

# EXPLORE®

## TEST QUESTION ANALYSIS ACTIVITY BOOKLET

### EXPLORE COLLEGE READINESS STANDARDS

#### Contents

This booklet contains information to help you complete the workshop activity for each of the four content areas EXPLORE measures:

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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 EXPLORE®: English, Mathematics, Reading, and Science. The Standards for each academic area are organized by *score range* (13–15, 16–19, 20–23, and 24–25) and by *strand* (distinct yet overlapping areas of knowledge and skill).

Please follow the steps outlined below to explore the relationship between the EXPLORE test questions and the EXPLORE 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 EXPLORE Test

### PASSAGE I

#### The Boise Nature Center

[1] In Boise, Idaho, a waterfall spills into a rocky pool, then forms a clear mountain stream. [2] The stream becomes a river and twisted across a semi-arid plateau. [3] From there the river <sup>1</sup>wanders through farmland and then vanishes underground. [4] Amazingly, all of this river's activity takes place within the shadow of tall office buildings a few feet from a city park. [5] The river, you see, is the centerpiece of Boise's Nature Center. [6] When at last it surfaces, it falls from a rock cliff into wetlands. 2

The Center reproduces four environmental systems found in Idaho; the heart of each is the river. Although it travels only 550 feet, ducks, geese, mink, squirrels, and quail call home. Keeping them company are fish: <sup>3</sup>salmon, sturgeon, bass, and trout. And the fish, more than anything else, draw visitors to the Center.

For a fish-eye view of the world, peer through an underwater window. Fat rainbow trout patrol between <sup>5</sup>

territory, chasing smaller fish from prime feeding areas. In the tangles of a sunken log, a three-foot-long sturgeon floats, motionless. At the bottom, naturally vacuuming <sup>6</sup> cleaner—the sucker—feeds on algae and waste.

Step to another window and suddenly you're alongside the spawning grounds. Safe within "redds" (shallow gravel nests), tiny eggs bob in the current. Look more closer for a dark dot in the orange egg. If you come <sup>7</sup>back in two weeks, the dot will be an eye, the egg will have a tail, and a witness for the first <sup>8</sup> stages of a trout's life.

<sup>9</sup>Built entirely with volunteer labor and paid for by donations, the Boise Nature Center is unique. Plenty of cities have aquariums. Others have zoos. Still others have wildlife refuges. Only Boise has blended them all together in a fascinating and educational mix.

Question 10 asks about the preceding passage as a whole.

## 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

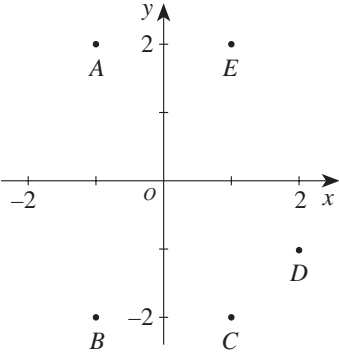
Sample Test Question	Strand(s) College Readiness Standards
<p><b>Score Range 24–25</b></p> <p>2. For the sake of unity and coherence, Sentence 6 should be placed:</p> <ul style="list-style-type: none"> <li>F. where it is now.</li> <li>G. before Sentence 2.</li> <li>H. before Sentence 3.</li> <li>*J. before Sentence 4.</li> </ul> <p><b>Judgment/Decision:</b></p>	
<p><b>Score Range 13–15</b></p> <p>7. A. NO CHANGE</p> <ul style="list-style-type: none"> <li>*B. closely</li> <li>C. most closer</li> <li>D. in closing</li> </ul> <p><b>Judgment/Decision:</b></p>	
<p><b>Score Range 24–25</b></p> <p>10. The writer has been asked to write an essay that would be part of a brochure on enjoyable things to do and see in Boise, Idaho. Would this essay successfully fulfill that assignment?</p> <ul style="list-style-type: none"> <li>F. Yes; the essay focuses on mammals, which are apparently of the greatest interest for visitors at the Boise Nature Center.</li> <li>G. Yes; the essay employs a lot of vivid descriptions of animals and fish that visitors to Idaho can see in zoos in cities across the U.S.</li> <li>*H. Yes; the essay provides a concise and informative description of one of Boise's attractive facilities.</li> <li>J. No; the essay does not tell readers how much it costs to go to the Center or how crowded the Center typically is.</li> </ul> <p><b>Judgment/Decision:</b></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 teachers.

## Worksheet

Sample Test Question	Strand(s) College Readiness Standards																		
<p><b>Score Range 13–15</b></p> <p>1. What is the remainder when 189,540 is divided by 27 ?</p> <p>*A. 0 B. 7 C. 13 D. 250 E. 7,020</p> <p><b>Knowledge and Skills:</b></p>																			
<p><b>Score Range 16–19</b></p> <p>2. What is the least expensive shower head on the chart below that will NOT deliver more than 3 gallons of water per minute (gpm)?</p> <p>Information from <i>Consumer Reports</i>, "How to Save Water." ©1990 by Consumers Union of U.S., Inc.</p> <table border="1" data-bbox="142 1276 771 1459"> <thead> <tr> <th><u>Brand and Model</u></th> <th><u>Price</u></th> <th><u>Maximum gpm</u></th> </tr> </thead> <tbody> <tr> <td>F. Sears 20173</td> <td>\$23</td> <td>3.4</td> </tr> <tr> <td>G. Teledyne 5 SM-3U</td> <td>\$43</td> <td>2.6</td> </tr> <tr> <td>*H. Alsons 462PB</td> <td>\$11</td> <td>2.6</td> </tr> <tr> <td>J. Alsons 45C</td> <td>\$58</td> <td>2.7</td> </tr> <tr> <td>K. Moen 3981</td> <td>\$95</td> <td>2.4</td> </tr> </tbody> </table> <p><b>Knowledge and Skills:</b></p>	<u>Brand and Model</u>	<u>Price</u>	<u>Maximum gpm</u>	F. Sears 20173	\$23	3.4	G. Teledyne 5 SM-3U	\$43	2.6	*H. Alsons 462PB	\$11	2.6	J. Alsons 45C	\$58	2.7	K. Moen 3981	\$95	2.4	
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Sample Test Question	Strand(s) College Readiness Standards
<p><b>Score Range 20–23</b></p> <p>7. Kane bought a bag of taffy at the candy store. He got 10 vanilla for his mom, 15 chocolate for his dad, 6 licorice for his sister, and 22 peppermint for himself. On the way home, Kane’s sister grabbed a piece out of the sack without looking. What are the chances that she pulled out a licorice piece?</p> <p>A. <math>\frac{1}{6}</math>  B. <math>\frac{6}{6}</math>  C. <math>\frac{6}{47}</math>  *D. <math>\frac{6}{53}</math>  E. <math>\frac{47}{53}</math></p> <p><b>Knowledge and Skills:</b></p>	
<p><b>Score Range 20–23</b></p> <p>10. One of the points, labeled <i>A</i> through <i>E</i>, shown in the standard <math>(x,y)</math> coordinate plane below has coordinates <math>(-1,2)</math>. Which point is it?</p> <p>*F. <i>A</i>  G. <i>B</i>  H. <i>C</i>  J. <i>D</i>  K. <i>E</i></p> <p><b>Knowledge and Skills:</b></p>	
<p><b>Score Range 24–25</b></p> <p>15. Paco wants to redecorate his room. On one wall he wants to put up new wallpaper. The wall is a 13-by-11-foot rectangle and has a door which takes up a 7-by-3-foot rectangular area. After the area of the door is subtracted, how many square feet of wall remain to be covered?</p> <p>A. 28  B. 48  *C. 122  D. 143  E. 288</p> <p><b>Knowledge and Skills:</b></p>	

The EXPLORE Reading Test includes three types of passages: Prose Fiction, Humanities (classified as literary narratives), and Social Science (classified as informational). Passages also differ in level of difficulty: uncomplicated or more challenging. When determining the difficulty of the passage below, please think in terms of a “typical (average) eighth-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 EXPLORE Test

### Passage I

**SOCIAL SCIENCE:** This passage is adapted from the article “Land of the Candy Bar” by Ray Broekel (©1986 by Forbes Inc.).

The candy bar as we know it was born in America. So too, many centuries earlier, was chocolate itself. Mexican natives cultivated the cocoa bean for more than twenty-five hundred years before Hernán Cortés took it to Spain with him in 1528. Spanish royalty drank a cold, sweetened beverage made from the beans, but they liked it so much they kept it a secret from the rest of Europe for the remainder of the century. Not until the 1840s did a British firm make the first chocolate bar. The *candy* bar, agglomerating a variety of flavors and textures—almost always including chocolate—in one piece, was a purely American invention, and (as of this writing) it’s still not one hundred years old.

Milton Snavely Hershey, the father of the modern candy bar, had already built a successful business in caramels when he first saw German chocolate-making machines at the 1893 Chicago world’s fair. He ordered some for his factory in Lancaster, Pennsylvania, and began turning out chocolate bars the next year. By the turn of the century he was through with caramels. He made not just plain chocolate and milk-chocolate bars but also innovative items like almond bars, kisses, and chocolate cigars. By 1911 his company had sales of five million dollars a year; by 1921 it was making four times that.

Such dazzling success begat swift competition, and soon a multitude of companies was making bars of chocolate combined with caramel, marshmallow, peanuts, crisped rice, and anything else that might sell.

30 Throughout the first two decades of the century, a bewildering variety of candy bars appeared on shelves across the country, most of them fleetingly. There have probably been more than one hundred thousand different candy bars sold in the United States, including some 35 thirty thousand that existed only in the years just after World War I. Nearly every confectioner in the land turned out a candy bar, choosing a name that might reflect a news or sports event, a popular hero, a food, a place, or even a popular saying of the age.

40 The industry began on the East Coast but quickly fanned out across the country. Since the basic ingredients were dairy products, Chicago became the natural hub for candy bars, and Milwaukee and Minneapolis were major producers.

45 The Depression brought lean times to the candy-bar business, and not until the late 1930s did the industry begin to recover. When war struck again, the makers of candy bars once more were pressed into service supplying the troops. Hershey made “field ration D,” a 50 refined chocolate that didn’t melt at high temperatures, and it was packed in kits for soldiers, sailors, and Marines. On the home front, as the supply of chocolate dwindled, manufacturers struggled to concoct new bars from ingredients such as peanuts and marshmallows and 55 gave them patriotic names like Torpedo.

If World War I made candy bars a major industry, World War II made them a worldwide symbol of America. The GI handing out candy bars to children came to stand for liberation everywhere. Hershey bars 60 became an international wartime currency.

## 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 or more challenging?
- 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 teachers.

### Worksheet

Passage classification: \_\_\_\_\_

Sample Test Question	Strand(s) College Readiness Standards
<p><b>Score Range 13–15</b></p> <p>1. The passage mentions all of the following as candy-bar ingredients EXCEPT:</p> <ul style="list-style-type: none"> <li>A. crisped rice.</li> <li>B. caramel.</li> <li>*C. raisins.</li> <li>D. almonds.</li> </ul> <p><b>Skills:</b></p>	
<p><b>Score Range 16–19</b></p> <p>3. Why, according to the passage, did Chicago become the hub for candy-bar production?</p> <ul style="list-style-type: none"> <li>A. It was located at the midpoint between Minneapolis and Lancaster, Pennsylvania.</li> <li>B. It was the transportation center of the U.S.</li> <li>C. The majority of the population was found in this part of the country.</li> <li>*D. Many dairy products came from the region around Chicago.</li> </ul> <p><b>Skills:</b></p>	
<p><b>Score Range 24–25</b></p> <p>8. The passage indicates that the first chocolate bar was made by the:</p> <ul style="list-style-type: none"> <li>F. Mexicans.</li> <li>G. Spanish.</li> <li>*H. British.</li> <li>J. Americans.</li> </ul> <p><b>Skills:</b></p>	

# EXPLORE Science Test

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.

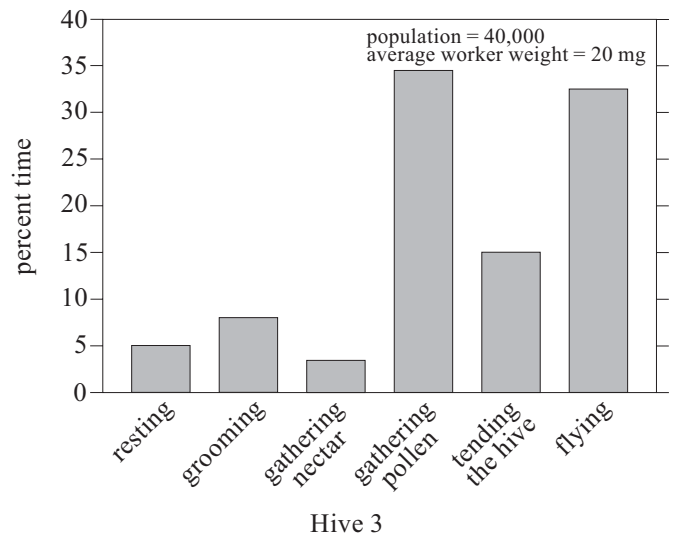
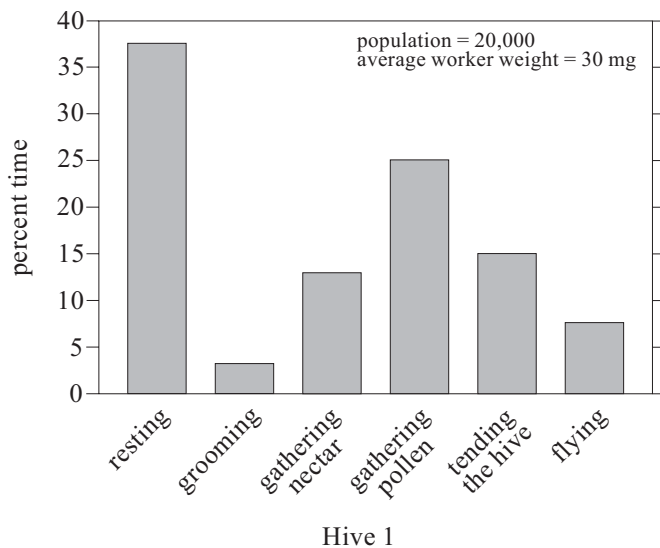
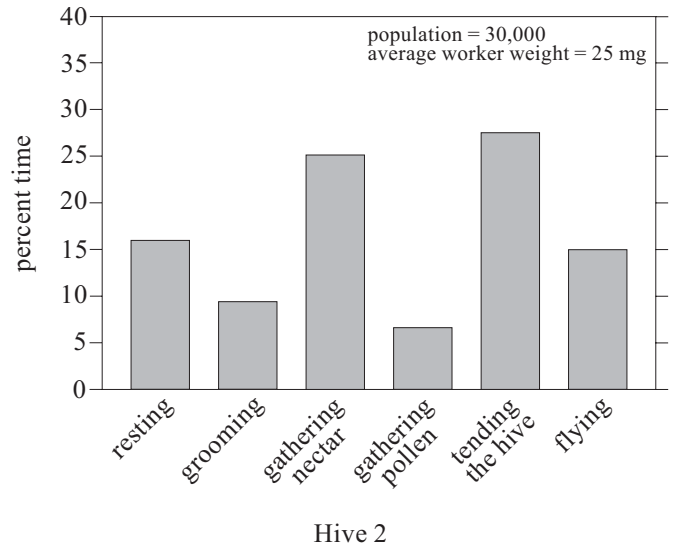
The Evaluation of Models, Inferences, and Experimental Results strand contains the skills needed to understand and analyze diverse scientific models. These skills include determining the hypothesis or conclusion that is supported by a given set of data, experiment, or model; finding the areas of agreement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

## Data Representation Passage

from the Abbreviated EXPLORE Test

### Passage I

Observations of three different beehives were made over a two-week period in the spring. The hives were located in different areas containing blooming flowers. The activities of the worker bees were observed for each hive at the same time of day for each day during the study period. The population and average weight of the worker bees in each hive were also determined. The data obtained from this study are displayed in the following figures, identified as Hive 1, Hive 2, and Hive 3.



## 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 teachers.

### Worksheet

Sample Test Question	Strand(s) College Readiness Standards
<p><b>Score Range 13–15</b></p> <p>2. According to the data presented for Hive 3, the percentage of time spent by the worker bees tending the hive was approximately:</p> <p><b>F.</b> 10%.  <b>*G.</b> 15%.  <b>H.</b> 20%.  <b>J.</b> 35%.</p> <p><b>Science Process Skills:</b></p>	
<p><b>Score Range 16–19</b></p> <p>4. According to the figures, what is the relationship between the weight of the individual worker bees and the amount of time spent flying?</p> <p><b>*F.</b> The lighter the bee, the more time spent flying.  <b>G.</b> The heavier the bee, the more time spent flying.  <b>H.</b> Lighter bees are faster, so less time is spent flying.  <b>J.</b> Heavier bees are faster, so less time is spent flying.</p> <p><b>Science Process Skills:</b></p>	

## Research Summaries Passage

from the Abbreviated EXPLORE Test

### Passage II

Several factors affect the *rate* (how fast the chemicals react) at which a chemical reaction proceeds. Reaction rate is affected by the *concentrations* (relative amounts per unit volume) of the chemicals being reacted and the temperature at which the reaction takes place. The addition of a *catalyst* (substance that affects the rate of a reaction without itself being used up) can also increase the reaction rate.

When Solutions A and B (two colorless liquids) are mixed, a reaction takes place. When the reaction is completed, the mixture turns dark blue.

#### *Experiment 1*

Students mixed 20 mL each of Solutions A and B at 22.2°C, and stirred the mixture as the reaction proceeded. The students recorded the time that it took for the mixture to turn dark blue. This was repeated 4 more times. The average time for the 5 trials was 29 seconds (sec).

The students then mixed 20 mL of Solution A, 10 mL of Solution B, and 10 mL of distilled water, all at 22.2°C. The average reaction time for 5 trials was 71 sec.

The students then mixed 10 mL of Solution A, 10 mL of distilled water, and 20 mL of Solution B, all at 22.2°C. The average reaction time for 5 trials was 72 sec.

#### *Experiment 2*

The students mixed 20 mL each of Solutions A and B at 3 different temperatures. Each time, they stirred until the reaction was complete. The average reaction times for 5 trials are shown in the table.

Temperature (°C)	Time until reaction was completed (sec)
12.2	58
22.2	29
32.2	15

#### *Experiment 3*

The students added 5 drops of copper sulfate, a catalyst, to 20 mL of Solution A. When this was mixed at 22.2°C with 20 mL of Solution B, the average reaction time for 5 trials was 19 sec.

## 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 teachers.

### Worksheet

Sample Test Question	Strand(s) College Readiness Standards
<p><b>Score Range 16–19</b></p> <p>6. Based on the results of Experiment 2, what is the relationship, if any, between the temperature of the mixture and the reaction time?</p> <ul style="list-style-type: none"> <li>*F. As the temperature increases, the reaction time decreases only.</li> <li>G. As the temperature increases, the reaction time stays the same.</li> <li>H. As the temperature decreases, the reaction time increases, then decreases.</li> <li>J. There is no relationship between the temperature and the reaction time.</li> </ul> <p><b>Science Process Skills:</b></p>	
<p><b>Score Range 24–25</b></p> <p>9. Based on the results of Experiment 2, one would predict that if the reaction was repeated at 2.2°C, the reaction time would be approximately:</p> <ul style="list-style-type: none"> <li>A. 8 sec.</li> <li>B. 30 sec.</li> <li>C. 60 sec.</li> <li>*D. 116 sec.</li> </ul> <p><b>Science Process Skills:</b></p>	
<p><b>Score Range 20–23</b></p> <p>10. Which of the following conditions was directly changed by the students in Experiment 1 ?</p> <ul style="list-style-type: none"> <li>F. Total volume of the mixture</li> <li>*G. Concentration of each solution in the mixture</li> <li>H. Temperature of the mixture</li> <li>J. Reaction rate</li> </ul> <p><b>Science Process Skills:</b></p>	