## Learning Targets

### Functions and Volume

### Lesson 1: Inputs and Outputs

* I can write rules when I know input-output pairs.
* I know how an input-output diagram represents a rule.

### Lesson 2: Introduction to Functions

* I know that a function is a rule with exactly one output for each allowable input.
* I know that if a rule has exactly one output for each allowable input, then the output depends on the input.

### Lesson 3: Equations for Functions

* I can find the output of a function when I know the input.
* I can name the independent and dependent variables for a given function and represent the function with an equation.

### Lesson 4: Tables, Equations, and Graphs of Functions

* I can identify graphs that do, and do not, represent functions.
* I can use a graph of a function to find the output for a given input and to find the input(s) for a given output.

### Lesson 5: More Graphs of Functions

* I can explain the story told by the graph of a function.

### Lesson 6: Even More Graphs of Functions

* I can draw the graph of a function that represents a real-world situation.

### Lesson 7: Connecting Representations of Functions

* I can compare inputs and outputs of functions that are represented in different ways.

### Lesson 8: Linear Functions

* I can determine whether a function is increasing or decreasing based on whether its rate of change is positive or negative.
* I can explain in my own words how the graph of a linear function relates to its rate of change and initial value.

### Lesson 9: Linear Models

* I can decide when a linear function is a good model for data and when it is not.
* I can use data points to model a linear function.

### Lesson 10: Piecewise Linear Functions

* I can create graphs of non-linear functions with pieces of linear functions.

### Lesson 11: Slicing Solids

* I can explain that when a three dimensional figure is sliced it creates a face that is two dimensional.
* I can picture different cross sections of prisms and pyramids.

### Lesson 12: Filling containers

* I can collect data about a function and represent it as a graph.
* I can describe the graph of a function in words.

### Lesson 13: How Much Will Fit?

* I know that volume is the amount of space contained inside a three-dimensional figure.
* I recognize the 3D shapes cylinder, cone, rectangular prism, and sphere.

### Lesson 14: Volume of Right Prisms

* I can explain why the volume of a prism can be found by multiplying the area of the base and the height of the prism.

### Lesson 15: Decomposing Bases for Area

* I can calculate the the volume of a prism with a complicated base by decomposing the base into quadrilaterals or triangles.

### Lesson 16: Surface Area of Right Prisms

* I can find and use shortcuts when calculating the surface area of a prism.
* I can picture the net of a prism to help me calculate its surface area.

### Lesson 17: Applying Volume and Surface Area

* I can solve problems involving the volume and surface area of children’s play structures.

### Lesson 18: The Volume and Dimensions of a Cylinder

* I can find missing information about a cylinder if I know its volume and some other information.
* I know the formula for volume of a cylinder.

### Lesson 19: The Volume of a Cone

* I can find the volume of a cone in mathematical and real-world situations.
* I know the formula for the volume of a cone.

### Lesson 20: Finding Cone Dimensions

* I can find missing information of about a cone if I know its volume and some other information.

### Lesson 21: Scaling One Dimension

* I can create a graph the relationship between volume and height for all cylinders (or cones) with a fixed radius.
* I can explain in my own words why changing the height by a scale factor changes the volume by the same scale factor.

### Lesson 22: Scaling Two Dimensions

* I can create a graph representing the relationship between volume and radius for all cylinders (or cones) with a fixed height.
* I can explain in my own words why changing the radius by a scale factor changes the volume by the scale factor squared.

### Lesson 23: Estimating a Hemisphere

* I can estimate the volume of a hemisphere by calculating the volume of shape I know is larger and the volume of a shape I know is smaller.

### Lesson 24: The Volume of a Sphere

* I can find the volume of a sphere when I know the radius.

### Lesson 25: Cylinders, Cones, and Spheres

* I can find the radius of a sphere if I know its volume.
* I can solve mathematical and real-world problems about the volume of cylinders, cones, and spheres.

### Lesson 26: Building Prisms

* I can build a triangular prism from scratch.

### Lesson 27: Volume As a Function of . . .

* I can compare functions about volume represented in different ways.



© CC BY Open Up Resources. Adaptations CC BY IM.