**Thinking Through a Lesson Protocol**

**Part 1: Selecting and Setting up a Mathematical Task**

• What are the mathematical objectives for the lesson? What is it that the students should 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?

* Which of these methods will your students use?
* What misconceptions might students have?
* What errors might students make?

• What are the 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 the students work – independently, in small groups, or in pairs – to explore this task? How long will the 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 students be introduced to the activity so as not to reduce the demands of the task? What will be heard that indicates that the students understood the task?

**Part 2: Supporting Students’ Exploration of the Task**

• As students are working independently or in small groups:

* What questions will be asked to focus students’ thinking?
* What will be seen or heard that indicates that the students are thinking about the mathematical ideas?
* What questions will be asked to assess students’ understanding of key mathematics ideas, problem solving, or representations?
* What questions will be asked to advance students’ understanding of the mathematics ideas?
* What questions will be asked to encourage students to share their thinking with others or to assess their understanding of their peer’s ideas?

• How will students remain engaged in the task?

* What will be done if a student does not know how to begin to solve a task?
* What will be done if a student finishes the task almost immediately and becomes bored or disruptive?
* What will be done if students focus on non-mathematical aspects of the activity? What if student’s focus on a project is making colorful drawings or downloading pictures from the internet and the mathematics is not addressed?

**Part 3: Sharing and Discussing the Task**

• How will the class discussion be orchestrated so that the mathematical objectives are accomplished? Specifically:

* Which solution paths will be shared during 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 the lesson?
* What specific questions will be asked so that students will:
	+ Make sense of the mathematical ideas that need to be learned?
	+ 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 be seen or heard that indicates that the students understand the mathematical ideas

taught?

What will be done tomorrow to build on this lesson?

Smith, M., Bill, V., Hughes, E. (2008) Thinking through a Lesson: Successfully Implementing High- Level Tasks. *Mathematics Teaching in the Middle School,14, 132-138*