## Thinking Through a Lesson Protocol

The main purpose of the *Thinking Through a Lesson Protocol* is to prompt you in thinking deeply about a specific lesson you will be teaching that is based on a cognitively challenging mathematical task.

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| • What are your mathematical goals for the lesson (i.e., what is it that you want students to know and understand about mathematics as a result of this lesson)? | • As students are working independently or in small groups:  
  - What questions will you ask to focus their thinking?  
  - What will you see or hear that lets you know how students are thinking about the mathematical ideas?  
  - What questions will you ask to assess students’ understanding of key mathematical ideas, problem solving strategies, or the representations?  
  - What questions will you ask to advance students’ understanding of the mathematical ideas?  
  - What questions will you ask to encourage students to share their thinking with others or to assess their understanding of their peer’s ideas?  
  - How will you ensure that students remain engaged in the task?  
    - What will you do if a student does not know how to begin to solve the task?  
    - What will you do if a student finishes the task almost immediately and becomes bored or disruptive?  
    - What will you do if students focus on non-mathematical aspects of the activity (e.g., spend most of their time making beautiful poster of their work)? | • How will you orchestrate the class discussion so that you accomplish your mathematical goals? Specifically:  
  - Which solution paths do you want to have shared during the class discussion? In what order will the solutions be presented? Why?  
  - In what ways will the order in which solutions are presented help develop students’ understanding of the mathematical ideas that are the focus of your lesson?  
  - What specific questions will you ask so that students will:  
    • make sense of the mathematical ideas that you want them to learn?  
    • expand on, debate, and question the solutions being shared?  
    • make connections between the different strategies that are presented?  
    • look for patterns?  
    • begin to form generalizations?  
| • In what ways does the task build on students’ previous knowledge? What definitions, concepts, or ideas do students need to know in order to begin to work on the task?  
  - Which of these methods do you think your students will use?  
  - What misconceptions might students have?  
  - What errors might students make?  
• What are all the ways the task can be solved?  
  - How will the students work – independently, in small groups, or in pairs – to explore this task?  
  - How long will they work individually or in small groups/pairs? Will students be partnered in a specific way? If so, in what way?  
  - How will students record and report their work?  
• What are your expectations for students as they work on and complete this task?  
  - What resources or tools will students have to use in their work?  
• How will you introduce students to the activity so as not to reduce the demands of the task?  
• What will you hear that lets you know students understand the task? | • What will you see or hear that lets you know that students in the class understand the mathematical ideas that you intended for them to learn?  
• What will you do tomorrow that will build on this lesson?