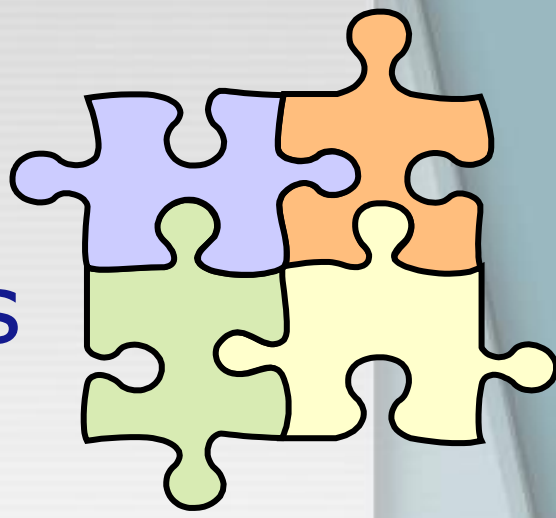
Good Morning
Las Vegas



#163 Three Great Tasks

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Attendees will distinguish between task and process, noting that both are invaluable when attacking and delivering CCSSM Content and Practices

Session #163 Goals

Participants will either:

1. Actively Engage in a Second Grade Great Task, or
2. Identify Evidence of CCSSM Math Practices

Attendees will leave the session with copies of one great task and have web access to at least 3 great tasks per grade level k-6

Session #163 Goals continued

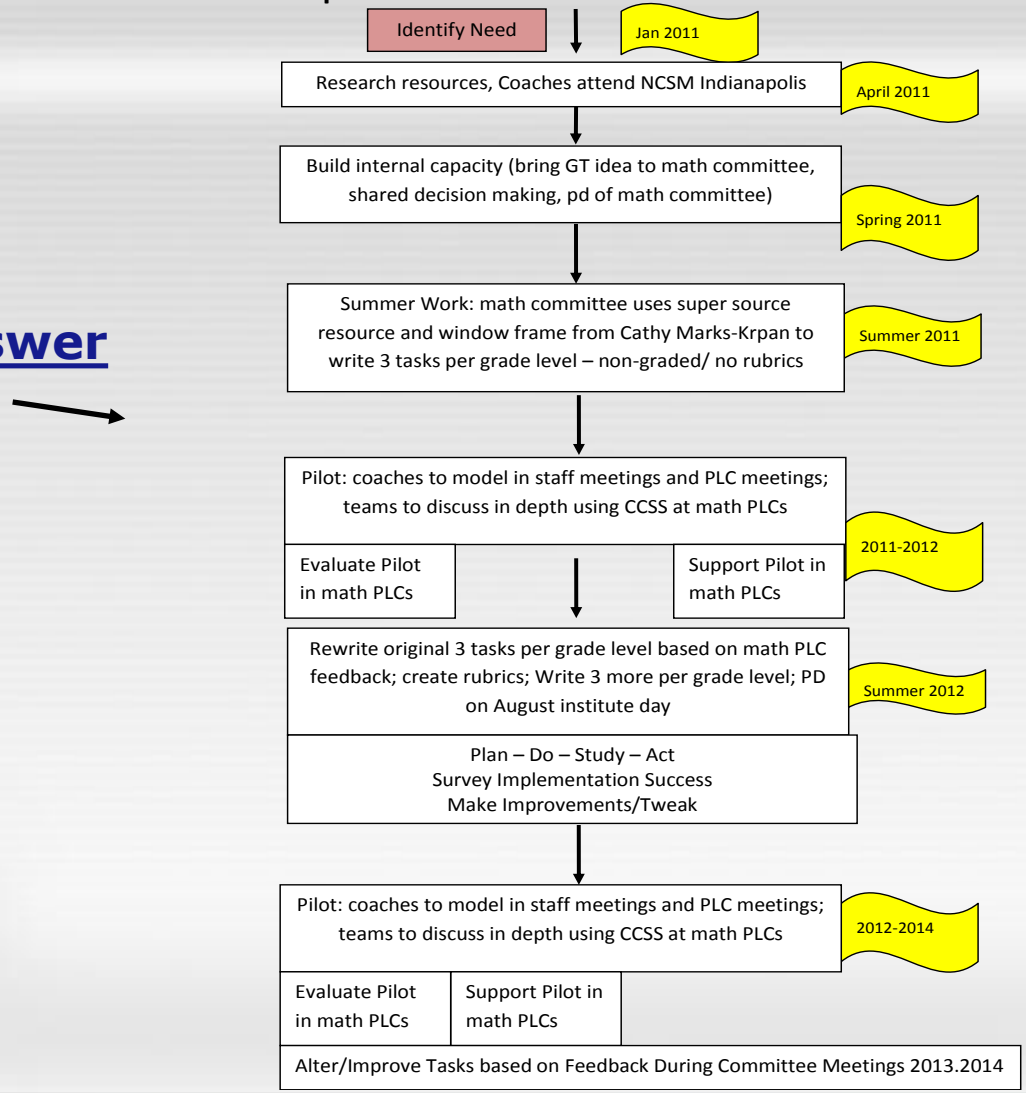
Challenge(s)

How to get all K-5 teachers in 4 elementary schools implementing CCSSM Math Practices Systemically????

…And then to keep doing it long enough to see if it is working?

Long Answer

D41 Great Tasks Implementation 2011 – 2014



Short Answer

Come up with a plan

Convince others

Model for teachers in small groups

Provide structures and time for PLC reflection of process

Accountability

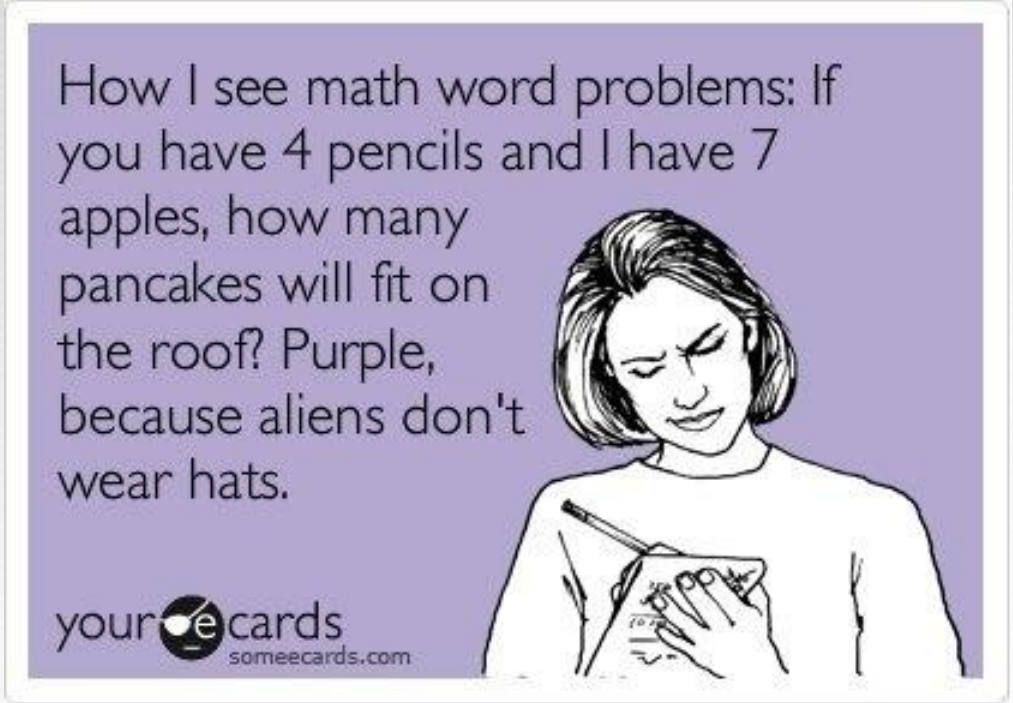
Fundamental to *"The Plan"*

It's Not Just A Task!

It's a Systemic Process Used to "Secretely" PD Teachers in Identification of Math Practices

(then they can do it every day while they teach math – not for isolated "acts of mathematics"

20th Century Task



The Plan Part 1

Identify systemic weakness based on data with math committee members

(using state test results and NWEA map, we determined problem solving, writing in math, place value and fractions needed a boost)

Ask for PAID summer (2011) curriculum development time

(got it!)

Beg math committee members (and super math teachers) to help develop the tasks

(they fell for it!)

The Plan Part 2

Provide PD to "curriculum developers" in CCSSM in Math Practices

(I used the PD from NCSM Indianapolis!)

Gather/Provide researched resources

(I brought only those I've observed being used effectively already in d41 classes!)

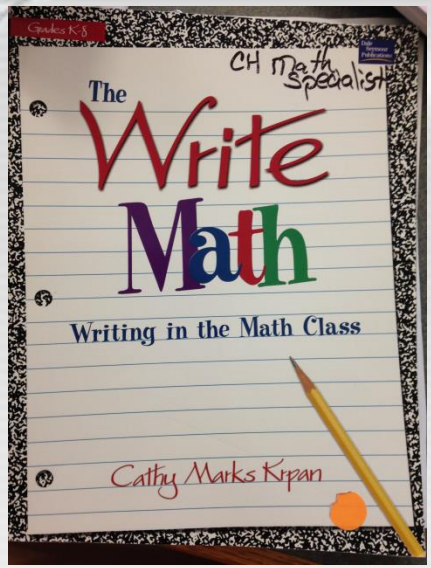
I modeled one task with the window frame

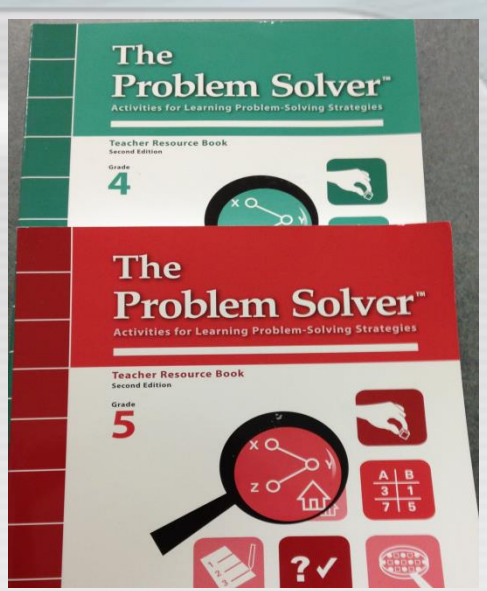
(My personal favorite to use when teaching teachers the math!)

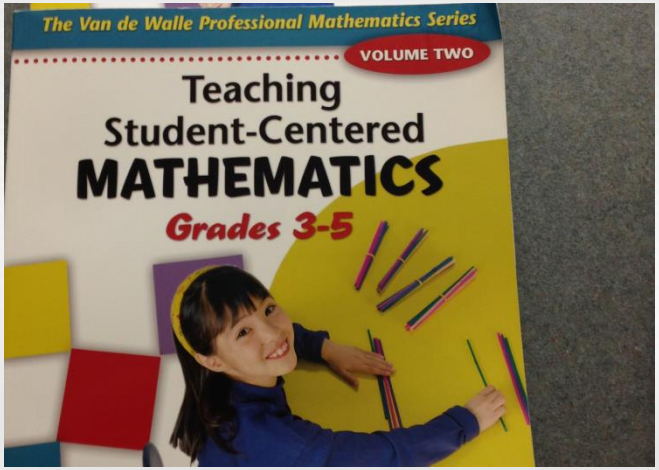
Create

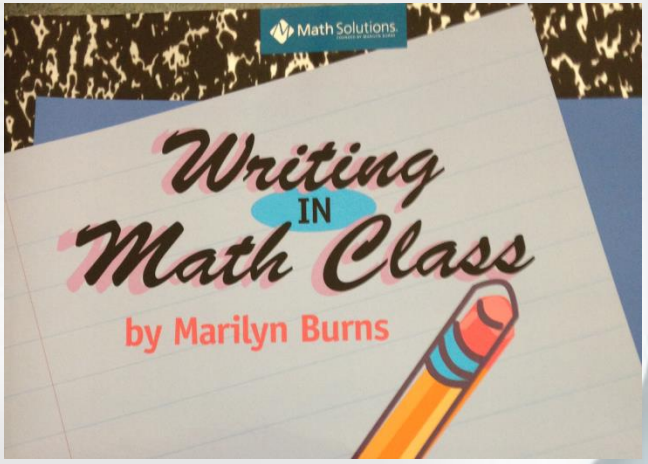
(Wow – can teachers create great stuff when given the time, resources and purpose!)

Gather Favorite d41 Teachers' Resources; Choose Great Problems









Year One 2011-2012

Required 3 tasks per grade level

All 3 to use the window frame format

Not graded

Non-negotiable: PLC time to fill out evaluation forms and discuss evidence of math practices

Teacher Evaluation: Fifth Grade Great Task #1

School:	Grade: **Fifth**	Teacher:	Overall Rating (out of 13 pts):

Task Title: **Painted Cubes**

CCSS Math Practices

Mathematical Practice	Evidence? Yes or No	GREAT TASK?	Evidence? Yes or No
1. Make sense of problems and persevere in solving them.		1. A deep, rich, interesting math problem	
2. Reason abstractly and quantitatively.		2. Meets most, if not all, of the CCSS mathematical practices	
3. Construct viable arguments and critique the reasoning of others.		3. Relevant to kids' lives	
4. Model with mathematics.		4. Meets more than one of the CCSS content standards	
5. Use appropriate tools strategically		5. Open ended	
6. Attend to precision.		IS THIS TASK MATHEMATICALLY APPROPRIATE?	
7. Look for and make use of structure.			
8. Look for and express regularity in repeated reasoning.			

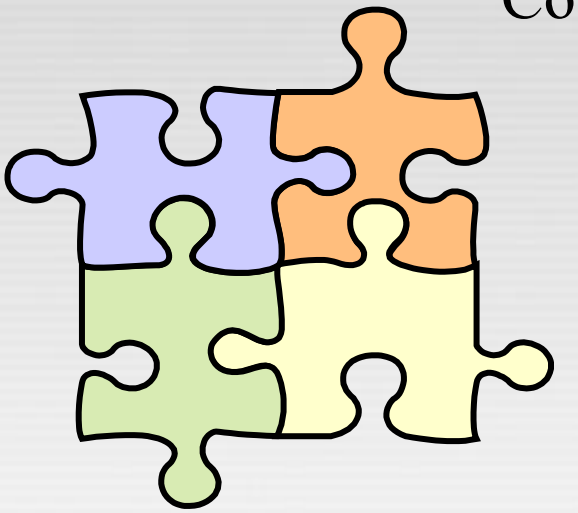
CCSS Content Standards

CCSS CONTENT STANDARDS

Domain	Cluster	Standard
Operations and Algebraic Thinking (5.OA)	Analyze patterns and relationships	Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.
Measurement and Data (5.MD)	Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.	3: Recognize volume as an attribute of solid figures and understand concepts of volume measurement. 3a: A cube with side length 1 unit, called a "unit cube", is said to have "one cubic unit" of volume, and can be used to measure volume. 3b: A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.
Measurement and Data (5.MD)	Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.	4: Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.
Measurement and Data (5.MD)	Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.	5: Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.

Model Task with Teachers First

Task is Administered; Coaches Co-Teach



PLC Analysis of Student Work

PLC Reflection, Formal Evaluation of Task given to District Level

After year one…now what?

Take all PLC Evaluation forms, analyze, and have difficult math committee conversations

Ask for PAID summer (2012) curriculum development time

2012…More Summer Work?

Beg math committee members (and super math teachers) to continue to polish the process

Create 3 new tasks per grade level for a total of 6

Create Rubrics and Math Practices Checklists

Plan a teacher training day for School Start Up (August) focused on Great Tasks and Math Practices

Great Task Changes Based on District-Wide PLC Feedback

-pink tasks have been deleted,
-other tasks have been edited/improved based on feedback,
-some tasks moved into different trimesters

Grade	Trimester One	Trimester Two	Trimester Three
Kindergarten	Pattern Block Fish	Creature Features	Frames of Ten
First	Cover the Caterpillar	Way to Pay	Scrabble Number Sentences
Second	In a Row	Tile Maker	Dream Day
Third	Sub Sandwich	Build a Fence	Fraction Design
Fourth	Day at the Pier	Snowman	What's the Point?
Fifth	Painted Cubes	It's What Inside that Counts	If the World Were a Village

Year Two 2012-2013

6 tasks per grade level

Non-negotiable: PLC to choose *at least 3* to incorporate the window frame

Continued PLC conversation around student work samples, evaluation forms for new tasks, strategies for implementation

2012-2013…green task is placed in pinnacle

Grade	Trimester One		Trimester Two		Trimester Three	
	Task One	Task Two	Task Three	Task Four	Task Five	Task Six
K	How Many Rectangles (color tiles)	Pattern Block Fish (pattern blocks)	Attribute Trains (attribute blocks)	Fractions to Fourths (buttons)	Frames of Ten (ten frames – place value)	Feed the Birds (counters)
1	The Disappearing Train (snap cubes)	Cover the Caterpillar (pattern blocks)	Invitations (ruler)	Scrabble Number Sentences (letter tiles with pt. values)	Making Fractions (geoboard)	Way to Pay (base ten blocks and/or money)
2	Toy Factory (pattern blocks and coins)	Build a Bug House (place value blocks and place value mat)	Valentine's Day Cards (rulers)	Tile Maker (pattern blocks)	Fraction Pairs (cuisenaire rods)	Dream Day (Judy clocks and charts)
3	Sub Sandwich (ruler and scale)	Thanksgiving Turkey (elapsed time, chart, clock)	Build a Fence (color tiles)	Geometric Design (geoboards)	Fraction Design (pattern blocks)	Heart Rate (place value mat)
4	Angles and Times (clocks)	Day at the Pier (elapsed time, money, charts)	Making Eighths (geoboard)	Snowman (charts/tables)	Part and Whole (geodot paper & fraction puzzles)	You Bought a Zoo (place value mat)
5	Chairs Around the Table (counters)	If the World Were a Village (place value mat)	Forming Fractions (geoboards)	It's What Inside that Counts (tangrams)	Plan a Park (scale/data table)	Painted Cubes (snap cubes)

And…

One task *(those that were piloted year one and considered "worthy")* per trimester will be graded using rubrics and put into computerized, standards-based gradebook

Demonstrates Application of the Common Core Mathematical Practices

(replacing the old problem solving standard)

Sample Rubric

Mathematical Practices	Not Meeting	Progressing	Meeting	Advanced
Make sense of problems and persevere in solving them.	Student displayed no success in understanding how to tile a large hexagon. Did not attempt the problem.	Student understood that he/she had to use the Shape Value Key, but did not arrive at a correct solution. He/she made an attempt to solve for one solution.	The task was completely understood. Student used the Shape Value Key correctly. Student correctly found the total value inside the shape. Student worked diligently toward a solution.	The mathematically proficient student completely understood the task and used the Shape Value Key The student consistently worked toward more than one solution. He/she planned a solution pathway and continually asked "Does this make sense?"

Make sense of problems and persevere in solving them.

Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.

Here's what it says on the great task checklist:

MP 1: Make sense of problems and persevere in solving them. *(Understand the problem and keep working until you are satisfied with a solution)*

Your 2012-2013 Experience with CCSS Mathematical Practices

Student Names	**MP 1:** Make sense of problems and persevere in solving them. *(Understand the problem and keep working until you are satisfied with a solution)*	**MP 2:** Reason abstractly and quantitatively. *(Understand the meaning of the numbers and the words to solve the problem)*	**MP 3:** Construct viable arguments and critique the reasoning of others. *(I can explain my reasoning/thinking; listen and respond to others by asking useful questions)*	**MP 4:** Model with mathematics. *(I can use words, symbols, pictures and objects to solve everyday problem)*	**MP 5:** Use appropriate tools strategically *(I know how and when to use math tools)*	**MP 6:** Attend to precision *(I can calculate accurately and efficiently; I can communicate using math vocabulary and symbols)*	**MP 7**: Look for and make use of structure *(I can see and understand how numbers and shapes are organized and put together as parts and wholes)*	**MP 8:** Look for and express regularity in repeated reasoning *(I notice when calculations are repeated and find more efficient methods to solve)*	**FINAL PINNACLE ENTRY**
1.									
2.									
3.									
4.									

Year Three 2013-2014

Only One Change

"power math practice"

FIRST GRADE Great Tasks	CCSS Math Practice Focus (All MP 1, 3 & 6)
TRI 1 Task 1: Cover the Caterpillar	MP 7
TRI 1 Task 2: The Disappearing Train	MP 4
TRI 2 Task 3: Invitations	MP 5
TRI 2 Task 4: Scrabble Number Sentences	MP 8
TRI 3 Task 5: Making Fractions	MP 4 and MP 7
TRI 3 Task 6: Way to Pay	MP 2

Your Turn: Choose One Role

Participant (pretend you are a second grader doing a great task called "tile maker")

Math Practice Investigator (MPI) (observe the process watching for evidence of any Math Practice)

“I Wonder…”

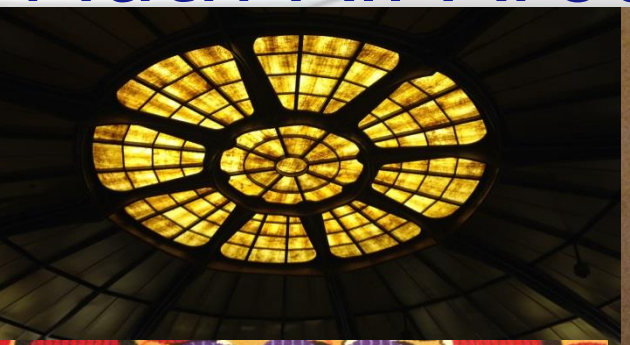
What part of this process might assist in decreasing math anxiety while problem solving?

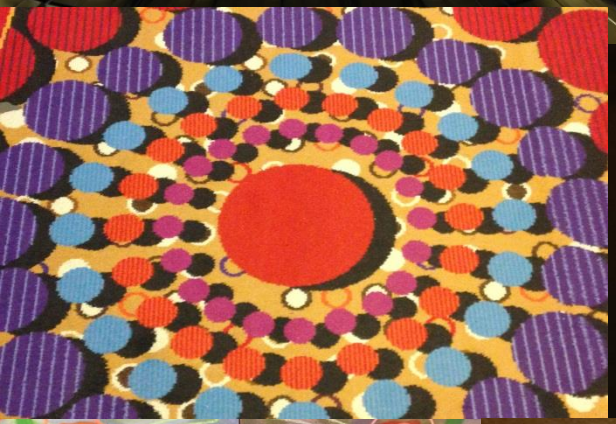
How are MP1 (make sense), MP 3 (viably argue), MP6 (precision) evident during this task?

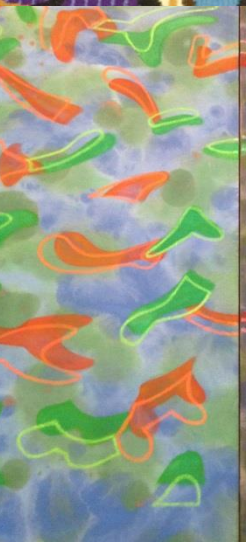
How might a classroom teacher differentiate for all students?

What grouping (homogeneous abilities or heterogeneous abilities) method is most effective?

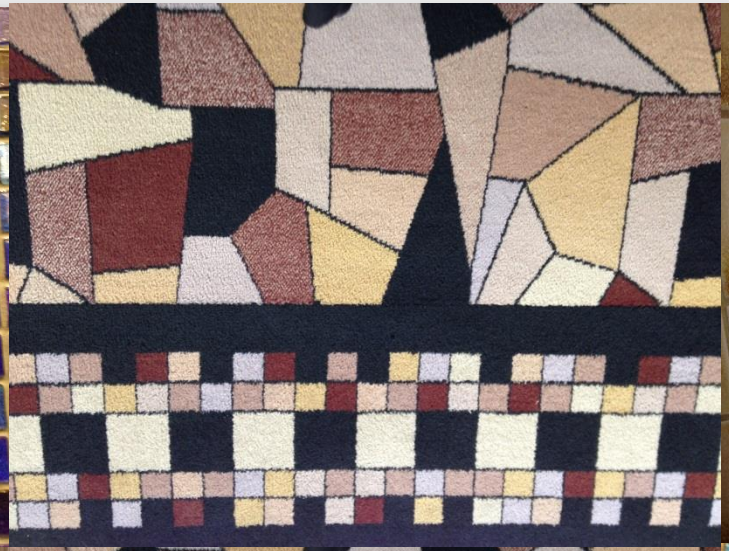
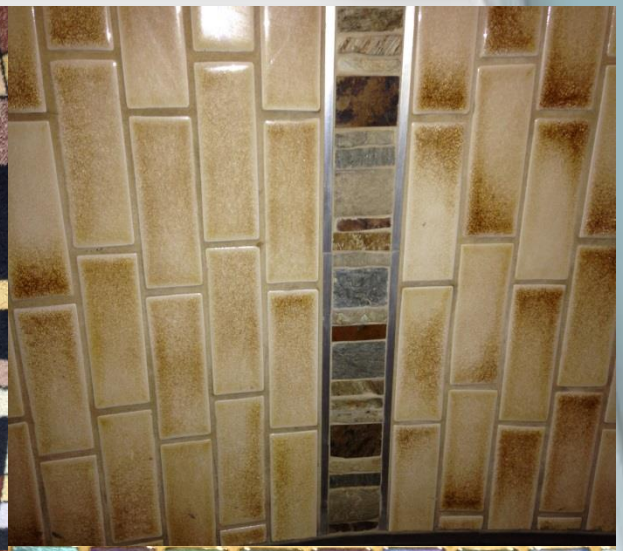
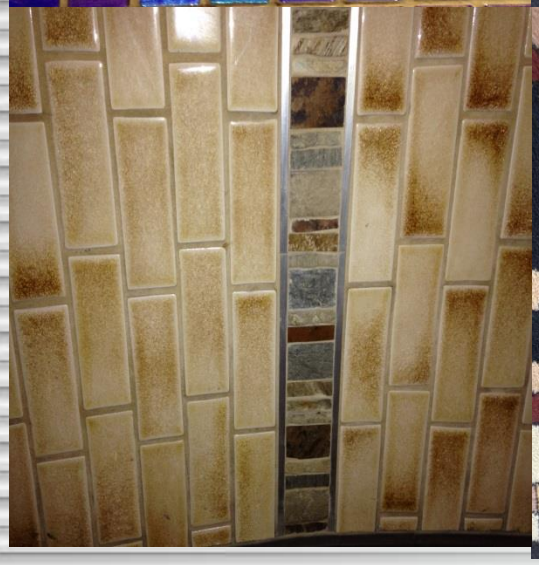
Math All Around Us







You are the Tile Maker

Checklist for the students:

- ✓ Fill in the hexagon using triangles, trapezoids, and hexagons. Your polygons may not fall outside the lines.
- ✓ Trace each pattern block
- ✓ Find the total value inside the shape using the pattern block key
- ✓ Be ready to explain your work with MATH!

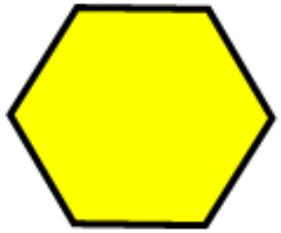
Shape Value Key

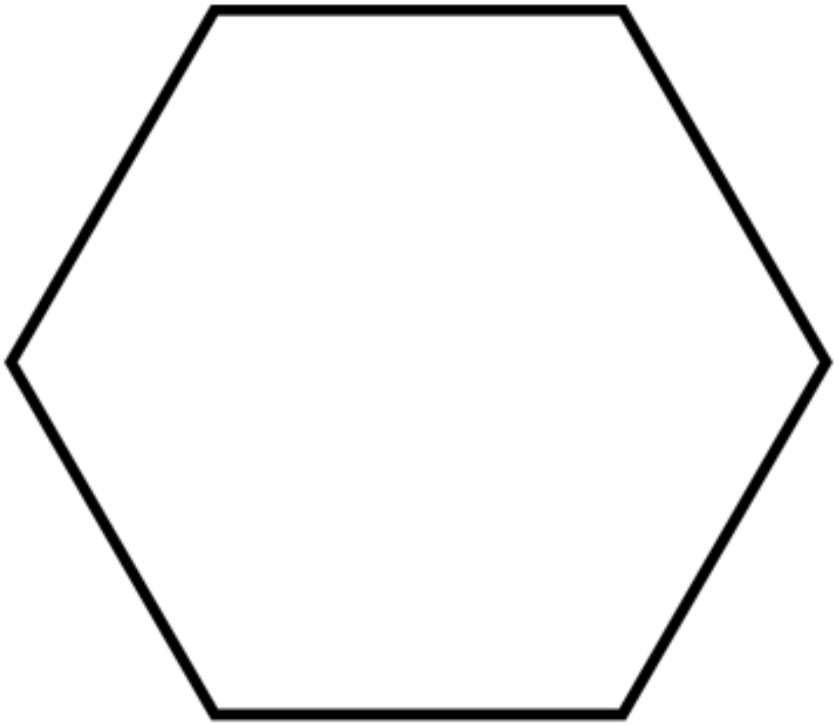
Each shape is worth the following value.

 = 3

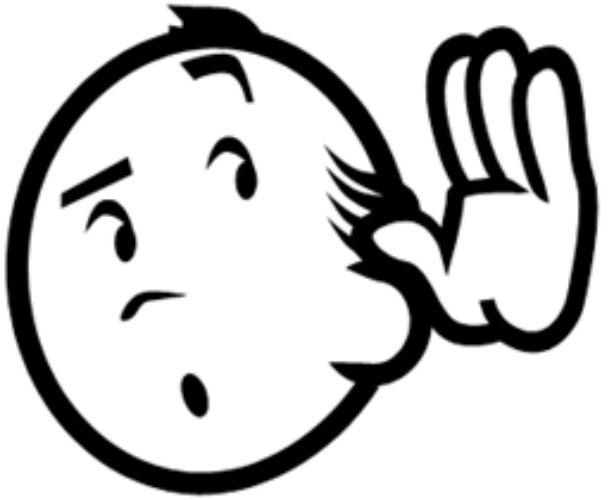
 = 9

 = 18





Once Around



I used...
_____ triangles,
_____ trapezoids,
and _____ hexagons.

The value of my tiles was _____.

The strategy I used to find the value was_____.

Wrap Around

Guiding Math Questions

- How did you come up with this value?
- Why did you choose that strategy?
- How did you decide which blocks to use in your design?
- What did you find easy or difficult?

Day 2: Extension

Extension Window Frame Question:

With a partner, create a symmetrical design inside the hexagon template. You must use triangles, rhombi, trapezoids, and hexagons in your design. Find the value of the rhombi using the shape value key. Finally, find the value of your symmetrical design.

 = ?

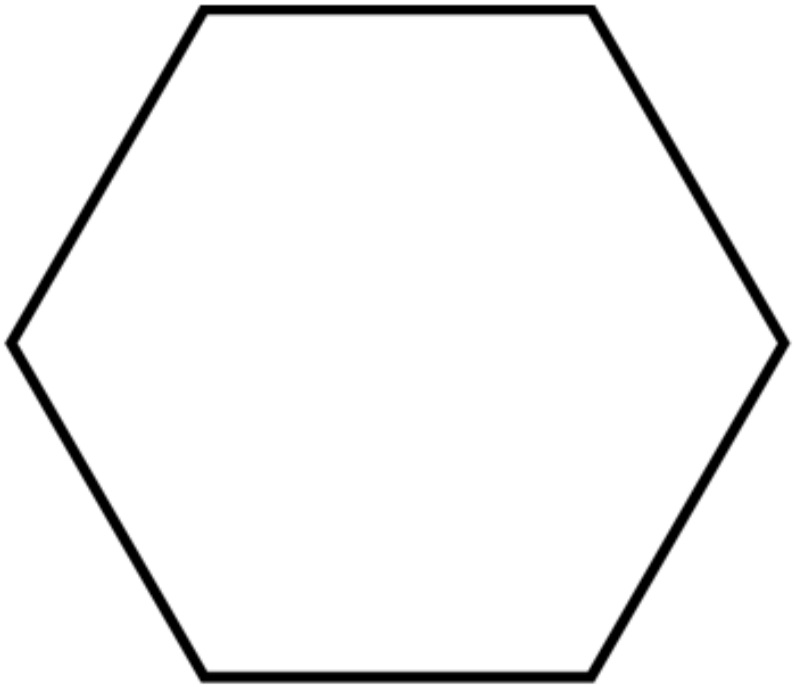
Shape Value Key

Each shape is worth the following value.

 = 3

 = 9

 = 18



Debrief

What intentional methods does the facilitator employ to engage children in this task?

What part of this process might assist in decreasing math anxiety while problem solving?

How are MP1 (make sense), MP 3 (viably argue), MP6 (precision) evident during this task?

How might a classroom teacher differentiate for all students?

What grouping (homogeneous abilities or heterogeneous abilities) method is most effective?

How do I get these tasks?

- www.math4infinity.org
- Conference materials

"What happens if you get scared half to death twice?"(Steven Wright)

www.mustshare**jokes**.com/page/**Steven**+**Wright**+**Jokes**