



More About Math

Mystery Café

Background for Leaders

This unit focuses on deductive reasoning and measurement skills for 6-8 year olds. Children will solve a series of mysteries and puzzles using deductive reasoning and measurement, particularly width, height, capacity, and weight.

Deductive Reasoning

Reasoning is an essential part of mathematics. First and second grade students should be able to draw conclusions based upon the clues, facts, or hints that they are given. They should also find the correct item in a set based upon the attributes listed in the clues (from 1-3 attributes).

Younger children may be unfamiliar with deductive reasoning and may need more explicit modeling of the thinking process. For example, the leader may talk through her reasoning to solve a problem or have other children explain their thinking. Ensure children are reasoning and not guessing by prompting them to explain how they got their answer. Ask **“What clues made you pick that object? Is there another object that you could have picked instead?”**

Geometry concepts are often reviewed using deductive reasoning to reinforce the defining characteristics of shapes. Children at this age should recognize circles, squares, triangles, rectangles, pentagons, hexagons, octagons, and parallelograms. They may count the sides and angles and compare side lengths in order to identify the shape. Other attributes that may be used in deductive reasoning include relative size (small, medium, large), color, or other distinctive categories (for example: fruits, meats, vegetables).

Measurement (width, height, capacity, and weight)

Children at this age should use comparative vocabulary to describe objects in comparison to one another. The suffix **-er** is used to compare two objects (i.e. smaller or larger) while the suffix **-est** is used to compare three or more objects (i.e. smallest or largest). For example, **Which rock is larger? Which book is the thinnest? Which block is the heaviest?**

Children should understand the difference between height and width and related vocabulary. Height is the distance from the bottom to the top of an object. When comparing objects based on height children should use the terms shorter, shortest, taller or tallest. Width is the distance that an object spans from left to right. The proper vocabulary terms are **thinner, thinnest, wider, or widest**. Occasionally narrow may be used in place of thin.

When measuring length, children at this age should be able to use both standard (centimeters or inches) and nonstandard measurement (repetition of the same sized objects end to end with no gaps or overlaps). For example, **the cereal box is nine paperclips tall**. Children will utilize measurement skills with capacity to measure the amount of liquid an object holds. To precisely measure capacity they will use standard units such as cups to tell which object holds more or less liquid based on these measurements.

During the learning activities, children will compare objects based on weight and use the terms **lighter, lightest, heavier, or heaviest**. Children should be able to compare the weight of objects by holding them, using pan balances (the lighter side goes up and the heavier side goes down), and using scales (provides weight measurements in standard units.) Children may also use pan balances to balance weights. This means that they must have the same amount of weight on both sides of the balance scale.

