

# Supporting your child in learning math

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# Tonight I will talk about

- How the teaching of math has and has not changed
- Things you can do to support your child's math learning

# How do you remember learning math?

- Do you have good memories when you remember learning math or less happy ones?

# What math skills are important in 2018 and beyond?

- The world has changed.
- We now have easy access to tools that can do calculations.
- What we need are people who know what calculations to do and people who can solve problems- whether numeric, geometric, about data or about measurement.

# For example...

- Rather than just an exercise like:
- What is 40% of \$120?
- I raise a problem like this.
- Your savings gets \$40 better when the discount goes from 25% to 50%.
- What was the original price?

OR

- Do you lose more heat with a 2-story 1200 square foot house or a bungalow?
- Or does it depend?

# Applied vs academic

- Some of the applied classes and academic classes are closer in content than others.
- There are always some differences, though.
- Sometimes it is the complexity of the content and sometimes the approach.

# Achievement chart categories

- In Ontario, our teachers need to collect data about:
- Knowledge
- Understanding
- Application
- Communication
- Thinking

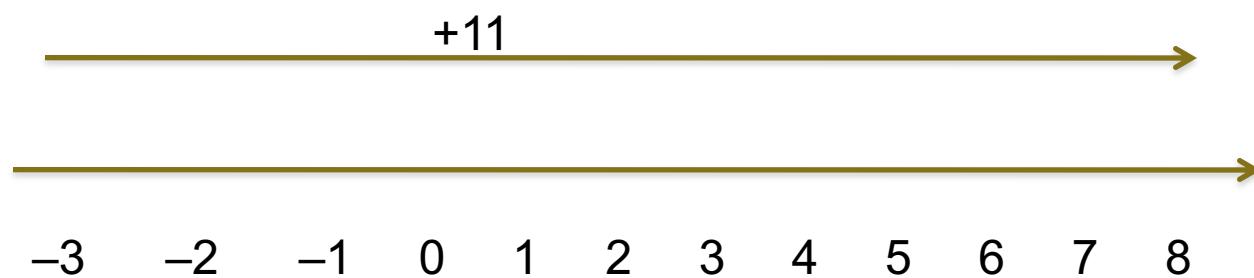
# In Grades 9-12, the focus is on

- Algebra
- Geometry/measurement
- Some number work
  
- If students have gaps, though, in number, this will impede them.
- Often the gaps are in work with integers, with fractions and with proportions.

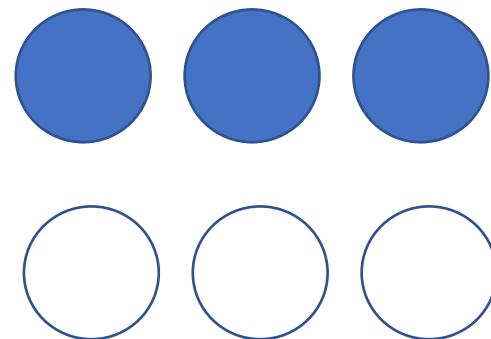
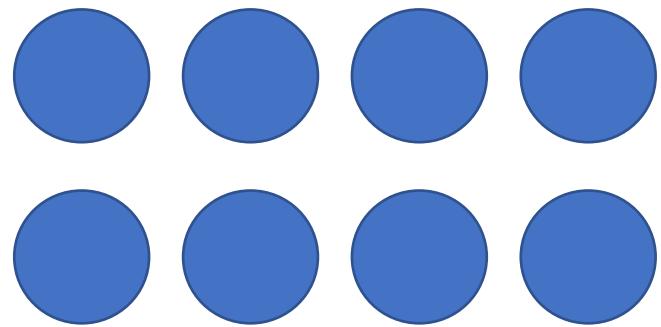
In Grade 7,

- Instead of learning a rule that to figure out  $8 - (-3)$ , you just add 8 and 3 because I told you to....
- Kids learn that  $8 - (-3)$  is actually asking how many steps and in what direction you move if a temperature of  $-3$  changes to a temperature of  $+8$ .

$$8 - (-3)$$

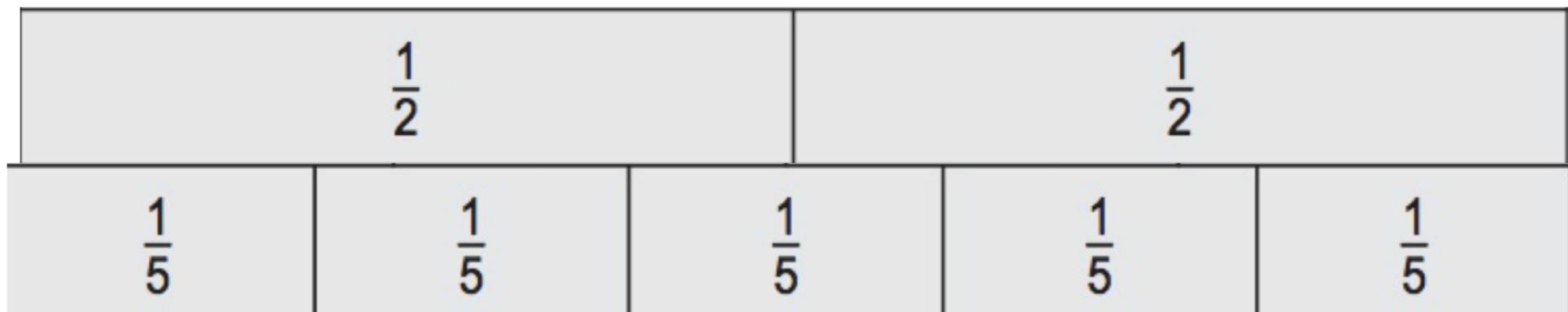


Or they learn



# Or instead of learning

- The reason that  $\frac{1}{2} \div \frac{1}{5} = \frac{5}{2}$  is not because of a “flip and multiply” rule, but because when you try to fit  $\frac{1}{5}$  into  $\frac{1}{2}$ , it fits  $2\frac{1}{2}$  ( $\frac{5}{2}$ ) times.



# in intermediate

- How can you figure out  $2/3 + 1/5$ ?
- One way is to do what you learned about renaming this as  $10/15 + 3/15$  to get  $13/15$ .
- But there are other ways

# Maybe

- You use a grid to show 2/3.

<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>x</b>
X	X	X	x	x

Then

- Add 1/5

<b>X o</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>x</b>
X 0	X	X	x	x
0				

Then rearrange

<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>x</b>
X	X	X	x	x
0	0	0		

# Accessing virtual manipulatives

- There are tools for materials your children use in class freely available on line.
- Many are also available as apps.

# Fraction bars

- [http://nlvm.usu.edu/en/nav/category\\_g\\_2\\_t\\_1.html](http://nlvm.usu.edu/en/nav/category_g_2_t_1.html)

# Colour chips for integers

- [http://nlvm.usu.edu/en/nav/category\\_g\\_2\\_t\\_1.html](http://nlvm.usu.edu/en/nav/category_g_2_t_1.html)

# Algebra tiles

- [http://nlvm.usu.edu/en/nav/frames\\_asid\\_189\\_g\\_4\\_t\\_2.html?open=activities](http://nlvm.usu.edu/en/nav/frames_asid_189_g_4_t_2.html?open=activities)

# Algebra tiles

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# Desmos

<https://www.desmos.com/calculator>

# Desmos

# Another resource for filling gaps

[http://www.edugains.ca/newsite/math/gap\\_closing.html](http://www.edugains.ca/newsite/math/gap_closing.html)

# Teaching through problem solving

- We show kids we have faith that they can figure things out.
- What happens is that as we solve a problem, we clarify a lot of ideas.

I might ask

- The volume of a cylinder is  $100 \text{ cm}^3$ .
- What could the dimensions be?
- (It could be taller and narrower or shorter and wider or...)

I might ask

- A line goes through (4,3) on a grid.
- What could the equation be if it slants steeply to the right?
- What could the equation be if it slants slowly to the left?

# assessment

- Assessment is required to be a mix of observational data, conversational data, and product (e.g. test, quiz, project) data.

# You might be wondering

- What is a flipped classroom and is it a good thing?
- Like everything else, it depends.
- If the videos are high quality, it can be good, but many believe there is value in a more problem-solving approach.

# You might be wondering

- What are open questions and why are they happening?
- Here is an example:
- One cell phone plan is better than another if you send more than 100 texts, but not if you don't.
- What could the plans be?

# You might be wondering

- What is 3-act math?
- This is not happening in every classroom but in an increasing number of them.

# You might be wondering

- Things seem more informal and somewhat less tight than before.
- Is that good?
- The quick answer is yes.

# You might be wondering

- Is it good for kids to work together in math or should I worry about that?
- It is important for you to realize that most people learn better with an opportunity to talk to others, so it's good.
- There will always still be opportunities for individual accountability.

# Sometimes

- We might offer two tasks for students to choose from.
- The tasks will be similar in nature, although one might be slightly less complicated than the other.
- This allows students to build success but still learn about the “more complicated” problem as both are discussed together.

# What will come home?

- In this sort of environment, what you will see coming home or showing you how your kids are doing will be different.
- It might be photos of work with manipulatives, recordings of their solutions, not worksheets.

# What can you do?

- Our big question as parents is what we can do to help our child.

# Support involves...

- Not showing, but probing.
- Asking why this or why that...
- Building connections

# You might

- Encourage kids to “teach you” what they learned or explain their thinking to you.
- Not worry about your kid’s “rank” but more about their own success with the math they are learning

# What is success?

- Not just a mark
- Enjoying the math
- Making sense of the world using math
- Building connections

# You need to...

- Encourage kids to “teach you” what they learned or explain their thinking to you.

# You need to...

- Show that you enjoy math too.
- Show confidence- believe that they can if you give them the time.
- Emphasize good thinking, not speed.
- Emphasize the good thinking, not the mistakes.

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