

## WEIGHING THE EVIDENCE

### Teaching Guidelines

**Subject:** Mathematics

**Topics:** Problem Solving, Algebra (variables, patterns and functions)

**Grades:** 6 - 8

**Concepts:**

- Variable

**Knowledge and Skills:**

- Can explain the reasoning used to solve a problem
- Can estimate an answer to a problem to determine if the calculated answer is reasonable
- Can evaluate whether an answer to a problem is sensible in the context of the problem
- Can identify and describe patterns in a collection of related numerical data

**Materials** (for each team):

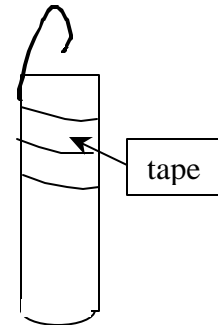
- one penny roll with 30 pennies, labeled “30”; one penny roll with 40 pennies, labeled “40”; one penny roll with 50 pennies, labeled “50”
- one penny roll with 35, 36, 37, 43, 44, 45, or 46 pennies, labeled “?”

Each of these rolls should also be marked with a letter (“A”, “B” etc.), and you should keep a secret table of how many pennies are in each roll according to its letter code.

For each team:

- a ruler
- one rubber band, 1/8” wide by 3” to 3 ½ long

Note: All penny rolls should be the same length, and each should have a paper clip attached as in the diagram to the right. Be sure that this clip is taped on quite firmly so that it can not pull loose.



**Procedure:**

Arrange the class in teams of three or four.

Tell students that each team has a problem to solve: how many pennies are in a “mystery” roll.

Tell students that you will give them one hint: *there are two variables involved in finding the answer, a length and a weight.* Review the concept of *variable* to ensure students understand it and can give examples of variables.

Tell students that their first task is to come up with a strategy for finding the answer. Each team is to look at what they have been supplied, come up with a strategy and write it down. They are to show you the strategy. (*Measure the amount that the rubber band is stretched by hanging on it penny rolls with known contents. Then make a similar measurement for the unknown penny roll, and compare that to the value for the known rolls to determine the number of pennies.*)

The second task is to carry out their strategy and come up with an answer.

The third task is to look at their answer and see if it seems sensible.

Once they complete all three tasks, each student is to individually write an explanation of what they did and the answer they found.

# Weighing the Evidence

Team members:

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Our strategy:

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Our data:

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