Eighth Grade

Common Core State Standards

Mathematics

Mathematical Practices

1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning

Domains

- The Number System
- Expressions and Equations
- Functions
- Geometry
- Statistics and Probability

The Number System

Eighth grade students extend and apply their previous understanding of integers to irrational numbers and are able to approximate them with rational numbers.

You can solve problems like these:

By knowing the perfect square root of 400 (20^2) and 900(30^2) I can estimate a value for $\sqrt{800}$

Expressions and Equations

Eighth grade students are expected to work with radicals (and integer exponents).

$\sqrt{4}$ 3^2

You are expected to understand the connection between proportional relationships, lines and linear equations.

Algebraic reasoning skills allow you to analyze and solve both linear equations and pairs of simultaneous linear equations.

You can solve problems like these:

Henry and Jose are gaining weight for football. Henry weighs 205 pounds and is gaining two pounds per week. Jose weighs 195 pounds and is gaining 3 pounds per week. When will they weigh the same amount?

Functions

While equations show equality between two algebraic expressions, functions model the relationship between two variables which enables students to model and solve real life problems. Eighth grade students are expected to define, evaluate and compare functions, as well as use functions to model the relationships between quantities.

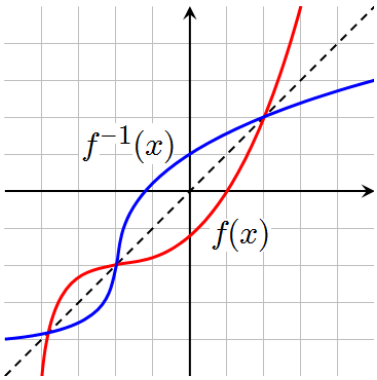
You can solve problems like these:

You have $100 to spend on a barbeque where you want to serve chicken and steak.

Chicken costs $1.29 per pound and steak costs $3.49 per pound.

a)a) Find a function that relates the amount of chicken and the amount of steak you can buy.

b) Graph the function. What is the meaning of each intercept in this context? What is the meaning of the slope in this context? Use this (and any other information represented by the equation or graph) to discuss what your options are for the amounts of chicken and amount of steak you can buy for the barbeque



Example of a function graph

Eighth Grade (cont.)

Common Core State Standards

Mathematics

Geometry

Eighth grade students explore the properties of congruence and similarity (translations, rotations, translations, and dilations) using physical models, transparencies, and/or geometry software. Students will apply the Pythagorean Theorem to real world problems

Another goal is to know and use the formulas for the volume of cylinders, cones, and spheres to solve real life problems.

You can solve problems like these:

Rolled oats (dry oatmeal) come in cylindrical containers with a diameter of 5 inches and a height of 912 inches. These containers are shipped to grocery stores in boxes. Each shipping box contains six rolled oats containers. The shipping company is trying to figure out the dimensions of the box for shipping the rolled oats containers that will use the least amount of cardboard. They are only considering boxes that are rectangular prisms so that they are easy to stack.

a) What is the surface area of the box needed to ship these containers to the grocery store that uses the least amount of cardboard?

b) What is the volume of this box?

Statistics and Probability

Eighth grade students explore relationships and patterns found in data comparing two sets of data. They will do this by creating scatterplots, making frequency tables and examining patterns involving clustering, outliers, positive and negative associations, linear associations and non-linear associations,

You will apply your understanding of both statistics and algebra to model data with two variables in an equation and then interpret it in a real life model using the meanings of slope and intercept.

Mathematical Practices

When working a math problem students should…

1. Ask: "What is the best way to solve the problems?", "Does this make sense?", and "Can I solve the problem in a different way?"
2. Represent: real world problems using numbers and variables and create coherent representations of the problem at hand, and make sense of problems - considering the units involved, and attending to the meaning of the quantities.
3. Evaluate and explain thinking (either verbally or in writing) as well as the thinking of others using mathematical words and ideas. Support their explanations, asking questions like "How did you get that?", "Why is that true?" and "Does that always work?"
4. Show different ways to solve a problem. They make and describe connections between different representations of the same problem. Check their answer to see if it makes sense. Look at models and choose which models are most useful to solve problems.
5. Consider available tools, including estimation and technology, to solve a problem and decide which are most helpful.
6. Solve problems accurately and efficiently and use mathematical vocabulary to explain their thinking
7. Discover patterns and rules that help them understand the problem and use what they know about numerical operations. Use equations with variables and understand geometric properties. Use drawings, diagrams, models, tables, lists or graphs and rules to explain their thinking.
8. Use reasoning to understand how algorithms work and make generalizations about mathematical patterns as they solve problems.

MATHEMATICS SCIENCE LITERACY

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