Theme: *Continuing our Professional Learning*

RAMP-A

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SUMMER INSTITUTE

Goals for today

- Cognitive Demand
- Turn any task into a rich task
- Rich task
- PLC time to work
- Teaching for coherence
- More on motivation

Cognitive Demand

- Think by yourself for a moment, then share at your table, what you mean by the ***cognitive demand*** of a task.

Task Sort

- Your group has 10 tasks, sort them into three piles:
  - Low cognitive demand
  - Medium cognitive demand
  - High cognitive demand
- As you discuss, list the characteristics you use to decide the level of cognitive demand.

Cognitive Demand and Coherence

- Look at the 5 tasks you rated as having the highest cognitive demand. What opportunities does each task provide for learning with coherence? What characteristics provide those opportunities?
- What SMP would you support students in using for each of the 5 highest-rated tasks?

Revisiting Rich Tasks

- What are the **characteristics** of a "rich task"?
- **Why** would a teacher want to use rich tasks?
- **When** would a teacher want to use rich tasks?
- What *Standards of Mathematical Practice* might be used in rich tasks?
- Today's focus: converting any text problems into richer activities

Conversions: Routine → Rich

- Peg Smith's *Task Modification* activity: changing routine problems to increase students' engagement in reasoning and proof
  - What steps can you take to make these changes?

- Dan Meyer Revisited: TED Talk http://www.ted.com/talks/dan_meyer_math_curriculum_makeover
  - What steps does Dan suggest for making a routine problem into a activity that engages students' intellectual curiosity and reasoning? Why?
  - Support from *Make Just One Change* (Right Question Institute): teaching students to generate and prioritize their own open-ended questions

Application

- Choose a textbook topic that is often taught in a routine way
  - Identify a **visual image or video** you could use to prompt students' intellectual curiosity in this topic
  - Plan ways to **have students' generate and prioritize** their own questions
  - Plan how you will engage students in investigation of a high priority question that will build their **mathematical creativity, content knowledge and connections, collaboration, and confidence**
  - **Add rich practice problems (high cognitive demand/Depth of Knowledge)**, using the Peg Smith strategies

Break

Gapfinder Website

- Google: Gapfinder World

Task

- You have 30 minutes to scratch out a possible activity students could do in a day or two.
- What could you ask students to do with this?
- You will present out your ideas in 30 minutes to the group in a 30 second overview.

Share out

- What content does their activity cover?
- What SMP are used in their activity?

Lunch!

Time to work in your PLCs

Teaching for Coherence

What would teaching the distributive property with coherence entail?

Create a poster with your group's ideas and post it on the wall near your table.

Suppose…

- You ask students to transform the expression using the distributive property:

$$2x(3x+2)+5(x-1)$$

1. When you have just introduced the topic.
2. When you are in the middle of working on the topic.
3. When you are ready to introduce factoring and want to make connections.

Create a Poster

- What ideas would you focus on at each of the times? What questions would you ask? (Create a 3-part poster.)

1. When you have just introduced the topic.
2. When you are in the middle of working on the topic.
3. When you are ready to introduce factoring and want to make connections.

A Teaching Event

Watch:

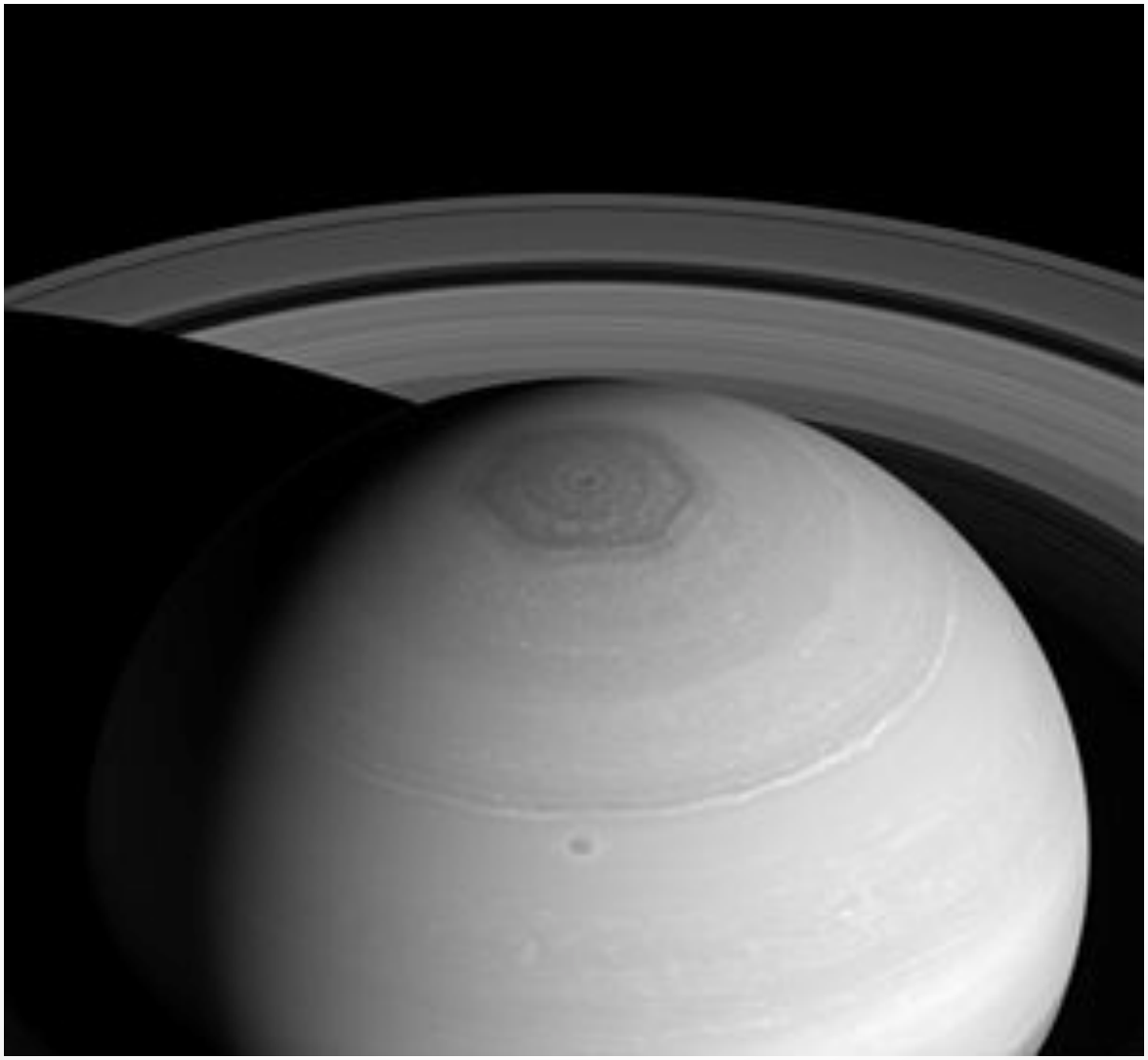
"My favorite No"

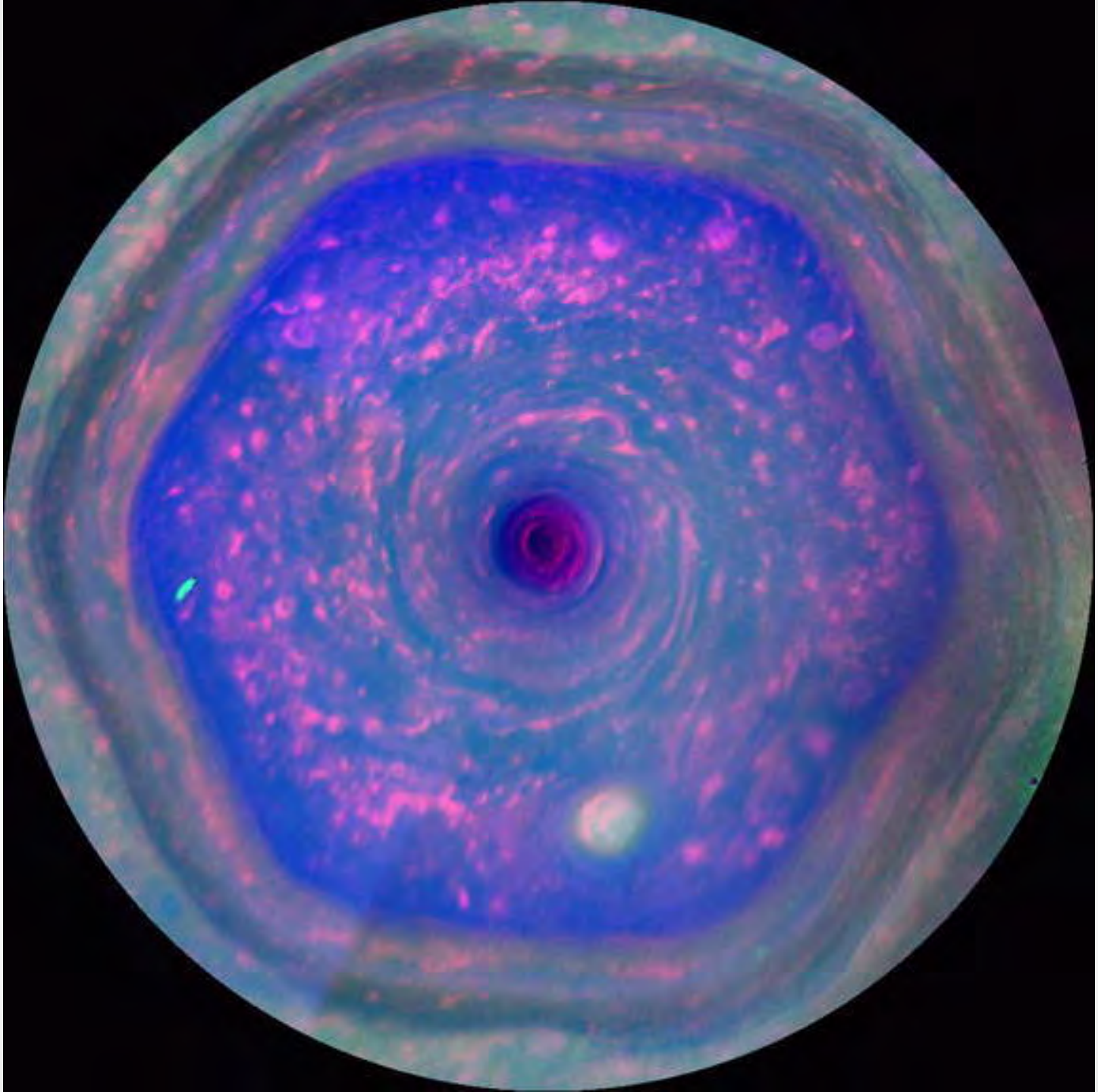
- https://www.youtube.com/watch?v=Rulmok_9HVs

Plan

Plan how you could use a similar teaching strategy as a 10-minute warm-up to a lesson on factoring while supporting coherent learning.

More On Motivation





My Questions

- So how big IS this thing?
- How does that compare to something I know?
- Why is it like that?
- How fast does it move?

What Causes Us to Be Motivated?

James Littlefield, et al.

- First, given the opportunity to engage in a learning activity, a student determines if the activity is one that is known to be **interesting**. If so, the student engages in the activity.
- If not, then the student evaluates the activity on two factors—the **stimulation** (e.g. challenge, curiosity, fantasy) it provides and the **personal control** (e.g. free choice, not too difficult) it affords.

What Causes Us to Be Motivated?

- If the student perceives the activity as stimulating and controllable, then the student tentatively labels the activity as interesting and engages in it. If either condition becomes insufficient, then the student disengages from the activity—unless some extrinsic motivator influences the student to continue.
- If the activity is repeatedly deemed stimulating and controllable, then the student may deem the activity interesting. Then the student will be more likely to engage in the activity in the future.
- If over time activities that are deemed interesting provide little stimulation or control, then the student will remove the activity from his or her mental list of interesting activities.

Contradictions…

- Scaffolding makes it easier…
- Support teaches independence…
- Not everyone has to meet the same standards…
- Telling how important this will be in further classes…
- Spend the day repairing their weaknesses…

Rick Wormeli

- Manipulation involves one person doing something to someone else in order to control his or her actions or attitude. Conversely, motivation comes from within. It's a welling desire to invest oneself in a topic, person, or activity. We can control a student's behavior through rewards or threats, but we can't use those methods to *motivate* that student to do anything he or she doesn't already want to do.

Rick continues…

So the first mind-set teachers need is the recognition that motivation is something we create *with* students, not something we do *to* them. Our goal should be a classroom culture that cultivates curiosity and personal investment, one in which students feel safe to engage in the activity or topic without fear of embarrassment or rejection.

Discourse Strategies (less involvement): Procedures

- Procedures
  - Give directions
  - Implement procedures
  - Tell students how to think and act
- Examples
  - Listen to what I say and write it down.
  - Take out your books and turn to page 45.

Discourse Strategies (less involvement): Extrinsic Support

- Extrinsic Support
  - Superficial statements of praise (focus is not on the learning goals and objectives)
  - Threats to gain compliance
- Examples
  - You have such neat handwriting.
  - These scores are terrible. I was really shocked.
  - If you don't finish up you will stay after class.

Discourse Strategies (more involvement): Intrinsic Support

- Intrinsic Support
  - View challenge/risk taking as desirable
  - Respond to errors constructively
  - Comment on students' progress toward the learning goals and objectives
  - Evoke students' curiosity and interest
- Examples
  - That's great! Do you see what she did for #5?
  - This may seem difficult, but if you stay with it you'll figure it out.
  - Good. You figured out the y-intercept. How might we determine the slope here?

Discourse Strategies (more involvement): Negotiation

- Negotiation
  - Adjust instruction in response to students
  - Model strategies students might use
  - Guide students to deeper understanding
- Examples
  - What information is needed to solve this problem?
  - Try to break the problem into smaller parts.
  - Here is an example of how I might approach a similar problem.

Discourse Strategies (more involvement): Transfer Responsibility

- Transfer responsibility
  - Support development of strategic thinking
  - Encourage autonomous learning
  - Hold students accountable for understanding
- Examples
  - Explain the strategy you used to get that answer.
  - You need to have a rule to justify your statement.
  - Why does Jenna's method work?

Building a Classroom Culture

Use of Physical Environment:

- Set up to promote and scaffold independence and ownership.

Classroom Routines and Rituals:

- Promote community, equity and accountability for learning.

Classroom Culture:

- Based upon relationships that promote high expectations and inclusivity while reducing issues of status.
- Promote risk-taking and collaboration.

Get Specific!

- Each group of 4 has been given some strategies for helping to create motivation with students…
- In your group choose ONE of the activities and think of or create a specific lesson or occasion you might use in your class.
- Create a poster of that activity and state which strategy you are addressing.
- Post around the room

Whole Group Reflection

(instead of Evaluations)

- What activities today and yesterday most spurred your thinking?

- Discuss in your groups and be ready to share.

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