



Get Connected: In the Math Workshop

Atomic 2011: Susan Austin & Danielle Legnard

Differentiation

Intervention

Technology Integration

Common Core State Standards

The **Math Workshop** is an inquiry-based model of differentiated instruction that fosters a deeper understanding of rigorous and rich mathematics that is attainable by all learners.

Legnard/Austin, NCTM
publication, 2012

Math workshop promotes a culture of engagement and individualization that gives mathematical access to all learners in the classroom community.

Math Workshop provides routines that promote problem solving and allows the teacher the flexibility to meet with small groups for differentiated instruction based on needs, readiness or interests, building stamina and courage in our students.

Core Ingredients of Math Workshop

- Focused mini lesson
- Guided instruction
- Collaborative practice
- Independent practice
- Ongoing formative assessment
- Discussion and reflection.

Awakening the Mind of EVERY Child!



- An in-depth look at comprehension strategies strive for deep understanding and computational fluency!

Math Workshop in Action!

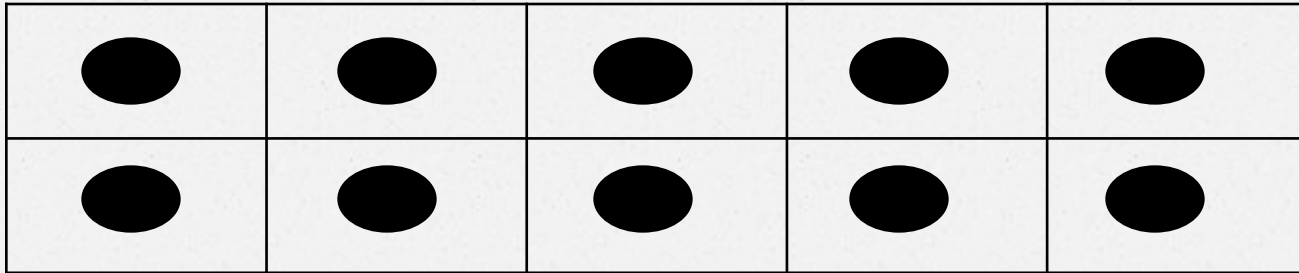
- Mini Lesson Essential Question

- Why is ten so important in mathematics?

Quick Image

- Image will appear for 3 seconds
- Thumb up when you know how many dots
- How do you know?

Quick Image














○ How many dots?

○ How do you know?

Quick Image

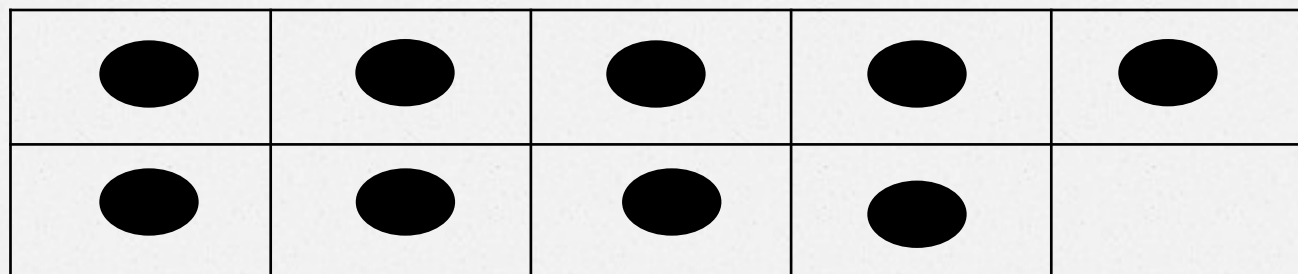
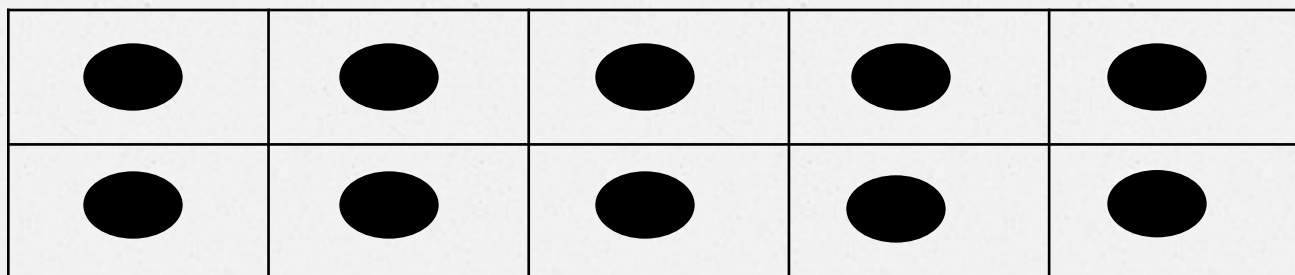
				
				



○ How many dots?

○ How do you know?

Quick Image





○ How many dots?

○ How do you know?

Quick Image - MMJ

- Move from the concrete to the abstract
- Visualizing number
- Developing estimation
- Develops flexibility and efficiency
- Commit images to working, active, long term mathematical memory
- Habit of Mind

Math Potatoes



Math Potatoes

- How many potatoes?
- How do you know?



MATH POTATOES

Boiled and baked and often mashed,
Peeled and fried and sometimes hashed.

No wonder spuds hide underground —
Life is painful when they're found!

Can you add up these poor souls,
For whom the bell already tolls?

In groups of ten you'll hear their cries,
"Please don't turn us into fries!"



Math Potatoes



Mini Lesson: Pocket Day

- How many pockets do we have all together in this room?
- First, make a predication
- Next, look at the data collected on the posters
- What is the most efficient way to count the number of pockets? Think TEN!

Mini Lesson: Pocket Day

- Intervention techniques and questions
- Count number of pockets at one table set or in one group rather than the whole class
- Provide concrete manipulatives to model tens
- Extensions: How many pockets at ATOMIC? Prove and justify your prediction.

Math Workshop Menu

- Math workshop is a chance to be connected to you students and what they REALLY know!
- Includes everything you need to be a responsive teacher
- RTI/SRBI
- Technology
- Differentiated Instruction

Math Workshop Menu

Today's Special: Snapshot Room #312			
CORE Math Workshop Ingredients	Flexible Groupings	Time Frame	Just Right Tasks
Mini Lesson	Whole Class Instruction	10-15 minutes	Counting Pockets
Workshop Tasks <ul style="list-style-type: none"> • Task A • Task B • Task C 	Pairs, collaborative groups, individuals	20-30 minutes	Task A: Tens Go Fish Task B: Turn Over Ten Task C: Quick Images/Ten Frames
Guided Instruction <ul style="list-style-type: none"> • Group A • Group B • Group C 	Flexible Small Groups Meet with teacher while students work on Workshop Tasks	10-15 minutes (per group)	Group A: Combinations of ten Group B: Ten Frames/Getting to the Ten Group C: Using tens to get to a hundred
Discussion and Reflection	Whole Class Reflection	5-10 minutes	Exit Card: <i>Why are combinations of ten important in our number system?</i> Journal Entry Turn and Talk Share
Additional Independent Practice (Homework)	Individualized, tiered and tailored to meet the needs of learners	10-15 minutes	Tens Go Fish Game Using Combinations of Ten Combinations of Ten Practice

Math Workshop Menu for Pocket Day: K-2 Menu

- MUST DO TASK
 - Combinations of Task
- K-2 Choices
 - Tens Go Fish
 - Turn Over 10
 - Quick Images
 - Illuminations: Tens Frames
 - [www.http://illuminations.nctm.org/ActivityDetail.aspx?ID=75](http://illuminations.nctm.org/ActivityDetail.aspx?ID=75)
 - Exit Slip

Math Workshop Menu for Pocket Day: 3-5 Menu

- MUST DO TASK
 - Combinations of More Tens Task
- 3-5 Choices
 - Close to Games
 - Close to 20, 100, 1000, 0, 7500
 - Close to App:
 - [www.http://investigations.terc.edu/library/Games_45.cfm](http://investigations.terc.edu/library/Games_45.cfm)

 - [www.http://express.smarttech.com/?url=http://mediadev.pearsoncmg.com/curriculum/math/inv_iwb_sampler/G3_U1_S2_2.notebook#](http://express.smarttech.com/?url=http://mediadev.pearsoncmg.com/curriculum/math/inv_iwb_sampler/G3_U1_S2_2.notebook#)
- Exit Slip

Math Workshop Menu for Pocket Day: 6-8 Menu

- MUST DO TASK
 - How do combinations of 10 help with Powers of 10? How are they related?
- 6-8 Choices
 - Close to Games
 - Close to 1000, 0, 7500, 1 (decimals)
 - How much is a million? Dot board
 - Close to App:
 - [www.http://investigations.terc.edu/library/Games_45.cfm](http://investigations.terc.edu/library/Games_45.cfm)

 - [www.http://express.smarttech.com/?url=http://mediadev.pearsoncmg.com/curriculum/math/inv_iwb_sampler/G3_U1_S2_2.notebook#](http://express.smarttech.com/?url=http://mediadev.pearsoncmg.com/curriculum/math/inv_iwb_sampler/G3_U1_S2_2.notebook#)
- Exit Slip

Close to 100

9

5

7

2

1

4

Use 4 cards to make two double digit numbers.

How close can you get to 100?

Technology in Math Workshop

- Ongoing part of math workshop
- Not just skill and drill
- Needs to be interactive and engaging for students...not just a center

- **Great Websites to Incorporate into your math workshop today!**
- Investigations in Number Data and Space: [www.http://investigations.terc.edu/](http://investigations.terc.edu/)
- Illuminations (NCTM) [www.http://illuminations.nctm.org/](http://illuminations.nctm.org/)
- Grade 3 and 4 Interactive games for CMT practice: [www.https://sites.google.com/site/grade34cmtstrands/](https://sites.google.com/site/grade34cmtstrands/)
- New Canaan Public Schools E-Math: [www.https://newcanaan.k12.ct.us/k5math](https://newcanaan.k12.ct.us/k5math)
- Ole Miss Math Contest (Problem of the week): [www.http://mathcontest.olemiss.edu/](http://mathcontest.olemiss.edu/)
- Virtual Manipulatives: [www.http://nlvm.usu.edu/en/nav/vlibrary.html](http://nlvm.usu.edu/en/nav/vlibrary.html)

Guided Instruction

- Guided instruction is when the teacher and the students do the work together; parallel to each other.
- During this time, the teacher's role is to take the learners lead as they try to apply the skills or strategies that have been modeled for them in the mini lesson
- Guided instruction primarily takes place in a small group (Fisher and Frey, 2008).
- This can happen both in the large and small group

Small Group Instruction

- Group A: This group needs more direct instruction constructing and building combinations of ten
- Group B: This group is ready to apply tens to the next ten
- Group C: This group is ready to apply the concept of “making tens” to larger tens and in computation.

Collaborative Learning

- This is a time when students NEED to do the work with other students: WITHOUT the teacher by their side
- Fisher and Frey note: this is a phase when students consolidate their thinking and understanding.
- Negotiating with peers, discussing ideas and information or engaging in inquiry with others causes students to USE what they have learned in the mini lesson and guided instruction!

Independent Practice

- Students need PRACTICE completing independent tasks
- Independent tasks should require individual application of information previously taught
- We must provide opportunities to TEACH students how to work independent
- NOT just give them things to do on their own!

Discussion and Reflection

- Can be whole group or small group
- A time to revisit essential questions
- Exit Slips
- Oral discussion and metacognitive reflection

CCSS – Getting Ready with Mathematical Practice

- Make sense of problems and persevere
- Reason abstractly and quantitatively
- Construct viable arguments; critique others
- Model with Mathematics
- Use appropriate tools strategically
- Attend to precision
- Look for and make use of structure
- Express regularity in repeated reasoning

Suggestions for Improvements and Transitions

- Use flexible grouping for instruction
- Best practice questioning techniques
- Careful task selection and mapping
- Accountability; teacher & administrator
- Ongoing professional development
- Collaborative lesson planning

MMJ Task 1

$$365/4 = \square$$

Self Reflection

- Where should I go from here?
- What can I implement right away?
- How can I foster more Independence through the gradual release model during Math Workshop?
- How are my students thinking, mathematically?
- What are some ways to ensure differentiation?
- What can I do to set up time for student conferencing with a purpose and a vision?

○ “This kind of teaching leads students not to memorizing, but to development of *mathematical memory*. Important mathematical procedures cannot be forgotten over the summer because they are based in a web of connected ideas about fundamental mathematical relationships.”

○ *Susan Jo Russell (Developing Computational Fluency with Whole Numbers, 1999)*