Homework: Making Matchsticks Task

Due: Thursday, February 20

Complete this Mathematics Assessment Project task and bring your solution to class Thursday.

Making Matchsticks

Here are the first three patterns in a sequence:

Pattern 1: One square made from 4 matchsticks
Pattern 2: Two squares sharing a side (7 matchsticks)
Pattern 3: Three squares in a row (10 matchsticks)

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Pattern 1:

              (4 matchsticks)

Pattern 2:

              (7 matchsticks)

Pattern 3:

              (10 matchsticks)
```

Your Task

Complete the following on a separate sheet of paper (or type). Show ALL your work and reasoning.

1. **Draw Pattern 4 and Pattern 5.** How many matchsticks does each use?
2. **Without drawing it, determine how many matchsticks you would need for Pattern 10.** Explain your method.
3. **Write a rule** that would allow you to calculate the number of matchsticks needed for ANY pattern number. Explain why your rule works.
4. **How many squares would be in a pattern that uses 100 matchsticks?** Show your reasoning.
5. **(Challenge)** Is there a pattern number that uses exactly 50 matchsticks? Why or why not?

What to Bring Thursday

- Your completed work (all 5 questions)
- Show multiple representations if possible (table, graph, equation, words)
- Be ready to post your work for a gallery walk
- We'll use these solutions to practice analyzing student thinking!

Note: There are multiple valid approaches to this problem. Focus on explaining YOUR thinking clearly, not on finding "the one right way."

Source: Adapted from Mathematics Assessment Project (MAP) Formative Assessment Lesson