

SMS STANDARDS

Grade Level 7

Subject: Mathematics—Numbers & Operations and Algebra

Standard

7.1.1 Develop, analyze, and apply models (including everyday contexts), strategies and procedures to compute with integers, with emphasis on negative integers.

7.1.2 Extend knowledge of integers and positive rational numbers to solve problems involving negative rational numbers.

7.1.3 Develop and use strategies to estimate the result of rational number computations and justify the reasonableness of results.

Blooms Level	Skills
<p style="text-align: right;">7.1.1</p> <ul style="list-style-type: none"> • Compute (3) • Develop & Analyze (3, 4) • Apply (3) 	<ul style="list-style-type: none"> • Integers (Negative integers) • Models (Everyday contexts) • Strategies • Procedures
<p style="text-align: right;">7.1.2</p> <ul style="list-style-type: none"> • Solve (3) • Extend knowledge (2) 	
<p style="text-align: right;">7.1.3</p> <ul style="list-style-type: none"> • Estimate (3) • Justify (4) • Use (3) • Develop (3) 	
<ul style="list-style-type: none"> • Problems (negative rational numbers) • Integers • Positive rational numbers 	
<ul style="list-style-type: none"> • Rational number computations • Reasonableness of results • Strategies 	

Big Ideas

- Negative numbers can represent quantities or amounts less than zero.
- A number line is an effective strategy in solving addition & subtraction problems using negative numbers.

Essential Questions

- What do negative numbers represent? How are they used in real life?
- How do you add, subtract, multiply and divide using negative numbers?

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Subject: Mathematics—Numbers & Operations and Algebra

Standard 7.1.4 Apply properties of rational numbers and algebra to write and solve linear equations in one variable.

Blooms Level	Skills
<ul style="list-style-type: none">• Write (3)• Solve (3) • Apply (3)	Linear equations <ul style="list-style-type: none">• One variable Properties <ul style="list-style-type: none">• Rational numbers• Algebra

Big Ideas

- Properties of writing and solving equations do not change when using rational numbers.
- Students will use opposite operations to balance and solve linear equations containing one variable.

Essential Questions

- What is a linear equation? What are some examples that aren't linear?
- What are rational numbers? Why do we need them?
- How does working with rational number equations compare to working with positive only equations?
- What types of situations could require an equation using negative numbers?

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Grade Level 7

Subject: Mathematics—Numbers & Operations, Algebra and Geometry

Standard 7.2.1 Represent proportional relationships with coordinate graphs and tables, and identify unit rate as the slope of the related line.
 7.2.2 Apply ratio and proportion to solve problems, including percent and simple probability.
 7.2.3 Use coordinate graphs, tables, and equations to distinguish proportional relationships from other relationships, including inverse proportionality.

Blooms Level	Skills
<ul style="list-style-type: none"> • Represent (3) • Identify (2) 	<p style="text-align: right; margin-right: 20px;">7.2.1</p> <p>Proportional relationships</p> <ul style="list-style-type: none"> • Coordinate graphs • Tables <p>Unit Rate</p> <ul style="list-style-type: none"> • Slope of the related line
<ul style="list-style-type: none"> • Solve (3) • Apply (3) 	<p style="text-align: right; margin-right: 20px;">7.2.2</p> <p>Problems</p> <ul style="list-style-type: none"> • Percent • Simple probability • Ratio • Proportionality
<ul style="list-style-type: none"> • Distinguish (2) • Use (3) 	<p style="text-align: right; margin-right: 20px;">7.2.3</p> <ul style="list-style-type: none"> • Proportional relationship from other relationships (inverse proportionality) • Coordinate graphs, tables and equations

Big Ideas

- Proportional relationships can be solved using graphs, tables, and equations.
- Proportional relationships can be used to solve real-life situations.

Essential Questions

- How can you use proportional relationships to solve real-life problems?
- What types of situations would proportional relationships apply to?
- How can graphs, tables and equations be used to represent proportional relationships?

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Grade Level 7

Subject: Mathematics—Numbers & Operations, Algebra and Geometry

Standard 7.2.4 Develop and use scale factors and proportional relationships to solve problems, including similarity and congruence.
 7.2.6 Apply scale factor to analyze how the change in one measure (e.g., length, area, volume) affects another.

Blooms Level	Skills
<ul style="list-style-type: none"> • Solve (3) • Develop (3) • Use (3) 	<p style="text-align: right; margin-right: 20px;">7.2.4</p> <ul style="list-style-type: none"> • Problems (Similarity & Congruence) • Scale Factor • Proportional relationships
<ul style="list-style-type: none"> • Analyze (4) 	<p style="text-align: right; margin-right: 20px;">7.2.6</p> <p>How change in one measure affects another</p> <ul style="list-style-type: none"> • Length • Area • Volume
<ul style="list-style-type: none"> • Apply (3) 	<ul style="list-style-type: none"> • Scale Factor

Big Ideas

- Scale factor can apply to many types of real-life problems.
- You can use proportional relationships and scale factor to solve many types of real-life problems.
- Changing the linear dimension of an object affects the area and volume.

Essential Questions

- How can scale factors help us with situations involving proportional relationships?
- What is scale factor? How can scale factor be used in solving real-life problems?

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Grade Level 7

Subject: Mathematics—Numbers & Operations, Algebra and Geometry

Standard 7.2.5 Convert among different units of measurement to solve problems, including rates.

Blooms Level	Skills
<ul style="list-style-type: none">• Solve (3)• Convert (3)	<ul style="list-style-type: none">• Problems (rates)• Different units of measurement

Big Ideas

- The same quantity can be represented with different units of measurement.
- Students will be able to convert different units to an appropriate and useful unit of measure.

Essential Questions

- When would you need to convert between units of measurement in real-life?
- What is the relationship between different units of measurement? How are both used in today's world?
- Why would you need to be able to convert between different units of measurement?

SMS STANDARDS

Grade Level 7

Subject: Mathematics—Measurement and Geometry

Standard 7.3.1 Use models to explain the reasonableness of formulas for the circumference and area of circles.

Blooms Level	Skills
<ul style="list-style-type: none">• Explain (4)• Use (3)	<ul style="list-style-type: none">• Reasonableness of formulas for circumference and area of circles.• Models

Big Ideas

- Circumference and area of circle depends on the ratio pi (π) and the radius or diameter.
- Circumference is the perimeter of a circle.
- Use formulas to find the area of a circle when given circumference, radius or diameter.

Essential Questions

- What does π represent? How is it used to find circumference and area?

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Grade Level 7

Subject: Mathematics—Measurement and Geometry

Standard 7.3.2 Know common estimates of π and use these values to estimate and calculate the circumference and area of a circle.
 7.3.3 Solve problems involving areas and circumference of circles.
 7.3.6 Solve problems involving surface areas of pyramids and cylinders and volumes of pyramids, cylinders and cones.

Blooms Level	Skills
<ul style="list-style-type: none"> • Estimate (3) • Calculate (3) • Know (1) • Use (3) 	<p style="text-align: right; margin-right: 20px;">7.3.2</p> <ul style="list-style-type: none"> • Circumference • Area of a circle • Common estimates of π
<ul style="list-style-type: none"> • Solve (3) 	<p style="text-align: right; margin-right: 20px;">7.3.3</p> <ul style="list-style-type: none"> • Problems (area of circles & circumference of circles)
<ul style="list-style-type: none"> • Solve (3) 	<p style="text-align: right; margin-right: 20px;">7.3.6</p> <p>Problems</p> <ul style="list-style-type: none"> • Surface area (pyramids & cylinders) • Volume (pyramids, cylinders & cones)

Big Ideas

- Common estimates of π are 3.14 and 22/7.
- Use common estimates of π to solve problems involving circumference and area of a circle.
- Identify circles from context.
- Know the formulas ($c=2\pi r$ or πd , $a=\pi r^2$).
- Identify the required shapes from context.

Essential Questions

- Why do we use estimates of π ? How do we use them to calculate circumference and area?
- How do you know when to find circumference or area?
- What strategies & formulas can you use? Why?

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Grade Level 7

Subject: Mathematics—Measurement and Geometry

Standard 7.3.4 Use models to explain the reasonableness of formulas for the surface area of pyramids and cylinders and volume of pyramids, cylinders and cones.

Blooms Level	Skills
<ul style="list-style-type: none">• Explain (4) • Use (3)	Reasonableness of formulas <ul style="list-style-type: none">• Surface area (pyramids & cylinders)• Volume (pyramids, cylinders & cones) • Models

Big Ideas

- There are relationships between the formulas for the volume of pyramids, cylinders and cones.
- Surface area is the total area of all the faces when working with prisms, pyramids, cylinders and cones.

Essential Questions

- How is the volume of a pyramid related to the volume of a box?
- How is the volume of a cone related to the volume of a cylinder?
- How do you find surface area?

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Grade Level 7

Subject: Mathematics—Measurement and Geometry

Standard 7.3.5 Find and justify relationships among the formulas for the areas of different polygons when determining surface area

Blooms Level	Skills
<ul style="list-style-type: none">• Find (2)• Justify (4)	<ul style="list-style-type: none">• Relationships among formulas• Areas of different polygons when determining surface area

Big Ideas

- Surface area can be calculated by finding the area of the component faces (polygons and circles).
- Surface area is 2-dimensional (squared) and volume is 3-dimensional (cubed).

Essential Questions

- What 2D shapes make up the 3D figure?
- How can you use the areas of the faces to find the total surface area?

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Grade Level 7

Subject: Mathematics—Measurement and Geometry

Standard 7.3.7 Estimate and compute the area and volume of complex or irregular shapes by dividing them into basic shapes.

Blooms Level	Skills
<ul style="list-style-type: none">• Estimate (3)• Compute (3)	<ul style="list-style-type: none">• Complex or irregular shapes• Area (dividing into basic shapes)• Volume (dividing into basic shapes)

Big Ideas

- Complex shapes can be visualized by several regular shapes.

Essential Questions

- What shapes do you see?
- What can you do with them to solve problems of area and volume?