

Establishing Math Centers

Why have centers in your classroom?

- Allow students to explore math skills/concepts
 - Provide additional practice for previously taught skills/concepts
 - Provide repetition for students having difficulty with a skill/concept
 - Provide a challenge for students who have mastered a skill or concept
- Provide meaningful math tasks for students
 - To allow the teacher to focus on a guided math group
 - To engage students who have completed classwork
- Promote differentiation of learning
 - Target different learning styles through varied center tasks
 - Allow for student choice
 - Allow the teacher to modify and personalize tasks

What makes a good center?

- Center is engaging and attractive
- Clear directions
- All materials are available and organized
- Students can be successful on their own

How to Introduce Centers

- Introduce one center at a time.
- Have directions displayed and a sample/display when appropriate.
- Explain procedures for use of the center, including center clean up.
- Teach the center activity to the class. Explain all rules and procedures.
- Have students practice using the centers as you monitor their behavior.
- Consistently enforce your expectations. Praise students who use centers correctly. Take away the privilege for those who abuse it.

Possible Math Centers

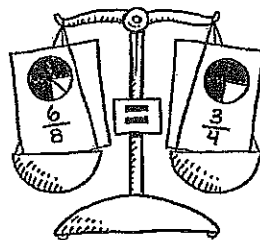
- Problem Solving Center
 - Problem of the week
- Writing Center
 - Pose a math writing task
- Math Words Center
 - Vocabulary activities
- Graph Center

- Graphs to create or analyze
- Counting Center
 - Different objects to count
- Math Facts Center
 - Varied games
- Measurement Center
 - Predicting and measuring objects
- Geometry Center
 - Hands-on or visual geometry explorations

Tips for Successful Centers

What can you do to ensure centers are successful and productive?

- Managing the supplies/materials?
 - Create simple centers.
 - Have all materials (and materials lists) at each center.
 - If possible, have a student helper inventory centers.
- Managing student behavior?
 - Determine how and when students can visit centers.
 - Discuss expectations.
 - Scatter centers throughout the room (if students remain at centers).
 - Teach procedures. (Introduce one at a time.)
 - Participation is a privilege.
- Ensuring productivity?
 - Check for accountability. Work completed?
 - Discuss center tasks at end of class or end of week



Integrating Guided Math Groups into the Math Classroom

Whole-class Introduction

Introduces all students to the objective.

- Might be:
 - Pose an introductory problem for students to discuss
 - Read a piece of math-related literature to set the context for explorations
 - Model a skill/Demonstrate an algorithm
 - Create a concept web to generate talk about a math topic (e.g., polygons, measurement, addition, division, bar graphs)
- Generally includes partner sharing and full-class discussions
 - Think-Pair-Share
 - Partner tasks (e.g., solving a math problem or doing 2-3 computations)
- May provide assessment to guide the grouping of students later in the lesson.
 - Teacher questioning to assess their current understanding
 - Partner talk so teacher can move through room hearing student thinking
 - All-pupil response techniques (e.g., pinch cards)
- Can last 10 minutes or more, dependent on the skill

Guided Math Groups

- Small groups of students who receive guided instruction related to the specific math objective
- Opportunity to incorporate manipulatives
- Opportunity to restate, clarify concepts
- Opportunity to assess in smaller group setting
- Opportunity to ask specific questions
- Opportunity to personalize activities

How are groups formed?

- Groups are flexible - students can move in and out of groups based on their changing needs
- Students are chosen and grouped based on formative assessment
 - The formative assessment often relies heavily on teacher observations and judgments about what a student needs - adjustments are a part of the process

Helpful assessment techniques

- Testing (formal) or Quick checks (2-3 quick items)
- Teacher/student conferences
- Small group conferences
- Observations of students at work
- Listening to student talk during group or class sharing
- Analyzing student work samples

What might we observe in a guided math group?

- Students solve the class problem *with manipulatives and teacher guidance.*
- The teacher models a computation skill *using a think-aloud technique (and maybe modeling with visuals)*, and then observes students at work on a similar task.
- Students *receive extra preparation* for the class task (e.g., developing specific vocabulary, reviewing a past skill).

Sample Guided Math Lesson - Addition

Skill: Using pictures, manipulatives, and number sentences to show addition

Whole Class:

Read the story *Rooster's Off To See The World* by Eric Carle and discuss adding animals as Rooster went off to see the world.

Write addition number sentences on the board as you discuss the ideas.

Assignment:

Have students work with partners to complete the following tasks:

Task 1: Work together to solve the problem: How many animals went off to see the world altogether? Explain how you know.

Task 2 (if they complete #1): Play *Double It* with your partner.

Guided Math Group (struggling students)

- Use the templates in the book to make manipulatives of the animals.
- Reread the story and act out some addition parts.
- Pose some questions for students to solve. They may use the animal templates (e.g., "How many cats and frogs went off to see the world?").
- Students work in pairs and the teacher listens to their thinking and asks questions to guide their thinking.
- The teacher might use a think-aloud technique as she draws a picture to solve a similar problem.
- If time, begin the class task with them, asking lots of questions to get them focused on the task. Have them complete it with their partners at their seats.

Summary

Have students share solutions and strategies for the class problem.

Double It

Provide students with 20 counters. Each student will roll a 1-6 number cube and ask students to make a row with that number of counters. Ask them to double it by making another row with that number of counters. Have them count to find the sum. Record the addition number sentence. Who has the most? Each will roll another number and repeat the process.

Ask students how they will know they are doubling when they see an addition number sentence. Do they notice that both addends in the number sentence are the same? Do they understand that means the size of each group is the same? Ask questions to guide students in observing the connection between the numbers in the equation (the same numbers) and the number of counters in each group (the same size groups).

Modifying Math Tasks

Personalization

Mrs. Smith's students were sorting cubes into bags. They put 16 cubes in each bag...

Mrs. O'Connell's second graders were sorting candy corn into bags. They put 16 pieces in each bag...

Data

Carol had 2 nickels and 3 pennies. How much money did she have?

Version #2 - Carol had 1 nickel and 1 penny. How much money did she have?

Version #3 - Carol had 3 nickels and 3 pennies. How much money did she have?

Readability

Annie put 6 grapes on her plate. She put 3 strawberries on her plate. How many pieces of fruit did she put on her plate?

Annie had 6 grapes and 3 berries.
How many pieces of fruit did she have?

6 grapes
3 berries
How much fruit?

Tools

Would students benefit from manipulatives, calculators, number lines, hundred charts...?

Output

Size of work space
Size/amount of lines for writing
Show work using *words, pictures, and/or numbers...*
Tell vs. write

Modifications to Support Specific Students

Consider some of the following modification to support struggling students:

Quantity

Modify the number of items that the student is expected to complete.

Time

Modify the time allowed for the task.

Level of Support

Increase the amount of assistance given (i.e., join a small group to provide guided support while others do a task independently, provide personal conferences to look over the student's work, or assign a peer buddy for support).

Input

Modify the instructional delivery (i.e., use visual demonstrations, allow the student to work with a partner, break apart multi-step tasks, or provide sentence starters for writing tasks).

Tools

Allow the student to use tools as resources (e.g., manipulatives, hundred charts, multiplication tables, or calculators).

Difficulty Level

Modify the skill level (i.e., simplify the readability level of task directions, or assign similar questions with a different level of difficulty).

Output

Modify how the student shows understanding (i.e., instead of requiring the student to answer a problem in writing, allow the student to respond verbally or using a word processor, or allow the student to list items rather than write complete paragraphs).

Participation

Modify the student's level of involvement in the task (i.e., assign a group recorder so the student can simply add her ideas to the discussion.)

Resource Exploration

- **Using the flash drive, drag the *Guided Math* folder onto your desktop.**
- **This folder contains the graphic organizer, PPT and the station directions from the Guided Math session.**
- **When playing the slide show in “Slide Show” mode, the video and web links are “click and go” ...**

Resource Exploration

- Mandy Gregory's Math Center
http://www.mandygregory.com/guided_math_groups.htm
- Guided Math: Cobb County Schools
http://mountainview.typepad.com/guided_math/what-is-guided-math.html
- **GUIDED MATH: Practical Strategies (pdf download)**
<http://mathconference.wiki.ciu20.org/file/view/Guided+Math.pdf>
- Guided Math: A Teacher's Guide to Guided Math
<http://www.guided-math.com/>