

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.

SET-UP <i>Selecting and setting up a mathematical task</i>	EXPLORE <i>Supporting students' exploration of the task</i>	SHARE, DISCUSS, AND ANALYZE <i>Sharing and discussing the task</i>
<ul style="list-style-type: none"> ▪ 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)? ▪ 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? ▪ What are all the ways the task can be solved? <ul style="list-style-type: none"> - Which of these methods do you think your students will use? - What misconceptions might students have? - What errors might students make? ▪ What are your expectations for students as they work on and complete this task? <ul style="list-style-type: none"> - What resources or tools will students have to use in their work? - 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? ▪ 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? 	<ul style="list-style-type: none"> ▪ As students are working independently or in small groups: <ul style="list-style-type: none"> - 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? <ul style="list-style-type: none"> - 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)? 	<ul style="list-style-type: none"> ▪ How will you orchestrate the class discussion so that you accomplish your mathematical goals? Specifically: <ul style="list-style-type: none"> - 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: <ul style="list-style-type: none"> ▪ 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? ▪ 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?