Best Practices for The Differentiated Math Class

Grades 3-5

Presented by Mary Peterson

Teacher Treasures.com

Differentiated Math Instruction

Differentiated math instruction meets the needs of all learners. It consists of whole group lessons, guided math groups, a wide variety of independent learning station activities and ongoing assessment.

Before the Unit

Determine Skills: Choose math unit and the specific outcomes of the unit.
Pretest: Find out what students already know through one-on-one screening, observation, pencil and paper test or a math project.
Compile Data - Make notes of the results of the pretest.
Plan Instruction – Pick and choose activities and lessons that will meet the diverse needs of the class.

During the Unit

Whole Group Lessons: The teacher teaches all the students a specific concept.
Guided Practice: The students practice the skill with guidance from the teacher. Individual white boards and wipe off markers work well for this.
Independent Practice: Students work on a project or worksheet as the teacher monitors and reteaches students who need more help.
Guided Math Lessons: The teacher works with students in a small group to provide support or challenge depending on their needs.
Learning Stations: The students who are not meeting with the teacher should be involved in independent math activities that provide meaningful practice in basic skills and problem solving. Here are some ways to differentiate learning stations:

1. The same open-ended activity for all students allows all students to be successful. *(Write an addition story problem.)*
2. Have the same activity but modify it for each group. *(Each group is playing an addition game, but the addends are adjusted according to the level of the group.)*
3. Providing a choice of leveled games and activities allows students to choose activities according to their interests and abilities.

Ongoing Assessment: Keep anecdotal notes of student progress.

At the End of the Unit

Review - In a fun and interactive way review the skills taught in the unit. This can be done with games, music or art.
Post Assessment – Find out what the students learned with some kind of a post test. You can also have students write about the unit, what they liked, what they had a hard time with, etc.
Follow Up - Note students still having difficulty and plan for further interventions.

The Guided Math Lesson

Guided math is a structured way of matching math instruction to diverse individual learners in a small group. The teacher's instruction is guided by careful assessment and observation, so appropriate support and challenge can be provided for each student. As students' needs and abilities change so does the composition of the guided math group. Here is a sequence for a guided math lesson:

1. Choose a problem or activity that will support the focus for the group.
2. Introduction of the problem or activity:
    - Model a strategy
    - Teach a mini lesson
    - Explain new vocabulary
    - Ask a question:
        - What do you notice?
        - What do you know about _____?
        - What is the problem asking us to do?
        - Do you see any tricky words?
3. Students solve the problem or begin the activity. The teacher observes and coaches students as needed.
4. Discuss the problem or activity and share strategies, solutions and connections. Teacher may need to clarify, reteach or review skills and vocabulary.
5. Teacher records observations as anecdotal notes, which leads into planning for the next guided math session.

<u>Tips for powerful math lessons:</u>

Have students <u>think</u> about math and not just <u>do</u> math. <u>Doing</u> is a set of steps to reach a result and does not necessarily enhance thinking. <u>Thinking</u> is the use of reasoning to solve a problem and then being able to explain the strategy so it makes sense to someone else.

Here are some "thinking" math verbs to use when planning math problems and activities:

explore	represent	explain	predict	investigate
discover	develop	solve	construct	describe
examine	check	verify	justify	formulate

Open Ended Math Questions

These are examples of questions to ask your students during math lessons and activities. They can be used for oral or written discussions and are an excellent way to encourage mathematical thinking.

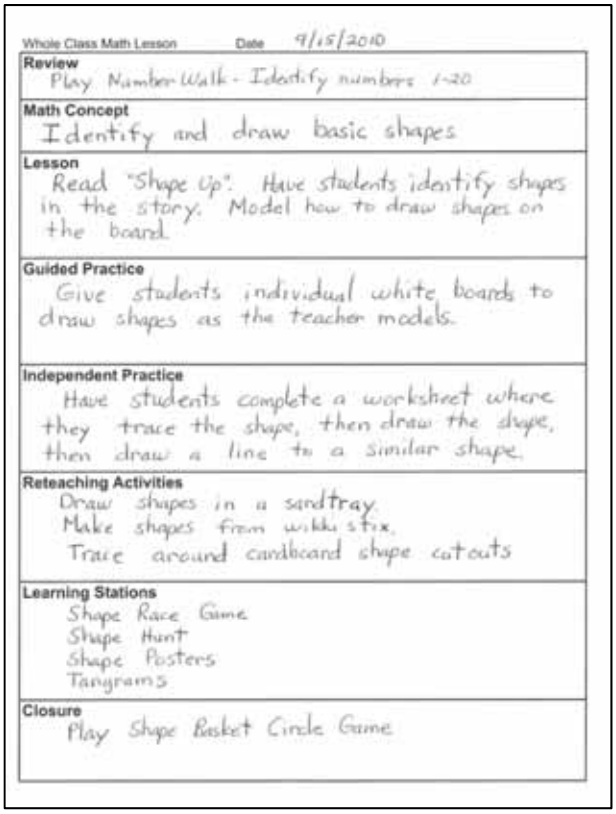
How did you solve this problem?
Can you explain your reasoning?
Does anyone have the same answer but a different way to explain it?
How would you explain this to a student who doesn't understand?
What would happen if _____?
How else might you solve this problem?
What connections can you make to _____?
How is this problem similar to another problem?
Do you see a pattern?
Is there anything you don't understand about _____?
What do you plan to do next?
How can you be sure that _____?
How does this relate to _____?
What were you thinking when you _____?
Why do you think that?
Where did you get stuck and what helped you get unstuck?
What did you try that didn't work?
What pictures do you have in your mind of _____?
Can you draw a picture to show how you solved the problem?
Does that always work? Why or why not?
What didn't work?
Do you agree? Disagree? Why or why not?
Can you convince the rest of us?
Can you show us how you figured it out?
What do you wonder about regarding _____?
How would you describe this problem in your own words?
Can you give an example of _____?
What have you learned that was helpful in solving this problem?
What do you think about what _____ said?
What do you understand now that you didn't understand before?
What is the most important idea or fact you learned while working on _____?
Can you explain your idea?
What are your observations about _____?
How do you feel about _____?

Sample Math Schedules

These two math schedules can be alternated each day depending on the best way to teach the math concept. Schedule A can be used to teach a math concept to the whole class with choice learning stations and reteaching for students who need extra help. Schedule B can be used to differentiate small group lessons and learning stations to support and challenge the needs of all the students.

Math Schedule A

5 -10 minutes: review
15 - 20 minutes: whole group lesson
5 -10 minutes: guided practice
20 - 35 minutes: independent practice, reteaching groups, choice learning stations
5 minutes: closure



Whole Class Math Lesson Date 9/15/2010

Review
Play Number Walk - Identify numbers 1-20

Math Concept
Identify and draw basic shapes

Lesson
Read "Shape Up". Have students identify shapes in the story. Model how to draw shapes on the board.

Guided Practice
Give students individual white boards to draw shapes as the teacher models.

Independent Practice
Have students complete a worksheet where they trace the shape, then draw the shape, then draw a line to a similar shape.

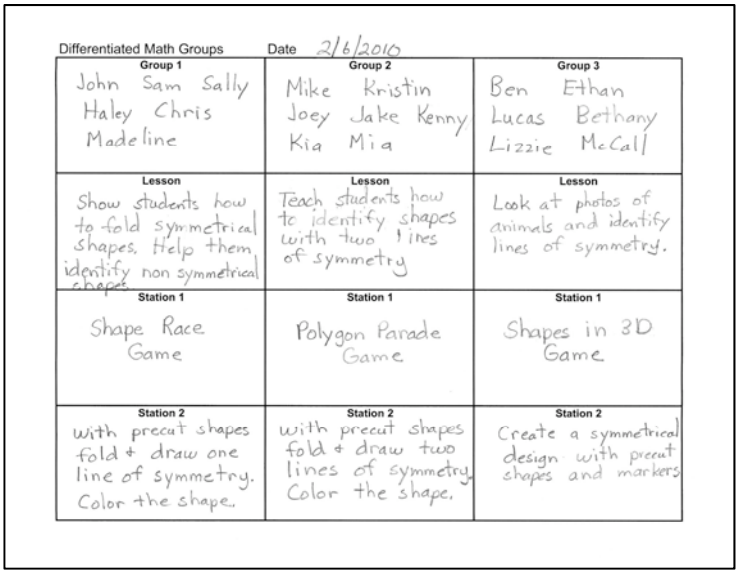
Reteaching Activities
Draw shapes in a sandtray
Make shapes from wikki stix.
Trace around cardboard shape cutouts

Learning Stations
Shape Race Game
Shape Hunt
Shape Posters
Tangrams

Closure
Play Shape Basket Circle Game

Math Schedule B

5 -10 minutes: review and learning station instructions
40 - 60 minutes: differentiated small math groups and rotation learning stations
5 minutes: closure



Differentiated Math Groups Date 2/6/2010

Group 1	Group 2	Group 3
John Sam Sally Haley Chris Madeline	Mike Kristin Joey Jake Kenny Kia Mia	Ben Ethan Lucas Bethany Lizzie McCall
Lesson: Show students how to fold symmetrical shapes. Help them identify non symmetrical shapes.	**Lesson**: Teach students how to identify shapes with two lines of symmetry	**Lesson**: Look at photos of animals and identify lines of symmetry.
Station 1: Shape Race Game	**Station 1**: Polygon Parade Game	**Station 1**: Shapes in 3D Game
Station 2: With precut shapes fold & draw one line of symmetry. Color the shape.	**Station 2**: With precut shapes fold & draw two lines of symmetry. Color the shape.	**Station 2**: Create a symmetrical design with precut shapes and markers

Whole Class Math Lesson Date

Review

Math Concept

Lesson

Guided Practice

Independent Practice

Reteaching Activities

Learning Stations

Closure

Differentiated Math Groups Date

Group 1	Group 2	Group 3	Group 4
Lesson	Lesson	Lesson	Lesson
Station 1	Station 1	Station 1	Station 1
Station 2	Station 2	Station 2	Station 2
Station 3	Station 3	Station 3	Station 3

Name Date

1.	2.	3.
4.	5.	6.

Name Date

1.	2.	3.
4.	5.	6.

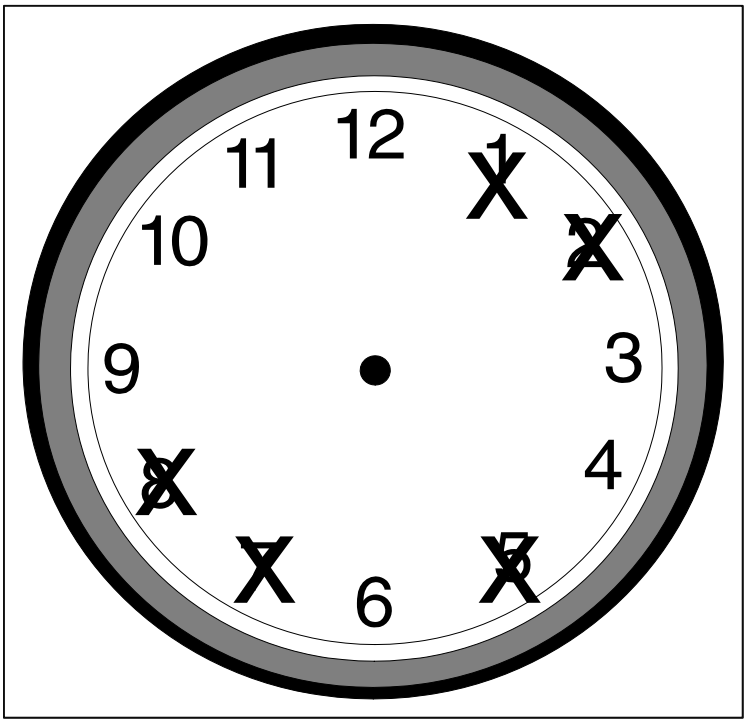
Clock Math

Preparation:

- Print a clock for each student.
- Make copies of the number cards and cut them apart.
- Each player needs a paper and pencil.

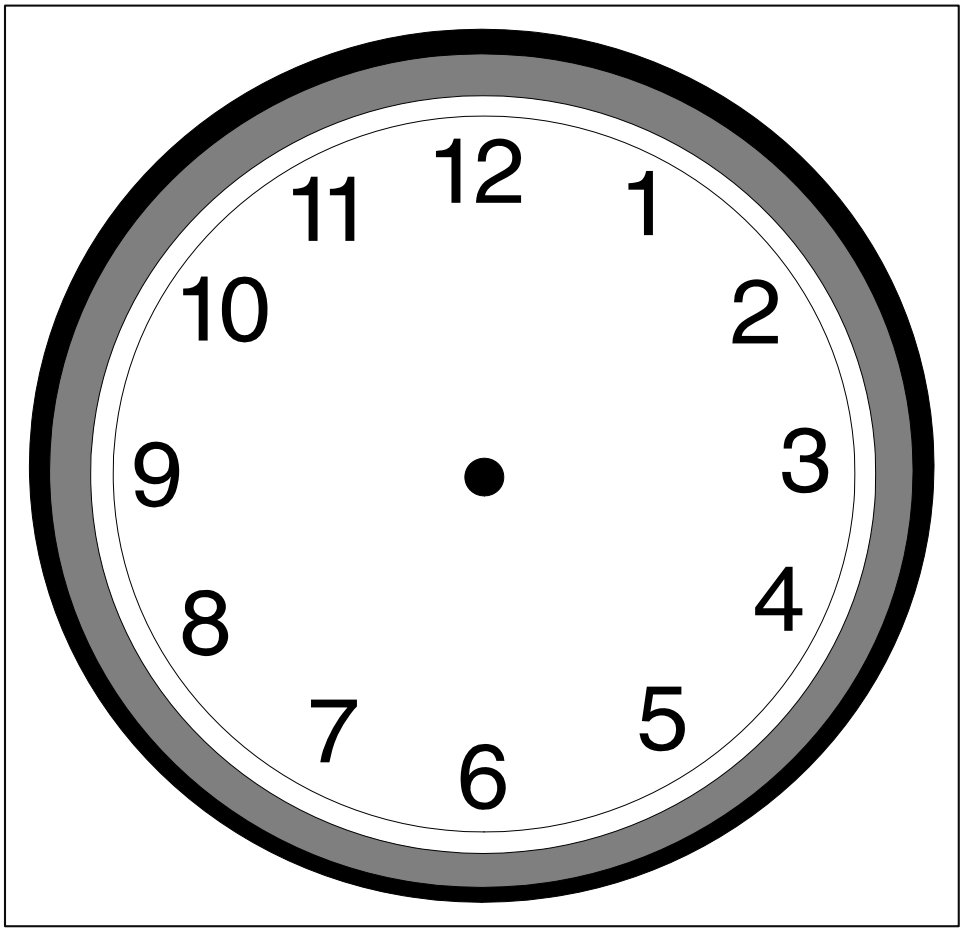
Directions for 2-4 players:

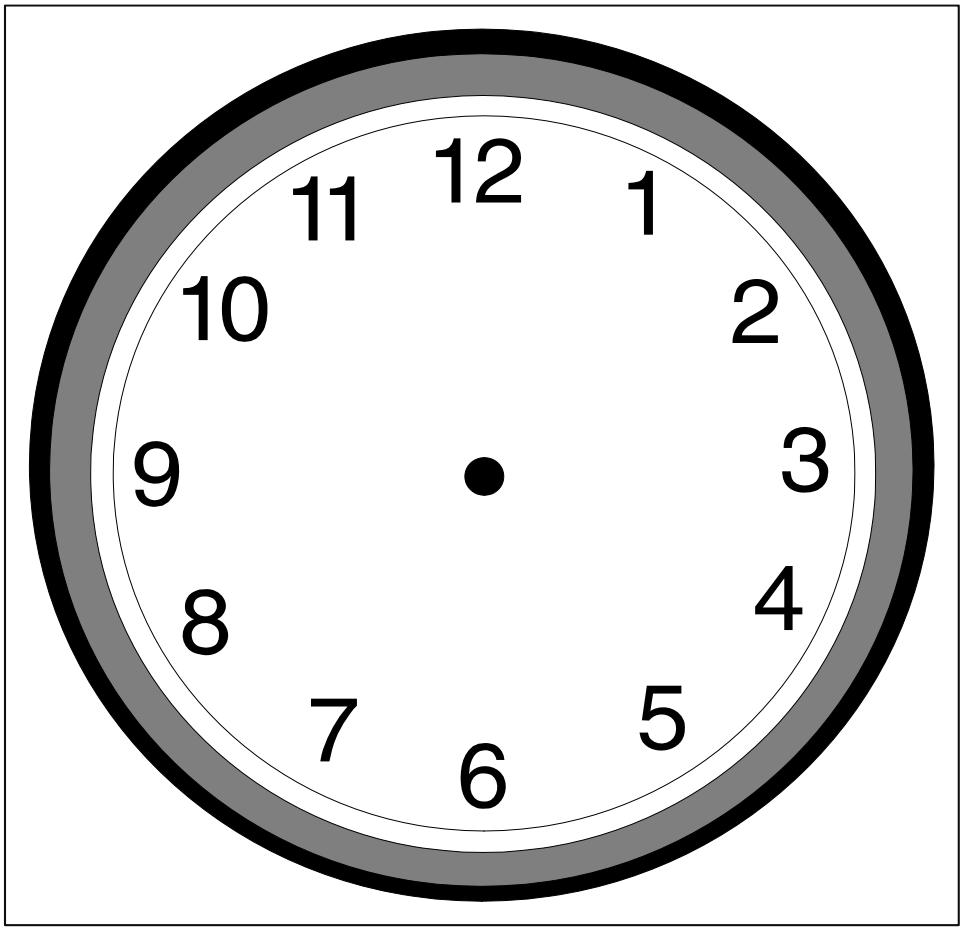
1. Stack the number cards in a pile.
2. Turn over the top three cards.
3. Players need to create equations using the three numbers with answers that are on the clock. Cross off the number on the clock for each equation. When players cannot create any more equations, you may turn over three more cards and continue the game.
4. The first player to cross off each number on the clock is the winner.



4	6	3

4 + 6 – 3 = 7
6 + 3 – 4 = 5
6 x 4 ÷ 3 = 8
4 + 3 – 6 = 1
3 x 4 ÷ 6 = 2





4	৩	4	৩
৩	৪	৩	৪
২	৭	২	৭
১	৬	১	৬
০	৫	০	৫

There are many math activities for grades 3-6 students in these books and learning station packets from our Teacher Treasures Store. Click on a product to see sample pages.