PRACTICE TEST ALIGNMENT DOCUMENT

Grade 6 Math

Item Number	Standards
1	06.RP.01.03.d Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.
2	06.EE.03.09 Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. *For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.*
3	06.NS.01.01 Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?*
4	06.SP.02.05.b Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.
5	06.G.01.04 Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.
6	06.NS.03.07 Understand ordering and absolute value of rational numbers.
7	06.RP.01.01 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote Candidate A received, Candidate C received nearly three votes."*
8	06.EE.02.07 Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.

9*	06.SP.02.05.d Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.
10	06.EE.02.08 Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x <$ c have infinitely many solutions; represent solutions of such inequalities on number line diagrams.
11	06.NS.03.07.a Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *For example, interpret –3 > –7 as a statement that –3 is located to the right of –7 on a number line oriented from left to right.*
12	06.SP.01.01 Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.*
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15*	06.EE.02.06 Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
16	06.RP.01.03 Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.
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18	06.NS.01.01 Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?*
19	06.SP.02.04 Display numerical data in plots on a number line, including dot plots, histograms, and box plots.

20	06.EE.03.09 Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. *For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.*
21	06.SP.01.03 Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.
22	06.NS.03.08 Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.
23	06.RP.01.03.b Solve unit rate problems including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?*
24	06.RP.01.02 Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship. *For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger." (Expectations for unit rates in this grade are limited to non-complex fractions.)*
25	06.NS.02.03 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
26	06.EE.01.02.a Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation "Subtract y from 5" as 5 – y.*
27	06.G.01.02 Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas *V = l w h* and *V = b h* to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.
28	06.SP.02.05.c Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.
29*	06.RP.01.03.c Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.

30	06.EE.02.06 Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
31	06.EE.01.04 Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). *For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.*
32	06.EE.01.03 Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.*
33	06.RP.01.03.b Solve unit rate problems including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?*
34	06.G.01.02 Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = l\ w\ h$ and $V = b\ h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.
35*	06.NS.03.05 Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.
36	06.G.01.01 Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.
37	06.NS.02.04 Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. *For example, express 36 + 8 as 4 (9 + 2).*
38	06.SP.02.05.a Reporting the number of observations.
39	06.NS.03.06.c Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.

40	06.RP.01.03.a Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.

* Please refer to Rubric below for Scoring Information.

#9

Concepts and Procedures Scoring Rubric

Score	Description
2	Student earns 2 points.
1	Student earns 1 point.
0	Student earns 0 points.
Blank	No response.

Concepts and Procedures Training Notes:

Part a 2 points for correct answer, **65**, with sufficient explanation or work to show understanding of how to find the measure of center given the shape of the data

OR

1 point for correct answer with insufficient or no work or explanation

or

for appropriate strategy to show understanding of how to find the measure of center given the shape of the data with incorrect or no answer

Mathematical Practices Scoring Rubric

Score	Description
1	Student earns 1 point.
0	Student earns 0 points.
Blank	No response.

Mathematical Practices Training Notes:

1 point for abstracting general principles from repeated phenomena (student relates the shape of the data distribution in the line plot to explain why the median is a better measure of center for the data in part b)

Exemplary Response:

a. There are 14 data values. The median is the average of the two middle values 64 and 66. So, the median is 65.

b. The data appears skewed. Most data values are at the lower temperatures on the line plot, and two data values are far from the majority of the data. As a result, the mean will likely give a value that is significantly larger than the typical data. Therefore, the median is the best measure of center.

#15

Concepts and Procedures Scoring Rubric:

Score	Description
4	The student earns 4 points.
3	The student earns 3 points.
2	The student earns 2 points.
1	The student earns 1 point.
0	The student earns 0 points.
Blank	No response.

Concepts and Procedures Training Notes:

Part a 1 point for correct answer, **59.95 + 0.79*f***

Part b 1 point for correct answer, **2.19*h***

Part c 1 point for correct answer**, *f* can be any number from 0 to 100 and *h* can be any whole number from 0 to 100**

Part d 1 point for correct answer, **the length of rope can be any number between 0 and 100 where the number of hand warmers must be a whole number**

Mathematical Practices Scoring Rubric:

Score	**Description**
2	The student earns 2 points.
1	The student earns 1 point.
0	The student earns 0 points.
Blank	No response.

Mathematical Practices Training Notes:

1 point for identifying important quantities in a practical situation (explains what the different variables represent)

1 point for interpreting the mathematical results in the context of the situation (understands that some variables can represent any number while others are limited to certain values, such as whole numbers)

Exemplary Response:

a. 59.95 + 0.79*f*; The variable *f* represents the number of feet of rope.

b. 2.19*h*; The variable h represents the number of hand warmers bought.

c. Possible values of *f* can be any number from 0 to 100 and *h* can be any whole number from 0 to 100; possible values of *h* are any whole number from 0 to 100.

d. Yes, the length of rope can be any number between 0 and 100 where the number of hand warmers must be a whole number.

#29

Concepts and Procedures Scoring Rubric

Score	Description
2	Student earns 2 points.
1	Student earns 1 point.
0	Student earns 0 points.
Blank	Blank response

Concepts and Procedures Training Notes:

Part a 1 point for correct answer, **30**

Part b 1 point for correct answer, **20(%)**

Mathematical Practices Scoring Rubric

Score	Description
1	Student earns 1 point.
0	Student earns 0 points.
Blank	Blank response

Mathematical Practices Training Notes:

1 point for knowing and using different properties of operations and objects and showing understanding of the meaning of the quantities (knows 4 : 1 means 4 out of 5 and 1 out of 5 and uses that knowledge to find the percent of 1 out of 5).

Exemplary Response:

a. 30

b. 20%. 1 out of every 5 animals is a sheep. 1/5=20/100=20%

#35

Concepts and Procedures Scoring Rubric

Score	Description
4	The student earns 4 points.
3	The student earns 3 points.
2	The student earns 2 points.
1	The student earns 1 point.
0	The student earns 0 points.
Blank	No response.

Concepts and Procedures Training Notes:

Part a 1 point for correct answer, **0 represents ground level**, or equivalent

Part b 2 points for correct answer, **60 feet above ground level and 60 feet below ground level**, with sufficient explanation to indicate understanding that positive and negative numbers are used together to describe quantities having opposite directions or values

OR

1 point for the correct answer with insufficient or no explanation shown

or

for correct strategy with incorrect or no answer

Part d 1 point for correct answer, **45 and –45**

Mathematical Practices Scoring Rubric

Score	**Description**
2	The student earns 2 points.
1	The student earns 1 point.
0	The student earns 0 points.
Blank	No response.

Mathematical Practices Training Notes:

1 point for distinguishing correct logic from that which is flawed (knows that Reese's thinking is incorrect since 30 feet above ground level is the same distance as 30 feet below ground level)

1 point for making plausible arguments that take into account the context (knows that Stephanie is correct since a distance can be a positive number above ground level and also a negative number below ground level)

Exemplary Response:

a. 0 represents ground level.

b. I know that the positive numbers represent feet above ground level and negative numbers represent feet below ground level. Therefore, 60 represents 60 feet above ground level and –60 represents 60 feet below ground level.

c. Reese's thinking is not correct since 30 feet above ground level is the same distance as 30 feet below ground level. The numbers 30 and –30 represent these distances, and both numbers are the same distance from 0, just in opposite directions.

d. Stephanie is correct, two numbers can be plotted. One number is 45 and the other number is –45. Both numbers represent the same distance from ground level; 45 represents 45 feet above ground level and –45 represents 45 feet below ground level.