

# 3rd Grade Math

## Chapter 2: iLEAP Math, Grade 3

This section describes the overall design of the iLEAP Math test to be administered to students in grade 3. Test specifications, sample test questions, and scoring rubrics are provided so that teachers may align classroom practices with the state assessment.

### Test Structure

**The Math test consists of three parts, or subtests, which are administered in a single day:**

- Part 1: a 30-item multiple-choice session that **does not** allow the use of calculators
- Part 2: a 20-item multiple-choice session that **allows** the use of calculators
- Part 3: a 2-item constructed-response session that **allows** the use of calculators

The suggested testing times for the Grade 3 iLEAP Math test listed in Table 2.1 are estimates only. The Math test is **untimed**.

**Table 2.1: Suggested Testing Times**

Part	Description	Number of Items	Testing Time
1	Multiple Choice, no calculator	30	60 minutes
2	Multiple Choice, calculator	20	40 minutes
3	Constructed Response, calculator	2	20 minutes
TOTAL		52	120 minutes

Information about additional time needed to read test directions to students and accomplish other activities related to test administration is included in the *iLEAP Test Administration Manual*.

The Math test is composed of criterion-referenced test (CRT) items only. These items measure Louisiana GLEs that more closely match the Common Core State Standards (CCSS) focus areas.

### Item Types and Scoring Information

The test has fifty (50) multiple-choice items and two constructed-response items.

The multiple-choice items consist of an interrogatory stem and four answer options. These items assess a student's knowledge and conceptual understanding, and responses are scored 1 if correct and 0 if incorrect.

The constructed-response items, which involve a number of separate steps and application of multiple skills, are designed to assess one or more of the GLEs. The response format is open-ended and may include numerical answers, short written answers, and other types of constructed response (e.g., construct and draw rectangles [including squares] with given dimensions). Students may be required to explain in writing how they arrived at their

answers. These items are scored, according to an item-specific rubric, on a scale of 0 to 2 points.

### General Scoring Rubric for Grade 3 *i*LEAP Math Constructed-Response Items

2	<ul style="list-style-type: none"> <li>The student’s response provides a complete and correct answer.</li> </ul>
1	<ul style="list-style-type: none"> <li>The student’s response is partially correct.</li> <li>The student’s response demonstrates limited awareness or contains errors.</li> </ul>
0	<ul style="list-style-type: none"> <li>The student’s response is incorrect, irrelevant, too brief to evaluate, or blank.</li> </ul>

### Description of the Math Test and GLEs Assessed

The Math test was developed specifically for Louisiana. Committees of Louisiana educators reviewed all items for content and alignment with Louisiana’s GLEs. Separate committees reviewed the items for potential bias and sensitive material.

The Math test is **untimed**. Suggested times are estimates for scheduling sessions and assisting students in managing their time.

Students are given a Mathematics Reference Sheet to consult as a reference. Calculators may be used on two parts of the test.

As Louisiana students and teachers transition to the CCSS ([http://www.doe.state.la.us/topics/common\\_core.html](http://www.doe.state.la.us/topics/common_core.html)) and PARCC assessments ([http://www.doe.state.la.us/topics/common\\_core\\_assessments.html](http://www.doe.state.la.us/topics/common_core_assessments.html)), the Math test will include only items measuring GLEs aligned to the CCSS. Table 2.2 provides a list of GLEs eligible for assessment during the transition. The table identifies the GLEs and the corresponding CCSS alignment. Some grade 3 GLEs align to CCSS at other grade levels but will continue to be taught and tested in grade 3 to decrease the possibility that the transition will create curricular gaps.

**Table 2.2: GLE Content To Be Taught and Tested in 2012–13 and 2013–14**

GLE #	Grade-Level Expectation Text	Aligned CCSS #
2	Read, write, compare, and order whole numbers through 9999 using symbols (i.e., <, =, >) and models	Retained <sup>1</sup>
3	Use region and set models and symbols to represent, estimate, read, write, and show understanding of fractions through tenths	3.NF.1 3.G.2
4	Use the concepts of associative and commutative properties of multiplication to simplify computations	3.OA.5
5	Recognize and model multiplication as a rectangular array or as repeated addition	3.OA.3 3.MD.7
6	Recognize and model division as separating quantities into equal subsets (fair shares) or as repeated subtraction	3.OA.3
7	Recognize and apply multiplication and division as inverse operations	3.OA.6

<sup>1</sup> This GLE was moved to another grade but will be taught and tested in this grade to decrease the possibility that the transition will create curricular gaps.

GLE #	Grade-Level Expectation Text	Aligned CCSS #
8	Recognize, select, connect, and use operations, operational words, and symbols (i.e., +, -, x, ÷) to solve real-life situations	3.OA.1 3.OA.2 3.OA.3
9	Know basic multiplication and division facts [0s, 1s, 2s, 5s, 9s, and turn-arounds (commutative facts), including multiplying by 10s]	3.NBT.3 3.OA.7
10	Calculate the value of a combination of bills and coins and make change up to \$5.00	Retained <sup>1</sup>
11	Add and subtract numbers of 3 digits or less	3.NBT.2
12	Round to the nearest 1000 and identify situations in which such rounding is appropriate	3.NBT.1
13	Determine when and how to estimate, and when and how to use mental math, calculators, or paper/pencil strategies to solve addition and subtraction problems	3.OA.8
15	Use objects, pictures, numbers, symbols, and words to represent multiplication and division problem situations	3.OA.3
16	Use number sentences to represent real-life problems involving multiplication and division	3.OA.3
18	Use letters as variables in mathematical statements that represent real-life problems (e.g., $2 \times n = 8$ )	3.OA.3 3.OA.8
19	Measure length to the nearest yard, meter, and half-inch	3.MD.4
21	Measure weight using grams and ounces	3.MD.2
22	Find the perimeter of a geometric shape given the length of its sides	3.MD.8
23	Find the area in square units of a given rectangle (including squares) drawn on a grid or by covering the region with square tiles	3.MD.5 3.MD.6 3.MD.7
24	Find elapsed time involving hours and minutes, without regrouping, and tell time to the nearest minute	3.MD.1
25	Select and use the appropriate standard units of measure, abbreviations, and tools to measure length and perimeter (i.e., in., cm, ft., yd., m), area (square inch, square centimeter), capacity (i.e., cup, pint, quart, gallon, liter), and weight/mass (i.e., oz., lb., g, kg, ton)	3.MD.2
29	Classify and describe 2- and 3-dimensional objects according to given attributes (triangle vs. quadrilateral, parallelogram vs. prism)	3.G.1
33	Construct and draw rectangles (including squares) with given dimensions (e.g., grid paper, square tiles)	3.MD.8
42	Match a data set to a graph, table, or chart and vice versa	3.MD.3 3.MD.4
43	Represent and solve problems using data from a variety of sources (e.g., tables, graphs, maps, advertisements)	3.MD.2 3.MD.3
46	Identify and model even and odd numbers with objects, pictures, and words	3.OA.9

<sup>1</sup> This GLE was moved to another grade but will be taught and tested in this grade to decrease the possibility that the transition will create curricular gaps.

GLE #	Grade-Level Expectation Text	Aligned CCSS #
47	Find patterns to complete tables, state the rule governing the shift between successive terms, and continue the pattern (including growing patterns)	3.OA.9

## Reporting Categories

To be more reflective of the focus areas of the CCSS at each grade, the GLEs available for assessment have been grouped into the Reporting Categories shown in Table 2.3. During the transition, the Reporting Categories replace the mathematics strands (e.g., Number and Number Relations, Algebra, etc.) for assessment purposes.

**Table 2.3: Grade 3 Math Reporting Categories**

Reporting Category	GLEs Covered
Multiplication and Division	4, 5, 6, 7, 9, 15, 16, 18
Number	2, 3, 8, 10, 11, 12, 13, 46, 47
Measurement, Data, and Geometry	19, 21, 22, 23, 24, 25, 29, 33, 42, 43

## Math Test Specifications

Table 2.4 provides test specifications for the multiple-choice parts of the grade 3 *iLEAP* Math assessment. The values in the table are approximations due to slight variations in the content across test forms at grade 3.

**Table 2.4: Grade 3 Math Test Specifications**

Reporting Category	Percentage of Multiple-Choice Points
Multiplication and Division	36
Number	44
Measurement, Data, and Geometry	20
<b>Total</b>	<b>100</b>

Fifty 1-point MC items plus two 2-point constructed-response items equals a 54-point test.

## **Calculator Recommendations and Restrictions**

It is recommended that a calculator be made available to **each** student for instructional and assessment purposes. As with all instructional materials, each individual district and school should determine which calculator best supports its mathematics curriculum and instructional program.

### **Calculators recommended for instruction and assessment:**

- K–4 students: four-function calculator
- 5–8 students: scientific calculator
- 9–12 students: scientific calculator with graphing capabilities

### **Calculators not permitted on statewide assessment:**

- handheld or laptop computers
- pocket organizers
- calculators with Computer Algebra Systems (CAS) or other symbolic manipulation capabilities
- calculators with paper tape
- calculators that talk or make noise
- calculators with QWERTY (typewriter-style) keypads
- electronic writing pads or pen input devices

## Sample Test Items: Grade 3 Math

### Sample Mathematics Constructed-Response Items and Scoring Rubrics

Questions 1 and 2 show sample constructed-response items. Each item involves a number of separate steps and the application of multiple skills. The constructed-response items are designed to assess one or more of the GLEs. The items are scored using an item-specific rubric on a scale of 0 to 2 points.

**1** Rita is baking cookies for a bake sale.

**A** She bakes 4 pans of peanut-butter cookies with 12 cookies on each pan. To find the total number of cookies, Rita writes the number sentence below.

$$12 + 12 + 12 + 12 = 48$$

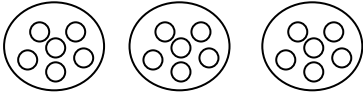
Write a different number sentence, using multiplication, to show another way Rita could find the total number of cookies.

**B** Rita also baked 18 chocolate-chip cookies. She needs to put the cookies on plates. She uses the number sentence below to show how she will divide the cookies.

$$18 \div 6 = 3$$

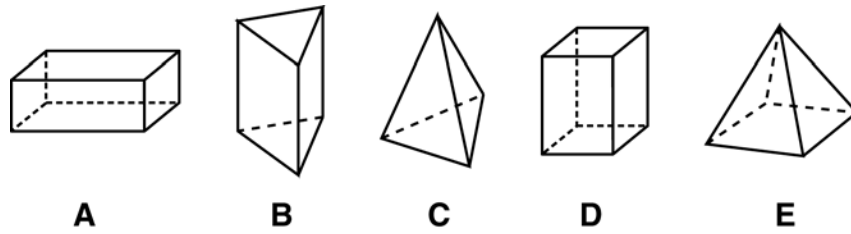
Draw a picture to show how Rita will divide the cookies.

*Match to GLE: This item measures GLE 5: Recognize and model multiplication as a rectangular array or as repeated addition and GLE 6: Recognize and model division as separating quantities into equal subsets (fair shares) or as repeated subtraction.*

<b>Scoring Rubric</b>	
<b>2</b>	The student earns 2 points.
<b>1</b>	The student earns 1 point.
<b>0</b>	The student's response is incorrect or irrelevant to the skill or concept being measured or is blank.
<b>Sample Answer:</b>	
Part A $4 \times 12 = 48$	
Part B 	
<b>Points Assigned:</b>	
Part A 1 point 1 point for writing $4 \times 12 = 48$ <b>or</b> $12 \times 4 = 48$	
Part B 1 point 1 point for drawing a model showing 3 groups of 6 <b>or</b> 6 groups of 3	



- 2 Amy will sort these shapes into two groups. The shapes in each group will share similar math features.



Show one way Amy could sort the shapes by placing the letter from each shape in one of these boxes. Label each box with a title that explains how you sorted the shapes.



*Match to GLE: This item measures GLE 29: Classify and describe 2- and 3-dimensional objects according to given attributes (triangle vs. quadrilateral, parallelogram vs. prism).*

<b>Scoring Rubric</b>	
<b>2</b>	The student earns 2 points.
<b>1</b>	The student earns 1 point.
<b>0</b>	The student earns 0 points. <b>OR</b> The student's response is incorrect or irrelevant to the skill or concept being measured or is blank.
<b>Sample Answer:</b>	
Box 1: B, C, E; Box 2: A and D. Titles: Shapes with Triangles and Shapes with Rectangles	
<b>Points Assigned:</b>	
2 points for sorting all five shapes into two sets with similar mathematical attributes and titling each box consistent with the way the student sorted the shapes <b>OR</b> 1 point for sorting all five of the shapes into two sets with similar mathematical attributes and labeling the boxes with titles inconsistent with the way the student sorted the shapes <b>OR</b> 1 point for sorting all five shapes with similar mathematical attributes but not titling the boxes <b>OR</b> 1 point for sorting fewer than five shapes into two sets with similar mathematical attributes and titling each box consistent with the way the student sorted the shapes	

### Sample Multiple-Choice Items

Questions 3 through 24 are sample multiple-choice items, arranged by GLE. The items test students' ability to solve math problems. Most items are provided in context and require students to use information from stories, graphs, or tables to solve a problem. Items may assess some of the skills of a GLE, while other items may measure all of the skills of the GLE.

**3**      **Which number sentence is true?**

**A**    $7 < 6$

**B**    $7 > 4$

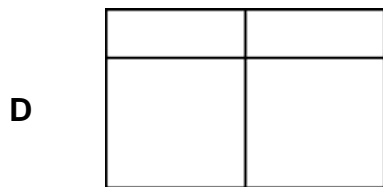
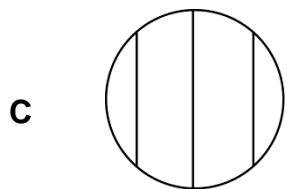
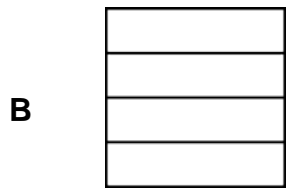
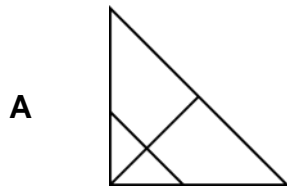
**C**    $3 > 7$

**D**    $6 < 3$

**Correct Response: B**

*Match to GLE: This item measures GLE 2: Read, write, compare, and order whole numbers through 9999 using symbols (i.e.,  $<$ ,  $=$ ,  $>$ ) and models.*

4 Which figure is divided into fourths?



**Correct Response: B**

*Match to GLE: This item measures GLE 3: Use region and set models and symbols to represent, estimate, read, write, and show understanding of fractions through tenths.*

- 5** Gina is sending boxes of books. She puts 20 books in each box. Gina sends 15 boxes of books to 5 different stores. She uses the expression below to find the total number of books she is sending.

$$20 \times (15 \times 5)$$

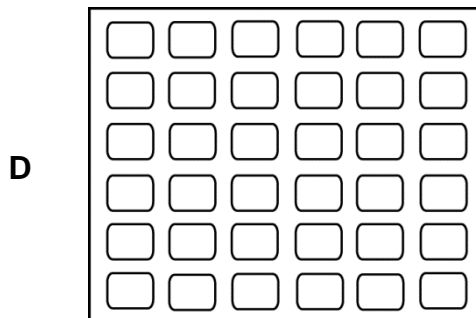
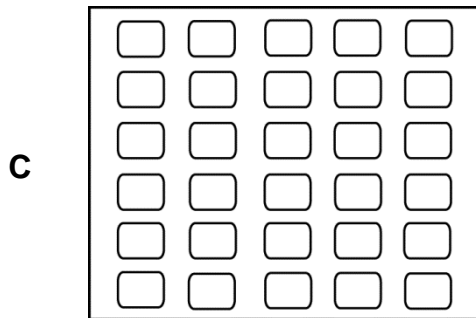
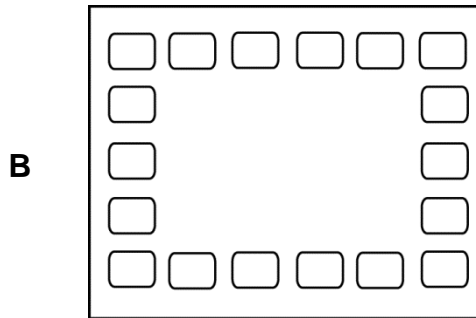
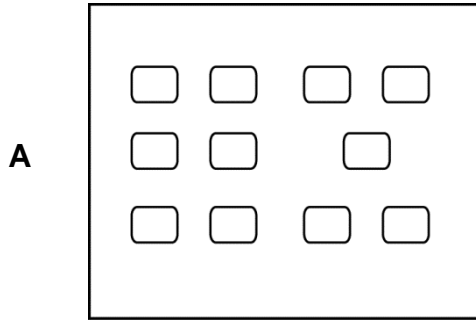
**Which other expression could Gina use?**

- A**  $20 \times 20$
- B**  $20 \times (15 + 5)$
- C**  $(20 + 5) \times 15$
- D**  $(20 \times 5) \times 15$

**Correct Response: D**

*Match to GLE: This item measures GLE 4: Use the concepts of associative and commutative properties of multiplication to simplify computations.*

- 6 The desks in Bill's classroom are in 6 rows. Each row has 5 desks in it. **Which model shows the total number of desks in Bill's classroom?**



**Correct Response: C**

*Match to GLE: This item measures GLE 5: Recognize and model multiplication as a rectangular array or as repeated addition.*

- 7** Pete has 32 books. He puts an equal number of books on each of the 4 shelves of his bookcase. **Which expression shows how Pete can find the number of books on each shelf?**

- A**  $4 \div 32$
- B**  $32 \times 4$
- C**  $32 - 4 - 4 - 4 - 4 - 4 - 4$
- D**  $32 - 4 - 4 - 4 - 4 - 4 - 4 - 4 - 4$

**Correct Response: D**

*Match to GLE: This item measures GLE 6: Recognize and model division as separating quantities into equal subsets (fair shares) or as repeated subtraction.*

- 8** **Which number fact does not belong to the same family or group of facts as the other three?**

- A**  $3 \times 9 = 27$
- B**  $27 \div 9 = 3$
- C**  $9 \times 3 = 27$
- D**  $9 \div 3 = 3$

**Correct Response: D**

*Match to GLE: This item measures GLE 7: Recognize and apply multiplication and division as inverse operations.*

- 9** Eli and Sam were trading baseball cards. Eli had 12 cards and Sam had 17. **Which shows how many cards the boys had all together?**

- A**  $12 + 17$
- B**  $17 - 12$
- C**  $17 \times 12$
- D**  $17 \div 12$

**Correct Response: A**

*Match to GLE: This item measures GLE 8: Recognize, select, connect, and use operations, operational words, and symbols (i.e., +, -, ×, ÷) to solve real-life situations.*

- 10** Jill has 7 vases of flowers. There are 9 flowers in each vase. **What is the total number of flowers Jill has?**

- A** 16
- B** 54
- C** 63
- D** 79

**Correct Response: C**

*Match to GLE: This item measures GLE 9: Know basic multiplication and division facts [0s, 1s, 2s, 5s, 9s, and turn-arounds (commutative facts), including multiplying by 10s].*



**Directions:** Use the pictures of the coins below to answer question 11.



- 11** Art bought a cookie costing 60¢ and paid for it with a dollar bill. The clerk gave Art the change shown above. **Which statement is true?**
- A** The change was the correct amount.
  - B** The change was 5¢ too little.
  - C** The change was 5¢ too much.
  - D** The change was 10¢ too much.

**Correct Response: C**

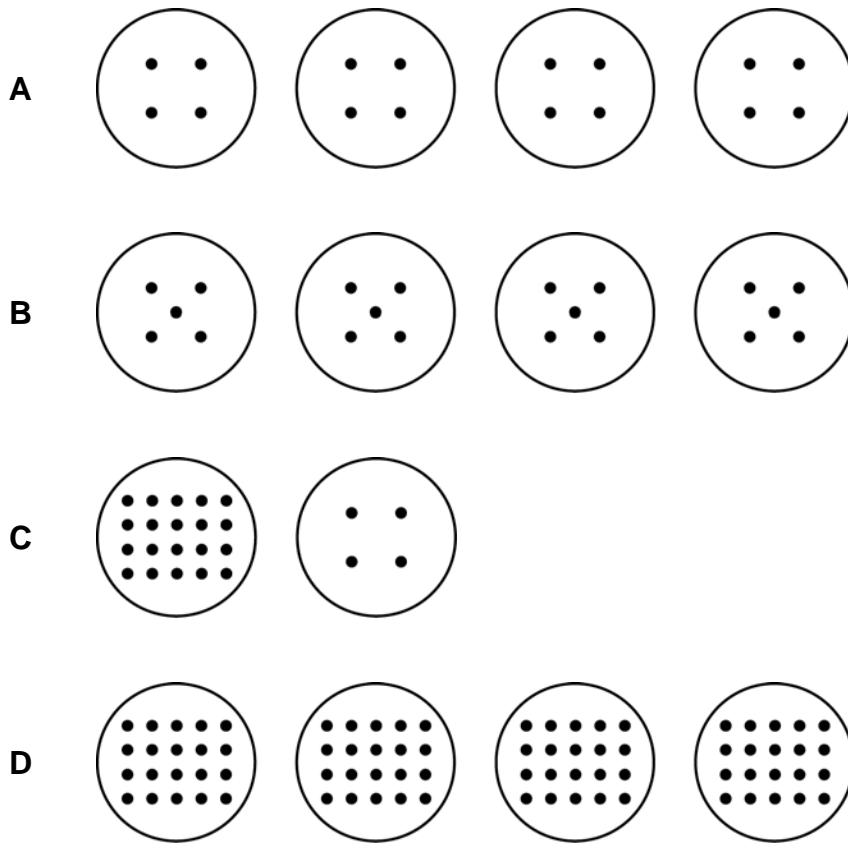
*Match to GLE: This item measures GLE 10: Calculate the value of a combination of bills and coins and make change up to \$5.00.*

- 12** There were 92,554 people at an LSU football game. **Which number shows the number of people rounded to the nearest 1,000?**
- A** 90,000
  - B** 90,600
  - C** 92,000
  - D** 93,000

**Correct Response: D**

*Match to GLE: This item measures GLE 12: Round to the nearest 1000 and identify situations in which such rounding is appropriate.*

- 13 Clare wants to divide her collection of 20 rocks equally into 4 groups. **Which model correctly shows the number of rocks Clare should put in each group?**



**Correct response: B**

*Match to GLE: This item measures GLE 15: Use objects, pictures, numbers, symbols, and words to represent multiplication and division problem situations.*

- 14** A zookeeper feeds a polar bear 21 fish each day for 7 days. **Which number sentence should the zookeeper use to find the total number of fish he will feed the polar bear during the 7 days?**

**A**  $21 + 7 = \square$

**B**  $21 - 7 = \square$

**C**  $21 \div 7 = \square$

**D**  $21 \times 7 = \square$

**Correct response: D**

*Match to GLE: This item measures GLE 16: Use number sentences to represent real-life problems involving multiplication and division.*

- 15** Sam and his mother have baked 24 cookies. They need a total of 120 cookies. **If  $c$  stands for the number of cookies they still need to bake, which number sentence should Sam and his mother use to find the number of cookies they still need to bake?**

**A**  $120 - 24 = c$

**B**  $c \times 24 = 120$

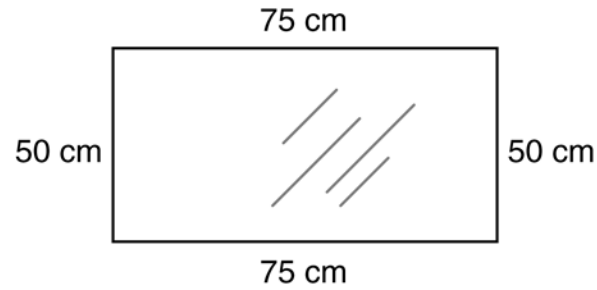
**C**  $120 + 24 = c$

**D**  $c \times 120 = 24$

**Correct response: A**

*Match to GLE: This item measures GLE 18: Use letters as variables in mathematical statements that represent real-life problems (e.g.,  $2 \times n = 8$ ).*

- 16 Mrs. Andrews wants to glue rope around the perimeter of this framed mirror to make it western style.



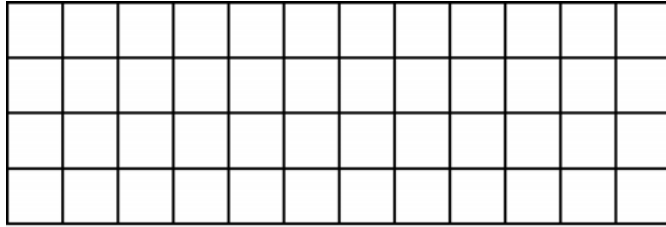
**How much rope does she need?**


- A 100 cm
- B 125 cm
- C 200 cm
- D 250 cm

**Correct response: D**

*Match to GLE: This item measures GLE 22: Find the perimeter of a geometric shape given the length of its sides.*

- 17 Devon wants to cover an entire shelf, shown below, with paper.



 = 1 square inch

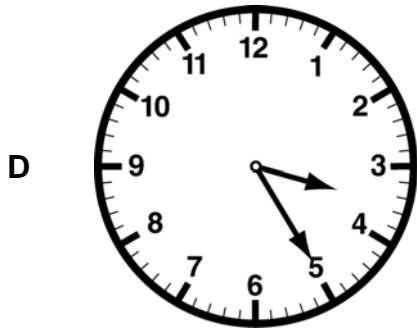
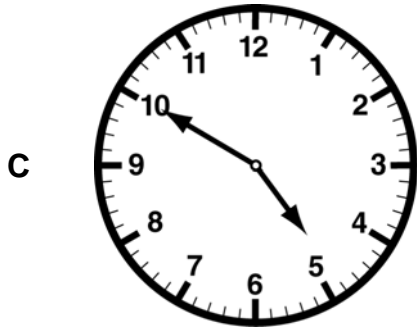
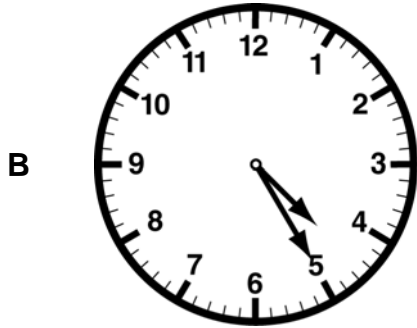
What is the least amount of paper that will cover the entire shelf?

- A 16 square inches
- B 32 square inches
- C 48 square inches
- D 52 square inches

**Correct answer: C**

*Match to GLE: This item measures GLE 23: Find the area in square units of a given rectangle (including squares) drawn on a grid or by covering the region with square tiles.*

- 18 A bus leaves Janell's town at 3:35 P.M. It arrives in New Orleans 50 minutes later. Which clock shows the time the bus arrives in New Orleans?



**Correct response: B**

*Match to GLE: This item measures GLE 24: Find elapsed time involving hours and minutes, without regrouping, and tell time to the nearest minute.*

**19** Mr. Harris will measure the heights of several desks in his classroom. **Which tool should Mr. Harris use to measure the heights of the desks?**

- A** meterstick
- B** scale
- C** thermometer
- D** measuring cup

**Correct response: A**

*Match to GLE: This item measures GLE 25: Select and use the appropriate standard units of measure, abbreviations, and tools to measure length and perimeter (i.e., in., cm, ft., yd., m), area (square inch, square centimeter), capacity (i.e., cup, pint, quart, gallon, liter), and weight/mass (i.e., oz., lb., g, kg, ton).*

**20** A shape has exactly 4 sides and 4 angles. **Which term describes the shape?**

- A** prism
- B** triangle
- C** cylinder
- D** quadrilateral

**Correct response: D**

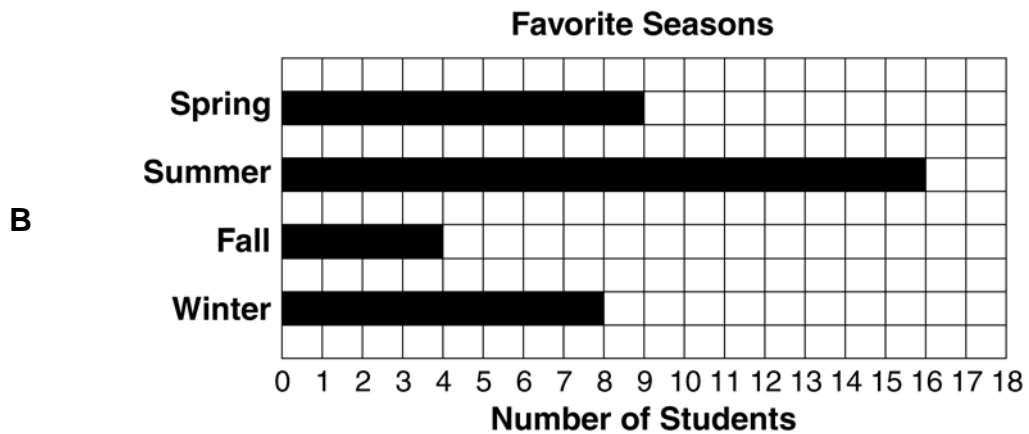
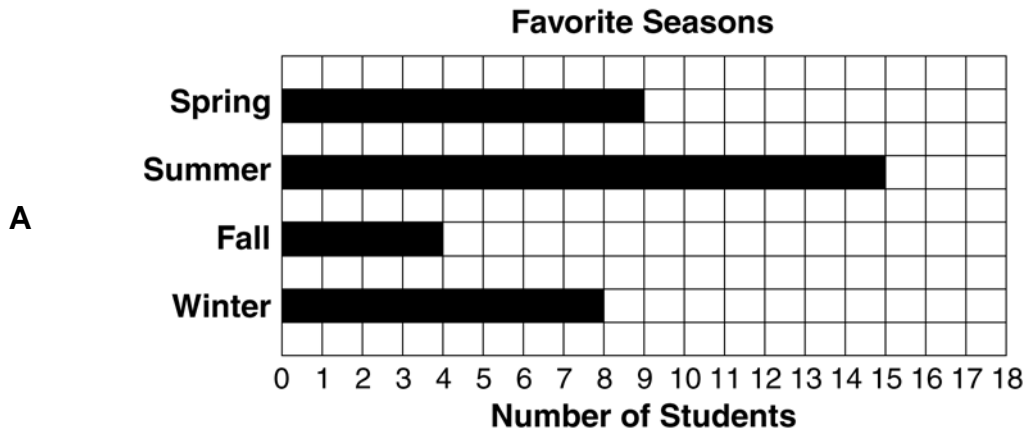
*Match to GLE: This item measures GLE 29: Classify and describe 2- and 3-dimensional objects according to given attributes (triangle vs. quadrilateral, parallelogram vs. prism).*

- 21 Each third grader made a tally mark by his or her favorite season of the year on this chart.

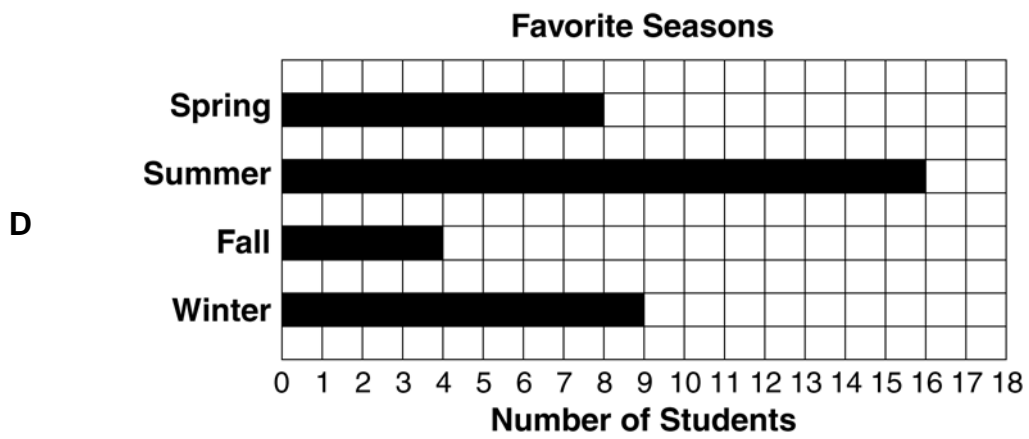
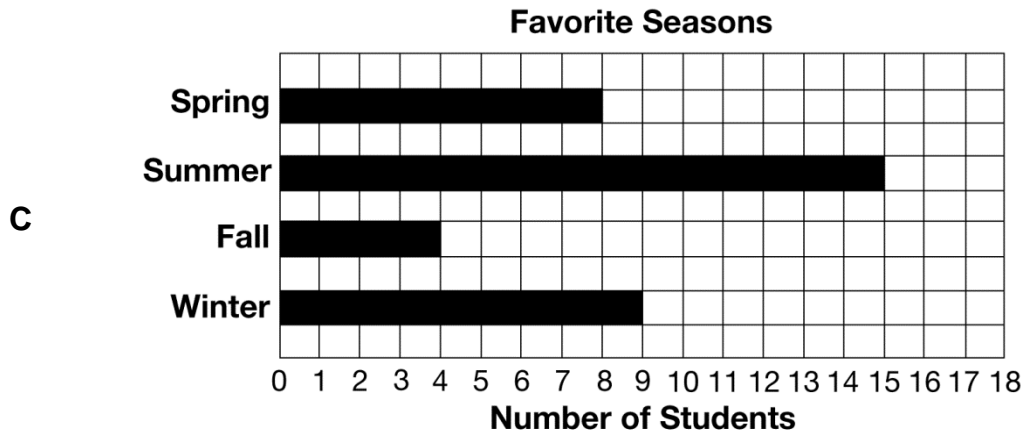
**What is your favorite season?**

<b>Spring</b>	<del>    </del>
<b>Summer</b>	<del>    </del> <del>    </del> <del>    </del>
<b>Fall</b>	
<b>Winter</b>	<del>    </del>

Which graph matches the data on this chart?







**Correct response: B**

*Match to GLE: This item measures GLE 42: Match a data set to a graph, table, or chart and vice versa.*

**Directions:** Use the table below to answer question 22.

**Supplies for a Doll Cart**

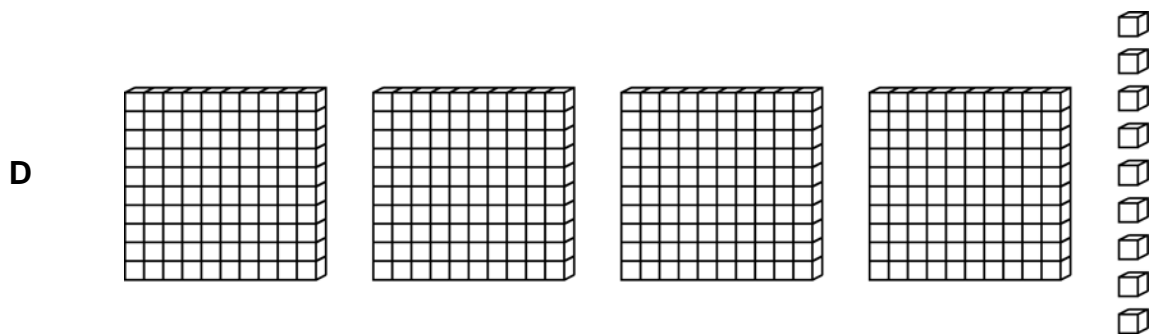
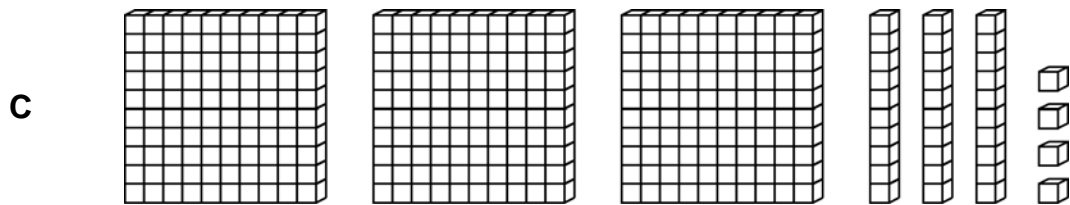
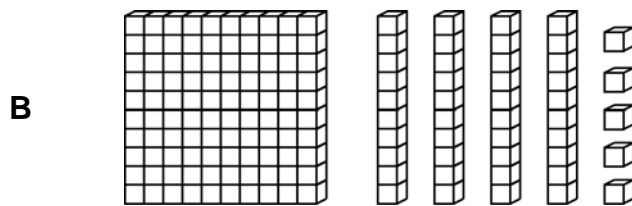
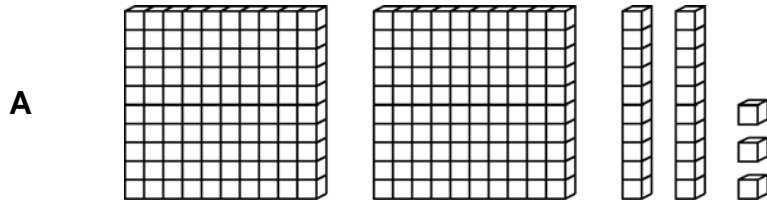
Supply	Cost
Nails	\$1.00
Paint	\$1.50
Glue	50¢
Bolts	50¢
Wheels	\$2.00
Wood	\$3.00
Handle	\$1.50

- 22** Ben made his sister a doll cart for her birthday. He spent ten dollars for all the supplies he used to make it. **Which supply costs as much as the glue and bolts?**
- A** paint
  - B** nails
  - C** handle
  - D** wheels

**Correct Response: B**

*Match to GLE: This item measures GLE 43: Represent and solve problems using data from a variety of sources (e.g., tables, graphs, maps, advertisements).*

- 23 Mary built these four number models using base ten blocks. **Which model shows an even number?**



**Correct response: C**

*Match to GLE: This item measures GLE 46: Identify and model even and odd numbers with objects, pictures, and words.*

- 24 LaBrian records his karate practice time on this table.

Week	Minutes of Practice
week 1	10
week 2	20
week 3	15
week 4	30
week 5	25
week 6	50
week 7	45
week 8	?

**How many minutes will LaBrian practice during week 8 if he continues his pattern?**

- A** 40 minutes
- B** 55 minutes
- C** 65 minutes
- D** 90 minutes

**Correct response: D**

*Match to GLE: This item measures GLE 47: Find patterns to complete tables, state the rule governing the shift between successive terms, and continue the pattern (including growing patterns).*