**Instructional Days:** 4-6

**Topic Description:**

Students will apply different strategies to help them make a plan and carry out the plan to solve several problems. These strategies may include (but are not limited to): draw a diagram or picture, make systematic lists, divide and conquer, find the pattern, and guess and check.

**Objectives:**

The students will be able to:

- Name and explain the steps in the problem-solving process.
- Solve a problem by applying the problem-solving process.
- Express a solution using standard design tools.
- Determine if a given solution successfully solves a stated problem.

**Outline of the Lesson:**

- Handshake Activity and Fence Post Activity (20 minutes)
- Explanation of solutions (15 minutes)
- Handshake Activity and reflections (75 minutes)
- Presentations of Handshake Activity (40 minutes)
- Discussion of reflections (15 minutes)

**Student Activities:**

- Work individually on Handshake Activity problem #1 and the Fence Post Activity.
- Volunteers present solutions to problems.
- Work in groups to complete Handshake Activity problem #2.
- Groups give presentations of their problem solutions.
- Discuss reflections on the process.

**Teaching/Learning Strategies:**

- Handshake Activity problem #1 and Fence Post Activity
  - Students work individually on Handshake Activity problem #1 and the Fence Post Activity.
- Explanation of solutions
  - Have some students volunteer their solutions to the problems.
  - Reinforce each step of the problem-solving process by asking questions similar to those from the candy bar problem. You want students to understand that
    - Diagrams can be very useful in problems like this to look at a smaller version of the problem before trying to solve for N.
- The fencepost problem is a variation of the candy bar problem or the handshake problem.

- **Handshake Activity problem #2 and Reflections**
  - In groups of 3 or 4, have students discuss, plan, execute, and reflect on Handshake Activity problem #2. Students should follow the directions given in the activity document and write their group’s thoughts on paper.
  - Encourage students to make drawings or charts and/or act out the solution. Chart paper can be given to students to display pictures, charts, or graphs. Their job is to explain the process and the solution so that everyone understands.

- **Student Presentations**
  - Each group should be given about 5-10 minutes (depending on the size of the class) to present their plan and solution to the class. Be sure the students show all 4 steps in the problem-solving process.
  - Students groups should explain their solutions—why they did what they did

- **Discussion of reflections**
  - Ask students questions that will get them to reflect on why they proceeded in the manner they did. Where did they start? (chart, etc.) What did they do next and why?
  - Is their solution complete enough that it could be given to a computer (if they knew the language the computer was using)? Why or why not?

**Resources:**

- Handshake and Fencepost Activity
- Handshake Activity #2 Sample Solution