

# 8TH GRADE MATH SCOPE AND SEQUENCE

## EARLY FIRST QUARTER

### **Number, Number Sense and Operations**

- A. Use scientific notation to express large numbers and numbers less than one.
- B. Identify subsets of the real number system.
- C. Apply properties of operations and the real number system, and justify when they hold for a set of numbers.
- E. Compare, order and determine equivalent forms of real numbers.

### **Measurement**

- B. Use formulas to find surface area and volume for specified three-dimensional objects accurate to a specified level of precision.

### **Geometry and Spatial Sense**

- A. Formally define geometric figures.
- B. Describe and apply the properties of similar and congruent figures; and justify conjectures involving similarity and congruence.
- C. Recognize and apply angle relationships in situations involving intersecting lines, perpendicular lines and parallel lines.
- D. Use coordinate geometry to represent and examine the properties of geometric figures.

### **Patterns, Functions and Algebra**

- A. Generalize and explain patterns and sequences in order to find the next term and the  $n$ th term.
- B. Identify and classify functions as linear or nonlinear, and contrast their properties using tables, graphs or equations.

### **Mathematical Processes**

A through H

## LATE FIRST QUARTER

### **Number, Number Sense and Operations**

- F. Explain the effects of operations on the magnitude of quantities.
- G. Estimate, compute and solve problems involving real numbers, including ratio, proportion and percent, and explain solutions.
- H. Find the square root of perfect squares, and approximate the square root of non-perfect squares.
- I. Estimate, compute and solve problems involving scientific notation, square roots and numbers with integer exponents.

### **Measurement**

- A. Solve increasingly complex non-routine measurement problems and check for reasonableness of results.
- C. Apply indirect measurement techniques, tools and formulas, as appropriate, to find perimeter, circumference and area of circles, triangles, quadrilaterals and composite shapes, and to find volume of prisms, cylinders, and pyramids.

### **Geometry and Spatial Sense**

- E. Draw and construct representations of two and three-dimensional geometric objects using a variety of tools, such as straightedge, compass and technology.
- F. Represent and model transformations in a coordinate plane and describe the results.

### **Patterns, Functions and Algebra**

- C. Translate information from one representation (words, table, graph or equation) to another representation of a relation or function.

### **Mathematical Processes**

A through H

## EARLY SECOND QUARTER

### **Measurement**

- D. Use proportional reasoning and apply indirect measurement techniques, including right triangle trigonometry and properties of similar triangles, to solve problems involving measurements and rates.
- F. Write and solve real-world, multi-step problems involving money, elapsed time and temperature, and verify reasonableness of solutions.

### **Patterns, Functions and Algebra**

- D. Use algebraic representations, such as tables, graphs, expressions, functions and inequalities, to model and solve problem situations.
- E. Analyze and compare functions and their graphs using attributes, such as rates of change, intercepts and zeros.

### **Data Analysis and Probability**

- A. Create, interpret and use graphical displays and statistical measures to describe data; e.g., box-and-whisker plots, histograms, scatter plots, measures of center and variability.
- B. Evaluate different graphical representations of the same data to determine which is the most appropriate representation for an identified purpose.
- C. Compare the characteristics of the mean, median and mode for a given set of data, and explain which measure of center best represents the data.
- D. Find, use and interpret measures of center and spread, such as mean and quartiles, and use those measures to compare and draw conclusions about sets of data.

### **Mathematical Processes**

- A. Formulate a problem or mathematical model in response to a specific need or situation, determine information required to solve the problem; choose method for obtaining this information, and set limits for acceptable solution.
- B. Apply mathematical knowledge and skills routinely in other content areas and practical situations.
- C. Recognize and use connections between equivalent representations and related procedures for a mathematical concept.
- D. Apply reasoning processes and skills to construct logical verifications or counter-examples to test conjectures and to justify and defend algorithms and solutions.
- E. Use a variety of mathematical representations flexibly and appropriately to organize, record and communicate mathematical ideas.
- F. Use precise mathematical language and notations to represent problem situations and mathematical ideas.
- G. Write clearly and coherently about mathematical thinking and ideas.
- H. Locate and interpret mathematical information accurately, and communicate ideas, processes and solutions in a complete and easily understood manner.

## LATE SECOND QUARTER

### **Measurement**

- E. Estimate and compute various attributes, including length, angle measure, area, surface area and volume, to a specified level of precision.

### **Patterns, Functions and Algebra**

- F. Construct convincing arguments based on analysis of data and interpretation of graphs.

### **Data Analysis and Probability**

- E. Evaluate the validity of claims and predictions that are based on data by examining the appropriateness of the data collection and analysis.

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# 8TH GRADE MATH SCOPE AND SEQUENCE

## EARLY THIRD QUARTER

### **Geometry and Spatial Sense**

- G. Prove or disprove conjectures and solve problems involving two and three-dimensional objects represented within a coordinate system.
- H. Establish the validity of conjectures about geometric objects, their properties and relationships by counterexample, inductive and deductive reasoning, and critiquing arguments made by others.

### **Patterns, Functions and Algebra**

- G. Solve quadratic equations with real roots by graphing, formula and factoring.
- H. Solve systems of linear equations involving two variables graphically and symbolically.

### **Data Analysis and Probability**

- F. Construct convincing arguments based on analysis of data and interpretation of graphs.

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## LATE THIRD QUARTER

### **Patterns, Functions and Algebra**

- I. Model and solve problem situations involving direct and inverse variation.

### **Data Analysis and Probability**

- G. Describe sampling methods and analyze the effects of method chosen on how well the resulting sample represents the population.
- H. Use counting techniques, such as permutations and combinations, to determine the total number of options and possible outcomes.

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## EARLY FOURTH QUARTER

### **Patterns, Functions and Algebra**

- J. Describe and interpret rates of change from graphical and numerical data.

### **Data Analysis and Probability**

- I. Design an experiment to test a theoretical probability, and record and explain results.
- J. Compute probabilities of compound events, independent events, and simple dependent events.
- K. Make predictions based on theoretical probabilities and experimental results.

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## LATE FOURTH QUARTER

### **Measurement**

- F. Write and solve real-world, multi-step problems involving money, elapsed time and temperature, and verify reasonableness of solutions.

### **Geometry and Spatial Sense**

- E. Draw and construct representations of two and three-dimensional geometric objects using a variety of tools, such as straightedge, compass and technology.

### **Mathematical Processes**

- A. Formulate a problem or mathematical model in response to a specific need or situation, determine information required to solve the problem; choose method for obtaining this information, and set limits for acceptable solution.
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