#### **Relationships** and Convergences

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

#### Notes:

- I. MPI-MP8 represent CCSS
- Mathematical Practices (p. 6-8). 2. SP1-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).

Stanford

GRADUATE SCHOOL OF

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. Stanford, 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\*.

1 Ise technology and digital media strategically and capably

**MP5.** Use appropriate tools strategically

SP2. Develop

MP4. Model with

SP5. Use mathematics and computational thinking

EPI. Support analysis of a range of gradelevel 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

and coherent writing in which the and style are appropriate to

**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 questions and define problems

**SP3.** Plan and carry out investigations

SP4. Analyze and interpret data

SP6. Construct explanations and design solutions

#### SP8. Obtain,

Science

evaluate, and communicate information

EP2. Produce clear development, organization, task, purpose, and audience

## Crazy Cakes (grade 3)

Divide each of the cakes below into two parts with equal area. Be able to explain your reasoning to your partner.



MP3. Construct viable arguments and critique the reasoning of others.
3MD5. Recognize area as an attribute of plane figures and understand concepts of area measurement.
3MD7. Recognize area as additive.

### What is argument?

Argument is	Comments:
a disagreement.	
a conflict.	
a confrontation.	
an explanation.	
an understanding.	
a line of reasoning.	
a proposition.	
a negotiation.	
(Other suggestions/thought)	

Task adapted from IDEAS curriculum. 2

### What is evidence?

Evidence is	Comments (as it relates to ELA, Science, and History/SS):
data.	
a fact.	
a theory.	
logical.	
information.	
an appeal.	
objective.	
a claim.	
verifiable.	
(Other suggestions/ thought)	

#### Heating Ice to Steam (Middle School)

Alex and Beatrice are studying the physical and chemical properties of water. Alex thinks diagram A is the correct representation of heating ice to steam. Beatrice thinks diagram B is the correct representation.

- 1. Why does Alex think he is correct?
- 2. Why does Beatrice think she is correct?



# Examples of evidence that may be helpful in your argument...

- $\bigcirc 1$  Ice will melt when it is heated and turns into water.
- 2 In solids, there are bonds between the particles that hold them together in a fixed shape.
- (3) When you heat a substance, the supply of heat energy is usually constant.
- 4 Energy is needed to break bonds between particles.
- 5) Ice melts at 0°C and water boils at 100°C.
- 6) When energy is being used to break bonds between particles, there will be no temperature change.
- 7) When substances are heated, the particles in them absorb heat energy and move about more quickly.