

THE ACT

TEST QUESTION ANALYSIS ACTIVITY BOOKLET

ACT COLLEGE READINESS STANDARDS

Contents

This booklet contains information to help you complete the workshop activity for each of the four content areas measured by the multiple-choice tests in the ACT:

	Page
Description of the Workshop Activity (all four content areas)	1
English (essay, selected test questions, guiding questions, and worksheet).....	2
Mathematics (selected test questions, guiding questions, and worksheet).....	4
Reading (passage, selected test questions, guiding questions, and worksheet).....	6
Science (passage, selected test questions, guiding questions, and worksheet)	8



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Description of the Workshop Activity (All Contents)

Each activity in this booklet helps you become more familiar with ACT's College Readiness Standards—sets of statements that communicate educational expectations for junior high/middle school and high school students. College Readiness Standards have been written for all four academic areas measured in the multiple-choice tests in the ACT: English, Mathematics, Reading, and Science. The Standards for each academic area are organized by *score range* (13–15, 16–19, 20–23, 24–27, 28–32, and 33–36) and by *strand* (distinct yet overlapping areas of knowledge and skill).

Please follow the steps outlined below to explore the relationship between the ACT test questions and the ACT College Readiness Standards. If you have questions, ask your workshop coordinator.

Step A: Find and briefly review the College Readiness Standards table for your respective content area. Please note that the College Readiness Standards are organized both by score range (along the left-hand side) and by strand (across the top).

- Step B:** Read the explanatory text and/or the guiding questions for your content area.
- Step C:** Read the sample test questions (and [except in Mathematics] their corresponding passage); then determine which strand(s) and Standards link to each test question. Space has been provided below each test question to write notes about what is measured in each test question. Write the College Readiness Standards number (e.g., 301, 502) and the strand abbreviation (e.g., in English, TOD, OUC) in the second column of the worksheet. Please note that the score range for each test question appears in column one.
- Step D:** Discuss your findings with the other participants in the workshop.

English Essay
from the Abbreviated ACT Test

PASSAGE I

A Voice of Her Own

Sandra Cisneros, perhaps the best known Latina author in the United States, writes poems and stories whose titles alone—“Barbie-Q,” “My Lucy Friend Who Smells Like Corn,” “Woman Hollering Creek”—engage potential readers’ curiosity.

Ironically, this renowned writer, whose books are printed on recycled paper, did not do well in school. When she lectures at schools and public libraries, Cisneros presents the evidence. An elementary school report card containing Cs, Ds, and a solitary B (for conduct). Cisneros has a theory to explain her low grades: teachers had low expectations for Latina and Latino students from Chicago’s South Side.

Despite the obstacles that she faced in school, Cisneros completed not only high school but also college. Her persistence paid off in her twenties, when Cisneros was admitted prestigious to the Writers’ Workshop at the University of Iowa.

Cisneros soon 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. Cisneros felt decided out of place.

9

She decided to speak from her own experience. Her voice, which by being one of a Latina living outside the mainstream, found a large and attentive audience in 1984 with the publication of her first short story collection, *The House on Mango Street*. Today, this book is read by middle school, high school, and college students across the United States.

Cisneros uses her influence as a successful writer to help other Latina and Latino writers get their works published. But having made the argument that, in order for large numbers of young Latinos to achieve literary success, the educational system itself must change. Cisneros hints that she succeeded in spite of the educational system. “I’m the exception,” she insists, “not the rule.” 15

Guiding Questions for English Workshop Activity

1. What judgment or editing decision (e.g., choosing transition words, correcting verb tense, determining the purpose of the essay) is the student asked to make in the test question?
2. Which strand most directly addresses that judgment or editing decision?
3. Which standard within that strand (and score range) do you think best describes the test question?
4. Think of one classroom activity that you've used successfully that either requires students to use the skill you've identified or that helps students learn the skill you've identified. Please informally describe that activity to your fellow educators.

Worksheet

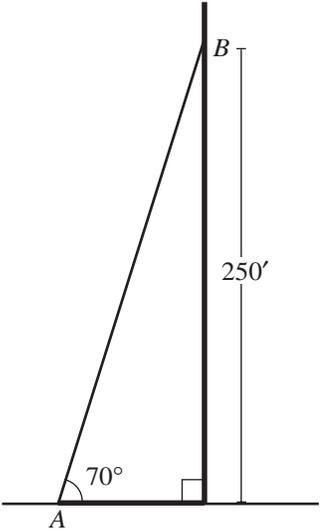
Sample Test Question	Strand(s) College Readiness Standards
<p>Score Range 20–23</p> <p>5. The best placement for the underlined portion would be:</p> <ul style="list-style-type: none"> A. where it is now. B. before the word <i>admitted</i>. *C. before the word <i>Writers</i>'. D. before the word <i>Workshop</i>. <p>Judgment/Decision:</p>	
<p>Score Range 16–19</p> <p>8. F. NO CHANGE</p> <ul style="list-style-type: none"> G. deciding *H. decidedly J. decidedly and <p>Judgment/Decision:</p>	
<p>Score Range 13–15</p> <p>12.*F. NO CHANGE</p> <ul style="list-style-type: none"> G. In the future, H. Meanwhile, J. At the same time, <p>Judgment/Decision:</p>	

Guiding Questions for Mathematics Workshop Activity

1. What topic (e.g., algebra, geometry, statistics) is the test question about?
2. Which strand focuses on the topic you chose?
3. What knowledge and skills does a student need to successfully respond to the test question?
4. Which standard within that strand (and score range) best describes the knowledge or skills you listed?
5. Think of one classroom activity that you've used successfully that requires students to use the skill you've identified or helps students learn the skill you've identified. Please informally describe that activity to your fellow educators.

Worksheet

Sample Test Question	Strand(s) College Readiness Standards												
<p>Score Range 13–15</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>Knowledge and Skills:</p>													
<p>Score Range 16–19</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="279 1339 792 1444"> <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> <p>Knowledge and Skills:</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								

Sample Test Question	Strand(s) College Readiness Standards
<p>Score Range 20–23</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. $\frac{1}{12}$ B. $\frac{1}{5}$ C. $\frac{5}{23}$ *D. $\frac{5}{12}$ E. $\frac{5}{7}$</p> <p>Knowledge and Skills:</p>	
<p>Score Range 33–36</p> <p>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?</p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="margin-right: 20px;"> <p>A. $250 \cos 70^\circ$ B. $250 \sin 70^\circ$ C. $250 \tan 70^\circ$ D. $\frac{250}{\cos 70^\circ}$ *E. $\frac{250}{\sin 70^\circ}$</p> </div>  </div> <p>Knowledge and Skills:</p>	

The ACT Reading Test includes four types of passages: Prose Fiction and Humanities (classified as literary narratives) and Social Science and Natural Science (classified as informational). Passages also differ in level of difficulty: uncomplicated, more challenging, or complex. When determining the difficulty of the passage

below, please think in terms of a “typical (average) eleventh- or twelfth-grade student.”

Most of the College Readiness Standards mention a specific type of passage and level of difficulty. When a Standard mentions level of difficulty only, students should be able to display the skill while reading both literary narratives and informational passages.

Reading Passage from the Abbreviated ACT Test

Passage I

SOCIAL SCIENCE: This passage, which describes land practices in the commons (tracts of land that belonged to and were used by a community as a whole), and the enclosure movement (when the commons were taken over by private interests and fenced off), is adapted from the essay “The Place, the Region, and the Commons” by Gary Snyder, which is included in his book *The Practice of the Wild* (©1990 by Gary Snyder).

I stood with my climbing partner on the summit of Glacier Peak looking all ways round, ridge after ridge and peak after peak, as far as we could see. He said: “You mean there’s a senator for all this?” It is easy to think there are vast spaces on earth yet unadministered, perhaps forgotten, or unknown, but it is all mapped and placed in some domain. In North America there is a lot that is in the public domain, which has its problems, but at least they are problems we are all enfranchised to work on.

American public lands are the twentieth-century incarnation of a much older institution known across Eurasia—in English called the “commons”—which was the ancient mode of both protecting and managing the wilds of the self-governing regions. It worked well enough until the age of market economies, colonialism, and imperialism. Let me give you a kind of model of how the commons worked.

Between the extremes of deep wilderness and the private plots of the farmstead lies a territory which is not suitable for crops. In earlier times it was used jointly by the members of a given tribe or village. This area, embracing both the wild and the semi-wild, is of critical importance. It is necessary for the health of the wilderness because it adds big habitat, overflow territory, and room for wildlife to fly and run. It is essential even to an agricultural village economy because its natural diversity provides the many necessities and amenities that the privately held plots cannot. It enriches the agrarian diet with game and fish. The shared land supplies firewood, poles and stone for building, clay for the kiln, herbs, dye plants, and much else. It is especially important as seasonal or full-time open range for cattle, horses, goats, pigs, and sheep.

In the abstract the sharing of a natural area might be thought of as a matter of access to “common pool resources” with no limits or controls on individual exploitation. The fact is that such sharing developed over

millennia and always within territorial and social contexts. In the peasant societies of both Asia and Europe there were customary forms that gave direction to the joint use of land. They did not grant free access to outsiders, and there were controls over entry and use by member households. The commons is both specific land and the traditional community institution that determines the carrying capacity for its various subunits and defines the rights and obligations of those who use it, with penalties for lapses. Because it is traditional and *local*, it is not identical with today’s “public domain,” which is land held and managed by a central government. Under a national state such management may be destructive (as it is becoming in Canada and the United States) or benign, but in no case is it locally managed. One of the ideas in the current debate on how to reform our public lands is that of returning them to regional control.

An example of traditional management: what would keep one household from bringing in more and more stock and tempting everyone toward overgrazing? In earlier England and in some contemporary Swiss villages, the commoner could only turn out to common range as many head of cattle as he could feed over the winter in his own corrals. This meant that no one was allowed to increase his herd from outside with a cattle drive just for summer grazing.

There is a well-documented history of the commons in relation to the village economies of Europe and England. In England from the time of the Norman Conquest the knights and overlords began to gain control over the many local commons. From the fifteenth century on the landlord class increasingly fenced off village-held land and turned it over to private interests. The enclosure movement was backed by the big wool corporations who found profit from sheep to be much greater than that from farming. The wool business had a destructive effect on the soils and dislodged peasants. The arguments for enclosure in England—efficiency, higher production—ignored social and ecological effects and served to cripple the sustainable agriculture of some districts.

The enclosures created a population of rural homeless who were forced in their desperation to become the world’s first industrial working class. The enclosures were tragic both for the human community and for natural ecosystems. The fact that England now has the least forest and wildlife of all the nations of Europe has much to do with the enclosures.

Guiding Questions for Reading Workshop Activity

- How would you classify this passage: literary narrative or informational passage?
- Using the passage descriptions at the bottom of the Reading College Readiness Standards table, what do you think is the difficulty level of the passage: uncomplicated, more challenging, or complex?
- What skills does a student need to successfully respond to the test question?
- Which strand focuses on the skills you listed?
- Which standard within that strand (and score range) best describes the skills you listed?
- Think of one classroom activity that you've used successfully that either requires students to use the skill you've identified or that helps students learn the skill you've identified. Please informally describe that activity to your fellow educators.

Worksheet

Passage classification: _____

Sample Test Question	Strand(s) College Readiness Standards
<p>Score Range 13–15</p> <p>1. As it is used in line 12 , the word <i>incarnation</i> most nearly means:</p> <ul style="list-style-type: none"> A. import. *B. version. C. area. D. relationship. <p>Skills:</p>	
<p>Score Range 28–32</p> <p>2. The author’s primary aim in this passage is to:</p> <ul style="list-style-type: none"> 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>Skills:</p>	
<p>Score Range 28–32</p> <p>5. The passage implies that the number of commons in Europe diminished primarily because of:</p> <ul style="list-style-type: none"> 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>Skills:</p>	

The Interpretation of Data strand describes the skills used to read and analyze information presented in tables, graphs, diagrams, or text. These skills include selecting data points from graphs, comparing 2 or more data points or sets of data, interpolation of data, and extrapolation from data.

The Scientific Investigation strand focuses on the skills needed to understand and analyze an experiment. These skills include determining the control in an experiment, determining the hypothesis that an experiment is designed to test, and

determining the purpose behind an experimental design or procedure.

The Evaluation of Models, Inferences, and Experimental Results strand contains the skills needed to understand and analyze diverse scientific models. These skills include determining the hypothesis or conclusion that is supported by a given set of data, experiment, or model; finding the areas of agreement and disagreement in different models; and identifying the strengths, weaknesses, key issues, and assumptions in various models.

Data Representation Passage from the Abbreviated ACT Test

Passage I

Herbicides are used to control the growth of weeds. An herbicide that may be used safely with one crop species may damage another crop if the latter crop is planted in soil containing residual amounts of the herbicide from an earlier application. Two experiments were performed to study this effect.

Experiment 1

A botanist filled 90 pots with Soil Type 1. No herbicide was added to the soil in 10 pots. The other pots were divided into groups of 10 and the soil in each group was treated with 10, 20, 50, or 100 ppm of either Herbicide A or B. All other factors were held constant. Ten seeds of a corn hybrid were planted in each pot. After 40 days, the plants were uprooted, oven-dried, and weighed. The results are shown in Table 1.

Table 1		
Herbicide dose (ppm)	Average mass of plants (g)	
	Herbicide A	Herbicide B
10	14.1	15.6
20	12.4	13.7
50	9.3	12.1
100	5.5	9.3

Note: Average plant mass in untreated soil was 16.0 g.

Experiment 2

Experiment 1 was repeated with 90 pots of Soil Type 1 and 90 pots of Soil Type 2. The same herbicide doses and corn hybrid were used. All other factors were held constant. After 40 days, the heights of the plants were measured. The results are shown in Table 2.

Table 2				
Herbicide dose (ppm)	Average height of plants (cm)			
	Soil Type 1		Soil Type 2	
	Herbicide A	Herbicide B	Herbicide A	Herbicide B
10	46.3	49.0	50.3	52.5
20	42.0	47.0	44.4	47.0
50	34.1	39.4	40.6	42.3
100	19.6	22.7	30.9	36.4

Note: Average plant height in untreated Soil Type 1 was 50.6 cm; average plant height in untreated Soil Type 2 was 52.7 cm.

Information on the two soil types used is given in Table 3.

Table 3			
Soil Type	pH	Organic matter (%)	Clay (%)
1	6.9	5.0	16.3
2	6.2	9.5	7.9

Guiding Questions for Science Workshop Activity

1. What science process skills must students use to answer the test question correctly?
2. Which strand focuses on the skills you chose?
3. Which standard within that strand (and score range) best describes the skills you listed?
4. Think of one classroom activity that you've used successfully that either requires students to use the skill you've identified or that helps students learn the skill you've identified. Please informally describe that activity to your fellow educators.

Worksheet

Sample Test Question	Strand(s) College Readiness Standards
<p>Score Range 20–23</p> <p>2. Which of the following sets of plants served as the control in Experiment 1 ?</p> <ul style="list-style-type: none"> *F. Plants grown in untreated soil G. Plants grown in soil treated with 10 ppm of Herbicide A H. Plants grown in soil treated with 10 ppm of Herbicide B J. Plants grown in soil treated with 100 ppm of Herbicide A <p>Science Process Skills:</p>	
<p>Score Range 28–32</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"> *A. less than 5.5 g. B. between 6.0 g and 9.3 g. C. between 9.4 g and 14.1 g. D. greater than 14.1 g. <p>Science Process Skills:</p>	
<p>Score Range 20–23</p> <p>8. According to Table 3, Soil Type 2 differs from Soil Type 1 in which of the following ways?</p> <ul style="list-style-type: none"> 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>Science Process Skills:</p>	

Research Summaries Passage

from the Abbreviated ACT Test

Passage II

Crustal *plates* (sections of Earth's crust) lie on top of a denser layer of material known as the *mantle*, which extends to a depth of 2,900 km, where the core begins. Mantle material moves by a process known as *convection*. In convection, molten or semisolid material is heated from below, rises as large *plumes*, spreads horizontally, cools, and then sinks, creating a *convection cell*. Plates are carried along by the convection cells and plate edges may be forced down into the mantle creating large, cold, *sinking slabs* of crust. Below are two opposing views about the nature of mantle convection.

Viewpoint 1

The mantle is composed of 2 layers that are chemically distinct and do not mix. The lower mantle is denser, hotter, enriched in iron and silicon, and under greater pressure than the upper mantle. Convection cells exist only in the 600 km deep upper mantle. Only heat passes between the 2 layers; no actual material is exchanged. The boundary between the mantle layers can be detected with *seismic* (earthquake) waves which speed up significantly at and below a depth of 600 km.

The sinking slabs are dense and cold enough to sink into the upper mantle but not into the lower mantle. Earthquakes have been detected in the sinking slabs, but none below a depth of 600 km. Scientists who believe that slabs penetrate deeper are misinterpreting their seismic data.

Viewpoint 2

The whole mantle circulates in convection cells and mixing occurs throughout. The 600 km deep "boundary" is merely a place where pressure transforms the crystal structure of the mantle material. Different crystal structures do not preclude mixing of the entire mantle. Seismic studies have detected sinking slabs of colder rock that had penetrated the mantle to depths between 600 and 1,400 km in many parts of the world.

Mathematical models have shown that the *tilt angle* (angle at which sinking slabs descend into the mantle) of known sinking slabs corresponds much more closely to that expected for whole mantle convection than to tilt angles expected for only upper mantle convection.

Guiding Questions for Science Workshop Activity

1. What science process skills must students use to answer the test question correctly?
2. Which strand focuses on the skills you chose?
3. Which standard within that strand (and score range) best describes the skills you listed?
4. Think of one classroom activity that you've used successfully that either requires students to use the skill you've identified or that helps students learn the skill you've identified. Please informally describe that activity to your fellow educators.

Worksheet

Sample Test Question	Strand(s) College Readiness Standards
<p>Score Range 28–32</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> <ul style="list-style-type: none"> 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>Science Process Skills:</p>	
<p>Score Range 24–27</p> <p>10. Which of the following statements best describes how the 2 viewpoints are alike?</p> <ul style="list-style-type: none"> F. Both are based on the nature of rock samples from the deep seafloor. G. Both agree that material from the lower mantle mixes with the upper mantle. H. Both agree that the mantle has the same properties throughout its depth. *J. Both depend to some extent on studies using seismic waves. <p>Science Process Skills:</p>	