

How is Math Taught Now? Why? How can you Support Your Child?

Marian Small April, 2017

What has not changed

- Math content has not changed much.
- There is more attention to data than earlier and algebra ideas are addressed earlier, but most topics are the same as they used to be even if grade levels move around a bit.

Math curriculum

- In Grades K – 8, there are 5 strands.
- Number
- Geometry
- Measurement
- Data
- Pattern and Algebra

Math curriculum

- In Grades 9 - 12, the attention is mostly on:
- Algebra
- Measurement

What has changed

- The belief that there is only one, or a best, procedure for various topics.
- We spend time having students articulate their strategies.

For example

- If I asked you to calculate 25×99 , what might you do?

For example

- If I asked a student to solve $3x + 5 = 47$, I might be ok with thinking like:
- 10 is too low; I only get to 35. I need 12 more, so since I multiply by 3, I have to add 4 to my 10.
- The solution is 14.

Black and white

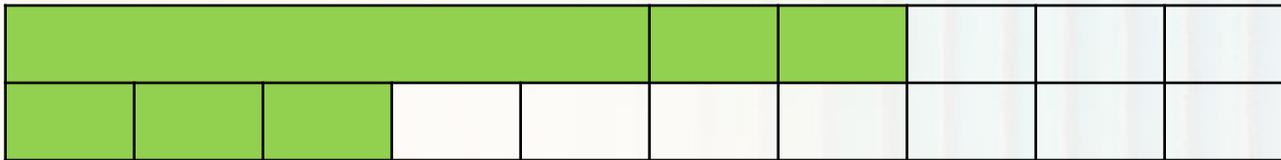
- It used to be that there was always one right answer.
- The focus was just on whether you are right or wrong.
- Now there is also grey (just like in other subjects).

Black and white

- For example, I might ask:
- Give me an example of an equation you think is easy to solve. Tell me why. OR
- You divide two fractions and the answer is a little more than 1. What could they be?
OR

Black and white

- How could you use a picture to help you see why $1 \frac{2}{5} - \frac{3}{5} = \frac{4}{5}$?



We want understanding

- There are an increasing number of digital tools that do the procedures, even solving quadratic equations.
- We need people who understand new situations and can make sense of what to do.
- That means lots more problem solving and a better understanding of why.

For example,

- You all learned that $-4 - (-8)$ is $-4 + 8$ by trying to remember some rule (hoping you remember it correctly).
- We want your kids to understand that $-4 - (-8)$ is the distance from -8 to -4 (just like $5 - 2$ is the distance from 2 to 5) and since it's 4 steps forward, the answer is $+4$.

For example,

- You all learned that $3/2 \div 1/10 = 3/2 \times 10$, but you didn't know why.
- Your kids learn that $3/2 \div 1/10$ asks how many tenths fit in $3/2$. Since 10 tenths fit in 1, then 15 tenths fit in 1 and a half.

For example,

- It also means they can recognize that if they are asked to figure out how many $\frac{1}{3}$ cup measures are necessary to measure out $2\frac{1}{4}$ cups of flour, what you do is divide $2\frac{1}{4}$ by $\frac{1}{3}$ (or multiply by 3).

Teaching through problem solving

- Kids solve problems to try to figure things out.
- The problems are appropriate to their prerequisite knowledge but extend them so that what the teacher says makes sense.

For example

- I might ask a problem like this:
- You saved \$20 on an item.
- What could the percent discount have been and on what original price?

For example

- Or— more challenging:
- You paid the same for a sweater than was 40% off as for shoes that were 20% off.
- How were the original prices related.

Collaboration

- We now know and use the notion that collaboration is valuable.
- Kids work together regularly, even though teachers attend to individual needs.

Speed

- It is not about how fast you are.
- It is about how sound your reasoning is.

Perseverance

- We recognize and value perseverance, resilience, trying different strategies often as much as getting solutions.

Mind set

- We do not talk about people who are “mathy” and those who are not.
- We foster the notion that any kid can do it if she or he tries and the teacher provides appropriate tasks and support.

Mind set

- So it is **VERY IMPORTANT** that you not tell your kids you find math hard or that you are not good at math.
- For girls, it is particularly important that it not be painted as a “male” subject.

Textbooks

- There is less reliance on text books because different kids have different needs.
- Also because we are trying to promote many approaches and not just one.

Homework

- Teachers are faced with conflicting parental views on homework.
- They often do suggest homework, and if you can participate with your child (not do it for them), that is valuable.
- It should be about the talk you have with them, not getting answers.

Differentiating instruction

- Teachers are expected, more than ever before, to recognize that one size does not fit all; they have to approach different students differently.

Technology

- Given our world, there is much more use of technology to help students explore math.

Technology

- It might mean use of calculators for complicated calculations.
- It might mean graphing software.
- It might mean apps that actually solve equations for students.

Technology

- There are also virtual manipulatives that students can do to make sense of math ideas.
- These are freely accessible to you and your child.

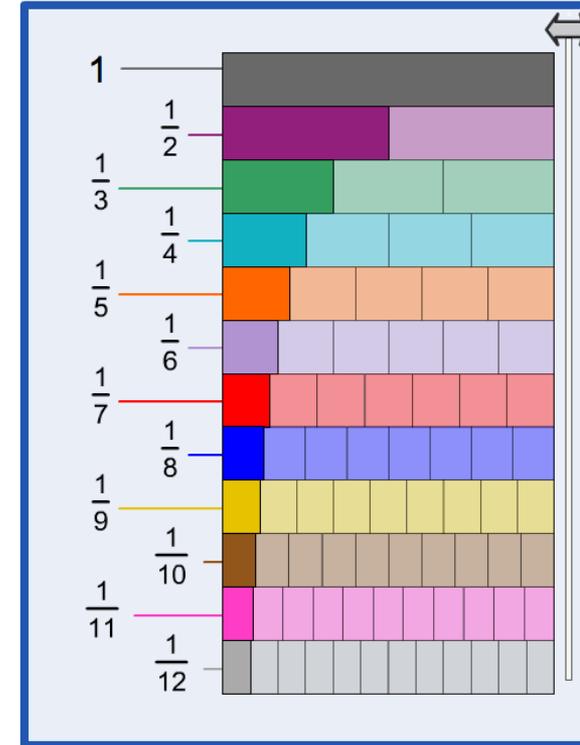
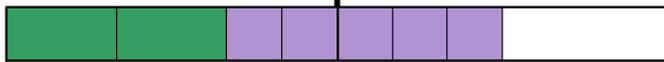
For example,

- To add $\frac{3}{5} + \frac{5}{6}$, students might access fraction strips.

Fraction strips

- <http://oame.on.ca/mathies/learningTools.php>

Fraction strips



It could be algebra

- <https://illuminations.nctm.org/activity.aspx?id=3482>

Solve

Substitute

Expand

Factor

$$-5 = 1 - 2x$$



Build your model.



	 
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-1

-x

-x²

Solve

Substitute

Expand

Factor

$$-5 = 1 - 2x$$



Build your model.



 	  
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-1

-x

-x²

Solve

Substitute

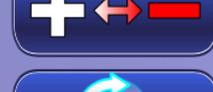
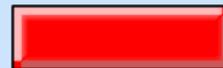
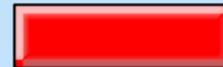
Expand

Factor

$$-5 = 1 - 2x$$



Build your model.



-1

-x

-x²

Assessment

- Not only through paper and pencil tests and quizzes, but through performances, conversations and observations.

Supporting your child

- Have your child explain ideas to you rather than showing them how.

Communicate

- Communicate with your child's teacher to make sure you are working consistently to build success.
- If there is something that makes you uneasy, ask.

Parent information

- http://www.ontariodirectors.ca/parent_engagement-math/en/index.htm

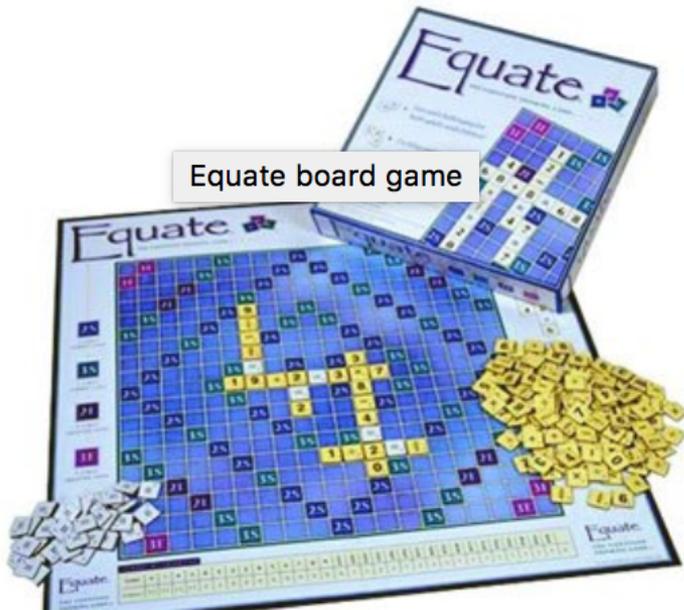
Homework help

- Many children in grades beyond grade 6 have heard about Homework Help.
- It really helps!

Try to bring up math

- In informal settings, e.g. at the store, in the kitchen, in games that involve mathematical thinking like Set or

Try to bring up math



Equate board game

Mathopoly

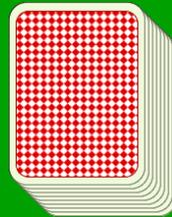


CRIBBAGE

[New Game](#) | [Rules](#) | [About](#) | [Statistics](#)



Bill



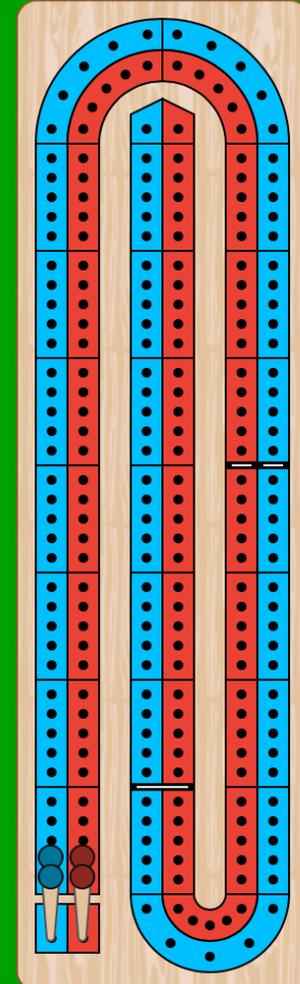
Start

Click Start to begin the game.

[Change player image...](#)



You



	Bill	0
	You	0

Mental math

- Mental math (more than paper and pencil) is useful.
- When the situation makes sense, encourage kids to calculate mentally.

Nice problems to do together

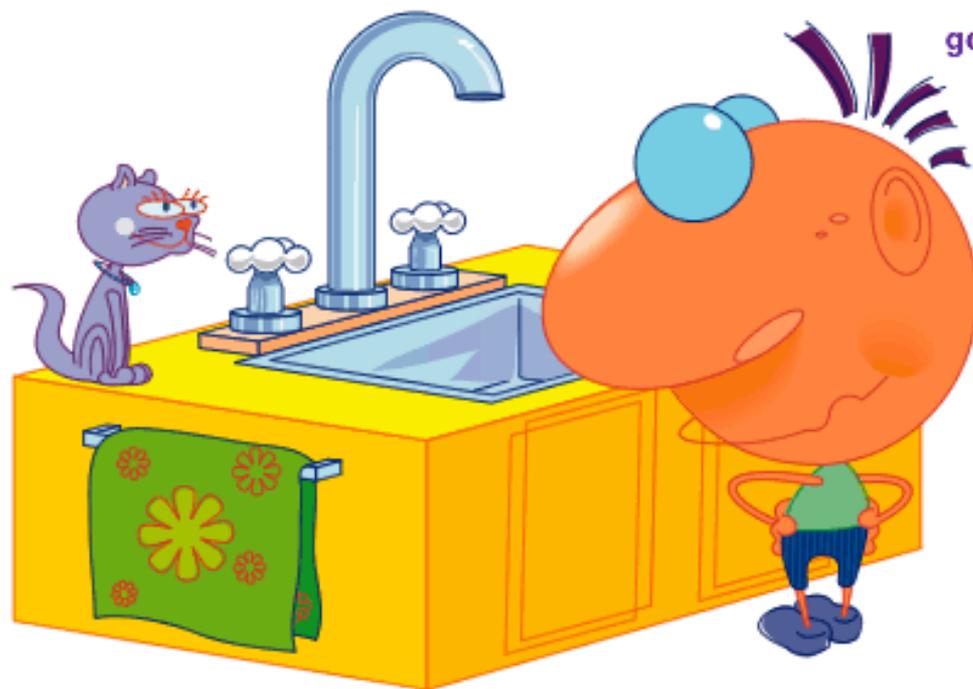
- <http://www.figurethis.org>



How much **Water** do you **waste??**

Figure This!
Math Challenges for Families

Figure This! A faucet drips every 2 seconds. In 1 week, how much water goes to waste —enough to fill a glass, a sink, or a tub?



Hint?

Mathematics can be used to describe, estimate, and measure environmental factors and to communicate this information to the public. This information is used by those interested in the environment, consumers, and governmental agencies.

Any questions

- Are there questions you would like to raise?

Download

- www.onetwoinfinity.ca
- Recent presentations
- ParentsApril