

Reflecting on Practice ...  
**WHERE THE WILD THINGS ARE**

# Reflecting on Practice: Making Connections that Support Learning

Unit 2, Session 2  
2016



At your table, work in pairs so that each pair is doing a different problem.

Find a solution for your problem and be ready to share your strategy. If you solve your problem quickly, find another strategy for finding the solution.

Do **all** your work on poster paper.



# What connections can you see?



How are all these connected?

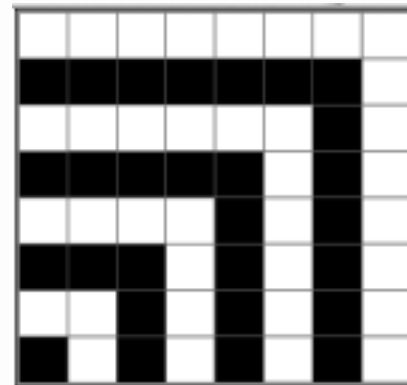
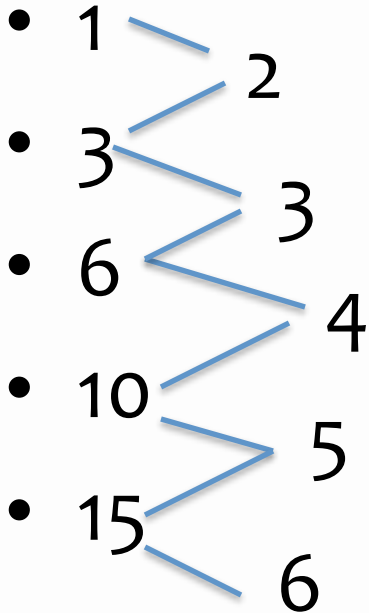
Think by yourselves for a minute, then round robin at your table. It is OK to pass if your ideas are not yet formed.



# Quadratics

If  $ax^2+bx+c = y$ ,

$$(y_2-y_1)-(y_1-y_0) = y_2-2y_1+y_0 = (a(x+2)^2 + b(x+2) + c) - 2(a(x+1)^2 + b(x+1) + c) + (ax^2 + bx + c) = 2a$$



Proof without words



# With your partner...

What are other mathematical situations in which the situations appear different, but the underlying structure is really the same.

For example

*adding fractions and combining like terms.*



# Key Finding 2 (How People Learn):

- “To develop competence in an area of inquiry, students must: (a) have a deep foundation of factual knowledge, ...”
- One element of factual knowledge is knowing and being able to reason from definitions.





# Mathematical Practices for AP Calculus

Emphasis on conceptual understanding  
through:

- Reasoning with definitions and theorems,
- Connecting concepts
- Implementing algebraic/computational processes
- Connecting multiple representations
- Building notational fluency
- Communicating

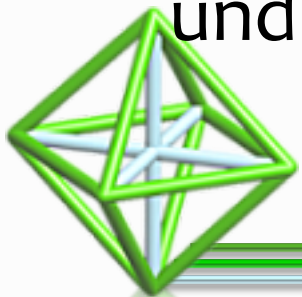


College Board, 2016

# Reasoning from definitions & theorems

- use definitions and theorems to build arguments, justify conclusions, prove results;
- confirm that hypotheses have been satisfied in order to apply the conclusion of a theorem;
- apply definitions and theorems in the process of solving a problem;
- develop conjectures based on exploration with technology; and
- produce examples and counterexamples to clarify understanding of definitions, to test conjectures.

College Board, 2016



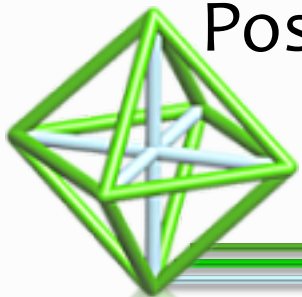
At your tables, consider the question:  
*Why is it important to reason from definitions?*



# Not all definitions (& theorems) are “equal”.

In groups of twos/ threes, choose a subject from *Number, ratio, expressions and equations; algebra, geometry, trigonometry, or calculus*. Identify 4 key definitions students should know and be able to reason from. (You may want to review the progressions work you did the first week.)

Post your choices for key definitions on the wall.



After class or before class tomorrow, use post it notes to agree or disagree and/or add to the definitions groups posed as key.



# Taste Test: Can people tell the difference between Pepsi and Coke? Do people who prefer Coke do better at identifying it?

- Spend the next few minutes at your table talking about how you would design the taste test.
- Have one volunteer from your table join your room's planning committee to plan the test. The planning committee should meet at Lunch to set up the plan for the experiment and email Cal ([sig225@gmail.com](mailto:sig225@gmail.com)) by 6pm Friday the supplies and procedures needed for Monday.



Reflection in your journal:

*What's one thing you're really excited about, or have found useful, that you've encountered this week?*



Reflection in your journal:

*What's one thing you're really excited about, or have found useful, that you've encountered this week?*

**Exit ticket:**

**What went well this week?**

**What ideas do you want to know more about?**

