6th GRADE LEARNING MAP III 2016-2017

Instructional Window: February 13, 2017 – April 28, 2017 ***Assessment Window:*** May 1-5, 2017

Suggested Timeline for 47 Days*: 8 Days (6.G.1); 6 Days (6.G.2); 5 Days (6.G.3); 5 Days (6.G.4); 2 Days (6.SP.1); 3 Days (6.SP.2); 6 Days (6.SP.3); 6 Days (6.SP.4); 6 Days (6.SP.5)

*The Suggested Timeline is only a *RECOMMENDATION* to assist with planning. Teachers and grade level teams should use their professional judgement to determine what is best for their students.

STANDARD	***FOCUS***
6.G.1 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.	**Student will know…(facts, vocabulary, concepts)** • Area • Perimeter • Quadrilateral • Polygon • Base • Height • Rhombus • Trapezoid • Squares • Rectangle • Pentagon • Isosceles triangle • Right triangle • Scalene triangle • Equilateral triangle • Special quadrilaterals • Decompose • Composite figure • Obtuse triangle • Acute triangle
	Student will be able to… • Identify various plane figures (e.g. special quadrilaterals, four types of triangles). • Decompose figures into triangles and rectangles (e.g. decompose a square into two triangles). • Construct figures from rectangles and triangles figures. • Model the area of squares and rectangles using square units. • Investigate the relationship between the area of a rectangle and the two congruent

	triangles that compose it. • Recognize the marks on the isosceles trapezoid indicating the two sides have equal measure. • Apply the appropriate formula to find the area of rectangles and triangles. • Decompose composite figures into rectangles and triangles to determine the area. • Determine 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.
	Standard Essential Question *How can we compose and decompose polygons strategically to find the area in real-world scenarios?*

6.G.2 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.	**Student will know…(facts, vocabulary, concepts)** • Volume • unit cubes • edges • base • height • length • width • right rectangular prism • fractional unit cube • V=lwh • V=bh
	Student will be able to… • Model how to the volume of right rectangular prisms (boxes) using unit cubes with whole number edge lengths. • Calculate the volume of right rectangular prisms using the volume formula (V = lwh) with whole number edge lengths. • Identify that v = l w h is the same as v = Bh and can be used interchangeably. • Recall that whole units are comprised of fractional parts. • Demonstrate competency with multiplying fractions. • Model how to the volume of right rectangular prisms (boxes) using unit cubes with fractional edge lengths. • Use the appropriate tools to measure fractional and whole number lengths of objects in real world situations and apply the measurements to find volume of the object using the volume formulas. • Determine 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.
	Standard Essential Question *How does finding the volume of a right rectangular prism with fractional edge lengths help us to solve real-world and mathematical problems?*

6.G.3 Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.	**Student will know…(facts, vocabulary, concepts)** • X-axis • Y-axis • X coordinate • Y coordinate • Cartesian Coordinate Plane • Length • Distance • Origin • Ordered pair • Coordinate pair • Unit • Polygon • Explicit • Absolute value • Quadrant I, II, III, IV • Scale • Key
	Student will be able to… • Understand ordered pairs (x, y). • Recognize that a coordinate plane has four quadrants. • Identify the x- and y-axes. • Plot coordinates in the first quadrant of the Cartesian Coordinate Plane. • Identify and plot points in all four quadrants of the Cartesian Coordinate Plane. • Draw a polygon in the Cartesian Coordinate Plane using the given coordinates. • Understand that if two coordinates have the same x or y value they are on the same line. • Recognize that the distance between two points on a coordinate plane is an absolute value. • Determine the distance between two points by counting the units between two points. • Understand that a coordinate plane can be used to represent real-world contexts (e.g., streets) • Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems
	Standard Essential Question *How do I calculate the distance between points on the coordinate plane in a real-world, mathematical context?*

6.G.4 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.	**Student will know…(facts, vocabulary, concepts)** • Lines, • Angles • Vertex • Two-dimensional • Area • Volume • Face • Edge • Explicit • Surface area • Net • Three-dimensional • Formulas • Base • Height • Congruent • Decompose • Plane figure • Solid figures • Polyhedron • Polygon • Pyramid • Prism • Rectangular prism • Triangular prism • Similar figures
	Student will be able to… • Calculate the area of triangles and rectangles. • Recognize that parallel lines of quadrilaterals are congruent. • Describe the faces, edges, and vertices of the three-dimensional figure. • List the two-dimensional shapes that make up the three dimensional figure. • Construct a model of a 3-D figure • Create a net of three- dimensional prism or pyramid • Understand that nets can be used to find the surface area of a three- dimensional figure • Calculate the area of each two-dimensional figure in the net and add the areas to calculate the surface area. • Make and test conjectures by determining what is needed to create a specific three- dimensional figures.

	• 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.
	Standard Essential Question *How do we use nets to find the surface area of three dimensional figures and apply this to real-world and mathematical problems?*
6.SP.1 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.*	**Student will know…(facts, vocabulary, concepts)** • Data • Line Plot • Statistics • Variability • Random sampling • Sample Population • Representative Population
	Student will be able to… • Define what is needed for a question to be identified as statistical (differences, variability) • Distinguish between statistical questions and those that are not • Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.
	Standard Essential Question *How do I design a statistical question?*

6.SP.2
Understand that a set of data collected to answer a statistical question has a distribution, which can be described by its center, spread, and overall shape.

Student will know…(facts, vocabulary, concepts)

- Data
- Line Plot
- Distribution
- Mean
- Median
- Spread
- Shape
- Variability
- Dot Plot
- Histogram
- Box Plot
- Skewed
- Distribution
- Measures of center
- Measures of variability

Student will be able to…

- Define distribution in context of statistical questions.
- Understand that data can be displayed in a graph
- Understand that distribution can be described center (mean or median) and
- Calculate mean and median
- Understand and use words that describe spread (e.g., peak, skewed to right, skewed to the left, increasing, decreasing)
- Examine the distribution of a data set and discuss the center, spread and overall shape with dot plots, histograms and box plots
- Understand that a set of data collected to answer a statistical question has a distribution, which can be described by its center, spread, and overall shape.

Standard Essential Question

What information does the mean, median, and the overall shape of a graph give us about a data set?

6.SP.3 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	**Student will know…(facts, vocabulary, concepts)** • Data • Line Plot • Distribution • Mean • Median • Spread • Shape • Variability • Dot Plot • Histogram • Box Plot • Skewed • Symmetrical • Distribution • Measures of center • Measures of variability
	Student will be able to… • Examine a graphically representation of a data set. • Calculate mean. • Identify median. • Describe the measure of center as a single value (midpoint of a set of values and balancing point) • Describe the measure of variation (spread—range) • 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.
	Standard Essential Question *How can I clearly summarize the pattern of data in a graph?*

6.SP.4 Display numerical data in plots on a number line, including dot plots, histograms, and box plots.	**Student will know…(facts, vocabulary, concepts)** • Data • Box plots • Dot plots • Histograms • Frequency tables • Cluster • Peak • Gap • Mean • Median • interquartile range • Measures of center • Measures of variability • Data, • Mean Absolute Deviation (M.A.D.) • Quartiles • Symmetrical • Skewed • Outlier • Variation/variability • Distribution • Measures of center • Measures of variability
	Student will be able to… • Determine the appropriate graph for a given statistical situation. (dot plot, box plot, histogram) • Examine the data set to determine the range of numbers represented on the line. • Plot each data value as an "x" above the number line (do not allow gaps in the numbers of the scale) • Create a histogram to display a set of data. • Group the data into convenient ranges and use these intervals to generate a frequency table and histogram. • Determine the values and labels for each axis of the graph. • Construct a box plot. • Order all data values from least to greatest (included all repeated values) • Find the median, lower quartile (Q1) and upper quartile (Q3), low extreme, high, extreme (five number summary) Draw a number line with an appropriate scale above the number line place a dot at each of the values from the five-number summary. • Connect the lower extreme to the 1st quartile with a line.

	• Draw a rectangle from the 1st quartile through the 3rd quartile. Divide the rectangle at the median • Connect the 3rd quartile and the upper quartile with a line • Recognize the each section of the graph represents 25% of the data. The rectangle represents 50% of the data. • Given a graph, describe and discuss the observations based on the data and its shape. • Display numerical data in plots on a number line, including dot plots, histograms, and box plots
	Standard Essential Question *How can I use different diagrams to display data?*

6.SP.5 Summarize numerical data sets in relation to their context, such as by: a. Reporting the number of observations. b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. 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. 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.	**Student will know…(facts, vocabulary, concepts)** • Data • Data set • Observation • Sample • Sample size • Attribute • Appropriateness • Deviation • Context • Box plots • Dot plots • Cluster • Peak • Gap • Mean • Median • Interquartile Range • Measures of center • Measures of variability • Data • Mean Absolute Deviation (M.A.D.) • Quartiles • Symmetrical • Skewed • Outlier (IQR x 1.5) • Random Sample • Inference • Population
	Student will be able to… • Understand how to identify a statistical question. • Understand how to write a statistical question. • Understand what an observation is (e.g. sample size, data set) • Find and report a given number observations given a plot. • Justify the appropriateness of the process used for data collection. • Understand the importance of the units used in the data sets. • Identify and describe the attribute being measured. • Describe how the data was gathered. • Interpret labels given on the plot including horizontal and vertical axes, the number line, title, and legend • Interpret a set of data describing its patterns and deviations

	• Determine mean and median • Determine variability through the interquartile range and mean absolute deviation • Describe the overall pattern of the data • Describe any striking deviation (outliers) in the data • Create and use data plots to describe and interpret data • Understand how the context of the data gathered can determine the measures of center and variability selected to interpret data • Understand how the shape of the data displayed can determine the measures of center and variability selected to interpret data. • Understand that the mean and the median emphasize different attributes in a data set (mean population vs. median population) • Choose the appropriate measure of center and measure of variability for the context of the data set. • Represent data in a dot plot in order to show the shape of the data. • Summarize numerical data sets in relation to their context, such as by: ➢ Reporting the number of observations. ➢ Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. ➢ 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. ➢ 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
	Standard Essential Question *How can I design a real-world meaningful statistical question to collect, display, and interpret data?*