Work Stations 101: Grades K-5

NCTM Regional Conference

11.20.14 & 11.21.14

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PISD Mathematics

Mathematics

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Work Stations 101

- Welcome!
- Our Goal:
  - Explore the “basics” of work stations
    - Who & What
- Our Norms
  - Be an active participant
  - Be a focused participant
  - Honor an attention signal

Mathematics

Work Stations 101

- Welcome!
- Our Goal:
  - Explore the “basics” of work stations
    - Who, What, When, Where, Why, How
- Our Norms
  - Be an active participant
  - Be a focused participant
  - Honor an attention signal

Mathematics

Work Stations 101

- Let's get started
  - Foldable for Reflections

"Math work stations are areas within the classroom where students work with a partner* and use

_____

_____

to

_____

and

_____

their mathematical thinking."
(Diller, 2011)

NCTM Regional Conference (Houston, TX) 11.21.14: Work Stations 101, Grades K-5
Janet Dodd, District Instructional Specialist – Elementary Mathematics, Pasadena ISD (TX) jdodd@pasadenaisd.org
President, Texas Association of Supervisors of Mathematics

Who?	What?	When?
Where?	Why?	How?

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"Math work stations are a time for children to practice problem solving while

_____,

_____,

_____,

and making

_____

among mathematical topics as the teacher observes and interacts with individuals at work or meets with a

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for

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math instruction."
(Diller, 2011)

Mathematics

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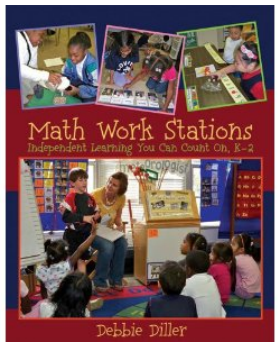
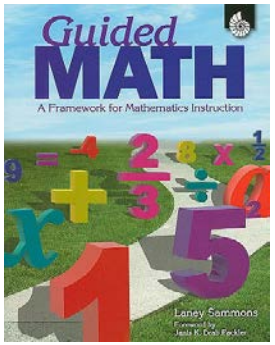
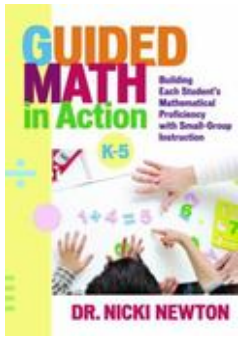
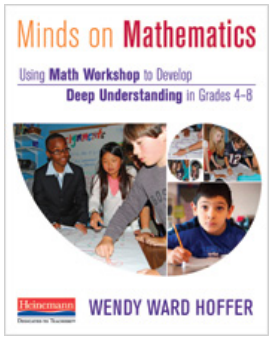
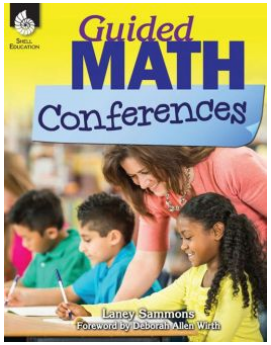
Who?	What?	When?
Where?	**Why?**	**How?**











PISD Mathematics

Work Stations 101

- *WHO and WHAT*
  - Sentence Frames
    - So … what are work stations?
    - So … who are work stations for?

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Work Stations 101

"Math work stations are a time for children to practice problem solving while reasoning, representing, communicating, and making connections among mathematical topics as the teacher observes and interacts with individuals at work or meets with a small group for differentiated math instruction ." (Diller, 2011)

Mathematics

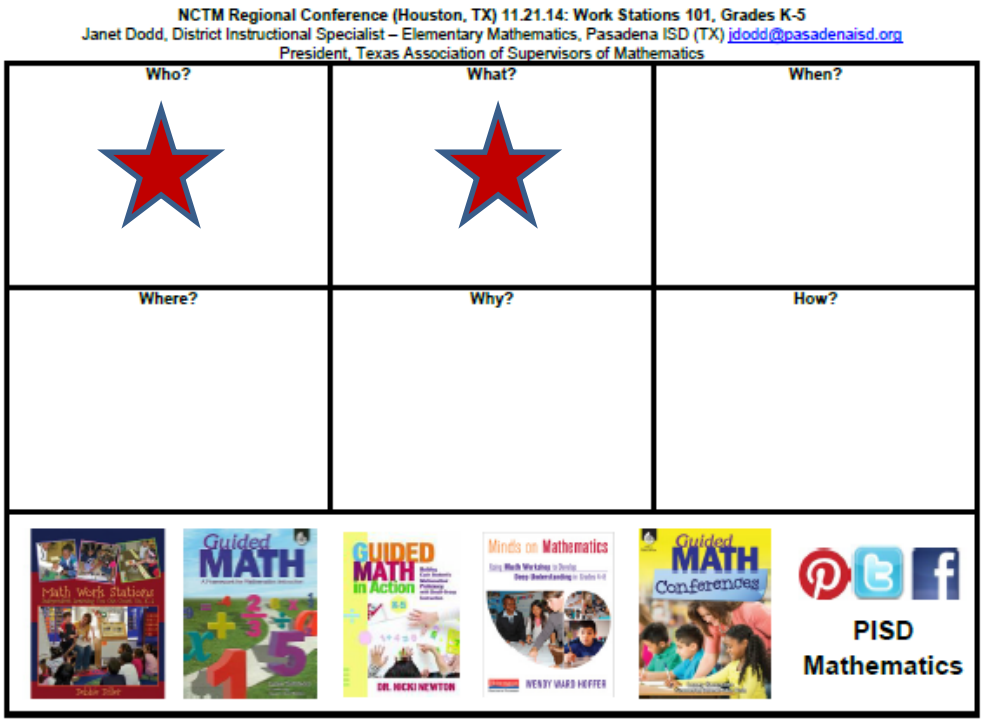
Work Stations 101

"Math work stations are areas within the classroom where students work with a partner and use instructional materials to explore and expand their mathematical thinking." (Diller, 2011)

Mathematics

Work Stations 101

- *Reflections: WHO and WHAT*
  - So … what are work stations?
  - So … who are work stations for?



30-Second Summary/ Take Away

Mathematics

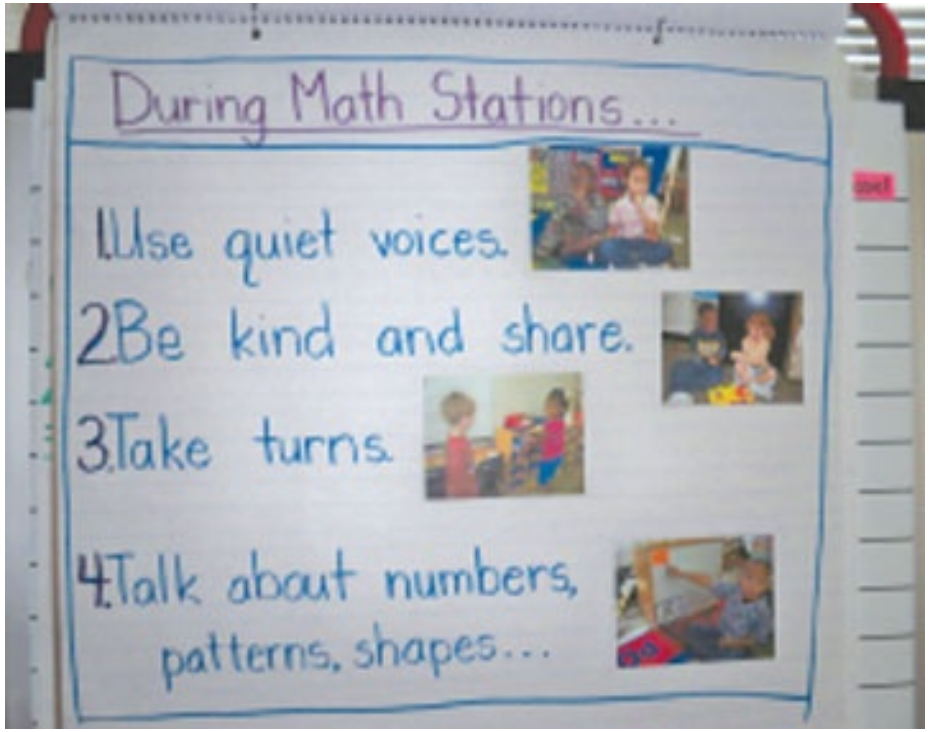
Work Stations 101

- WHAT
  - So … what instructional materials should be in a work station?

Mathematics

Work Stations 101

- WHAT
  - Work Stations Sampler



(Diller, pg.)

Mathematics

Work Stations 101

- WHAT
  - Work Stations Sampler

Directions are on the activity's task card

Grades K-2	Grades 3-5
Solving Story Problems (white)	Problem Puzzler (pink)
Holt's Hardware Haven (yellow)	Representing Division (blue)
Tic Tac Toe: Pick 3 (green)	Tic Tac Toe: Pick 3 (purple)

Solving Story Problems

- Use counters to model each story problem.
- Record a number sentence that represents the story problem.
- Determine the solution to the story problem.

Alma had 7 counters. She gave some counters to her brother. Now she has 3 counters left. How many counters did she give to her brother?	Alma had 8 counters. She had 5 more counters than her brother. How many counters did her brother have?	Alma had some counters. She gave 2 counters to her brother and now she has 6 counters left. How many counters did Alma have at the start?
Alma has 9 counters. 4 of the counters are red and the rest of the counters are yellow. How many yellow counters does Alma have?	Alma had 5 counters. Her brother gave her some more counters. Now she has 10 counters. How many counters did Alma's brother give her?	Alma had some counters. Her brother gave her 4 more counters. Now she has 7 counters. How many counters did she have at the start?

Student Name: _____ Date: _____

Holt's Hardware Haven Activity Page

At Holt's Hardware Haven, nails are sold in boxes of 24 nails and boxes of 49 nails. If Mrs. Ross purchased 1 box of 24 nails and 1 box of 49 nails, how many nails did Mrs. Ross purchase?

- Cut apart the cards on the **Holt's Hardware Haven Activity Master**.
- Partner A: Use base ten blocks to solve the problem.
- Partner B: Use the pictures from **Holt's Hardware Haven Activity Master** to record the sequence of steps your partner used to solve the problem.
- Glue or tape the cards in **My Workspace**. If you need more space, use the back of this paper.

My Workspace

Communicating about Mathematics

How are the parts of the problem represented in your picture model?

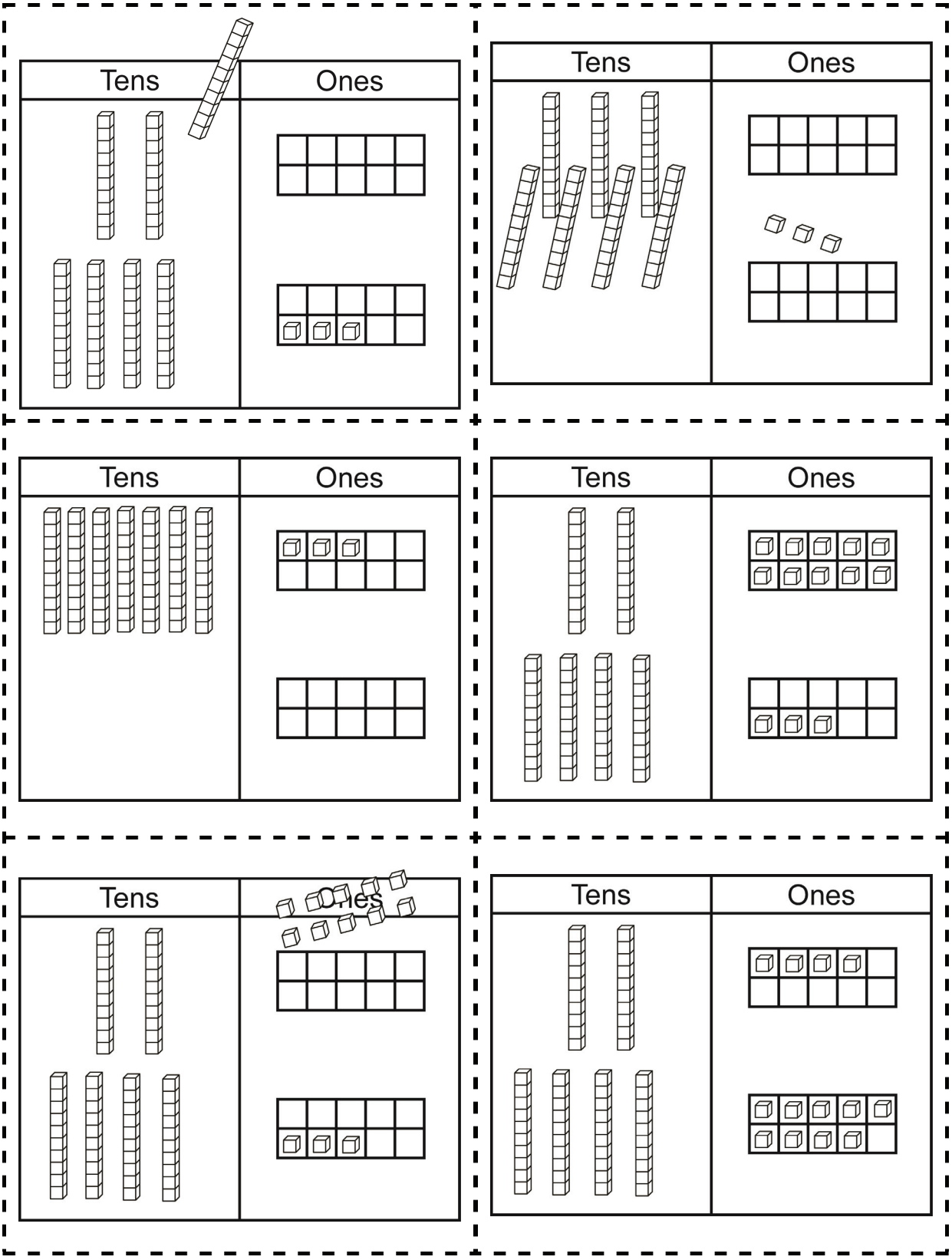
_____

_____

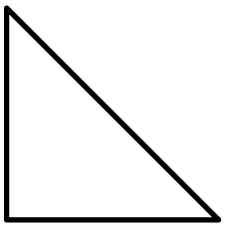
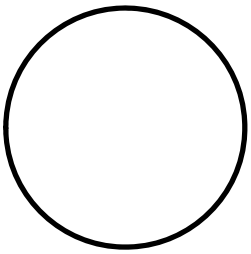
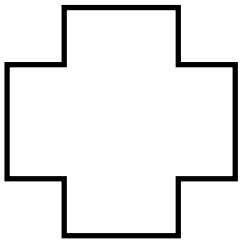
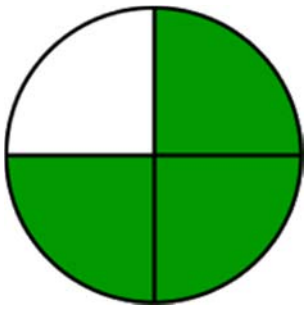
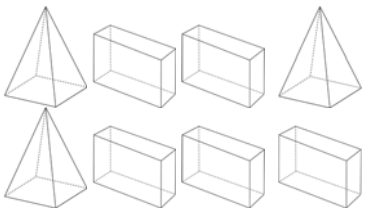
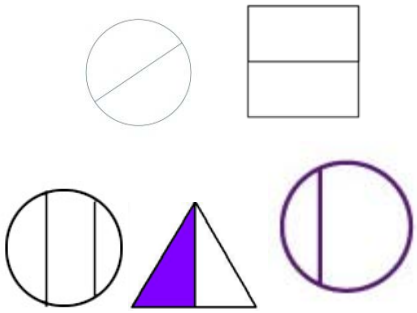
_____

Student Name: _____ Date: _____

Holt's Hardware Haven Activity Master



Tic Tac Toe Activity Board: Choose 3 Activities to Complete

Use words to describe the part of the set that is apples. 	Shade $\frac{1}{2}$ of the figure below. 	Divide the figure into 8 equal parts. 
Use two-color counters to represent a set that is three-fourths red. Draw a picture of the set below.	Draw a picture to represent the fraction $\frac{1}{2}$.	Shade $\frac{1}{4}$ of the figure below. 
Write words and a fraction to describe the part of the figure that is **NOT** shaded. 	Record a fraction that represents the part of the set that is pyramids. 	Circle the figures that show two equal parts. 

Name: _____ Date: _____

Problem Puzzler

- Solve Problem 1 below.
- Read your **Strategy Card**. Determine if your card gives a correct answer for Problem 1.
- Determine which group member's **Strategy Card** contains a correct solution process for Problem 1. Record the letter of the card containing the correct answer.
- Repeat this process for Problems 2 – 4.

Problem 1 A movie theater has 25 rows with 40 seats in each row. If 472 seats are occupied, find the number of empty seats in the movie theater. **Card _____ described a correct process.**	**Problem 3** At the dollar store, Joyce can purchase 6 soft drinks for $1. If she plans to drink 2 soft drinks each day, how many days will $12 worth of soft drinks last? **Card _____ described a correct process.**
Problem 2 Look at the pattern of numbers below. 18, 24, 30, _____, 42 Determine the missing number in the pattern. **Card _____ described a correct process.**	**Problem 4** William was playing a card game. Each time he scored 10 points, he added an X to his score card, as shown below. X X X X X X William scored 5 additional points after he recorded his last X. How many total points, *p,* did William score? **Card _____ described a correct process.**

Activity Master: Strategy Cards

Cut along dotted lines.

Strategy Card A

Problem 1 Find the sum of 472 and the product of 25 and 40.
Problem 2 (30 – 24) + 42
Problem 3 Multiply 6 by 12 and then divide by 2.
Problem 4 $p = 6 + 10 + 5$

Strategy Card B

Problem 1 Subtract 40 from the product of 25 and 472.
Problem 2 (30 – 24) + 30
Problem 3 Find the product of 2 and 12 and then divide by 6.
Problem 4 $p = (6 \times 5) + 10$

Strategy Card C

Problem 1 Subtract 472 the product of 25 and 40.
Problem 2 30 + 24
Problem 3 Find the quotient of 12 and 2.
Problem 4 $p = 6 \times 10 \times 5$

Strategy Card D

Problem 1 Find the difference of 472 and 40.
Problem 2 (30 + 24) ÷ 2
Problem 3 Add 6 and 12 and then divide by 2.
Problem 4 $p = (6 \times 10) + 5$

Student Name: _____ Date: _____

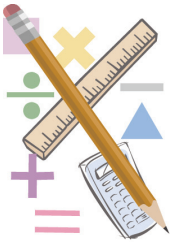
Representing Division Activity Page

- Cut apart the cards on the **Representing Division Activity Master (Pages 1-2)**.
- Match the numerical representation of each step of the division process with its corresponding pictorial representation.
- Organize the sets of cards to represent the steps of the division process in sequential order.
- Glue or tape the cards onto a separate piece of paper.

My Workspace

Communicating about Mathematics

How did you determine which numerical and pictorial representations represented the same step of the division process?



_____

_____

_____

_____

_____

_____

Student Name: _____ Date: _____

Representing Division Activity Master (Page 1)

$$\begin{array}{r} 1\_\_ \\ 4\overline{)\,537} \\ -\,4 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 13\_ \\ 4\overline{)\,537} \\ -\,4 \\ \hline 13 \\ -\,12 \\ \hline 017 \end{array}$$

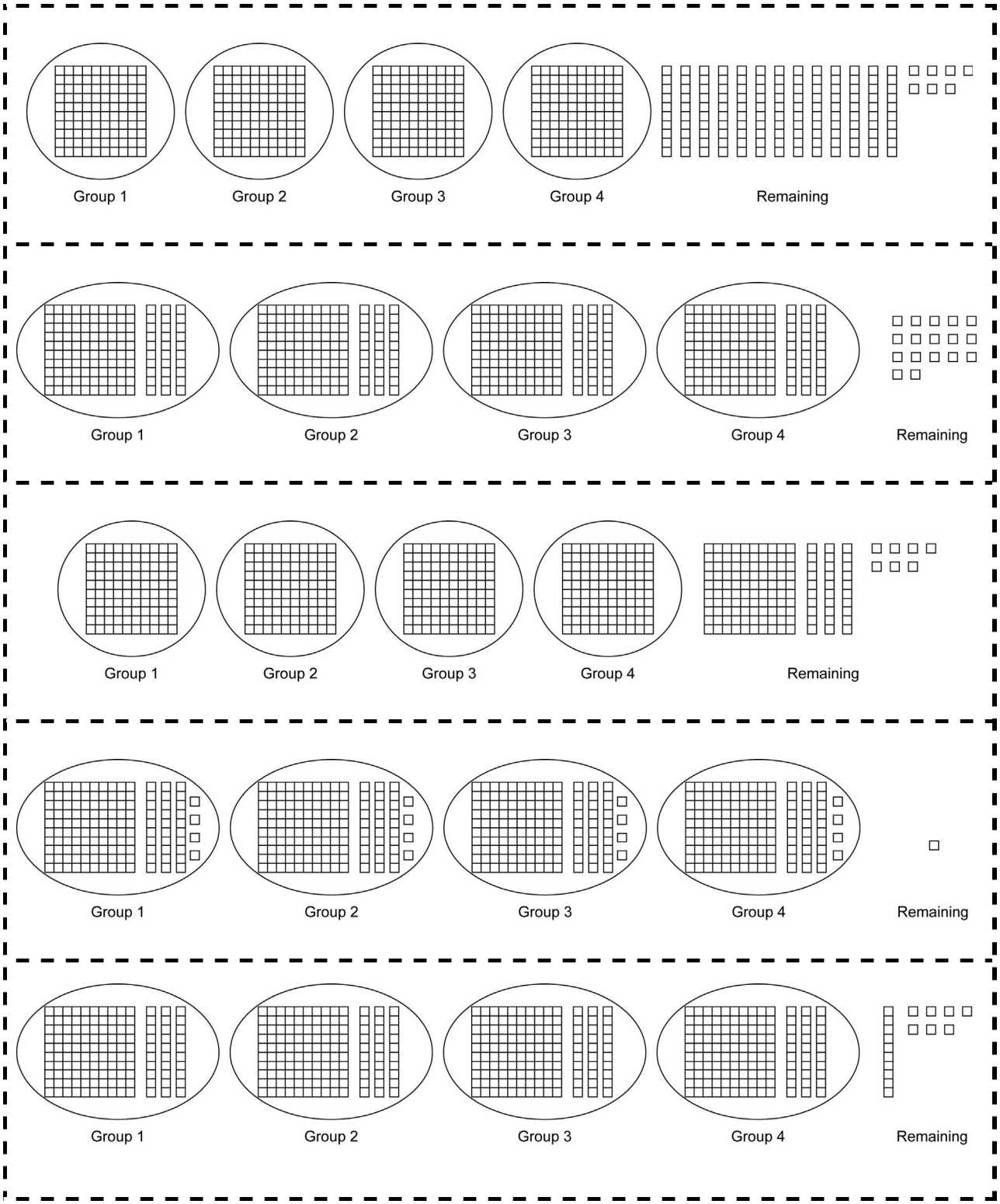
$$\begin{array}{r} 134 \\ 4\overline{)\,537} \\ -\,4 \\ \hline 13 \\ -\,12 \\ \hline 017 \\ -\,16 \\ \hline 01 \end{array}$$

$$\begin{array}{r} 1\_\_ \\ 4\overline{)\,537} \\ -\,4 \\ \hline 13 \end{array}$$

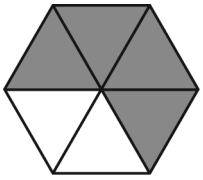
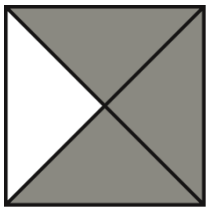
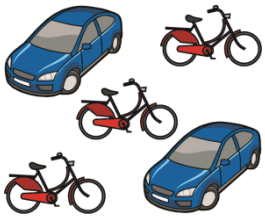
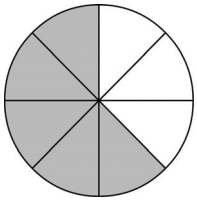
$$\begin{array}{r} 13\_ \\ 4\overline{)\,537} \\ -\,4 \\ \hline 13 \\ -\,12 \\ \hline 01 \end{array}$$

Student Name: _____ Date: _____

Representing Division Activity Master (Page 2)



Tic Tac Toe Activity Master

1 Draw a picture to represent a fraction that is closer to 1 than it is to zero or $\frac{1}{2}$. Explain your thinking.	**2** Write a fraction to describe the part of the hexagon that is shaded. Write a fraction to describe the part of the hexagon that is **NOT** shaded.  What is similar about your fractions? What is different?	**3** Write a fraction to describe the part of the set below that is spiders.  Which part of the set does the numerator represent? Which part of the set does the denominator represent?
4 Write words and a fraction to describe the part of the square that is **NOT** shaded. 	**5** Draw a set of objects that shows that $\frac{5}{7}$ is red. Explain your thinking.	**6** Draw a number line. Use the number line to represent a fraction that is between zero and one but is closer to zero than it is to one. Explain your thinking.
7 Write a fraction to represent the part of the set that are cars.  Add two cars to the set. Write a fraction that could represent the part of the set that is now cars.	**8** Which fraction below is closest to $\frac{1}{2}$? $\frac{3}{4}$ or $\frac{3}{8}$ Draw a picture to represent the fraction that you chose. Explain your thinking.	**9** Write a sentence to describe the part of the circle that is shaded. Write a fraction to describe the part of the circle that is shaded. 

Work Stations 101

- WHAT
  - So … what did the instructional materials in the work stations look like?

Mathematics

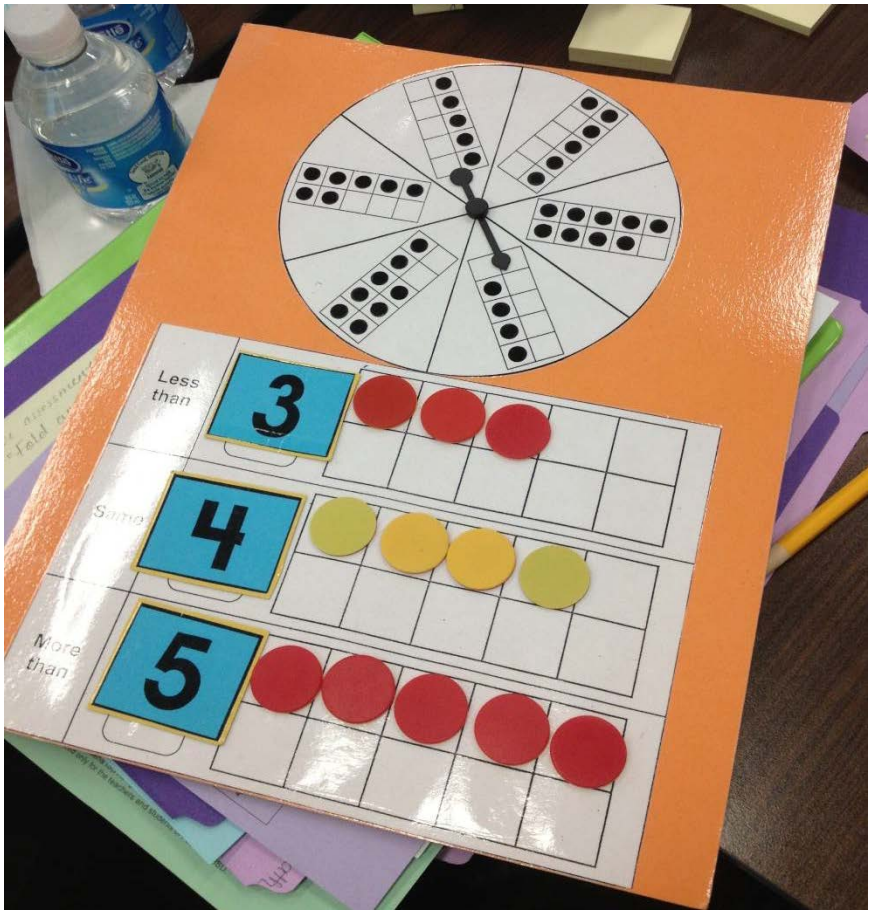
Work Stations 101

- WHAT
  - Manipulatives:"When students visualize and then manipulate aspects of mathematical ideas they are exploring, they gain deeper understanding of the concept." (Ennis and Witeck, 2007 in Sammons, 2010)
  - Problem Solving: "Students participate in a "climate of inquiry where ideas are generated, expressed, justified, thus creatively exploring mathematical relationships and constructing meaning." (Sammons, 2010)
  - Choice: "Choice is an important feature in making work stations successful. Over time, a station should include a variety of things for children to choose from, but there shouldn't be so many choices that the children feel overwhelmed." (Diller, 2011)

Mathematics

Work Stations 101

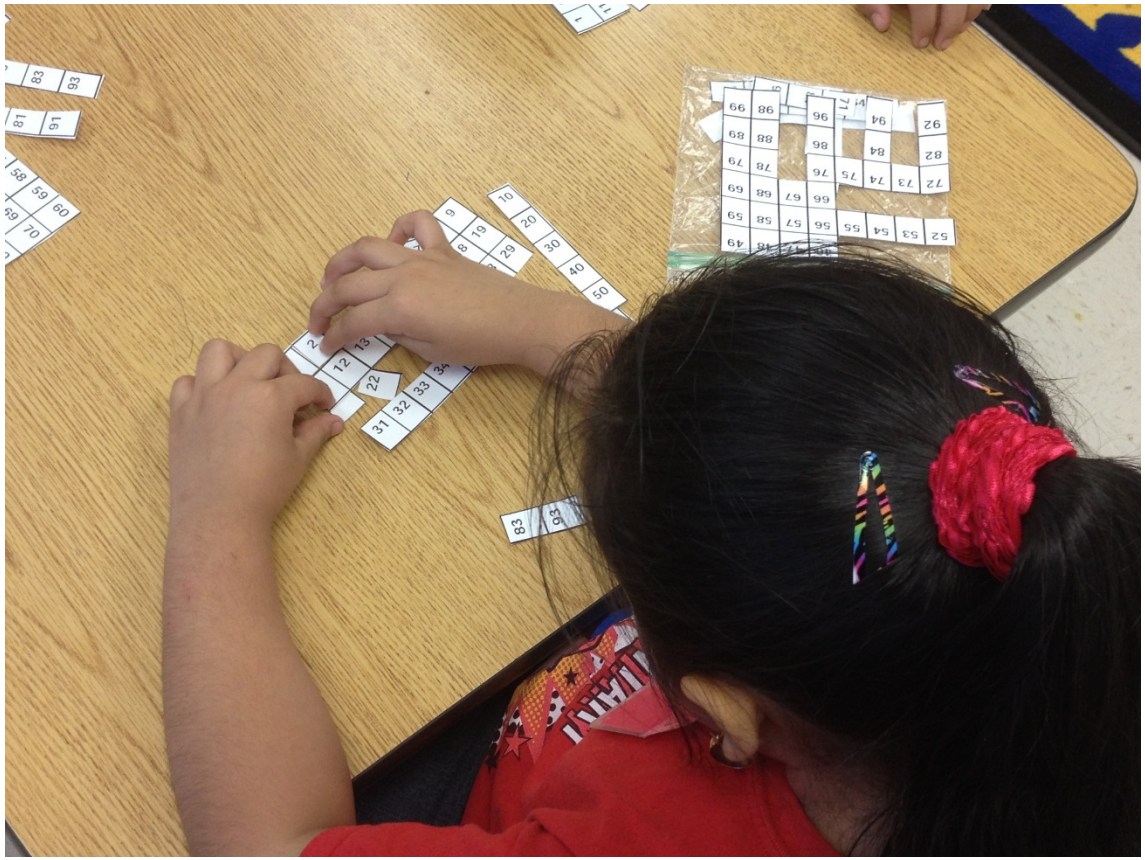
- WHAT



Mathematics

Work Stations 101

- WHAT



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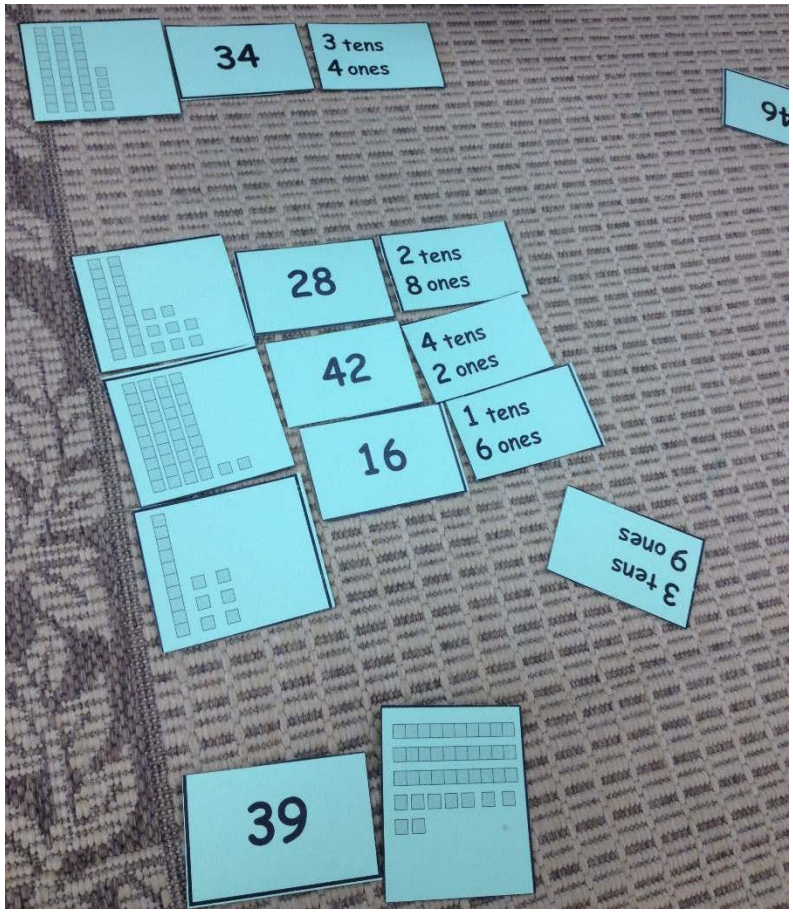
Work Stations 101

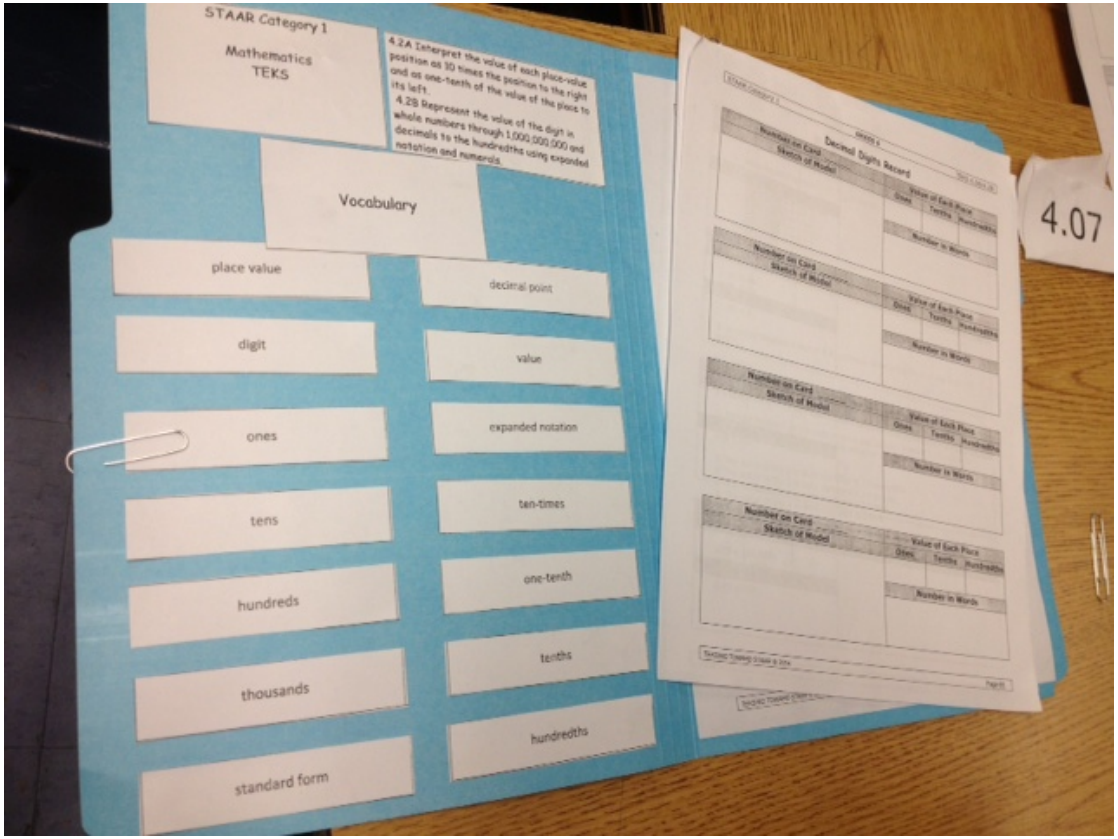
- WHAT



Mathematics

Work Stations 101

- WHAT



Mathematics

Work Stations 101

- WHAT

Mathematics

Work Stations 101

- WHAT
  - So … what instructional materials should be in a work station?
    - Concepts/Activities:
      - previously explored during class
      - from previous grade level's standards to preview upcoming concepts
      - to support low-performing standards
      - that enrich/extend current standards

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Work Stations 101

- *Reflections: WHAT*
  - So … what instructional materials should be in a work station?

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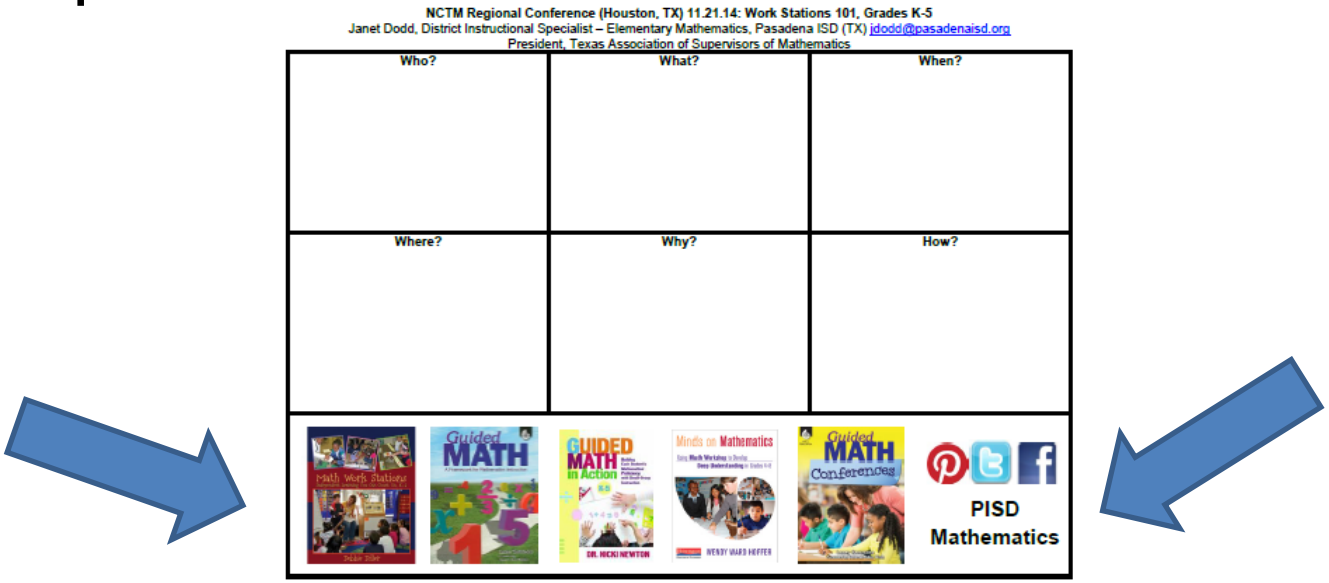
Who?	What?	When?
Where?	Why?	How?

30-Second Summary/ Take Away

Mathematics

Work Stations 101

- Our Goal:
  - Explore the “basics” of work stations



Please return the activities to the baggie!

Thank you!

Mathematics