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Math Block: How to Plan 60 Minutes of Effective Math Instruction

Today's Goals

- Analyze different instructional models for math
- Learn the components of math workshop
- Learn how to engage students in purposeful math for 60 minutes

What is “Effective?”

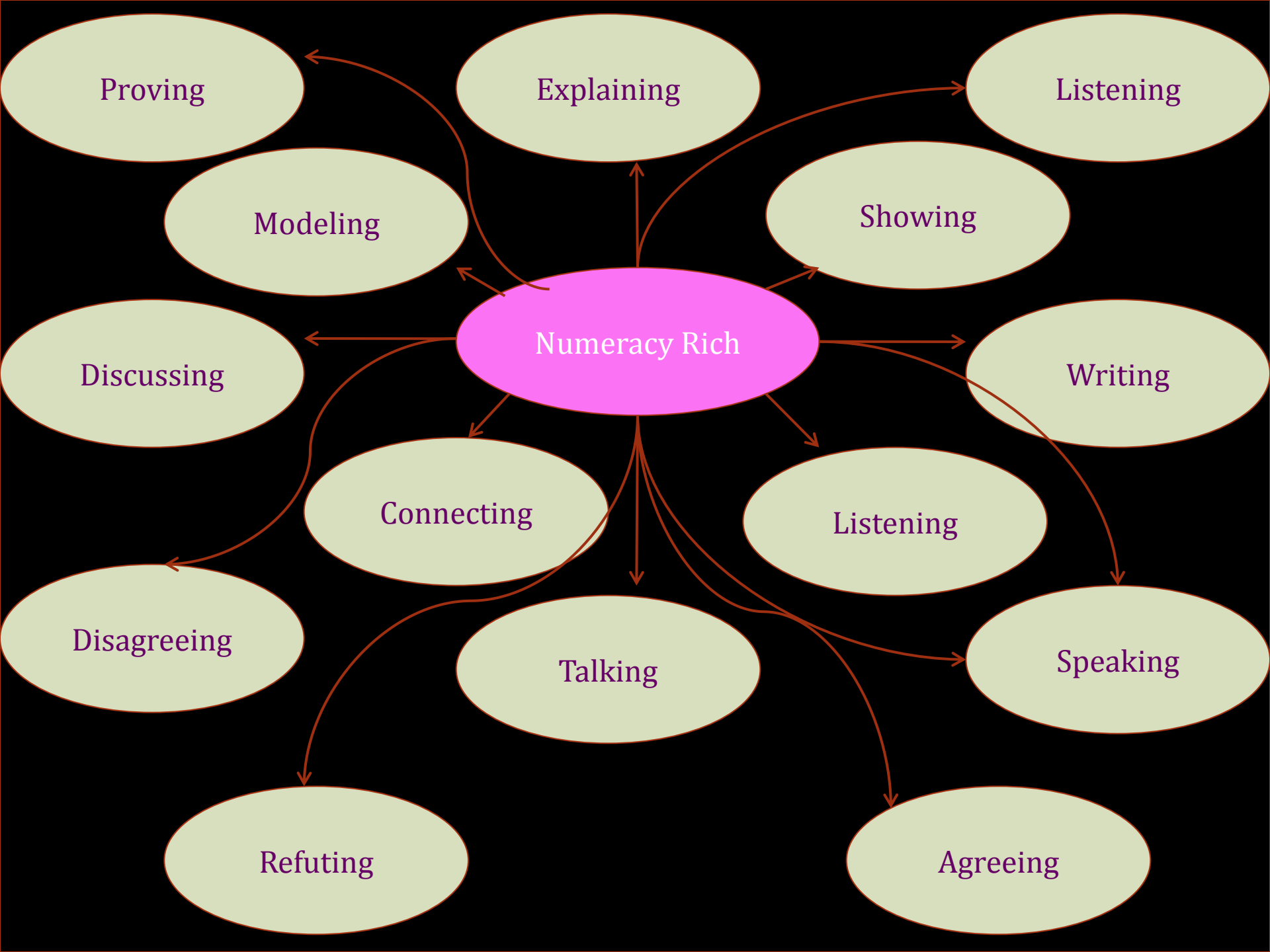
- o What defines effective teaching?
- o What are effective practices in your math classroom?
- o What are road blocks you encounter?

Effective Teachers at CREC

- Ensure that all students achieve mastery of the central concepts, skills, and tools of inquiry prescribed in the curriculum
- Motivate students to achieve the high expectations established for behavior and academic performance
- Demonstrate enthusiasm, passion for learning, and respect for each individual
- Plan and implement engaging, rigorous, and relevant lessons that employ a high degree of valid and reliable instructional methods
- Use multiple measures to analyze student performance and to inform planning and instruction.
- Engage in reflection, self-evaluation, and professional development to continually improve teaching and learning.

Math Energizer

- o Brainstorm the verbs in a mathematics classroom.
- o Turn and Talk/Group Share



Instructional Models for Math

- o 3 Group Models
- o 2 Group Models
- o Weekly Rotation (Guided Math)
- o Whole Class

What is Math Workshop?

- o Your thoughts?
- o Several Models
 - o Developmental Grouping
 - o Debbie Diller Math Work Stations
 - o Guided Math

Why Do Math Workshop?

“When a teacher tries to teach something to the entire class at the same time, chances are, one third of the kids already know it, one third will get it, and the remaining third won't get it. So two thirds of the children are wasting their time.”

~Lillian Katz

Benefits of Guided Math Groups

Teachers	Students
Targeted teaching/ Differentiation	Targeted Standards based instruction
On the spot error/ Misconception analysis	Individual Attention
Question Deeply	Opportunity to Speak & Listen about Mathematical Thinking
Focus on specific Content and practices	Mathematical Disposition Levels Increase
Uses time more efficiently	Frequent movement through activities of appropriate length

Crosswalk with Reader's Workshop

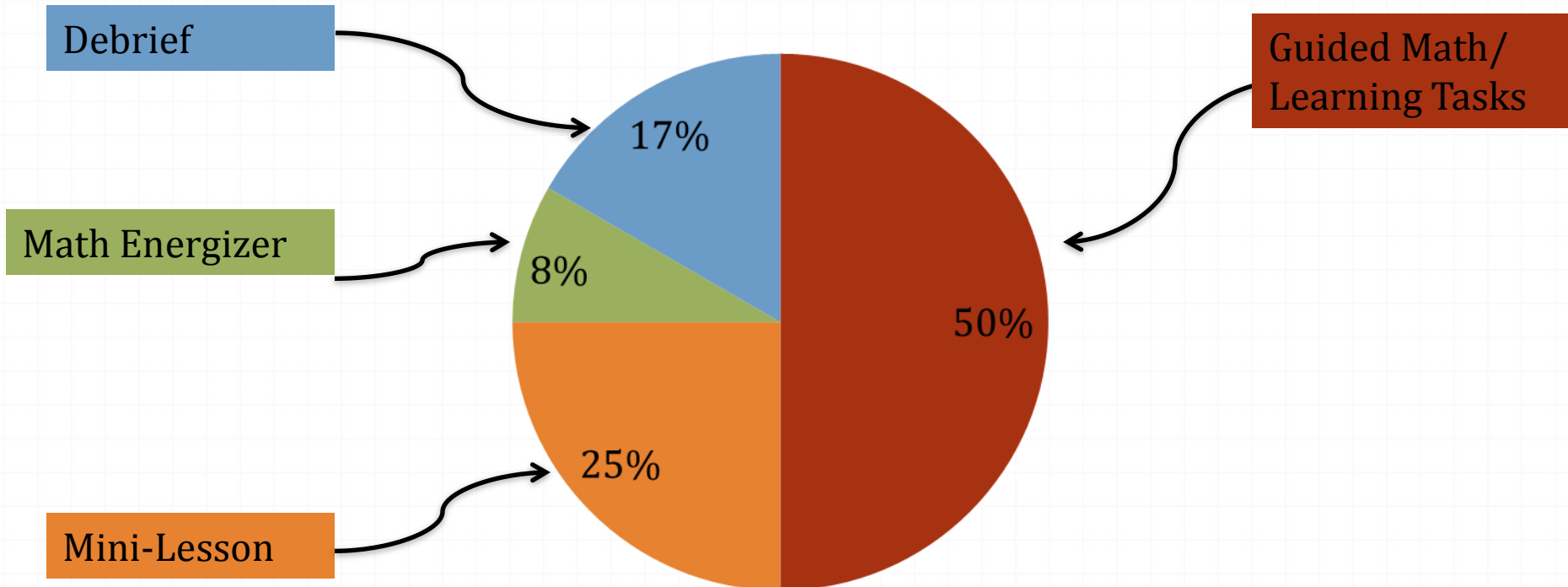
Reader's Workshop	Math Workshop
Mini-Lesson	Mini-Lesson
Word Work	Vocabulary Practice
Fluency Practice	Fact Fluency Practice (Automaticity)
Strategy Practice	Strategy Practice
Conferences	Conferences
Share Time	Share Time
Groups	Small Guided Math Groups

Structure of Math Block

Math Energizers	5 Minutes	Review and Practice
Whole Group Mini-Lesson	10-15 Minutes	Standards-based lesson
Guided Math/ Learning Tasks	30 Minutes	<ul style="list-style-type: none">• Small guided math group• Individual math interview or conferencing• Workstations• Tiered tasks
Share	10 Minutes	<ul style="list-style-type: none">• Discuss Major Takeaways• Writing Response
Total Time	60 Minutes	

Math Block

- Balance procedural understanding and conceptual understanding
 - Balance whole group and small group
 - Balance teacher directed and student-focused



Turn and Talk

- o Talk to your shoulder buddy about how math is taught in your building (think about the differences in classrooms & grade levels). Are these components part of the math instruction?
 - o ___ whole group instruction
 - o ___ mini-lesson
 - o ___ debrief
 - o ___ small guided math group
 - o ___ workstations

Math Energizers

- o The first 5 minutes...you want to grab their attention!
- o Some Ideas
 - o Introduce a new game (but tease 😊)
 - o Counting Games
 - o Tell Me All You Can – Number of the Day
 - o Silent Math
 - o 24
 - o Number Talk
 - o Mental Math Pop

Mini-Lesson

- o What is the most important element of your lesson?
- o What is it you want to “stick” with the students?
- o Look at your unit goals and the standards you are addressing in the unit
- o Suggestions
 - o Prior learning needed to be successful
 - o Sample problem that connects to goal
 - o Introducing a game/task that ALL students will complete

Rotations–

Developmental Grouping Model

- o Three or four rotations depending on number of students
- o Rotation #1 – Teacher-led
 - o Where concept is taught.
 - o Differentiate according to group's needs
- o Rotation #2 – Journal/Worksheet
 - o Students work together and have to reach consensus on answers
- o Rotation #3 – Game
 - o Connected to that lesson or prior lesson
 - o Can be differentiated to meet needs of learners
- o Optional Rotation #4 – Computers/Game/Fact Fluency
 - o Connected to that lesson or prior lesson
 - o Can be differentiated to meet needs of learners

Rotations – Math Work Station Model

- o Two rotations
- o Materials are used by teacher and students during instruction first.
- o Materials change to reflect students' levels of math understanding, strategies being taught, and topics being studied.
- o Students are working in pairs

Rotations – Guided Math Model

- Three groups with two rotations a day for three days with whole class starting and ending week.

Day 1	Day 2			Day 3			Day 4			Day 5
Whole Class	A	B	C	A	B	C	A	B	C	Whole Class
	Teacher	Activity	Activity	Activity	Computer	Teacher	Activity	Teacher	Computer	
	Computer	Teacher	Activity	Teacher	Activity	Activity	Activity/Computer	Activity	Teacher	

- Groups are homogeneous and change based on formative data
- Activities for each group are based on needs of students

Student Share/Reflection

- o Students brought back together to share what they learned
 - o What do you know now that you didn't know?
 - o What math did you do today? (if following guided math model or work stations, opportunity for students to share since they are not all doing the same thing)
- o Connect back to the mini-lesson

Getting Started

- Supplies need to be organized in a child-friendly fashion. For example, containers that have pencils, erasers, rulers, calculators, scissors and number grids.
- Materials for workshop rotations should be placed in separate bins (worksheets, game pieces or additional math supplies)

Getting Started

- Rules and procedures need to be taught the first few weeks of workshop (like Readers Workshop)
 - Set out three different math games that students are already familiar with from previous instruction.
 - Review the instructions for each game and what configuration to play the game (pairs, foursomes or whole table). Talk about general rules for group activities and acceptable noise levels. Explain that each game rotation lasts for ten minutes. When they hear the timer bell they have one minute to finish, straighten their table and get ready to rotate. Students rotate clockwise to the next game table.
 - Randomly divide the class into three groups and send each group to a game. For this practice session, monitor all tables and help with the transition from game to game.
 - After completing the rotations, bring the students to the floor and discuss what went well and what could be better. Based on the student comments, compile a list of rules that can be modified as needed over the next two weeks.

Planning

- Decide which model you will use
- Thinking about your week, identify the goals and standards addressed
- Map out mini-lessons for the week (sometimes these need to change based on the formative data from previous day's lesson)
- Identify resources to support your instruction. This may not be EDM.
- Thinking about your student data, identify groups of students
- Map out rotations

Planning Templates

- o Guided Math
 - o 3 Groups vs. 4 Groups
- o Developmental Grouping
- o Math Workstations

Small Group Guided Instruction

- Similar to guided reading
- Homogenous grouping by ability or heterogeneous grouping by interest
- Provides scaffolding to support the learning efforts of students
- Encourages exploration and understanding of math concepts in a risk-free learning environment
- Increases teacher knowledge of students

Small Group Guided Instruction

- Work may be differentiated in procedure, level of difficulty, or by work product
- Enhanced communication which builds competent math thinkers
- Encourage use of manipulatives to increase student comprehension
- Students stay focused
- Incorrect understanding easily detected and corrected
- Cooperation among all levels of students is encouraged

Small Groups: Data-Driven Instruction

- o Small group instruction is always based on data (Unit Assessments, student interviews or conferences, anecdotal notes, teacher observations, etc.)
- o Data will point to student misconceptions, error patterns, and levels of understanding (see Depth of Knowledge/Bloom's)
- o Groups should be flexible. Student A may be in group 1 this week but group 2 next week based on baseline data.

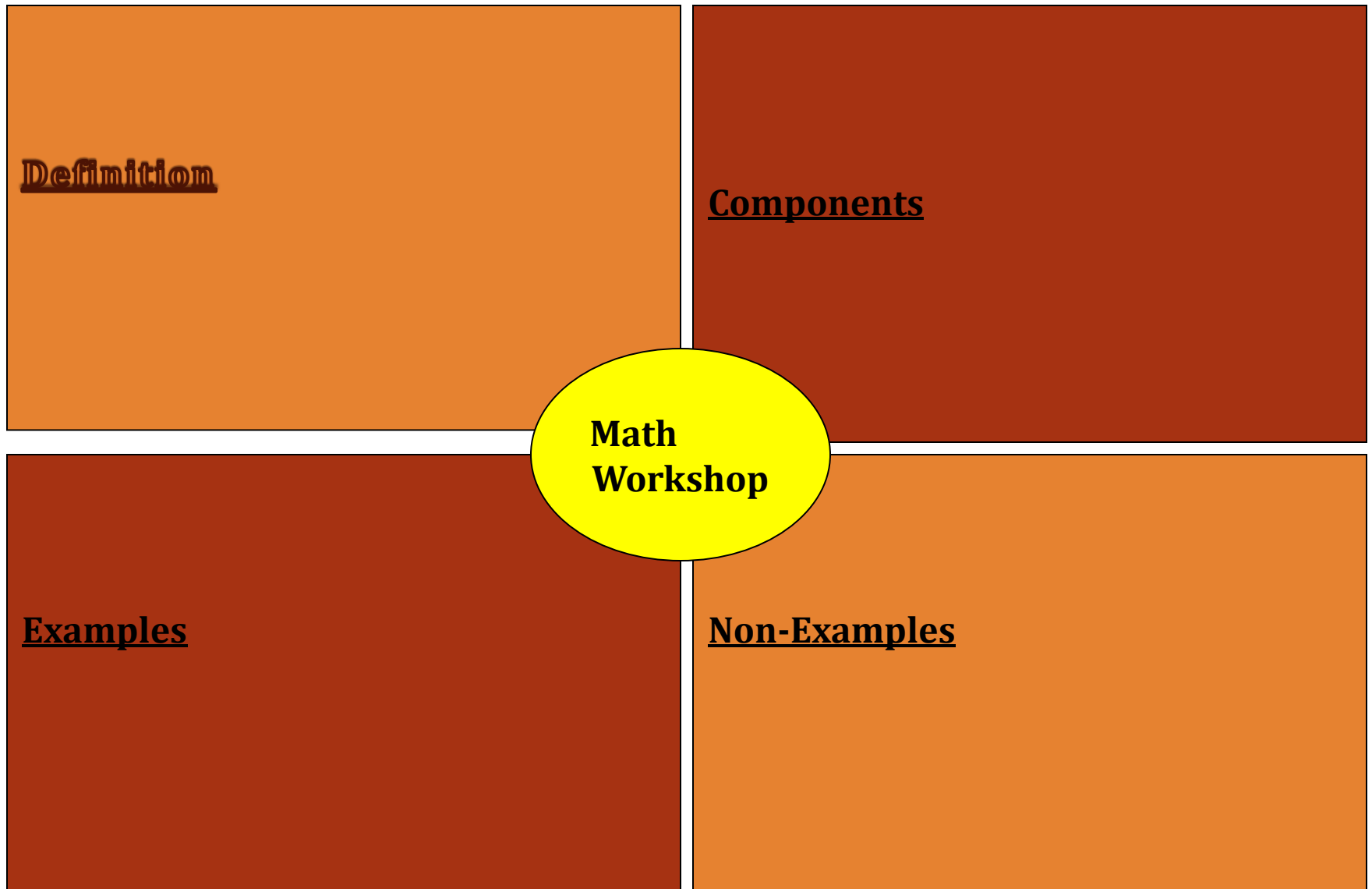
Lessons I Learned

- Management of materials
- Accountability of learning tasks/Tracking
- Length of task to be completed
- Timing
- Anchor Tasks

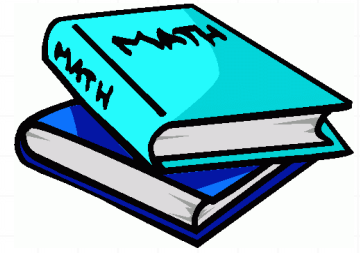
In Summary

- o Fill in your Frayer model with your group mates. What have you learned?

Frayer Concept Organizer



Resources



- o www.guidedmath.wordpress.com
- o [Alice's Math Workshop](#)
- o [Developmental Grouping to Differentiate](#)
- o *Math Work Stations: Independent Learning You Can Count On, K-2* by Debbie Diller
- o *Guided Math: A Framework for Mathematics Instruction* by Laney Sammons

Last Thoughts

- o Math Workshop may not happen every day
 - o Some content or activities can be tiered or differentiated such that the whole class is doing the same activity at the same time
- o Common planning is a great way to combine your resources and years of expertise
- o I am here to help!

3, 2, 1, Exit Ticket

- o 3 Things you will do to prepare for an effective math block in your classroom
- o 2 Things you discovered about an effective math block
- o 1 Question you still have