

Building thinkers

Marian small

COMA

Sept 2018

Followers can be nice

But thinkers
are even
better!

My goal

as an educator is to
support teachers to develop kids who
think mathematically, not just do
math.

Teachers Matter!

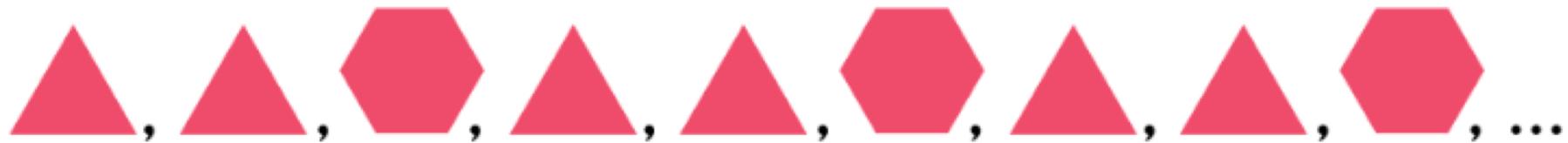
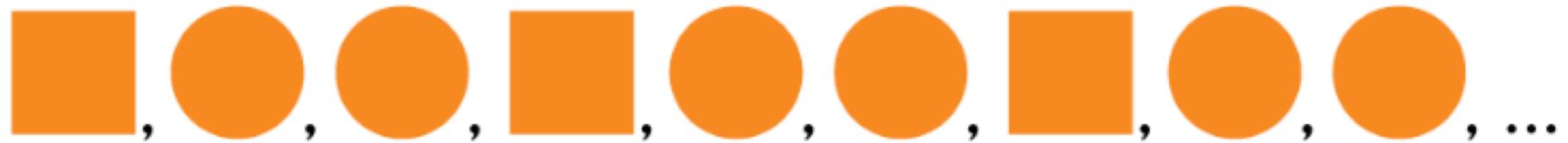
All of you know that a good teacher can change the course of a kid's life or can at least make a year a happier one.

So what does it take?

- Being nice, of course!
- Caring, of course!
- But building thinkers, too.

What might that look like?

Maybe in Grade 1



Which 2 patterns do you think are **most** alike? Why?

Maybe in Grade 1

Do you think the number 15 is more like 10 or more like 20?

Make your case!

Or extend

Do you think the fraction $4/3$ is more like $13/12$ or more like $7/3$?

Or extend

Do you think that $\sqrt{20}$ is more like
 1.424π or more like $\sqrt{25}$ or more like
4.5?

Maybe in primary

What sums can you get if you add two next-to-each other numbers?

What can you not get?

OR EXTEND

Do you think you can add five consecutive whole numbers and get a number whose digits add to 5?

Could be

50

140

230

320

410

500

And more

Maybe in PPrimary



The number 50 is in one section. What numbers make sense for the other sections?

OR EXTEND



The number 8π is in one section. What irrational numbers make sense for the other sections?

Maybe in primary

You subtract two numbers.

You also add them.

The answers are 50 apart. What could they be?

Or extend

You subtract two numbers.

You also add them.

One answer is $\frac{2}{3}$ of the other. What could they be?

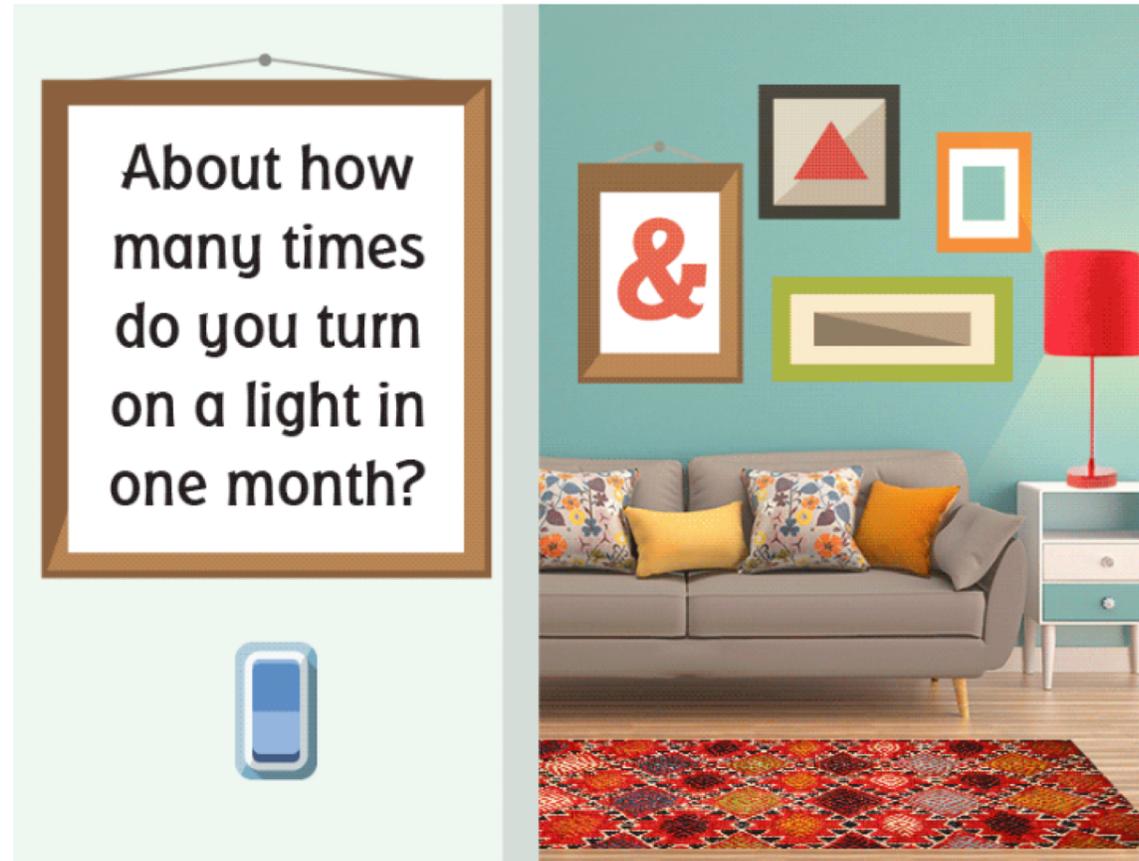
$(x, 5x)$

Maybe in Grades 3 - 6

If two sides of a triangle are 4 units and 6 units, what perimeters are possible?

What perimeters are impossible?

Maybe in junior or intermediate



Maybe in junior or intermediate

Every hour, about 40 new apps are made available to download.
At this rate, about how long will it take for there to be 1 million new apps?

A central black smartphone is shown with a grid of colorful app icons on its screen. Surrounding the phone are numerous other colorful icons representing various app categories, such as social media, productivity, and entertainment. The background is a light gray gradient.

Maybe in junior or intermediate

Can 25% of one number be 75% of another? How?

How about 60% of another? How?

Maybe in intermediate

Create a set of data.

Remove one value so that the median goes up more than the mean does.

1, 1, 1, 4, 4, 8 becomes 1,1,4,4,8

Maybe in intermediate

WITHOUT CALCULATING,

List 10 fractions for a/b so that

$2/3 \div a/b$ HAS to be more than 1.

Maybe in intermediate

Create an algebraic expression that is sometimes more than $-2m$, but not always.

Maybe in Grade 9 or 10

Why might a line with slope $\frac{2}{3}$
look steep?

Why might it not?

Maybe in Grade 11

Can every function be written as a composite function?

Explain.

Maybe in Grade 11 or 12

An exponential function is a LOT
like $y = 2^x$.

What might it be and how are the
graphs similar and different?

Maybe in Grade 9 or 10

You evaluate an algebraic expression when $x = \frac{2}{3}$ and the value is $1\frac{1}{4}$.

What could the expression be?

Maybe in Grade 9 or 10

I was solving a system of two equations in two unknowns. After elimination, I was left with $13y = 22$.

What could the original two equations have been?

I BELIEVE

The game is not about what the curriculum requires or does not require.

It is about what we want our kids to be. Doing math is part of it, but clearly, to me, not enough.

And now for a different hat!



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Desmos is
helping us by
sending Eli as a
featured
speaker and
helping with
other
speakers,
elementary,
too, on

Great
weekend
for
guests to
Ottawa!

We would
LOVE for you
to offer to
speak.

Proposals are
being
accepted now.

We would
LOVE for
you to
offer to
volunteer
to help. We
need lots
of help.

We would
LOVE for
you make
sure to
register to
come.