour)</p>	<p>10. A truck sprang a leak at the bottom of its radiator, which held 480 ounces of fluid when it started to leak, and started losing radiator fluid at a constant rate of 4 ounces per minute. Suppose that the radiator continued to leak at this constant rate and that the truck, traveling at 35 miles per hour, could continue traveling at this rate until its radiator was completely empty. In how many <i>miles</i> would the radiator be empty?</p> <p>F. 13.7 G. 17.5 H. 35.0 *J. 70.0 K. 120.0</p>
<p><b>Numbers: Concepts &amp; Properties (NCP), 24–27</b></p> <p>506. Work problems involving positive integer exponents</p>	<p>11. For <math>y \neq 0</math>, <math>\frac{y^8}{y^2}</math> is equivalent to:</p> <p>A. 1 B. 4 C. <math>y^3</math> D. <math>y^4</math> *E. <math>y^6</math></p>
<p><b>Properties of Plane Figures (PPF), 24–27</b></p> <p>501. Use several angle properties to find an unknown angle measure</p>	<p>12. In <math>\triangle ABD</math> below, points <math>D</math>, <math>C</math>, and <math>B</math> are collinear, <math>\overline{AD}</math> is perpendicular to <math>\overline{DB}</math>, and <math>\overline{AC}</math> bisects <math>\angle DAB</math>. If the measure of <math>\angle CBA</math> is <math>40^\circ</math>, what is the measure of <math>\angle ACB</math>?</p>  <p>*F. <math>115^\circ</math> G. <math>112.5^\circ</math> H. <math>110^\circ</math> J. <math>107.5^\circ</math> K. <math>105^\circ</math></p>
<p><b>Measurement (MEA), 24–27</b></p> <p>501. Compute the area of triangles and rectangles when one or more additional simple steps are required</p>	<p>13. You have enough material to build a fence 40 meters long. If you use it all to enclose a square region, how many square meters will you enclose?</p> <p>A. 160 *B. 100 C. 80 D. 40 E. 20</p>

**ACT Mathematics  
College Readiness Standards**

**ACT  
Sample Test Question**

**Numbers: Concepts & Properties (NCP), 28–32**

**602.** Apply number properties involving even/odd numbers and factors/multiples

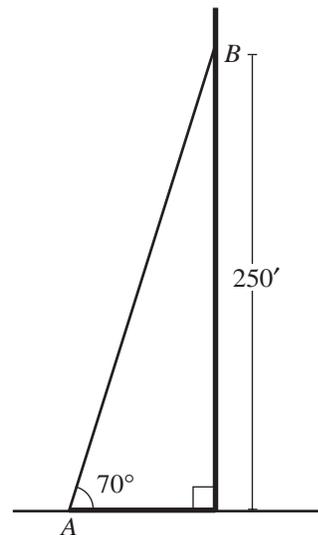
**14.** One neon sign flashes every 6 seconds. Another neon sign flashes every 8 seconds. If they flash together and you begin counting seconds, how many seconds after they flash together will they next flash together?

- F. 48
- \*G. 24
- H. 14
- J. 7
- K. 2

**Functions (FUN), 33–36**

**702.** Use trigonometric concepts and basic identities to solve problems

**15.** The radio station WEST is erecting a new transmitting tower that is 280 feet tall. A support wire will be attached to the ground at point  $A$  and to the tower 250 feet up at point  $B$ , as shown below. The wire must be at least as long as  $\overline{AB}$ . Which of the following expresses the length of  $\overline{AB}$ , in feet?



- A.  $250 \cos 70^\circ$
- B.  $250 \sin 70^\circ$
- C.  $250 \tan 70^\circ$
- D.  $\frac{250}{\cos 70^\circ}$
- \*E.  $\frac{250}{\sin 70^\circ}$

**ACT Reading:**  
Match Between College Readiness Standards and Test Questions

ACT Reading College Readiness Standards	ACT Sample Test Question
<p><b>Meanings of Words (MOW), 13–15</b></p> <p>201. Understand the implication of a familiar word or phrase and of simple descriptive language</p>	<p>1. As it is used in line 12, the word <i>incarnation</i> most nearly means:</p> <p>A. import. *B. version. C. area. D. relationship.</p>
<p><b>Main Ideas and Author’s Approach (MID), 28–32</b></p> <p>601. Infer the main idea or purpose of more challenging passages or their paragraphs</p> <p>602. Summarize events and ideas in virtually any passage</p>	<p>2. The author’s primary aim in this passage is to:</p> <p>F. criticize Canadian and United States management of public domain lands. *G. describe traditional commons and explain the effects of their disappearance. H. praise the commons movement and explain how the enclosure movement benefitted from it. J. persuade members of central governments to tighten their control over commonly held land.</p>
<p><b>Sequential, Comparative, and Cause-Effect Relationships (REL), 28–32</b></p> <p>603. Understand implied or subtly stated cause-effect relationships in more challenging passages</p>	<p>3. During the period of enclosure in England, production and efficiency were increased at the expense of the:</p> <p>A. landlord class, which had to fence commons land. *B. local communities and their environment. C. profits made by big wool corporations. D. knights and overlords who owned the land.</p>
<p><b>Main Ideas and Author’s Approach (MID), 24–27</b></p> <p>502. Infer the main idea or purpose of straightforward paragraphs in more challenging passages</p>	<p>4. According to the passage, what would keep a commoner from overgrazing the commons?</p> <p>F. A reminder that this could be harmful to the community G. A realization that profits would eventually diminish H. A belief that no one in the community would do this *J. A rule listing the limits to the commoner’s herd size</p>
<p><b>Sequential, Comparative, and Cause-Effect Relationships (REL), 28–32</b></p> <p>603. Understand implied or subtly stated cause-effect relationships in more challenging passages</p>	<p>5. The passage implies that the number of commons in Europe diminished primarily because of:</p> <p>A. dissatisfaction on the part of villagers. B. displacement of the population of rural homeless. C. increased production by farmers, villagers, and tribal members. *D. greed on the part of landowners and corporations.</p>
<p><b>Meanings of Words (MOW), 33–36</b></p> <p>701. Determine, even when the language is richly figurative and the vocabulary is difficult, the appropriate meaning of context-dependent words, phrases, or statements in virtually any passage</p>	<p>6. As it is used in line 5, the word <i>unadministered</i> most nearly means <i>not</i>:</p> <p>F. farmed. G. crossed. H. given to people. *J. governed.</p>

<p style="text-align: center;"><b>ACT Reading College Readiness Standards</b></p>	<p style="text-align: center;"><b>ACT Sample Test Question</b></p>
<p><b>Sequential, Comparative, and Cause-Effect Relationships (REL), 33–36</b></p> <p>703. Understand implied, subtle, or complex cause-effect relationships in virtually any passage</p>	<p>7. According to the passage, what happened to change the traditional commons?</p> <ul style="list-style-type: none"> <li>*A. Landowners fenced off portions of it which were then used for private purposes.</li> <li>B. The rural homeless population left the land and moved to the cities to take jobs in industry.</li> <li>C. Knights and overlords began to dictate that the commons would be used for farming.</li> <li>D. Peasants fenced the lands because they had been dislodged by big wool corporations.</li> </ul>
<p><b>Main Ideas and Author’s Approach (MID), 28–32</b></p> <p>602. Summarize events and ideas in virtually any passage</p>	<p>8. Which of the following statements best summarizes the author’s view of commons?</p> <ul style="list-style-type: none"> <li>F. The commons provided an ideal place where new settlers could build farms, raise their families, and run livestock.</li> <li>G. The commons worked well as an abstract idea, but in fact its maintenance was a burden on village economies.</li> <li>*H. The commons provided an area where wild plants and animals could thrive, which benefitted villagers.</li> <li>J. The commons tempted villagers to overgraze, and eventually such overgrazing led to the enclosure movement.</li> </ul>
<p><b>Sequential, Comparative, and Cause-Effect Relationships (REL), 28–32</b></p> <p>602. Understand the dynamics between people, ideas, and so on in more challenging passages</p>	<p>9. The main difference between today’s land in the public domain and the traditional commons described in the passage is that:</p> <ul style="list-style-type: none"> <li>A. land in the public domain is locally controlled, while the commons were controlled by a central government.</li> <li>B. land in the public domain includes both wild and semi-wild areas, while the commons included only land suitable for farming.</li> <li>*C. the commons were under the control of a local government, while land in the public domain is controlled by a central government.</li> <li>D. the commons were available for use without limits or controls, while land in the public domain is carefully managed to avoid overuse.</li> </ul>
<p><b>Supporting Details (SUP), 28–32</b></p> <p>601. Locate and interpret minor or subtly stated details in more challenging passages</p>	<p>10. According to the passage, the commons provided necessities for villagers that local farms could not provide, such as:</p> <ul style="list-style-type: none"> <li>F. cattle, horses, goats, pigs, and sheep.</li> <li>G. fish, game, poultry, and grain.</li> <li>H. bricks, clay pots, spices, and fabrics.</li> <li>*J. building materials, fish, game, and herbs.</li> </ul>

**ACT Science:**  
Match Between College Readiness Standards and Test Questions

ACT Science College Readiness Standards	ACT Sample Test Question
<p><b>Interpretation of Data (IOD), 24–27</b> 502. Compare or combine data from a complex data presentation</p>	<p>1. The results of Experiment 2 indicate that, at every herbicide dose, average plant height was <i>lowest</i> under which of the following conditions?</p> <ul style="list-style-type: none"> <li>*A. Herbicide A and Soil Type 1</li> <li>B. Herbicide B and Soil Type 1</li> <li>C. Herbicide A and Soil Type 2</li> <li>D. Herbicide B and Soil Type 2</li> </ul>
<p><b>Scientific Investigation (SIN), 20–23</b> 403. Identify a control in an experiment</p>	<p>2. Which of the following sets of plants served as the control in Experiment 1 ?</p> <ul style="list-style-type: none"> <li>*F. Plants grown in untreated soil</li> <li>G. Plants grown in soil treated with 10 ppm of Herbicide A</li> <li>H. Plants grown in soil treated with 10 ppm of Herbicide B</li> <li>J. Plants grown in soil treated with 100 ppm of Herbicide A</li> </ul>
<p><b>Scientific Investigation (SIN), 20–23</b> 402. Understand a simple experimental design</p>	<p>3. Which of the following best explains why the herbicides were applied to the soil instead of directly onto the corn plants?</p> <ul style="list-style-type: none"> <li>A. Corn plants are not affected when herbicides are applied directly on them.</li> <li>B. Corn plants usually die immediately upon application of herbicides.</li> <li>*C. The experiments were testing how herbicides present in the soil affect corn growth.</li> <li>D. The experiments were testing how soil pH affects corn growth.</li> </ul>
<p><b>Evaluation of Models, Inferences, and Experimental Results (EMI), 24–27</b> 501. Select a simple hypothesis, prediction, or conclusion that is supported by two or more data presentations or models</p>	<p>4. Assume that a second corn hybrid was grown in soil treated with varying doses of a third herbicide (Herbicide C). Based on the results of the experiments, what prediction, if any, about the effect of Herbicide C on the growth of this second corn hybrid can be made?</p> <ul style="list-style-type: none"> <li>F. Herbicide C would have no effect on the growth of these plants.</li> <li>G. Herbicide C would interfere with plant growth, but only at doses above 50 ppm.</li> <li>H. Herbicide C would interfere with plant growth at low doses, but have no effect at high doses.</li> <li>*J. No prediction can be made on the basis of the results.</li> </ul>
<p><b>Interpretation of Data (IOD), 28–32</b> 603. Extrapolate from data points in a table or graph</p>	<p>5. Another set of corn seeds was planted in Soil Type 1 under the same conditions as Experiment 1, except that the soil was treated with 150 ppm of Herbicide A. Based on the results of Experiment 1, one would predict that the approximate average mass of a corn plant after 40 days would be:</p> <ul style="list-style-type: none"> <li>*A. less than 5.5 g.</li> <li>B. between 6.0 g and 9.3 g.</li> <li>C. between 9.4 g and 14.1 g.</li> <li>D. greater than 14.1 g.</li> </ul>



<p style="text-align: center;"><b>ACT Science College Readiness Standards</b></p>	<p style="text-align: center;"><b>ACT Sample Test Question</b></p>
<p><b>Scientific Investigation (SIN), 28–32</b> 601. Determine the hypothesis for an experiment</p>	<p>6. Which of the following best describes the hypothesis tested in Experiment 2 ?</p> <p>F. Growing time affects plant height. *G. Soil type influences herbicide effects. H. The amount of soil moisture affects herbicide toxicity. J. A combination of herbicides has a greater effect on plant growth than do individual herbicides.</p>
<p><b>Interpretation of Data (IOD), 20–23</b> 403. Translate information into a table, graph, or diagram</p>	<p>7. Which of the following graphs best illustrates the relationship of average plant mass and herbicide dose in Experiment 1 ?</p> <div style="text-align: center;"> <p><i>Key</i></p> <p>■ Herbicide A ▨ Herbicide B</p> </div> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>*A.</p> </div> <div style="text-align: center;"> <p>C.</p> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;"> <p>B.</p> </div> <div style="text-align: center;"> <p>D.</p> </div> </div>
<p><b>Interpretation of Data (IOD), 20–23</b> 402. Compare or combine data from a simple data presentation (e.g., order or sum data from a table)</p>	<p>8. According to Table 3, Soil Type 2 differs from Soil Type 1 in which of the following ways?</p> <p>F. Soil Type 2 is less acidic than is Soil Type 1. *G. Soil Type 2 has a higher percent organic matter than does Soil Type 1. H. Soil Type 2 has a higher percent clay content than does Soil Type 1. J. Soil Type 2 contains higher levels of Herbicides A and B than does Soil Type 1.</p>
<p><b>Evaluation of Models, Inferences, and Experimental Results (EMI), 28–32</b> 601. Select a complex hypothesis, prediction, or conclusion that is supported by a data presentation or model</p>	<p>9. According to Viewpoint 1, an ascending plume of hot mantle material that originates near a depth of 2,900 km would be able to rise:</p> <p>A. all the way to the bottom of the crust. B. all the way to the surface of Earth. *C. only to the bottom of the upper mantle. D. only a few km above that depth.</p>



<b>ACT Science College Readiness Standards</b>	<b>ACT Sample Test Question</b>
<p><b>Evaluation of Models, Inferences, and Experimental Results (EMI), 24–27</b></p> <p>504. Identify similarities and differences between models</p>	<p>10. Which of the following statements best describes how the 2 viewpoints are alike?</p> <ul style="list-style-type: none"><li>F. Both are based on the nature of rock samples from the deep seafloor.</li><li>G. Both agree that material from the lower mantle mixes with the upper mantle.</li><li>H. Both agree that the mantle has the same properties throughout its depth.</li><li>*J. Both depend to some extent on studies using seismic waves.</li></ul>
<p><b>Evaluation of Models, Inferences, and Experimental Results (EMI), 33–36</b></p> <p>701. Select a complex hypothesis, prediction, or conclusion that is supported by two or more data presentations or models</p>	<p>11. Which of the following hypotheses provides the best compromise between the 2 viewpoints on the current structure of the mantle?</p> <ul style="list-style-type: none"><li>A. Convection took place only in the upper mantle when Earth was new, but billions of years later, the entire mantle was involved.</li><li>B. Convection took place throughout the entire mantle when Earth was new, but today, convection is limited to the upper mantle.</li><li>C. Mantle convection has ceased and the mantle is now a layer of uniform temperature and density.</li><li>*D. Only the hottest part of the material ascending from the lower mantle rises past the 600 km boundary, so only part of the lower mantle mixes with the upper mantle.</li></ul>