Coaching Using the Mathematical Teaching Practices: Building Number Sense

Rhonda White, Norfolk Public Schools

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Goals for our time together:

- Explore The 8 Mathematical Teaching Practices
- Decide ways to coach with each practice in mind

Stand when you can say: Just Like Me……

I live in a city outside the Tidewater Area.

I live in the Tidewater Area.

I am a building level math leader.

I am a district level math leader.

I am an awesome Math Educator!

Principles to Actions: Ensuring Mathematical Success For All

Effective Teaching and Learning

Eight Mathematics Teaching Practices that serve as a framework

Mathematics Teaching Practices
Establish mathematics goals to focus learning. Effective teaching of mathematics establishes clear goals for the mathematics that students are learning, situates goals within learning progressions, and uses the goals to guide instructional decisions.
Implement tasks that promote reasoning and problem solving. Effective teaching of mathematics engages students in solving and discussing tasks that promote mathematical reasoning and problem solving and allow multiple entry points and varied solution strategies.
Use and connect mathematical representations. Effective teaching of mathematics engages students in making connections among mathematical representations to deepen understanding of mathematics concepts and procedures and as tools for problem solving.
Facilitate meaningful mathematical discourse. Effective teaching of mathematics facilitates discourse among students to build shared understanding of mathematical ideas by analyzing and comparing student approaches and arguments.
Pose purposeful questions. Effective teaching of mathematics uses purposeful questions to assess and advance students' reasoning and sense making about important mathematical ideas and relationships.
Build procedural fluency from conceptual understanding. Effective teaching of mathematics builds fluency with procedures on a foundation of conceptual understanding so that students, over time, become skillful in using procedures flexibly as they solve contextual and mathematical problems.
Support productive struggle in learning mathematics. Effective teaching of mathematics consistently provides students, individually and collectively, with opportunities and supports to engage in productive struggle as they grapple with mathematical ideas and relationships.
Elicit and use evidence of student thinking. Effective teaching of mathematics uses evidence of student thinking to assess progress toward mathematical understanding and to adjust instruction continually in ways that support and extend learning.

Fig. 1. Mathematics Teaching Practices

Handout Work Mat

Mathematics Teaching Practice	Ideas
Establish Mathematics Goals to Focus Learning	
Implement tasks that promote reasoning and problem solving	
Use and Connect Mathematical Representations	
Facilitate meaningful mathematics Discourse	
Pose Purposeful Questions	
Build procedural fluency from conceptual understanding	
Support productive struggle in learning mathematics	
Elicit and use evidence of student thinking	

As we work today, fill this in with ideas, or names of people to contact that had great ideas!

Number sense is……

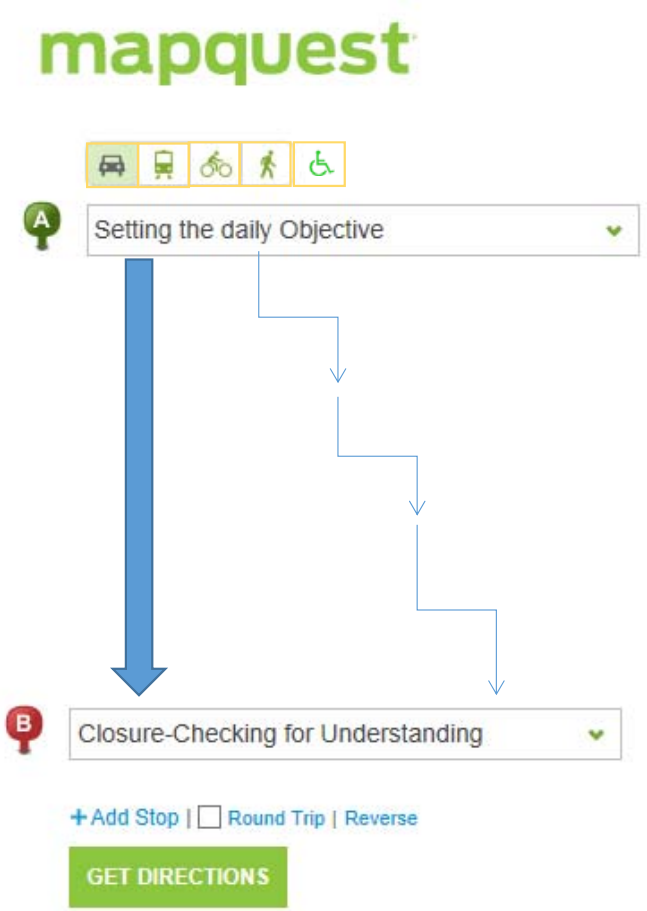
Students with number sense…

- naturally decompose numbers;
- develop and use benchmarks as referents;
- use the relationships among operations and their knowledge of the base-ten number system to solve problems;
- estimate a reasonable result for a problem; and
- have a disposition to make sense of numbers, problems, and results.

NCTM's *Principals and Standards for School Mathematics-Standards 2000*

Establishing Mathematical Goals to Focus Learning

K. Batista says: “It’s Like a Journey…….”



How do I get my learners from Point A to Point B?

Using The Framework to Establish Goals

A progression of student friendly goals can be developed.

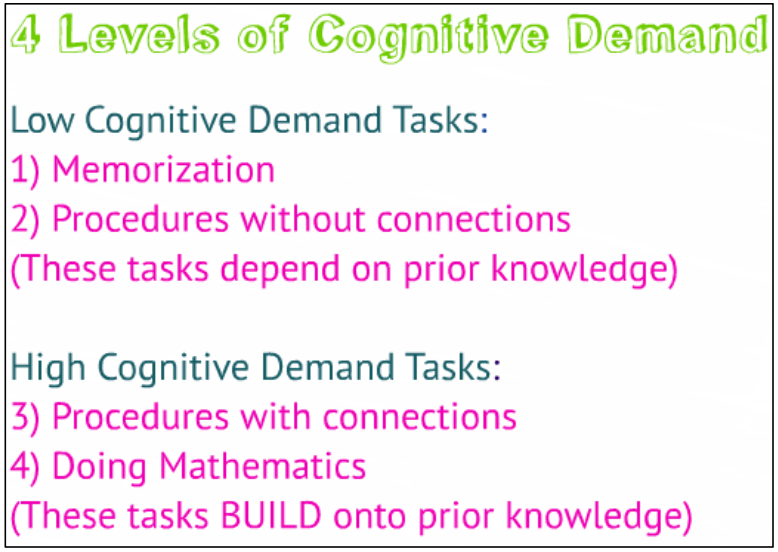
Student Goals For 2.1	Student Goals For 3.1	Student Goals For 4.1

Coaching Lens: How could you utilize this activity as a coach?
What would you change?

Implement Tasks that Promote reasoning and problem solving

Support productive struggle in learning mathematics

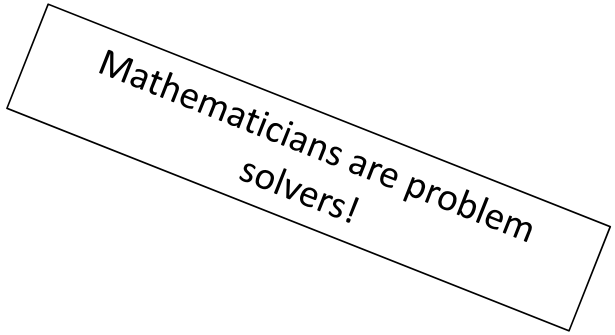
What kinds of tasks promote reasoning?



Activity: Sorting into Levels of Cognitive Demands

Coaching Lens: How would doing a task sort like this (during planning) before the onset of a unit help teachers?

Fostering Patient Problem Solvers



Share Problem Solving to scaffold ownership

- Use Teacher Think Aloud
- Use Cooperative Groups

Coaching lens: Does your district have a problem solving plan? Do you think it is needed?

Facilitate Meaningful Discourse

How can we get them to talk? (About math)

Use student responses in math discussions:

Anticipate, Monitor, Select, Sequence, Connect

Talk Moves Poster (Resource: Classroom Discussions)

Sentence Starters help to model and support discourse

Coaching Lens: How can you model this for teachers?

Pose purposeful questions

Questions to Consider When Thinking about Questioning…..

What kinds of questions are we asking?

What's the purpose of our questioning?

Who is asking the questions?

Activity: Questioning Observation Review

Coaching Lens: Would you say there is an acceptable use of funneling vs. focusing questions?

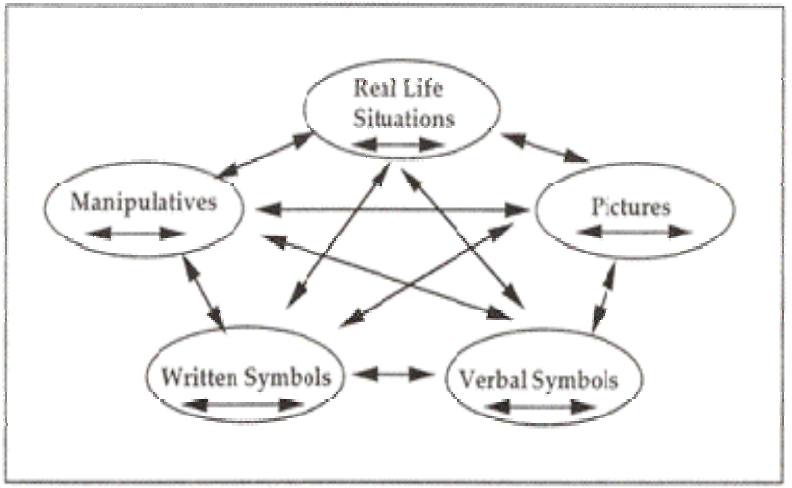
Build procedural fluency from conceptual understanding

Use and connect mathematical representations

Use and Connecting the Representations

The Lesh Model

- Supports Concrete-Representation-Abstract



Activity: Is it in the Plan?

Coaching Lens: What would your response be to a teacher that says: "I can't keep using concrete models every day to solve problems because our pacing guide says we have to move on and get these kids to solve more rigorous problems."

Elicit and use evidence of student thinking

Did they reach their goals?

How can we elicit their thinking?

Exit Tickets, Quick Checks, Discourse…….

The key is to utilize this data formatively

- Errors can be addressed on a Daily Math Review
- Misconceptions can be explored in targeted small groups

Activity: What's right with what's wrong?

Coaching Lens:

What are some ways teachers can do formative checks daily?

Develop your own plan

How can we as math leaders be purposeful and support the Mathematics Teaching Practices?

The Toolkit

http://www.nctm.org/ptatoolkit/

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Thank you!

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I would love to hear about your explorations with math.

You can contact me at

rwhite@nps.k12.va.us