

Mathematics Teaching Institute

Day Four– Exploring Measurement and Geometry

Mathematics Teaching Institute, July 27-31, 2015



Through the Eyes of Mathematicians – Making Mathematical Modeling Accessible to Students

With special guests, Dr. Bart Snapp and Dr. Jim Fowler, The Ohio State University Department of Mathematics

Sponsored by Ohio Department of Education 2



Break See you in 10 minutes



Developing measurement concepts

Non-metric countries







Measurement activities:

Measurement Poems

"One inch tall" from Where the Sidewalk End by Shel Silverstein





Measurement activities:

- The Great Estimations Contest
- Frames of reference for standard units

Great Estimations by Bruce Goldstone Greater Estimations by Bruce Goldstone



Relationships and Convergences

Found in: L CCSS for Mathematics (practices) 2a, CCSS for ELA & Literacy (student capacity) 2b. ELPD Framework (ELA "practices") 3. NGSS (science and engineering practices)

Notes:

- 1. MP1–MP8 represent CCSS Mathematical Practices (p. 6-8).
- 2. SPI-SP8 represent NGSS Science and Engineering Practices.
- 3. EPI-EP6 represent CCSS for ELA "Practices" as defined by the ELPD Framework (p. 11).
- 4. EP7* represents CCSS for ELA student "capacity" (p. 7).

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Understanding Language

Suggested citation:

Cheuk, T. (2013). Relationships and convergences among the mathematics, science, and ELA practices. Refined version of diagram created by the Understanding Language Initiative for ELP Standards. Palo Alto, CA: Stanford University.

MPI. Make sense of problems and persevere in solving them

Math

- MP2. Reason abstractly and quantitatively
- MP6. Attend to precision

MP7. Look for and make use of structure

MP8. Look for and express regularity in repeated reasoning

EP7*.

Use technology and digital media strategically and capably

MP5. Use appropriate tools strategically

SP2. Develop and use models

MP4. Model with mathematics

SP5. Use mathematics and computational thinking

EPI. Support analysis of a range of grade-

level complex texts with evidence

MP3 and EP3. Construct viable and valid arguments from evidence and critique reasoning of others

SP7. Engage in argument from evidence

communicate information

and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience

EP4. Build and present knowledge through research by integrating, comparing, and synthesizing ideas from text

EP5. Build upon the ideas of others and articulate their own clearly when working collaboratively

EP6. Use English structures to communicate context specific messages



SPI. Ask guestions and define problems

> SP3. Plan and carry out investigations

> > SP4. Analyze and interpret data

SP6. Construct explanations and design solutions

SP8.

Science

Obtain. evaluate, and

EP2. Produce clear



Lunch We will return at 12:45



Measurement activities:

Geometry & Measurement Discovery Hunt A device to take pictures (cell phone, iPad, etc.)





Geometry/Measurement Activity: Venn Diagrams and Geometric Thinking Rectangles, Squares, and Rhombi



Three Circle Venn Diagram Example





Problem Posing Part II – Mathematics is EVERYWHERE!

Identify variables and influential factors I notice/I wonder/What If Generating Mathematical Tasks



How many pennies are needed to equal your height, the height of the school, the tallest building in the world, the summit of Mount Everest?



Your Turn!

Start with the picture your group will be given

-Identify the potential for mathematics in the picture

-I notice/I wonder/What if...

-What information regarding this picture could you search and learn about using additional resources (Internet, books, etc.)?

-What mathematical content could your picture portray?



Your Turn!

- What mathematical tasks can you generate from this picture?
- Work with a partner and begin constructing a plan to find a solution to one of your more challenging tasks.
- Identify the mathematical practices that students might engage with as a result of the tasks you designed
- Gallery walk of pictures and tasks at the end of the day



Daily Feedback Form

Homework Read: Tales, tasks, tools and talk (McKeny & Foley, 2012)