

# SMS STANDARDS

**Grade Level**   8  

**Subject:** Mathematics

## Standard

8.1.1 Translate among contextual, verbal, tabular, graphical, and algebraic representations of linear functions.

8.1.2 Determine the slope of a line and understand that it is a constant rate of change.

8.1.3 Identify and interpret the properties (i.e., slope, intercepts, continuity, and discreteness) of linear relationships as they are shown in the different representations and recognize proportional relationships ( $y/x = k$  or  $y = kx$ ) as a special case.

Blooms Level	Skills
Translate (3) Applying (3) Identify (1)	<ul style="list-style-type: none"><li>• Translate between linear function representations.</li><li>• Determine slope of a line</li><li>• Understand slope equals the rate of change</li><li>• Identify properties of linear relationships</li><li>• Recognize proportional relationships</li></ul>

## Big Ideas

- Slope represents the constant rate of change between two values.
- Linear relationships can be represented in many different ways.
- The properties of linear relationships can be found from any representation.

## Essential Questions

- How do you determine slope and intercepts of linear relationships from any representation?
- In a real situation, what do the slope and intercepts represent?
- How can you describe a linear relationship?

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**Standard**

8.1.4 Use linear functions and equations to represent, analyze and solve a variety of problems, and to make predictions and inferences.

<b>Blooms Level</b>	<b>Skills</b>
Use (3)	<ul style="list-style-type: none"><li>• Solve problems involving linear functions/equations</li><li>• Predict and infer linear functions/equations</li><li>• Use linear functions/equations to represent, analyze, and solve problems</li></ul>

**Big Ideas**

- Some real-life situations can be modeled and solved using a linear function.
- Models of linear functions allow you to make predictions and inferences.

**Essential Questions**

- What does the graph represent? What other relationships can you find?
- What does the table represent? What other relationships can you find?
- What does the equation represent? What other relationships can you find?
- What kinds of real-life situations can you solve with a linear function?

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8.1.5 Relate systems of two linear equations in two variables and their solutions to pairs of lines that are intersecting, parallel, or the same line.

8.1.6 Use informal strategies (e.g., graphs or tables) to solve problems involving systems of linear equations in two variables.

Blooms Level	Skills
Relate (2) Use (3)	<ul style="list-style-type: none"><li>• Relate/compare systems of linear equations with two variables to their graphs</li><li>• Relate/compare solutions of the system of equation and the relationship between the graphed lines that are intersecting, parallel, and the same line</li><li>• Use graphs and tables to solve problems of systems of linear equations with two variables</li></ul>

## Big Ideas

- Understand the relationship between lines that intersect, are parallel, or are the same and the solutions of the system of equations.
- Systems of linear equations can be represented and solved using a variety of strategies.

## Essential Questions

- What are some strategies to find the solution(s) of two linear equations?
- How do you determine if there is a solution of two linear equations?

# SMS STANDARDS

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**Subject:** Mathematics

**Standard**

8.2.1 Organize and display data (e.g., histograms, box –and-whisker plots, scatter plots) to pose and answer questions; and justify the reasonableness of the choice of display.

<b>Blooms Level</b>	<b>Skills</b>
Organize (4)  Display (1)	<ul style="list-style-type: none"><li>• Organize and display data sets using histograms, box-and-whisker plots, and scatter plots</li><li>• Pose and answer questions about data from the display</li><li>• Justify your choice of display</li></ul>

**Big Ideas**

- There are multiple ways to display data depending on the outcome you are intending (truth/skewed).

**Essential Questions**

- How would you organize and display the data and why?
- How could you manipulate the display to misrepresent that data?

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## Standard

8.2.2 Use measures of center and spread to summarize and compare data sets.

8.2.3 Interpret and analyze displays of data and descriptive statistics.

8.2.4 Compare descriptive statistics and evaluate how changes in data affect those statistics.

8.2.5 Describe the strengths and limitations of a particular statistical measure, and justify or critique its use in a given situation

Blooms Level	Skills
Use (3)	<ul style="list-style-type: none"><li>• Use measures of center and spread to summarize and compare data sets</li><li>• Interpret and analyze displays of data and descriptive statistics</li><li>• Compare mean, median, mode, range, quantities, and quartiles</li><li>• Evaluate how change of data affects statistics</li><li>• Describe the strengths and limitations of statistical measures</li><li>• Justify and critique the use of statistical measures in a given situation</li></ul>
Interpret (2)	
Compare (2)	
Describe (1)	

## Big Ideas

- Data can be summarized and compared using measures of spread.
- Statistical measures and displays have strengths and limitations.

## Essential Questions

- In what situations would you use different display models? Why?
- What are the strengths and limitations of a specific display model and in what situations would you use it?
- How would you describe a set of data?

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**Subject:** Mathematics

## Standard

8.2.6 Use sample data to make predictions regarding a population.

8.2.7 Identify claims based on the statistical data and evaluate the reasonableness of the claims

8.2.8 Use data to estimate the likelihood of future events and evaluate the reasonableness of predictions

Blooms Level	Skills
Use (3) Identify (1) Use (3) Evaluate (5)	<ul style="list-style-type: none"><li>• Use sample data to represent population and to make predictions of population</li><li>• Identify claims based on statistical data</li><li>• Evaluate the reasonableness of claims</li><li>• Use data to estimate and evaluate the likelihood of future events and the reasonableness of predictions</li></ul>

## Big Ideas

- Sample data can be used to make predictions of populations.
- All predictions have to be justified given the sample data.

## Essential Questions

- What can you predict based on data? Defend your choice.
- When and why would you use a sample population? Can samples be biased?

# SMS STANDARDS

**Grade Level**   8  

**Subject:** Mathematics

**Standard**

8.3.1 Use properties of parallel lines, transversals, and angles to find missing sides and angles, and to solve problems including determining similarity or congruence of triangles.

<b>Blooms Level</b>	<b>Skills</b>
Use (3)  Solve (3)	<ul style="list-style-type: none"><li>• Use the properties of parallel lines, transversals, and angles</li><li>• Find missing sides and angles of triangles</li><li>• Solve problems involving similarity and congruence of triangles</li></ul>

**Big Ideas**

- Understand the relationships between angles and lines.
- Apply multiple strategies using the relationship between angles and lines to determine congruence or similarity.

**Essential Questions**

- How are angles formed?
- If you have parallel lines cut by a transversal, what can you say about the angles created?
- How does the relationship between lines and angles help you discover similarity and congruence of shapes?

# SMS STANDARDS

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**Subject:** Mathematics

## Standard

8.3.2 Use models to show that the sum of the angles of any triangle is 180 degrees and apply this fact to find unknown angles.

8.3.3 Use models and logical arguments to show that the sum of the angles of any quadrilateral is 360 degrees, and apply this fact to find unknown angles.

Blooms Level	Skills
Use (3)  Apply (3)	<ul style="list-style-type: none"><li>• Use models to show that the sum of interior angles of any triangle is 180 degrees and of any quadrilateral is 360 degrees</li><li>• Find unknown angles of triangles or quadrilaterals</li></ul>

## Big Ideas

- All triangles, regardless of size or shape, have three angles that add to 180 degrees.
- All quadrilaterals, regardless of size or shape, have four angles that add to 360 degrees.
- The property of the sum of angles can be used to find unknown angle measurements.

## Essential Questions

- How could you prove that the sum of the interior angles of any triangle is 180 degrees?
- How could you prove that the sum of the interior angles of any square is 360 degrees?
- How would you find the measurement of missing angle measurements in figures made of triangles and quadrilaterals?



# SMS STANDARDS

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## Standard

8.3.4 Use models to explore the validity of the Pythagorean Theorem, and use it to find missing lengths.

8.3.5 Apply the Pythagorean Theorem to find distances in a variety of 2 and 3 dimensional contexts, including distances on coordinate graphs.

8.3.6 Use models and referents to explore and estimate square roots.

Blooms Level	Skills
Use (3)  Apply (3)	<ul style="list-style-type: none"><li>Apply the Pythagorean Theorem using models to find missing lengths and distances in two and three dimensional contexts and coordinate graphs</li></ul>

## Big Ideas

- The Pythagorean Theorem can be used to solve real-life problems.
- Models can be used to simulate real-life situations.
- There is a relationship between square roots, side lengths and areas, and the Pythagorean Theorem

## Essential Questions

- How does the Pythagorean Theorem apply in real-life situations?
- What types of real-life situations could the Pythagorean Theorem or square roots apply to? Why?