Spring 2012 Student Performance Analysis

Grade 6 Mathematics Standards of Learning

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

VIRGINIA DEPARTMENT OF EDUCATION

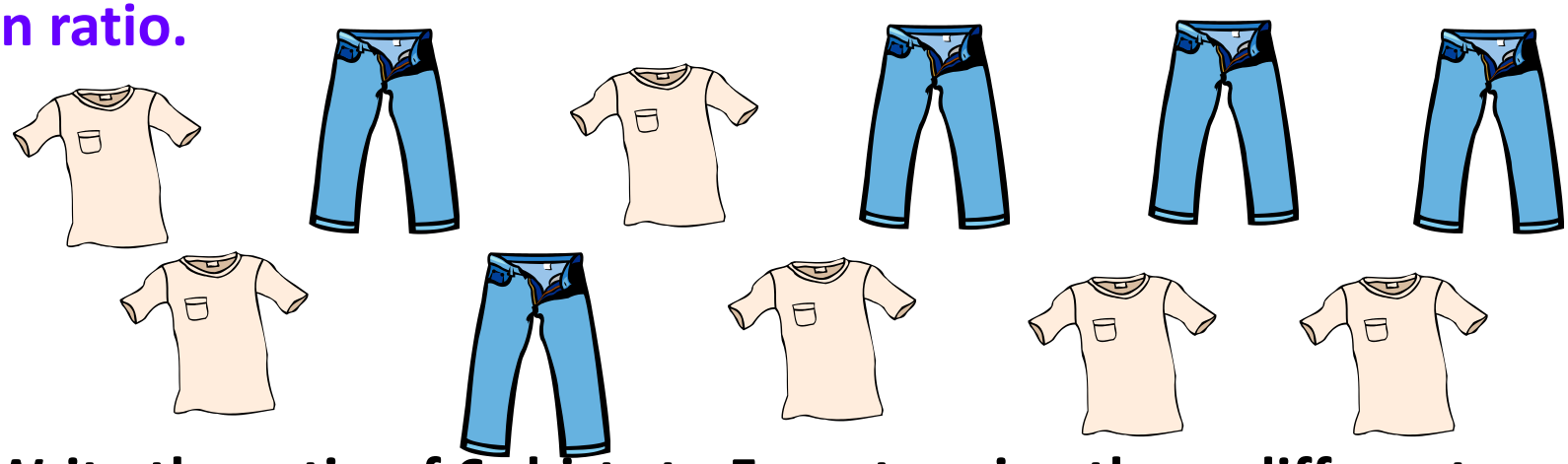
Using Ratios

SOL 6.1

The student will describe and compare data, using ratios and will use appropriate notations, such as $\frac{a}{b}$, a to b, and $a{:}b$.

Suggested Practice for SOL 6.1

Students need additional practice representing ratios using the three notations and identifying pictorial representations for a given ratio.

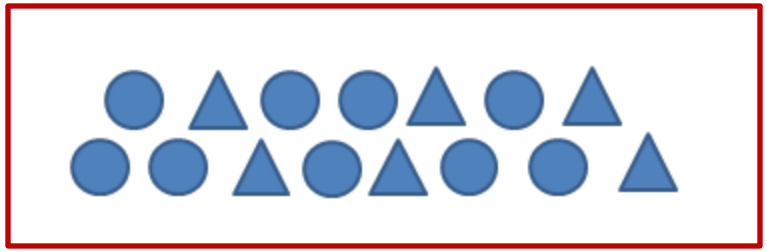


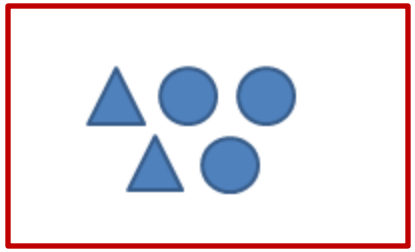
a) **Write the ratio of 6 shirts to 5 pants using three different notations.** $\frac{6}{5}$ $6:5$ $6\ to\ 5$

b) **Represent the ratio of shirts to pants using numbers other than 6 and 5.** Sample Answers: $\frac{12}{10}$, $18:15$, 24 to 20

Suggested Practice for SOL 6.1

Identify each picture that has a ratio of 2:3 for the number of triangles to the number of circles.





Comparing and Determining Equivalent Relationships Between Decimals, Percents, and Fractions

SOL 6.2

The student will

a) investigate and describe fractions, decimals and percents as ratios;

b) identify a given fraction, decimal, or percent from a representation;

c) demonstrate equivalent relationships among fractions, decimals, and percents; and

d) compare and order fractions, decimals, and percents.

Suggested Practice for SOL 6.2

Students need additional practice describing decimals, fractions, and percents as ratios.

a) Which ratio is equivalent to 4.2?

a) $\boxed{\frac{21}{5}}$ b) $\frac{17}{4}$ c) $\frac{42}{100}$ d) $\frac{21}{42}$

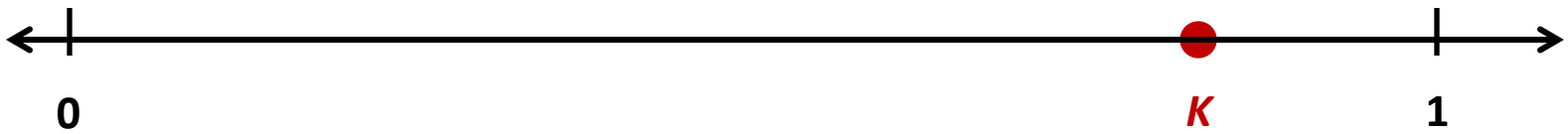
b) What ratio is equivalent to 0.3% ?

$\frac{3}{1,000}$ **and equivalent ratios**

Suggested Practice for SOL 6.2

Students need additional practice identifying a given fraction, decimal, or percent on a number line.

Which number could represent point *K*?

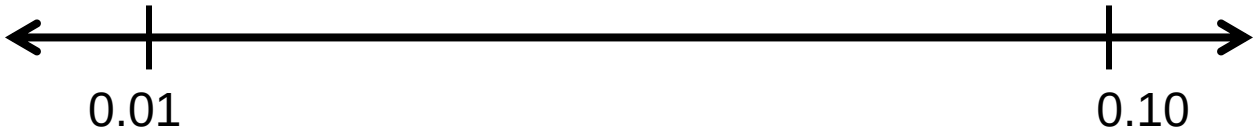


a) 0.08 b) $\boxed{\frac{8}{10}}$ c) 0.8% d) $\frac{3}{8}$

Suggested Practice for SOL 6.2

Students need additional practice comparing numbers on a number line.

Select all of the given numbers that lie between 0.01 and 0.10 on the number line.



0.015	**0.31**	**0.023**	**0.002**
0.004	**0.50**	**0.049**	**0.205**

Identifying and Representing Integers

SOL 6.3

The student will

a) **identify and represent integers;**
b) **order and compare integers; and**
c) **identify and describe absolute value of integers.**

Suggested Practice for SOL 6.3

Students need additional practice identifying integers represented in any form.

Identify each number that is an integer.

$\boxed{5^2}$ $\quad \frac{1}{2} \quad$ $\boxed{-6}$ $\boxed{\frac{57}{3}}$ $\boxed{21}$ $-\frac{8}{24} \quad 2.76$

Representations of Multiplication and Division of Fractions

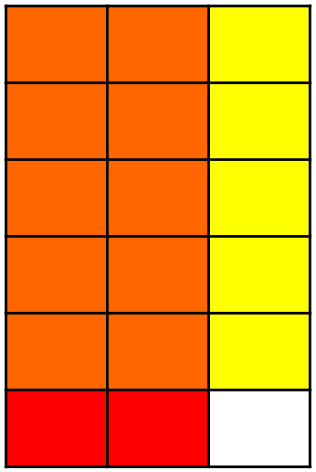
SOL 6.4

The student will demonstrate multiple representations of multiplication and division of fractions.

Suggested Practice for SOL 6.4

Students need additional practice demonstrating multiplication of fractions using models.

Which product is represented by the shading of the model?



a) $\frac{5}{9} \cdot \frac{2}{9}$

b) $\boxed{\frac{2}{3} \cdot \frac{5}{6}}$

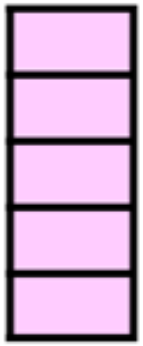
c) $\frac{5}{18} \cdot \frac{2}{18}$

d) $\frac{2}{6} \cdot \frac{5}{6}$

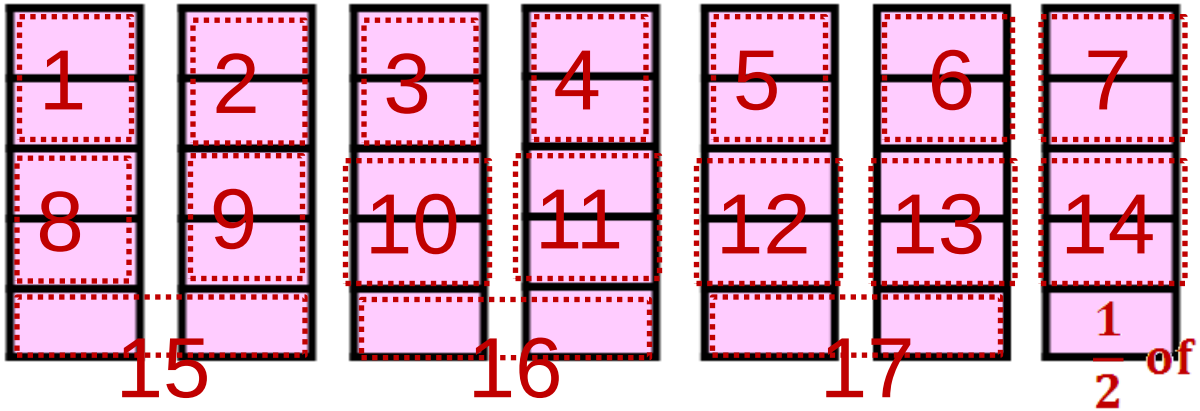
Suggested Practice for SOL 6.4

Students need additional practice using models to determine the number of fractional parts in a given number.

This figure represents one whole divided into five equal parts.



Exactly how many $\frac{2}{5}$ are in 7 ?



$17\frac{1}{2}$

$\frac{1}{2}$ of a $\frac{2}{5}$

Solving Problems with Decimals

SOL 6.7

The student will solve single-step and multistep practical problems involving addition, subtraction, multiplication, and division of decimals.

Suggested Practice for SOL 6.7

Students need additional practice solving practical problems that require decimal calculations.

Jake made punch by combining 2.75 liters of orange juice, 1.25 liters of pineapple juice, and 3.5 liters of soda. He then poured equal amounts of all the punch into 3 different containers. How much punch did Jake pour into each container?

2. 5 liters

Solving Practical Problems Involving Circumference, Area and Perimeter

SOL 6.10

The student will

a) **define pi (π) as the ratio of the circumference of a circle to its diameter;**

b) **solve practical problems involving circumference and area of a circle, given the diameter or radius;**

c) **solve practical problems involving area and perimeter; and**

d) **describe and determine the volume and surface area of a rectangular prism.**

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Suggested Practice for SOL 6.10

Students need additional practice finding circumference, perimeter, and area when figures are not included.

a) **Clinton purchased a circular rug to cover part of a floor. The diameter of the rug is 8 feet. Rounded to the nearest whole number, what area of the floor will the rug cover?**

50 square feet

b) **A circular pool has a radius of 12 feet. What is the approximate distance around the pool, rounded to the nearest foot?**

Approximately 75 feet

c) **Dana has a rectangular garden that she wishes to fence in. If the dimensions of the garden are 15 feet by 13 feet, what is the minimum amount of fencing that she needs to enclose her garden?**

56 feet

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Graphing Points in a Coordinate Plane

SOL 6.11

The student will

a) identify the coordinates of a point in a coordinate plane; and

b) graph ordered pairs in a coordinate plane.

Suggested Practice for SOL 6.11

Students need additional practice recognizing the location of points that lie on the x- or y-axis.

1) Identify the location of the point (10,0).
   a) In Quadrant I
   b) In Quadrant III
   c) On the x-axis
   d) On the y-axis

2) Select the two points that are located on the y-axis.

(0,0) (0,1) (1,1) (-1,-1) (1,0)

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Using Properties to Classify Quadrilaterals

SOL 6.13

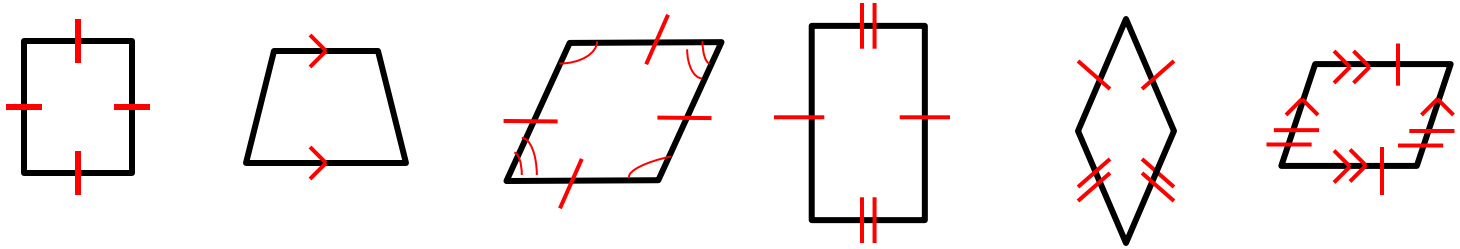
The student will describe and identify properties of quadrilaterals.

Suggested Practice for SOL 6.13

Students need additional practice describing and identifying properties of quadrilaterals.

a) Name each figure using the given attributes with its most precise name.
b) What term most accurately classifies all of these figures? **quadrilateral**
c) What term most accurately classifies figures 1, 3, 4, and 6? **parallelogram**
d) What term most accurately classifies figures 1 and 3? **rhombus**

square	trapezoid	rhombus	rectangle	kite	parallelogram
1	2	3	4	5	6



Each angle is 90°

Each angle is 90°

Defining Mean as Balance Point and Determining Appropriate Measure of Center

SOL 6.15

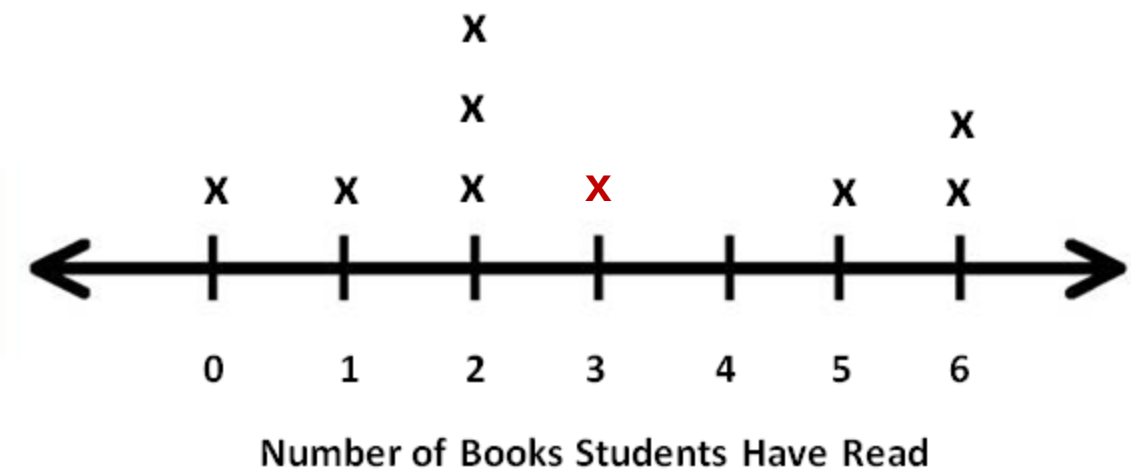
The student will

a) **describe mean as balance point; and**
b) **decide which measure of center is appropriate for a given purpose.**

Suggested Practice for SOL 6.15

Students need additional practice using a line plot to determine the mean as balance point.

This line plot shows the number of books that a group of students have read. Use this data to determine where on the line plot the mean will appear.



Suggested Practice for SOL 6.15

Students need additional practice determining the appropriate measure of center.

This data shows the ages of members of a youth book club and the age of the facilitator.

11 12 13 14 15 16 17 57

What is the most appropriate measure of center for this data?

Sample answer: Median because the age of the facilitator is much higher than the ages of the other members, and there is no mode.

Determining Probability of Dependent and Independent Events

SOL 6.16

The student will

a) **compare and contrast dependent and independent events; and**

b) **determine probabilities for dependent and independent events.**

Suggested Practice for SOL 6.16

Students need additional practice finding the probability of dependent and independent events.

This chart shows the three pairs of pants and four shirts that Bobby packed for a trip. Bobby will randomly select an outfit to wear. He can choose one pair of pants and one shirt. Using the chart, determine the probability that he will select a pair of blue jeans and the yellow shirt.

Pants	Shirt Color
Blue Jeans	Orange
Blue Jeans	Yellow
Khakis	Green
	Red

$\frac{1}{6}$ or approximately 16.7%

Suggested Practice for SOL 6.16

Alexis has a deck of cards labeled as follows:

- **3 cards with a heart**
- **2 cards with a circle**
- **1 card with a flower**
- **1 card with a ball**

a) What is the probability that she will randomly select a card with a heart, replace it, and then select a card with a ball?

$\frac{3}{49}$ **or approximately 6.1%**

b) What is the probability that she will randomly select a card with a circle, NOT replace it, and then select a card with a circle?

$\frac{1}{21}$ **or approximately 4.8%**

Identifying and Extending Sequences

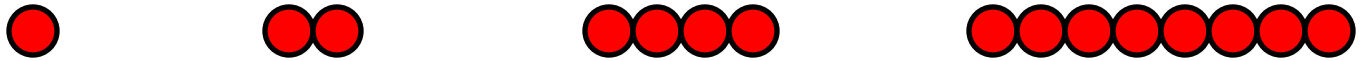
SOL 6.17

The student will identify and extend geometric and arithmetic sequences.

Suggested Practice for SOL 6.17

Students need additional practice determining whether a sequence is arithmetic or geometric, and extending the pattern.

This circle pattern represents terms in a sequence.



1st term 2nd term 3rd term 4th term

a) What is the numerical value for each term in the sequence? 1, 2, 4, 8

b) What rule is applied from one set of circles to the next? Multiply by 2

c) Is this sequence arithmetic or geometric?

d) How many circles would be in the 6th term of this sequence? 32

Suggested Practice for SOL 6.17

Students need additional practice determining and using a common ratio or common difference.

Look at this sequence.

108, 112, 116, 120, . . .

a) **Does this sequence have a common difference or a common ratio?** **Common difference**
b) **What is it?** 4
c) **What is the 8th term of this sequence?** 136

Graphing Inequalities on a Number Line

SOL 6.20

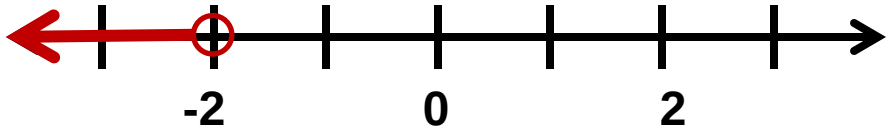
The student will graph inequalities on a number line.

Suggested Practice for SOL 6.20

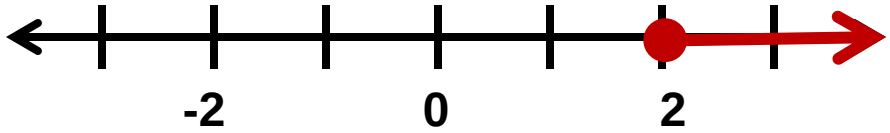
Students need additional practice graphing inequalities on the number line, particularly when the variable is on the right side of the inequality.

Graph each inequality.

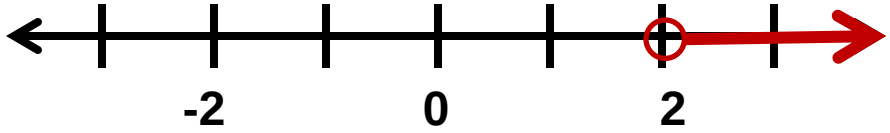
a) $x < -2$



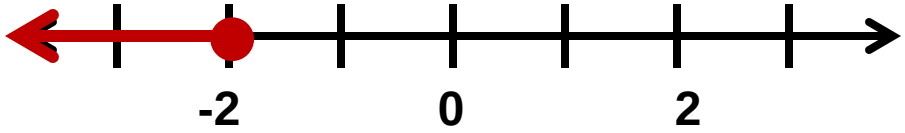
b) $x \geq 2$



c) $2 < x$



d) $-2 \geq x$



Practice Items

This concludes the student performance information for the spring 2012 Grade 6 Mathematics SOL test.

Additionally, test preparation practice items for Grade 6 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

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