Strategies for Teaching Common Core Math to Language Learners

Brentwood School District
December 2, 2013
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Agenda with Key Questions

- 9:00-10:30 What are Sheltering Strategies for Common Core Math Instruction?
- 10:30-10:50 Break
- 10:50-12:00 Work Groups: How can you integrate sheltering strategies into your Common Core math instruction?
- 12:00-1:00 Lunch
- 1:00- 1:30 What Primary Language Resources Can Support Math Instruction?
- 1:30-2:30 How Can I Differentiate Common Core Math Instruction?
- 2:30-3:00 Closure and Evaluation

Objectives

- Language Objectives: I can describe at least 5 sheltering strategies that I want to use in my math instruction to support student Common Core math language acquisition.
- Content Objective: I can explain to a partner why and how to differentiate instruction during Common Core math.

Introduce Your Partner

- Pair with someone who you don't know well and has the same or similar birthdate as you. For example, August 6th and August 5th.
- Ask them:

  Name?

  School?

  Grade?

  Favorite subject to teach?

  One word to describe math.

  A hobby?
- Introduce your partner to the group.

Warm-Up: "*Head Notes*"

- ★ Students are handed a card or post-it note with a major vocabulary or concept that we've talked about that they are to place on their forehead facing out (DON'T PEEK).
- ★ Participants circulate, asking <u>only yes-no questions of others</u>, trying to guess what's on their card.
- ★ Students can only ask one question of a person before going on to another player.
- ★ When players know who they are, they continue to circulate answering questions for other players.

What I know	What I want to know	What I learned

Example of Sheltered Math Instruction

- As you watch the video, note sheltering strategies that you see.

Write-On/Wipe-Off Lesson Planning Sheet for Common Core Math Lessons with Language Learners

Common Core Critical Area (*What critical area from the Math Common Core will this lesson address?*):

Make sure the lesson makes sense to LLs!

_____

Objectives (*What **math** and **math language** can I expect the students be able to use at the end of this lesson?*):

Math Objective: *I can ...* _____

Math Language Objective: *I can ...* _____

Vocabulary (*What key vocabulary will I need to teach so the students can understand the lesson?):*

Key Vocabulary	How I will teach it?
	❏ use pictures/clipart/animation ❏ topical/thematic word wall with visuals ❏ act out the word ❏ write a student-friendly definition ❏ write/draw classroom-based examples ❏ talk about parts of the word ❏ 2 or 4 corners vocabulary ❏ Jeopardy! ❏ charades ❏ write/sing a song ❏ write/perform a rhyme/poem ❏ word web ❏ create a hand signal/body motion for vocab ❏ provide a desk reference of math terms and symbols ❏ other: _____ _____

Connecting to Prior Knowledge and/or **Providing Background Information** (*How will I remind the students what they already know about this math concept? Or how will I introduce them to new concepts in a fun or meaningful way?*): ❏ read aloud book/poem ❏ tell a story from personal or school experience ❏ whole class K/W/L ❏ show a video clip ❏ show pictures/clip art ❏ role-play with student help ❏ student 2 min. quick-write ❏ share a story problem based on the class/room
❏ other(s):

_____

Hands-On Materials (*What materials can students touch and manipulate as they practice?*): ❏ blocks ❏ counting beans & cups ❏ unifix cubes ❏ attribute blocks ❏ paper & scissors ❏ tangrams ❏ organizers made out of yarn/string and slips of paper with words/numbers to fill in spaces ❏ cut up the worksheet ❏ word cards and examples to match ❏ store-bought, teacher and student-made games ❏ make a giant-sized version of the problem with masking tape, boxes, props, signs etc. ❏ calculators ❏ individual whiteboards and dry-erase markers ❏ index cards with numbers, problems, answers etc. ❏ small bags, containers, boxes with rice, Cheerios etc.
❏ other(s):

Write-On/Wipe-Off Lesson Planning Sheet for Common Core Math Lessons with Language Learners

Meaningful Practice (*How will students repeatedly practice with the math and math language in a meaningful way?*) ❑ turn & talk ❑ finish sentence frames (i.e. "I can ___ using ___." "One way to ___ is ___.") ❑ partner work ❑ place vocab. in graphic organizers ❑ add words to word bank/personal dictionaries ❑ make/build a model ❑ create 5 problems and switch with a partner to solve ❑ with a partner, say/write as many sentences with key vocab as possible ❑ pairs solve problems and write answers on individual whiteboards ❑ students write story problems ❑ solve problems/answer questions in small groups ❑ solve real-world/school based problems ❑ math conversations ❑ math dramatization ❑ give students math discussion starter sentence frames (e.g. "If I try ___ I think ___will happen." etc.) ❑ model thinking aloud when problem-solving
❑ provide a checklist of problem solving steps
❑ other(s):
_____

_____

_____

Open-Ended Questions (*What interesting questions will I ask during the lesson that could be answered in many different ways (i.e. will elicit higher-order thinking)?):*
_(Ideas: *Do you think..? What would happen if...? Is there a better solution..? How many ways can you..? What's the easiest/hardest part...? What is this similar to? Do you think...? Why did you...? How can you use this in life? What do you notice about...? etc.*)

1)_____

2)_____

3)_____

Constant Assessment (*How will I and how will the students measure their math and math language learning throughout the lesson?*):
❑ ask open-ended questions related to your objective (e.g. "How do you know..." "How will you know if you are right?" etc. ❑ students give a thumbs up, down or sideways based on their achievement of the objective ❑ conference with individual students and note successes and stuck places ❑ ask individual students a question they would need to answer with a key vocabulary word ❑ partners share what they are learning with one another ❑ direct a student to think out-loud about a problem ❑ exit tickets where students write 1-3 things they learned or questions on a post-it
❑ other(s):
_____

_____

Break

- Please enjoy a break and return by 11:00

Plan a Sheltered Lesson

- With a grade-level partner, choose a Common Core Critical Area and Standard and plan a lesson using the planning guide.

Work Groups: How can you integrate sheltering strategies into your Common Core math instruction?

- When do students not understand math instruction? What parts of the Common Core challenge students most?
- Identify 5-10 areas of concern, problems, student needs.
- Work together to plan sheltering strategies (use the planning guide) that might support student language load.
- Share your planning progress with the large group.

Lunch

- Please enjoy lunch and return by 1:00.

How do you use the primary language to support math instruction?

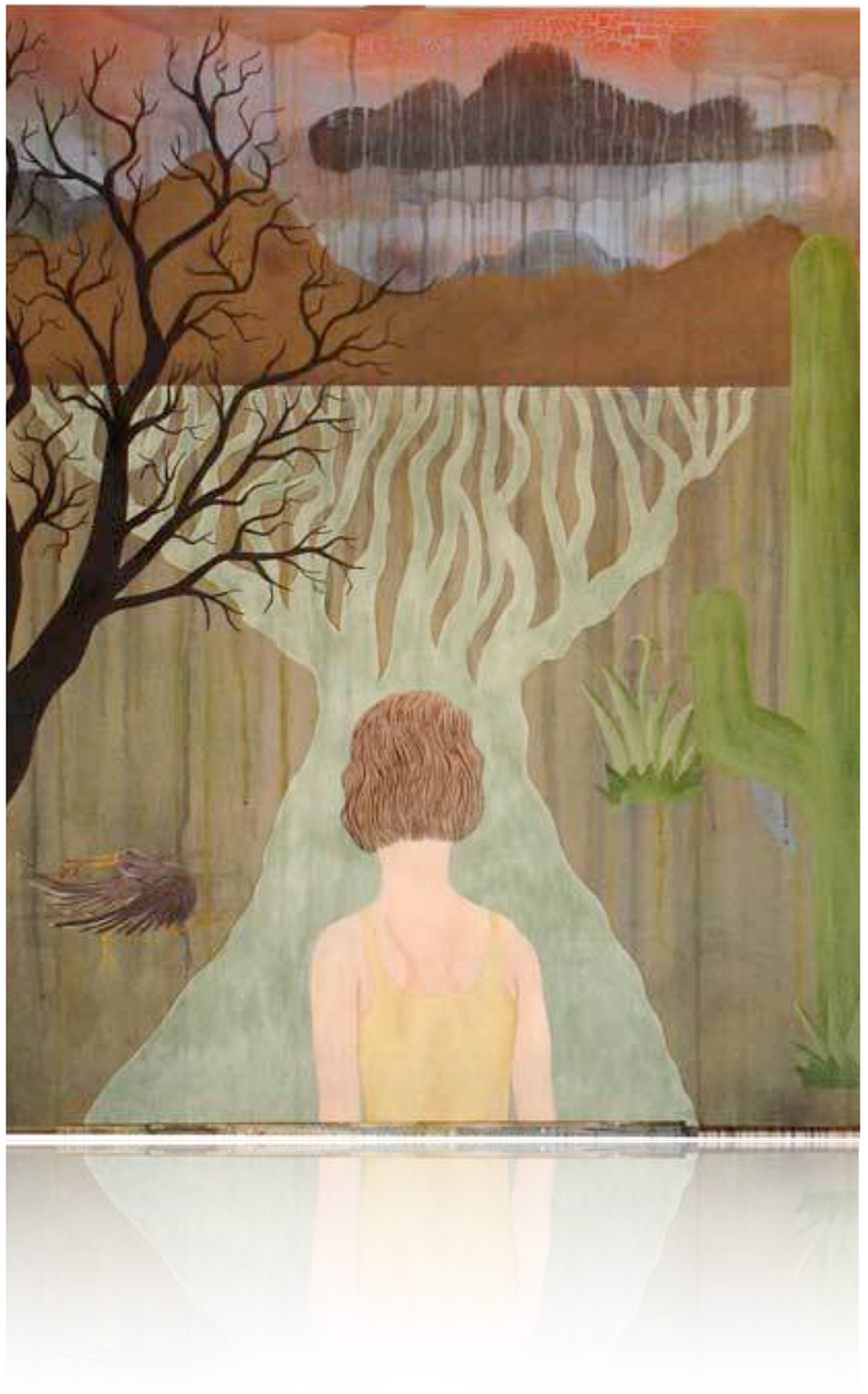
- Turn & Talk: When do you use the primary language in the classroom and how do you decide?
- Quick-write: What primary language resources do you use?
- Chart and share.
- Additional Resources

How Can I Differentiate Common Core Math Instruction?

- Talk to your partner:
  - What are the different language levels in your class?
  - What are the different educational levels in your class?
  - What are the different needs of your students in math?

How many ways are there to get there?

Usually, we ask students to walk the same exact path to understanding. What would happen if we asked them to choose among a few paths to the same understanding?



teachers are not dispensers of knowledge but organizers of learning opportunities

Tomlinson (1995)

When we teach the same thing to all kids at the same time,

1/3 already know it,

1/3 get it,

and 1/3 never will.

so 2/3 of the kids are wasting their time.

Scott Willis (2006)

What kind of classroom needs differentiation?

- Classrooms with…
  - Different abilities
  - Different languages
  - Different reading levels
  - Different skill levels
  - Different interests
  - Different cultural and life backgrounds

What's a differentiated classroom teacher like?

"In differentiated classrooms, teachers provide specific ways for each individual to learn as deeply as possible and as quickly as possible, without assuming one student's road map for learning is identical to anyone else's. These teachers believe that students should be held to high standards. They work diligently to ensure that struggling, advanced, and in-between students think and work harder than they meant to; achieve more than they thought they could; and come to believe that learning involves effort, risk, and personal triumph"

(Tomlinson, 1999, p. 2).

What is differentiated instruction?

Differentiated instruction is…

- teaching and curriculum that responds to the learning needs of individual students
- It responds to:
  - Individual student interests
  - Individual student academic (content and language) and social abilities/readiness
  - Individual learning style

The Right Instructional Level

10-2 What is the most important thing you are learning about differentiated instruction right now?

- Give *moderately challenging* work to each student so that with moderate effort, they can succeed.

Tools to know your students better:

- Sticky notes in individual folders
- Journal entries
- Checklists
- Interviews
- Interest inventories
- Sticky notes
- Funds of Knowledge
- Home visits

Sticky Notes in Individual Folders

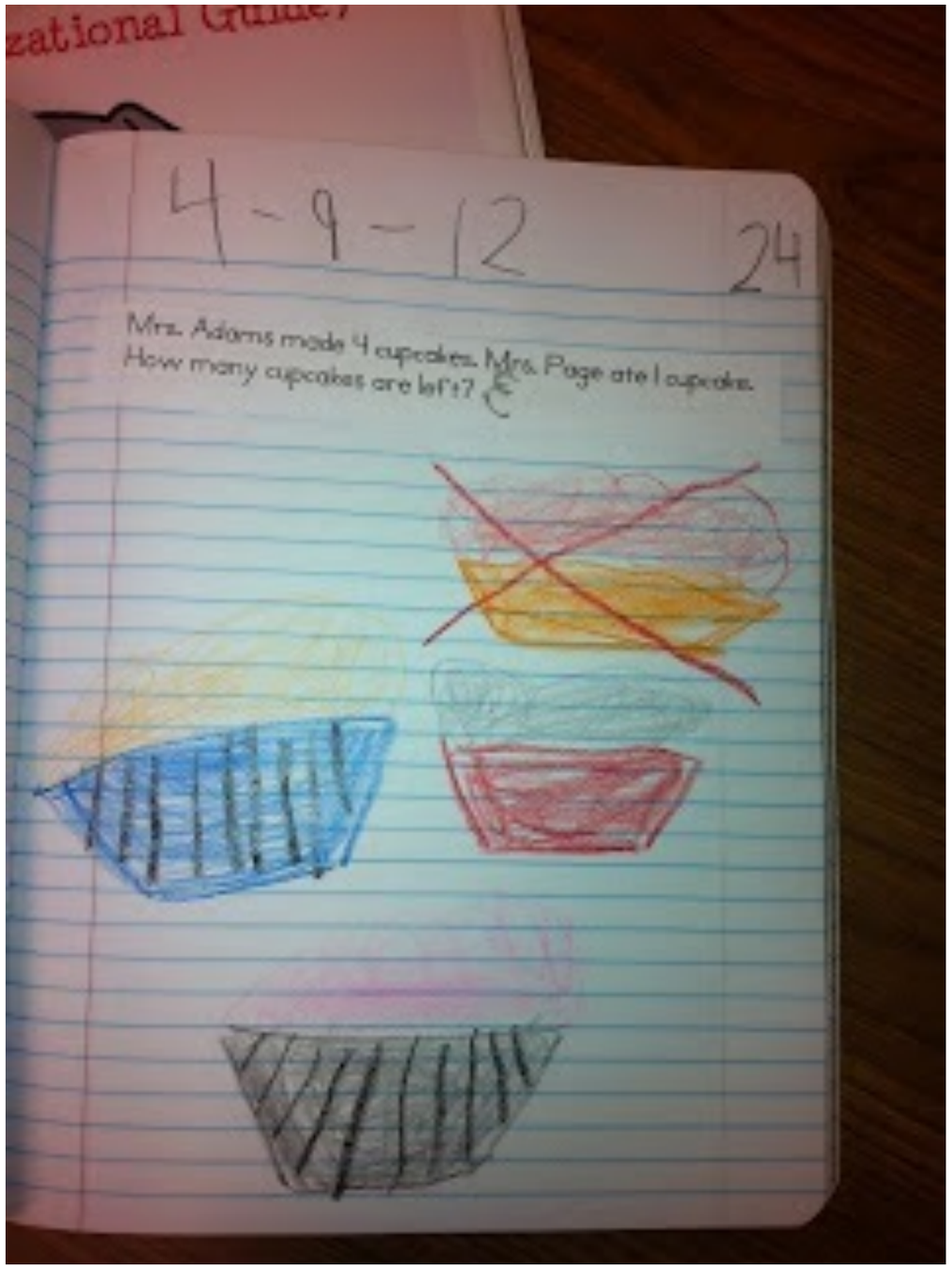
- Keep your clipboard with you during class discussions and take notes on individual students questions, comments, and understandings.
- Use stickies that you can stick into individual folders later.
- Could focus on a cluster, standard, or mathematical practices

Student Math Thinking Journals & Logs

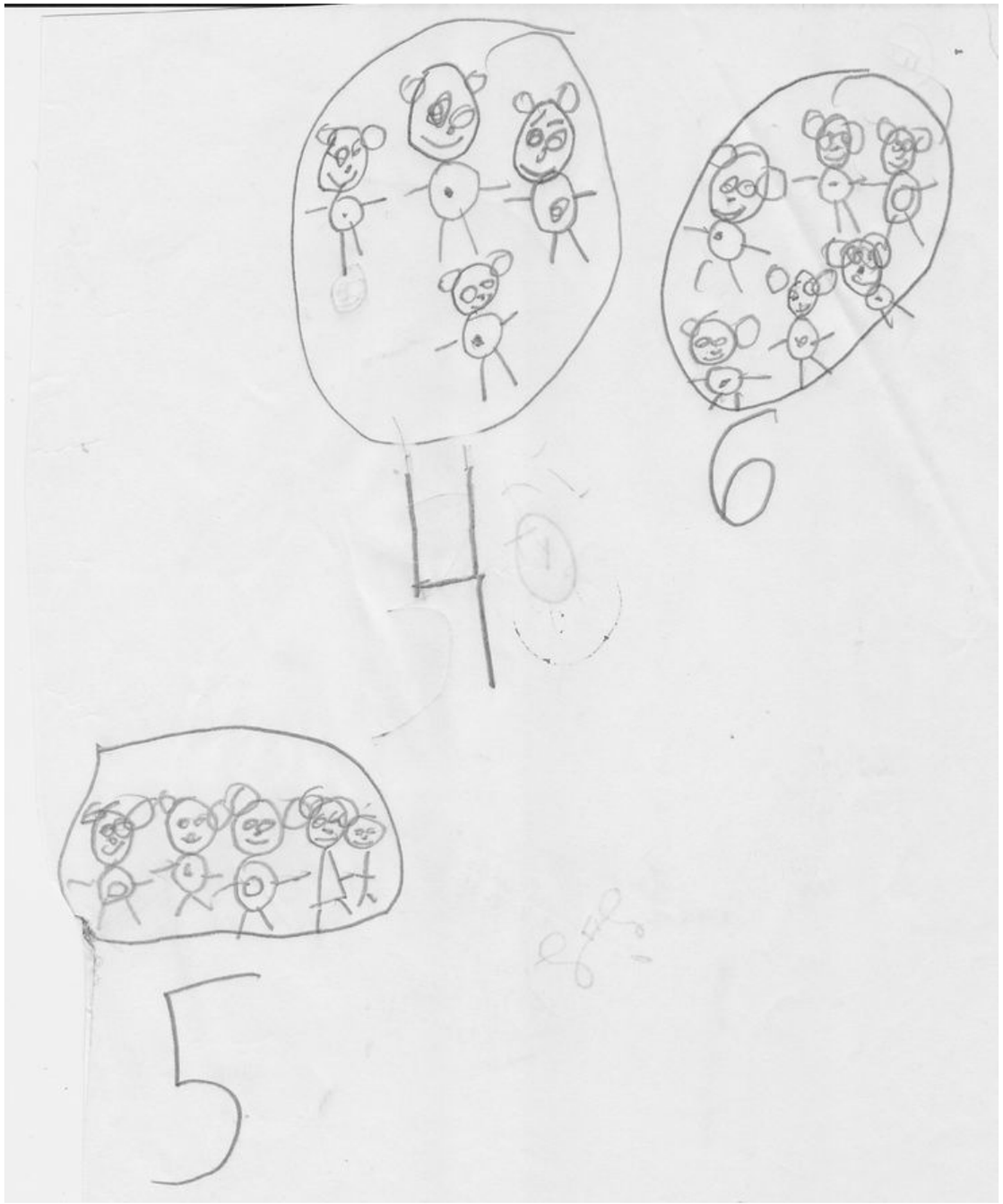
- Open-ended math thinking journals
  - Notebook dedicated to journal
  - Student-generated math topics
  - Focused on ideas, thinking, and questions about math
  - At least twice a week
  - Could include drawings and sketches

- Math Learning Logs
  - One for all units or unit-specific
  - Students write down what they did, learned, and plan to do next time.
  - Use graphic organizers to organize thinking/writing
- Review 6-10 journals a day so you keep tabs on all students over time.
- Can comment and direct or not.
- Make assessment notes in their individual folders.

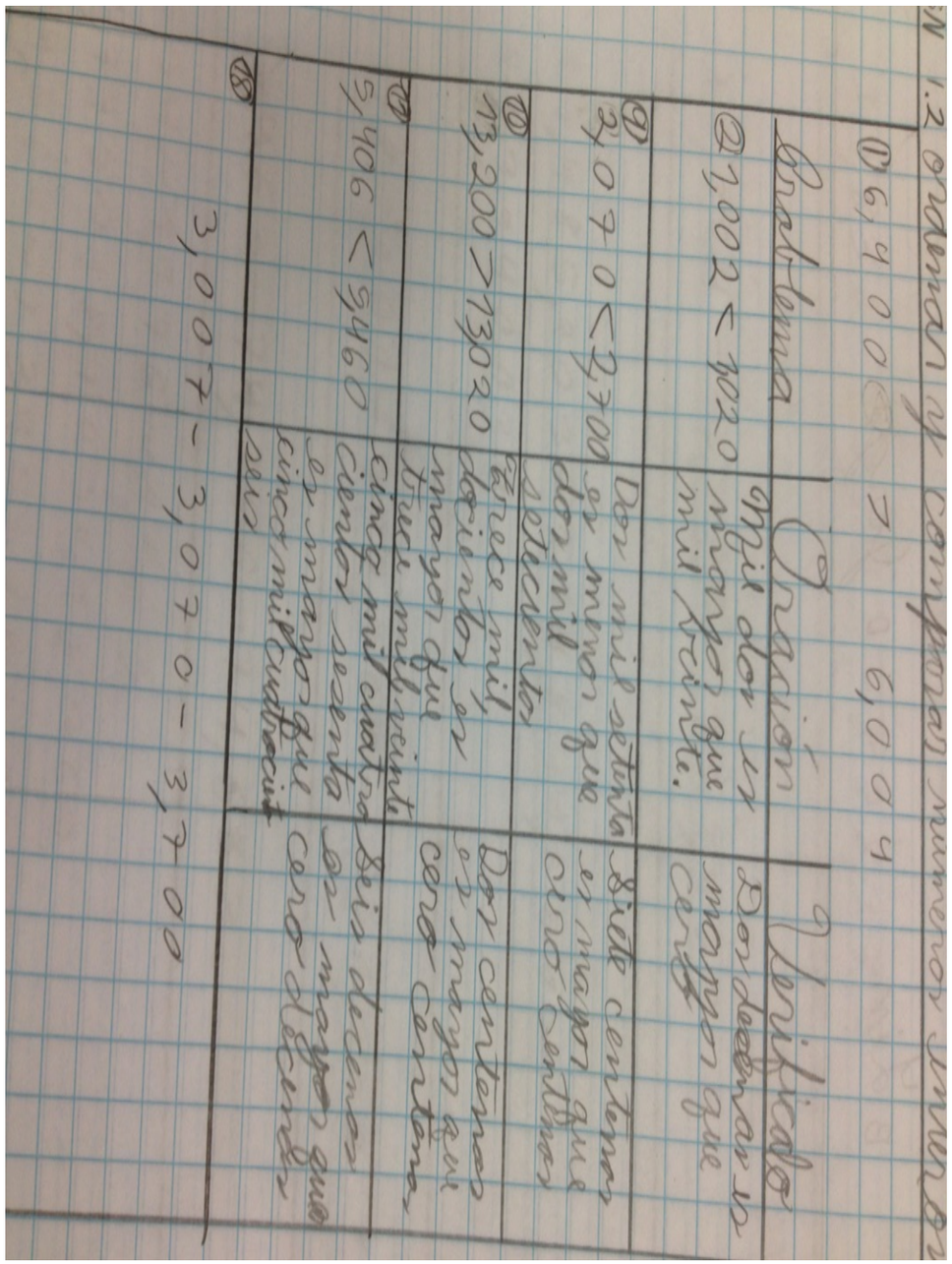
Math Journal



Math Learning Log



Math Learning Log



Checklists

- A great way to use ongoing assessment
- Flexible tool that can focus on whatever skill or competency you want to observe and measure
- Quick
- Helps you redesign instruction

- Assessment Checklists
  - Flexible checklists
  - Individual student checklists

Individual Student Assessment Checklist

STUDENT ________________________________ START DATE__________ - END DATE ____________

enjoyment/interest				
1	2	3	4	5
no interest/off-task	inconsistent/low	moderate	strong engagement	high/focused/ animated

mastery				
1	2	3	4	5
does not understand	inconsistently understands/ succeeds	consistently succeeds at skill/ task/concept	strong understanding of the skill/ concept	able to challenge/ question & extend skill/ concept

date	time	skill/task/concept description	enjoyment/ interest (1-5)	mastery (1-5)	notes/observations=> differentiation idea/strategy
10/5		subtraction within 20	2	2	Jerry seems frustrated with subtraction—> teach him decomposing to a 10 strategy; have him work with 2 ten frames and counters center

Interviews

- Invite parents/ guardians to come before or after school to talk about how they use math in their lives
- Ask student to interview parents/ guardians about how they use math
- Send a tape recorder home with students
- Ask about strengths and interests
- Ask about family math history
- Ask about family members who can speak/share in class (e.g. build, cook, show examples of math in daily life and on the job.).

Home Visits

- Contact parents/ guardians before school or at the beginning of school year
- Phone call or letter
- Keep it positive
- Ask about strengths and interests and be sure to ask about math and numbers in the home.
- Take your time

Interest Inventories

- Find out what your students like and dislike in general and about math
- What do they think they do well?
- What do they think they don't do well?

- Interest inventories: Find ways to create curriculum around student interests (e.g. games with characters they like; story problems related to their lives; sharing with family members etc.)

(Math) Funds of Knowledge

- Luis Moll (1992)
- Historically developed and accumulated strategies or bodies of knowledge that are essential to a household's functioning and well-being
- Gather information about funds of knowledge through home visits, home surveys & interviews.
- Some examples: animal husbandry, construction, trade, business, finance, coal mining etc.

Sticky notes

- Choose 5-10 students a day
- Focus on observing them throughout the period
- Write down the date & time
- Write down the strength or need
- At the end of the day, put the stickies in the student folder

Differentiation Strategies for All

- Orbital Studies
- Flexible Grouping
- 10-2
- concrete->abstract
- Personal Agendas

Orbital Studies

- Focuses on a topic of student interest that aligns with the Common Core
- Student groups work on it from 2-3 weeks
- Teachers help student come up with a clear question, plan for research, method of presentation, and criteria for quality
- Students keep a work log and get teacher and peer feedback throughout

- <u>Examples:</u> a collection of items that come in 1s, 2s, 3s, etc.; graphing the weather; a mural of mathematicians and their contributions; measuring plant growth; collecting shapes in our neighborhood; a comic book about ways to solve word problems; a short film on how to use geometry in real life; research on female scientists and the math they utilize etc.

Flexible Grouping

- Purposeful reordering of students
- Ensures that students change groups *often* so they work with peers with both similar and dissimilar academic readiness, interests, and learning styles.
- Students experience individual, pair, small group, and whole class configurations.
- The teacher thinks about the content and language objectives, individual student strengths and needs and groups thoughtfully.
- The teacher observes and takes notes on how the groupings work and readjusts.

5-1

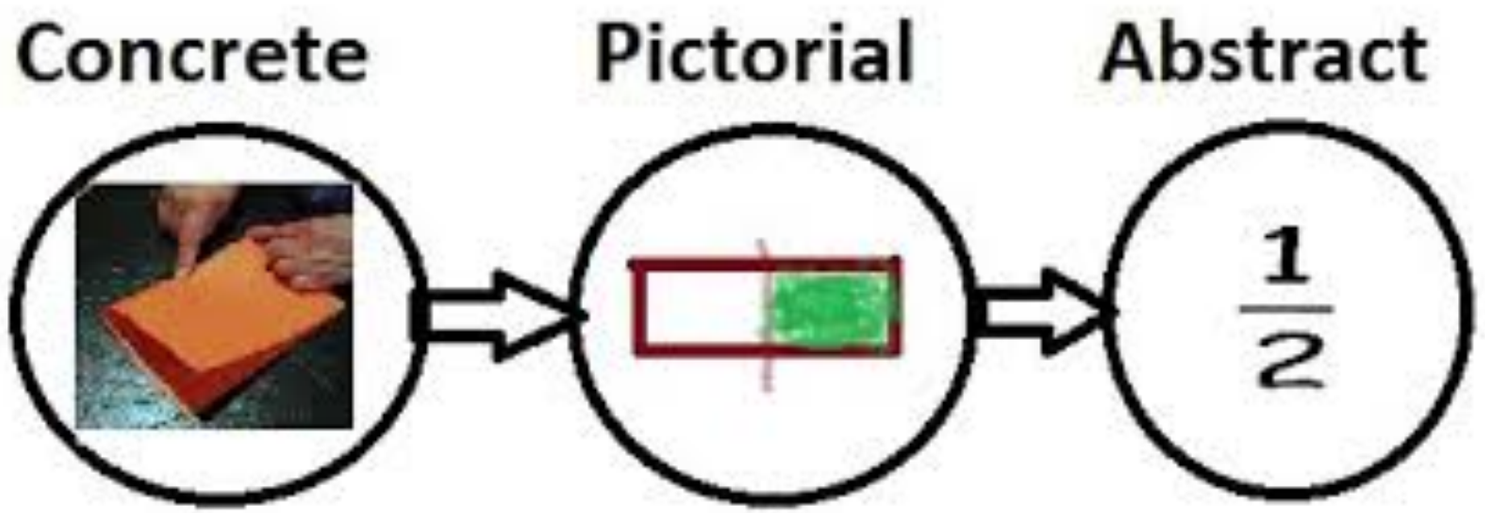
- When giving students information in a teacher-centered way, STOP every 5 minutes.
- Give the students 1 minute to process what they are learning with…

1 activities

- Quick write on what you are learning
- Pair-Share: Tell your partner one thing…
- Write down one question on your whiteboard
- A quick sketch (of a character, a setting, an item etc.)
- Fill in one thing on a KWL chart etc.
- What do you think will happen next?

Concrete to Pictorial to Abstract

- Move from concrete experiences to a pictorial representation to abstract…
  - e.g. math manipulatives-->solving equations with pencil and paper



Personal Agendas

- A personalized list of tasks that a particular student must finish in a specified time
- Usually lasts 2-3 weeks
- A certain time each period is “agenda time”
- Gives the teacher time to work with individuals or small groups

Personal Agenda for _____

Starting Date_____

Teacher and student initials at successful completion	Task	Special Instructions

When a student needs to be challenged…

Advanced learners spend their time grappling with important complexities rather than repeating work they already know.

- Assess students and eliminate work that has been mastered already
- Give students individualized projects that challenge them.
- Draw upon student imagination and creativity
- Give choices for final products (e.g. artwork, report, book, share with a small group, model, short video, skit/play , Webquest etc.)

When a students struggles…

- The teacher ensures that they focus on essential understandings and skills in the CCSS Critical Areas; they don't drown in a pool of disjointed facts
- Give students genuine and specific praise
- Status Treatments (give publicly for the most impact)

Differentiation *is* more work…

...but benefits of differentiating instruction include:

- More student access to learning
- More student success
- More engaged student; more students engaged
- More self-directed and responsible students
- Higher order thinking
- Real-life application; meaningful lessons
- Efficient learning

Start small…

- Use an anchor activity
- Use and anchor with another task at the same time
- Try differentiation for a small block of time

Anchor Activity

- Gives you time to pull aside students who need your focus and time and conduct Guided Math
- Should be quiet, independent, and predictable
- For example:
  - journal writing about a math story
  - free writing about math
  - warm-up - a math question/problem

Anchor activity and another task at the same time

- Ask some students to work on an anchor task (e.g. silent reading) and another group to work on another quiet task that is different.
- This helps students focus on individual work without focusing on what someone else is doing.

Differentiate for a small block of time

- …open up the period with students reading from their math reading library (a collection of different math-themed texts and reading levels)
- …after sharing a math mini-lesson a new topic have students draw or write in response to the most important ideas
- In this way you are showing students that your classroom is a place where students work independently on tasks that are individualized and learner-centered.

Work Time

- Work with your grade level team and choose 1 or 2 differentiation strategies that will support your students during math and plan activities and materials that you will use.
- Share your progress with the whole group.

Make a Plan to Focus on Language in Your Lessons

Based on what you learned today and your current thinking about language learners:

- What are 5 things you need to start doing?
- What are 2 things you need to stop doing?
- What are 2 questions that you have.

Assessment

- With a partner, describe at least 5 sheltering strategies that I want to use in my math instruction to support student Common Core math language acquisition.
- Explain to a partner why and how to differentiate instruction during Common Core math.

Assessment

 = I can't do it.

 = I can do it, but I am getting closer.

 = I can do it.

Evaluation

- Please provide feedback about the session and presenter.