Overview of Session 5

- Working on a math problem with a focus on making and justifying conjectures and explaining approaches

- Naming the features of a "good" explanation

- Sharing tasks from curriculum materials with potential for mathematical reasoning

5.1a

Sum of Consecutive Odd Numbers Problem

What is the sum of the first 10 consecutive odd numbers greater than zero?

Find a way to know the sum of any set of consecutive odd numbers (that start with 1) without adding every number in the set. Why are you convinced that this way will always work?

Solve this problem and record your reasoning.

Work on this problem independently. Record your initial conjecture(s) and the reasoning you use to justify or refute your conjecture(s).

5.2a

Sum of Consecutive Odd Numbers Problem: Partner work

What is the sum of the first 10 consecutive odd numbers greater than zero?

Find a way to know the sum of any set of consecutive odd numbers (that start with 1) without adding every number in the set. Why are you convinced that this way will always work?

With a partner:
- Take turns sharing your conjectures and the reasoning you used to justify or refute your conjectures
- Create a representation that either of you could use to explain a method for finding the sum of any set
- Listen and watch for examples of mathematical practices 1, 3, and 8

5.2b

The mathematical practices (CCSS)

1. **Make sense of problems and persevere in solving them**
2. Reason abstractly and quantitatively
3. **Construct viable arguments and critique the reasoning of others**
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of structure
8. **Look for and express regularity in repeated reasoning**

5.2c

Sum of Consecutive Odd Numbers Problem: Discussion

What is the sum of the first 10 consecutive odd numbers greater than zero?

Find a way to know the sum of any set of consecutive odd numbers (that start with 1) without adding every number in the set. Why are you convinced that this way will always work?

During the discussion, consider:

- The different approaches that are being used
- Whether each justification is convincing and what aspect convinces you
- The language, representation, and logic used in each justification
- How mathematical practices 1, 3, and 8 connect with the work that was done

5.3a

Features of a "good" mathematical explanation

- Has a clear purpose

- Has a logical structure

- Uses representations and language clearly and carefully

- Focuses on meaning and is oriented to the listener(s)

5.4a

Why be explicit about mathematical practices?

- Practices <u>are</u> basic skills of mathematics – they matter for success in math
- Students may not be attending to the practices even when they are in use
- Using a practice skillfully and effectively involves:
  - Understanding why it matters
  - Knowing how it works
  - Becoming skillful with its use in different situations

5.4b

How can teachers make mathematical practices explicit?

- Integrating practices with work on mathematical topics
- Modeling use of practices
- Scaffolding students' use of practices
- Establishing and maintaining an environment that supports engagement in mathematical practices
- Providing and capitalizing on tasks that create opportunities for developing skill with mathematical practices

5.4c

Tasks from your curriculum

Teachers can support mathematical practices by providing and capitalizing on tasks that create opportunities for developing skill with mathematical practice.

- With a partner, discuss the examples of tasks that you found in your curriculum materials that appear to provide strong opportunities for developing mathematical practice.

5.5a

The mathematical practices (CCSS)

1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning

5.5b

Summary

In this Session, you:

- Focused on making and justifying conjectures and explaining your approach to solving a mathematics problem

- Considered features of good mathematical explanations and ways for teachers to provide opportunities for students to learn to explain

- Considered problems from curriculum materials with potential to support mathematical reasoning

5.6a