

RAMP-A

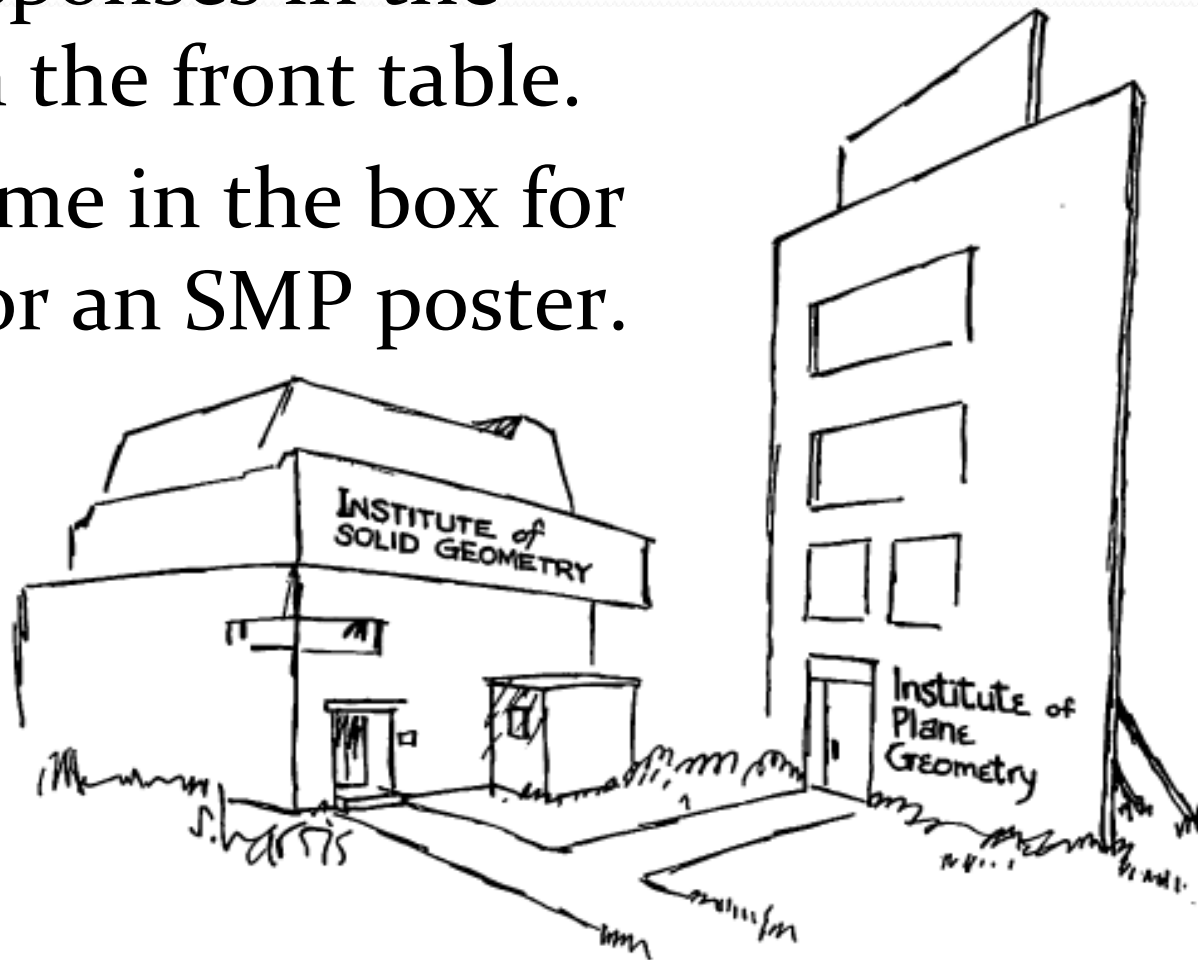
April 18

2014

- Investigate the progression of *rates* in the CCSS to plan for students' coherent learning of rates of change.
- Do math task.
- Start planning a lesson with Growing Rectangles.
- Present and reflect on Learning Studies.

Take a Survey

- Put your responses in the envelope on the front table.
- Put your name in the box for a drawing for an SMP poster.



PLC Discussion

- How does your principal/assistant principal currently support your efforts to learn and implement strategies of teaching the CCSS?
- What other actions could your principal or assistant principal take to improve your ability to learn and implement strategies of teaching the CCSS?

Summarize your discussion and be ready to share.

High School Functions Standard:

- Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.

Discuss:

What understandings of *rates* would help students develop robust meanings for rates of change?

What meanings of *average* might help students to meaningfully develop ideas about average rates of change?

Rates of Change Progression

Yellow: Cluster statements from 6th-8th grade

Blue: Standards within those clusters

Follow the directions to order them without looking at your CCSS!

Think about the *math*:

- How do the mathematical ideas differ and build at each grade level?
- What other mathematical ideas must be developed and how are they connected to the F-IF standard?
- How are the mathematical ideas related to the F-LE standards (linear, exponential, and quadratic functions)?

Think about the *learners*:

- How do students' understandings change from one year to the next?
- What formative assessment could you use to see where students are along this progression?
- If your FA reveals that some students are not ready for this standard, what, specifically, could you do?
- If your FA reveals that some students have a good understanding of all these standards, what, specifically, could you do?

Discuss:

- How do you help students understand *average rates of change*?
- How does your approach build on their understandings of *average*?
- How does your approach use what students already understand about *rates and constant rates of change*?

Math Task

- Remember Math Norms:
 - Allow others time to think
 - Look for more than one way to think about the problem
 - Listen carefully and ask questions to understand
 - Explain your thinking fully



Motorcycle Race

Compare problems

- Compare Motorcycle Race with Growing Rectangles.
- What is the same in terms of the learning targets of the standards? What is different in terms of the learning targets of the standards?
- How does this problem build on the prior knowledge of the students?
- What Standards for Mathematical Practice did you use when doing these problems?
- What higher level questions can you create that would promote students' complex thinking?

Break



Thinking Through a Lesson

Successfully Implementing High -Level Tasks

Margaret S. Smith, Victoria Bill, and Elizabeth K. Hughes
Mathematics Teaching in the Middle School Vol. 14, No. 3,
October 2008

Why are rich tasks so difficult to implement?

How can we implement rich tasks so that they maintain their richness?

How can we keep ourselves from getting in the way of student learning?

How can we control the learning outcomes, yet allow students to find their own path?

Thinking Through a Lesson Protocol (TTLP)

- Part 1: Selecting and Setting up a Mathematical Task
- Part 2: Supporting Students' Exploration of the Task
- Part 3: Sharing and Discussing the Task

Part 1: Selecting and Setting up a Mathematical Task – Growing Rectangles

Read Part 1 of the TTLP protocol.

Part 1: Selecting and Setting up a Mathematical Task – Growing Rectangles

- *What are the mathematical goals for the lesson?
- *In what ways does the task build on students' previous knowledge, experiences, and culture?
- *What are all the ways the task can be solved?
- *What are your expectations for students as they work on and complete this task?
- *How will you introduce students to the activity?

Sharing your work:

What are the mathematical goals for the lesson?

*In what ways does the task build on students' previous knowledge, experiences, and culture?

More sharing....

*What are your expectations for students as they work on and complete this task?

*How will you introduce students to the activity?



- Part 2: Supporting Students' Exploration of the Task

What questions will you ask?

How will you keep students engaged in the task?

- Part 3: Sharing and Discussing the Task

How will you manage the class discussion so that mathematical goals are accomplished?

How will you ensure that each student has the opportunity to share?

How will you know that all students understood the math to be learned?

How will you build on the learning tomorrow?

Lunch and Gallery Walk

- What similarities and differences do you notice when you compare your plan to the others in the gallery? What differences did you notice in other plans that you could use to enhance your plan? Be prepared to explain how you intend to revise your plan.
- What differences in your lesson (when compared to others) are necessary due to the specific characteristics of your students? Be prepared to explain these characteristics and differences and how the latter supports the former.

Reflection

Write your individual thoughts on:

- When you compared your lesson to others, what differences were necessary due to the specific characteristics of your students?
- How did your students' characteristics affect your decisions?

Directions for Presentations

- 12:00-1:00: Three Presentations per room A, B, C, in that order. PLCs who are not presenting, split up among the rooms.
- 1:00-1:30: Team debrief
- 1:30-2:10: Two presentations per room D and E, in that order. PLCs who are not presenting, split up among the rooms.

Rooms for Presentations

	Classroom 1	Classroom 2	Big Room
A	Shadle	Ferris	Mead
B	West Valley	Cheney	East Valley
C	Mt. Spokane	Republic	G-Prep
D		Libby/Sac	

	Classroom 1	Classroom 2	Big Room
A	University	Mountainside	LC
B	Rogers	Central Valley	Salk/Bowdish

Debrief

Use the sentence strip to contribute to the poster:

- What did your team learn?
- What did your team want to learn?
- What spurred your thinking in some way?

Your Tasks Due in June:

Plan and teach a lesson with the Growing Rectangles task.

Reflect on the lesson together.

Bring student work to the June workshop.

Evaluations

- Your evaluations are important to us. They guide and inform our work.
- Have a terrific last couple of months of school!



Thank you for your thoughtful work today...

- that is helping all of us grow to better understand and support our students' learning,
- that is creating and sustaining a community of math educators in our region and state,
- And, for caring for our children!