Module 7 Lesson 2:
Math Lab: Pennies and Paper Clips

Purpose

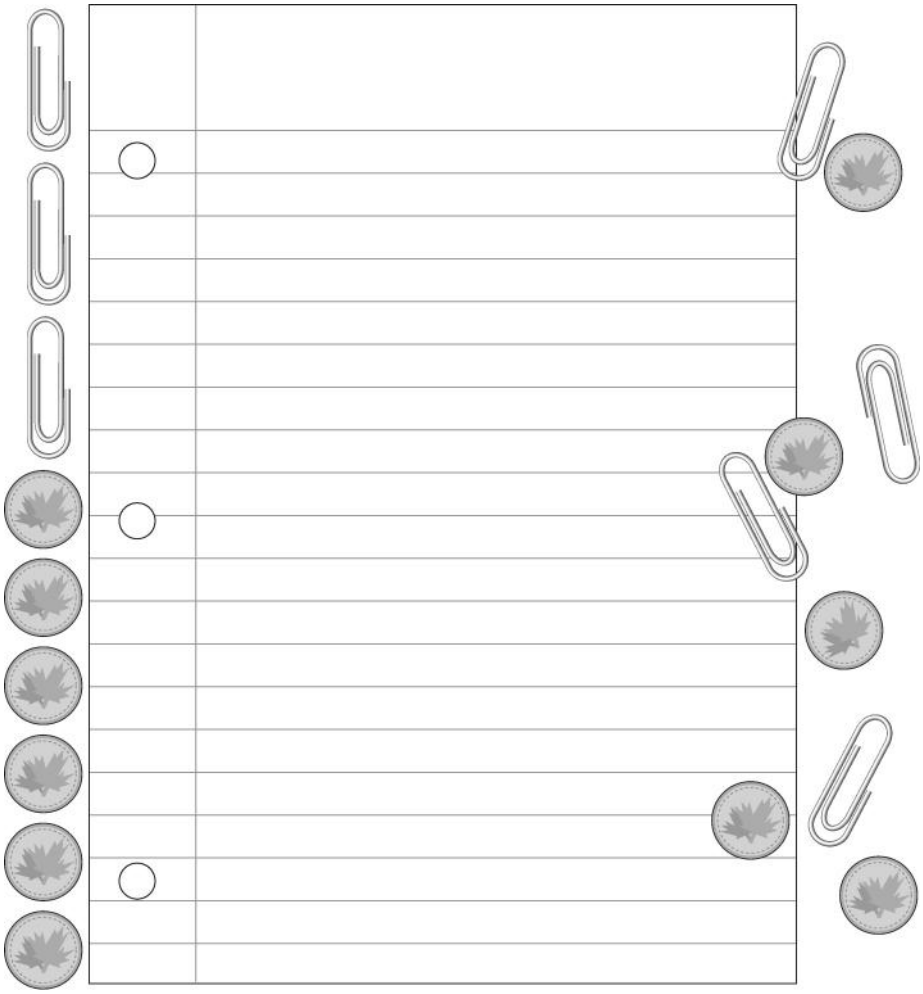
You will model a system of linear equations.

Materials

- a sheet of paper with dimensions 8.5 in × 11 in
- a handful of identical paper clips
- a handful of pennies

Procedure

Step 1: Place a combination of paper clips and pennies along the longer edge of the sheet of paper. Line them up so that the total length of paper clips and pennies is equal to the length of the paper.



Step 2: Place a combination of paper clips and pennies along the shorter edge of the sheet of paper. Line them up so that the total length of paper clips and pennies is equal to the width of the paper.

Step 3: Write an equation in terms of paper clips, *C*, and pennies, *P*, to express the length of the sheet. (Remember that your expression should be equal to 11, since the length of the sheet is 11 in.)

Step 4: Write a second equation in terms of *C* and *P* to express the width of the sheet. (What should this expression be equal to?)

Step 5: Use graph paper or the graph paper template to graph the system of equations you wrote. Label the solution. What does the solution represent?

Step 6: Repeat the experiment but with a different combination of paper clips and pennies along the edges of the paper. Write and graph the system of equations and note the solution.

Analysis

1. **a)** What is the significance of the solution? What does it mean?

   b) How do the solutions from the two trials compare?

   c) Should the solutions be identical or can they be different? Why?

2. How can you verify the accuracy of the solution?

3. What is the connection between the number of pennies and paper clips used in the experiment and the equations used in the linear system?

4. Why can a linear system be used to represent this situation?