

Grade 3

MGSD, Summer 2014

Pencil groupings

- A pencil packaging company puts 10 pencils in a box, 10 boxes in a bin, and 10 bins in a basket.
- Draw what you think a box, a bin, a basket, and a barrel look like. Try to draw close to scale/size. Compare your drawing with your neighbor.

How many pencils?

- How many pencils are there if a store has:
5 boxes and 7 single pencils?
5 bins 7 boxes and 8 single pencils?
 $500 + 70 + 8 = 578$
5 baskets, 7 bins, 4 single baskets, and 4 single pencils?
 $5000 + 700 + 4000 + 4 =$
 $9000 + 700 + 4$

How many pencils?

- What was the math involved? What did you have to know?

Packaging Pencils

- Now.... How can we group pencils in as few packages as possible if we have:
- 27 single pencils?
- 5 boxes and 16 single pencils?
- 1 basket, 12 bins, 27 boxes, and 39 single pencils?
- 1 basket, 1 basket and 2 bins, 2 bins and 7 boxes, 3 boxes and 9 pencils
- 2 baskets, 4 bins, 10 boxes, 9 pencils
- 2 baskets, 5 bins, 9 pencils

Packaging Pencils

- What was the math involved? What did you have to know?

Article

- As you read...
- What are the big “take aways” as it relates to your classroom?
- What thoughts and/or opinions do you have based on this article?
- What strategies have you used to help your students with the concepts mentioned in this article?

“Using facts I know”

- Students are trying to find the product of 8 and 7 and are using various strategies. For each draw it on an array, a number line, a set model (e.g., circles and tallies), and write related equations.
 - Tyrisha: Started with 8×5 and then added 8 twice.
 - Samuel: Started with 7×5 then added 7 three more times.
 - Antonio: Started with 2×7 and doubled it and then doubled it again.
 - Celeste: Started with 10×7 and then subtracted 7 twice.

“Using facts I know”

- What do representations of these strategies look like?
- What do the equations look like in terms of what students did to solve the problem?
- Thoughts of each strategy- some you liked? Some you didn’t like? Which ones are most likely to be used?

Exploring some activities

- Building a rectangle
 - Pull two number cards using only the cards 1-6. Build a rectangular array with those dimensions and find the area (product).
 - Write a multiplication equation.
- Break the rectangle into two smaller rectangles. Write two equations.

Exploring some activities

- Building and changing rectangles
 - Pull two number cards. Build a rectangular array with those dimensions and find the area (product).
 - Write a multiplication equation.
- Pull one more card... add that many rows or columns to your array. Find the new area (product).
 - Write an equation $(__ \times __) + (__ \times __) = __$

Factor Game – online [here](#)

- Pick a number between 1 and 30.
- You get the points for the number that you picked.
- Your partner gets the points for the sum of all of the factors
- Keep track of numbers so you don’t reuse them.

- Elemath.pbworks.com

Product Game

- Draw a 4x4 grid and put 16 numbers in it that are “common products” of 1 digit multiplication questions.
- Write a number line from 0 to 9 on your paper. Use two cubes for game pieces.
- When it is your turn you can move one of the game pieces to create new product.
- Cover a number on your game board if it matches your product.

- Multiplication and Division

Independently—

- Write a one sentence definition of each.
- Where do your students struggle?
- What does addition and subtraction skills have to do with multiplication and division?

Multiplication and Division

- Are all problems “equal” in difficulty? Why or why not?
- What makes some problems more difficult than others for students?
- Think about... How can we help students who struggle with these operations?

Problem Types

- Solve using a picture of objects.
- Solve using an array.
- Solve using a number line.
- Write an equation.
- There are 8 bags with 7 plums in each bag. How many plums are there in all?

Problem Types

- Solve using a picture of objects.
- Solve using an array.
- Solve using a number line.
- Write an equation.
- If 56 plums are shared equally into 8 bags, then how many plums will be in each bag?

Problem Types

- Solve using a picture of objects.
- Solve using an array.
- Solve using a number line.
- Write an equation.
- If 56 plums are to be packed with 7 plums to a bag, then how many bags are needed?

Problem Types Debrief

- How was each task modeled?
 - picture.
 - Array.
 - number line.
 - equation.
- Which tasks are more difficult?
- Why?
- How can you help support students with these types of tasks?

Multiplication and Division Problem Types

- Let's check out what the Common Core authors have to say about types of problems...

Problem Types

- Think about last year...
 - Out of all the time your students worked with multiplication and division ideas, including fractions, etc., which types of problems did:
 - You focus a lot on?
 - You not focus a lot on?
 - Your students do well with?
 - Your students struggle more with?

Guess the problem type

- There are 24 peanut butter sandwiches. How many bags can be filled if we put 6 sandwiches in a bag?
- There are 60 crackers in a pack. If there are 9 packs how many crackers are there?
- There are 3 cups of flour in the bowl. How many cups does each person get if I share it between two friends and myself?
- A rectangle has a width of 7 inches and an area of 42 inches. What is the length of the rectangle?

Guess problem type

- Which ones is your grade level responsible for?
- What about the sizes of numbers?

Problem Types...carrying it forward

- Where do they fit in your pacing guide for the year?
- How can you be more diligent on posing these types of tasks?
- How do we help students with these types of tasks?

Rigor

- What does rigor mean in terms of your students' math work?
- Does rigor matter in your grade?
- How can you increase the rigor in your classroom?

Efficiency

- What does efficiency mean in terms of your students' math work?
- Does efficiency matter in your grade?
- How can you guide students to becoming more efficient?

Rigor

- What does rigor mean in terms of your students' math work?
- Does rigor matter in your grade?
- How can you increase the rigor in your classroom?

Rigor...types of tasks

Memorization: What is $8+7$?

Procedures without connections: There are 17 boys and 8 girls on the playground. How many children are on the playground?

Procedures with math connections: There are 17 boys and 8 girls on the playground. How many children are on the playground? Show your answer in pictures, numbers and words.

Doing Math:

There are 15 children on the playground. At least 5 of them are boys. How many boys and girls could there be? Find multiple answers. Show each answer with pictures, numbers, or words.

Task Writing and [Resources](#)

- NCDPI Task website
- NCDPI math wiki- unit, Unpacking document
- Georgia Common Core units
- Elementarymathematics.org
 - Fractions unit
- Others?

Number Talks

- I want you to think about the number 36.
- What do you know about the number 36?
- Can you think of a few ways to put 36 objects into equal groups? Draw pictures and write equations for the different ways that you have.

Number Talks

- What math concepts did you work with?
- Describe the questions... what were they like?
- How would you carry this out in your classroom?
- How long would it take your students to complete?

Questions?