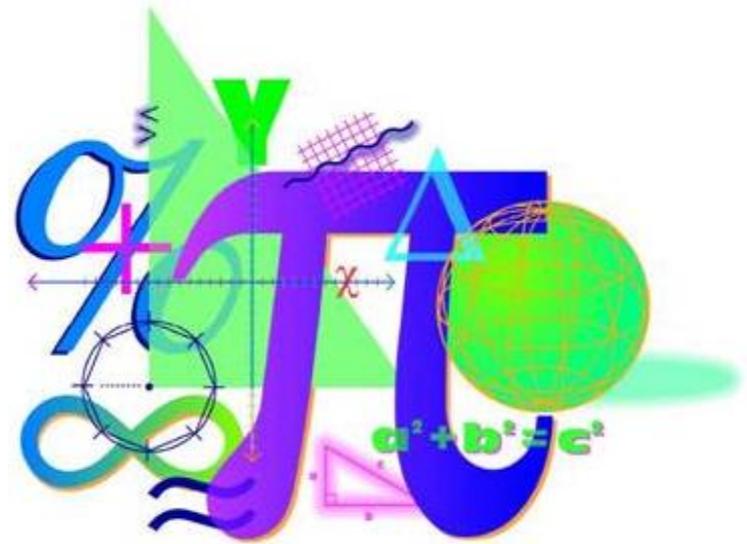


# Spring 2013 Student Performance Analysis

## Grade 4 Mathematics Standards of Learning



Presentation may be paused and resumed  
using the arrow keys or the mouse.

# Ordering Fractions and Representing Equivalent Fractions

**SOL 4. 2**

**The student will**

- a) compare and order fractions and mixed numbers;**
- b) represent equivalent fractions; and**
- c) identify the division statement that represents a fraction.**

# Suggested Practice for SOL 4.2a

Students need additional practice ordering fractions and mixed numbers.

1. Order from greatest to least:  $\frac{3}{8}$ ,  $\frac{2}{3}$ ,  $\frac{7}{12}$ ,  $\frac{4}{9}$ ,  $\frac{2}{3}$ ,  $\frac{7}{12}$ ,  $\frac{4}{9}$ ,  $\frac{3}{8}$

2. The numbers in the set shown are in order from least to greatest, but one number is missing.

$$\frac{5}{6}, \quad \underline{\quad}, \quad \frac{9}{8}, \quad 1\frac{1}{3}$$

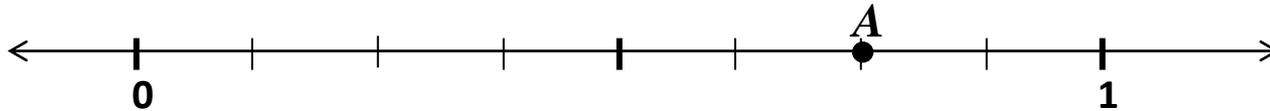
Write a number that could be placed in the blank to complete this ordered set.

Possible answers:  $\frac{6}{7}$ ,  $\frac{7}{8}$ ,  $\frac{9}{10}$ ,  $\frac{8}{8}$ ,  $1\frac{1}{12}$ , or  $\frac{11}{10}$

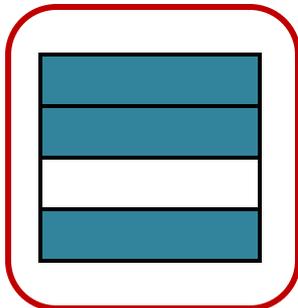
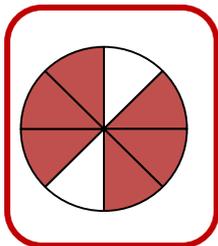
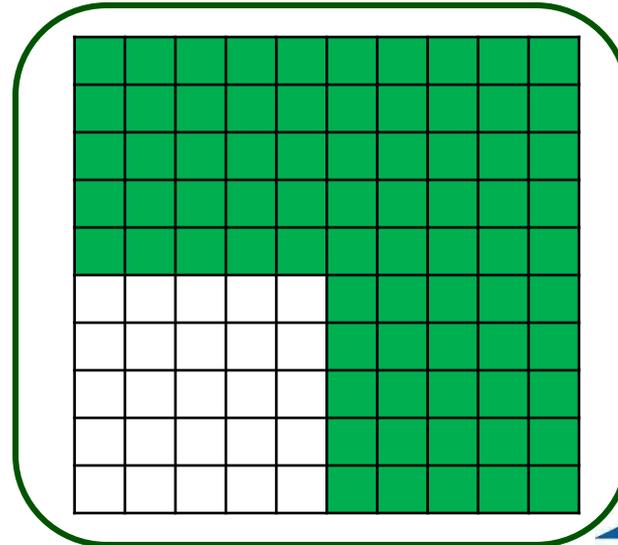
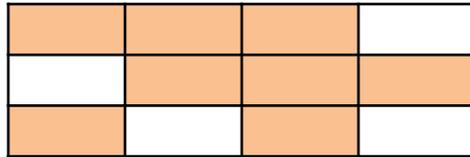
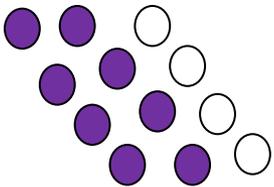
# Suggested Practice for SOL 4.2b

Students need additional practice identifying models that represent equivalent fractions and mixed numbers.

A fraction is represented at point  $A$  on this number line.

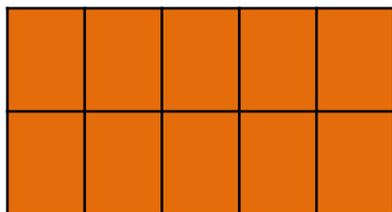


Select each model that is shaded to represent a fraction equivalent to the fraction represented by point  $A$ .



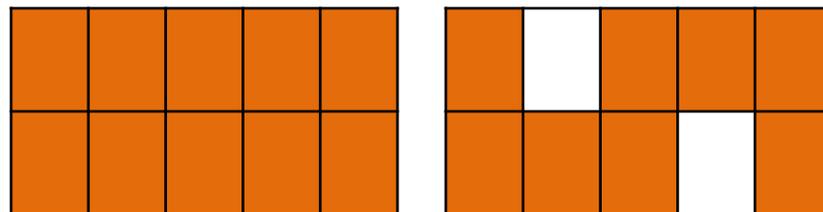
# Suggested Practice for SOL 4.2b

This model is shaded to represent one whole.

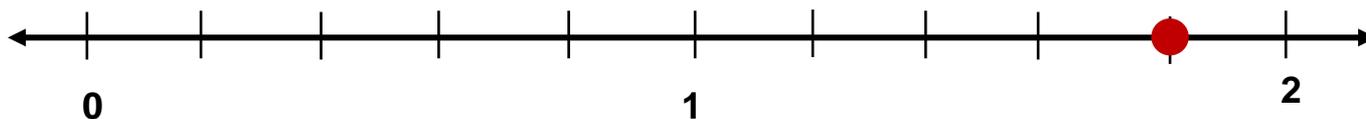


Model 1 is shaded to represent a fraction.

Model 1



Place a point on the number line to represent the number equivalent to the fraction shaded in Model 1.



Extension:

Write a fraction equivalent to the number represented by Model 1 and make a model of that fraction.

Connections:

What is the decimal equivalent to this number? (SOL 4.3)

Write the fraction using the least possible denominator. (SOL 4.5)

# Rounding Decimals and Decimal and Fraction Equivalents

## SOL 4.3

The student will

- a) read, write, represent, and identify decimals expressed through thousandths;
- b) round decimals to the nearest whole number, tenth, and hundredth;
- c) compare and order decimals; and
- d) given a model, write the decimal and fraction equivalents.

# Suggested Practice for SOL 4.3b

Students need additional practice rounding decimals to a given place value.

1. When rounded to the nearest tenth, which of these numbers would round to 52.8 ?

52.762

52.719

52.817

52.83

52.86

52.809

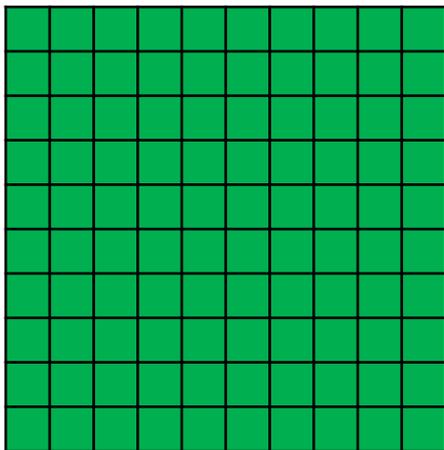
2. Complete the table.

Number to Round	Round to the Nearest Whole Number	Round to the Nearest Tenth	Round to the Nearest Hundredth
167.208	167	167.2	167.21
1,498.954	1,499	1,499.0	1,498.95

## Suggested Practice for SOL 4.3d

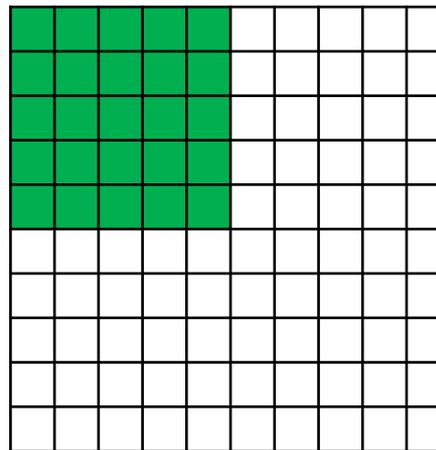
Students need additional practice identifying equivalent fractions and decimals when presented with a model.

This model is shaded to represent one whole.



Model 1 is shaded to represent a decimal.

Model 1



1. Name the decimal shaded in Model 1. **0.25**
2. Which fraction is equivalent to the decimal shaded in Model 1?

$$\frac{2}{5}$$

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

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

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

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

# Solving Multistep Multiplication Problems

## SOL 4.4

The student will

- a) **estimate** sums, differences, **products**, and quotients of **whole numbers**;
- b) **add, subtract, and multiply whole numbers**;
- c) **divide whole numbers, finding quotients with and without remainders; and**
- d) **solve single-step and multistep addition, subtraction, and multiplication problems with whole numbers.**

## Suggested Practice for SOL 4.4a

Students need additional practice with problems presented in context for which an estimated product is the solution.

1. A one-gallon bucket of paint is on sale for \$39. Which is closest to the total cost of 19 of these buckets of paint?  
a) **\$800**                      b) \$600                      c) \$400                      d) \$300
  
2. Each ticket to a concert cost \$42. Which is closest to the total cost of 409 tickets?  
a) \$440                      b) \$1600                      c) **\$16,000**                      d) \$20,000

## Suggested Practice for SOL 4.4d

Students need additional practice solving single-step and multistep addition, subtraction, and multiplication problems with whole numbers.

1. On each of 4 days Mr. Evans drove 38 miles. What is the total number of miles Mr. Evans drove over these 4 days?

$$4 \times 38 = 152 \text{ miles}$$

2. Candace practiced for her piano lesson.
  - She practiced a total of 35 minutes on the weekend.
  - She also practiced for 25 minutes on each of 3 days after school.

What was the total number of minutes Candace practiced for her piano lesson on these days?

$$35 + (25 \times 3) = 35 + 75 = 110 \text{ minutes}$$

# Finding Multiples and Factors, Subtracting Decimals, and Solving Multistep Fraction Problems

**SOL 4.5**

**The student will**

- a) determine common multiples and factors, including least common multiple and greatest common factor;**
- b) add and subtract fractions having like and unlike denominators that are limited to 2, 3, 4, 5, 6, 8, 10, and 12, and simplify the resulting fractions, using common multiples and factors;**
- c) add and subtract with decimals; and**
- d) solve single-step and multistep practical problems involving addition and subtraction with fractions and with decimals.**

## Suggested Practice for SOL 4.5a

Students need additional practice determining the least common multiple and the greatest common factor for a given set of numbers.

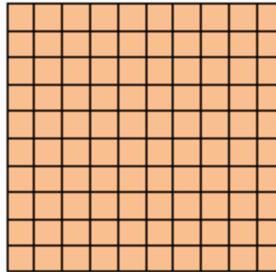
1. What is the least common multiple of 4, 7, and 14? **28**
2. What is the greatest common factor of 12, 30, and 42? **6**
3. For each set of numbers in the table, find the least common multiple and the greatest common factor.

Set of Numbers	Least Common Multiple	Greatest Common Factor
16, 20	<b>80</b>	<b>4</b>
6, 12, 48	<b>48</b>	<b>6</b>
4, 6, 15	<b>60</b>	<b>1</b>

# Suggested Practice for SOL 4.5c

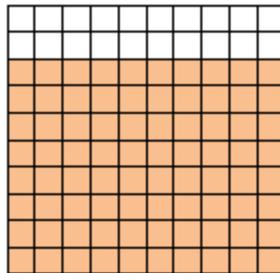
Students need additional practice subtracting decimals.

This model is shaded to represent one whole.

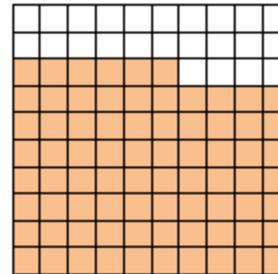


Model 1 and Model 2 have each been shaded to represent a decimal.

Model 1



Model 2



What is the difference between the decimals shaded in Model 1 and Model 2?

$$0.80 - 0.76 = 0.04$$

## Suggested Practice for SOL 4.5d

Students need additional practice finding solutions to multistep practical problems involving addition and/or subtraction with fractions.

Steve and Joshua shared one large pizza. Steve ate  $\frac{1}{3}$  of the pizza and Joshua ate  $\frac{3}{8}$  of the pizza. Exactly what fraction of this pizza was NOT eaten by Steve and Joshua?

$$\frac{1}{3} + \frac{3}{8} = \frac{8}{24} + \frac{9}{24} = \frac{17}{24} \text{ of this pizza was eaten, so}$$

$$1 - \frac{17}{24} = \frac{24}{24} - \frac{17}{24} = \frac{7}{24} \text{ was not eaten}$$

# Estimating Mass and Identifying Equivalent Measurements

**SOL 4.6**

**The student will**

- a) estimate and measure weight/mass and describe the results in U.S. Customary and metric units as appropriate; and**
- b) identify equivalent measurements between units within the U.S. Customary system (ounces, pounds, and tons) and between units within the metric system (grams and kilograms).**

# Suggested Practice for SOL 4.6a

Students need additional practice with estimation when metric units are required.

1. Which item has a mass closest to 1 kilogram?

a penny

a textbook

an apple

a bicycle

2. Sort the items according to the most appropriate unit to use when measuring mass of the item.

	Grams	Kilograms
Cell phone	Cell phone	Baby elephant
Baby elephant	Flip-flop	School bus
Flip-flop	Pencil	
Pencil		
School bus		

## Suggested Practice for SOL 4.6b

Students need additional practice determining equivalent measurements within the U.S. Customary system.

Determine the equivalent measurements.

1. 6 tons = 12,000 pounds
2. 12 tons = 24,000 pounds
3. 4 pounds = 64 ounces
4. 48 ounces = 3 pounds

Extension:

Mrs. Smith's baby gained 2 pounds 3 ounces. What is the total number of ounces Mrs. Smith's baby gained? **35 ounces**

# Determining Elapsed Time

## SOL 4.9

The student will determine elapsed time in hours and minutes within a 12-hour period.

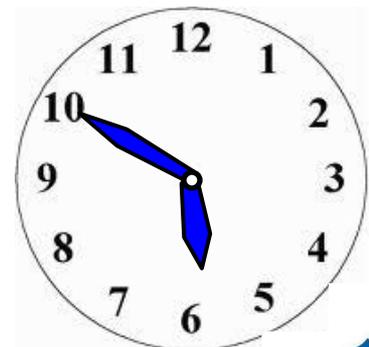
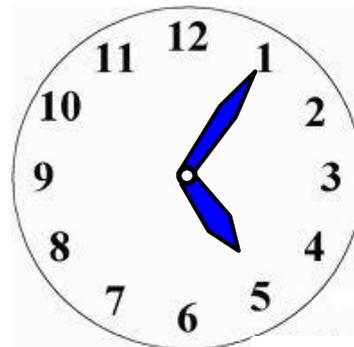
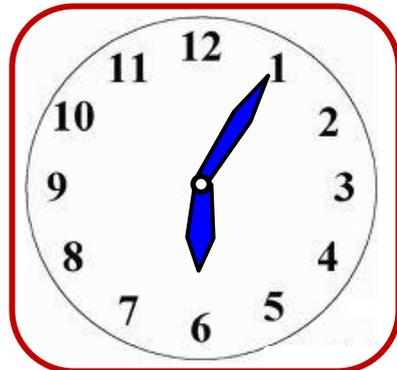
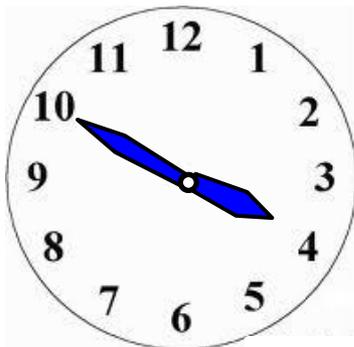
# Suggested Practice for SOL 4.9

Students need additional practice determining elapsed time.

1. A movie started at 4:50 P.M. and ended at 7:13 P.M. What was the total amount of time that passed between the time the movie started and the time the movie ended?

**2 hours 23 minutes**

2. The school basketball team played a game that started at 4:15 P.M. The game ended 1 hour 50 minutes later. Which clock shows the time closest to the time this game ended?



# Defining Characteristics of Polygons

**SOL 4.12**

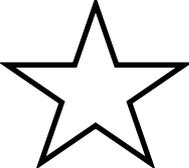
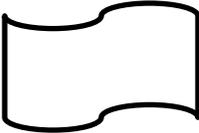
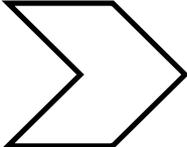
**The student will**

- a) define polygon; and**
- b) identify polygons with 10 or fewer sides.**

# Suggested Practice for SOL 4.12a

Students need additional practice determining whether given figures are polygons.

Use what you have learned about polygons to complete the table.

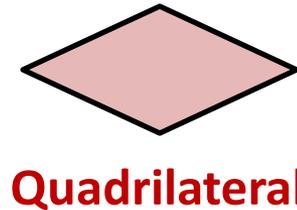
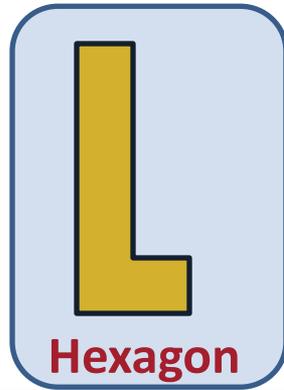
						
Is the figure a polygon?	yes	yes	no	no	yes	no
If it is NOT a polygon, give one reason why.	Possible answers:		Two sides are not line segments.	It is not a closed figure.		The sides have curves.

# Suggested Practice for SOL 4.12b

Students need additional practice naming polygons with no more than 10 sides.

Label each figure with the correct name. A name may be used more than one time. You will not use every name.

Figure Names
Decagon
Heptagon
Hexagon
Nonagon
Octagon
Pentagon
Quadrilateral



# Representing Probability

## SOL 4.13

The student will

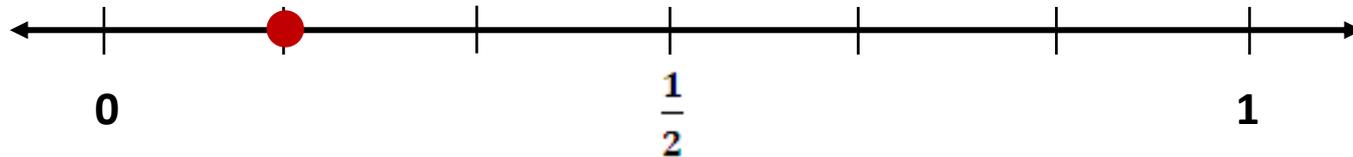
- a) predict the likelihood of an outcome of a simple event; and
- b) represent probability as a number between 0 and 1, inclusive.

## Suggested Practice for SOL 4.13b

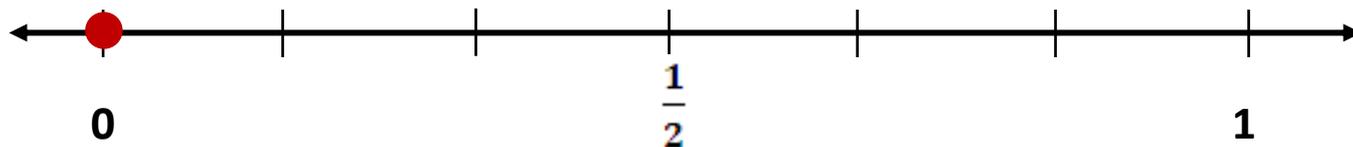
Students need additional practice representing the probability of a given situation on a number line.

Latasha will roll a fair number cube that has sides labeled 1 through 6. Place a point on the number line to represent the probability of each situation.

a) What is the probability Latasha will roll a 5 on the first roll?

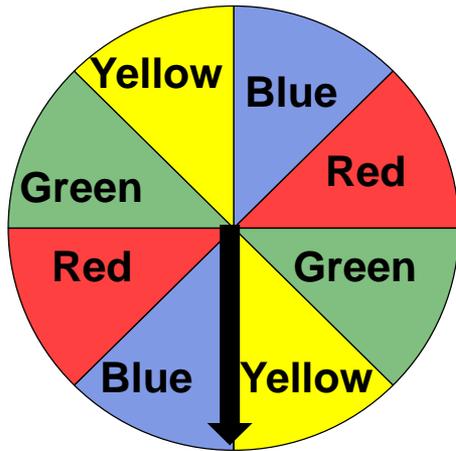


b) What is the probability she will roll a number greater than 6?



# Suggested Practice for SOL 4.13b

Zeke has a spinner with eight equal sections as shown.

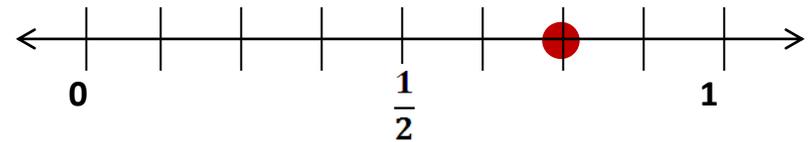


Zeke will spin the arrow on this spinner one time.

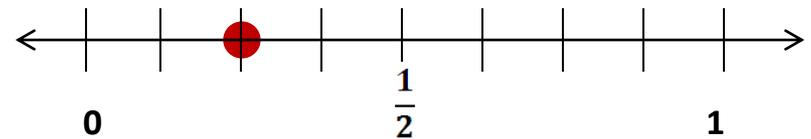
Extension: Place a point on a number line to represent the probability of landing on a section that is red or blue. Label this point *P*. **Point *P* should be located at one-half on a number line.**

Place a point on the number line to represent the probability described in each situation.

1. What is the probability the arrow will land on a section that is NOT blue?



2. What is the probability the arrow will land on a red section?



# Evaluating and Extending Patterns

## SOL 4.15

The student will recognize, create, and **extend numerical and geometric patterns.**

# Suggested Practice for SOL 4.15

Students need additional practice with numerical patterns.

1. This number pattern follows a rule.

137, 129, 121, 113, 105, ...

The pattern will continue in the same way. What are the next two numbers in this pattern? **97, 89**

2. The table has information about the number of balloons contained in packages.

Number of Packages	2	4	6	8	10	12
Total Number of Balloons	24	48	72	96	120	?

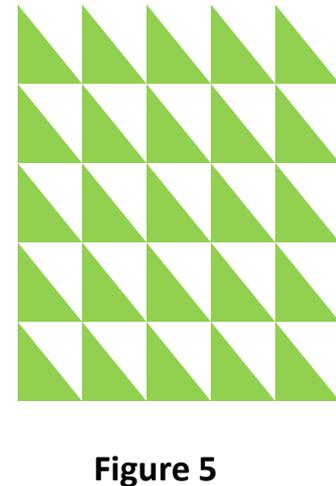
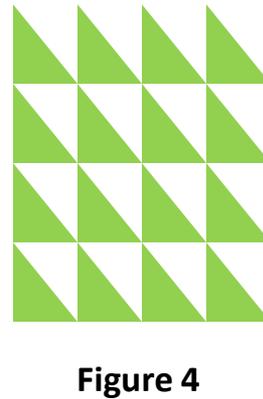
Based on the table, what would be the total number of balloons in 12 of these packages? **144 balloons**

# Suggested Practice for SOL 4.15

Students need additional practice with geometric patterns.

Johanna is using a pattern to make figures from paper triangles like this one: 

She has made four figures using this pattern, as shown.



Exactly how many paper triangles will Johanna need to make the sixth figure in this pattern? **36**

# Practice Items

This concludes the student performance information for the spring 2013 Grade 4 Mathematics SOL test.

Additionally, test preparation practice items for Grade 4 Mathematics can be found on the Virginia Department of Education Web site at:

[http://www.doe.virginia.gov/testing/sol/practice\\_items/index.shtml#math](http://www.doe.virginia.gov/testing/sol/practice_items/index.shtml#math)

# Contact Information

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