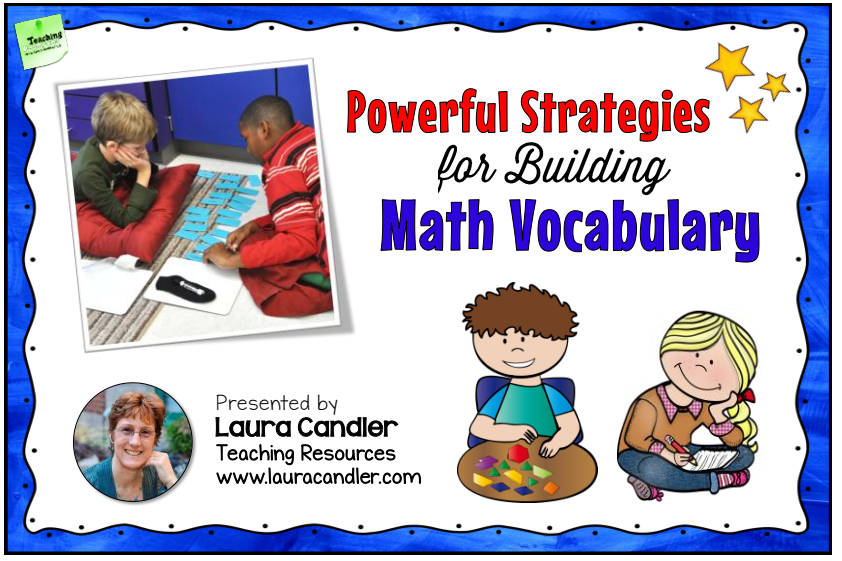
Powerful Strategies
for Building
Math Vocabulary
Presented by
Laura Candler
Teaching Resources
www.lauracandler.com


Laura Candler - Classroom Teacher
• Classroom teacher (30 years)
• National Board Certified
• Master's Degree in Elementary Ed.
• Milken Educator Award


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- Facebook – Teaching Resources & FB Groups
- Pinterest and Instagram
- Teacher Training – Virginia Beach – July 28th and 29th

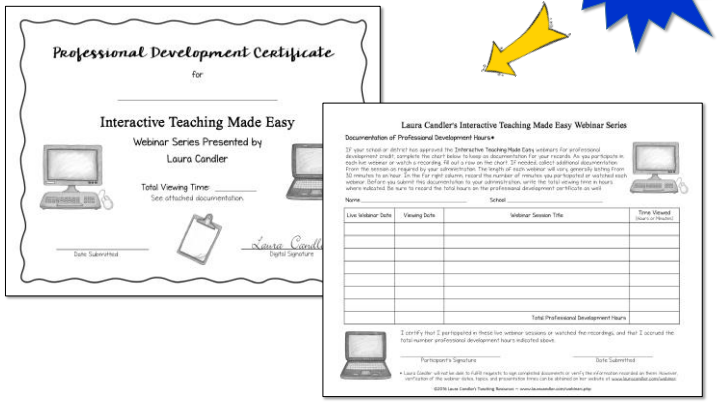
You're in the Right Place

- Your students struggle with the complex language of math, and you'd like to learn fun (and effective) strategies to foster vocabulary growth.
- You want to know how to make your lessons more fun without adding extra "fluff."
- You need time-saving strategies that will reduce (instead of increase) your paperwork load.

Professional Development Certificate

DIY – Use the certificate and form to seek PD credit from your school or district.

Webinar Resources



Math Vocabulary Webinar Notes

Here's What You'll Learn...

- Why you should spend time teaching math vocabulary
- How to "power up" any activity to make it more effective and to foster vocabulary development
- 4 phases of math vocabulary development
- Specific games, activities, and strategies for each phase

Why Teach Math Vocabulary?

The ability to read, write, and speak the "language of math" is **ESSENTIAL** for mathematical concept development and mastery.

Math Concepts ⇆ Math Vocabulary

Guess My Number Game

The leader thinks of a number and the other players try to guess what it is by asking yes/no questions.

Examples of Yes/No Questions

- Is the number odd?
- Is it a multiple of 4?
- Is it greater than 30?

My Number is...

- I'm thinking of a number.
- Type yes/no questions in the question box and I'll answer as many as I can.
- When you know the number, type it into the question box.
- Ready, set, go....!

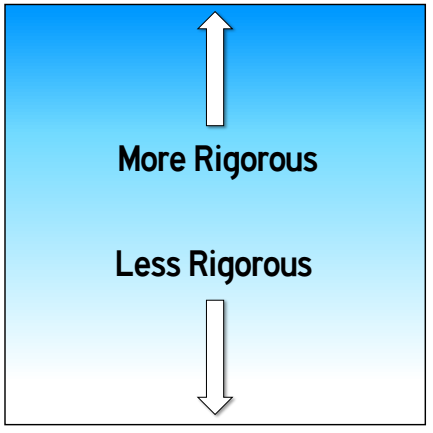
How can we "power up" this learning game?

Let's tweak it to increase engagement and to foster vocabulary development!

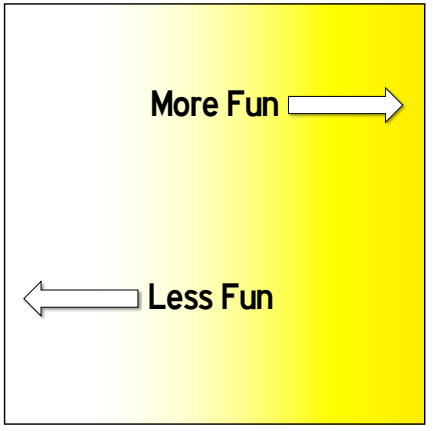
Think of a Lesson You've Taught Recently and Ask ....

- **How rigorous is the activity?**
  - Does it make kids think?
  - Is it challenging?
  - Does it involve higher level thinking such as strategizing or analyzing?
- **How fun is the activity?**
  - Is it a game, or similar to a game?
  - Are kids actively engaged? (Moving, talking, manipulating materials)
  - Would they want to do the activity if they had a choice?

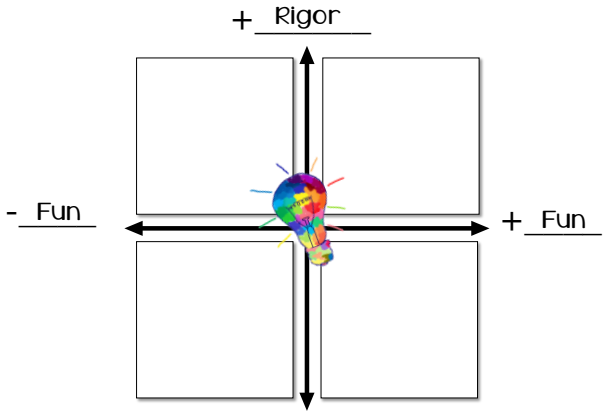
How rigorous is the activity?



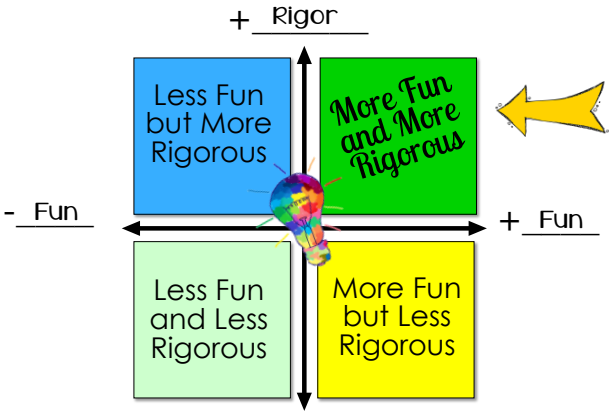
How fun is the activity?



Power Up Learning Matrix



Power Up Learning Matrix



How can we power up Guess My Number?

Let's tweak it to make it more challenging AND more engaging/fun!

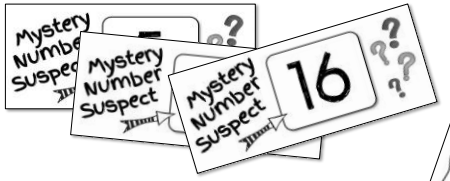
How to Power Up Guess My Number

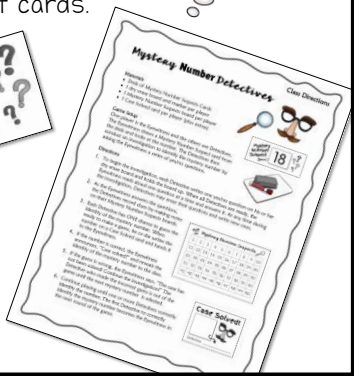
1. Give it a mystery theme
2. All players write questions.
3. Add rules to eliminate guessing.
4. Encourage precise math vocabulary.
5. Record clues on number boards.
6. Assign partners who discuss new questions clues, and game strategies.

1 Give It a Mystery Theme

+Fun?
+Rigor?

- The Leader becomes the "Eyewitness"
- He or she selects a number from a deck of Mystery Number Suspect cards.





- The other players become Detectives who conduct an investigation to find out the identity of the "suspect."

2 All Players Write Questions

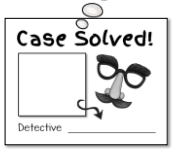
- Provide time for each detective to write one question on a dry erase board
- Eyewitness chooses one question at a time to answer

+Fun?
+Rigor?

3 Add Rules to Eliminate Guessing

+Fun?
+Rigor?

- Each student may only have **one** chance to guess the mystery number
- When making a guess, the student must write down the number and give it to the leader.
- If incorrect, that student is out of the game for that round.



- Students may not write questions in which the answer reveals the number to all players. For example: "Is the number between 3 and 5?"

4 Encourage Precise Vocabulary

- Encourage creative questions that use more challenging and/or precise vocabulary
- Consider limiting the number of times a math term can be used (once in upper grades)

Examples

- Does it have a 7 in the one's place?
- Is it a single-digit number?
- Is it a prime number?
- Is the number divisible by 3?
- Is the sum of the digits less than 12?

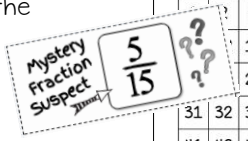
4 Encourage Precise Vocabulary

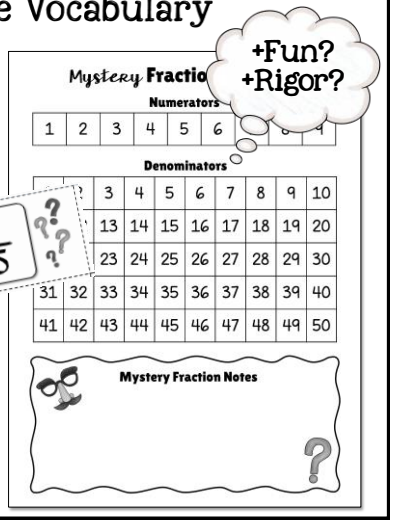
Mystery Fraction Detectives Variation

Questions must be about the numerator, the denominator, or the fraction.

Examples:

- Is the numerator a multiple of 3?
- Is the fraction greater than ½?

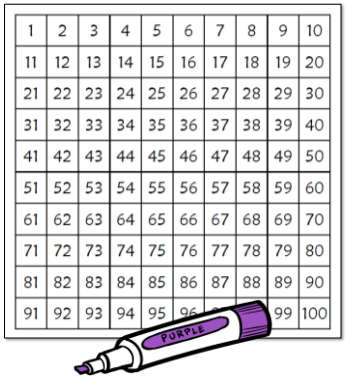




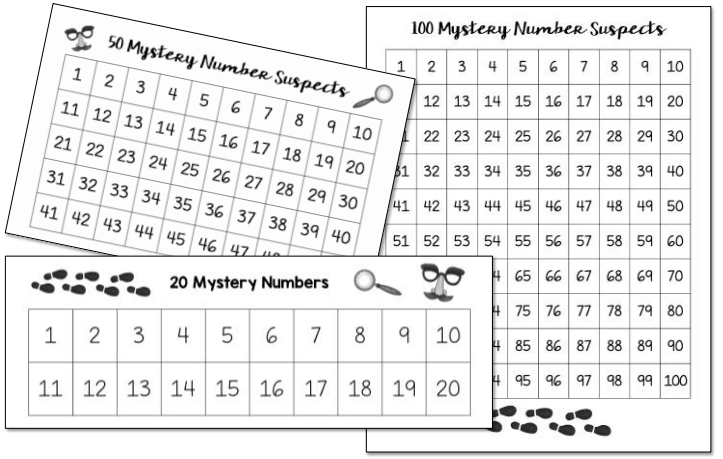
5 Record Clues on a Number Board

Each player needs a laminated number board and a dry erase marker.

As each question is asked and answered, the detectives record "clues" on their number boards to help them find the identity of the mystery number suspect.



Mystery Number Board Variations



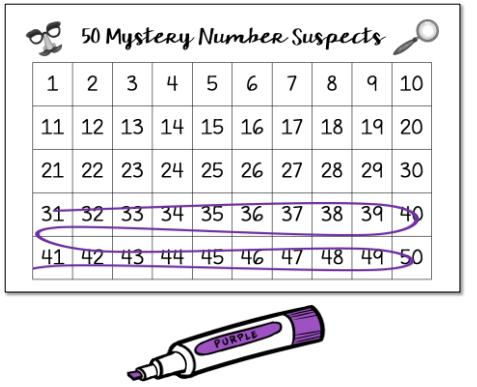
5 Record Clues on a Number Board

Examples

Q: Is the mystery number suspect greater than 30?

A: No

→Cross off all numbers >30



5 Record Clues on a Number Board

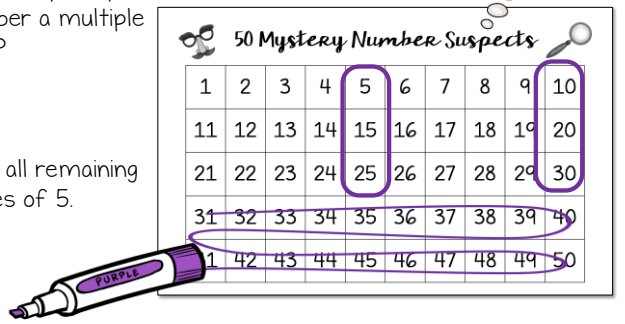
+Fun?
+Rigor?

Examples

Q: Is the mystery number a multiple of 5?

A: Yes

→Circle all remaining multiples of 5.



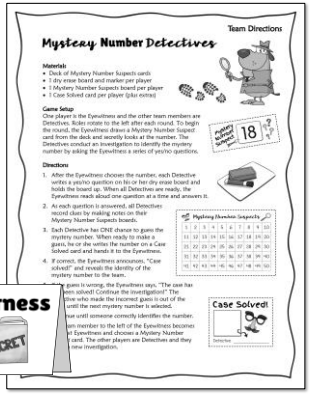
6 Assign Partners Who Discuss New Questions, Clues and Game Strategies

- Assign partners (High–Average & Average–Low)
- Give each pair one dry erase board and one number board for recording clues
- After each question is answered, encourage players to discuss "clues" with their partner

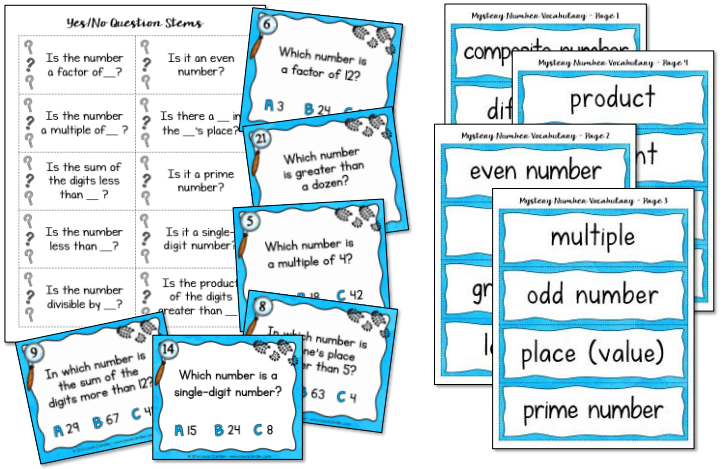
+Fun?
+Rigor?

Tips for Team or Math Center Use

- First play together as a class
- Use Role Cards
- Potential Problem: Eyewitness answers incorrectly
- Recommended Solution: Play two against two (2 Eyewitnesses play against 2 Detectives)



Mystery Number Detectives Extras



Mystery Number Detectives

Comments from Cassie Dahl's Students

- Did you realize you can cut the numbers in half by just asking if it is odd or even? Why wouldn't you start with that?
- Coming up with questions is really making my brain work.
- This was so much fun!
- Wow! This is the best game ever.
- Can we please play just one more round??

Cassie Dahl
teaching and technology
www.cassiedahl.com

Whoever is doing the talking is doing the learning.

~Anonymous

Get Kids Talking and Writing!

4 Phases of Math Vocabulary Development

1. Discover new math vocabulary
2. Deepen understanding
3. Practice words & meanings
4. Use math vocabulary fluently

1. Discover new math vocabulary

- Direct instruction / math word wall
- Hands-on lessons
- Exploratory activities
- Real world experiences

1 Discover new vocabulary

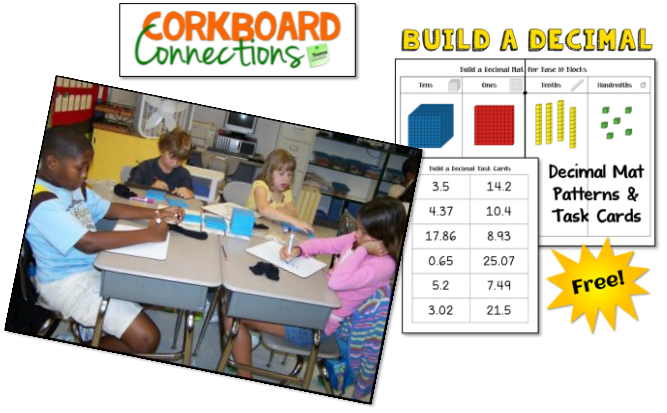
2. Deepen Understanding

- Talking & writing about math
- Using graphic organizers
- Sorting words & concepts
- Exploring models

2 Deepen understanding

Teaching Decimals with Manipulatives

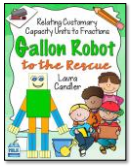
Link to Post on Webinar Resources Page

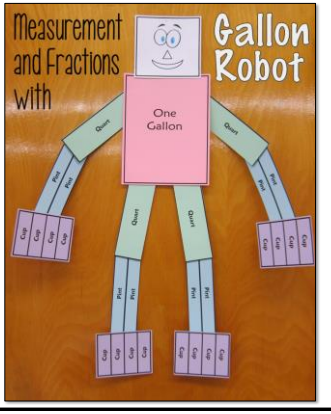


2 Deepen understanding

Gallon Robot Fraction Model

Each body part is proportional to the fractional part of the gallon.





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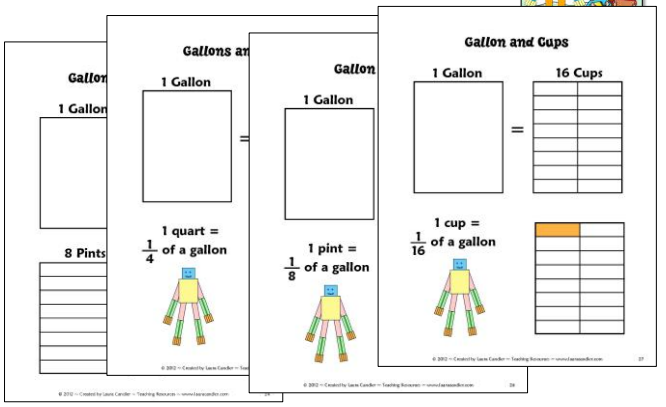

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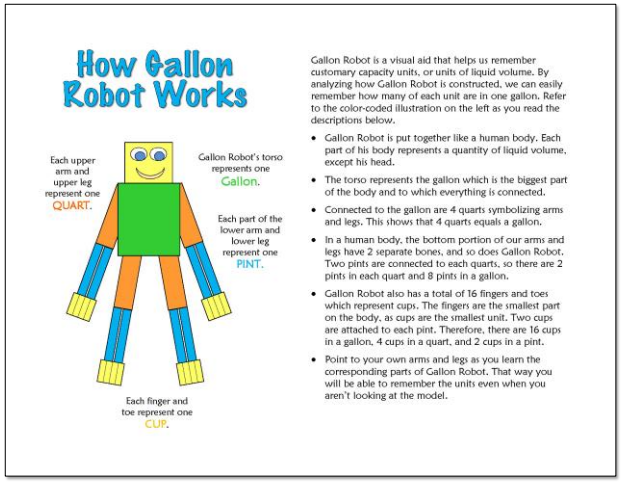
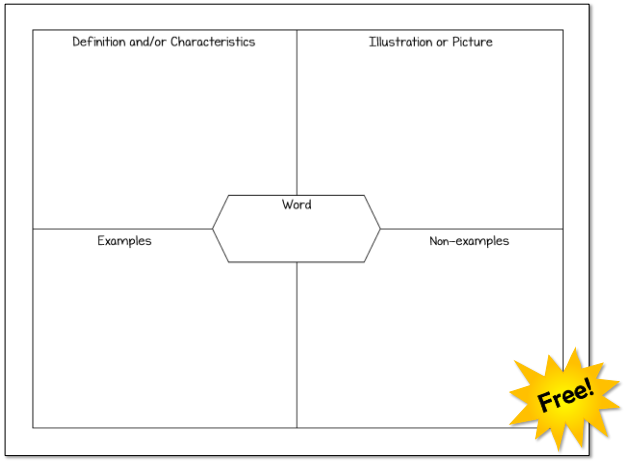
Gallon Robot Fraction Model



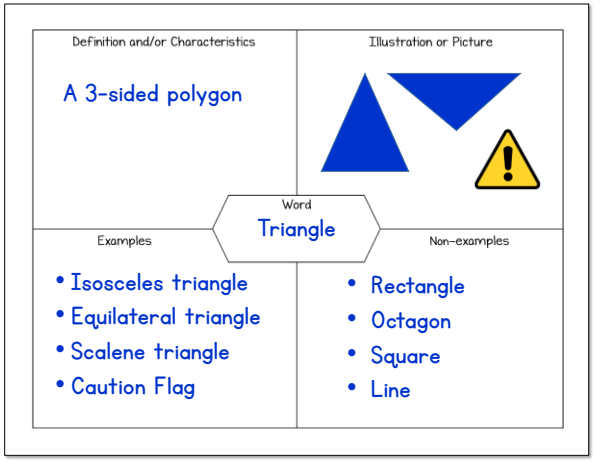
2 Deepen understanding

Frayer Model (Math Version)



2 Deepen understanding

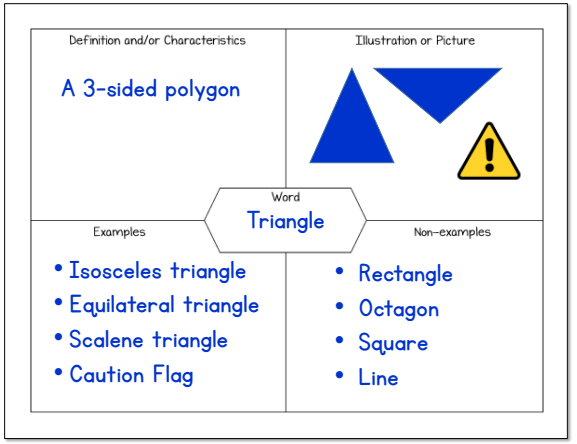
Frayer Model (Math Version)



2 Deepen understanding

Frayer Model Activity #1 - Introductions

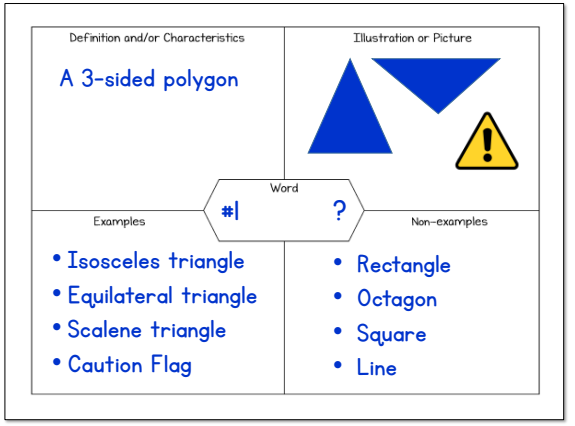
Team members complete a Frayer Model for an assigned vocabulary word, then take turns "Introducing" the word to the team.



2 Deepen understanding

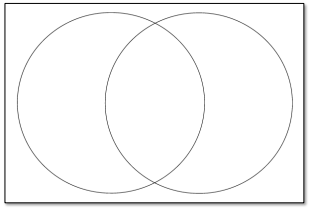
Frayer Model Activity #2 – Mystery Word

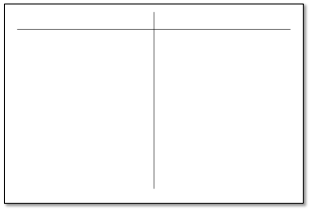
Teacher secretly assigns a vocabulary word to each student by number. The student fills out all 4 sections and writes the number in the middle. Frayer models are posted and students try to guess the word that matches the clues.



2 Deepen understanding

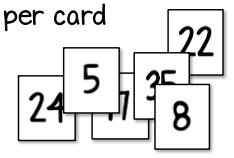
Team/Partner Concept Sorting





Materials Needed

- Large graphic organizer
- Deck of sorting cards with one number, word, definition, image, sentence, etc. per card

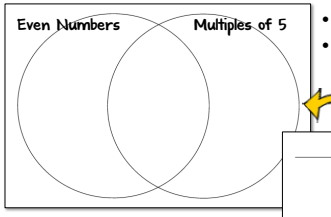


2 Deepen understanding

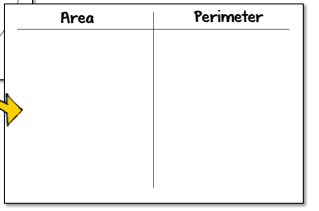
Team/Partner Concept Sorting

Venn Diagram or T-chart?

- Venn diagram categories must overlap
- T-chart categories should NOT overlap



- Prime / 2-Digit
- Quadrilaterals / Polygons with Parallel Lines

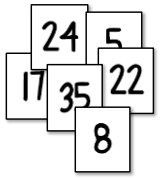


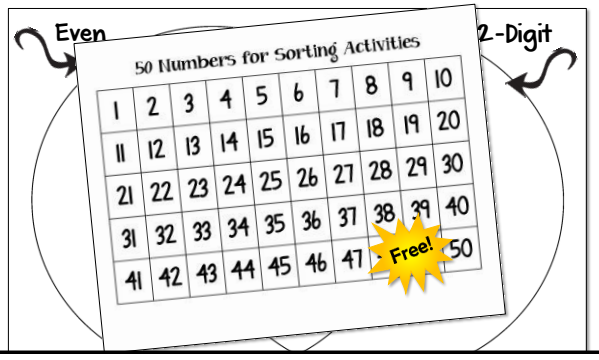
- Odd / Even
- Quadrilaterals / Triangles

2 Deepen understanding

Number Sorting

Students take turns sorting number tiles. Before placing any number, each student explains his or her reason and the other partner must agree. If they don't agree, they set the number aside for the time being.





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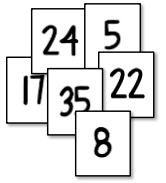

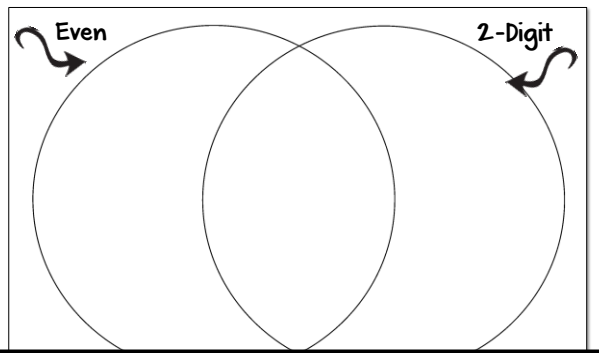

2 Deepen understanding

Number Sorting

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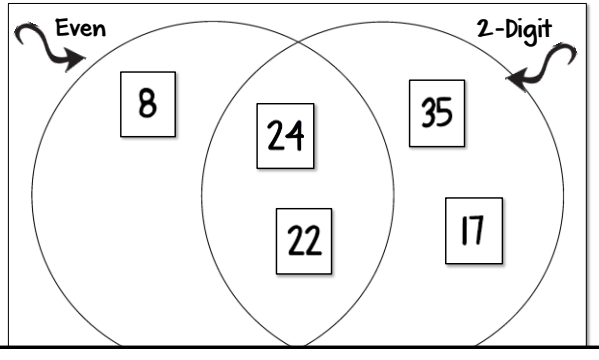
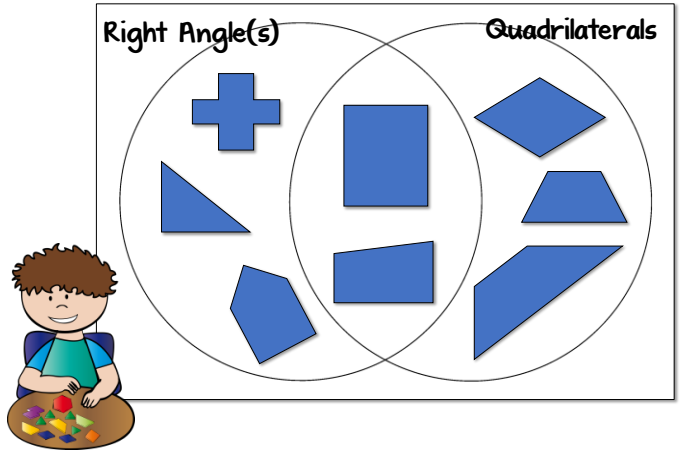
5



2 Deepen understanding

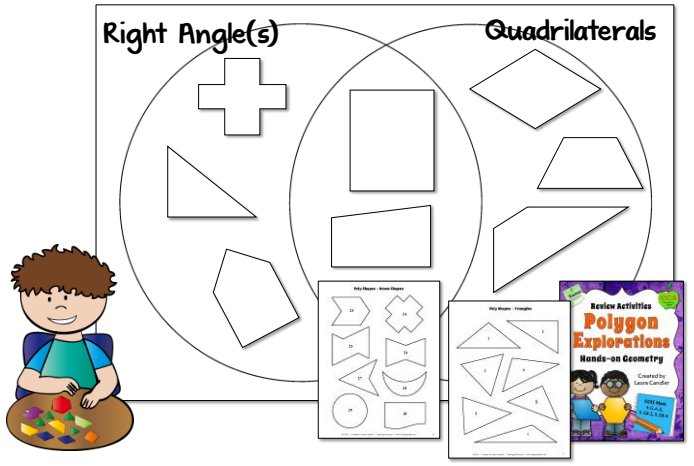
Polygon Sorting



2 Deepen understanding

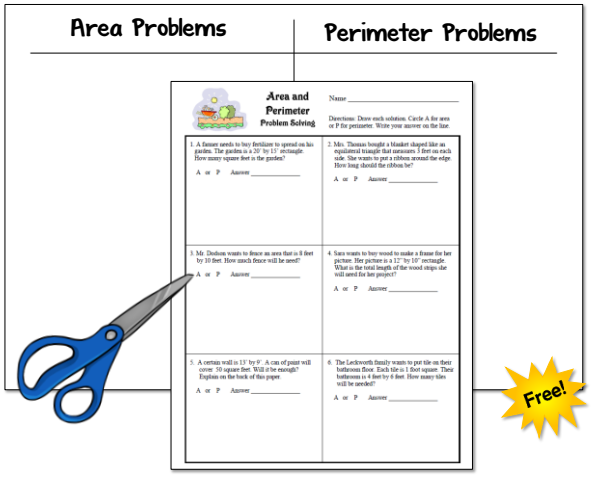
Polygon Sorting

2 Deepen understanding



Area and Perimeter Sorting

2 Deepen understanding



Area and Perimeter Word Problem Sorting

Stack cards face down.

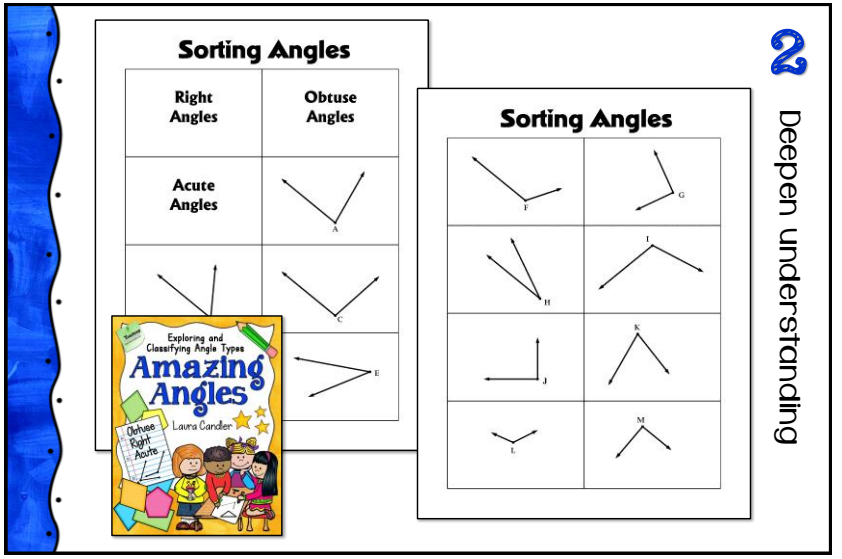
2 Deepen understanding

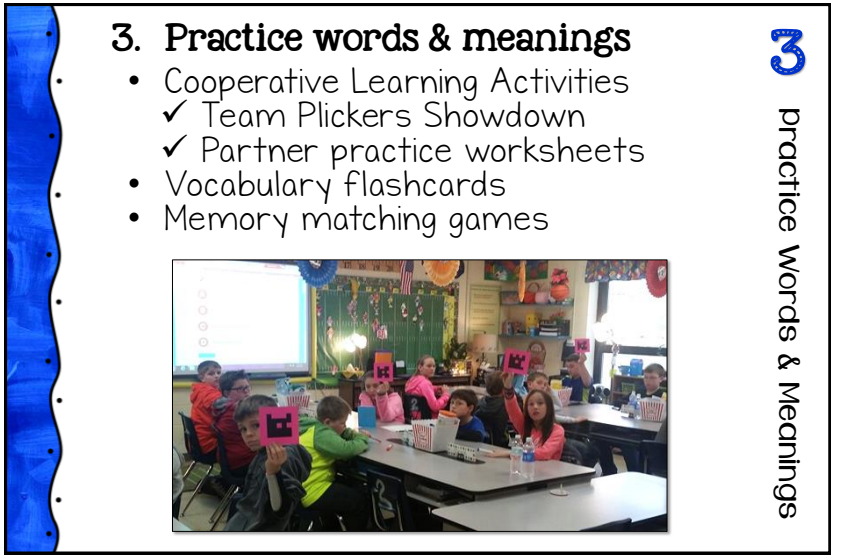
Area Problems	Perimeter Problems

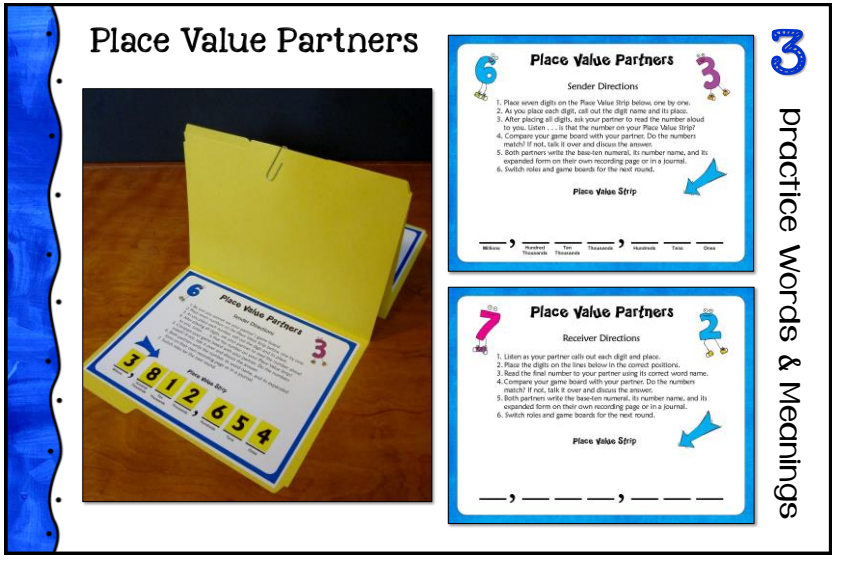
Area and Perimeter Word Problem Sorting

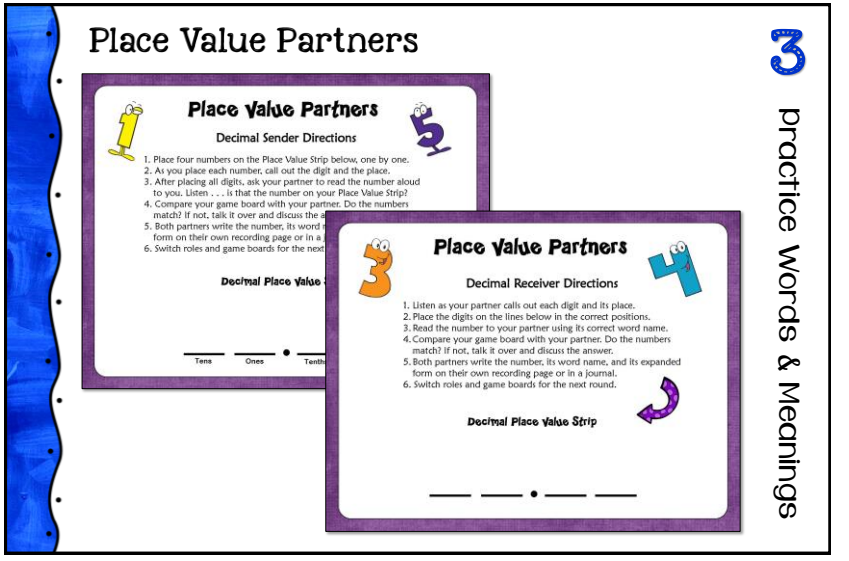
2 Deepen understanding

Area Problems	Perimeter Problems
5. A certain wall is 13' by 9'. A can of paint will cover 50 square feet. Will it be enough? Explain on the back of this paper. A or P Answer _____	2. Mrs. Thomas bought a blanket shaped like an equilateral triangle that measures 3 feet on each side. She wants to put a ribbon around the edge. How long should the ribbon be? A or P Answer _____
6. The Leckworth family wants to put tile on their bathroom floor. Each tile is 1 foot square. Their bathroom is 4 feet by 6 feet. How many tiles will be needed? A or P Answer _____	
1. A farmer needs to buy fertilizer to spread on his garden. The garden is a 20' by 15' rectangle. How many square feet is the garden? A or P Answer _____	


Sorting Angles
Right Angles
Obtuse Angles
Acute Angles
Exploring and Classifying Angle Types
Amazing Angles
Laura Candler
Obtuse
Right
Acute
Sorting Angles
2
Deepen understanding

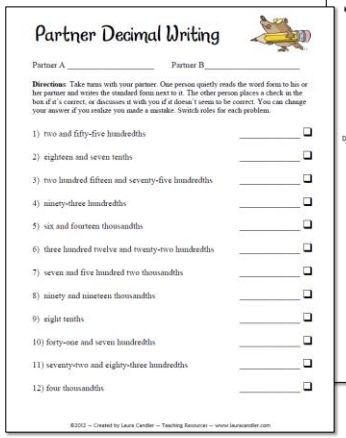

3. Practice words & meanings
• Cooperative Learning Activities
✓ Team Plickers Showdown
✓ Partner practice worksheets
• Vocabulary flashcards
• Memory matching games
3
Practice Words & Meanings

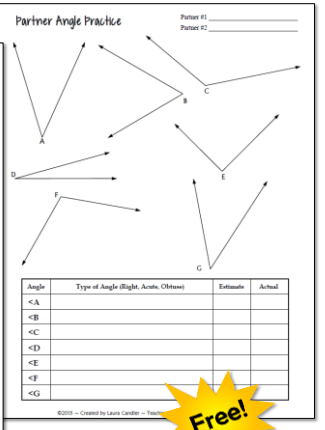

Place Value Partners
Place Value Partners
Sender Directions
Place Value Strip
Place Value Partners
Receiver Directions
Place Value Strip
3
Practice Words & Meanings


Place Value Partners
Place Value Partners
Decimal Sender Directions
Place Value Partners
Decimal Receiver Directions
Decimal Place Value Strip
3
Practice Words & Meanings

Worksheet Partner Practice

3 Practice Words & Meanings





Free!

Memory Matching Games

3 Practice Words & Meanings

Student turns over a card, then describes the match BEFORE turning over the next card to find it.

Quadrilateral Matching Cards

parallelogram	a quadrilateral with both sets of opposite sides parallel
rectangle	a quadrilateral with 4 right angles
trapezoid	a quadrilateral with exactly one set of opposite sides parallel
square	a quadrilateral with four right angles and all sides the same length
rhombus	a quadrilateral with all sides the same length

Free!

Measurement Matching Cards

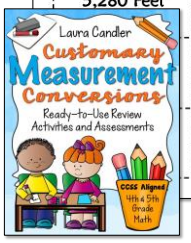
3 Practice Words & Meanings

Basic Units Matching 1

12 Inches	1 Foot
3 Feet	1 Yard
5,280 Feet	1 Mile
	1 Pound
	1 Gallon

Basic Units Matching 2

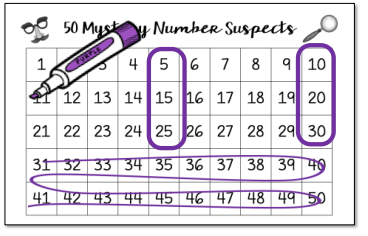
2,000 Pounds	1 Ton
2 Pints	1 Quart
8 Fluid Ounces	1 Cup
2 Cups	1 Pint
4 Quarts	1 Gallon

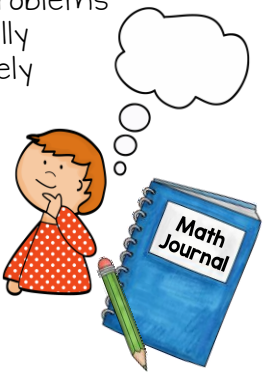


4. Use math vocabulary fluently

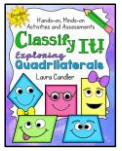
4 Use Math Vocabulary Fluently

- Play games that require knowledge of math vocabulary and concepts
- Read and solve word problems
- Think and reason logically
- Communicate effectively about math





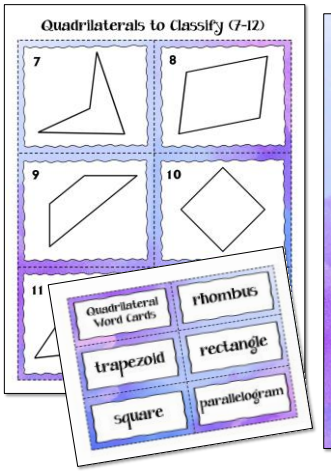
Math Vocabulary-Building Games

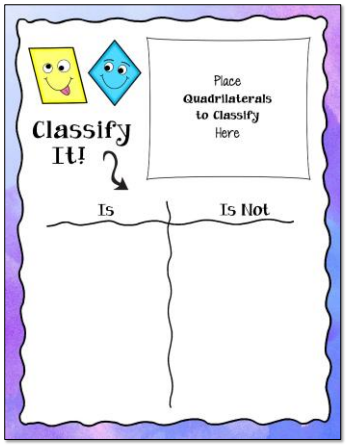


Introduce games that require students to apply knowledge of math vocabulary and skills in order to win.

4 Use Math Vocabulary Fluently

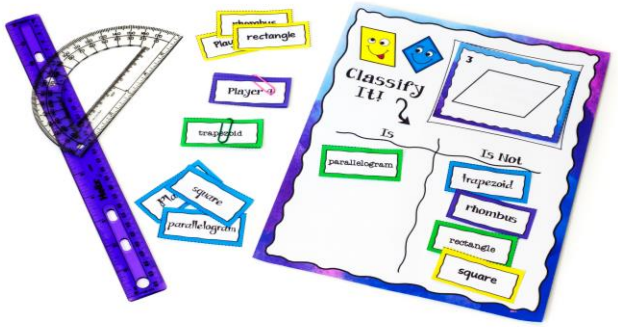
Classify It! Exploring Quadrilaterals





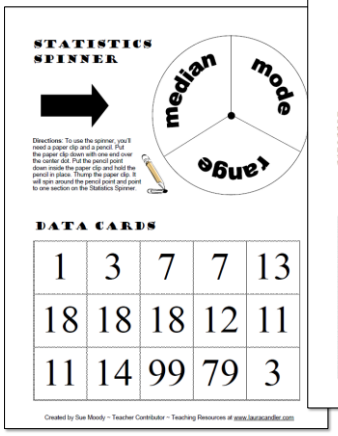
4 Use Math Vocabulary Fluently

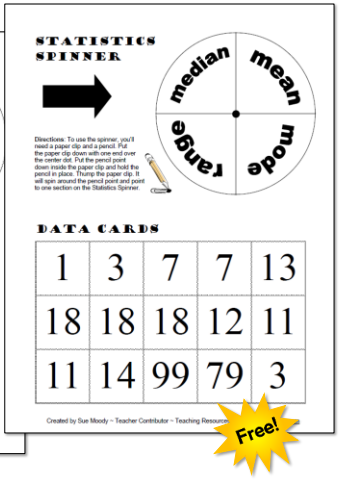
Classify It! Exploring Quadrilaterals



4 Use Math Vocabulary Fluently

Dynamic Data Game – 2 Levels

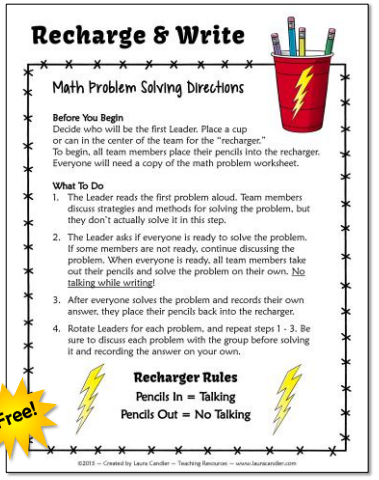




4 Use Math Vocabulary Fluently

Recharge & Write (Math Problem Solving)

4 Use Math Vocabulary Fluently



Recharge & Write

Math Problem Solving Directions

Before You Begin
Decide who will be the first Leader. Place a cup or can in the center of the team for the "recharger." To begin, all team members place their pencils into the recharger. Everyone will need a copy of the math problem worksheet.

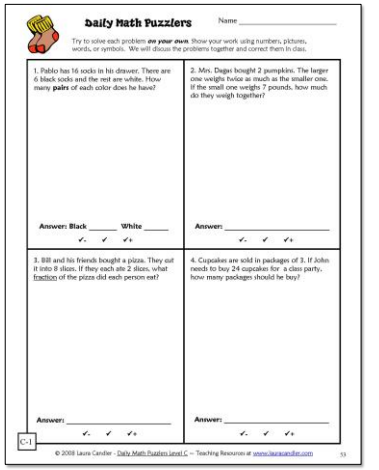
What To Do
1. The Leader reads the first problem aloud. Team members discuss strategies and methods for solving the problem, but they don't actually solve it in this step.
2. The Leader asks if everyone is ready to solve the problem. If some members are not ready, continue discussing the problem. When everyone is ready, all team members take out their pencils and solve the problem on their own. No talking while writing!
3. After everyone solves the problem and records their own answer, they place their pencils back into the recharger.
4. Rotate Leaders for each problem, and repeat steps 1 - 3. Be sure to discuss each problem with the group before solving it and recording the answer on your own.

Recharger Rules
Pencils In = Talking
Pencils Out = No Talking

Free!

Recharge & Write (Math Problem Solving)

4 Use Math Vocabulary Fluently



Daily Math Puzzlers Name _____

Try to solve each problem **on your own**. Show your work using numbers, pictures, words, or symbols. We will discuss the problems together and correct them in class.

1. Pablo has 16 socks in his drawer. There are 6 black socks and the rest are white. How many **pairs** of each color does he have?

Answer: Black _____ White _____

2. Mrs. Dagas bought 2 pumpkins. The larger one weighs twice as much as the smaller one. If the small one weighs 7 pounds, how much do they weigh together?

Answer: _____

3. Bill and his friends bought a pizza. They cut it into 8 slices. If they each ate 2 slices, what fraction of the pizza did each person eat?

Answer: _____

4. Cupcakes are sold in packages of 3. If John needs to buy 24 cupcakes for a class party, how many packages should he buy?

Answer: _____

C-1

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Virginia Beach, VA – July 28 & 29

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- Literacy Toolkit: Engaging Strategies for Success

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