Making the Most Out of Math Workstations

And Guided Small Group Math Instruction

Ice Breaker

- Let's create a Tree Map with small groups about what Math Workshop is/What it is not.
- Think about how it looks, sounds, and feels

Traditional Math Instruction

Research

- Mathematical literacy is a serious problem in the United States
- 78% of adults cannot explain how to compute the interest paid on a loan
- 71% cannot calculate miles per gallon when on a trip
- 58% cannot calculate a 10% tip for a lunch bill

(Phillips, 2007)

Research

"there are persistent disparities in mathematics achievement related to race and income- disparities that are not only devastating for the individuals and families but also project poorly for the nation's future, given the youthfulness and high growth rates for the largest minority populations"

(U.S. Department of Education, 2008)

A Shift is Needed

- Lack of teaching time
- More demanding math standards
- New curriculum requirements
- Diverse needs of students

- Accelerated learners
- Struggling students

WHAT IS SMALL GROUP GUIDED MATH INSTRUCTION?

Small Group Guided Math

- A component of the math block
- Students learn in small flexible groups
- Students practice with their teacher, with each other, and by themselves
- Teachers provide specific interventions

Why it is Important?

"Effective mathematics teaching requires understanding what students know and need to learn and then challenging and supporting them to learn it well."

NCTM, 2000

Elements of Guided Math

- Provides a structure for differentiated instruction
- Creates flexible small groups
- Provides activities
- Offers immediate feedback
- Is data-driven

- Supports questioning and talk time
- Allows for re-teaching
- Scaffolds lessons
- Builds self-confidence
- Is standards based

Classroom Environment

"Modeling and think-alouds, combined with ample opportunities for guided and then independent problem solving and purposeful conversations create a learning environment in which students' mathematical understanding grows."

Laney Sammons

(author of Guided Math: A Framework for Mathematics Instruction)

Classroom Environment

- Encourage the use of manipulatives
- Compare
- Compute
- Categorize
- Question
- Estimate
- Solve Problems

- Write about their thinking processes
- Converse with each other

Whole Group vs. Small Group

Whole Group

- For everybody
- Happens everyday
- Includes mini-lessons
- Exposes kids to grade level skills, strategies, and standards
- For modeling

Small Group

- For 4-6 kids at a time
- 3-5 times a week
- Teach small group and/or push into stations
- For extra work on a skill
- For re-teaching

Forming Guided Groups

- Questions
- Diagnostic Tasks
- Formative Assessment
- Performance Tasks
- Observation
- Conferences
- Tests

Talk at Your Table

- How is Guided Math similar to Guided Reading?

WHAT IS A MATH WORK STATION?

Math Work Stations

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.

(Debbie Diller, 2011)

Math Work Stations

Math work stations are a time for students to practice problem solving with 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.

(Debbie Diller, 2011)

- Deep not wide
- Do not try to focus on everything
- Focus on your most important pieces
- Do not change stations every week
- Reuse materials to help thinking go deeper
- Add math talk
- "Stay in your lane"
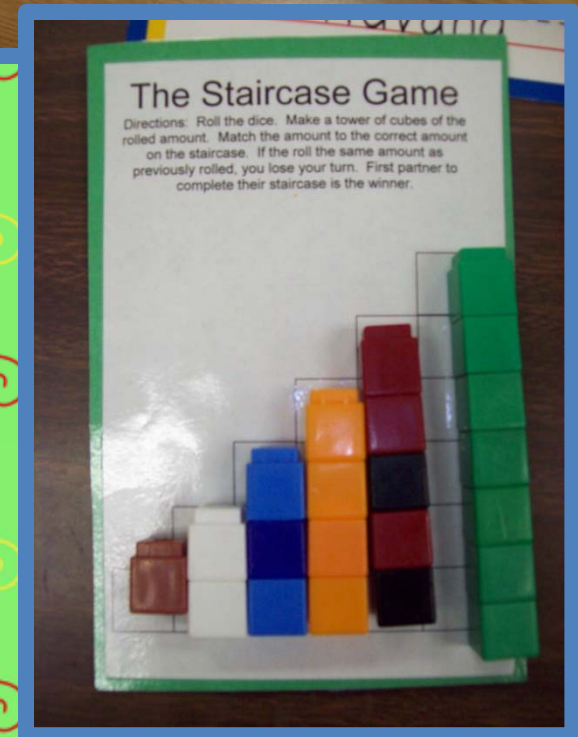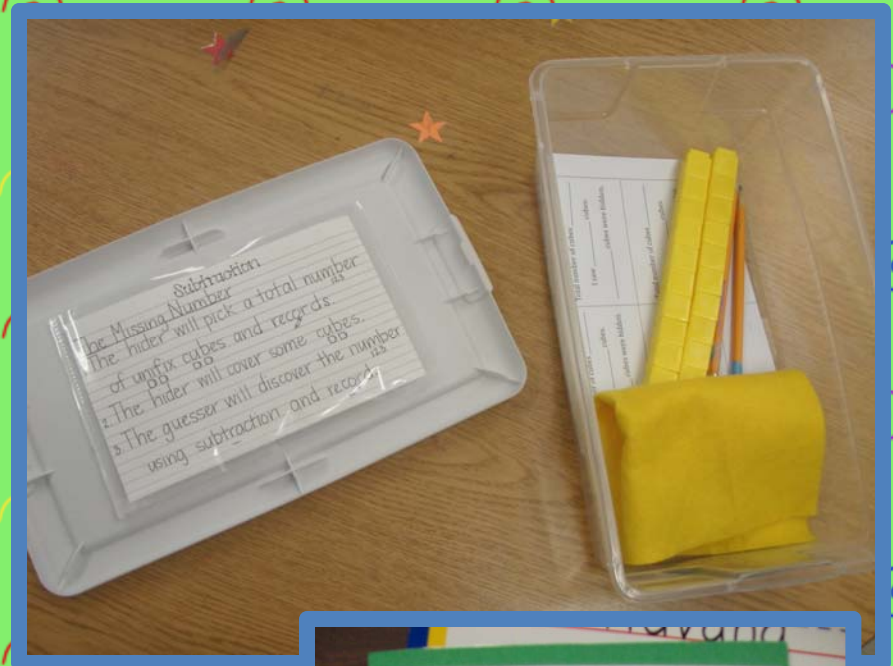
Talk at Your Table

- Turn and talk with the people at your table about the principle "deep, not wide."

- What does this principle mean to you and how can you use it when implementing math workstations and guided math instruction in your classroom?

Areas Within the Classroom

- Number areas where students will work
- Space numbers evenly
- Use every inch of your classroom
- Utilize computer and pocket chart spaces

Working With Partners

- Pair students to reduce the noise level and increase engagement
- Couple students who get along well together
- Utilize flexible groupings

- Use both parallel and partner activities
- Allow for individual work

Using Instructional Materials

- Use materials previously used in whole group lessons
- Model and review
- Caution against moving materials too quickly
- Avoid commercially made centers

- Utilize thoughtfully planned stations that produce exploration and deeper thinking

Variety of Activities

- Choice is the key to success
- Controlled choice
- Use the same materials at stations as used in whole group lessons
- Include all of the materials needed

- Offer several choices to eliminate the problem of "early finishers"
- Start small

Independent Exploration

- Avoid worksheets, Bingo games, and flashcards
- You should hear math vocabulary being used
- Students should solve problems, and use reasoning skills

- Students represent their learning through drawing, writing, and dramatization

Differentiated Instruction

- Observe students at work
- Gather data to make informed decisions
- Record what you hear and see
- Plan for each student's need

- Meet individually and with small groups

Differentiated Instruction

- Use an anecdotal system
- Carry a clipboard
- Record observations on index cards
- Prepare a card for each student
- Jot down notes

- Date notes and keep them brief
- Observe a few students each day

Differentiated Instruction
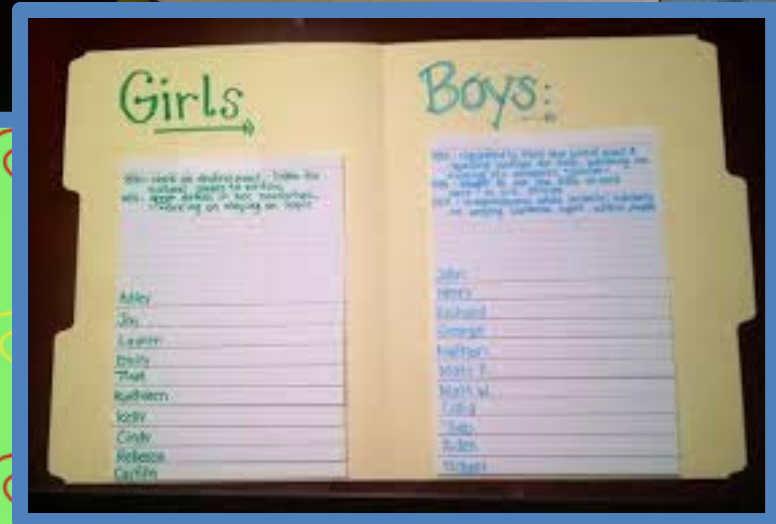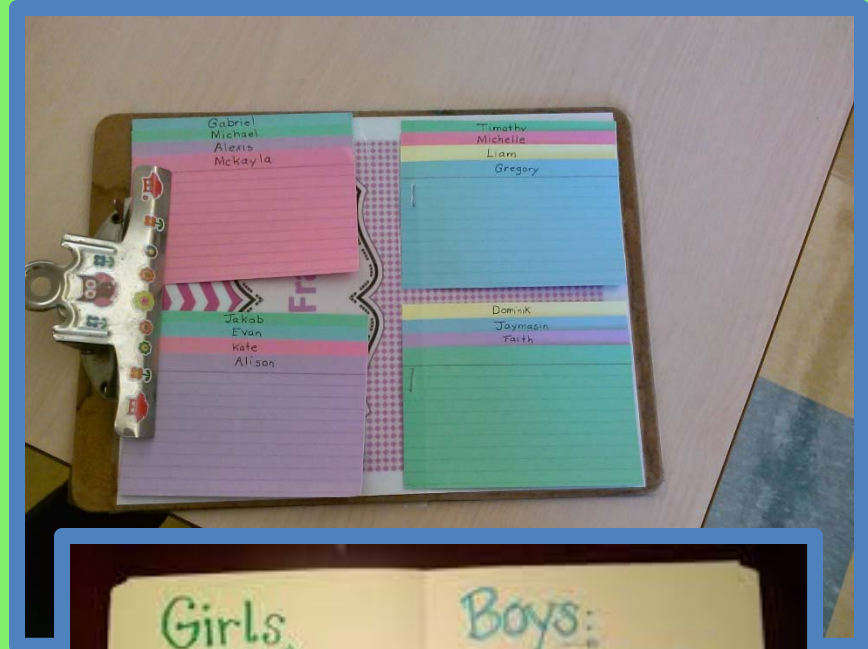
Gradual Release Model

- Demonstrate how to get materials out and organize them
- Model how to work quietly
- Show students how to play the game
- Teach students how to clean up

- Do several times before releasing responsibility
- Use math language

Table Activity

- What parallels do you see between literacy stations and math work stations?

- How are math work stations different from traditional math learning centers?

- Use the chart paper at your table to create a t-chart. Record your ideas.

- Be prepared to share out.

ORGANIZING AND MANAGING MATH MATERIALS

Organizing Manipulatives

- Sort and label math manipulatives that are being stored
- Keep a basket or container for materials that get left out of their tub (missing pieces)
- Label the shelf with numbers for easy clean up

Teaching with Manipulatives

- Build in exploration time
- Limit the amount
- Be explicit
- Be consistent
- Demonstrate
- Practice
- Speak in complete sentences

- Avoid paper manipulatives
- Use math mats
- Set a purpose
- Let them use them
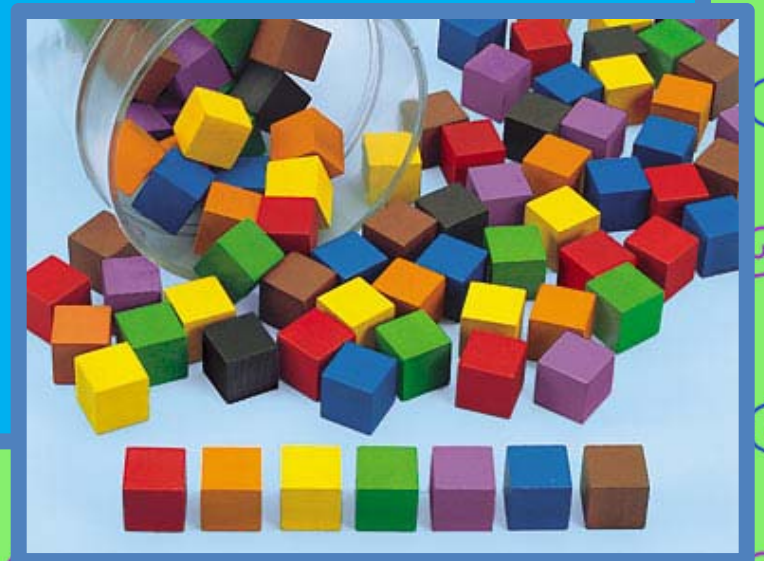
- Less is more
- Use what you have
- Don't get caught up in buying so much stuff
- Use 1 or 2 big ideas (a main focus)
- Use fewer materials and pieces in stations
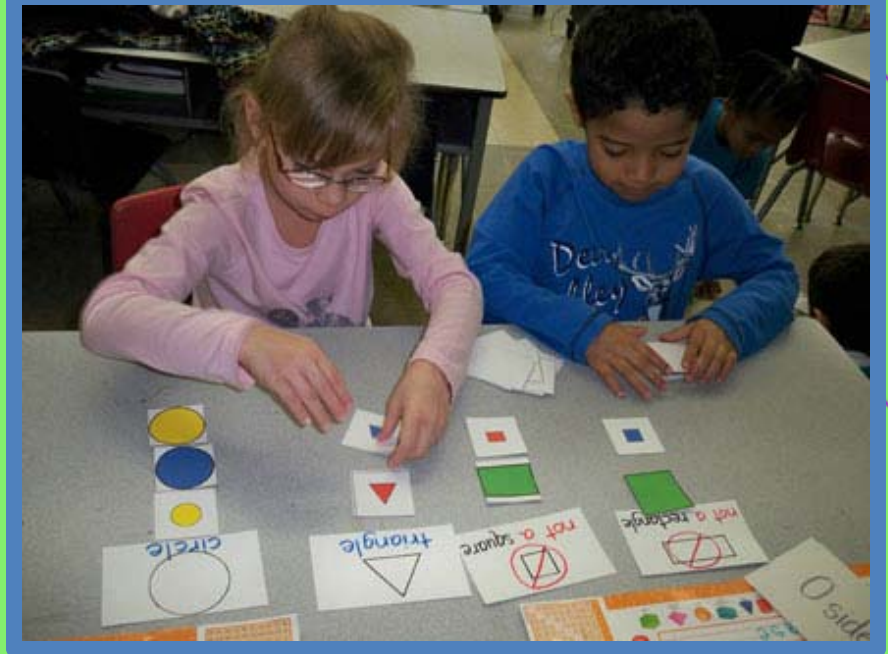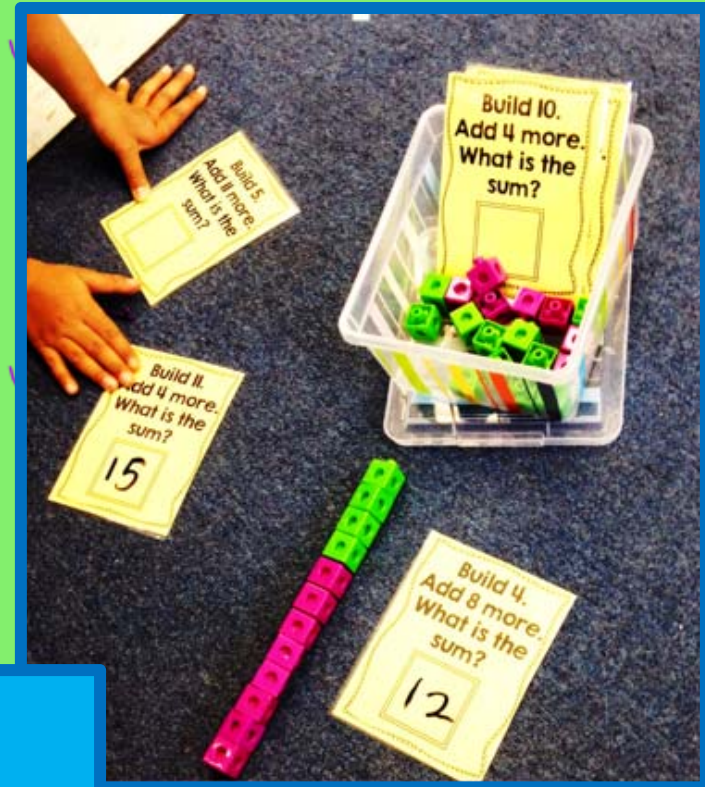
Talk at Your Table

- Turn and talk with the people at your table about the principle "less is more."

- What have you learned about this principle and how can you apply it when implementing math workstations and guided math instruction in your classroom?

Setting Up the Tubs

- Use clear plastic containers and lids that stack
- Include paper and pencils Pencil flags
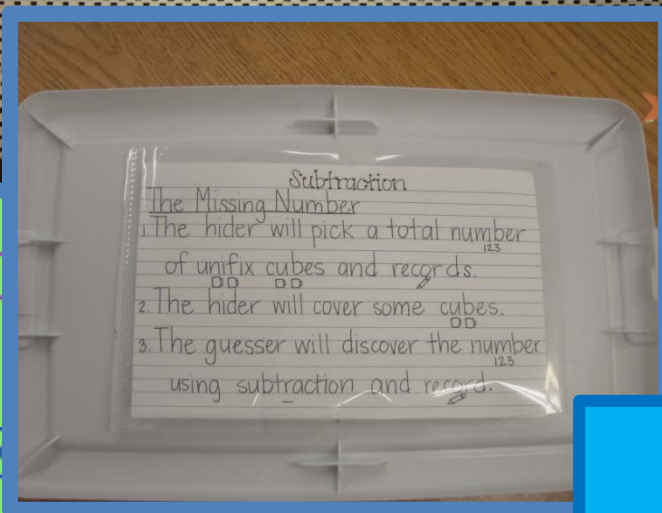- Add all of the materials needed for the activity
- Number the tubs

Setting up the Tubs

include all items that students need to do the activity

Setting up the Tubs

Pencil Flags

Subtraction
The Missing Number
1. The hider will pick a total number of unifix cubes and records.
2. The hider will cover some cubes.
3. The guesser will discover the number using subtraction and record.

I Can Lists

Talk at Your Table

- Which ideas on organization did you find most helpful?

- Share your three favorite ideas with the others at your table.

- Commit to trying at least one of them.

Table Activity

- Look at the math manipulatives on your table.
- Think about the principles we just discussed.
- Discuss different ways you can use the same manipulative to practice different concepts.
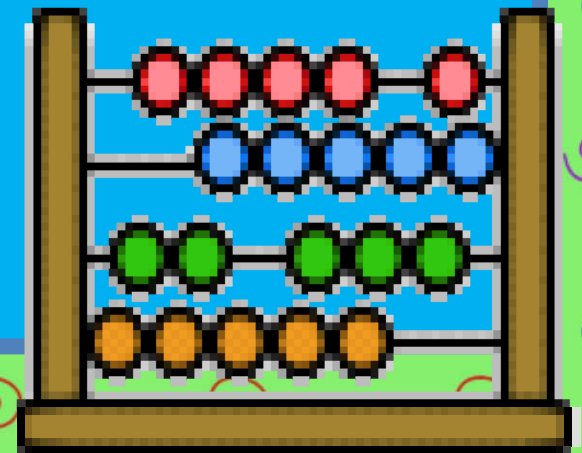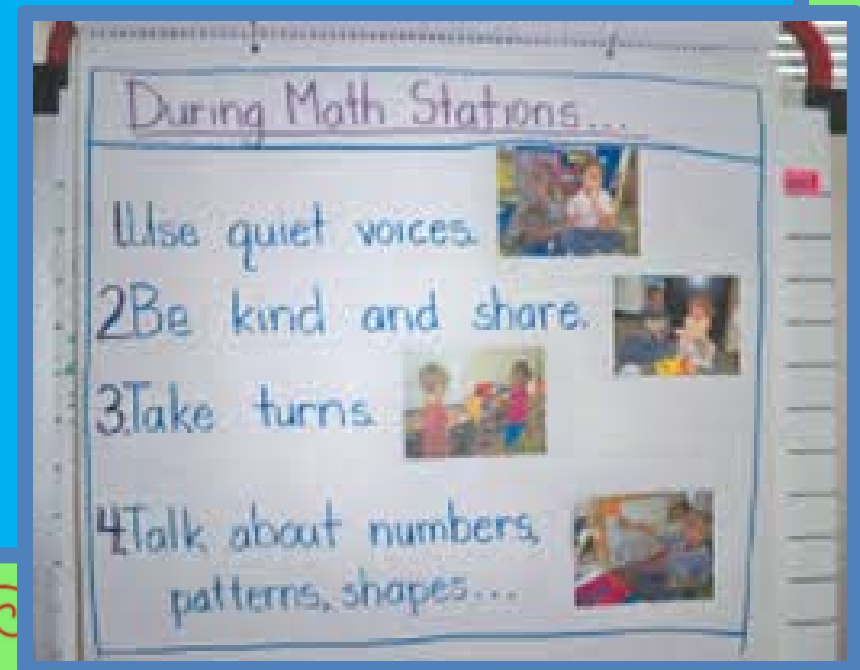
GETTING STARTED WITH MATH STATIONS

Getting Started

- Start with a partner game
- Everyone gets materials & plays
- Teach the game
- Write directions together
- Make the "I Can" list together
- Practice playing

Introducing a New Station

- Gather materials
- Place in a labeled container
- Show the materials
- Discuss what can be done at the station
- Make an "I Can" list
- Observe & circulate

- Give assistance
- Brainstorm Look Like, Sound Like, & Feel Like

During Math Stations...

1 Use quiet voices.
2 Be kind and share.
3 Take turns.
4 Talk about numbers, patterns, shapes...

Station Mini-Lessons

- How to share materials
- How to take turns
- How to decide what to do
- How to solve a problem
- How to switch to the next station

- How can I go for help
- How can I put things away
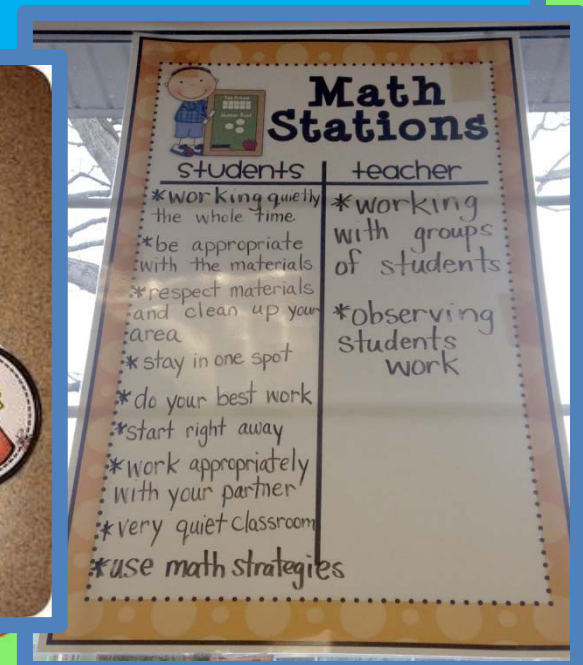
Table Activity

- Let's do a group review. Tell someone at your table something you learned about mini-lessons.

- Think about everything that students might possibly not do right concerning math stations. Incorporate one of those ideas into a mini-lesson.
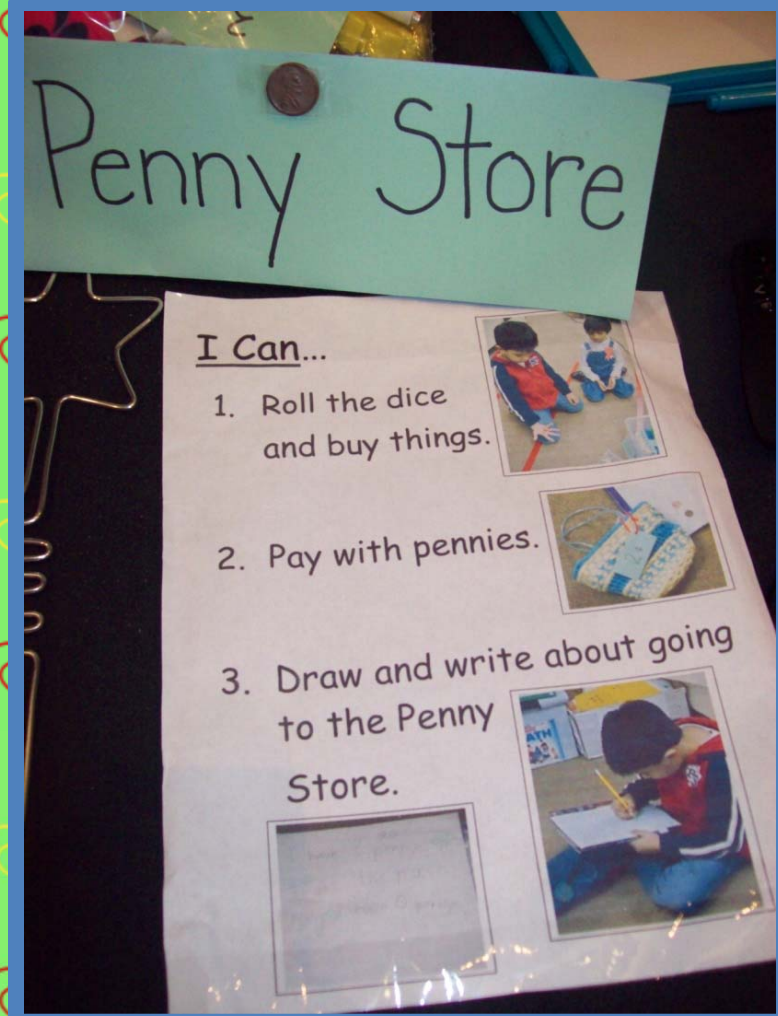
- Share your mini-lesson at your table.

Anchor Charts

- Make for those ideas you want to return to time and time again
- Need a title
- Use color
- Not too wordy
- Use borders
- Has visuals
- Based on academic vocabulary
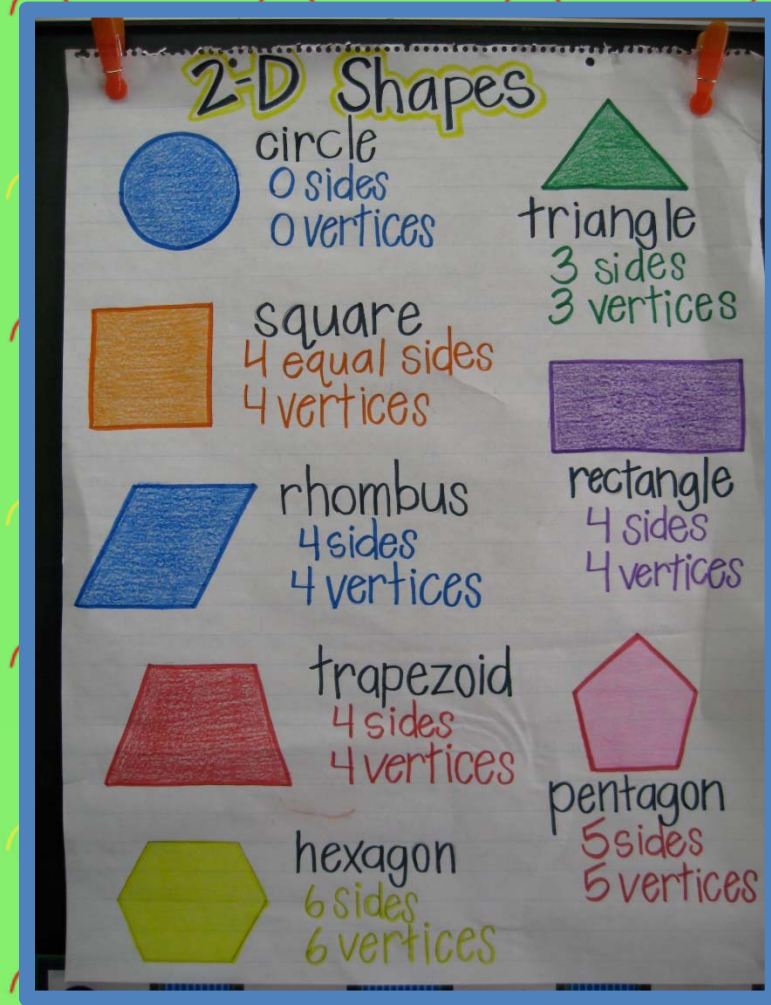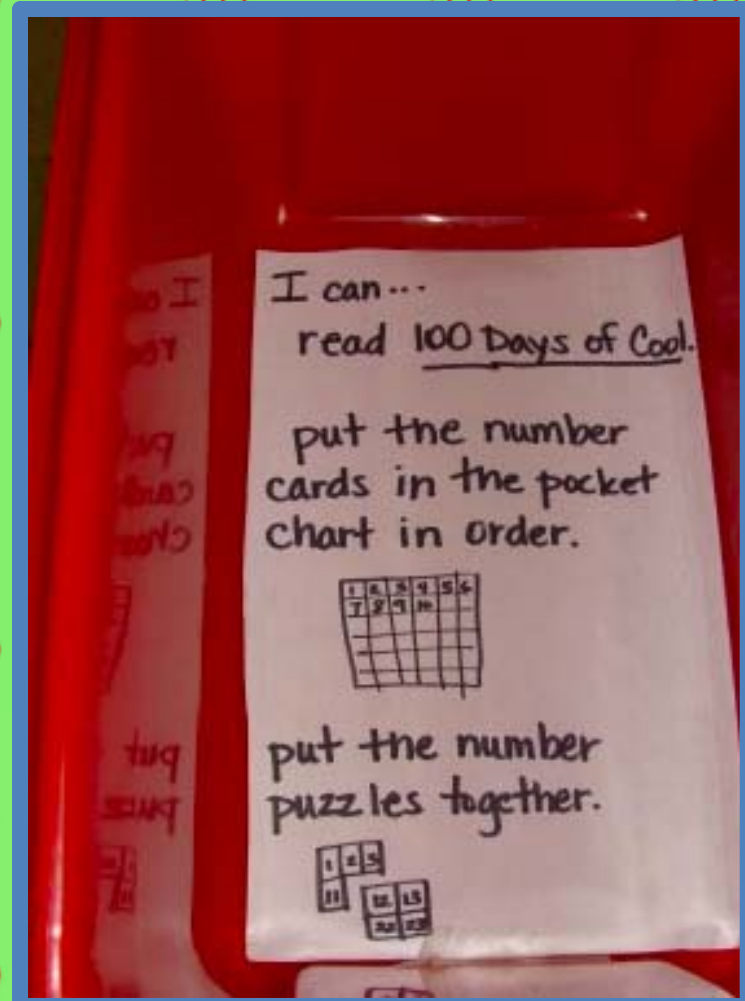
Making "I Can" Lists

- Take pictures of students playing the game or doing the activity
- Print them out
- Use them to make the "I Can" lists
- Add picture clues if not using photographs

Penny Store

I Can...
1. Roll the dice and buy things.
2. Pay with pennies.
3. Draw and write about going to the Penny Store.

Making "I Can" Lists

I Can:
tell the story
with the cubes

make a prediction
and write the
next page

use pictures or photographs

I can...
read 100 Days of Cool.

put the number
cards in the pocket
chart in order.

put the number
puzzles together.

Math Talk Cards

- Use kid friendly language
- Don't be too wordy
- Use black ink and highlight special words in another color
- Add a simple visual
- Borders (speech bubbles)
- Laminate
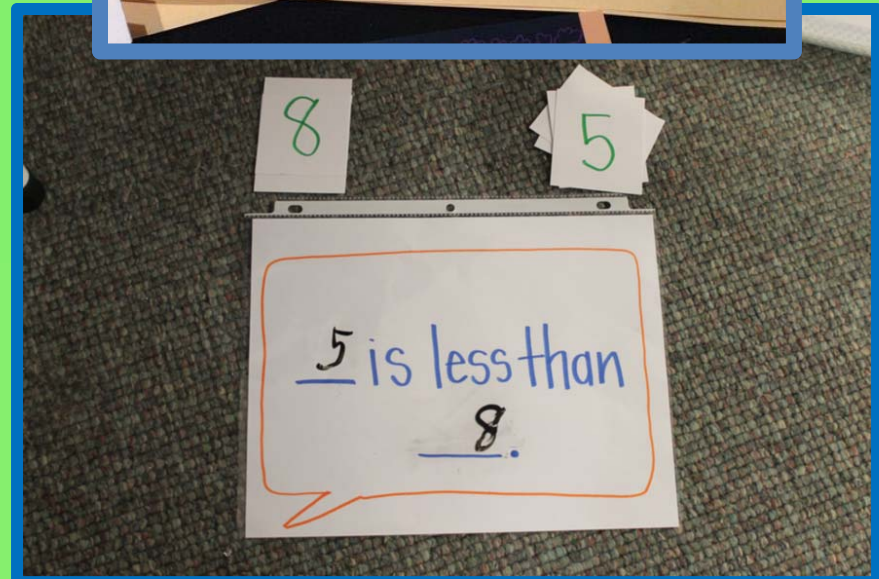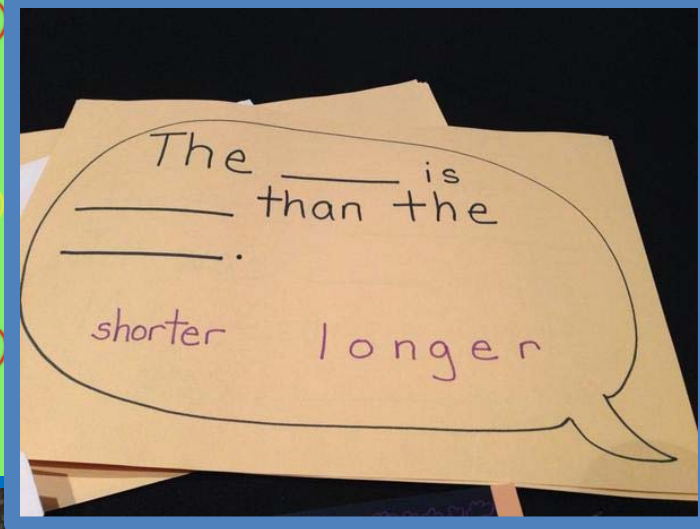
Math Talk Stems

- How did you get that?
- Did anyone try something that didn't work?
- How do you know?
- Can you show me another way?
- How can you make a drawing to explain your thinking?
- Did anyone do it differently?
- What would happen if? Why?
- Can anyone tell me something about…

Table Activity

- Think about what we have discussed about using math language, math stems, and creating math talk cards

- Use the markers and cardstock at your table to make several math talk cards for a math station that you can use in your classroom
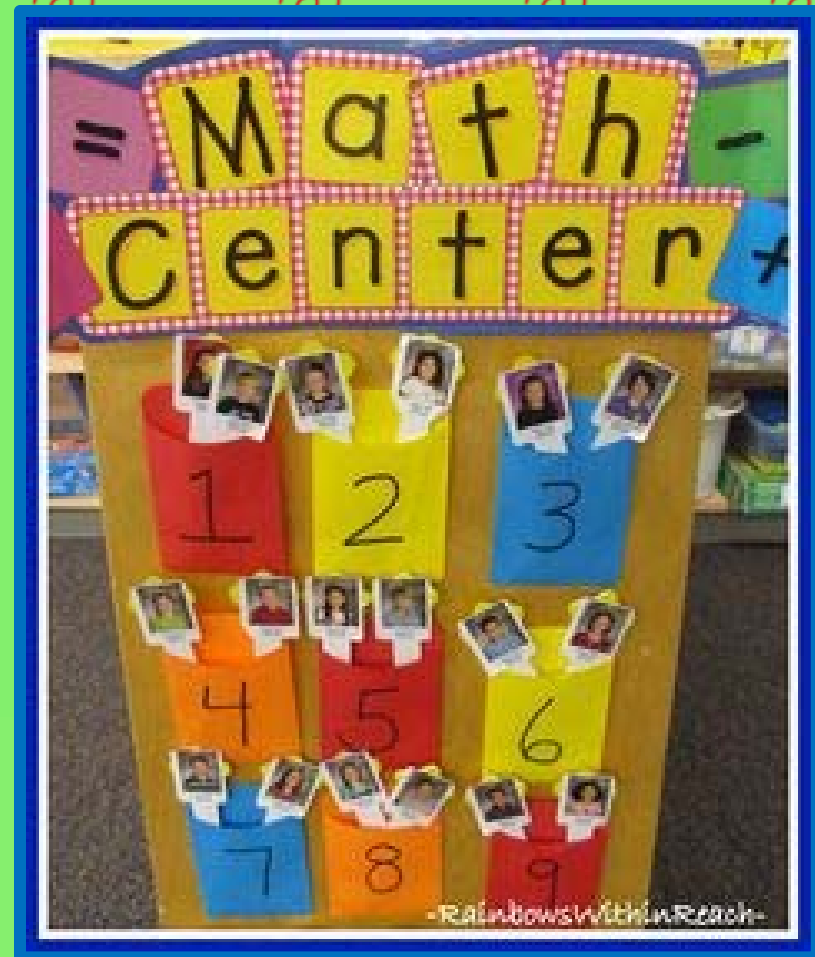
Management Boards

assign jobs to students

call one group at a time

Management Boards

Talk at Your Table

- What questions do you still have concerning small group guided math and math work stations?

- Record your questions on sticky notes.

- Place them on the board at the front of the room.

Implementation Time Frame

- **Week 1 & 2 –** introduce math routines (signals, getting and returning materials, station areas)
- Introduce one manipulative a day
- Show students how to use math materials

- **Week 3 & 4 –** introduce one station a day
- Start with easy
- Add rigor over time
- Connect your stations to your teaching and standards
- **Week 5 & 6 –** think about adding small groups

- Slow down to speed up
- It takes 4-6 weeks to get started
- Start with something that can be practiced by the whole class
- Make "I Can" lists
- Small groups are not started until about the 6th week
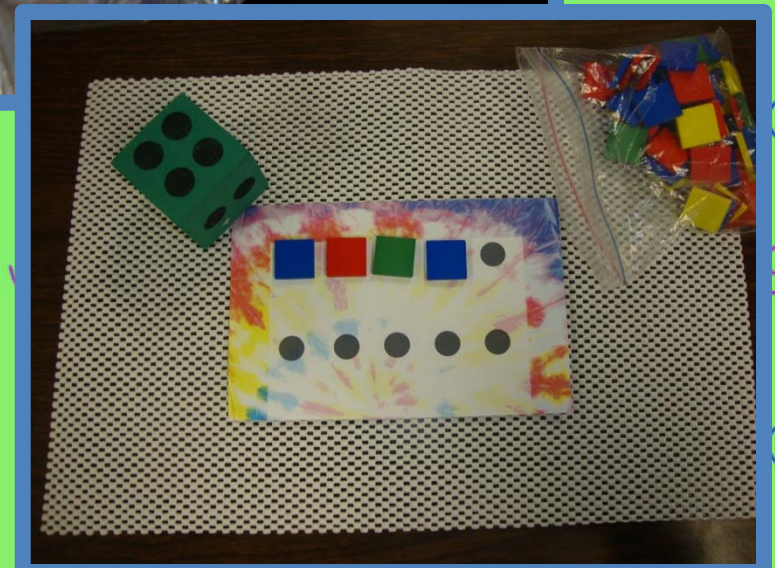
Talk at Your Table

- Turn and talk with the people at your table about the principle "slow down to speed up."

- How do you see this principle helping the students in your classroom?

- What can you do in your classroom to "slow down to speed up?"
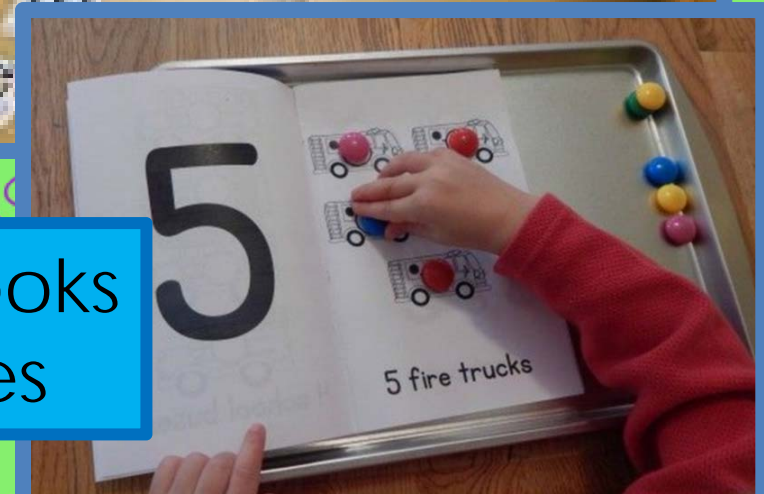
Beginning Number Concepts

grab and graph objects

counting and comparing games

counting books and games

Beginning Number Concepts
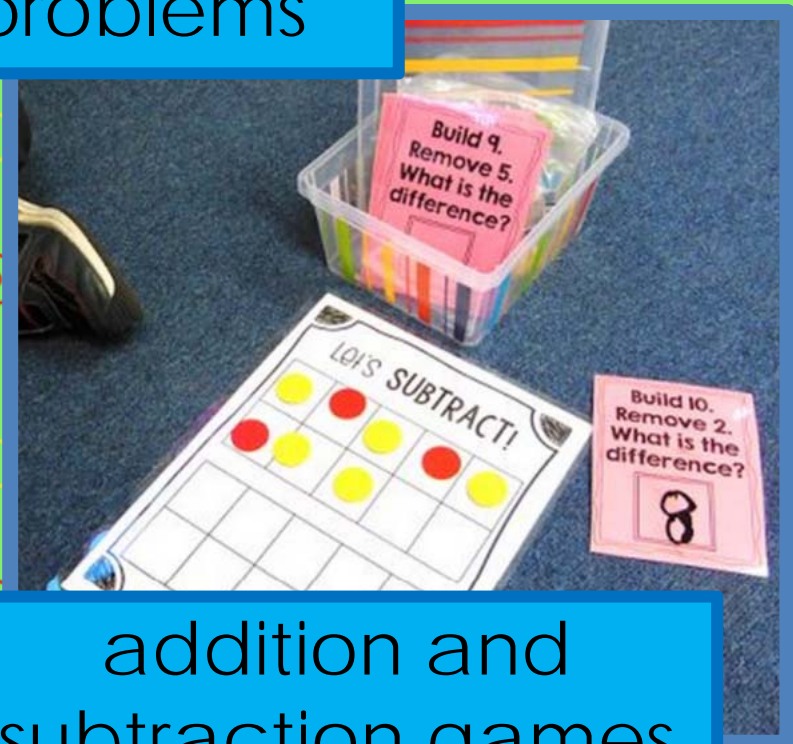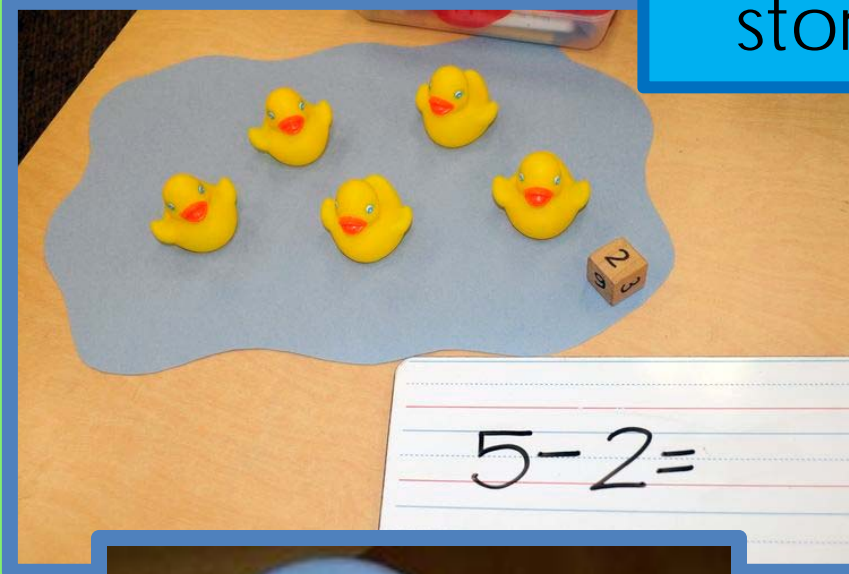
play odd and even

estimation jars

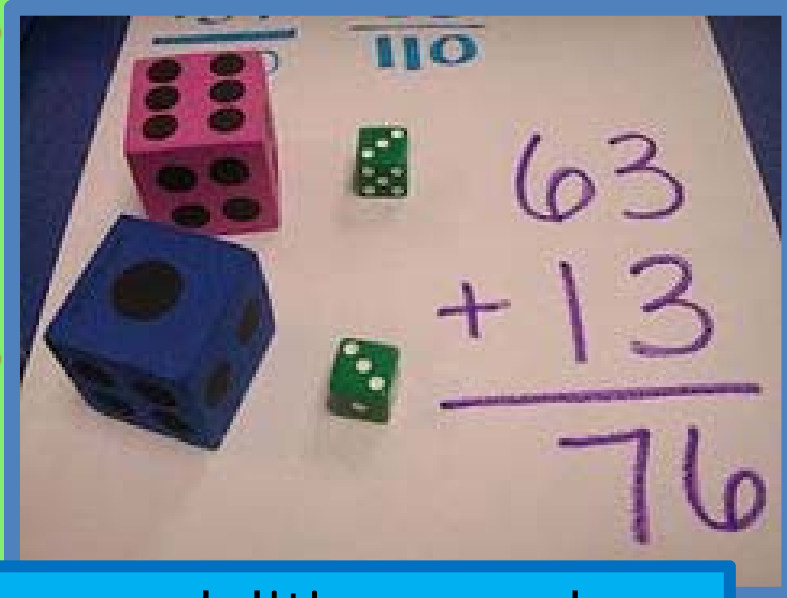counting money

Addition and Subtraction

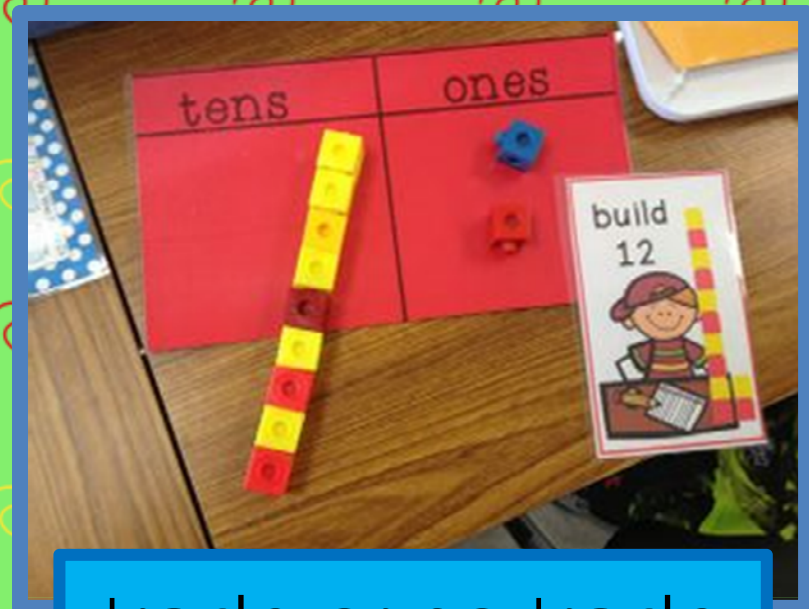story problems

addition and subtraction games

how many are hiding games

Addition and Subtraction

addition and subtraction games

trade or no trade

use mental math strategies to solve two digit problems

Table Activity

- Look at the math TEKS for the first six weeks.

- Brainstorm a list of math workstation activities that could be used to reinforce one or more of the TEKS covered in the first six weeks.

- Be ready to share out with the group.

GUIDED MATH AND WORK STATIONS: WRAPPING IT ALL UP

Finding Resources & Materials

- Just ask
- Ask colleagues
- Ask coaches
- Ask librarians
- Ask parents
- Ask students
- Ask administrators

- Don't have a "make and take" to create workstations
- Have a "station fair"

What Makes a Good Station?

- A station that is engaging
- A station with clear, easy to follow directions
- A station that "stays in your lane"
- A station that self-corrects
- A station that has an objective

What Makes a Bad Station?

- A station that is too difficult to do without teacher assistance
- A station that allows students to practice a skill incorrectly over and over
- A station that is not aligned with the TEKS
- A station that has not been taught yet in class
- A station that does not have a clear objective

Talk at Your Table

- Write it, Apply it: Write down four ways you are going to apply something you have learned from this session.

- Share out at your table.

References

Diller, Debbie. (2011). Math Work Stations: Independent Learning You Can Count On, K-2. Stenhouse Publishers: Portland, Maine.