

## Grade 1

### Health Objective 1.02

Identify problem solving strategies and demonstrate the ability to make choices using those strategies.

### Math Objective 2.01 and 3.04

2.01 For given objects: Select an attribute (length, capacity, mass) to measure (use non-standard units); develop strategies to estimate size; compare, using appropriate language, with respect to the attribute selected.

3.04 Solve problems using spatial visualization.

### Materials Needed:

6-7 hula-hoops

Music

Construction paper or plain paper

Scissors

Cut out of large footprint -one per small group

Cut out of large handprint - one per small group

A jar of marbles or other small objects (jelly beans, pennies, BBs)

Small paper cups (3 oz size) - one per small group

Large bag of marbles, candies, or pennies

Large container (big bowl or tub)

### Focus:

You will need an open area like a gym, atrium, blacktop, or playground for this activity. Place six to seven hula-hoops on the ground with a good distance between them. Explain to the students that you will play music and when they hear the music stop they should find a hoop to step into. They may share the hoop with more than one person. After giving students an opportunity to get comfortable with the activity and at each interval, take one hoop away. The students will have to work together to figure out how to keep getting more and more people into hoops.

### Teacher Input:

Ask the students how they got so many people into a hula-hoop in the previous activity. Students probably used a variety of skills and strategies to address the difficult task such as teamwork, cooperation, and hopefully using problem solving skills. Ask the students to share the strategies that they used to solve the problem. Discuss how the basic steps to problem solving are the same regardless of the problem:

1. Determine what the problem is.
2. Decide whether you have seen a similar problem before.  
If so, how is this problem similar? How is it different?
3. Choose at least three strategies to try to solve the problem. (Use strategies that you may have used in the past with similar problems.)
4. Try a strategy (even if it does not work), and it may lead you to one that will.  
Continue to try different strategies and ask for help if it is appropriate.

### Practice & Assessment:

The following activities utilize problem-solving and decision-making skills through measurement activities. Process the steps used in problem solving and decision making as students complete each activity. It will be important to remind students that even though the problem or task changes, often the steps to solving the problem and testing and revising the strategies will stay the same. Emphasize the importance of thinking through the problem before taking action for more accurate results.

#### Activity 1

Divide students into small groups and give each group a set of scissors, paper, crayons, or pencils, and a large handprint and a large footprint. Ask the students to trace their own hand and foot and cut out their drawings. Ask the students to estimate or guess how many of their handprints it would take to fill the large handprint and how many of their footprints it will take to fill the large footprint without overlapping. Students can work together to try to solve the problem and share strategies. Process the various strategies that students used to determine how many hand and footprints it would take to fill the larger cutouts. Allow the students to work as a group to see how many of their combined footprints and handprints it takes to fill the larger prints. Each group can report their answers and begin to make a bar chart on the board using hand and foot prints.

#### Activity 2

Display a large jar filled with marbles, pennies, jellybeans, or other small objects. Ask the students to record their individual estimations and as a class brainstorm strategies for solving the problem. The students may suggest strategies that they used when working with the hand and footprint activity, allow the students to practice multiple strategies to solve the estimation problem. After using several strategies, announce the actual number of items in the jar and then determine as a class which strategies gave you the closest estimates and why they were successful or process how to improve some of the strategies that were used.

#### Activity 3

Display a large container and give small groups of students one small paper cup (3 oz size) filled with marbles, paper clips, or jellybeans. Allow students to work together to develop problem-solving strategies when estimating how many cups of marbles it will take to fill the given container. Once the group feels comfortable with their estimation strategy, allow groups an opportunity to test the strategy and compare their estimated results to actual measurements. Discuss as a class or with each small group the methods they used to determine their estimates and solve the problem. Ask the students which strategies were more successful and why.