

## AERO Fall Conference: December 6, 2013, The Old Mill

### Discussion Notes

#### **How do you address teacher's lack of deep understanding of math?**

- Disconnect between how parent teaches it and how teachers teach it
- Cross curricular connections with math
- Where do teachers go for support?
- Poor math experience at teacher's college
- We value reading more "read with your child"
- Have a math specialist teach math
- Math resources are being slashed from school board budgets
- Higher expectation required in terms of math content
- Finite math should be a bigger piece of math curriculum
- Keep content more holistic
- Reporting drives how its taught
- Parent's discomfort with math
- Barriers beyond school
- Technology for PD (YouTube, Khan Academy, Online tutoring)
- How to motivate teachers to want to professionally develop in the area of math? Need better marketing
- Pay attention to evidence (i.e. data)
- Have to have learning culture – has huge impact
- Media/general population driving math teaching. Has to be driven by research and by best practices
- Importance of balance
- Student's perceptions = teacher's expectations

#### **Should the problem solving approach be delayed until students reach a certain age or cognitive capacity?**

- No, they learn through problem solving
- Problem solving approach should be appropriate to age level or level development
- Kindergarten class – play based learning, curiosity and fun drives learning
- Need to look at preconceptions – not just one solution, there are multiple solutions to problems
- Teacher engagement and level of comfort of teacher knowledge is important, teachers need to be engaged in collaborative inquiry
- Need to change teacher practice (e.g., moderated marking)
- Need to see thought processes of students to see where students going wrong or where going right
- EQAO results – why are they declining?
- Assessment and instruction not aligned
- Teacher don't have M4T

- Young children and qualitative problems – why not nurture and develop that?
- Deficit model – can't solve till you can think
- It is not either /or. Problem solving or basics. Need both at the same time.
- Challenge perceptions – need to package it for greater understanding for stakeholders
- Need balance between the two
- Should be more math in teacher prep programs
- More math pedagogy and not educational philosophy
- Levels of practice disjointed among grades (i.e., should 2 x 3 be rote by a certain grade level)
- Grow skills that can use same manipulatives
- Bridge conversations and connections between grade levels and divisions to increase knowledge and understanding of what is being taught and covered.
- We believe that a problem solving approach is imperative at every level. The earlier problem solving is supported, the better. The teacher's role is to tap into the innate curiosity/inquiry of each child and support the child's growth via problem solving.

### **How do we counter the critics comments "We have to go back to basics"?**

- Drill, kill, multiplication tables will bring world peace
- We never got to teaching through problem solving by everyone yet, so how can we go back?
- Knowing the skill doesn't mean you can think, apply and communicate in math
- Fear of change in government
- Are we doing enough home/parent connecting?
- We need to get more explicit with the highlight/summary piece
- OMCA should make a position statement to defend teaching through problem solving
- Teachers say they want to see evidence that teaching through problem solving is effective
- We need to focus on building computational fluency (i.e., not drill and kill but Fosnot's "automaticity") while we continue to work on teaching through problem solving.
- Teaching and curriculum needs to evolve and be responsive to the students, their challenges, and the resources available and society as a whole
- Based in open ended thinking to accept the challenge of today/challenges that are not even known yet
- Not an either/or scenario- need basics but also the ability to adapt challenges of tomorrow
- Students need to more than simply know the curriculum, they need to understand
- Learning needs to be interactive and live (follow where the learning leads you/ interests are going). Not simply linear in nature
- Know/understand – how does this relate to the world we live in
- Needs to be an understanding of concepts but need time for practice
- Apply learning outside of context
- What are basics? Why are former approaches the best way? Are they the best way?
- Primary curriculum already has mental math strategies
- Differentiate math from arithmetic
- Connect arithmetic to numeration
- Reinforce sense of understanding rather than learning by rote

- Help students articulate understanding of concepts
- Communication of understanding is extremely important
- Balance between communicating prior understanding and moving forward
- Need to strengthen the ability to communicate what's in a student's head on paper (succinctly synthesizing learning, focus thinking)
- Does it mean drill? Memorize time tables?
- Getting people to memorize it doesn't make it better.
- Struggling with math helps us understand how kids learn
- We learn by doing not memorizing
- We need to understand how it works in order to "get it"
- Kids learn differently and at different speeds
- Does repetition help? Work?
- Teachers need to think about a variety of strategies to be able to support students as they grapple with the concepts
- Pushed by teachers and parents sometimes
- Define "basics" – reframe i.e., Do students know how to define/ refine the problem?
- People value basics=people value computation
- Move/extend from computation to include fractions, integers, problem –solving
- Use of EQAO data to identify teacher PD
- Important to open up conversations – people value what they know
- New math at elementary vs. secondary approach
- Problem solving is messy, group work is challenging at the secondary level
- We can't go back to the basics if you've never moved away from the basics
- People are stuck in their own approach therefore are not comfortable with new strategies
- Some teachers lack self-efficacy to try new approaches
- Have we had enough PD with the new approaches to realistically be able to use them effectively in our own classroom
- We need to value new approaches, even if we're not convinced its going to work
- We still are covering the basics, we've just also included open –task methods as well

### **Diagnostic Assessments**

- Not necessarily standardized (EQAO) diagnostic assessment, but more often diagnostic assessments in other grades
- What do we have to determine where our students are? This impacts teaching.
- Use something other than diagnostic assessments, a more informal way

### **Staffing Math Classes**

- Shared examples of both positive and negative experiences – of teachers who lack math background who have to teach math – teacher's attitude is the key
- Impacts decisions around staffing in schools
- Impact of FSL instruction on math instruction – what happens when language of instruction changes? Impact on EQAO scores?