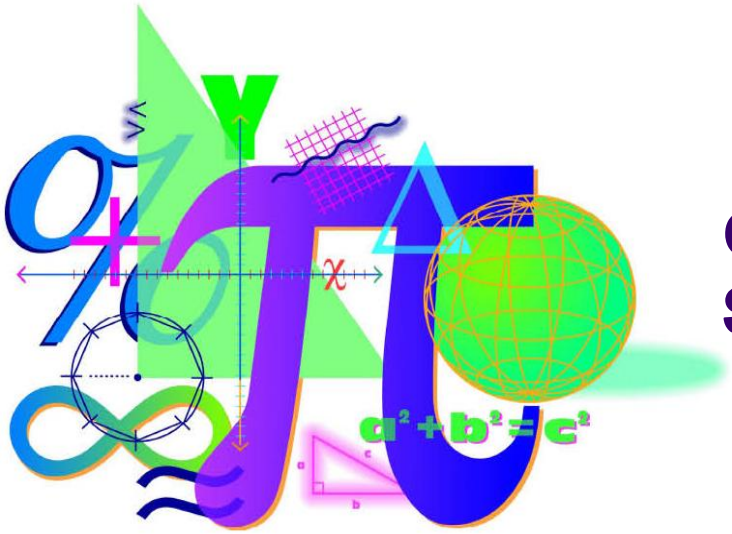
Spring 2012 Student Performance Analysis



Grade 4 Mathematics Standards of Learning

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

VIRGINIA DEPARTMENT OF EDUCATION

Rounding and Ordering Decimals

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 4.3

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

1) **Select all of the numbers that will round to 372.81, when rounded to the nearest hundredth.**

372.815 **372.799** **380.999** **372.804**

372.807 **372.812** **372.8**

Suggested Practice for SOL 4.3

Students also need additional practice ordering decimal numbers.

2) **Select each set of decimal numbers that is ordered from least to greatest.**

1.07; 1.069; 1.6; 1.679

21.3; 21.301; 21.39; 21.299

123.168; 123.17; 123.618; 123.67

209.25; 209.263; 209.272; 209.281

Estimating Solutions

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 4.4

Students need additional practice estimating solutions to practical problems.

1) **Bobby's mom is having a party for Bobby and his friends at a local restaurant.**
   - **Bobby and eleven of his friends will attend the party, and each of them will eat a kids' meal during the party.**
   - **Kids' meals at this restaurant cost $4.85 each.**

   About how much money will the kids' meals for this party cost?

12 x 5 = 60, so approximately $60

Suggested Practice for SOL 4.4

2) There are 230 fourth-grade students at Madison Elementary School this year. The principal must purchase a new mathematics textbook for each of these students. Each textbook will cost $37. Which of these numbers is the best estimate for the cost of these 230 textbooks?

$400	$4,000	$1,000
$10,000	$1,200	$12,000

Determining Multiples and Factors and Solving Multistep Fraction Problems in Context

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 4.5

Students need additional practice determining common multiples and factors, including least common multiple and greatest common factor.

1) What is the greatest common factor of 12, 20, and 24? **4**

2) Which of these are common factors for 18 and 27? (Select all.)

(1) 2 (3) (9) 18 27 486

3) What is the least common multiple of 8, 12, and 24? **24**

4) Select each number that is a common multiple of 4, 12, and 24.

1 2 4 12 (24) 36 (48)

Suggested Practice for SOL 4.5

Students need additional practice solving multistep problems involving fractions in the context of a practical situation.

5) Melanie, Joanne, and Carol shared a pan of brownies.

- **Melanie ate $\frac{1}{3}$ of the pan of brownies.**
- **Joanne ate $\frac{1}{4}$ of the pan of brownies.**
- **Carol ate $\frac{1}{6}$ of the pan of brownies.**

What fraction of this pan of brownies was NOT eaten?

$\frac{1}{4}$ of the pan of brownies was not eaten

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 4.6

Students need additional practice finding measurements that are equal to a given measure within the same measurement system.

1) __?__ kilograms = 47 grams 0.047

2) 41 kilograms = __?__ grams 41,000

3) 14 pounds = __?__ ounces 224

4) __?__ pounds = 3 tons 6,000

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 in practical situations.

1) **Sasha started working on her project last night at 7:10 p.m. and finished working on her project at 9:05 p.m. How much time did Sasha spend working on her project last night?**

1 hour and 55 minutes

Suggested Practice for SOL 4.9

2) The Smith family will take the train from Richmond, Virginia to New York City. Their train will leave the station at 1:50 p.m. and is scheduled to arrive in New York City 6 hours and 22 minutes later. What is this train's scheduled arrival time in New York City?

8:12 p.m.

3) Kevin's class arrived back at their school from a field trip to Petersburg at 3:10 p.m. Friday. They spent a total of 1 hour and 40 minutes traveling back to school. At what time did Kevin's class leave Petersburg to return to their school?

1:30 p.m.

Defining Characteristics of Polygons

SOL 4.12

The student will

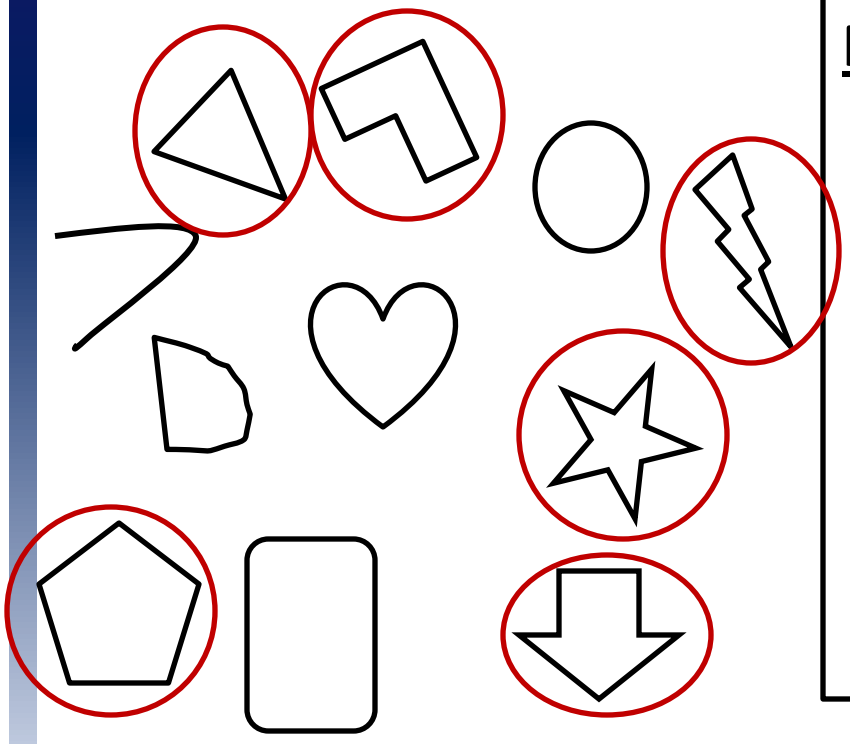
a) define polygon; and

b) identify polygons with 10 or fewer sides.

Suggested Practice for SOL 4.12

Students need additional practice identifying images of polygons.

1) **Some of these figures are polygons and some are not polygons. Sort all of these figures.**



Polygons	Not Polygons
The polygons have been circled in red.	

Suggested Practice for SOL 4.12

Students need additional practice defining and identifying polygons through descriptions.

2) Which polygon has more than 3 sides and less than 7 sides?

   a) Triangle
   b) Octagon
   c) Pentagon
   d) Heptagon

3) Which statement about an octagon is true?

   a) An octagon must have exactly eight congruent sides.
   b) An octagon must have exactly eight angles.
   c) An octagon must have exactly six congruent sides.
   d) An octagon must have exactly six angles.

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 evaluating and extending geometric and numerical patterns.

1) **Yao used toothpicks to create a pattern. The first five steps of his pattern are shown.**

Step 1 Step 2 Step 3 Step 4 Step 5

Yao will continue using toothpicks to extend his pattern.

a) **How many toothpicks will Yao use for the next step of his pattern?** 11

b) **How many will he use for step 8?** 15

Suggested Practice for SOL 4.15

2) Look at this number pattern.

208, 183, 158, 133, ___

a) If the pattern continues in the same way, what will be the next number? **108**

b) What will be the seventh number in the pattern? **58**

Recognizing the Associative Property

SOL 4.16

The student will

a) **recognize and demonstrate the meaning of equality in an equation; and**

b) **investigate and describe the associative property for addition and multiplication.**

Suggested Practice for SOL 4.16

Students need additional practice identifying the use of the associative property as well as applying it.

1) **Select each equation that shows the use of the associative property of multiplication.**

14 x 8 = 8 x 14

(14 + 12) x 25 = (14 x 25) + (12 x 25)

(22 x 2) x 3 = 22 x (2 x 3)

32 x 5 x 1 = 1 x 5 x 32

(12 x 3) x 6 = 6 x (12 x 3)

17 x (2 x 10) = (17 x 2) x 10

Suggested Practice for SOL 4.16

2) Complete these equations to show the application of the associative property of addition.

a) (12 + 14) + 6 = 12 + (14 + 6)

b) 27 + (3 + 19) = (27 + 3) + 19

Practice Items

This concludes the student performance information for the spring 2012 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