

## Sixth Grade - Eighth Grade Mathematics Milestones

### Sixth Grade

- Develop an understanding of rate (e.g., If it took 8 hours to mow 4 lawns, then 1 lawn can be mowed in 2 hours)
- Write equations to solve word problems
- Reason about statistics
- Use positive and negative numbers to represent quantities in real-world contexts
- Understand negative numbers as numbers on the number line
- Determine area, surface area, and volume of various shapes

### Seventh Grade

- Use proportional reasoning to solve problems
- Solve two-step equations
- Use statistics to make decisions
- Solve percent problems (e.g., tax, tips, markup, and markdown)
- Create a drawing that accurately shows an object with actual sizes reduced or enlarged
- Understand and find probabilities of events

### Eighth Grade

- Compare and order real numbers, including irrational numbers
- Develop an understanding of functions
- Use statistics to make predictions
- Work with positive and negative exponents, square root and cube root symbols, and scientific notation
- Solve multi-step equations and inequalities
- Develop an understanding of congruence and similarity

## Family Engagement

### How to help your student succeed in mathematics:

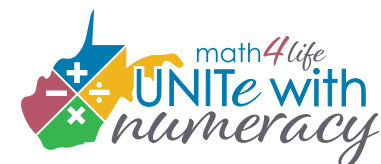
Make mathematics a part of your student's daily routine by:

- » Computing gas mileage
- » Calculating discounts and sales tax on purchases
- » Interpreting charts and graphs found in news media
- » Mixing solutions such as paint or juice

Talk with the teacher about the problem-solving strategies and content your student is learning and practice those strategies at home.

Visit the *math4life* website at: [wvde.us/math4life](http://wvde.us/math4life) for information about:

- » Resources for families
- » Examples of fostering success in mathematics
- » Information about what your student should master in each grade level
- » Activities to help with mathematics fluency and understanding
- » Links to the best apps and sites for practice and assistance in mathematics



# What Students Will Learn

6<sup>TH</sup> GRADE - 8<sup>TH</sup> GRADE



# Sample Problems for Sixth Grade - Eighth Grade

## Sixth Grade: Represent and analyze quantitative relationships between dependent and independent variables

Students recorded the number of objects present at the beginning and during each round of a game.

Round	Number of Objects
0	?
1	5
2	7
3	?
4	11

Find the missing terms in the pattern. Student says, "In round 0, there would be 3 objects and in Round 3, there would be 9."

How do you know? Student says, "Because the numbers increase by 2 each round. So, I subtracted 2 from the 5 in Round 1 to get 3 for Round 0 and added 2 to the 7 in Round 2 to get 9 in Round 3." What is the pattern? Student says, "Start with 3 and add 2 each round."

## Eighth Grade: Understand the connections between proportional relationships, lines and linear equations

Students are given a table of information and are asked questions.

Number of days after it snowed	Amount of snow in inches
0	5
1	3
2	1

How could you represent analyze the information from the table? Student responds, "I could plot points on a graph and use the graph to analyze the relationship."

## Seventh Grade: Solve mathematical problems using algebraic equations

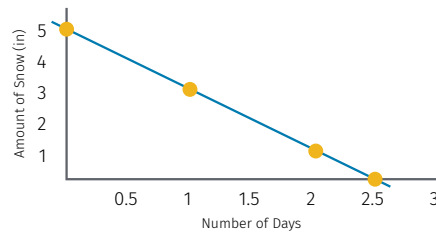
Students are given a table of information and are asked questions.

Round (x)	Number of Objects (y)
0	3
1	5
2	7
3	9
4	11

Generate an equation to illustrate this pattern. Student writes, " $y = 2x + 3$ ."

How many objects would there be after 75 rounds? Student says, "153."

What does the coefficient 2 mean in this equation? Student says, "The 2 is the increase in the number of objects from one round to the next."



What is the y-intercept of this line? Student responds, "5." How do you know? Student says, "Because the line crosses the y-axis at 5, where  $x=0$ ."

What is the slope of the line? Student says, "Negative 2." How did you determine that? Student says, "Slope is the constant rate of change and the line goes down 2 every time it moves one unit to the right. It is negative because the line is decreasing." Write the equation for this line. Student writes, " $y=-2x + 5$ ."

## Mathematical Habits of Mind Thinking Skills for Life

### MHM1: Make sense of problems and persevere to solve them.

Identify what the problem is asking and continue working until a solution is found.

### MHM2: Reason abstractly and quantitatively.

Use reasoning to examine and connect numbers and ideas.

### MHM3: Construct viable arguments and critique the reasoning of others.

Explore, explain, discuss, and share thinking and reasoning used to solve problems.

### MHM4: Model with Mathematics.

Represent problems in multiple ways using drawings, objects, charts, and equations.

### MHM5: Use appropriate tools strategically.

Use math tools that will help solve a problem, such as blocks, manipulatives, rulers, protractors, drawings, etc.

### MHM6: Attend to precision.

Use clear and accurate language, units, calculations, and symbols to solve problems and check the reasonableness of answers.

### MHM7: Look for and make use of structure.

Look for patterns and structure to gain understanding and speed in problem solving. Ex.  $4 + 7$  and  $7 + 4$  both equal 11.

### MHM8: Look for and express regularity in repeated reasoning.

Look for repeated patterns in calculations to make generalizations and solve problems.