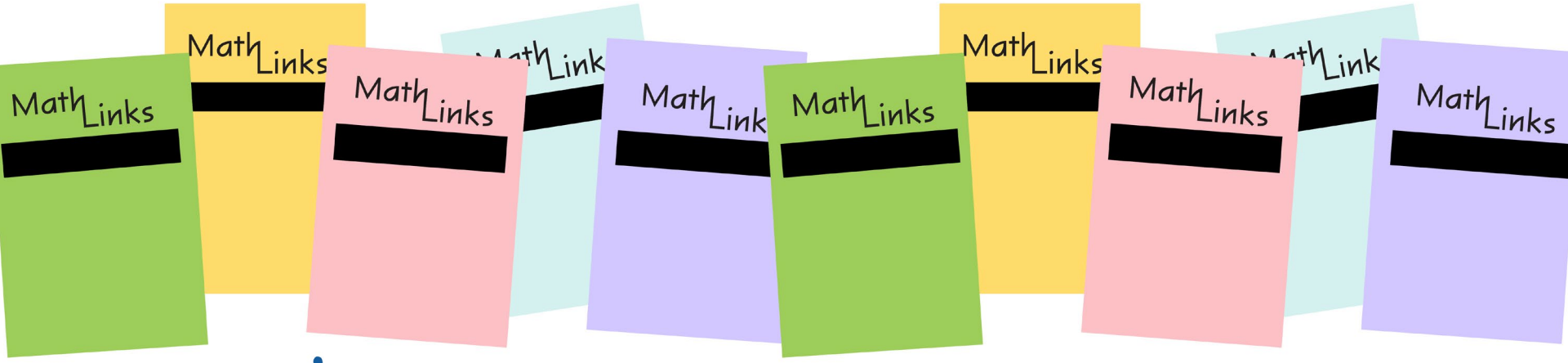
MathLinks : Core (2nd Edition)

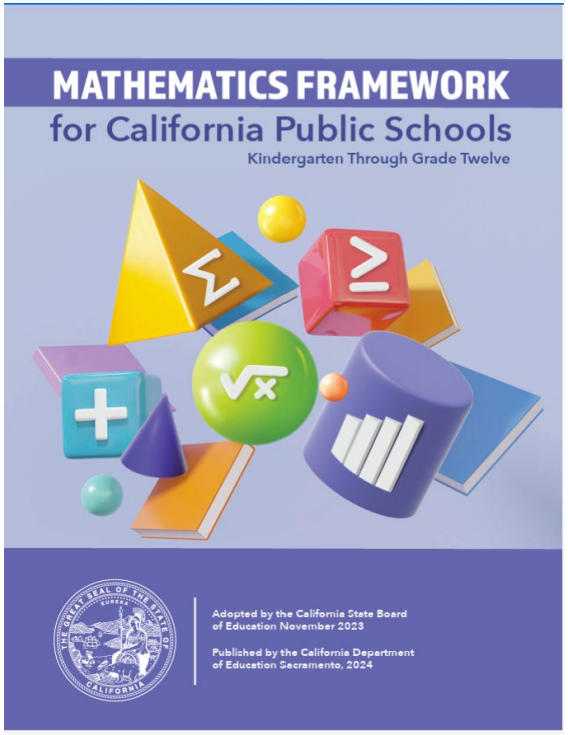
Grades 6-8



Celebrate Joy in Your Math Classroom

EQUITY - ENGAGEMENT

All students, regardless of their background, language of origin, learning differences, or foundational knowledge, are capable and deserving of deep understanding and engagement in rich mathematics tasks.



Engaging

MathLinks Highlight
OPENING PROBLEMS

Engaging

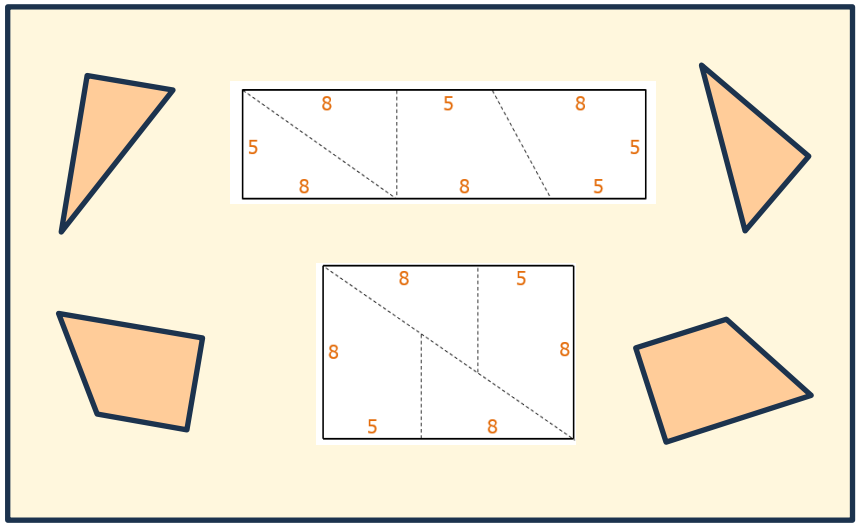
THE RECTANGLE PARADOX

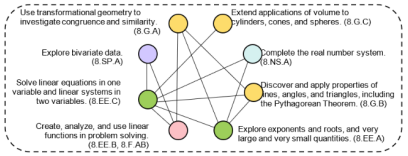
Hands-on, visual investigation

Offers multiple solution paths
Creates a need to know

Motivates learning in Unit 2 (Pythagorean Theorem)
and revisited in Unit 5 (Linear Functions)

$A = bh$
$A = (21)(5)$
$A = 105 \text{ u}^2$

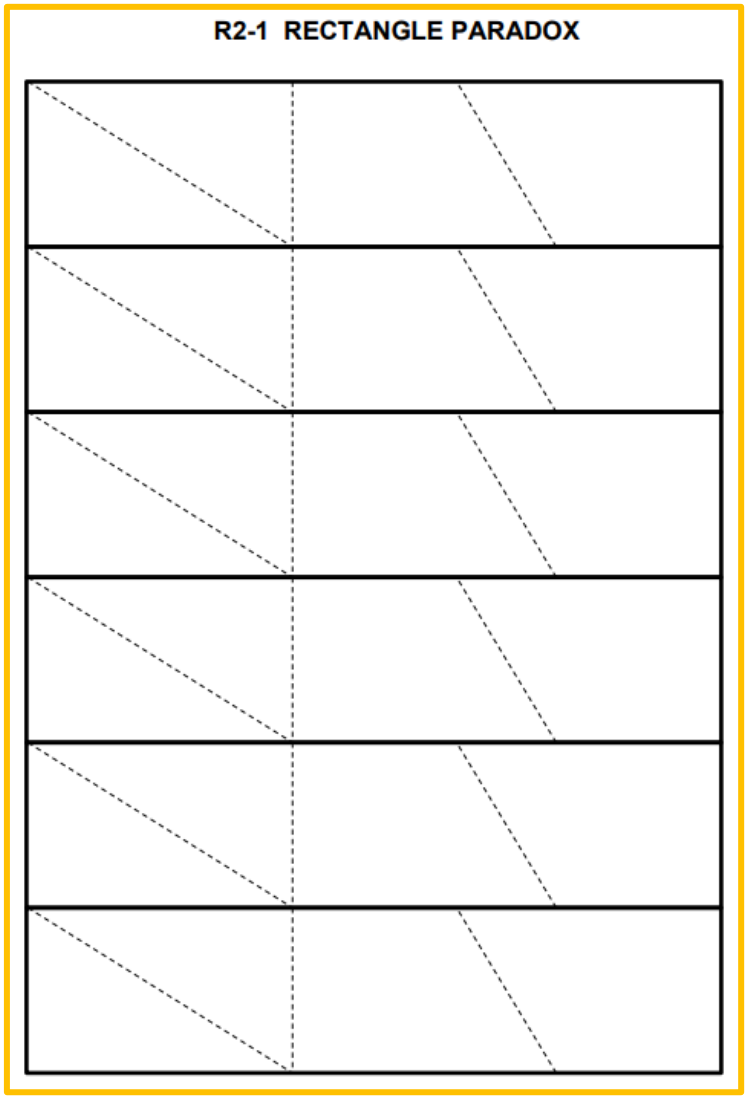




Big Ideas

$A = bh$
$A = (13)(8)$
$A = 104 \text{ u}^2$

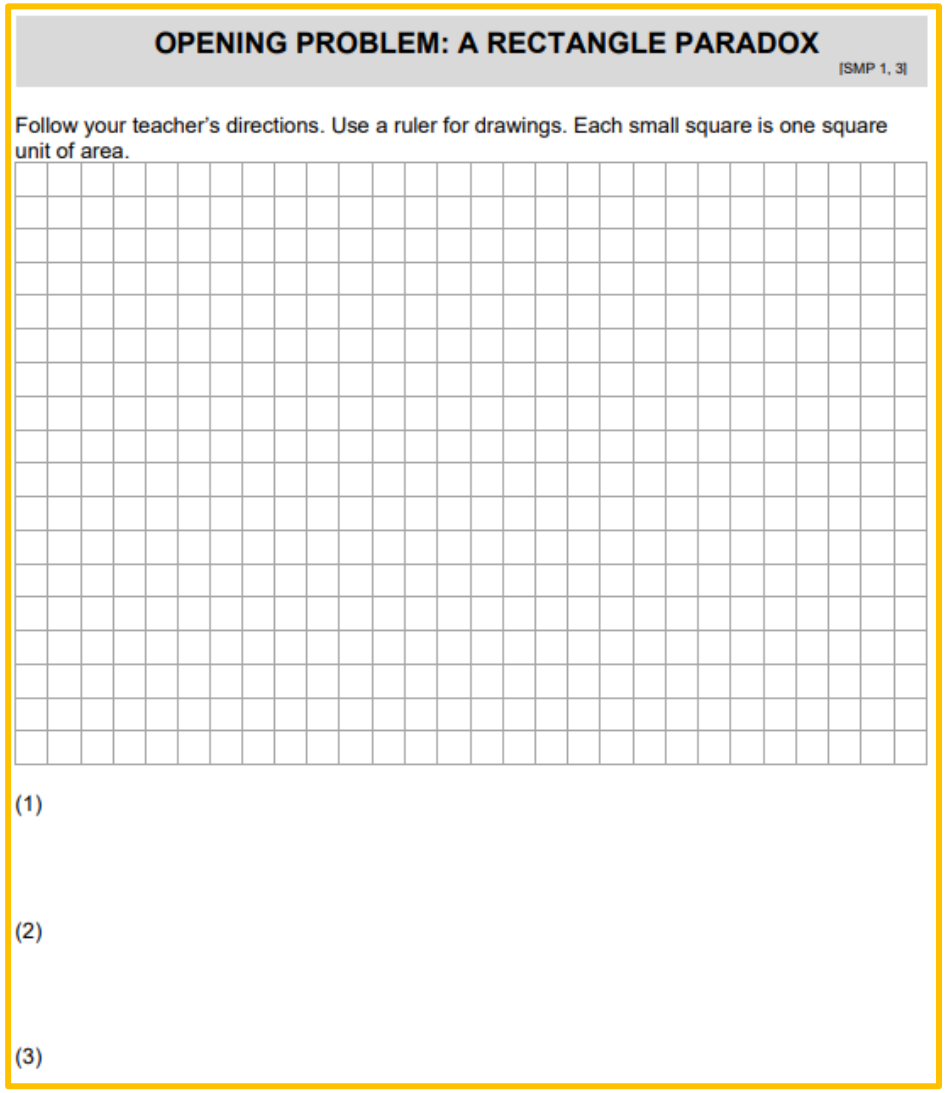
GOOD FOR STUDENTS



Aligned with the way students learn best.

GOOD FOR STUDENTS

Give students a much-needed break from screen time



OPENING PROBLEM: A RECTANGLE PARADOX [SMP 1, 3]

Follow your teacher's directions. Use a ruler for drawings. Each small square is one square unit of area.

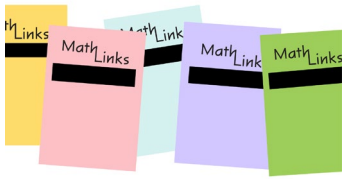
(1)

(2)

(3)

GOOD FOR TEACHERS

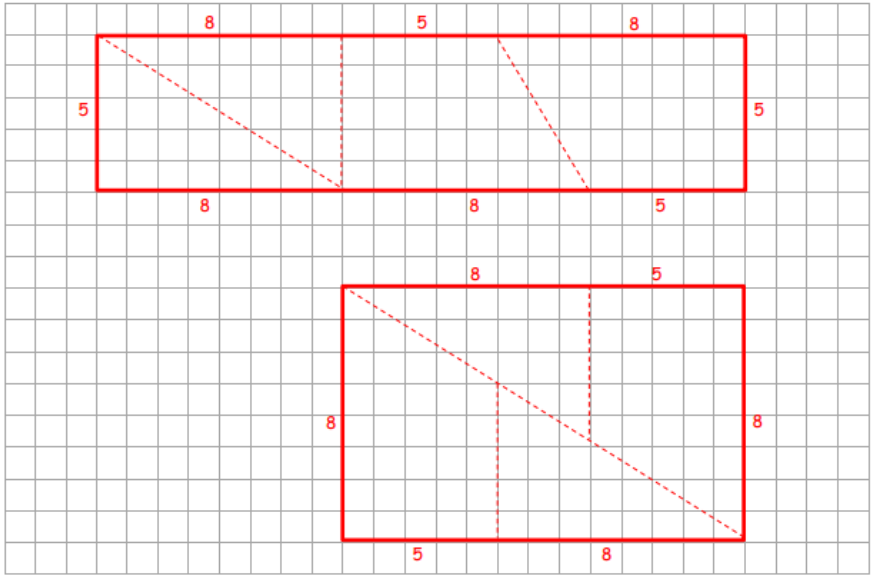
The simple design supports instructional success for teachers.



Simplicity

OPENING PROBLEM: A RECTANGLE PARADOX [SMP 1, 3]

Follow your teacher's directions. Use a ruler for drawings. Each small square is one square unit of area.



(1) *Copy the diagram and find its area.*
21 × 5; 105 square units.

(2) *Cut the rectangle (from R2-1) and rearrange the pieces to create an 8x 13 rectangle. Draw it here.*
Orientation may vary.

(3) *Find the area of the new rectangle. Write what you notice.*
8 × 13 = 104 square units, so 1 u^2 has been "lost."

Center For Mathematics And Teaching

Math Links

GOOD FOR TEACHERS

LESSON NOTES S2.0: A RECTANGLE PARADOX

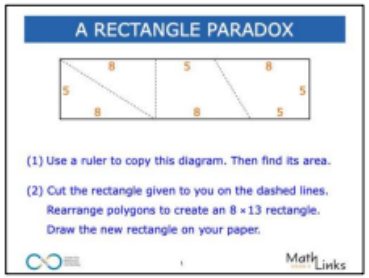
On slides, blue italic text suggests discussion; blue numbered text suggests written responses.

A paradox is an idea that goes against common sense, but still may be true. This problem can be solved in more than one way, but students likely do not yet know the mathematics to solve it. Provide a reasonable amount of work time to complete the beginning. Students will revisit the problem after they study the Pythagorean theorem.

- Slide 1: For (1), students copy the diagram at the top of grid paper, including inner polygons, and leaving plenty of space for the next drawing. Then they find the total area.

  What is the area of this rectangle? $21 \times 5 = 105$ u^2

  Distribute **R2-1 Rectangle Paradox**. Students cut along the dashed lines and rearrange the four polygons to form a rectangle that is 8×13. Allow for some productive struggle, but if students have trouble doing it, that's okay. They can copy it from slide 2. For (2), students draw this new rectangle on their paper, including the inner polygons.



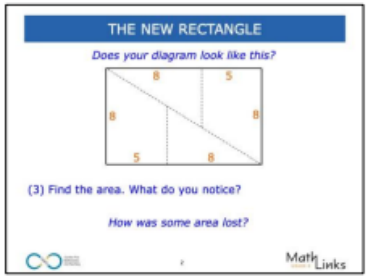
- Slide 2: Reveal a completed rearranged rectangle. Allow students to "catch up" as needed. For (3), students find the area of the reconfigured rectangle and write what they notice.

  What is the area of this new rectangle? $13 \times 8 = 104$ u^2

  What do you notice about the new area? Record ideas.

  How can area be lost if the polygons are simply rearranged? Encourage conjectures. For example, the paper may seem to be overlapping in places, or there may be gaps. Remind students that paper cutouts are VERY inexact, and mathematical evidence is required.

  In lesson 2, students will learn some tools that are useful for solving this problem.



Choose what suits your style, and works best for your students

MathLinks Highlight
ACTIVITY ROUTINES

Efficiency

Engaging

A SCHOOL IN CALIFORNIA

In a recent survey more than 85% of students "liked" or "loved" Activity Routines in the program.

- Poster Problems
- Why Doesn't It Belong
- Match and Compare Sorts

- Spiral Review Exercises
- Vocabulary Crosswords

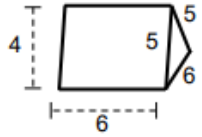
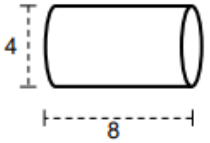
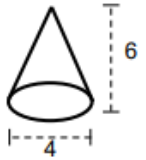
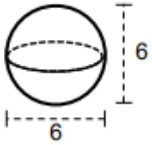
MATHLINKS POSTER PROBLEMS

POSTER PROBLEMS: PLANE AND SOLID FIGURES

Part 1: Your teacher will divide you into groups.

- Identify members of your group as A, B, C, or D.
- Each group will start at a numbered poster. Our group start poster is _____.
- Each group will have a different colored marker. Our group marker is _____.

Part 2: Do the problems on the posters by following your teacher's directions.

Poster 1 (or 5)	Poster 2 (or 6)	Poster 3 (or 7)	Poster 4 (or 8)
			

Use $\pi = 3.14$ and round results to two decimal places as needed.

A. Write the name of the solid figure and its volume formula. If a second, equivalent formula exists, include it.

B. Find the volume of the solid.

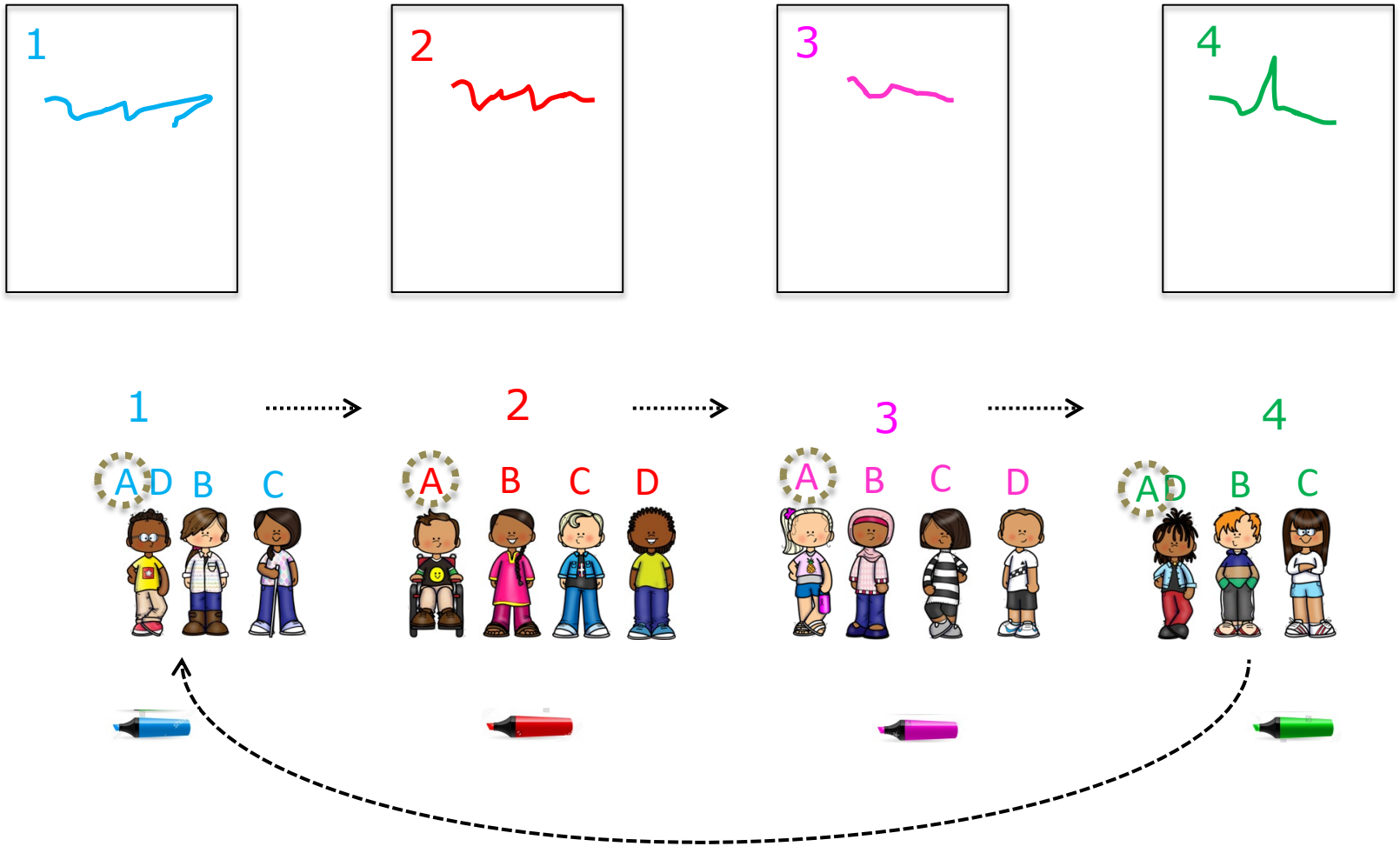
C. Find the volume if the height of the solid is doubled.

D. Find the volume of the solid if ALL given measures on the figure are doubled.

Part 3: Return to your seats. Work with your group, and show all work.

Compare the three volume measures in parts B – D for your "start problem." Record what you notice below. Be ready to share with the class.

GROUP WORK AT VERTICAL SURFACES



ACTIVITY ROUTINES

The Alge-Grid

$\frac{3}{4}a + 0.5$	a^2	$(a + 1)^2$
$3a$	a^0	$a^2 - 1$
$a^2 + 1$	$a^2 + 2a - 1$	a^3

The Clues

Perfect number	Factor of all numbers	
		(Prime)^3

A Grade 8 Spiral Review Feature

Puzzles, games, and card sorts are recurring features for review and practice.

WHY DOESN'T IT BELONG?

A 0.181818...	**B** 0.1888...
C 0.18	**D** 0.181181118...

GET EXCITED!
NEXT STEPS

PREVIEW – PILOT - PRESENTATIONS

Visit our website
www.mathandteaching.org

Preview/Pilot/Presentation

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