



Launching a Task: Providing Opportunities for All Students to Learn

THE IMPORTANCE OF AN EFFECTIVE TASK LAUNCH

Have you ever found yourself re-explaining aspects of a task after you have directed students to begin working on the task? This is valuable time for both students and teachers. For students, they are not engaging with each other around mathematics. For teachers, you are missing seeing what others in the class are doing. The mathematical tasks you pose during class determine the nature of the mathematics your students have the opportunity to engage in. However, as we all know, you can't just put a task in front of your students and expect to see a perfect lesson. The way you introduce tasks to your students makes a big difference in the effectiveness of your lesson. **Good tasks only live up to their potential if students productively engage in them!**

An effective launch sets students up for meaningful engagement, provides supports needed to promote opportunities for productive struggle, and helps to maintain the cognitive demand of the task (Clark et al., 2014; Jackson et al, 2013). Furthermore, research has shown that students are more likely to learn from a summary mathematics discussion if the task was launched in a way that allowed for all students to participate in the task (Jackson et al., 2013).

MAINTAINING THE COGNITIVE DEMAND OF A TASK

When you identify a high-level task to use in a lesson, simply selecting the task does not ensure that your students engage with it as a high-level task. Tasks go through three phases during a lesson (See Figure 1). The first is the task as it appears on paper to be given to students. The second is the task as it is set up by teachers during a lesson (the launch). The third is tasks as they are interpreted and engaged in by students. Taken together these phases determine opportunities our students have to learn mathematics related to our learning goals and are thus important instructional decisions we make as teachers (Stein & Smith, 1998). *For additional information on selecting cognitively demanding mathematics tasks, see The Role of Mathematics Task brief.*

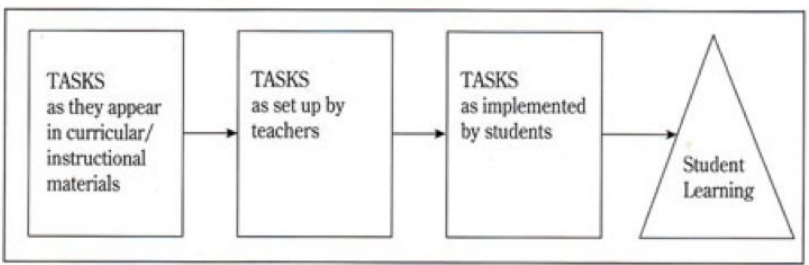


Figure 1: Mathematical Task Framework (Stein & Smith, 1998)

As was noted above, attending to maintaining the cognitive demand during the launch of a task is both challenging and important. When students ask questions about the task itself it is easy to suggest a strategy to help them get started. However, by doing so teachers may lower the cognitive demand of the task, thus diminishing student's opportunities to engage with the task from a problem-solving perspective and potentially depriving them of developing conceptual understandings that are key to your learning goals.

QUESTIONS FOR DISCUSSION

1. In what ways might the launch of a task support **all** students in engaging with the task as a learner?
2. What are some of the instructional challenges you face during the launch of a task?
3. What are some of the instructional challenges you face while you are working to support students' productive struggle while working on a math task?
4. How can effective launches help meet these challenges?

CHARACTERISTICS OF A GOOD TASK LAUNCH

Through a study of over 150 mathematics teachers' effective task launches, researchers have identified four key characteristics of an effective task launch (Jackson, 2013).

1. **Discuss the Key Contextual Features of the Task:** If the task is situated within a context, some students might have trouble getting started because the context or scenario is unfamiliar. Thus, it is important to discuss any features of the context of the task that might be unfamiliar. You might do this through sharing pictures, asking students to imagine the situation, or by making connections to people, places or things that you think might be more familiar to them.
2. **Discuss the Key Mathematical Ideas of the Task:** Being able to engage in the task means being able to interpret key mathematics presented in the task. This includes addressing basic barriers regarding language as it relates to the mathematical ideas of the task and ensuring that students have an image of the mathematics represented in the task.
3. **Develop Common Language to Describe the Key Features:** Effective launches are those where you don't just talk to the students, but engage them in the conversation so that a common language is developed when identifying the key features (contextual and mathematical) of the task that are central to students being able to get started on the task.
4. **Maintain the Cognitive Demand:** Throughout the launch, it is important that the cognitive demand of the task is not lessened. For example, when discussing the key mathematical ideas, it is very important not to suggest methods to solve the task. Doing so robs students of the opportunity to develop important understandings and practices.

As you think about how to address these characteristics of a good launch begin by clearly identifying where you are heading mathematically. Remember that the purpose of your launch is to make sure that all students have access to the math, understand the goal they are working towards, and can get started. Thus, all your instructional decisions related to the above characteristics should be enacted toward this purpose. It is important that students participate in this discussion so that you can assess if each of your goals above have been met before setting them off to work.

SUPPORTING PRODUCTIVE STRUGGLE

Launching a task effectively is the first step toward supporting students' productive struggle. Research has shown that struggling to make sense of mathematics is a "necessary component" of learning math with understanding (Hiebert & Grouws, 2007). The importance of struggle and persistence in learning is reflected in the **NC Mathematic Practice Standard #1: Make sense of problems and persevere in solving them**, as well as in the NCTM Principles to Actions (2014) as an important mathematics teaching practices.

Figuring out how to support students as they struggle with mathematics is not always easy. However, research provides insight to successful strategies that include the following (Warshauer, 2015):

1. Ask questions that help students focus on *their* thinking and identify sources of their struggle.
2. Encourage students to reflect on their work and support them in ways that don't simply focus on finding the right answer.
3. Provide time for students to manage their struggles through adversity and failure by not stepping in too soon or too much, thereby taking the intellectual work away from the students.
4. Acknowledge often that struggle is an important part of learning and doing mathematics and that students will be stronger learners if they engage in collaborative problem-solving.

FINAL THOUGHTS

In developing a culture where struggle is not only expected, but welcomed, it is important to encourage risk taking, to focus on strategy rather than answer, and to allow time for the struggle. However, setting students up to persist is one of the most important moves you can make, and that is directly related to a successful task launch.

References

- Clarke, D., Roche, A., Cheeseman, J., & Sullivan, P. (2014). Encouraging students to persist when working on challenging tasks: Some insights from teachers. *Australian Mathematics Teacher*, 70(1), 1 – 9.
- Hiebert, J. & Grouws, D.A. (2007). *The effects of classroom mathematics teaching on students learning*. In (F.K. Lester Jr, Ed) *Second Handbook of Research on Mathematics Teaching and Learning*. Pp. 371 – 404. Charlotte, NC.: Information Age Publishing.
- Jackson, K., Shahan, E.C., Gibbons, L.K., & Cobb, P.A. (2012). Launching Complex Tasks. *Mathematics Teaching in the Middle School*, 18(1), 24 – 29.
- Jackson, K., Garrison, A., Wilson, J., Gibbons, L., & Shahan, E. (2013). Exploring relationships between setting up complex tasks and opportunities to learn in concluding whole-class discussions in middle grades mathematics instruction. *Journal for Research in Mathematics Education*, 44(4), 646-682.
- National Council of Teachers of Mathematics (2014) *Principles to Actions: Ensuring Mathematical Success for All*. Reston, VA.: NCTM.
- Stien, M.K. & Smith, M.S. (1998). Selecting and creating mathematical tasks: From research to practice. *Mathematics Teaching in the Middle School*, 3(5), 344 – 350.
- Warshauer, H.K. (2015). Strategies to Support Productive Struggle. *Mathematics Teaching in the Middle School*, 20(7), 390 – 393.

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