Intentionality around the SMPs: Through the Lens of Rich Tasks


Monday, February 9th
Katey Arrington, Manager, K-12 Services
Bill Hopkins, Professional Learning Facilitator, K-12 Services
Brian Newsom, Business Development Specialist, K-12 Services
Ann Roman, Professional Learning Facilitator, K-12 Services

Goals

Session Goal:
To provide participants a learning experience and materials that could be used for professional development with teachers in your district

Learning Experience Goal:
Enhance learning and the use of Standards for Mathematical Practice (SMPs) with intentional planning
Agenda

Participants will . . .

• Engage in a rich task that will spark initial discussions highlighting the SMPs.

• Engage in multiple SMPs by exploring different approaches to solving the task.

• Reflect on the use of SMPs and how to enhance learning of targeted SMPs through intentional planning.

Group Norms

• Understand that those who work, learn.

• Look for solutions, not blame.

• Focus on systems, not people.

• Be honest.

• Recognize that everyone has expertise.

• Challenge ideas.

• Share talk time.
Let’s Do Some Math

S-Pattern Task

Write a description that could be used to define any figure in the pattern shown below, including an expression for the total number of square tiles in the figure. After describing the pattern one way, find a second way and show that the expression is equivalent to the expression for your first pattern.

Directions:
1. Work as a group to complete the task.
2. Record your methods on chart paper.

Each triangle represents one fourth of the rectangle.

Directions:
1. Determine if this statement is true or false.
2. Justify your conclusion using two methods.
3. Record your methods on chart paper.
Reflection

• Which SMPs does this task highlight?

• How does a rich task contribute to the learning of the SMPs?

*How might a teacher be intentional to increase the likelihood that students engage in a targeted SMP?*

Intentionality around the SMPs: Through the Lens of Rich Tasks (Continued)


Wednesday, February 11th

Katey Arrington, Manager, K-12 Services
Bill Hopkins, Professional Learning Facilitator, K-12 Services
Brian Newsom, Business Development Specialist, K-12 Services
Ann Roman, Professional Learning Facilitator, K-12 Services
Goals

Session Goal:
To provide participants a learning experience and materials that could be used for professional development with teachers in your district

Learning Experience Goal:
Enhance learning and the use of Standards for Mathematical Practice (SMPs) with intentional planning

Agenda
Participants will . . .
- Revisit the overarching questions from Monday.
- Consider intentional planning for instruction of a targeted SMP.
- Discuss the learning experience as a potential professional learning opportunity for educators in your district.
Group Norms

- Understand that those who work, learn.
- Look for solutions, not blame.
- Focus on systems, not people.
- Be honest.
- Recognize that everyone has expertise.
- Challenge ideas.
- Share talk time.

Overarching Questions

- Which SMPs does this task highlight?
- How does a rich task contribute to the learning of the SMPs?

How might a teacher be intentional to increase the likelihood that students engage in a targeted SMP?
Connect to Mathematics Teaching Practices

**Implement tasks that promote reasoning and problem solving.**

“Effective teaching of mathematics engages students in solving and discussing tasks that promote mathematical reasoning and problem solving and allow multiple entry points and varied solution strategies.”  (p. 17)


---

Connect to Mathematics Teaching Practices

**Establish Mathematics Goals to Focus Learning**

“The mathematical purpose of a lesson should not be a mystery to students. Classrooms in which students understand the learning expectations for their work perform at higher levels than classrooms where the expectations are unclear.”  (p. 13)

Overarching Questions

• Which SMPs does this task highlight?
• How does a rich task contribute to the learning of the SMPs?

How might a teacher be intentional to increase the likelihood that students engage in a targeted SMP?

Moving into Intentional Planning

1. Do the task with your group.
2. Use the SMP Recording Sheet to document evidence of any practices observed while doing the task.
3. Choose one SMP as the target. Brainstorm some ways you could be intentional to increase the likelihood that students engage in the targeted SMP when using this task?
Seeing SMPs in Action

Conjecturing About Functions (Grades 6-8)
https://www.teachingchannel.org/videos/conjecture-lesson-plan

Reasoning About Division (Grades 3-5)
https://www.teachingchannel.org/videos/common-core-teaching-division

In the video, how is the teacher intentional in encouraging students to engage in
SMP #3: Construct viable arguments and critique the reasoning of others?

Intentional Planning Process

Select a target SMP for this task, and then…

• Develop an “I will” statement that communicates the SMP learning outcome clearly to students.

• Consider carefully what student engagement in the SMP looks like, and what teacher actions will encourage those behaviors.
“I will” Statement

Similar to learning objectives that focus on content, the SMP “I will” statement is the learning objective that focuses on specific skills or abilities called for in the SMP.

Example:

*I will use visual representations and equations to make sense of situations, solve problems, and justify my ideas and understandings.*

Student Engagement

- Describe what it looks like and sounds like for students to be engaged in learning through the lens of the SMP.
- Describe what the teacher actions will be that support student engagement in the SMP and that establish the supportive classroom environment.

Guiding Questions:

1. *What are the students saying and doing?*
2. *What is the teacher saying and doing to ensure student action? How is the classroom environment molded by teacher moves?*
Student and Teacher Actions

Student

Teacher

The Charles A. Dana Center at the University of Texas at Austin
The S Pattern Task

1. What patterns do you notice in the set of figures?
2. How many square tiles are in figure 7? Write a description that could be used to determine the shape of and total number of square tiles in figure 7. Your description should be clear enough so that another person could read it and use it to think about another figure.
3. Determine an equation for the total number of squares in any figure. Explain your rule and show how it relates to the visual diagram of the figures.
4. Find a second way to describe the pattern and write the equation that matches the description. Compare the two equations and show in the visual representation how one equation is equivalent to the other.
5. If you knew that a figure had 9802 squares tiles in it, how could you determine the figure number? Explain.
6. Does the pattern describe a linear relationship between the figure number and the total number of squares? Why or why not?

This task was adapted from Visual Mathematics Course II, Lessons 1-10 published by The Math Learning Center, Salem, OR.

This question requires you to show your work and explain your reasoning. You may use drawings, words, and numbers in your explanation. Your answer should be clear enough so that another person could read it and understand your thinking. It is important that you show all your work.

The first 3 figures in a pattern of tiles are show below. The pattern of tiles contains 50 figures.

Describe the 20th figure in this pattern, including the total number of tiles it contains and how they are arranged. Then, explain the reasoning that you used to determine this information. Write a description that could be used to define any figure in the pattern.
Reflection

Why is setting clear mathematical goals around both content and practice necessary?

How can intentional planning for goals around both content and practice enhance the learning experience for students?

Goals

Session Goal:
To provide participants a learning experience and materials that could be used for professional development with teachers in your district

Learning Experience Goal:
Enhance learning and the use of Standards for Mathematical Practice (SMPs) with intentional planning
Action Plans

1. Share with your district colleagues a new learning from this morning’s experience.

2. How, when, and with whom might you use these ideas and materials?

3. What else might you need in order to make these ideas and materials more useful?

4. How might the Dana Center support you in moving forward?