

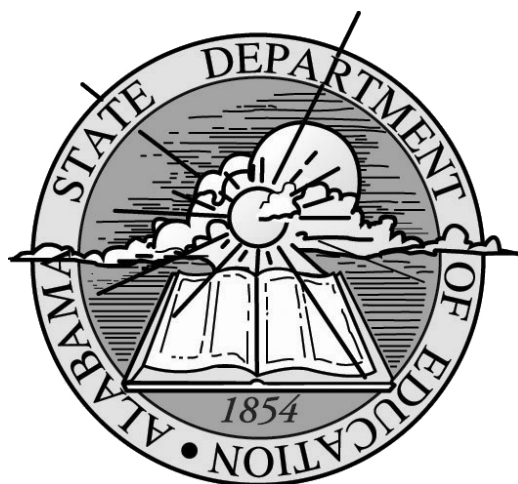
Alabama Reading and Mathematics Test⁺

Item Specifications

for

Mathematics

Grade 4



**Alabama State Department of Education
Montgomery, Alabama
December 2011**

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INTRODUCTION

This document provides specific information about the *Alabama Reading and Mathematics Test*⁺ (ARMT⁺). Educators representing each State Board of Education district as well as both city and county school systems served on committees to determine the content standards on which the ARMT⁺ is based. In addition, educators from throughout the state of Alabama served on committees to review the content of the tests, including selecting and reviewing specific mathematics test items, and determining achievement levels.

Teachers must be familiar with the information in this document so that they may incorporate effective teaching of the mathematics content standards with classroom assessments. Using classroom assessments with similar test formats from time to time will help to enable students to demonstrate proficiency on the various content standards in mathematics.

Three item types are included in the ARMT⁺. Multiple-choice, gridded, and open-ended items assess student performance on the ARMT⁺ in mathematics. Multiple-choice items and gridded items carry a point value of 1, while open-ended items carry a point value of 3. In this document, teachers will see representative item types for each mathematics content standard.

Content Standard	A statement of what students should know and be able to do by the end of the academic year
Item Type	Multiple-choice, gridded, open-ended items
Additional Information	Further information about the test items for the content standard
Sample Items	A collection of item types for each content standard
Answer Key	Answers for multiple-choice items and gridded items
Scoring Rubrics for Open-Ended Items	Scoring guide for open-ended items

CONTENT STANDARDS

Grade 4

CONTENT STANDARD	POINTS POSSIBLE
Number and Operations 1- Demonstrate number sense by comparing and ordering decimals to hundredths and whole numbers to 999,999. 2- Write money amounts in words and dollar-and-cent notation. 3- Rename improper fractions as mixed numbers and mixed numbers as improper fractions. 4- Demonstrate addition and subtraction of fractions with common denominators. 5- Round whole numbers to the nearest ten, hundred or thousand and decimals to the nearest tenth. 6- Solve problems, including word problems, that involve addition and subtraction of four-digit numbers with and without regrouping. 7- Solve problems, including word problems, involving the basic operations of multiplication and division on whole numbers through two-digit multipliers and one-digit divisors. 8- Recognize equivalent forms of commonly used fractions and decimals.	4 3 3 4 4 7 7 <u>4</u> 36
Algebra 9- Write number sentences for word problems that involve multiplication or division. 10- Complete addition and subtraction number sentences with a missing addend or subtrahend.	4 4 <u>8</u>
Geometry 11- Identify triangles, quadrilaterals, pentagons, hexagons, or octagons based on the number of sides, angles, and vertices. 12- Find locations on a map or a grid using ordered pairs.	4 <u>4</u> 8
Measurement 13- Calculate elapsed time in hours and minutes. 14- Measure length, width, weight, and capacity using metric and customary units, and temperature in degrees Fahrenheit and degrees Celsius.	3 6 <u>9</u>

ARMT⁺ GRADE 4 MATHEMATICS

CONTENT STANDARD	POINTS POSSIBLE
Data Analysis and Probability	
15- Represent categorical data using tables and graphs, including bar graphs, line graphs, and line plots.	4
16- Determine if outcomes of simple events are likely, unlikely, certain, equally likely, or impossible.	3
17- Represent numerical data using tables and graphs, including bar graphs and line graphs.	4
	<u>11</u>
TOTAL POINTS POSSIBLE	72

ITEMS BY CONTENT STANDARD

DIRECTIONS (These are the directions read by students and the test administrator for Part 1.)

Read the problem and find the answer.

Calculators may *not* be used for Part 1 of the test.

If the problem has a multiple-choice answer, darken the bubble in the correct space in your answer document.

If the problem has an answer grid:

- Write your answer in the boxes at the top of the grid.
- Darken the correct bubble of the number or symbol in the column below.

If your answer is a repeating decimal, round to the nearer hundredth.

For the problems that ask you to show your work, use the space given in your answer document.

- Be sure to show all of your work or explain how you got your answer in the space given.

For all problems, be sure to check your answers.

ITEMS BY CONTENT STANDARD

There are no written directions for Part 2. The directions will be given orally by the test administrator.

DIRECTIONS (These are the directions read by students and the test administrator for Part 3.)

Read the problem and find the answer.

Calculators may be used for Part 3 of the test.

If the problem has a multiple-choice answer, darken the bubble in the correct space in your answer document.

If the problem has an answer grid:

- Write your answer in the boxes at the top of the grid.
- Darken the correct bubble of the number or symbol in the column below.

If your answer is a repeating decimal, round to the nearer hundredth.

For the problems that ask you to show your work, use the space given in your answer document.

- Be sure to show all of your work or explain how you got your answer in the space given.
- If you use your calculator to get your answer, explain the steps you take.

For all problems, be sure to check your answers.

NUMBER AND OPERATIONS**Content Standard 1**

Demonstrate number sense by comparing and ordering decimals to hundredths and whole numbers to 999,999.

Item Type

Multiple-choice

Additional Information

In comparing numbers, *larger, smaller, greater than, less than, or equal to* may be used.

In ordering numbers, *first, second, third, etc.*, may be used.

In ordering numbers, *greatest to least, least to greatest, longest to shortest, or shortest to longest* may be used.

In ordering numbers, arranging numbers may be used.

Tables and charts may be used.

Word problems/real-life situations may be used.

Money values may be used.

Inequality symbols may be used.

Sample Multiple-Choice Items

1. Fiona measured the lengths of four different boards. The lengths were 1.73 meters, 3.14 meters, 2.05 meters, and 3.51 meters.

What is the *greatest* length of Fiona's four boards?

- A** 1.73 meters
- B** 3.14 meters
- C** 2.05 meters
- D** 3.51 meters *

2. Phillip measured four line segments using his inch ruler.

Which of the following lists the lengths of the line segments in order from *greatest* to *least*?

- A** 1.09; 1.26; 0.56; 0.71
- B** 0.56; 0.71; 1.09; 1.26
- C** 1.26; 1.09; 0.71; 0.56 *
- D** 1.26; 0.56; 1.09; 0.71

3. John bought the 5 fishing supplies shown in the chart below.

John's Fishing Supplies

Item	Price
Bait	\$2.99
Fish finder	\$279.99
Fishing rod	\$11.99
Hooks	\$6.99
Spinning reel	\$39.99

Which of the following lists the prices in order from *least* to *greatest*?

- A** \$6.99; \$2.99; \$11.99; \$39.99; \$279.99
- B** \$2.99; \$6.99; \$11.99; \$39.99; \$279.99 *
- C** \$2.99; \$11.99; \$6.99; \$39.99; \$279.99
- D** \$279.99; \$39.99; \$11.99; \$6.99; \$2.99

4. The amount Jared spent on different foods is listed in the chart below.

Amounts Jared Spent

Food	Amount
Bread	\$1.59
Cheese	\$3.19
Turkey	\$3.04
Lettuce	\$0.99

Which was the *least* amount of money Jared spent?

\$1.59 \$3.19 \$3.04 \$0.99

A **B** **C** **D ***

5. The distance Talia and each of her friends jumped during a standing broad jump contest is listed in the chart below.

Standing Broad Jump

Student	Number of Meters Jumped
Amber	1.90
Brent	2.14
Marques	2.04
Talia	1.92

Which list shows the students in order from the *greatest* distance jumped to the *least* distance jumped?

- A** Amber; Talia; Marques; Brent
B Amber; Talia; Brent; Marques
C Brent; Marques; Amber; Talia
D Brent; Marques; Talia; Amber *

6. Helen and her friends each threw a softball. The table below shows the distance, in meters, each softball was thrown.

Softball Throwing Distance

Name	Distance (in meters)
Helen	11.3
Wanda	8.09
Nadira	8.78
Marisol	9.15

Which distance, in meters, is the *least*?

- 11.3 8.09 8.78 9.15
A **B *** **C** **D**

7. The average number of goals scored by different soccer players is listed in the chart.

Average Goals Scored

Person	Average Number of Goals Scored
Jake	1.42
Lisa	1.24
Melissa	2.40
Nate	2.04

In which list are the averages in order from *least* to *greatest*?

- A** 1.24; 1.42; 2.40; 2.04
B 1.24; 1.42; 2.04; 2.40 *
C 2.04; 1.24; 2.40; 1.42
D 2.40; 2.04; 1.42; 1.24

8. Swimming pools at four different schools hold 12,800 gallons, 13,500 gallons, 16,200 gallons, and 10,900 gallons.

Which inequality correctly compares the number of gallons in two of the pools?

- A** $12,800 > 16,200$
- B** $13,500 < 12,800$
- C** $16,200 < 10,900$
- D** $16,200 > 13,500$ *

Answer Key

Content Standard 1

Sample Multiple-Choice

1. D
2. C
3. B
4. D
5. D
6. B
7. B
8. D

NUMBER AND OPERATIONS**Content Standard 2**

Write money amounts in words and dollar-and-cent notation.

Item Type

Multiple-choice
Gridded

Additional Information

Word problems/real-life situations may be used.
Symbols for dollars and cents will be used.

Sample Multiple-Choice Items

1. Carrie paid six dollars and ninety-nine cents for a book.

Which shows how much Carrie paid for the book?

- A** \$6.90
- B** \$16.90
- C** \$6.99 *
- D** \$69.09

2. William bought a model car.
The car cost \$59.73.

Which of the following shows the cost of the car written in word form?

- A** Fifty-nine dollars and seventy-three cents *
- B** Five hundred ninety dollars and seventy-three cents
- C** Fifty dollars and seventy-three cents
- D** Five dollars and seventy-three cents

3. Cynthia's dad earned \$40,444.40 last year.

Which of the following is the same as \$40,444.40?

- A** Four thousand, four hundred forty-four dollars and forty cents
- B** Four million, four hundred forty-four dollars and forty cents
- C** Four hundred thousand, four hundred forty dollars and forty cents
- D** Forty thousand, four hundred forty-four dollars and forty cents *

4. Samuel has coins worth two dollars and thirty cents in his pocket.

Which is the same as two dollars and thirty cents?

- A** \$2.03
- B** \$2.30 *
- C** \$23.00
- D** \$230.00

Sample Gridded Items

1. Jermaine has three dollars in paper money. He has twenty-two cents in coins.

How much money does Jermaine have altogether?

Mark your answer in the answer grid.

3. The land sold during the Gold Rush cost one dollar and sixty-three cents per acre.

What is one dollar and sixty-three cents written in numerical form?

Mark your answer in the answer grid.

2. Candace paid fifty-seven cents for lemonade.

What is this amount written in numerical form?

Mark your answer in the answer grid.

4. The price of a DVD player is one hundred fifty-six dollars and seventy-eight cents.

What value should be written on the price tag?

Mark your answer in the answer grid.

Answer Key

Content Standard 2

Sample Multiple-Choice

1. C
2. A
3. D
4. B

Sample Gridded

1. \$3.22
2. \$0.57
3. \$1.63
4. \$156.78

NUMBER AND OPERATIONS

Content Standard 3

Rename improper fractions as mixed numbers and mixed numbers as improper fractions.

Item Type

Multiple-choice

Additional Information

Use reasonable denominators less than 100.

Word problems/real-life situations may be used.

Sample Multiple-Choice Items

1. Mabel ate $\frac{4}{3}$ cupcakes.

Which of the following is
equivalent to $\frac{4}{3}$?

$$4\frac{1}{3}$$

A

$$1\frac{1}{4}$$

B

$$3\frac{1}{4}$$

C

$$1\frac{1}{3}$$

D *

2. Which of the following has the
same value as $1\frac{3}{5}$?

$$\frac{8}{5}$$

A *

$$\frac{5}{8}$$

B

$$\frac{5}{3}$$

C

$$\frac{6}{5}$$

D

3. Which of the following is
equivalent to $\frac{75}{4}$?

$18\frac{3}{18}$

A

$18\frac{3}{4}$

B *

71

C

79

D

5. Which is $\frac{5}{3}$ written as a mixed
number?

$1\frac{2}{3}$

A *

$5\frac{1}{3}$

B

$1\frac{1}{3}$

C

$5\frac{2}{3}$

D

4. Roberto solved a puzzle in
 $4\frac{1}{2}$ hours.

Which of the following is
equivalent to $4\frac{1}{2}$?

$\frac{5}{2}$

A

$\frac{8}{2}$

B

$\frac{9}{2}$

C *

$\frac{41}{2}$

D

Answer Key

Content Standard 3

Sample Multiple-Choice

1. D
2. A
3. B
4. C
5. A

NUMBER AND OPERATIONS

Content Standard 4

Demonstrate addition and subtraction of fractions with common denominators.

Item Type

Multiple-choice

Additional Information

Use reasonable denominators less than 100.

Reducing fractions will not be required.

Mixed numbers will not be used.

Sample Multiple-Choice Items

$$1. \quad \frac{10}{16} + \frac{3}{16} = \square$$

$$\frac{13}{16}$$

A *

$$\frac{13}{32}$$

B

$$\frac{7}{16}$$

C

$$\frac{7}{32}$$

D

$$2. \quad \frac{5}{6} - \frac{1}{6} = \square$$

$$\frac{4}{12}$$

A

$$\frac{6}{12}$$

B

$$\frac{4}{6}$$

C *

$$\frac{5}{6}$$

D

$$3. \frac{2}{15} + \frac{9}{15} = \square$$

$$\frac{7}{30}$$

A

$$\frac{11}{30}$$

B

$$\frac{7}{15}$$

C

$$\frac{11}{15}$$

D *

$$5. \frac{8}{9} - \frac{3}{9} = \square$$

$$\frac{5}{18}$$

A

$$\frac{5}{9}$$

B *

$$\frac{11}{18}$$

C

$$\frac{11}{9}$$

D

$$4. \frac{19}{20} - \frac{5}{20} = \square$$

$$\frac{14}{40}$$

A

$$\frac{24}{40}$$

B

$$\frac{14}{20}$$

C *

$$\frac{24}{20}$$

D

Answer Key

Content Standard 4

Sample Multiple-Choice

1. A
2. C
3. D
4. C
5. B

NUMBER AND OPERATIONS

Content Standard 5

Round whole numbers to the nearest ten, hundred, or thousand and decimals to the nearest tenth.

Item Type

Multiple-choice
Gridded

Additional Information

Word problems/real-life situations may be used.
Money values may be used.

Sample Multiple-Choice Items

1. The Colorado River is 1,387 kilometers in length.
- What is 1,387 rounded to the *nearer* hundred?

1,300 1,390 1,400 1,380

A **B** **C *** **D**

3. Jessica measured her fish tank and found its length to be 23.64 inches.
- What is 23.64 rounded to the *nearer* tenth?

23.0 23.6 23.7 24.0

A **B *** **C** **D**

2. Mr. Mason's class collected 14,391 cans to recycle.
- What is 14,391 rounded to the *nearer* ten?

A 14,000 **C** 14,400

B 14,390 * **D** 15,000

4. Mr. Fisher has \$4,551 in his bank account.
- What is \$4,551 rounded to the *nearer* thousand dollars?

A \$4,000 **C** \$4,600

B \$4,550 **D** \$5,000 *

5. What is 15,891 rounded to the *nearer* thousand?

A 16,000 *

C 15,890

B 15,900

D 15,000

Sample Gridded Items

1. Samuel's keyboard is
45.6 centimeters wide.

What is 45.6 rounded to the
nearer ten?

Mark your answer in the answer grid.

3. There are 2,475 air miles
between New York City and
Los Angeles.

What is 2,475 rounded to the
nearer hundred?

Mark your answer in the answer grid.

2. A bag of birdseed weighs
4.28 pounds.

What is 4.28 rounded to the
nearer tenth?

Mark your answer in the answer grid.

4. The wingspan of a bird in a
museum is 189.49 centimeters.

What is 189.49 rounded to the
nearer tenth?

Mark your answer in the answer grid.

Answer Key

Content Standard 5

Sample Multiple-Choice

1. C
2. B
3. B
4. D
5. A

Sample Gridded

1. 50
2. 4.3
3. 2500
4. 189.5

NUMBER AND OPERATIONS**Content Standard 6**

Solve problems, including word problems, that involve addition and subtraction of four-digit numbers with and without regrouping.

Item Type

Multiple-choice

Gridded

Open-ended

Additional Information

Word problems/real-life situations may be used.

Tables may be used.

Fractions will not be used.

Multiple steps may be used.

Money values may be used.

Sample Multiple-Choice Items

1. The land area of Gulf State Park is 6,150 acres. The land area of Oak Mountain State Park is 9,940 acres.

What is the difference in land area between the two state parks?

7,090 3,790 2,810 2,710

A**B *****C****D**

2.
$$\begin{array}{r} 4,879 \\ + 385 \\ \hline \end{array}$$

A 5,154**C** 5,263**B** 5,254**D** 5,264 *

3. $4,693 + 1,204 = \square$

- A** 4,817
- B** 5,807
- C** 5,897 *
- D** 5,933

4. Jefferson Elementary School has 1,132 students. Adams Elementary School has 1,370 students.

How many more students does Adams Elementary School have than Jefferson Elementary School?

- | | | | |
|------------|----------|----------|----------|
| 238 | 248 | 262 | 362 |
| A * | B | C | D |

Sample Gridded Items

1. The worker at a ticket office sold 4,920 tickets for the Thursday performance of a play and 3,879 for the Friday performance.

How many more tickets were sold for the Thursday performance than for the Friday performance?

Mark your answer in the answer grid.

3. The fourth-grade wing on the new elementary school has 8,998 square feet of area. The fifth-grade wing has 9,220 square feet of area.

How much larger, in square feet, is the fifth-grade wing than the fourth-grade wing?

Mark your answer in the answer grid.

2. Mr. Thomas sold ice cream over the weekend. On Saturday he earned \$52.42 and on Sunday he earned \$37.59.

In all, how much money did Mr. Thomas earn over the weekend?

Mark your answer in the answer grid.

4. Jacob went to the store to buy some clothes. He purchased a shirt for \$17.27 and a pair of pants for \$32.39.

How much did Jacob spend in all?

Mark your answer in the answer grid.

Sample Open-Ended Items

This problem requires you to show all your work or explain all your reasoning. You may use drawings, words, or numbers in your answer. Your answer should be written so that another person could read it and understand your reasoning.

1. A store sells three different sizes of boxes in which to keep trading cards. The largest box can contain up to 3,575 cards. The smallest box can contain up to 1,040 cards.
 - a. The third box can contain 1,250 cards more than the smallest box. How many fewer cards can the third box contain compared to the largest box?
 - b. Owen buys one box of each size. What is the *greatest* number of trading cards Owen can put in all three boxes combined?

Show all your work or explain your reasoning *for each part* in the space provided in the answer document.

This problem requires you to show all your work or explain all your reasoning. You may use drawings, words, or numbers in your answer. Your answer should be written so that another person could read it and understand your reasoning.

2. Jo and Ella are planning a vacation from their home in Anniston to Orlando and Washington, D.C. The distance from Anniston to Orlando is 529 miles and from Anniston to Washington, D.C., is 728 miles. It is 852 miles from Washington, D.C., to Orlando.
- If Ella and Jo go from their home in Anniston to Washington, D.C., then go on to Orlando, and from Orlando return home, how many miles would they go?
 - If Ella and Jo plan a shorter vacation going from their home in Anniston to Washington, D.C., then return home, how many *fewer* miles would they go?

Show all your work or explain your reasoning *for each part* in the space provided in the answer document.

This problem requires you to show all your work or explain all your reasoning. You may use drawings, words, or numbers in your answer. Your answer should be written so that another person could read it and understand your reasoning.

3. A store sells shoes that cost \$59.99 and sandals that cost \$23.89.
 - a. How much do the shoes and sandals cost altogether?
 - b. How much more do the shoes cost than the sandals?
 - c. The store sells gloves that cost \$5.90 less than the sandals. How much do the gloves cost?

Show all your work or explain your reasoning *for each part* in the space provided in the answer document.

This problem requires you to show all your work or explain all your reasoning. You may use drawings, words, or numbers in your answer. Your answer should be written so that another person could read it and understand your reasoning.

4. North High School's football stadium holds 8,432 fans. South High School's football stadium holds 7,696 fans.
 - a. How many more fans does North High's stadium hold than South High's stadium?
 - b. In total, how many fans do the two stadiums hold?
 - c. East High's stadium holds 1,700 more fans than North High's stadium. How many more fans does East High's stadium hold than South High's stadium?

Show all your work or explain your reasoning *for each part* in the space provided in the answer document.

This problem requires you to show all your work or explain all your reasoning. You may use drawings, words, or numbers in your answer. Your answer should be written so that another person could read it and understand your reasoning.

5. For a reading contest at school, Janet and Dwayne kept track of how many pages they read all year. Janet read 9,285 pages, and Dwayne read 1,122 pages fewer than Janet.
- How many pages did Dwayne read?
 - In total, how many pages did Janet and Dwayne read?

Show all your work or explain your reasoning *for each part* in the space provided in the answer document.

Answer Key

Content Standard 6

Sample Multiple-Choice

1. B
2. D
3. C
4. A

Sample Gridded

1. 1041
2. \$90.01
3. 222
4. \$49.66

Sample Open-Ended

(continued on next page)

1. Sample Response(s):

a. $3,575 - 1,250 - 1,040 = 1,285$

OR

$3,575 - 1,250 = 2,325$ and $2,325 - 1,040 = 1,285$

OR

$3,575 - 1,040 = 2,535$ and $2,535 - 1,250 = 1,285$

OR

$1,250 + 1,040 = 2,290$ and $3,575 - 2,290 = 1,285$

OR

Equivalent

b. $3,575 + 1,040 + 1,040 + 1,250 = 6,905$

OR

Equivalent

Score Point	Response Attributes
3	All is correct.
2	Both logics are correct. OR One or more logics and one or more answers are correct.
1	One or more answers to problems are correct without logic. OR Any one logic is correct.
0	None correct. (Also, blanks, rewrites problem, foreign language, illegible, refusals, off task, etc., scored as invalid.)

2. Sample Response(s):

a. $728 + 852 + 529 = 2,109$

OR

I used a calculator and added all three numbers to get 2,109.

OR

Equivalent

b. $2,109 - 2(728) = 653$

OR

Since it is 728 miles from Anniston to Washington, D.C., I added 728 twice to get 1,456 miles. Then I took the answer in part **a**, and subtracted 1,456 from 2,109 to get 653 fewer miles.

OR

I used my calculator to add the miles from Anniston to Washington, D.C., 2 times. Then, I subtracted that number from part **a**. They would go 653 fewer miles.

OR

Equivalent

Score Point	Response Attributes
3	All is correct.
2	Both logics are correct. OR One logic and one or more answers are correct.
1	One or more answers to problems are correct without logic. OR Any one logic is correct.
0	None correct. (Also, blanks, rewrites problem, foreign language, illegible, refusals, off task, etc., scored as invalid.)

3. Sample Response(s):

a. $\$59.99 + \$23.89 = \$83.88$

OR

Equivalent

b. $\$59.99 - \$23.89 = \$36.10$

OR

Equivalent

c. $\$23.89 - \$5.90 = \$17.99$

OR

Equivalent

Score Point	Response Attributes
3	All is correct.
2	All logics are correct. OR Two correct logics and correct answers for two problems. OR One correct logic and all answers are correct.
1	One or more answers to problems are correct without logic. OR Any one logic is correct.
0	None correct. (Also, blanks, rewrites problem, foreign language, illegible, refusals, off task, etc., scored as invalid.)

4. Sample Response(s):

a. $8,432 - 7,696 = 736$

OR

Equivalent

b. $8,432 + 7,696 = 16,128$

OR

Equivalent

c. $8,432 + 1,700 = 10,132$ and $10,132 - 7,696 = 2,436$

OR

Equivalent

Score Point	Response Attributes
3	All is correct.
2	<p>All logics are correct.</p> <p>OR</p> <p>Two correct logics and correct answers for two problems.</p> <p>OR</p> <p>One correct logic and all answers are correct.</p>
1	<p>One or more answers to problems are correct without logic.</p> <p>OR</p> <p>Any one logic is correct.</p>
0	None correct. (Also, blanks, rewrites problem, foreign language, illegible, refusals, off task, etc., scored as invalid.)

5. Sample Response(s):

a. $9,285 - 1,122 = 8,163$

OR

Equivalent

b. $9,285 + 8,163 = 17,448$

OR

Equivalent

Score Point	Response Attributes
3	All is correct.
2	Both logics are correct. OR One or more logics and one or more answers are correct.
1	One or more answers to problems are correct without logic. OR Any one logic is correct.
0	None correct. (Also, blanks, rewrites problem, foreign language, illegible, refusals, off task, etc., scored as invalid.)

NUMBER AND OPERATIONS

Content Standard 7

Solve problems, including word problems, involving the basic operations of multiplication and division on whole numbers through two-digit multipliers and one-digit divisors.

Item Type

Multiple-choice
Open-ended

Additional Information

Word problems/real-life situations may be used.
Tables may be used.
Fractions will not be used.
Division with remainders will not be used.
Money values may be used.

Sample Multiple-Choice Items

1.
$$\begin{array}{r} 52 \\ \times 60 \\ \hline \end{array}$$

- A** 3,120 * **C** 312
B 3,102 **D** 300

3.
$$\begin{array}{r} 135 \\ \times 12 \\ \hline \end{array}$$

- 395 405 1,610 1,620
A **B** **C** **D** *

2. $3,570 \div 7 = \square$

- 51 501 510 5,010
A **B** **C** * **D**

4. Sammy had 75 pieces of candy. He gave an equal number of pieces of candy to each of his 5 friends.

What is the total number of pieces of candy Sammy gave to each friend?

80 70 25 15
A **B** **C** **D ***

6. Mrs. Grimes will put 14 markers in each box.

How many markers will Mrs. Grimes need to fill 4 boxes?

10 18 46 56
A **B** **C** **D ***

5. There are 27 students in Abigail's history class. Abigail wants to give 12 stickers to each student in her class.

What is the total number of stickers Abigail will need?

A 540 **C** 324 *
B 394 **D** 319

Sample Open-Ended Items

This problem requires you to show all your work or explain all your reasoning. You may use drawings, words, or numbers in your answer. Your answer should be written so that another person could read it and understand your reasoning.

1. In an art class, 24 students each were given 14 colored pencils.
 - a. What was the total number of colored pencils the students were given?
 - b. At the end of class, the students put all the colored pencils into 7 jars. Each jar had the same number of colored pencils. How many colored pencils were in each jar?

Show all your work or explain your reasoning *for each part* in the space provided in the answer document.

This problem requires you to show all your work or explain all your reasoning. You may use drawings, words, or numbers in your answer. Your answer should be written so that another person could read it and understand your reasoning.

2. Devon has 16 boxes. Each box has 142 golf balls in it.
 - a. How many golf balls are there in all?
 - b. Devon has 4 large bins and he wants to separate all the golf balls equally. How many golf balls should go into each of the 4 bins?

Show all your work or explain your reasoning *for each part* in the space provided in the answer document.

This problem requires you to show all your work or explain all your reasoning. You may use drawings, words, or numbers in your answer. Your answer should be written so that another person could read it and understand your reasoning.

3. Aria has a jar with *exactly* 180 jellybeans. She wants to give an equal number of jellybeans to 4 of her friends.
 - a. How many jellybeans would each friend get?
 - b. If Aria gave 180 jellybeans to 6 of her friends, how many jellybeans would each friend get?

Show all your work or explain your reasoning *for each part* in the space provided in the answer document.

This problem requires you to show all your work or explain all your reasoning. You may use drawings, words, or numbers in your answer. Your answer should be written so that another person could read it and understand your reasoning.

4. Mary's mom is planning a party. There will be a total of 18 children.
 - a. If each child gets 2 scoops of ice cream, how many scoops of ice cream in total will Mary's mom need?
 - b. If Mary's mom can get 6 scoops of ice cream out of every container, how many containers will she need to buy?

Show all your work or explain your reasoning *for each part* in the space provided in the answer document.

This problem requires you to show all your work or explain all your reasoning. You may use drawings, words, or numbers in your answer. Your answer should be written so that another person could read it and understand your reasoning.

5. A farmer has 15 packs of sunflower seeds. Each pack has 26 sunflower seeds.
 - a. How many sunflower seeds in total does the farmer have?
 - b. The farmer wants to plant 112 sunflower seeds with 8 seeds in each row. How many rows of seeds does the farmer need to plant?

Show all your work or explain your reasoning *for each part* in the space provided in the answer document.

Answer Key

Content Standard 7

Sample Multiple-Choice

1. A
2. C
3. D
4. D
5. C
6. D

Sample Open-Ended

1. Sample Response(s): a. $24 \times 14 = 336$ colored pencils OR Equivalent b. $336 \div 7$ or $336/7 = 48$ colored pencils OR Equivalent	
Score Point	Response Attributes
3	All is correct.
2	Two logics and one answer are correct. <div style="text-align: center;">OR</div> One logic and two answers are correct.
1	One or more answers to problems are correct without logic. <div style="text-align: center;">OR</div> Any one logic is correct.
0	None correct. (Also, blanks, rewrites problem, foreign language, illegible, refusals, off task, etc., scored as invalid.)

2. Sample Response(s):

- a.** To find the total number of golf balls in all, I multiplied 142 and 16 to get 2,272.

OR

$$142 \times 16 = 2,272 \text{ golf balls.}$$

OR

Equivalent

- b.** To separate all the golf balls equally, I divided 2,272 by 4 to get 568.

OR

$$2,272 \div 4 = 568 \text{ golf balls}$$

OR

Equivalent

Score Point	Response Attributes
3	All is correct.
2	Two logics are correct. OR One logic and all answers are correct.
1	One or more answers to problems are correct without logic. OR Any one logic is correct.
0	None correct. (Also, blanks, rewrites problem, foreign language, illegible, refusals, off task, etc., scored as invalid.)

3. Sample Response(s):

- a.** There are 180 jellybeans and 4 friends, so I divided 180 by 4. Each friend would get 45 jellybeans.

OR

180 ÷ 4 = 45. Each friend would get 45 jellybeans.

OR

Equivalent

- b.** This time there are still 180 jellybeans, but 6 friends. I divided 180 by 6. Each friend would get 30 jellybeans.

OR

Equivalent

Score Point	Response Attributes
3	All is correct.
2	Two logics are correct. OR One logic and all answers are correct.
1	One or more answers to problems are correct without logic. OR Any one logic is correct.
0	None correct. (Also, blanks, rewrites problem, foreign language, illegible, refusals, off task, etc., scored as invalid.)

4. Sample Response(s):

- a.** There are 18 children and each child gets 2 scoops. Mary’s mom will need 36 total scoops of ice cream.

OR

$(18 \times 2 = 36 \text{ scoops})$

OR

Equivalent

- b.** Since Mary’s mom needs 36 scoops of ice cream and she can get 6 scoops out of 1 container, then she will need 6 containers.

OR

$(36 \div 6 = 6 \text{ containers})$

OR

Equivalent

Score Point	Response Attributes
3	All is correct.
2	Two logics are correct. OR One logic and all answers are correct.
1	One or more answers to problems are correct without logic. OR Any one logic is correct.
0	None correct. (Also, blanks, rewrites problem, foreign language, illegible, refusals, off task, etc., scored as invalid.)

5. Sample Response(s):

a. $15 \times 26 = 390$ seeds

OR

Equivalent

b. $112 \div 8 = 14$ rows

OR

Equivalent

Score Point	Response Attributes
3	All is correct.
2	Two logics and one answer are correct. OR One logic and two answers are correct.
1	One or more answers to problems are correct without logic. OR Any one logic is correct.
0	None correct. (Also, blanks, rewrites problem, foreign language, illegible, refusals, off task, etc., scored as invalid.)

NUMBER AND OPERATIONS

Content Standard 8

Recognize equivalent forms of commonly used fractions and decimals.

Item Type

Multiple-choice

Additional Information

Word problems/real-life situations may be used.

Items may give fraction and ask for decimal equivalent.

Items may give decimal and ask for fraction equivalent.

Money equivalents may be used.

Graphics will not be used.

Reducing fractions will be required.

Sample Multiple-Choice Items

1. Which of the following is equivalent to 0.83?

$$8 \frac{3}{10}$$

A

$$8 \frac{3}{100}$$

B

$$\frac{83}{100}$$

C *

$$\frac{830}{10}$$

D

3. Which of the following is equivalent to $\frac{2}{5}$?

0.1

A

1.2

B

0.4

C *

0.5

D

2. Which of the following is equivalent to $\frac{1}{2}$?

A 0.12

C 1.02

B 0.50 *

D 1.2

4. Richard had to unload 50 boxes from a truck. He unloaded 20 boxes in the morning and the rest in the afternoon.

What fraction of the boxes did Richard unload in the afternoon?

$\frac{3}{5}$ $\frac{1}{2}$ $\frac{2}{5}$ $\frac{2}{3}$
A * **B** **C** **D**

6. Jake played the piano for $\frac{1}{4}$ of an hour.

What decimal is equivalent to $\frac{1}{4}$?

0.14 0.20 0.25 0.75
A **B** **C *** **D**

5. What fraction of a dollar is 20 cents?

$\frac{1}{20}$ $\frac{2}{100}$ $\frac{1}{2}$ $\frac{1}{5}$
A **B** **C** **D ***

7. Stuart had 100 stickers in his collection. He placed $\frac{2}{10}$ of them on his folder.

What decimal is equivalent to $\frac{2}{10}$?

0.01 0.10 0.02 0.20
A **B** **C** **D ***

8. Which is equivalent to 0.17?

$$\frac{1}{7}$$

A

$$\frac{17}{100}$$

B *

$$\frac{7}{10}$$

C

$$\frac{100}{17}$$

D

10. Which fraction is equivalent
to $\frac{6}{24}$?

$$\frac{1}{4}$$

A *

$$\frac{2}{6}$$

B

$$\frac{1}{5}$$

C

$$\frac{3}{8}$$

D

9. Lanny used $\frac{9}{10}$ of a dollar to buy a
small carton of milk.

What amount of money is
equivalent to $\frac{9}{10}$ of a dollar?

\$0.99

A

\$0.90

B *

\$0.10

C

\$0.09

D

Answer Key

Content Standard 8

Sample Multiple-Choice

1. C
2. B
3. C
4. A
5. D
6. C
7. D
8. B
9. B
10. A

ALGEBRA

Content Standard 9

Write number sentences for word problems that involve multiplication or division.

Item Type

Multiple-choice

Additional Information

Word problems/real-life situations may be used.

One- or two-digit divisors may be used.

Two-digit multipliers may be used.

Sample Multiple-Choice Items

1. Jerry gave 12 pieces of candy to each of his 10 friends.

Which number sentence could be used to determine how many pieces of candy Jerry gave away?

- A** $12 \times 10 = \square$ *
- B** $12 \div 10 = \square$
- C** $12 + 10 = \square$
- D** $12 - 10 = \square$

2. The auditorium has 480 seats. There are exactly 60 seats in each row.

Which number sentence could be used to find how many rows are in the auditorium?

- A** $480 - 60 = \square$
- B** $480 \times 60 = \square$
- C** $480 + 60 = \square$
- D** $480 \div 60 = \square$ *

3. There are 19 shelves in the library. Each shelf has exactly 27 books.

Which number sentence could be used to find B , the total number of books in the library?

- A** $27 \times 19 = B$ *
- B** $27 + 19 = B$
- C** $27 \div 19 = B$
- D** $27 - 19 = B$

5. Debbie bought 18 hair clips. Each hair clip costs \$3, including tax.

Which number sentence could be used to determine the total cost of the hair clips?

- A** $18 + \$3 = \square$
- B** $18 - \$3 = \square$
- C** $18 \times \$3 = \square$ *
- D** $18 \div \$3 = \square$

4. Mr. Lester has 120 cookies to pack in boxes. He will pack 20 cookies in each box.

Which number sentence could be used to determine B , the total number of boxes Mr. Lester needs to pack the cookies?

- A** $120 - 20 = B$
- B** $120 \div 20 = B$ *
- C** $120 \times 20 = B$
- D** $120 + 20 = B$

6. Melissa spent \$8.58 for a package of 6 golf balls.

Which number sentence could be used to determine the price per golf ball if the golf balls were sold individually?

- A** $\$8.58 \times 6 = \square$
- B** $\$8.58 - 6 = \square$
- C** $\$8.58 + 6 = \square$
- D** $\$8.58 \div 6 = \square$ *

7. Which word problem can be solved using this number sentence?

$$32 \times 16 = \square$$

- A** The lunchroom had 32 tables. The teachers removed 16 tables. How many tables remained in the lunchroom?
- B** The lunchroom had 32 tables. The teachers brought in 16 more tables. How many tables are now in the lunchroom?
- C** The lunchroom has 32 tables. There are 16 students sitting at each table. How many students in total are sitting at tables in the lunchroom? *
- D** The lunchroom has 32 tables. The students are split into 16 groups, and the groups sit at different tables. How many tables are there for each group?

8. Which word problem can be solved using this number sentence?

$$27 \div 3 = \square$$

- A** The 27 students in Mr. Baker's class went on a field trip. Including Mr. Baker, 3 adults also went on the field trip. How many students and adults in total went on the field trip?
- B** Mr. Baker gave 3 pencils to each of the 27 students in his class. How many pencils in total did Mr. Baker give to his students?
- C** Of the 27 students in Mr. Baker's class, 3 students do not ride the bus. How many students in Mr. Baker's class ride the bus?
- D** The 27 students in Mr. Baker's class were put into 3 groups. Each group had the same number of students. How many students were in each group? *

Answer Key

Content Standard 9

Sample Multiple-Choice

1. A
2. D
3. A
4. B
5. C
6. D
7. C
8. D

ALGEBRA

Content Standard 10

Complete addition and subtraction number sentences with a missing addend or subtrahend.

Item Type

Multiple-choice
Gridded

Additional Information

Word problems/real-life situations may be used.

Use up to 4-digit numbers.

Money values may be used.

A box may be used.

Sample Multiple-Choice Items

1. What number goes in the \square to make the number sentence below true?

$$3,652 - \square = 2,145$$

- A** 1,497 **C** 3,407
B 1,507 * **D** 5,797

3. What number goes in the \square to make the number sentence below true?

$$\square - 42 = 294$$

- 764 722 336 366
A **B** **C** * **D**

2. What number goes in the \square to make the number sentence below true?

$$12 + \square = 92$$

- 104 92 80 71
A **B** **C** * **D**

4. What number goes in the \square to make the number sentence true?

$$\square - 14 = 1,904$$

- A** 1,918 * **C** 1,890
B 1,908 **D** 1,880

5. What number goes in the \square to make the number sentence below true?

$$3,429 + \square = 3,783$$

66 354 364 7,566

A **B *** **C** **D**

7. The area of Barbados is 91 square kilometers greater than the area of Grenada. The number sentence below can be used to determine the area of Grenada.

$$430 - \square = 91$$

What is the area, in square kilometers, of Grenada?

521 511 349 339

A **B** **C** **D ***

6. Callie has \$19 to spend. She wants to buy a baseball glove that costs \$26. The number sentence below can be used to determine how much more money she needs to buy the baseball glove.

$$\square + \$19 = \$26$$

How much more money does Callie need to buy the baseball glove?

\$7 \$17 \$35 \$45

A * **B** **C** **D**

8. When Juan entered the department store, he had \$68 in his pocket. When he left the department store, he only had \$49. The number sentence below can be used to determine the amount of money he spent in the department store.

$$\$68 - \square = \$49$$

How much money did Juan spend in the department store?

\$19 \$29 \$107 \$117

A * **B** **C** **D**

Sample Gridded Items

1. What number goes in the to make the number sentence below true?

$$\square + 17 = 96$$

Mark your answer in the answer grid.

3. What number goes in the to make the number sentence below true?

$$\square + 32 = 75$$

Mark your answer in the answer grid.

2. What number goes in the to make the number sentence below true?

$$58 - \square = 48$$

Mark your answer in the answer grid.

4. Dimitri scored 37 more points during the basketball season than Evette. Dimitri scored a total of 123 points. The number of points Evette scored can be determined by solving the number sentence below.

$$37 + \square = 123$$

What is the total number of points scored by Evette?

Mark your answer in the answer grid.

5. What number goes in the \square to make the number sentence below true?

$$\square - 56 = 272$$

Mark your answer in the answer grid.

6. What number goes in the \square to make the number sentence below true?

$$97 - \square = 40$$

Mark your answer in the answer grid.

7. The workers in the school store ordered 4,500 pencils. They ordered 2,800 more pencils than pens. The number of pens they ordered can be determined by solving the number sentence below.

$$2,800 + \square = 4,500$$

How many pens did the workers order?

Mark your answer in the answer grid.

Answer Key

Content Standard 10

Sample Multiple-Choice

1. B
2. C
3. C
4. A
5. B
6. A
7. D
8. A

Sample Gridded

1. 79
2. 10
3. 43
4. 86
5. 328
6. 57
7. 1700

GEOMETRY**Content Standard 11**

Identify triangles, quadrilaterals, pentagons, hexagons, or octagons based on the number of sides, angles, and vertices.

Item Type

Multiple-choice

Additional Information

Graphics may be used.

Word problems/real-life situations will be used.

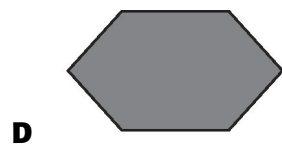
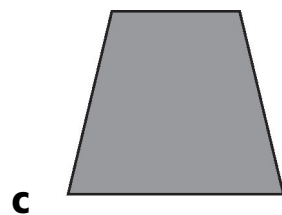
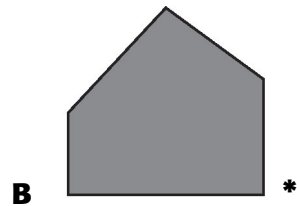
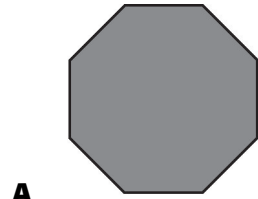
Heptagons may be used.

Sample Multiple-Choice Items

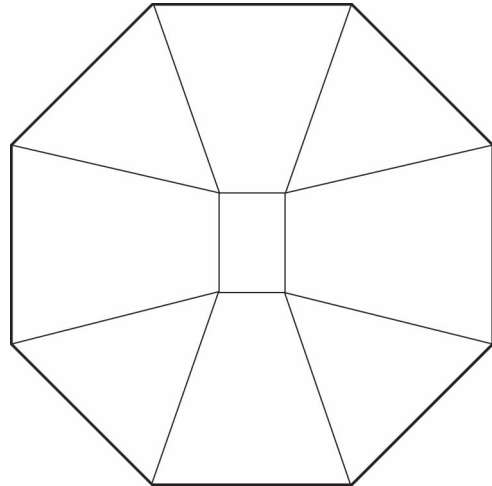
1. In which pair of shapes does each shape have *exactly* 4 sides?

- A** Pentagon and rectangle
- B** Trapezoid and triangle
- C** Square and hexagon
- D** Rectangle and square *

2. Which figure shown below is a pentagon?



3. Macy picked up a vegetable container like the one pictured below.



What type of shape does the outside edge of the container form?

A Octagon *

C Pentagon

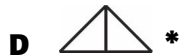
B Hexagon

D Quadrilateral

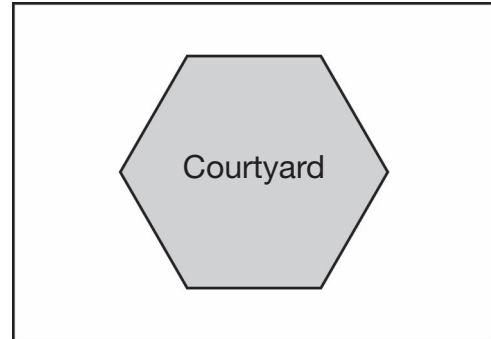
4. Jake put these two shapes together to make a quadrilateral.



Which shape could *not* be the shape Jake made?



6. The top view of a hotel courtyard is pictured below.



What type of shape is the courtyard in the picture?

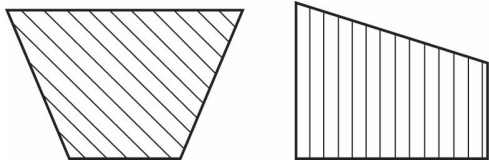
- A** Quadrilateral **C** Octagon
B Pentagon **D** Hexagon *

5. Austin's garden is in the shape of a quadrilateral.

What is the total number of vertices in a quadrilateral?

- 3 4 5 6
A **B** * **C** **D**

7. Callie cut two shapes, like the ones pictured below, out of a magazine and glued them to her poster.



Which statement *best* describes the two shapes?

- A** Both are triangles.
- B** Both are hexagons.
- C** Both are pentagons.
- D** Both are quadrilaterals. *

8. Marilyn is sketching a hexagon on her folder.

What is the total number of angles in a hexagon?

- | | | | |
|----------|------------|----------|----------|
| 8 | 6 | 5 | 4 |
| A | B * | C | D |

9. Rosa is painting a piece of wood with *exactly* 7 sides and 7 vertices.

What shape is the piece of wood?

- A** Heptagon *
- B** Hexagon
- C** Pentagon
- D** Quadrilateral

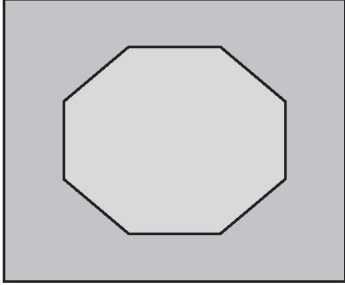
10. What is the total number of sides on an octagon?

- | | | | |
|------------|----------|----------|----------|
| 8 | 6 | 5 | 4 |
| A * | B | C | D |

11. Which list shows three types of geometric figures sorted in order from the *least* number of vertices to the *greatest* number of vertices?

- A** Pentagon, Hexagon, Quadrilateral
- B** Octagon, Triangle, Hexagon
- C** Triangle, Pentagon, Quadrilateral
- D** Quadrilateral, Hexagon, Octagon *

12. The picture below shows a tile on the side of a swimming pool.



Which *best* describes the two shapes on the tile?

- A** An octagon inside a quadrilateral *
- B** An octagon inside a pentagon
- C** A hexagon inside a quadrilateral
- D** A hexagon inside a pentagon

13. Which type of geometric figure has *exactly* 4 vertices?

- A** Triangle
- B** Hexagon
- C** Quadrilateral *
- D** Pentagon

Answer Key

Content Standard 11

Sample Multiple-Choice

1. D
2. B
3. A
4. D
5. B
6. D
7. D
8. B
9. A
10. A
11. D
12. A
13. C

GEOMETRY

Content Standard 12

Find locations on a map or a grid using ordered pairs.

Item Type

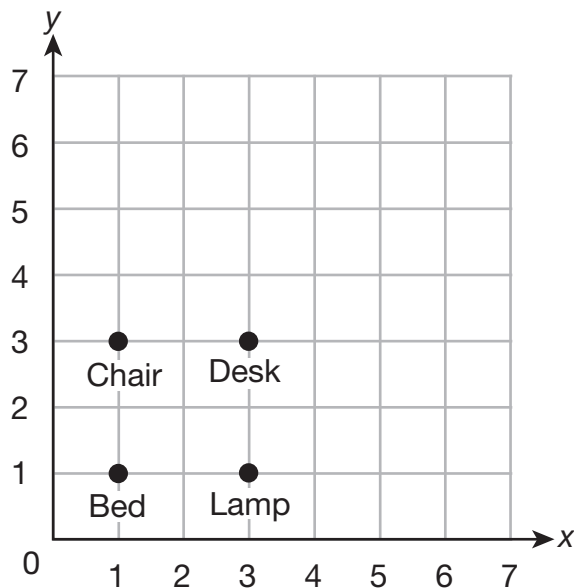
Multiple-choice

Additional Information

Word problems/real-life situations may be used.

Sample Multiple-Choice Items

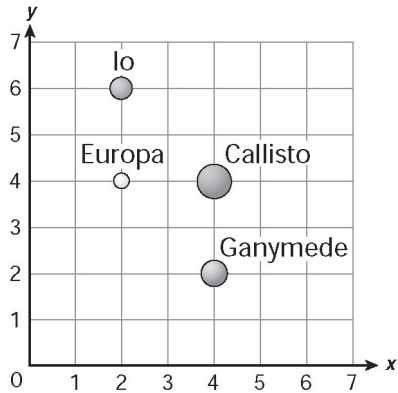
1. The grid below shows the location of items in Benita's room.



Which ordered pair represents the location of the chair?

- A** (1,1)
- B** (3,3)
- C** (1,3) *
- D** (3,1)

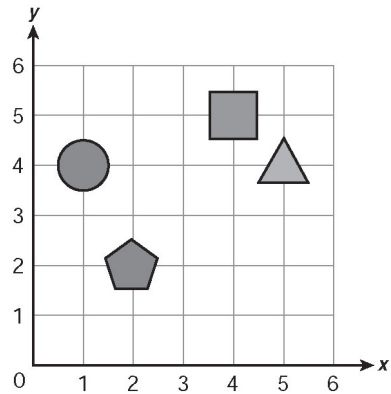
2. Jupiter has many moons. The grid below shows Jupiter's 4 largest moons.







Which moon appears to be located at (4, 2) on the grid?

- A** Callisto
- B** Europa
- C** Ganymede *
- D** Io

3. The grid below shows 4 shapes.

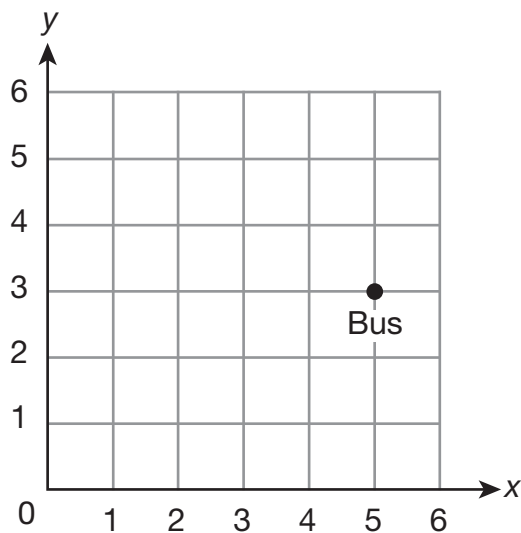


Which shape appears to be located at (4, 5) on the grid?

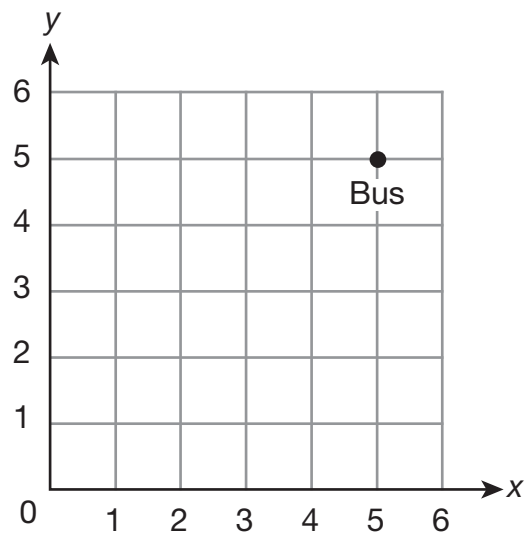
- A** 
- B**  *
- C** 
- D** 

4. A grid shows the location of a parked bus at the point $(5, 3)$.

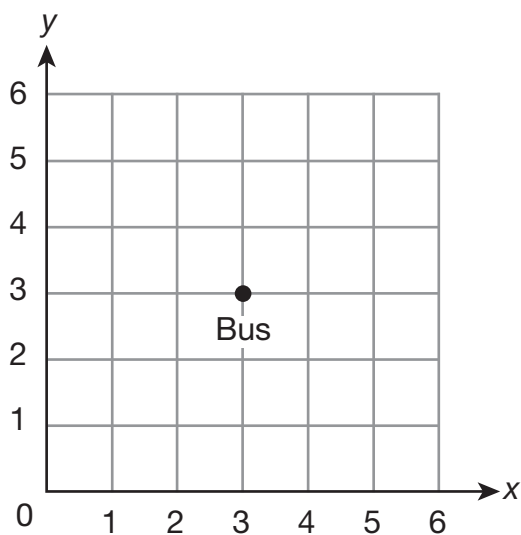
Which grid shows the bus at $(5, 3)$?



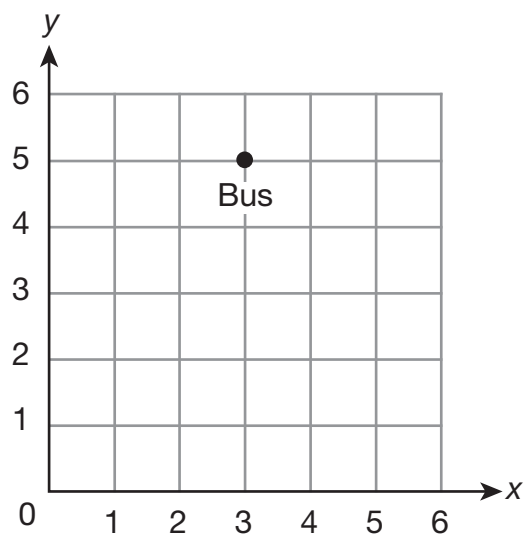
A *



C

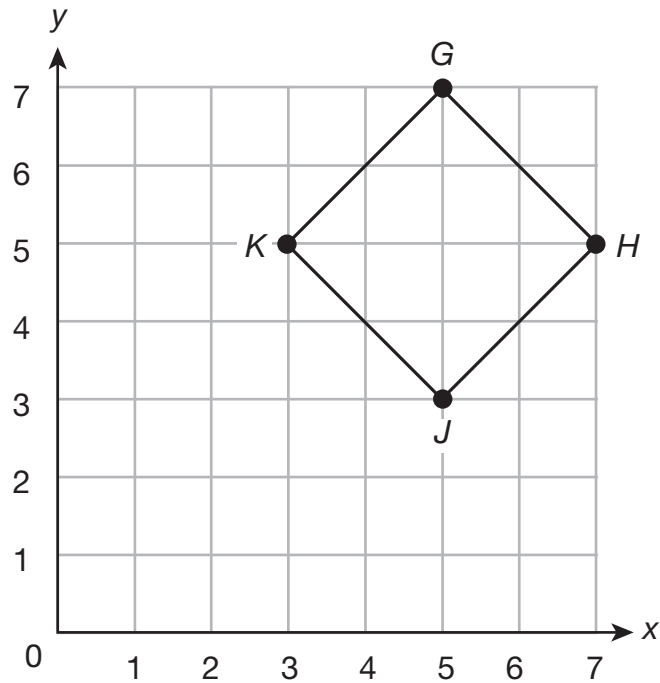


B



D

5. The grid below shows a figure Spencer drew.



Which point is located at (7, 5) on the grid?

- A** Point *G*
- B** Point *H* *
- C** Point *J*
- D** Point *K*

Answer Key

Content Standard 12

Sample Multiple-Choice

1. C
2. C
3. B
4. A
5. B

MEASUREMENT**Content Standard 13**

Calculate elapsed time in hours and minutes.

Item Type

Multiple-choice

Additional Information

Word problems/real-life situations may be used.
Will include a start time and an end time.

Sample Multiple-Choice Items

1. Hal's race began at 8:15 A.M.
The race ended at 3:30 P.M.

What was the total time of the race?

- A** 5 hours and 15 minutes
- B** 7 hours and 15 minutes *
- C** 8 hours and 45 minutes
- D** 11 hours and 45 minutes

2. Angela began studying at 3:17 P.M.
She studied until 4:22 P.M.

How long did Angela study?

- A** 49 minutes
- B** 55 minutes
- C** 1 hour and 5 minutes *
- D** 1 hour and 32 minutes

3. Renee arrived at a friend's house at 11:15 A.M. She left at 4:05 P.M.

How long was Renee at her friend's house?

- A** 4 hours and 50 minutes *
- B** 5 hours and 10 minutes
- C** 7 hours and 10 minutes
- D** 15 hours and 20 minutes

4. Keefe put a cake in the oven at 12:35 P.M. He took the cake out of the oven at 1:28 P.M.

What is the total amount of time the cake was in the oven?

- A** 47 minutes
- B** 53 minutes *
- C** 1 hour and 7 minutes
- D** 2 hours and 3 minutes

Answer Key

Content Standard 13

Sample Multiple-Choice

1. B
2. C
3. A
4. B

MEASUREMENT**Content Standard 14**

Measure length, width, weight, and capacity using metric and customary units, and temperature in degrees Fahrenheit and degrees Celsius.

Item Type

Multiple-choice

Additional Information

Thermometers will not have both Celsius and Fahrenheit scales.

Measure length to the nearer whole unit, half unit, quarter unit.

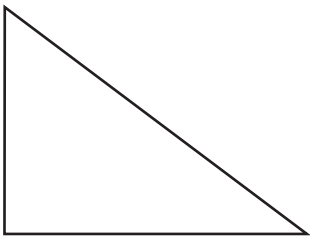
Word problems/real-life situations may be used.

Measurements of mass may be used.

Sample Multiple-Choice Items

1. Use your centimeter ruler to help you answer this question.

Yvette drew the triangle shown below.




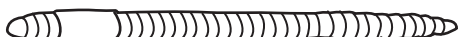


What is the distance, in centimeters, around the triangle?

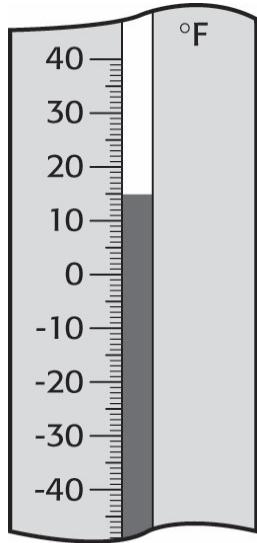
- A** 9 centimeters
- B** 10 centimeters
- C** 11 centimeters
- D** 12 centimeters *

2. Monica found a worm with a length of 5 centimeters.

Which could be the worm Monica found?

- A** 
|—— Length ——|
- B** 
|—— Length ——| *
- C** 
|—— Length ——|
- D** 
|—— Length ——|

3. The thermometer below shows the temperature in Minneapolis, Minnesota, on February 26.



Which is *closest* to the temperature shown on the thermometer?

- 10 °F 15 °F 20 °F 25 °F
A **B *** **C** **D**

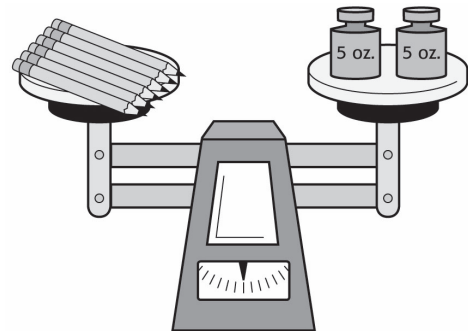
4. Look at the drawing of an eraser below.



Using your ruler, what is the width of the eraser to the *nearer* half-centimeter?

- 1 cm 1.5 cm 2 cm 2.5 cm
A * **B** **C** **D**

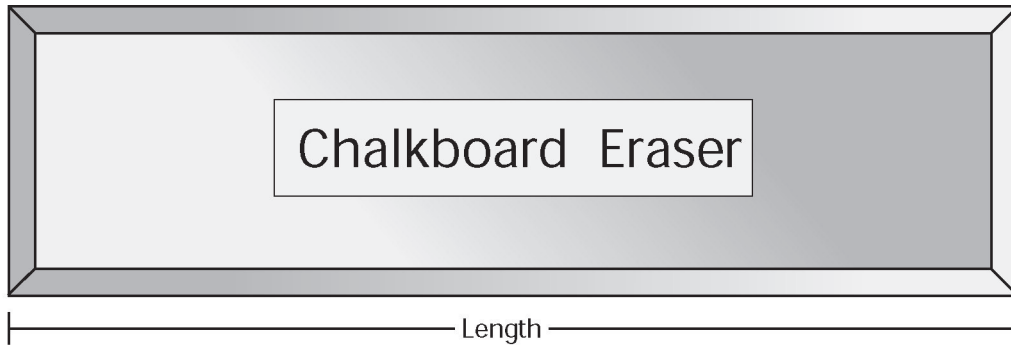
5. The scale below is balanced.



What is the mass, in ounces, of the pencils?

- 2 5 6 10
A **B** **C** **D ***

6. Look at the drawing of a chalkboard eraser shown below.



Using your ruler, what is the length of the eraser to the *nearer* quarter-inch?

5 in.

A

$5 \frac{1}{4}$ in.

B *

$5 \frac{1}{2}$ in.

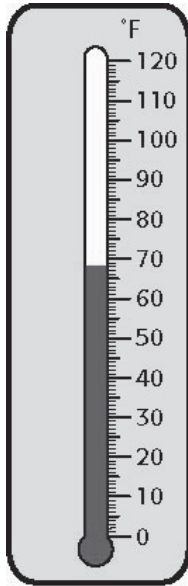
C

$5 \frac{3}{4}$ in.

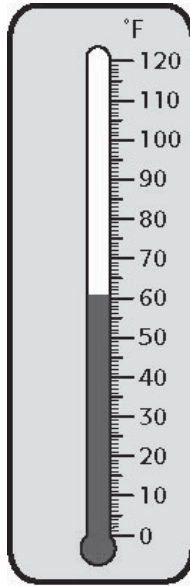
D

7. The temperature at the peak of Mt. Cheaha is 68 °F.

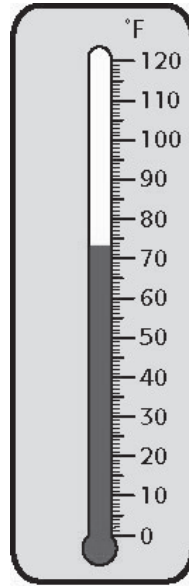
Which thermometer below shows the correct temperature at the peak of Mt. Cheaha?



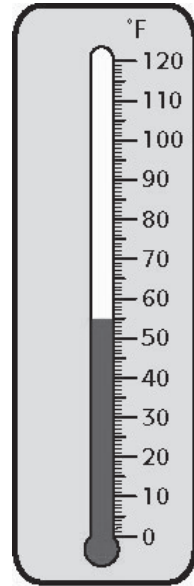
A *



B

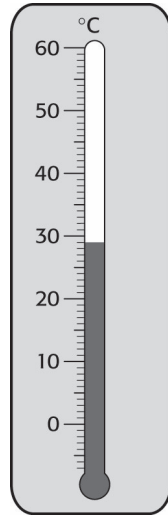


C



D

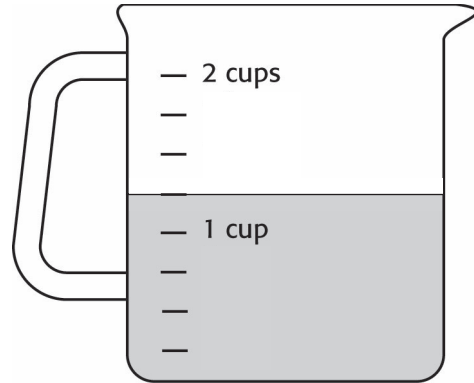
8. The thermometer below shows the high temperature for a day in September.



Which is *closest* to the temperature shown on the thermometer?

- 3 °C 21 °C 29 °C 31 °C
A **B** **C *** **D**

9. Gretta poured juice into a measuring container like the one shown below.

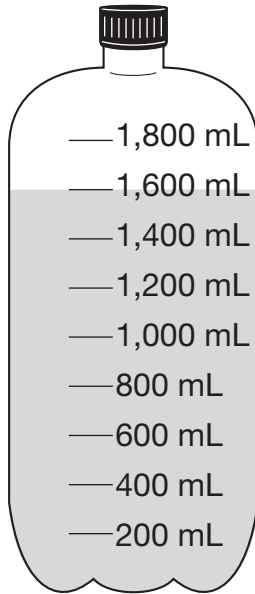


How much juice is in the container?

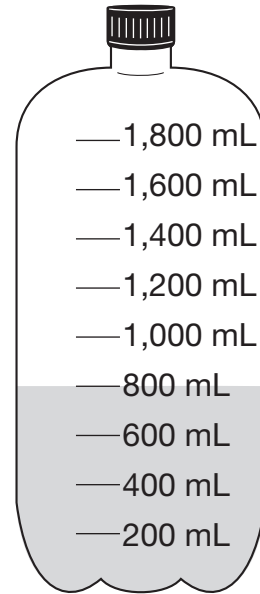
- $\frac{1}{4}$ cup 1 cup $1\frac{1}{4}$ cups $1\frac{1}{2}$ cups
A **B** **C *** **D**

10. Ellen has a bottle of water with 600 milliliters remaining in it.

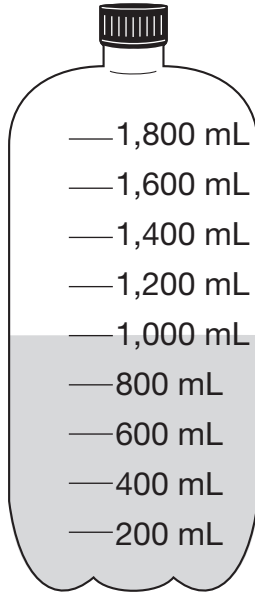
Which bottle shows 600 mL remaining in it?



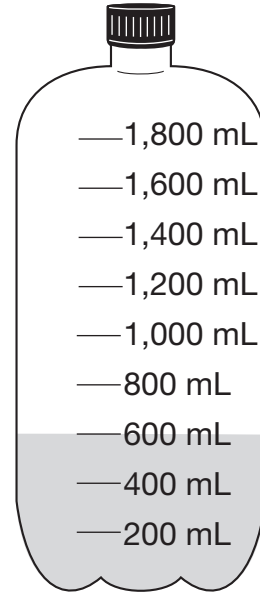
A



C



B



D *

Answer Key

Content Standard 14

Sample Multiple-Choice

1. D
2. B
3. B
4. A
5. D
6. B
7. A
8. C
9. C
10. D

DATA ANALYSIS AND PROBABILITY

Content Standards 15 & 17

Represent categorical and numerical data using tables and graphs, including bar graphs, line graphs, and line plots.

Item Type

Multiple-choice

Open-ended

Additional Information

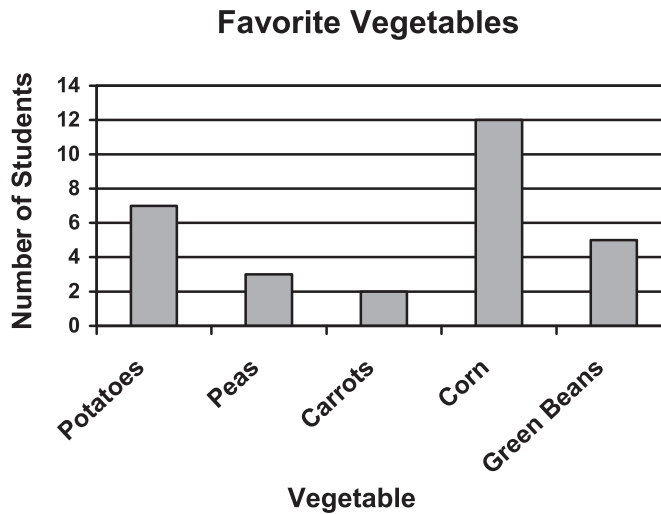
Data in graphs, tables, etc., limited to no more than 5 items.

Word problems/real-life situations may be used.

Sample Multiple-Choice Items

(continued on next page)

1. Mrs. Maguire surveyed her fourth-grade class to learn their favorite vegetables. The results are in the following graph.



Which table *best* represents the data in the graph?

Favorite Vegetables

Vegetable	Number of Students
Potatoes	7
Peas	2
Carrots	2
Corn	12
Green Beans	4

A

Favorite Vegetables

Vegetable	Number of Students
Potatoes	8
Peas	4
Carrots	2
Corn	12
Green Beans	6

C

Favorite Vegetables

Vegetable	Number of Students
Potatoes	7
Peas	3
Carrots	2
Corn	12
Green Beans	5

B *

Favorite Vegetables

Vegetable	Number of Students
Potatoes	6
Peas	3
Carrots	2
Corn	10
Green Beans	5

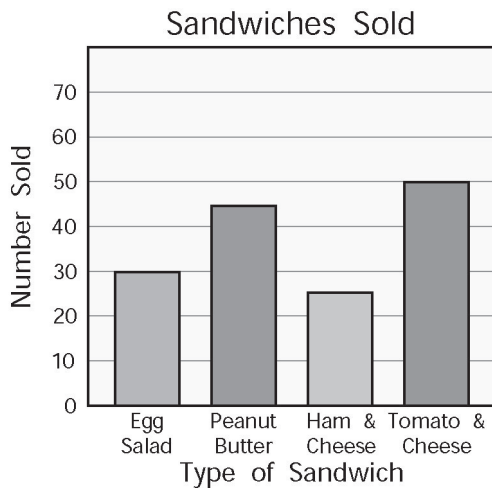
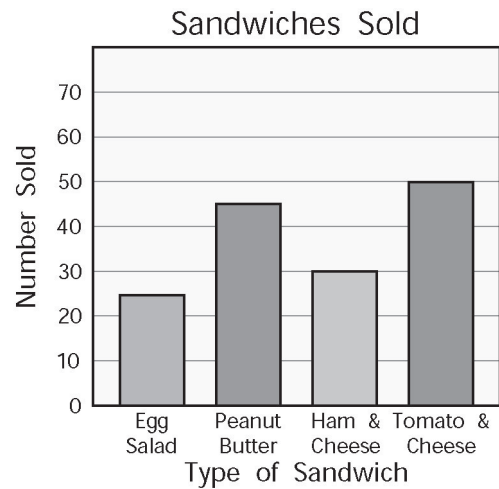
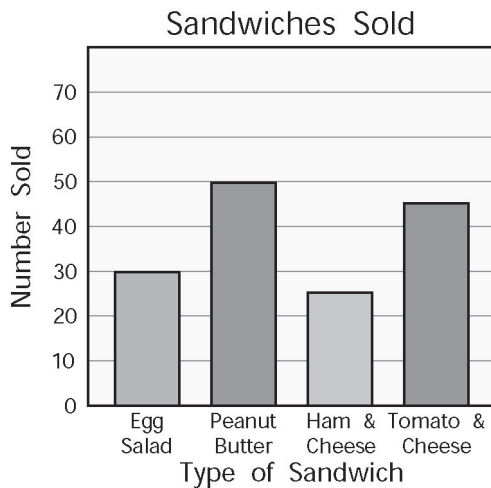
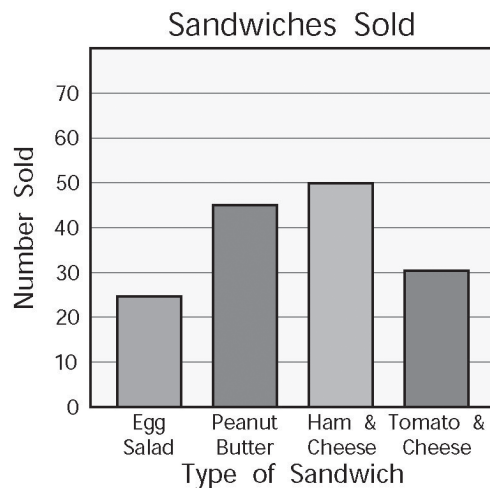
D

2. The manager of the cafeteria counted the number of sandwiches sold on a particular day. The results are shown in the table below.

Sandwiches Sold

Type of Sandwich	Egg Salad	Peanut Butter	Ham & Cheese	Tomato & Cheese
Number Sold	30	45	25	50

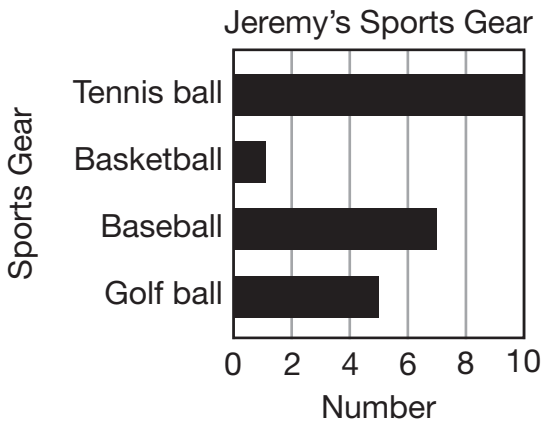
Which graph *best* represents the data in the table?

**A *****C****B****D**

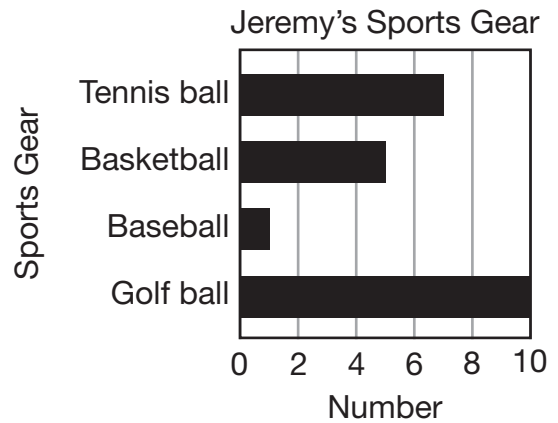
3. The tally chart below shows Jeremy's sports gear.

Jeremy's Sports Gear	
Sports Gear	Number
Tennis ball	
Basketball	
Baseball	
Golf ball	

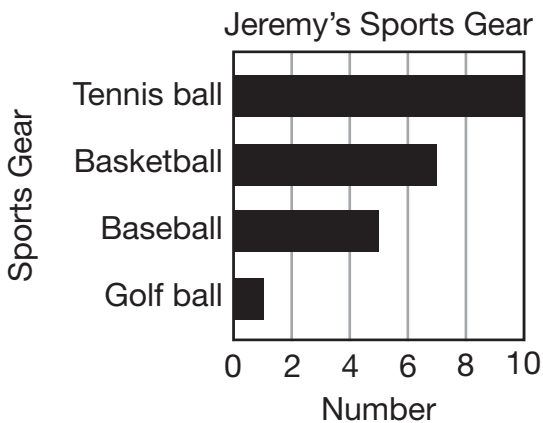
Which graph *best* represents the data from the tally chart?



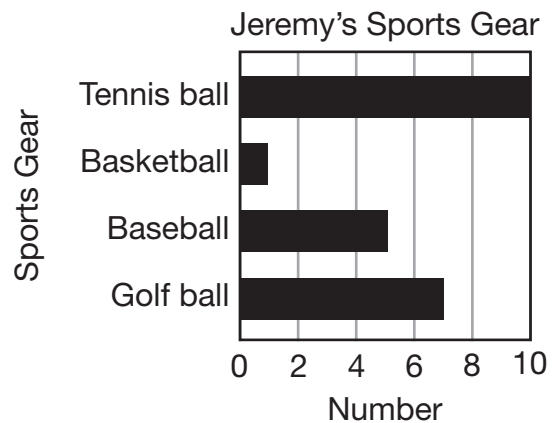
A



C



B



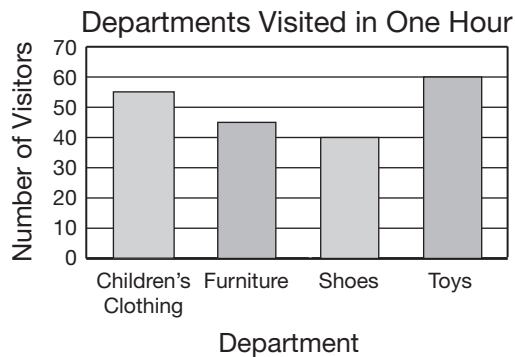
D *

4. The workers at a department store kept track of the total number of people who visited different departments during a one-hour time period. The results are shown in the table below.

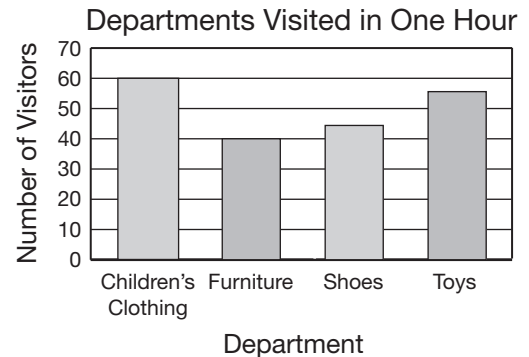
Departments Visited in One Hour

Department	Total Number of Visitors
Children's Clothing	60
Furniture	40
Shoes	45
Toys	55

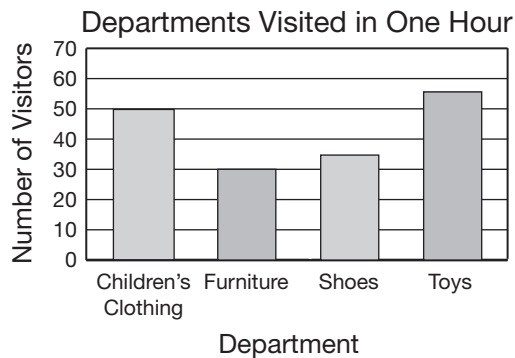
Which graph *best* represents the data in the table?



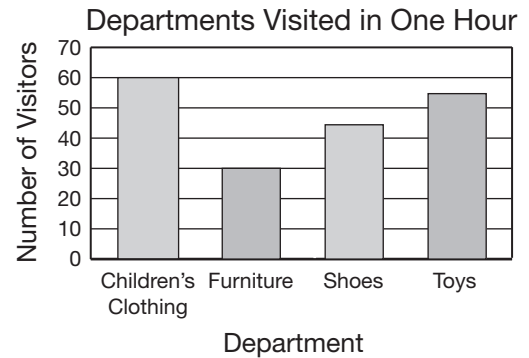
A



C *

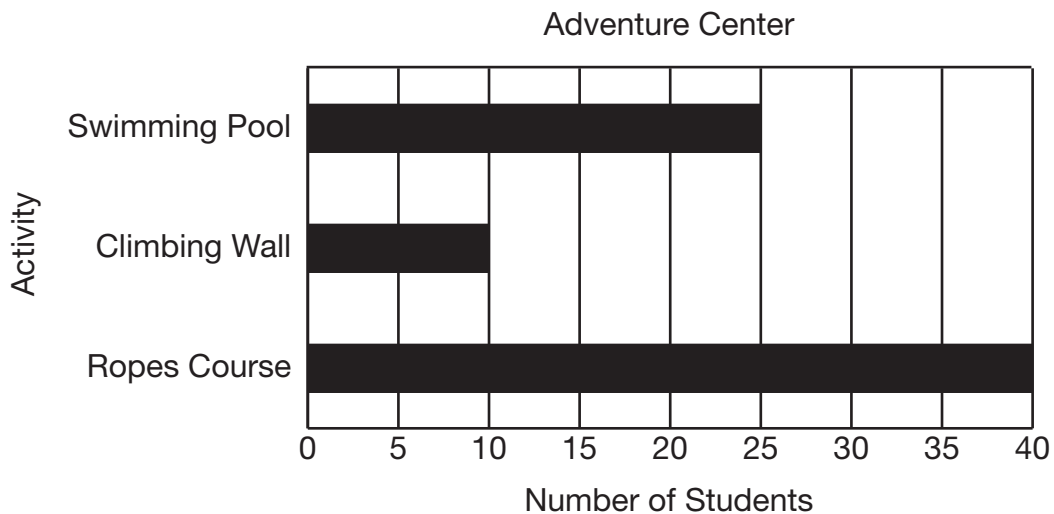


B



D

5. The bar graph below shows the number of students at each activity in the Adventure Center.



Which table *best* represents the data in the bar graph?

Adventure Center

Activity	Swimming Pool	Climbing Wall	Ropes Course
Number of Students	25	40	10

A

Adventure Center

Activity	Swimming Pool	Climbing Wall	Ropes Course
Number of Students	10	25	40

B

Adventure Center *

Activity	Swimming Pool	Climbing Wall	Ropes Course
Number of Students	25	10	40

C

Adventure Center

Activity	Swimming Pool	Climbing Wall	Ropes Course
Number of Students	30	15	40

D

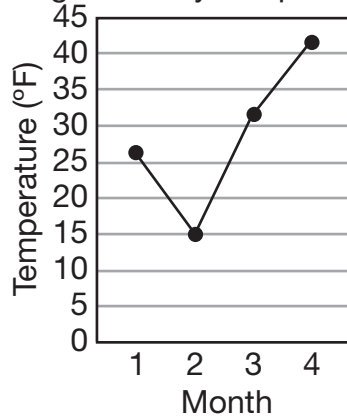
6. The table below shows the average monthly temperatures during the winter.

Average Monthly Temperatures

Month	Temperature (°F)
1	26
2	15
3	32
4	41

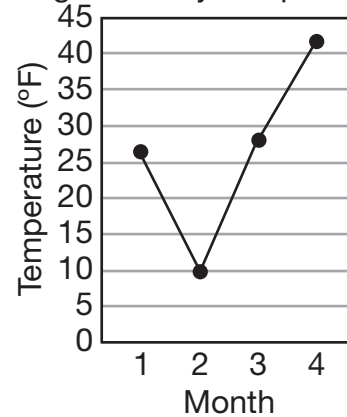
Which line graph *best* represents the data in the table?

Average Monthly Temperatures



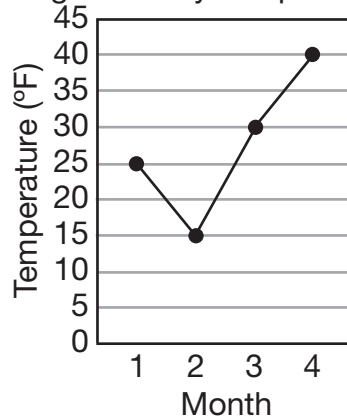
A *

Average Monthly Temperatures



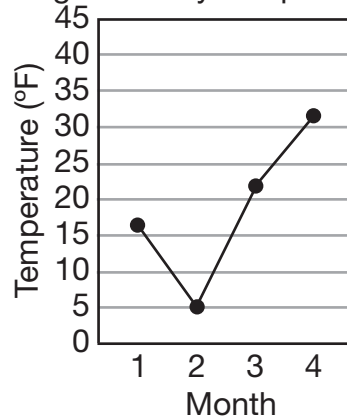
C

Average Monthly Temperatures



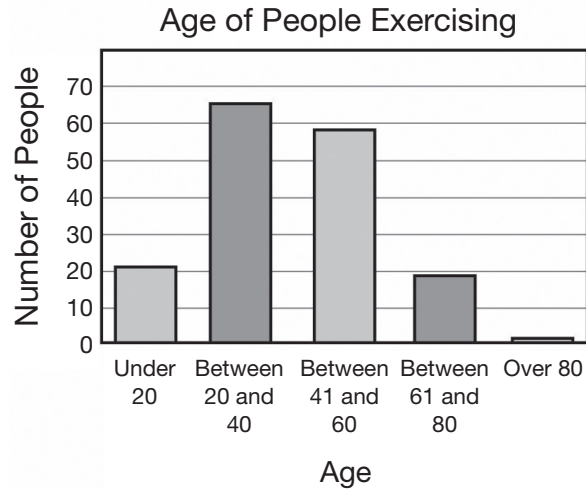
B

Average Monthly Temperatures



D

7. The age of people who exercised at a gym is shown in the bar graph below.



Which table *best* represents the data in the bar graph?

Age of People Exercising

Age	Number of People
Under 20	21
Between 20 and 40	55
Between 41 and 60	48
Between 61 and 80	19
Over 80	1

A

Age of People Exercising

Age	Number of People
Under 20	21
Between 20 and 40	85
Between 41 and 60	58
Between 61 and 80	19
Over 80	1

C

Age of People Exercising

Age	Number of People
Under 20	1
Between 20 and 40	19
Between 41 and 60	58
Between 61 and 80	75
Over 80	21

B

Age of People Exercising

Age	Number of People
Under 20	21
Between 20 and 40	65
Between 41 and 60	58
Between 61 and 80	19
Over 80	1

D *

8. The cost of a package of chewing gum from 1950 to 1990 is shown in the table below.

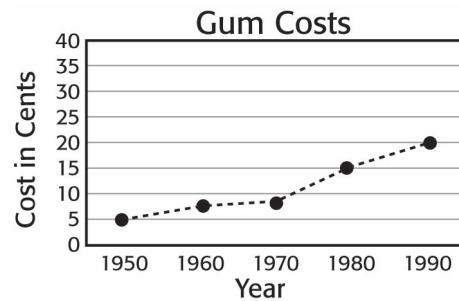
Gum Costs

Year	Cost in Cents
1950	5
1960	7
1970	10
1980	20
1990	25

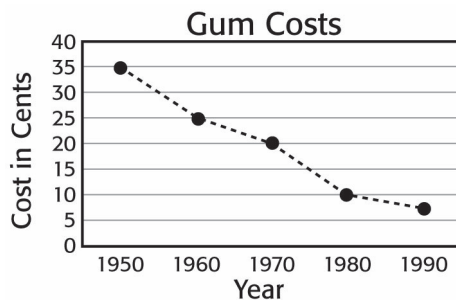
Which line graph *best* represents the data in the table?



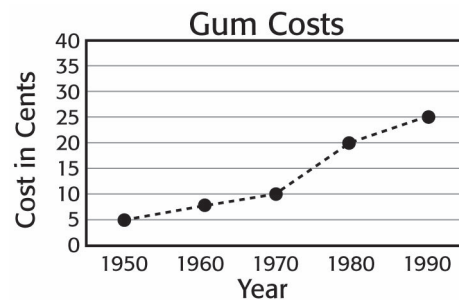
A



C



B



D *

Sample Open-Ended Items

This problem requires you to show all your work or explain all your reasoning. You may use drawings, words, or numbers in your answer. Your answer should be written so that another person could read it and understand your reasoning.

1. The table below shows favorite subjects of a fourth-grade class.

Favorite Subjects	
Subject	Number of Students
Math	7
Reading	3
Science	5
History	6
Grammar	4







Use the information from the table to make and label a line graph.

Show all your work or explain your reasoning *for each part* in the space provided in the answer document.

This problem requires you to show all your work or explain all your reasoning. You may use drawings, words, or numbers in your answer. Your answer should be written so that another person could read it and understand your reasoning.

2. For six weeks, Mr. Jackson recorded the number of students who walked to school every day. He recorded the results in the tally chart shown below.

Students Walking to School

Week	Number of Students
1	
2	
3	
4	
5	
6	

Make a line graph that shows the data in the tally chart.

Show all your work or explain your reasoning *for each part* in the space provided in the answer document.

This problem requires you to show all your work or explain all your reasoning. You may use drawings, words, or numbers in your answer. Your answer should be written so that another person could read it and understand your reasoning.

3. The ages of some of the members of Elaine's quilting club are listed in the table below.

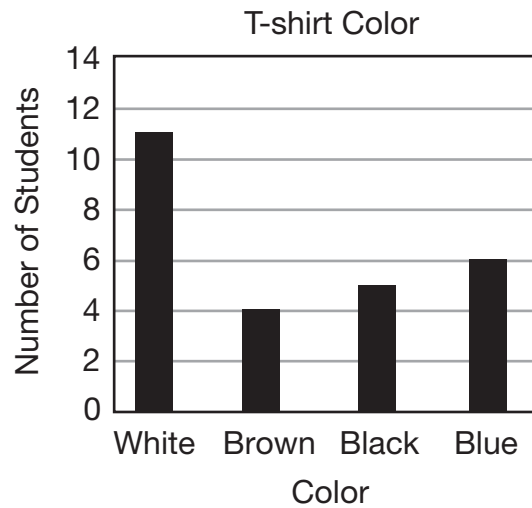
Ages of Quilting Club Members	
Member	Age
Elaine	22
Juan	43
Marsha	67
Nadine	39
Sheila	33

Use the information from the table to make and label a bar graph.

Show all your work or explain your reasoning *for each part* in the space provided in the answer document.

This problem requires you to show all your work or explain all your reasoning. You may use drawings, words, or numbers in your answer. Your answer should be written so that another person could read it and understand your reasoning.

4. The bar graph below shows the number of students wearing each color of T-shirt.



Make a table using the data in the bar graph.

Show all your work or explain your reasoning *for each part* in the space provided in the answer document.

This problem requires you to show all your work or explain all your reasoning. You may use drawings, words, or numbers in your answer. Your answer should be written so that another person could read it and understand your reasoning.

5. At each second, Jenny is measuring the amount of water left in a container that is being drained. She notices that 4 ounces of water leaves the container each second.

Water in Container	
Number of Seconds	Amount of Water Left, in Ounces
1	62
2	58
3	54
4	50
5	46

Make and label a line graph using the information from the chart.

Show all your work or explain your reasoning *for each part* in the space provided in the answer document.

Answer Key

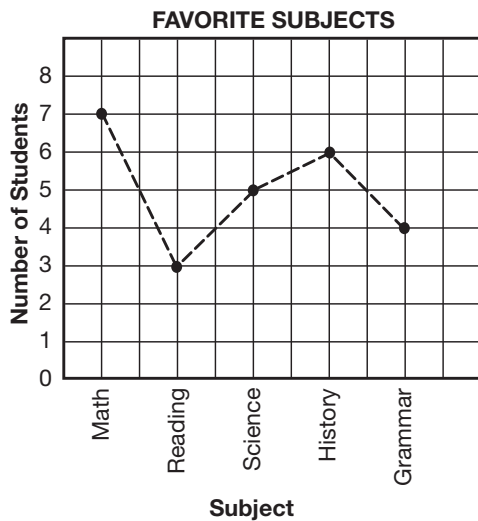
Content Standards 15 & 17

Sample Multiple-Choice

1. B
2. A
3. D
4. C
5. C
6. A
7. D
8. D

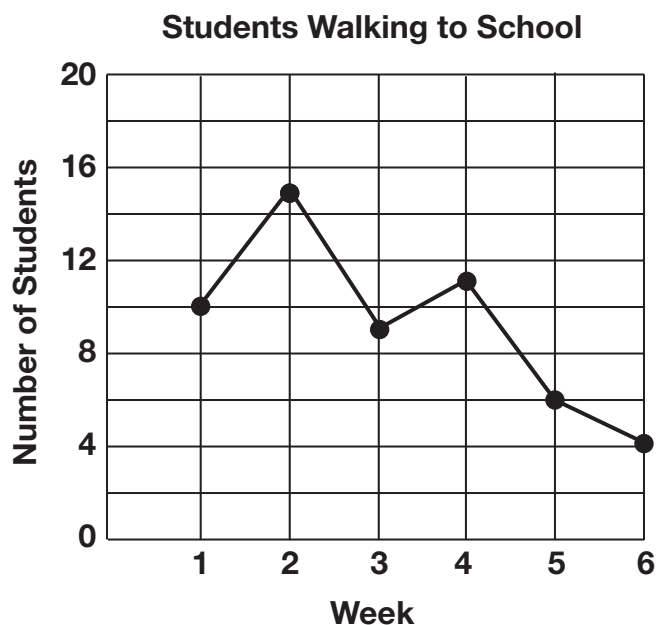
Sample Open-Ended

1. Sample Response(s):

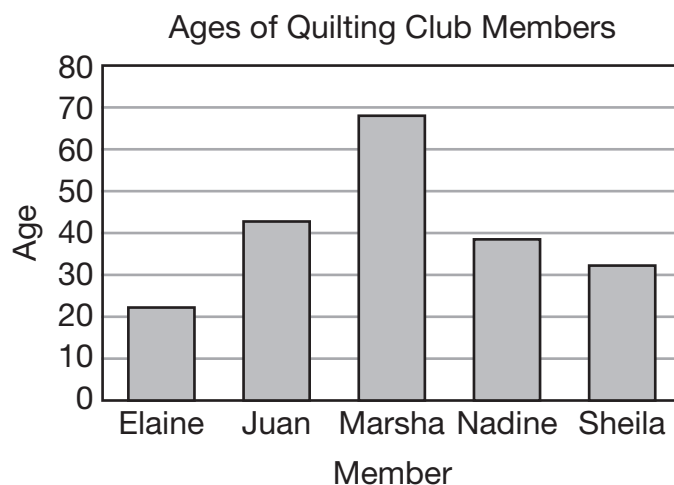


Score Point	Response Attributes
3	Line graph is completely correct.
2	Line graph has one to three errors.
1	Line graph has more than three errors.
0	No line graph or none correct. (Also, blanks, rewrites problem, foreign language, illegible, refusals, off task, etc., scored as invalid.)

2. Sample Response(s):



Score Point	Response Attributes
3	Line graph is completely correct.
2	Line graph has one to three errors.
1	Line graph has more than three errors.
0	No line graph, or none correct. (Also, blanks, rewrites problem, foreign language, illegible, refusals, off task, etc., scored as invalid.)

3. Sample Response(s):

Score Point	Response Attributes
3	Bar graph is completely correct.
2	Bar graph has one to three errors.
1	Bar graph has more than three errors.
0	No bar graph or none correct. (Also, blanks, rewrites problem, foreign language, illegible, refusals, off task, etc., scored as invalid.)

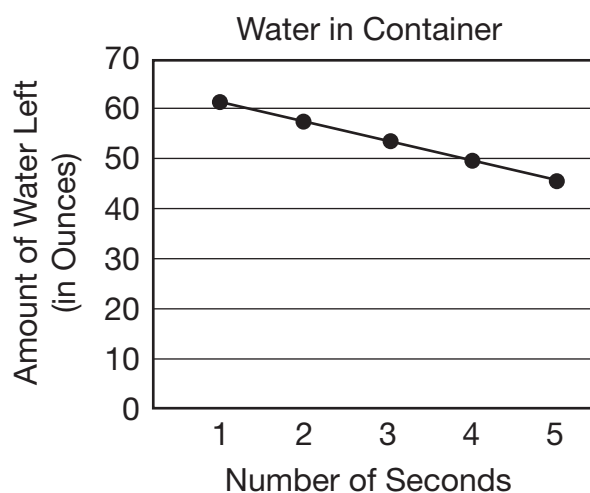
4. Sample Response(s):**T-shirt Color**

Color	Number of Students
White	11
Brown	4
Black	5
Blue	6

OR**T-shirt Color**

Color	White	Brown	Black	Blue
Number of Students	11	4	5	6

Score Point	Response Attributes
3	Table is completely correct.
2	Table has one to three errors.
1	Table has more than three errors.
0	No table or none correct. (Also, blanks, rewrites problem, foreign language, illegible, refusals, off task, etc., scored as invalid.)

5. Sample Response(s):

Score Point	Response Attributes
3	Line graph is completely correct.
2	Line graph has one to three errors.
1	Line graph has more than three errors.
0	No line graph or none correct. (Also, blanks, rewrites problem, foreign language, illegible, refusals, off task, etc., scored as invalid.)

DATA ANALYSIS AND PROBABILITY**Content Standard 16**

Determine if outcomes of simple events are likely, unlikely, certain, equally likely, or impossible.

Item Type

Multiple-choice

Additional Information

Use only the choices mentioned in content standard.
Word problems/real-life situations may be used.

Sample Multiple-Choice Items

1. Ellie placed 18 red marbles, 2 black marbles, and 3 yellow marbles into a bag. She will choose 1 marble from the bag without looking.

Which *best* describes the likelihood that Ellie will choose a red marble?

- | | |
|---------------------|-------------------|
| A Unlikely | C Certain |
| B Impossible | D Likely * |

2. Avery was born in a month that begins with the letter *M*.

Which of the following *best* describes the likelihood that Avery was born in April?

- | | |
|-------------------|-----------------------|
| A Certain | C Impossible * |
| B Unlikely | D Likely |

3. Abby has 10 red, 1 black, and 2 blue pens in a box. She will select 1 pen from the box without looking.

Which pen is Abby *most likely* to select?

- A** Red *
- B** Blue
- C** Black
- D** Green

5. Without looking, Ann will choose a horse to ride. She can choose from 5 black, 1 brown, 4 grey, and 3 white horses.

Which color of horse is Ann *unlikely* to choose?

- A** Grey
- B** Black
- C** White
- D** Brown *

4. A radio station manager gives out a prize every day at 10:00 in the morning.

If it is 9:45 in the morning, which *best* describes the likelihood that the manager will give a prize out within the next hour?

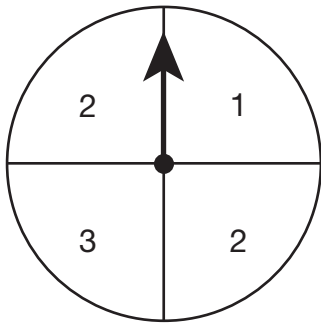
- A** Certain *
- B** Unlikely
- C** Impossible
- D** Likely

6. Tracie wrote 18 boys' names and 18 girls' names on separate pieces of paper and placed them into a hat. She will take one piece of paper out of the hat without looking.

Which *best* describes the chance that the piece of paper she will take out of the hat will have a boy's name on it?

- A** Certain
- B** Unlikely
- C** Impossible
- D** Equally likely *

7. Wesley will use the spinner below to play a game.



Which *best* describes the chance Wesley will get a 4 on his first spin?

- A** Likely
- B** Certain
- C** Unlikely
- D** Impossible *

9. Kendra counted exactly 10 different vehicles in the parking lot. She noticed that 5 of the vehicles were white and 5 were blue.

Which of the following *best* describes the chance that the first vehicle to leave the parking lot is blue?

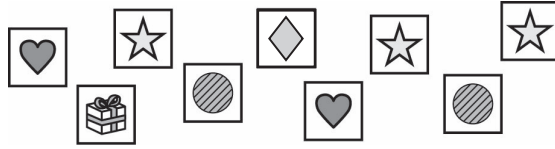
- | | |
|-------------------|---------------------------|
| A Certain | C Equally likely * |
| B Unlikely | D Impossible |

8. Matt has several lollipops in a bag. He has 5 green, 2 yellow, 3 red, 5 orange, and 3 purple lollipops. Matt will select 1 lollipop out of the bag without looking.


Which color is Matt *equally likely* to select as the color purple?

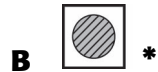
- A** Red *
- B** Green
- C** Yellow
- D** Orange

10. Tiffany has the stickers shown below.



She puts all the stickers into an envelope and chooses one sticker without looking.

Which sticker is Tiffany *equally likely* to choose as ?



Answer Key

Content Standard 16

Sample Multiple-Choice

1. D
2. C
3. A
4. A
5. D
6. D
7. D
8. A
9. C
10. B

SAMPLE RESPONSE FORMAT

SAMPLE RESPONSE: MULTIPLE-CHOICE

Page _____

1	(A)	(B)	(C)	(D)
2	(A)	(B)	(C)	(D)
3	(A)	(B)	(C)	(D)
4	(A)	(B)	(C)	(D)
5	(A)	(B)	(C)	(D)

Page _____

6	(A)	(B)	(C)	(D)
7	(A)	(B)	(C)	(D)
8	(A)	(B)	(C)	(D)

Page _____

9	(A)	(B)	(C)	(D)
10	(A)	(B)	(C)	(D)

SAMPLE RESPONSE: GRIDDED

1

\$
0	0	0	0	0	0	0
1	1	1	1	1	1	1
2	2	2	2	2	2	2
3	3	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	5	5	5
6	6	6	6	6	6	6
7	7	7	7	7	7	7
8	8	8	8	8	8	8
9	9	9	9	9	9	9

2

\$
0	0	0	0	0	0	0
1	1	1	1	1	1	1
2	2	2	2	2	2	2
3	3	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	5	5	5
6	6	6	6	6	6	6
7	7	7	7	7	7	7
8	8	8	8	8	8	8
9	9	9	9	9	9	9

3

\$
0	0	0	0	0	0	0
1	1	1	1	1	1	1
2	2	2	2	2	2	2
3	3	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	5	5	5
6	6	6	6	6	6	6
7	7	7	7	7	7	7
8	8	8	8	8	8	8
9	9	9	9	9	9	9

4

\$
0	0	0	0	0	0	0
1	1	1	1	1	1	1
2	2	2	2	2	2	2
3	3	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	5	5	5
6	6	6	6	6	6	6
7	7	7	7	7	7	7
8	8	8	8	8	8	8
9	9	9	9	9	9	9

5

\$
0	0	0	0	0	0	0
1	1	1	1	1	1	1
2	2	2	2	2	2	2
3	3	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	5	5	5
6	6	6	6	6	6	6
7	7	7	7	7	7	7
8	8	8	8	8	8	8
9	9	9	9	9	9	9

SAMPLE RESPONSE: OPEN-ENDED

Be sure to leave room in your answer space for all parts of this test question.

Answer question ____ in this box.

DO NOT WRITE OUTSIDE THE BOX.

DO NOT WRITE OUTSIDE THE BOX.

DO NOT WRITE OUTSIDE THE BOX.