Selecting, Sequencing, and Connecting: Using Technology to Support Area Measurement through Tasks, Strategies, and Discussion

Eryn Michelle Stehr  
*Georgia Southern University, estehr@georgiasouthern.edu*

Ha Nguyen  
*Georgia Southern University, hnguyen@georgiasouthern.edu*

Jia He  
*Augusta University, jhe@augusta.edu*

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Eryn M. Stehr
Georgia Southern University
estrehr@georgiasouthern.edu

Jia He
Augusta University
jhe@augusta.edu

Ha Nguyen
Georgia Southern University
hnguyen@georgiasouthern.edu

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**Session Goals & Plan**

5 Practices of Productive Discussion

- **Area Measurement**
  - Why concepts of area measurement?

- **Open Tasks**
  - What is an open task?

- **Online Tasks**
  - Try out the open, online task!

- **How do we use the open, online task with the 5 practices to support students’ thinking about area measurement?**

- **What are the 5 practices?**
Why concepts of area measurement?

From Strengthening Tomorrow’s Education in Measurement:

Textbooks emphasize procedural knowledge

Students are great at procedural knowledge!

But...

- Textbooks do not always emphasize conceptual knowledge for area measurement
- Students struggle with conceptual understanding (applying in the real world in meaningful ways)
For example, NAEP, 2013 – 8th Grade

On the scale drawing, the shaded area represents a piece of property along the river. Which of the following measurements is the best estimate of the area of the property?

A. 750 square meters  
B. 850 square meters  
C. 900 square meters  
D. 1,050 square meters  
E. 1,200 square meters
On the scale drawing, the shaded area represents a piece of property along the river. Which of the following measurements is the best estimate of the area of the property?

A. 750 square meters
B. 850 square meters
C. 900 square meters
D. 1,050 square meters
E. 1,200 square meters

41%
What is an open task?

Multiple entry points & Multiple strategies
- Low threshold / High ceiling
- Built-in differentiation
- Open to students’ knowledge & perspectives

Multiple answers & Mathematical consequences
- Not all answers are valid, but
- Multiple answers can be “right” (valid)
- Confronting both valid & invalid answers allows richer discussion & deeper understanding
Try out the open, online task!

Work with a partner or group.

- How many different strategies can you create?
- What math consequences can you notice?

https://goo.gl/pQCeEc
What are the 5 practices?

- Anticipating ...likely student responses
- Monitoring ...students’ actual responses
- Selecting ...students who share in class discussion
- Sequencing ...student strategies strategically
- Connecting ...mathematical ideas across strategies and to bigger mathematical concepts
How do we use the open, online task with the 5 practices to support students’ thinking about area measurement?

**Sorting Task Image 5**
Half: 14 purple means $14 \times 2 = 28$ rectangles!

**Sorting Task Image 21**
Half is 16 rectangles means $16 \times 2 = 32$ rectangles

**Sorting Task Image 8**
Big half: 2 up / 11 across = 22 rectangles
Small half: 2 up / 7 across = 14 rectangles
Whole puddle is 36 rectangles

**Sorting Task Image 7**
Big half: 4 up / 5 ½ across = 22 rectangles
Small half: 4 up / 3 ½ across = 14 rectangles
Whole puddle is 36 rectangles

Find strategies to partition a shape and add areas (MGSE3.MD.7c / MGSE4.MD.8)
Let’s practice using a sorting task:

On the sheet are potential learning outcomes that we can use the task to support.

Talk to your neighbor / group:
- Which look interesting for you?
- What other learning outcomes can you imagine?
Sorting Task

Choose at least 2 learning outcomes to start with.

For each learning outcome, sort the cards:

- Select 3 or 4 strategies that would support the learning outcome
- Sequence the strategies to “tell a story” supporting that learning outcome

What changes in your choices?

What strategies are missing?
Thank you for coming!

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If you have any future questions

Eryn M. Stehr
Georgia Southern University
estehr@georgiasouthern.edu

Jia He
Augusta University
jhe@augusta.edu

Ha Nguyen
Georgia Southern University
hnguyen@georgiasouthern.edu