AHSI MINT Visit Debrief Snapshot

Problem Solving

Observations:

- Problem solving going on in each classroom – students asked to apply what they've learned in another form
- Saw students in all classes share how they got results and there was generally an openness to different methods
- Saw multi-step problems/activities in classes (Pythagorean Theorem and Quadrilaterals) and students were engaged in finding solutions in all
- Quadrilaterals – good scaffolding "3 branches to start" – enough of a clue to get them started but still had to solve problem. Teacher knew when students were guessing – didn't respond
- Quadrilaterals – good transfer of a problem-solving process to a non-related situation

Suggestions/Recommendations:

- Pythagorean Theorem – great real-world situations though suggest more set up to make more real (ex. Your construction company has 2 ladders – a 30 ft. and a 40 ft. The 30 ft. ladder is already in the truck – do you need to take the time and energy to add the 40 ft. ladder?)
- Try implementing some routines that foster independence – for example, instead of asking "Is this right?", consider "I'm confident about this answer because . . ."
- Scientific Notation – student centered activity exploring the half-life of the H1N1 virus or the Hubble telescope's pictures would lend itself to rich problem solving opportunities
- Problems used did not always clearly demonstrate the skill or weren't well connected to the set up. Consider finding resources on line or via print materials rather than create your own
- Don't make problems/questioning easier until students are answering (ex. What is 180 – 75?). Provide support by helping make connections – "What do you know/what connections can you make?"
- Real world questions that come from students would benefit problem solving, engagement, retention, and vocabulary. Students need to learn to use the language of Math.
- Allow students more "think time" and let them walk out of class not necessarily knowing the answer. Demonstrate how to ask the right questions to reach a viable solution – use conundrums.

Student Engagement

Observations/Evidence:

- All lessons made connections to real-world situations and student interests
- Evidence of good/growing staff expertise with SmartBoards – possibilities are endless
- All classes had very clear opening procedures (get notebooks, Do Now, etc.) and workshop format was evident – helps with "finding their place"
- Pythagorean Theorem – involved each student, good movement in classroom; high expectations – used clock as motivator; good use of SmartBoard as a tool – included student giving explanation
- Scientific Notation – good use of SmartBoard during demonstration of Frayer Model; students enjoyed pop-up answers at the end

Suggestions/Recommendations:

- Encourage students to make predictions (e.g. what do you think will happen?)
- Use real-world connections that have a clear, direct connection to the content (family tree and NYC map wasn't a perfect fit for student understanding)
- Probability Lesson – challenge students by: asking more probing questions; greater focus on fraction/percentage relationship; create an in-class simulation using probability (i.e. allow students to

place fictional wagers)
- Probability & Quadrilateral Lessons – talk about how the SmartBoard works by asking, "How does the spinner/dice on screen act like a real spinner/dice?" (They use the same rules of theoretical probability we do). "How/why does the trapezoid stay a trapezoid when it's stretched?" (bases remain parallel)

Vocabulary/Math Literacy

Observations/Evidence:
- Vocabulary building strategies in all classes: word walls, vocabulary journals
- Students break words into parts to find meaning!
- Geometry teacher was very consistent about using proper vocabulary and correcting students when they did not
- Pythagorean Theorem – introduced new V.W.; students participating to write the word; used terms and encouraged students to use the terms; identified/referenced previously learned terms; explanation of why $a^2 + b^2 = b^2 + a^2$
- Quadrilaterals – strong warm-up to review properties/definitions of each shape (access prior knowledge); interactive activity reinforced vocabulary

Suggestions/Recommendations:
- Use and vocabulary <u>within</u> activities and with a deeper understanding (e.g. ask if a rhombus is a square)
- In Geometry, have students sketch picture to understand and retain
- Try having students formulate their own definitions in groups and then assess them as a class by finding counter-examples
- Look for opportunities to explain how math syntax and logic are unique and students must learn to speak the language of the discipline of math (e.g. it seems counter-intuitive to call the <u>actual</u> outcome the <u>experimental probability</u>

Retention Strategies

Observations/Evidence:
- "Do Now" used in every class to make connections
- Students applied vocabulary as soon as it was defined
- Pythagorean Theorem – good initial question to define a P.T.; reinforcing vocabulary "when does the theorem not work?"; Real – life example: ladder and house; Aim was posted on the board; Responses were positive – good feedback; safe environment for student participation
- Quadrilaterals – real world connection with family tree and quadrilateral tree; making connections to other disciplines, i.e. Social Studies
- Scientific Notation – exposure to Regent's prep online; use of Frayer Model; closure activity re-capped learning

Suggestions/Recommendations:
- Have students defend their findings and explain their processes whether answers are right or wrong.
- Continue to build/strengthen students teaching one another
- Make sure to "close" every lesson (maybe use journaling, think-pair-share to involve everyone)
- Encourage students' posing of problems rather than it always being the responsibility of the teacher
- Quadrilaterals – include a closure activity (perhaps another full group "quiz" on the SmartBoard, Venn diagram, Exit cards – identify a type of each shape in the room
- Pythagorean Theorem - Make sure transition from P.T. to Activity 2 (maps) effectively reinforces P.T.; check for understanding before moving to independent work