



IT WORKED!

Bringing Worthwhile Mathematics to the Mathematics Classroom

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Math teachers often spend a considerable amount of time searching for mathematics tasks and even working to develop math tasks that can truly engage students in meaningful mathematics. Many times they find the resource(s), but become discouraged when they observe students not engaging in the task as they wished. They want to fully engage their students, but they are not sure how to facilitate that process while resisting the temptation to guide them through the task. Realizing the need for structures to support teachers with task implementation, I began working with a team of teachers through a process of selecting, preparing for, and reflecting on a worthwhile mathematics task.

Task Selection: *Is this a worthwhile mathematics task?*

We began our process by selecting 2-3 tasks related to a specific content standard. From this collection of tasks, we selected one that we prepared for implementation in the classroom. We evaluated the selected task using the Worthwhile Task Evaluation tool referenced in the *Field Experience Guide: Resources for Teachers of Elementary and Middle School Mathematics* (Bay-Williams & Van de Walle, 2010). This was completed individually before comparing our scores in each component of the evaluation and sharing our reasoning behind each score. This process allowed us to examine how well the current task allowed students to communicate about mathematics, develop a deeper understanding of the mathematical concepts, and engage in problem solving and reasoning. As a team, we discussed how to improve the task in the areas in which it scored lower and we included these ideas in the comments section of the tool. These ideas guided our work in modifying the task and developing questions to extend student thinking. After finalizing the task, we were ready to discuss how we would implement the task.

Task Preparation: *How will we implement the task?*

During this second phase of the task implementation process, it is important for teachers to understand the importance of completing the task themselves and thinking about the task from the perspective of the students. Teachers may be able to complete the task quickly, but the coach must remind teachers to focus on the process and how students might approach the task. Even if teachers struggle to take this perspective, the guiding questions in the Math Task Analysis Tool (Bay-Williams & Van de Walle, 2010) will help facilitate this process. I used the tool with this particular team of teachers. Before we completed the tool, one teacher suggested that we plan additional activities for that class period because the task would only take students 5-10 minutes to complete. After working through the tool, the teacher realized that students could spend an entire 50-minute class period (and possibly an additional half period) engaging in this task on a deeper level. This realization came after we considered some of the following questions from the tool: What materials might students use to complete the task? What are students expected to do? What might be some student struggles? What will students need to think about and/or reflect upon?

In addition to considering how students would engage with the task, we also considered how the teacher would engage with the task by identifying specific teacher moves for before, during, and after the task. These specific teacher moves developed from the conversations we had regarding student engagement with the task. For example, teachers wanted students to justify their solution to the task using appropriate mathematics vocabulary, but they thought students might struggle with this part of the

task. As a result, we decided to give students the opportunity to brainstorm mathematics vocabulary they might be expected to include in their justification. This strategy was added to the before phase of the task.

Teachers were also concerned about students' persevering with the task, so were referenced a planning tool from *Mathematics Coaching* (Bay-Williams, McGatha, Kobett, & Wray, 2014) that specifically addresses building perseverance. This tool includes suggested questions to ask when beginning the task, when a student gets stuck, and even as they are progressing through the task. From this list of questions, we selected specific questions that we incorporated into the before, during, and after phases of the task. At the conclusion of our preparation process, teachers left with the completed Math Task Analysis tool, which provided them a set of specific teacher moves to use as they implemented the task.

Task Reflection: *It Worked!*

In order to have a meaningful discussion about the implementation of the task and how it worked with students, it was important that I observe the task as it unfolded in the classroom. It is equally important to note that I observed the same classes prior to the implementation of the task to gain a better understanding of the student group and class structure. As we reflected on the task, most of our discussion focused on students' processes rather than a finished product. Teachers commented on students' enthusiasm about the mathematics and their level of engagement with the task. I observed one classroom where the teacher remarked, "I have never seen you all so excited about math!" It was evident that students enjoyed the experience, even when they were challenged. The teachers also observed students engaging in meaningful discussions about the task and sharing their various approaches to the task. We discussed the importance of allowing students to share their different approaches to the task so students can examine different solution pathways and begin to develop a set of strategies for solving mathematical and real world problems. This will help students begin to develop, or enhance, their toolbox of skills and resources for problem solving.

When we began the process of planning for this task, one teacher in particular thought this might be a waste of time; valuable instructional time that she could not afford to lose. After implementing the task, she realized the instructional value of not just the task, but also the process in which students engaged. Implementing and engaging students with worthwhile math tasks does not have to be an impossible task, or something to be avoided. Given the appropriate tools and resources, such as those I have described, all teachers can bring worthwhile mathematics to their classrooms through the implementation of worthwhile math tasks.

References:

- Bay-Williams, J.M. & Van de Walle, J.A. (2010). *Field Experience Guide: Resources for Teachers of Elementary and Middle School Mathematics*. Coston: Allyn & Bacon.
- Bay-Williams, McGatha, Kobett, & Wray (2014). *Mathematics Coaching: Resources and Tools for Coaches and Leaders, K-12*. Pearson.

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