Grade 6&7 Numeracy Session

January 2019

Agenda

- Assessment
- Geometry - areas of shapes
- Outside activities (weather permitting): ratio and estimating and measuring distance, perimeter and area

Session Goals

- To continue to deepen our understanding of the new math curriculum
- To understand how assessment practices align with the new math curriculum and development of growth mindsets

Number Talk Examples

What is larger $\frac{13}{17}$ *or* $\frac{5}{8}$?

True or False 29 x 16 = 30 x 15?

How much will a pair of $70 runners cost including 12% tax?

Estimysteries

https://www.stevewyborney.com/?p=1744

Formative Assessment

These following 3 slides are from the ATI Assessment conference in Portland, 2016 and are from Margaret Heritage:

Teachers who are

Expert in Formative Assessment	Not expert in Formative Assessment
• Collect evidence of student thinking (quality of thinking) • Interpret student responses in terms of what students are thinking • Consider what feedback or immediate next step in instruction will move learning forward	• Collect evidence of student performance (quantity of thinking) • Evaluate the correctness of responses • Re-teach topics based on percent correct [Minstrell, Anderson, & Li (2009); Hattie (2009); Hattie & Timperley (2007); Kroog, Ruiz-Primo, & Sands (2014)]

Source: Susan Brookhart

Educating now

Teachers who are

Expert in Formative Assessment	Not expert in Formative Assessment
• Support learning as it is developing • Actively involve students in the assessment process • Share responsibility for learning with students	• Deliver instruction • Give students test results • Focus on instructing students

[Cowie, Harrison & Willis, 2016; Heritage, 2010, 2013)

Educating now

Students who are

Expert in Formative Assessment	Not expert in Formative Assessment
• Generate personal feedback loops • Set goals • Adapt learning tactics • Make decisions about feedback use • Provide effective feedback to peers	• Comply with teaching/ learning directions • Complete assignments • Make judgments about their learning based on a grade • Rely on grades for motivation • Regard learning as a private activity

(cf. Zimmerman & Schunk, 2011)

Assessment

Work in teams of 4 (and then as pairs) to discuss how you would assess student work based on the rubrics provided. Please be ready to share your observations.

Discuss as a Whole

Share out how you assessed. Discuss similarities and differences.

Consider the following:

- What would you change in the rubric? Why?
- What part was the most challenging for you? Why?
- Which students would you want to have a follow-up conversation with? What questions would you ask them?
- What else do you think needs to be assessed with this concept?

Assessment Methods

- Portfolios:
  - assessment questions/tasks
  - individual work from collaborative tasks
  - “Write to explain” tasks
- Collaborative Quizzes:
  - Students write a quiz on their own, then write the exact same quiz again with a group of 4
- Projects
- Interviews/Conferences/Conversations
- Authentic Problem Solving Task:
  - If in group, determine how you will assess individually - will each member complete a follow up reflection or summary after the task?

Projects

Line graphs Art:
https://www.sciencefriday.com/educational-resources/illustrated-graphs-using-art-enliven-scientific-data/

You can see other student samples here:

https://twitter.com/hashtag/illustratedgraph?src=hash&ref_src=twsrc%5Etfw%7Ctwcamp%5Etweetembed%7Ctwterm%5E816919109262721024&ref_url=https%3A%2F%2Fwww.sciencefriday.com%2Feducational-resources

You can create a unit on environment and then give students a choice of data to use and then they create their artwork (not assessed for math) and interpret their graphs using mathematical vocabulary and numbers

Projects

- Financial Literacy: each student chooses an item they'd like to save up for and then determine a plan for how to save for the item. Students write up their plan including a running total of their saving/spending
- Using cm square dot paper, create a piece of art that includes the following:
    - All types of triangles (label each) - acute, obtuse, right, scalene, isosceles, equilateral
    - 2 parallelograms
    - 2 trapezoids
    - Include the perimeter and areas of each shape showing your calculations
    - Explain how the areas of triangles, parallelograms and trapezoids are all related to the area of rectangles

Assessment AS Learning

Students need to be an integral part of their assessment and learning.

- Set clear learning targets and expectations
- Provide students with the rubric to self-assess or provide evidence of their learning
- Conduct error analysis after assessments or assignments and set goals
- Re-write parts of assessments until mastery is achieved
- Ongoing discussions about *learning* - where are you at? Where do you need to get to? How do we get you there?

Student Agency

We want our students to be able to:

- Adjust their strategies when things aren't working
- Seek and use feedback to improve their learning
- Provide feedback to others to promote learning
- Know exactly where they are in terms of the learning targets
- Know how to work independently to reach their goals
- Self-assess regularly to monitor their own thinking and learning

How do we achieve this? Discuss

Student Agency

- Daily inclusion of learning target/goal and reflection upon that goal at the end of the lesson
- Reflection questions daily (what affected my ability to learn, what am I not understanding, what new learning did I have today, how is this concept similar/different to another concept
- Practising assessing themselves and others (often)
- Stop them throughout lessons with a timer to assess how their current strategy is working and what they might do differently next, ‘what’s working?’ ‘what’s not?’ ‘what do I understand and how well?’
- Coach them daily (a few at a time) on the above

GET UP and Show Me..

- An acute angle
- A right angle
- An obtuse angle
- Perpendicular
- Parallel
- About 30°
- About 100°
- A straight angle
- A reflect angle

Geometry - It's all about the rectangle!

- Use your grid paper to draw a rectangle and find its area
  - What was challenging or easy for you? Why?
  - Challenge: Draw 3 different rectangles that all have the same area but different perimeters - do you see a pattern with the shape of the rectangle and the size of its perimeter? Did you get stuck on this one and have to choose a different area? Explain why or why not.
- Identify the height and base of the rectangle (same as length and width) and that they are always perpendicular

Connect to Parallelograms

- Draw a parallelogram with the SAME height and base as your rectangle and make any cuts necessary to show HOW it is related to the area of the rectangle.
- Gallery Walk - do you see different visual proofs? What can you generalize about the relationship between the areas of rectangles and parallelograms?

Triangles

- Draw a triangle that has the SAME height and base as your rectangle
- Determine (show visually) how the area of the triangle is related to the area of the rectangle and explain in words
- Gallery Walk - check out all the different shapes and see if there's a common relationship. Can you summarize it?
- Same again for the trapezoid (hint: cut out two identical trapezoids)

Learning on the land and from the land

Learning from the land means we need to be observers and pay attention to nature and see what we can learn from it. In general, this takes regular practice but we can always dip our toes in...

- Ratios with rulers to measure heights of trees/buildings AND to explore a bit more about trees in general
- Estimating perimeters and areas using meter sticks and our strides and getting to know our own school grounds more mathematically and how they might compare to other spaces (relational thinking)

Explore More Deeply

There are many things to learn about trees...

How do we use and connect with trees?

How do trees connect with each other?

We're going to focus on one aspect: height!

How do we know how tall a tree is? Do we include roots and crowns?

Why might it matter how tall a tree is?

Why Estimate?

Why not just measure the height of the tree with a measuring tape?

Sample Answers:

Building: houses, totems, canoes, longhouses

Logging, exploration of ages and types of trees

If you want to learn more about how trees talk to each other:

https://www.ted.com/talks/suzanne_simard_how_trees_talk_to_each_other?language=en

Outside Activities

1. See the handout for Estimating the Height of trees and Estimating and Measuring Perimeter and area
2. As you participate in the activities think about the First Peoples Principles of Learning we discussed earlier

Reflection and Action Plan

“If you don’t use it, you lose it”

Action Plan:

- What are you going to implement this week?
- What are you going to share with other teachers in the next month?

Feedback sheets for reflections please...