Spring 2014 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 a set of fractions or mixed numbers.

1. **Which lists these fractions in order from least to greatest?**

$$\frac{3}{8}, \quad \frac{3}{2}, \quad \frac{3}{5}$$

A $\quad \frac{3}{2}, \quad \frac{3}{5}, \quad \frac{3}{8}$ ⟵ **Most common error**

B $\quad \frac{3}{8}, \quad \frac{3}{5}, \quad \frac{3}{2}$

C $\quad \frac{3}{2}, \quad \frac{3}{8}, \quad \frac{3}{5}$

D $\quad \frac{3}{8}, \quad \frac{3}{2}, \quad \frac{3}{5}$

Suggested Practice for SOL 4.2a

2. **Which list is ordered from greatest to least?**

A $\quad 1\dfrac{2}{10}\, , \quad 1\dfrac{1}{3}\, , \quad 1\dfrac{7}{8}$ ⟵ **Most common error**

B $\quad 1\dfrac{7}{8}\, , \quad 1\dfrac{2}{10}\, , \quad 1\dfrac{1}{3}$

C $\quad 1\dfrac{1}{3}\, , \quad 1\dfrac{7}{8}\, , \quad 1\dfrac{2}{10}$

D $\quad 1\dfrac{7}{8}\, , \quad 1\dfrac{1}{3}\, , \quad 1\dfrac{2}{10}$

Suggested Practice for SOL 4.2b

Students need additional practice identifying representations of equivalent fractions.

All of the circles shown are the same size. Each is shaded to represent a fraction of the circle. Select two models that are shaded to represent equivalent amounts of the circle.
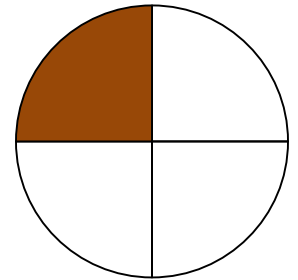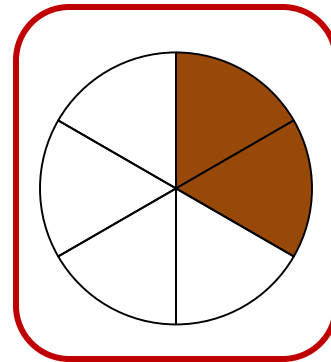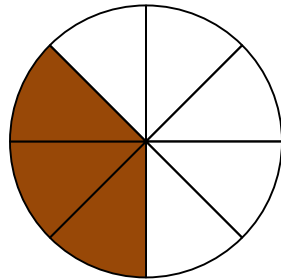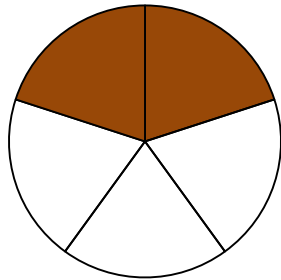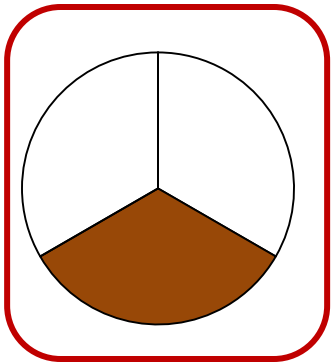
Writing Decimals Expressed Through Thousandths

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 4.3a

Students need additional practice writing decimals expressed through thousandths.

Write each number.

1. **Seventy-two and thirteen thousandths**   72.013

2. **One hundred six and four hundred nine thousandths**
106.409

Estimating and Solving Problems with Whole Numbers

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 estimating the product of two whole numbers.

The product of 579 and 28 is closest to –

A 20,000

B 18,000

C 12,000 ⟵ **Most common error**

D 10,000

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Suggested Practice for SOL 4.4c

Students need additional practice finding quotients of whole numbers, particularly when the quotient has a remainder.

Find the quotients:

1. $7 \overline{) 713}$

     A 10 R 6   **B** 11 R 6   **C** 100 R 6   **D** 101 R 6

Most common error

2. $8 \overline{) 602}$ **75 R 2**

Suggested Practice for SOL 4.4d

Students need additional practice solving single-step and multistep problems involving whole numbers.

1. **An empty soup can has a mass of 51 grams. Together, the can and the soup it contains have a mass of 354 grams. What is the mass of the soup in the can?**

    354 − 51 = 303 grams **Most common error:**
    51 + 354 = 405 grams

2. **Jane had a box containing exactly 42 pieces of candy. She put 3 pieces of candy into each of 9 treat bags for a party. How many pieces of candy were left in the box?**

    15 pieces **Most common errors:**
    42 − 3 = 39 pieces
    42 − 9 = 33 pieces
    42 − 12 = 30 pieces

Suggested Practice for SOL 4.4d

3. The Johnson family is going to a concert. The prices for concert tickets and parking are shown in this table.

Concert Items

Item	Price
Adult Ticket	$ 10
Child Ticket	$ 4
Senior Ticket	$ 8
Parking Ticket	$ 5

The Johnsons will buy 1 parking ticket, 2 adult tickets, 3 child tickets, and 1 senior ticket. What will be the total cost for these items? $ 45

Most common error: $10 + 4 + 8 + 5 = 27$ dollars

Solving Problems With Fractions and Decimals

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.
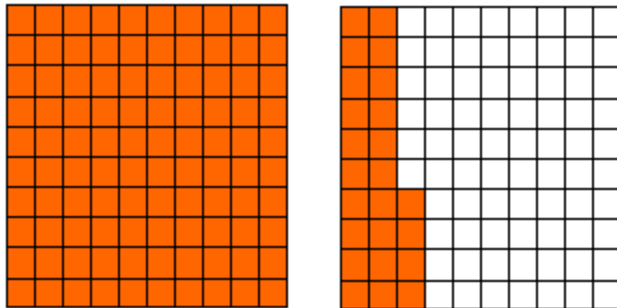
Suggested Practice for SOL 4.5c

Students need additional practice subtracting decimals with pictorial representations and with the vocabulary associated with addition and subtraction.

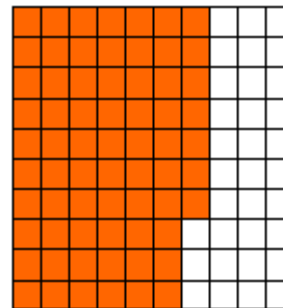**This model is shaded to represent one whole.**
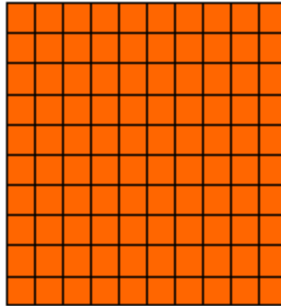
Model 1 and model 2 have each been shaded to represent a decimal.

Model 1   Model 2

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

A   1.91   **B**   1.21   **C**   0.67   **D**   0.57

14

Most common error

Suggested Practice for SOL 4.5d

Students need additional practice solving problems involving fractions or mixed numbers with unlike denominators.

A doll house with two levels has a total height of $3\frac{5}{6}$ feet. The height of the roof is $\frac{3}{4}$ foot, as shown in the picture.

$3\frac{5}{6}$ feet

$\frac{3}{4}$ foot

? height of the two levels
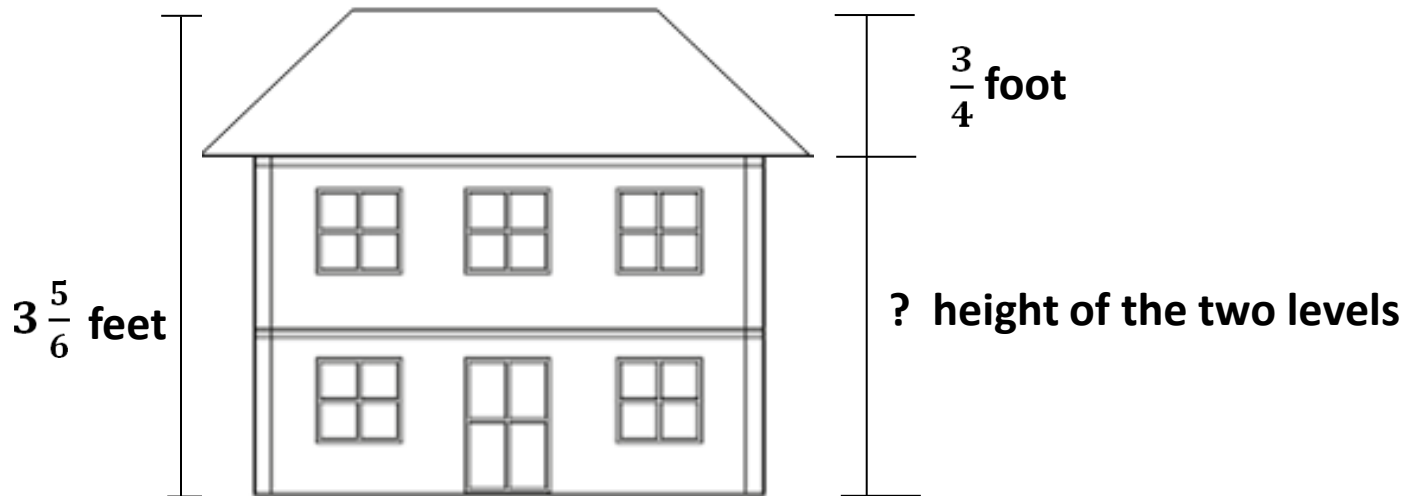
What is the combined height of the two levels of this doll house?

A $3\frac{1}{12}$ feet   B $3\frac{4}{5}$ feet   C $3\frac{1}{3}$ feet   D $4\frac{7}{12}$ feet

Most common error

15

Slide revised 3/17/2015

Suggested Practice for SOL 4.5d

Mrs. Smith made a quilt using different fabrics.

- $\dfrac{3}{8}$ **of the fabric used was blue**

- $\dfrac{1}{12}$ **of the fabric used was green**

- $\dfrac{1}{12}$ **of the fabric used was yellow**

The rest of the fabric Mrs. Smith used was white. What fraction of this fabric was white?

$\dfrac{11}{24}$ **of the fabric used was white**

Most common error: $\dfrac{3}{8} + \dfrac{1}{12} + \dfrac{1}{12} = \dfrac{13}{24}$

Identifying Equivalent U.S. Customary Weights

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 4.6b

Students need additional practice identifying equivalent measurements of weight within the U.S. Customary system.

1. A large dump truck can haul 13 tons of material. Which weight is equivalent to 13 tons?

   A 26,000 pounds   C   2,600 pounds

   B 13,000 pounds ⟵ **Most common error** D   1,300 pounds

2. How many pounds are equivalent to 112 ounces? **7 pounds**

Identifying Equivalent Metric Lengths

SOL 4.7

The student will

a) estimate and measure length, and describe the result in both metric and U.S. Customary units; and

b) identify equivalent measurements between units within the U.S. Customary system (inches and feet; feet and yards; inches and yards; yards and miles) and between units within the metric system (millimeters and centimeters; centimeters and meters; and millimeters and meters).

Suggested Practice for SOL 4.7b

Students need additional practice identifying equivalent metric measurements of length.

1. Use the correct number from the list to complete the equation.

a.   40 centimeters = _____400_____ millimeters

400	40	4	0.4

b.   _____30,000_____ millimeters = 30 meters

30,000	3,000	300	3

Suggested Practice for SOL 4.7b

2. Select two measurements equivalent to 2,500 millimeters.

2.5 meters

25 meters

250 centimeters

25 centimeters

Determining Elapsed Time

SOL 4.9

**The student will determine elapsed time in hours and minutes within a 12-hour period.**
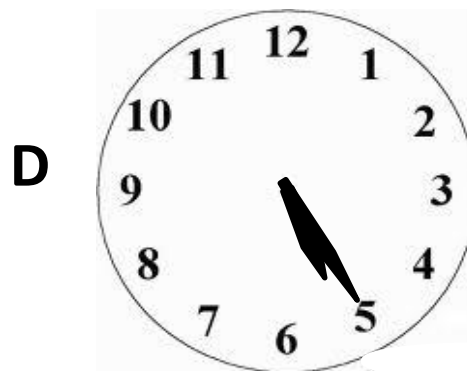
Suggested Practice for SOL 4.9

Students need additional practice determining elapsed time.

A store manager arrived at work one morning at 8:52. She left work 9 hours 25 minutes later. Which clock best represents the time she left work?

A

C

B

← **Most common error**

D

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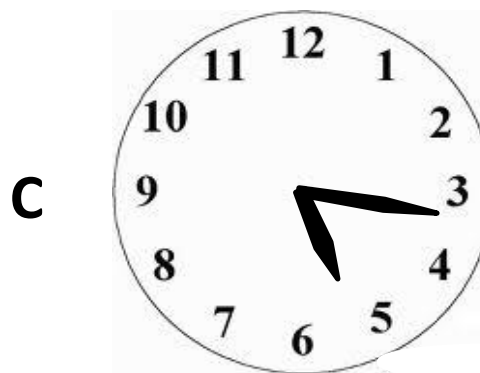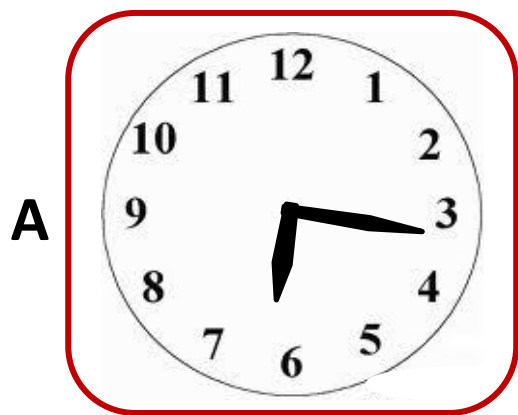
Describing Points, Lines, Line Segments, Rays, and Angles

SOL 4.10

The student will

a) **identify and describe representations of points, lines, line segments, rays, and angles, including endpoints and vertices; and**

b) **identify representations of lines that illustrate intersection, parallelism, and perpendicularity.**

Suggested Practice for SOL 4.10a

Students need additional practice with verbal descriptions of points, lines, line segments, rays, and angles.

1. Select three statements about a ray that are true.

   A ray has exactly one endpoint.

   A ray has exactly two endpoints.

   A ray goes on and on infinitely in two directions.

   A ray goes on and on infinitely in one direction.

   A ray is part of a line segment.

   A ray is part of a line.

Suggested Practice for SOL 4.10a

2. Use the word bank to name each figure described.

Word bank:	angle	line	ray
	point	line segment	vertex

Description	Figure
a figure with exactly two endpoints	line segment
the point shared by two rays that form an angle	vertex
a figure that extends infinitely in one direction	ray
a location in space with no height, length, or width	point
a figure always formed by two rays with the same endpoint	angle
a figure with no endpoints	line

Representing Probability as a Number

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 probability as a number between 0 and 1, inclusive.

Jared has twelve math fact cards that are all the same size, as shown.

$3 \times 4 = 12$	$3 \times 2 = 6$	$3 \times 3 = 9$	$3 \times 5 = 15$
$4 \times 4 = 16$	$4 \times 3 = 12$	$4 \times 5 = 20$	$5 \times 2 = 10$
$4 \times 2 = 8$	$5 \times 3 = 15$	$5 \times 4 = 20$	$5 \times 5 = 25$

Jared will randomly select one of these cards from a bag without looking. What is the probability Jared will select a card that has a 3 on it?

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

# Interpreting Bar Graphs

SOL 4.14

The student will collect, organize, display, and interpret data from a variety of graphs.

Suggested Practice for SOL 4.14

Students need additional practice interpreting data represented in a bar graph.

Fourth grade students in a school each chose one subject as their favorite. The resulting data are shown in this graph. Use the information shown in the graph to answer the questions on the next two slides.

Favorite Subjects
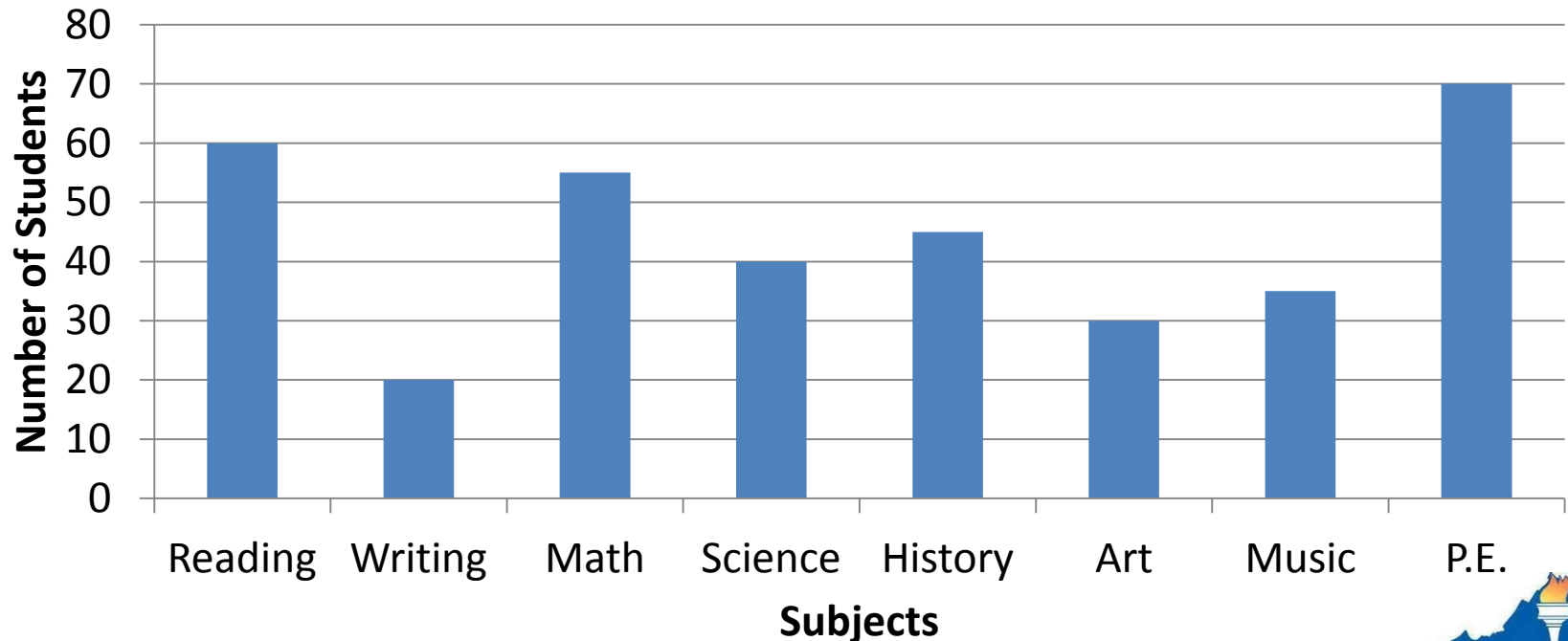
Suggested Practice for SOL 4.14

1. Based on the graph, which statement is true?

   A   The number of students who chose reading is exactly two times the number of students who chose music.

   B   The number of students who chose P.E. is equal to the number of students who chose math and art combined.

   C   The number of students who chose science is exactly two times the number of students who chose writing.

   D   The number of students who chose history is greater than the number of students who chose art and writing combined.

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Suggested Practice for SOL 4.14

2. Which subject was chosen by half the number of students who chose reading?   **art**

3. The number of students who chose math is equal to the number of students who chose writing and _**music**_____ combined.

4. Reading was chosen by three times more students than _**writing**_____.

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 recognizing and extending numerical patterns.

Each box of crayons has the same number of crayons. This table shows the total number of crayons in different numbers of boxes.

Crayons	
Number of Boxes	**Total Number of Crayons**
2	48
4	96
6	144
9	216
10	?

Based on the table, what would be the total number of crayons in 10 boxes?

A   288   B   240   C   244   D   360

Most common error

Suggested Practice for SOL 4.15

Students need additional practice extending geometric patterns.

The first four figures are the core of this pattern.

The 18ᵗʰ figure in this pattern will be a --

A   ⟵ **Most common error**

B

C

D

Demonstrating the Meaning of Equality in an Equation

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 4.16a

Students need additional practice demonstrating the meaning of equality in an equation.

What number can be placed in the box to make a true equation?

$$84 + 30 = 4 + \square + 30$$

A   30

B   34

C   80

D   84   ⟵——— Most common error

Practice Items

This concludes the student performance information for the spring 2014 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

Contact Information

For questions regarding assessment, please contact
Student_assessment@doe.virginia.gov

For questions regarding instruction, please contact
Michael.Bolling@doe.virginia.gov