Guided Math
Small-Group Lessons
For
Targeted Instruction

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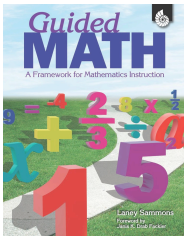

GUIDED MATH: A FRAMEWORK FOR MATHEMATICS INSTRUCTION

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Menu of Instruction

Daily: Classroom Environment of Numeracy
A classroom where students are surrounded by math: real-life math tasks, data analysis, math word walls, instruments of measurement, mathematical communication, class-created math charts, graphic organizers, calendars and evidence of problem solving.

Daily: Calendar Math/Morning Work
This daily appetizer prepares the palate for the following entrees with Math Stretches, calendar activities, problems of the day, data work, incredible equations, review of skills to be maintained, and preview of skills to come.

Your Choice: Whole Class Instruction
An excellent teaching strategy when students are working at the same level of achievement, to introduce lessons with an activating strategy, for teacher modeling and think alouds, for read alouds of math-related literature, to review previously mastered skills, as preparation for work in cooperative groups, or for paper and pencil assessments.

Your Choice: Small Group Instruction
Students are instructed in small groups whose composition changes based on their needs. The individualized preparation for these groups offers tantalizing opportunities to introduce new concepts, practice new skills, work with manipulatives, provide intensive and targeted instruction to struggling learners, introduce activities that will later become part of Math Workshop, conduct informal assessments, and re-teach based on student needs.

Your Choice: Math Workshop
Independent work by students either individually, in pairs, or in cooperative groups. The work may be follow-up from whole class or small group instruction, practice of previously mastered skills, investigations, math games, math journals, or interdisciplinary work.

Daily: Conferencing
To enhance learning, teachers confer individually with students, informally assessing understanding, providing opportunities for one on one mathematical communication, and determining teaching points for individual students as well as for the class.

Daily: Assessment
A generous helping of Assessment for Learning to inform instruction with a dollop of Assessment of Learning to top off each unit.

Yahoo Guided Math Group: http://tech.groups.yahoo.com/group/guidedmath/

STRATEGIES FOR TEACHING A SMALL-GROUP LESSON

1. Briefly introduce the lesson by providing **supportive strategies** for learners. Use **modeling and think-alouds**.
2. Provide students with a **clear understanding** of the activity or task on which they will work including the criteria for success.
3. Encourage students to **try a variety of strategies** to solve the problem or complete the activity by creating a **supportive, risk-free learning environment**.
4. **Scaffold student learning** by giving just enough support to move students to the next level of understanding and proficiency.
5. Provide many opportunities for **rich mathematical discourse** both between pairs of students, between you and individual students, and among the group. Listen carefully to understand their mathematical thinking. Use **probing questions** that encourage **students to do most of the talking.**
6. Give students **specific, descriptive feedback** as they work and encourage them to self-assess their work based on the established **criteria for success**.

Grade 1 Sample Small-Group Lesson

Overview:

M1N1. Students will estimate, model, compare, order, and represent whole numbers up to 100.

a. Represent numbers up to 100 using a variety of models, diagrams, and number sentences. Represent numbers larger than 10 in terms of tens and ones using manipulatives and pictures.

M1N3. Students will add and subtract numbers less than 100, as well as understand and use the inverse relationship between addition and subtraction.

Identify one more than, one less than, 10 more than, and 10 less than a given number.

Students are challenged to determine what the similarities are when presented with groups of ten (pennies, a dime, a row from a hundreds chart, a ten frame). They learn to use their knowledge of tens to determine ten more and ten less with a hundreds chart.

Informal Assessment: Have students draw twelve circles. Ask them to circle ten of them. Ask them to write how many they would have if they had ten more than that.

Small-Group Lesson

Connection: Your teacher tells me that you have been working with groups of tens and groups of ones. We are going to talk more about that today. (Put out the groups of ten on the table.) Who can think of a way in which these are alike? How are they similar? (Lead students to see that each is a ten, just represented in different ways.) How else have you represented tens?

Teaching Point: Today we are going to learn how we can use what we know about tens and ones to find out what ten more than a number is or ten less using mental math. How do we show how many groups of tens we have when we write a number? How do we show how many ones we have?

Active Engagement: Let's look at a hundred chart. (Have students find ten more or ten less than a given number and explain how they find their answers.) Let's play a game using what we know. (Play "I have___. Who has_____?)

Link: Whenever you are asked to find what ten more or ten less than a number is remember to use these strategies. Mathematicians use what they know to find solutions to problems.

Reflection: What did you learn or think about mathematically today?

Need for Additional Challenge

Challenge students to find ten more or ten less than a three digit number or find a hundred more or less.

Need for Rebuilding Foundational Knowledge

(List Common Gaps and Ways to Address Them)

- Inability to accurately count out objects: Practice rote counting to be sure students have acquired that skill. If students can rote count, have students practice counting objects by touching each one and moving the objects counted to another area.
- Inability to circle groups of ten: Use concrete objects. Have students place ten objects on individual mats or cups. When they can do this, have them either use ink stamps to create a picture with ten or more stamped images and then circle groups of ten. Or use printed gift wrap and have students circle groups of ten.

Grade 5 Sample Small-Group Lesson

Overview:

Student will demonstrate understanding of decimals to thousandth by

- Describing and representing
- Relating to fractions
- Comparing and ordering

Prerequisite Knowledge or Skills/Informal Assessment:

- Understands what a fraction represents.
- Understands what a decimal represents.
- Identifies equivalent fractions.

Small-Group Lesson

Connection:

I understand you have been learning about equivalent fractions and how to compare and order fractions.

Teaching Point:

Today we are going to be learning about how fractions and decimals are related.

Active Engagement:

Ask students to turn to a buddy and tell what they know about fractions. Listen to be sure that they understand what a fractional part is and what the terms numerator and denominator mean. Have students share what they discussed with the group. Then ask them to turn to a buddy and tell what they know about decimals. Listen to determine understanding and to identify any misconceptions. Share with group. Ask: "How are fractions and decimals related? Explain your thinking." Give ample think time. As students share their thoughts, call on others to respond to and build on those ideas. Ask them to work in pairs and write a decimal/s that is/are equivalent to 5/10. Ask students to share and justify their answers. "Is there only one decimal that is equivalent to the fraction? How do you know?" Lead students to discover equivalent decimals—tenths, hundredths, and thousandths. If time permits, have students match cards with addition/subtraction of fractions with decimal cards.

Link:

Remind students "that mathematicians strive to be able to understand and represent concepts—in this lesson, parts of a whole can be represented by fractions and by decimals. Always remember that when you are working with numbers." Have students reflect and share something mathematical they learned or thought about during the lesson.

Adapted from *Relating Fractions Equivalences to Decimal Fractions* designed by Kentucky Dept. of Education and modified by Boone County Schools.
http://www.jennyray.net/uploads/1/2/9/7/12975776/4_grade_relating_fractions_equivalencies_to_decimal_fractions_draft-boone1.pdf

Need for Additional Challenge

Confirm that students have a basic understanding of the relationship between fractions and decimals. Working in pairs have them match fraction and decimal cards from three sets: fractions, decimals, words, number line representations, and area representations.

Need for Rebuilding Foundational Knowledge

(List Common Gaps and Ways to Address Them)

--*Does not understand what a fraction represents:* Give each student a sheet of paper. Have them fold it in half and then open it. Discuss how the paper is divided into 2 equal parts. Two is the denominator of the fraction 1/2. The upper numeral in the fraction tells how many halves. Have them fold the paper in fourths and repeat. Ask them what the denominator would be if the paper was divided into 8 equal parts. If 3 were shaded, what would the numerator be? Continue with the current lesson in which this understanding will be reinforced. Continue to monitor and strengthen their understanding.

--*Does not understand what a decimal represents:* Use money to illustrate the concept of hundredths. Lead students to understand that since there are 100 cents in a dollar, each cent is 1/100 or 0.01. Use base 10 blocks. Let a block represent 1, a flat 0.1, a rod 0.01, and a unit 0.001. Have students represent decimals using base 10 blocks. Continue with current lessons reinforcing this understanding.

--*Cannot identify equivalent fractions:* Review the term *equivalent*. Using fraction strips have students find fractions that are equivalent to ½. As they work, have them use correct mathematical terminology—numerator, denominator, and equivalent. As they manipulate the strips, have them explain their thinking. Continue with current lesson that will reinforce this understanding.

Vocabulary: fraction, numerator, denominator, equivalent, decimal

Small-Group Lesson Planning Form

<table>
<tr><td colspan="2">Overview:</td></tr>
<tr><td colspan="2">Informal Assessment:</td></tr>
<tr><td rowspan="2">Small-Group Lesson Connection:

Teaching Point:

Active Engagement:

Link:</td><td>Need for Additional Challenge</td></tr>
<tr><td>Need for Rebuilding Foundational Knowledge (List Common Gaps and Ways to Address Them)</td></tr>
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Sample Math Block

	Guided Math Component
10-15 Minutes	**Math Warm-Ups/Calendar Math/Hotspot of the Day** In addition to warm-up activities, choose five hotspot areas and each day of the week address one of them throughout the year.
5-10 Minutes	**Whole group mini lesson (optional)** Use only if there is a compelling reason for using large group instruction, for example using children's literature, math word wall work, or activating strategies.

30-50 Minutes

Up to 6 students per group
Small group lessons, flexible grouping based on needs

2 or more groups per day – Differentiate instruction as you fill gaps, introduce new concepts, practice, and extend learning. Include a reflection or wrap-up as part of each group lesson.

Independent Workshop

Games and activities should target skills students are secure with. This time is meant for students to work apart from the teacher alone or in pairs. They will review skills from a prior grade or skills they have mastered in previous lessons or practice to increase math fact fluency.

The purpose of having students work on secure skills during independent time is to:

- Minimize disruptions to the teacher during small group time.
- Ensure students are accurately practicing skills rather than cementing incorrect information in their memory.
- Ensuring retention and deepening understanding and skill.
- Build fluency and speed of skills.

Conferences and Assessment

Conduct conferences and assess students as needed, informally or formally. Use assessment results to determine grouping and instruction.