Session Goals:

- To identify the five mathematical processes and how these can be implemented into the K-1 classroom to enhance teaching and student learning.
- To explore teaching episodes using the process standards and mathematical ideas as lenses to reflect upon teaching, learning, and mathematics.
- To consider how different strategies can be used to solve the same task.

Class Activities:

1. **Introductions, collection of student work from assigned problem**
2. **Course syllabus**
3. **Pre-assessment**
   - The pre- and post-assessments will be used to inform what we are doing in the professional development courses.
4. **Process Standards**
   - We will develop working definitions of the National Council of Teachers of Mathematics Process Standards from the *Principles and Standards of School Mathematics* (PSSM) (2000). The process standards are included in the narrative before the mathematics SOLs and according to the Virginia Department of Education, are expected to be used in the teaching and learning of mathematics in grades K-12.
   - More information pertaining to PSSM can be found at [http://www.nctm.org/standards/content.aspx?id=16909](http://www.nctm.org/standards/content.aspx?id=16909). If you are not a member of NCTM, you can sign up for a free trial and gain full access to the online version of PSSM for 120 days.
5. **Doing mathematics.**
   - We will be engaging in some mathematical problems throughout the module which are meant to help develop and refine your understanding of the mathematical ideas embedded in the SOLs at your grade level and a little beyond. You may use any manipulatives, tools, or representations which might help support your reasoning about these problems. We will be sharing our ideas in small group and large group settings as well as through writing.
   - Keep in mind that while it is important to think about how your students might solve these mathematical tasks, we encourage you to challenge yourself and solve the tasks from an adult’s perspective. This will provide more opportunities for you to better develop and refine your own mathematical understanding.
   - Your instructor will provide the mathematical problems in class.
5. **Video of kindergarten classroom and discussion (Cognitively Guided Instruction blue CD)**
   - The children you will watch in this video are not a gifted group of children but are the most advanced students in this kindergarten classroom. It is later in the year and the children have been in a classroom which readily emphasizes the process standards. The teacher also uses research-based frameworks to inform planning, instruction, and assessment – frameworks you will be learning about during this professional development experience. Consider the following prompts as you watch the video:
     a. What are the mathematical ideas children are using and exploring?
     b. Where are the process standards at play in this classroom episode and how do those seem to affect students’ learning?
     c. Notice how the teacher interacts with the children. What kinds of statements and questions does he use?
     d. What about the video strikes you as significant?
6. Introduction to *Young Mathematicians at Work* (YMW)
7. Introduction to the online environment where you will post online discussion responses.

**Homework:**
1. a. **Read** Chapters 1-3 of *Young Mathematicians at Work: Constructing Number Sense, Addition, and Subtraction*. (YMW)

   b. Participate in an **online discussion** with your colleagues by posting your responses to the discussion questions (see below) and then post **meaningful comments** to at least one colleague’s postings by the dates provided by your instructor. (“I agree” is not a meaningful comment. You can agree, but you have to explicitly state why you agree or don’t agree with someone’s posting.)

   **Discussion Questions:**
   1. In Chapter 2 (p. 16), the authors state, “One important finding is that children do not all think the same way.” This idea is also further developed in Chapter 3. **How does this statement support or challenge your notions of teaching mathematics?**
   2. **What questions has this reading prompted for you?**

   c. Come to the next class prepared to discuss the differences and relationships between landmarks, big ideas, strategies, and models.

2. **Mathematical problems.** Your task is to find two different ways to solve the following problem that does not use drawings of single objects or objects grouped into groups of ten or the standard procedure for subtraction. In other words, use number relationships to find different ways to solve the problem.

   \[ 93 - 69 = ? \]

   You may use some kind of manipulative or representation (like the open number line introduced in class) as you think about this task. Write up your ideas in a word document and submit to the instructor by the date provided by your instructor. Your ideas should include drawings (Microsoft Word has drawing tools), numbers, strategies you used to think about the problem.