7.2 Launching a Technology-Mediated Math Task

The mathematical tasks you pose during class determine the nature of your students' engagement with mathematics. However, as we all know, you can't just put a task in front of your students and expect them to engage with it perfectly. 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. The ways you set up a task (i.e., introduce it) is often referred to as "launching the task".

An effective launch sets students up for meaningful engagement, provides support needed to promote opportunities for productive struggle, and helps to maintain the cognitive demand of the task. As you can imagine, this is especially important when using a technology-mediated mathematics task. Consider these four important elements of setting up high-cognitive demand tasks to support all students' learning:

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 or video, asking students to imagine the situations, using digital simulations, 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 mathematical ideas presented in the task. This includes addressing basic barriers regarding language and ensuring that students have an image of the mathematics represented in the task. If the task includes dynamic representations of the key mathematical ideas, it is important that the launch include ways to interact with the technological representations to investigate the key mathematical ideas.

3. **Develop Common Language to Describe 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 successfully beginning 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.

(adapted from Jackson et al., 2013)

Context

Ms. Fye is using the Introduction to the Sine Graph Desmos Activity in a remote synchronous class session.

This is an introduction activity focused on reasoning about the relationship between the equation of a sine function and characteristics of the sine graph. Ms. Fye designed the activity knowing that her students had explored the relationship between function structure and their graphs by varying the parameters for many different function families. With that in mind she had the following learning goals:

- Students will recognize the connection between the structure of a sine function equation (i.e., $y = a\sin(bx) + k$) and its related graph with respect to amplitude, midline, and period. Specifically,
    - Amplitude is $|a|$
    - Midline is $y = k$
    - Period is $\frac{360}{|b|}$

Specific performance goals include:

- Given a sine function equation, students will be able to determine the amplitude, period, and midline without graphing.
- Given the amplitude, midline, and period, students will be able to determine the function equation.
- Given the graph of a sine function, students will be able to determine the amplitude, period, and midline.
- Given the graph of a sine function, students will be able to determine the function equation.

Q1. Given your engagement with the Introduction to the Sine Graph Desmos Activity and what you have read about launching tasks, what do you think it would be important to attend to when launching this task with students in Ms. Fye's class? Explain.

Q2. Next, watch this video clip of Ms. Fye launching this activity in a remote synchronous class. Identify moments in the video where you see Ms. Fye enacting any of the four elements of an effective launch (listed above). Note the time, what she does, and how it addresses one (or more) of the four elements.

Ms. Fye Launching the Task

Below is a link to the teacher dashboard as it looked at the end of Ms. Fye's class. Here you can examine the pages Ms. Fye referred to as she launched the task.

Ms. Fye's Teacher Dashboard

Q3. Reflect on the way in which Ms. Fye launched the activity. Describe how she used her students' ideas in this process.

Q4. Ms. Fye thought carefully about the way she planned to launch this activity and noted it in her planning guide. Compare and contrast what you noticed in the video with what she planned for her launch of the activity.

Here is her planning guide for implementing the activity.

Imagine Ms. Fye had designed the same task using a worksheet and an NCTM dynamic graphing applet rather than Desmos Activity Builder.

Introduction to the Sine Graphs Desmos Activity

Q5. Consider how you would launch this same task if you were to use it in a face to face (not remote) classroom setting. Describe how you would launch the task. Then explain how your launch addresses the elements of an effective launch.