

# A Problem-solving Approach to Differentiated Instruction and Response to Intervention

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**Grayson  
Elementary School**

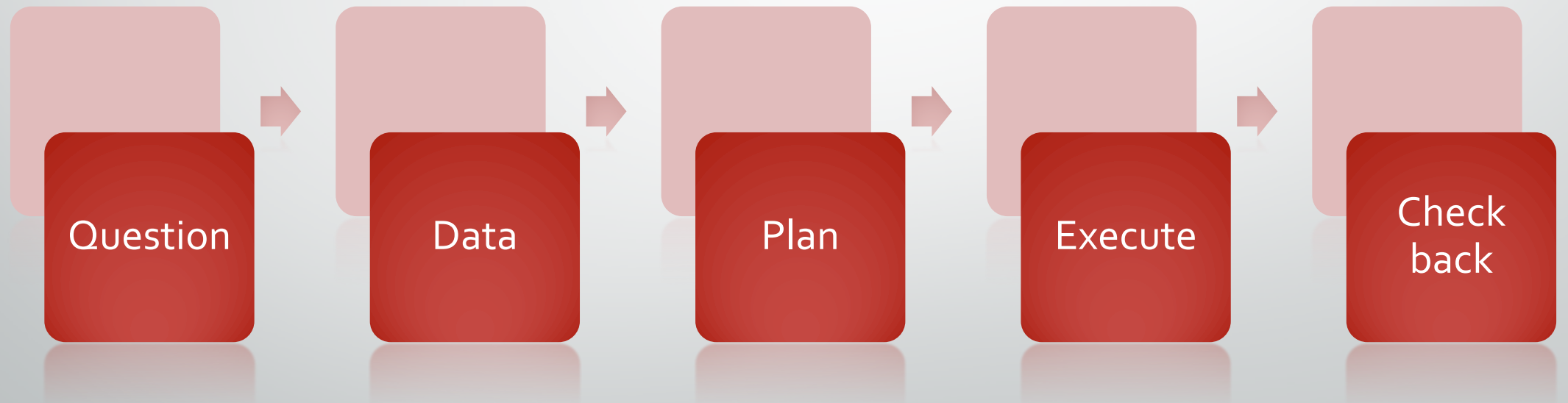
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# Problem Solving

- with math
- with struggling learners





# Foundational Ideas

- Build relationships.
- Listen (for what kids are saying, NOT for the answer YOU want) and be patient.
- Create a supportive classroom environment where mistakes mean you're learning! (Kids' mistakes AND your mistakes!)
- Productive struggle is a goal!



# Question

- What is keeping this student from understanding?
- How do I turn non-productive struggle into productive struggle?

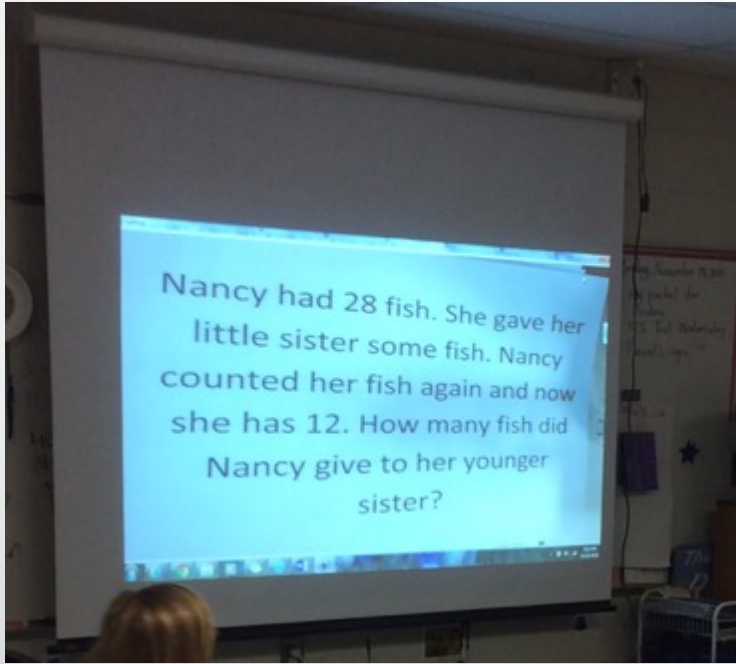



# Data

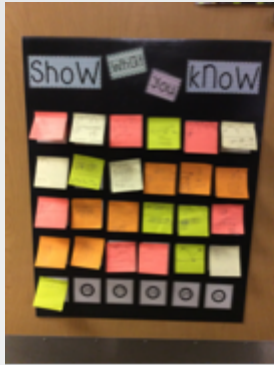
- What, specifically, does this child know and understand? Where does this child seem to be hitting a wall?
- Individual student data → patterns across the class

# Turn and Talk

- How do you collect data?



Nancy had 28 fish. She gave her little sister some fish. Nancy counted her fish again and now she has 12. How many fish did Nancy give to her younger sister?





# Show What You Know

Concept/Standard:

Problem for Students Need to Solve:



Where Do I Go from Here: Tasks, Small Group Focus, and/or Mini-Lesson

# Show what you know



# Ways to Collect Data

- Let them talk.
- Take notes.



# Class summary

## Place Value Pretest

6. Represent the number 210 using base ten blocks

Chloe, Alexis, De'Andre, Sebastian, Mya, Finley, Skylar, Jameson, Raegan

7. Write the standard form for the numbers below.

a) fifteen Sebastian, Carlos, De'Andre

b) two \_\_\_\_\_

c) ninety-nine Sebastian, Carlos

d) sixty Sebastian, Carlos, De'Andre, Mya

8. Write the expanded form of the number 1,998

Chloe, Finley, Mya, Jillian, Carlos, Alan, Daniel, Madi, Raegan, Cale, Jameson, Luke

9. What is the value of the underlined number?

a) 156 Chloe, Mya, Jillian, Carlos, Jameson, Luke

b) 308 Chloe, Jillian, Mya, Jameson

c) 152 Jillian, Jameson

10. Model the number 538 using the chart below.

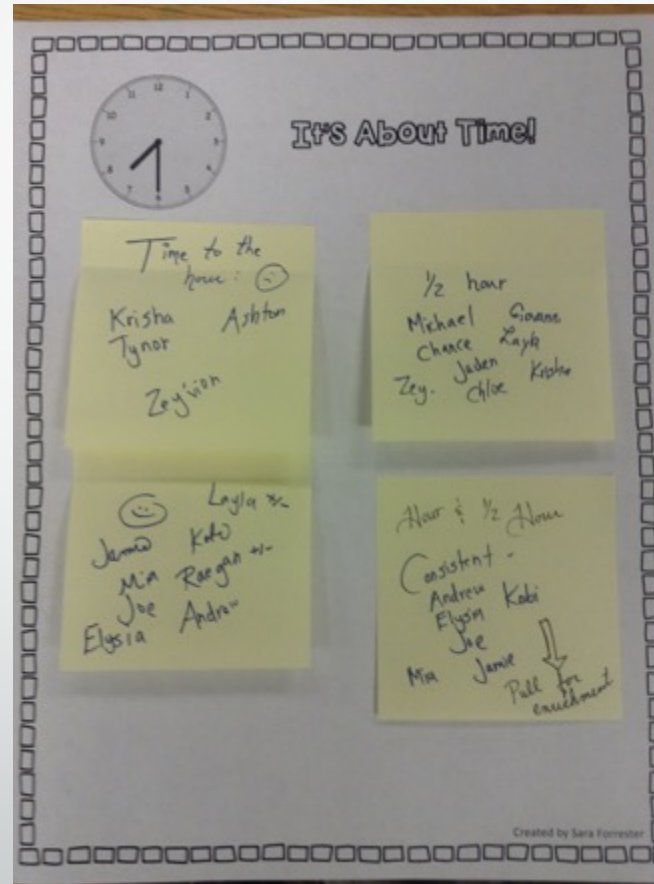
Carlos, Alan, Chloe, Mya, Jillian

| Hundred | Tens | Ones |
|---------|------|------|
|         |      |      |

4 corners

• Video


# Post-it groups





# Other

- Math journals, center recording sheets, homework
- Checklist
- Websites/programs that give you data
- Data notebook



# Implementation

- What is one thing you can go back and implement right away?



# Differentiation without Destruction

- Build confidence in all students by engaging them in productive struggle.
- Task, recording sheet look the same for all students
  - Secret icon for teacher (border, symbol)
- Change numbers, dice, representations

# Turn and Talk

- How do you differentiate tasks?

# Plan: Tasks

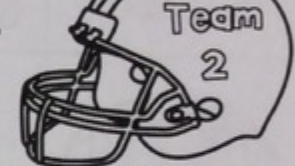
- Tasks that lend themselves to
  - Changing numbers
  - Multiple representations, materials
  - Changing levels of questioning
  - Scaffolding to build success and self-confidence





Team 1

ure out who won the game. Roll 3 dice to get a score for each team. Draw base ten blocks to model each score. Then write the correct symbol in the field goal.

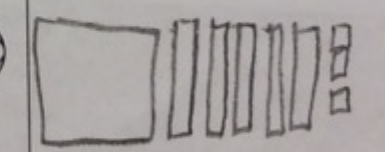
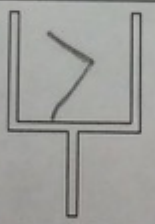
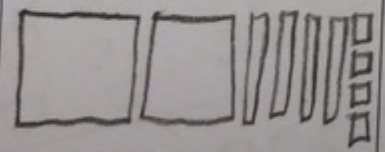
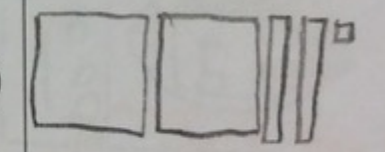
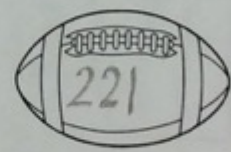
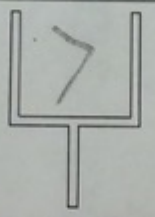
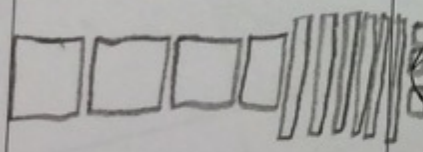
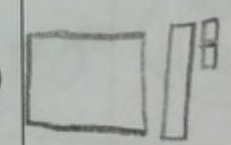
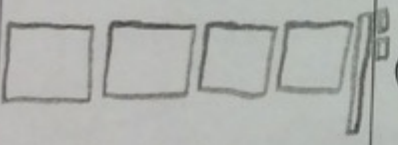
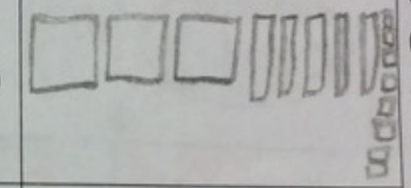
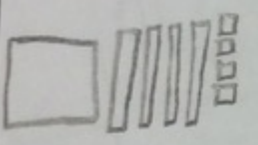
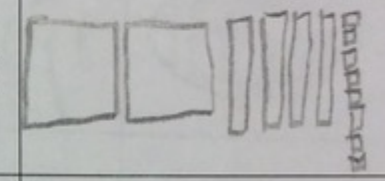
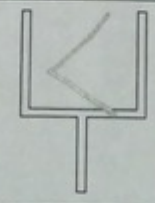
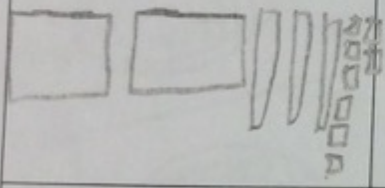


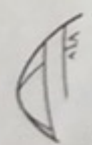
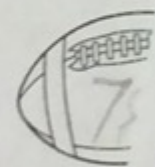
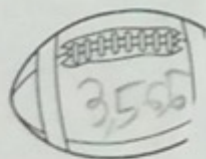
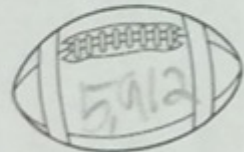
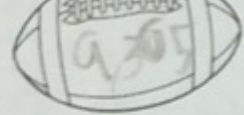
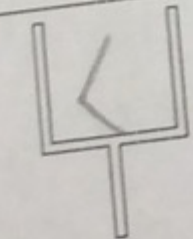
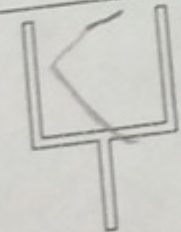
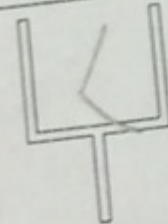
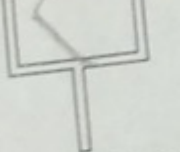
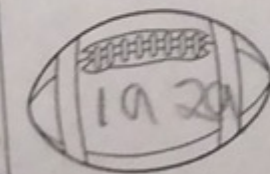
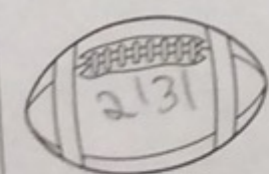
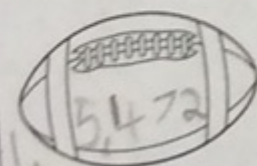
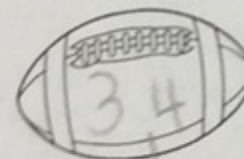
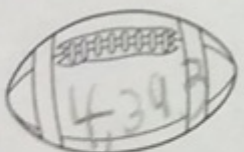
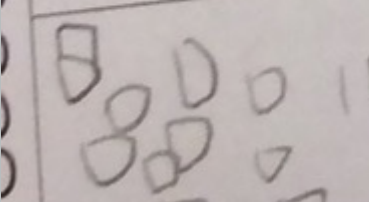
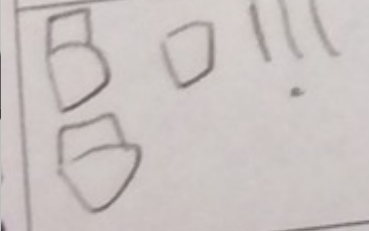
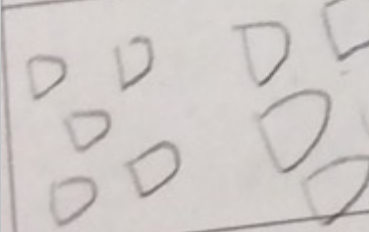
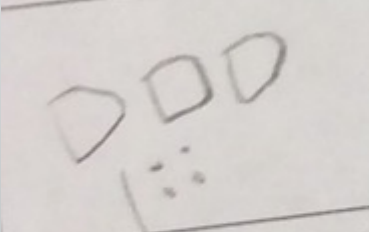
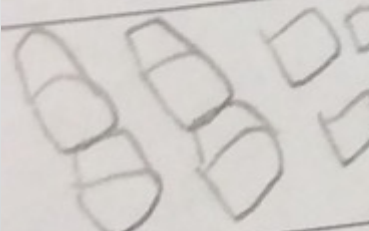
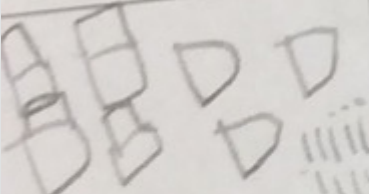
Team 2

Draw It

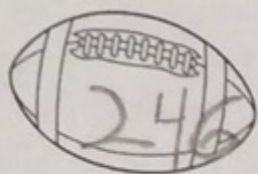
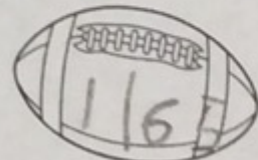
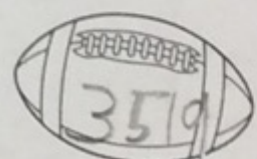
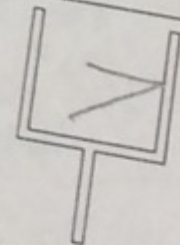
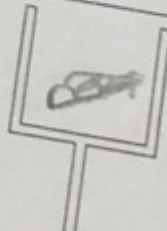
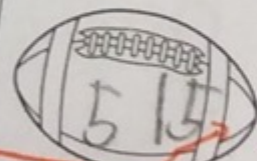
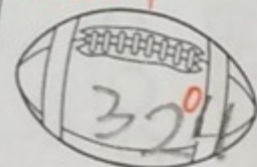
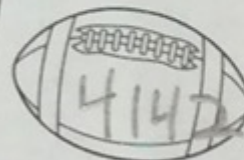
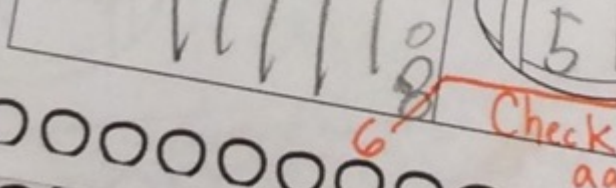
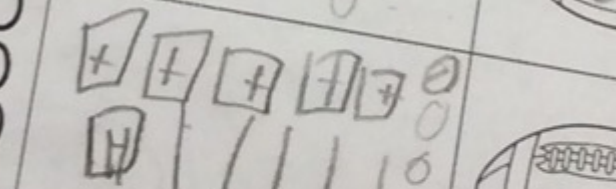
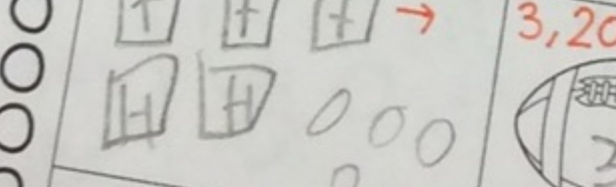
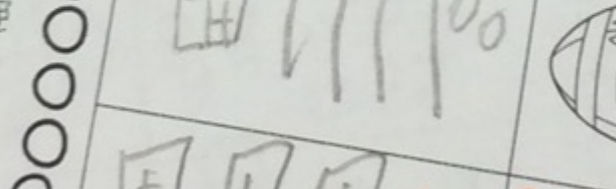
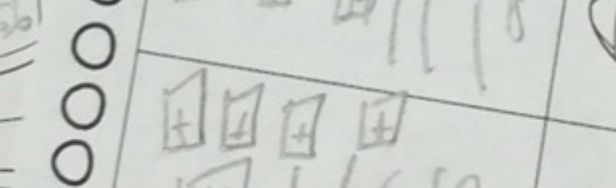
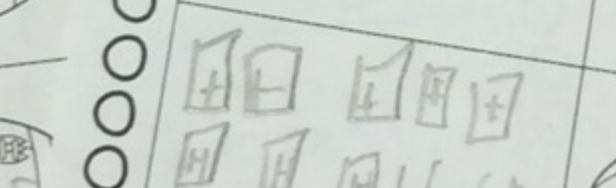
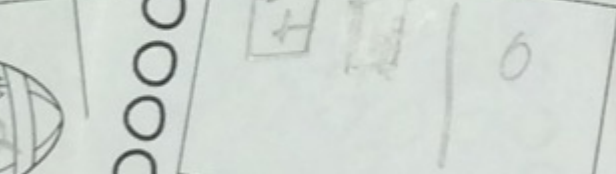
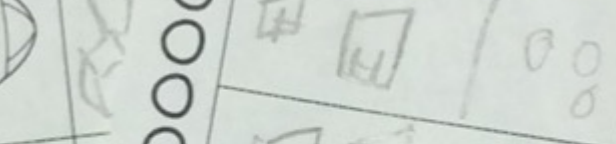
Compare the Scores:  $<$ ,  $>$ , or  $=$

Draw It



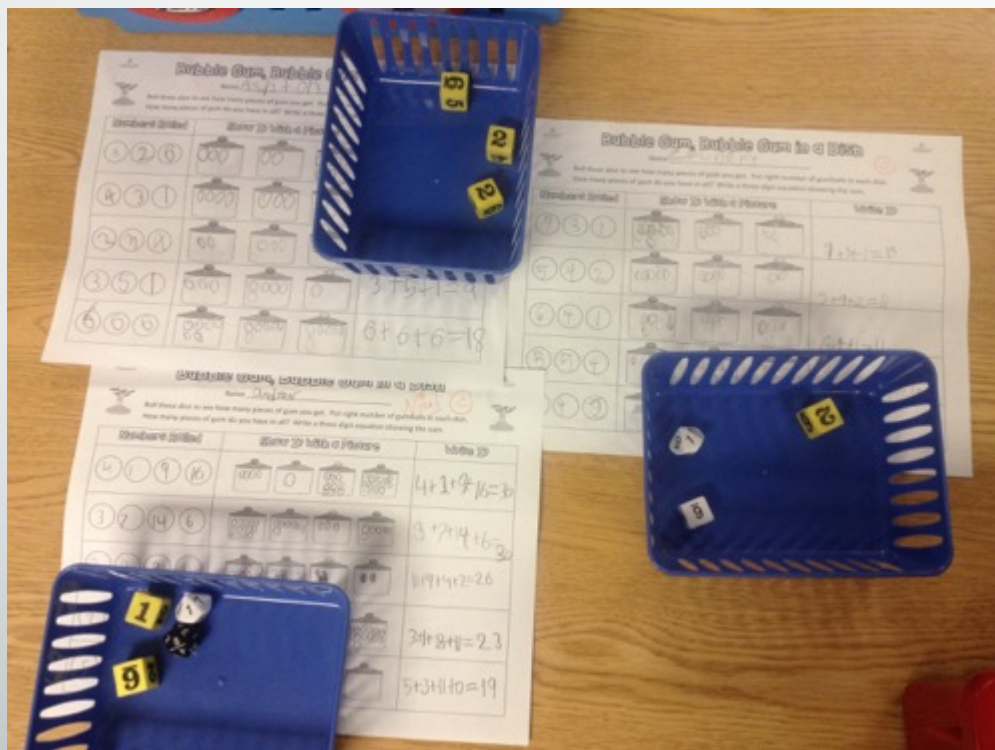


Handwritten notes or symbols in the margin.



3,204

6 Check this # again



# Student Choice



## Made to Measure choice board

Name \_\_\_\_\_

|  |  |  |
|--|--|--|
| <p><b>Choice 1:<br/>Longer</b></p> <p>Find at least 5 objects in the classroom that are longer than 10 unifix cubes. Record the name of each object and tell how many unifix cubes long it is. What did you notice about these objects?</p>                                  | <p><b>Choice 2:<br/>Shortest to Longest</b></p> <p>Use a crayon, a pencil, and a pair of scissors. Put them in order from shortest to longest. Draw and label your findings. Collect 3-5 more objects. Put them in order from shortest to longest. Record your findings.</p> | <p><b>Center 3:<br/>Sizing Up Shoes</b></p> <p>Trace an outline of your shoe and cut it out. Measure the length of your shoe using unifix cubes. Then measure the length of Shaq's shoe. Record your findings. What do you notice?</p>       |
| <p><b>Choice 4:<br/>Measuring Penny's World</b></p> <p>Create your own Penny. Measure her height and width using large paperclips, small paperclips, unifix cubes, and small cubes. Record your findings.</p>  | <p><b>Center 5:<br/>Scoop and Stack</b></p> <p>Grab a handful of cubes, stack them, then count them. Repeat two more times, so that you have three stacks. Order them from tallest to shortest. Record your findings.</p>  | <p><b>Center 6:<br/>Shorter</b></p> <p>Find at least 5 objects in the classroom that are shorter than 5 unifix cubes. Record the name of each object and tell how many unifix cubes long it is. What did you notice about these objects.</p> |
| <p><b>Center 7:<br/>Measure Mrs. F.</b></p> <p>Use the cutout to measure Mrs. F. using paperclips. Record your findings on your recording sheet. What do you think would happen if you measured Mr. Garner? Would you need more, less, or the same number of paperclips?</p> | <p><b>Center 8:<br/>Inching Along</b></p> <p>Using the inchworms, measure a stapler, pencil, math journal, ruler, and marker. Record your findings. Then, measure those items with a ruler using inches. What do you notice?</p>   | <p><b>Center 9:<br/>You Choose</b></p> <p>Pick ten objects in the room to measure using the nonstandard unit of your choice. Make sure you let Mrs. F. know the unit you are going to use before you get started. Record your findings.</p>  |



# Plan: Flexible Groups

- Mix up groups so students learn to work with all kinds of other students and to avoid type casting students.
- Individual, partner, small group work
- Partners and small groups change based on DATA from formative assessment, math journals, center work recording sheets
- Start with table mates and use gradual release



# Execute

- Opportunity to collect more data
- Opportunity to differentiate on the fly

# Check Back

- With the child directly: “Tell me what’s hard.”
- By looking at written work, watching the child work with representations
- By listening during partner/group work
- Prove it! Show me how you know.
- Check back tomorrow, next week, next month...