

It Can Be Done

Engaging ALL Students in Productive Struggle

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GA-400 Toll Robbery

Earlier this morning a man held up a GA-400 toll booth. His stolen getaway car broke down and he is now on the run with a 58 lb. bag of quarters.

– The Morning X Radio Show 99x - Nov. 10, 1999

MATH
IS MY PASSION







Double the Value of your card

Add 2 to your total

Multiply your sum by 5

Subtract 3





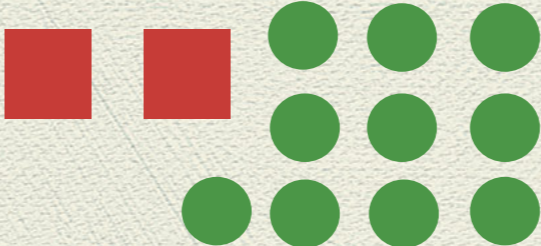
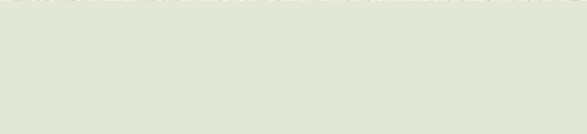
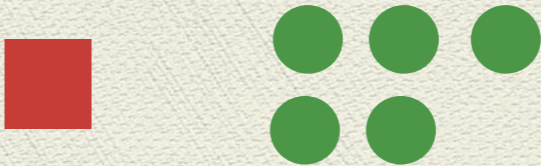
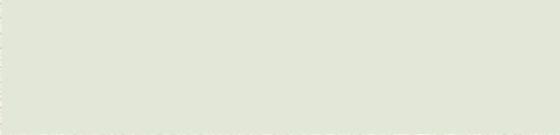


Volkswagen

Let's Try a Different One.

- Think of a Number.
- Double it.
- Add 10.
- Half your total.
- Take away your original number.

- Think of a number.
- Double it.
- Add 10.
- Half your total.
- Subtract your original number.

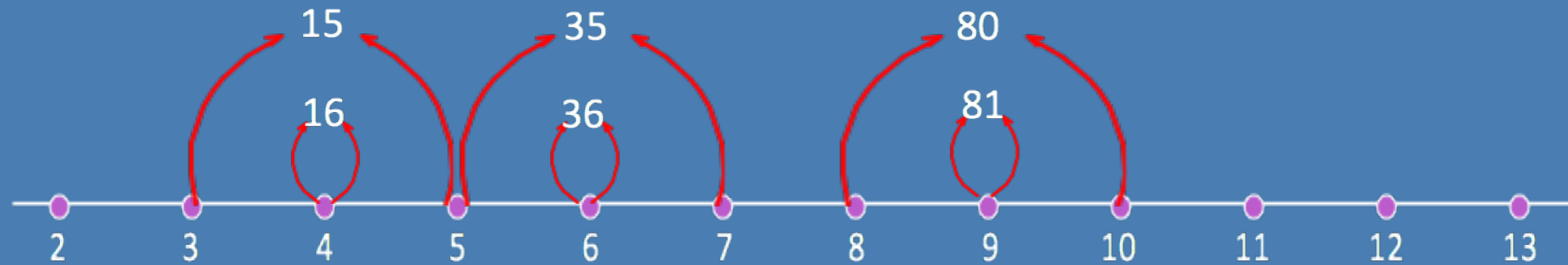
Model it!

Words	Numbers	Symbols	Variables
Think of a number	7		
Double it.	14		
Add 10.	24		
Half your total.	12		
Subtract your original number.	5		

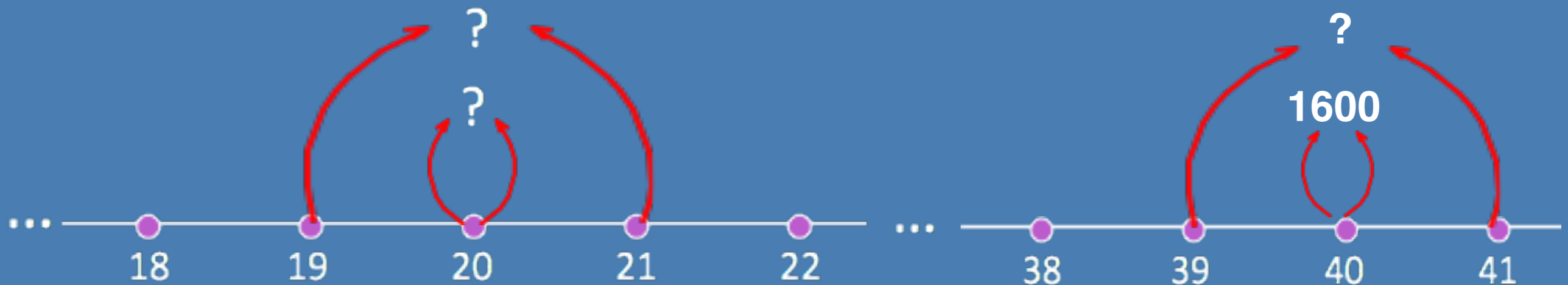
Teaching Without Talking

Source: Paul Goldenberg

Shhh... Students Thinking



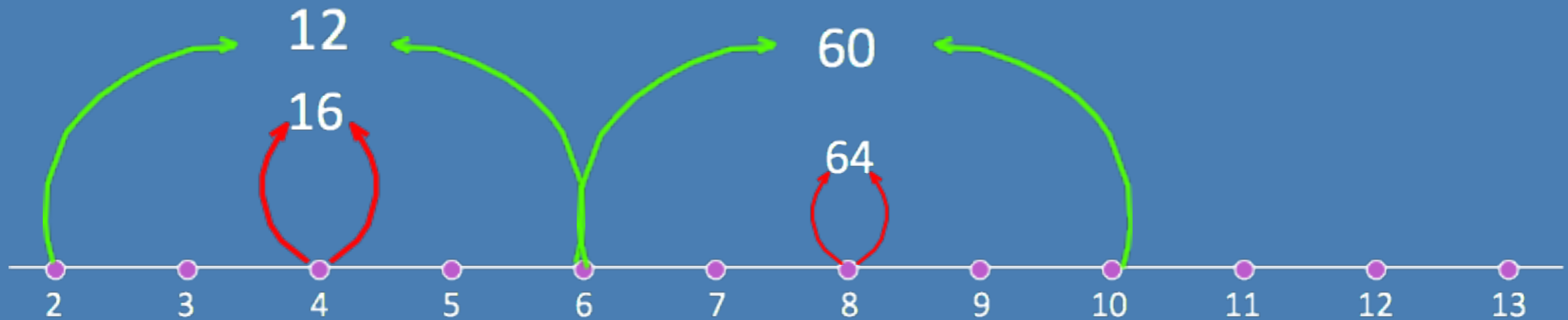
Wow! Will it always work? Big numbers?



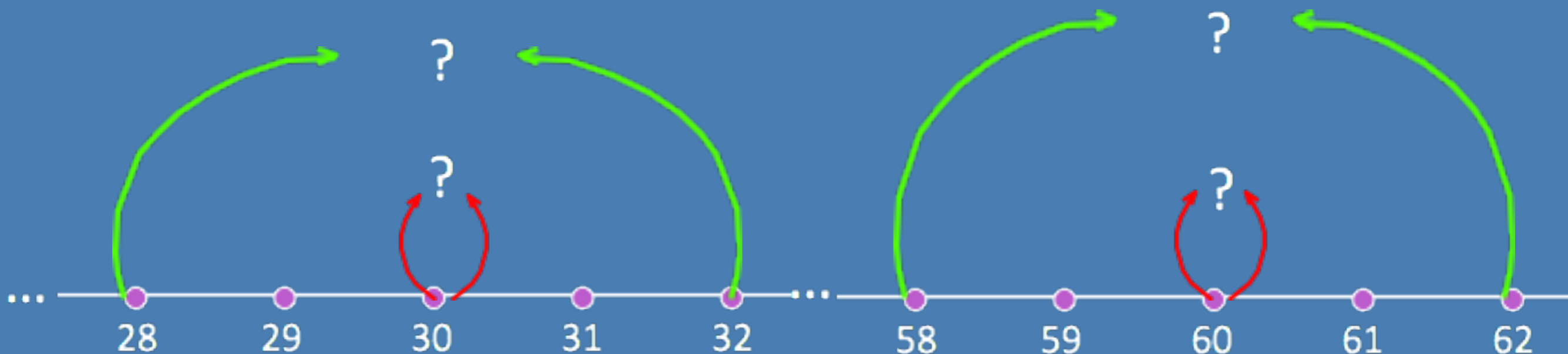
Teaching Without Talking

Source: Paul Goldenberg

Shhh... Students Thinking



Again!?! Always? Try some bigger numbers.



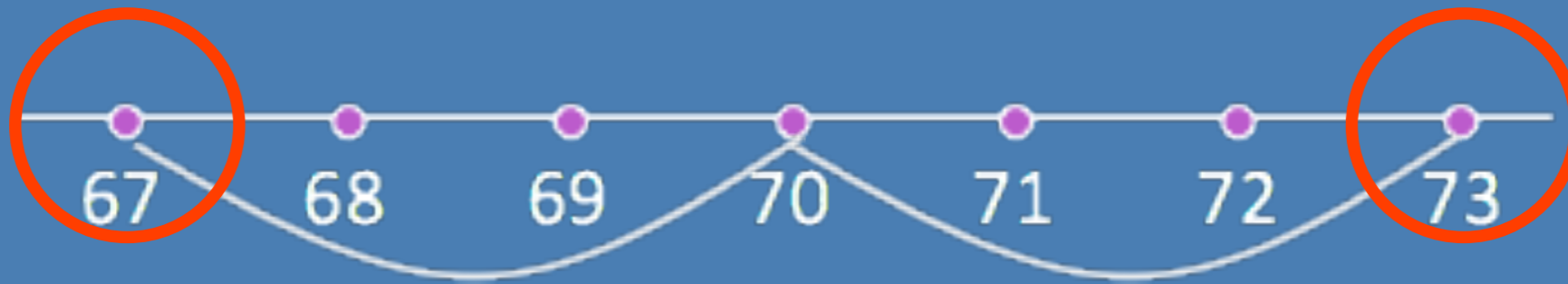
Take it even further...

Source: Paul Goldenberg

What about 3 steps out?

What about 4?

What about 5?



Think...

$$70 \times 70 = 4900$$

$$3 \times 3 = 9$$

$$4900 - 9 = 4891$$

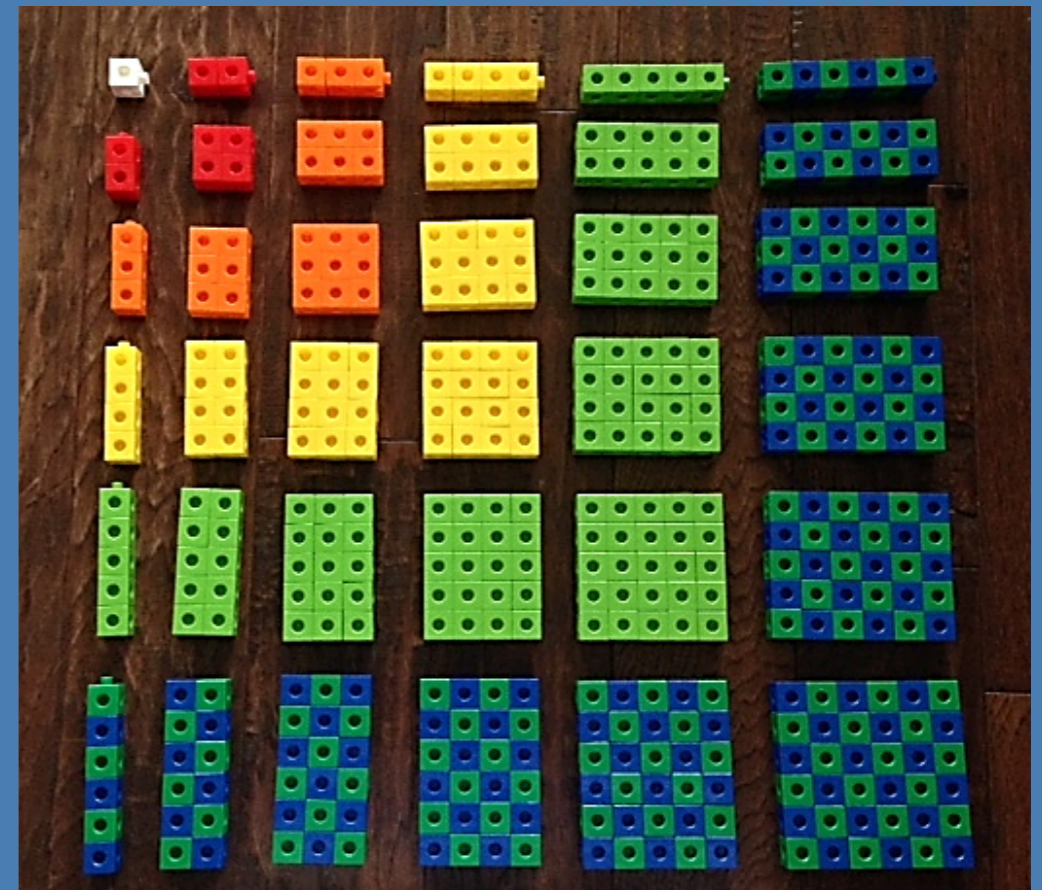
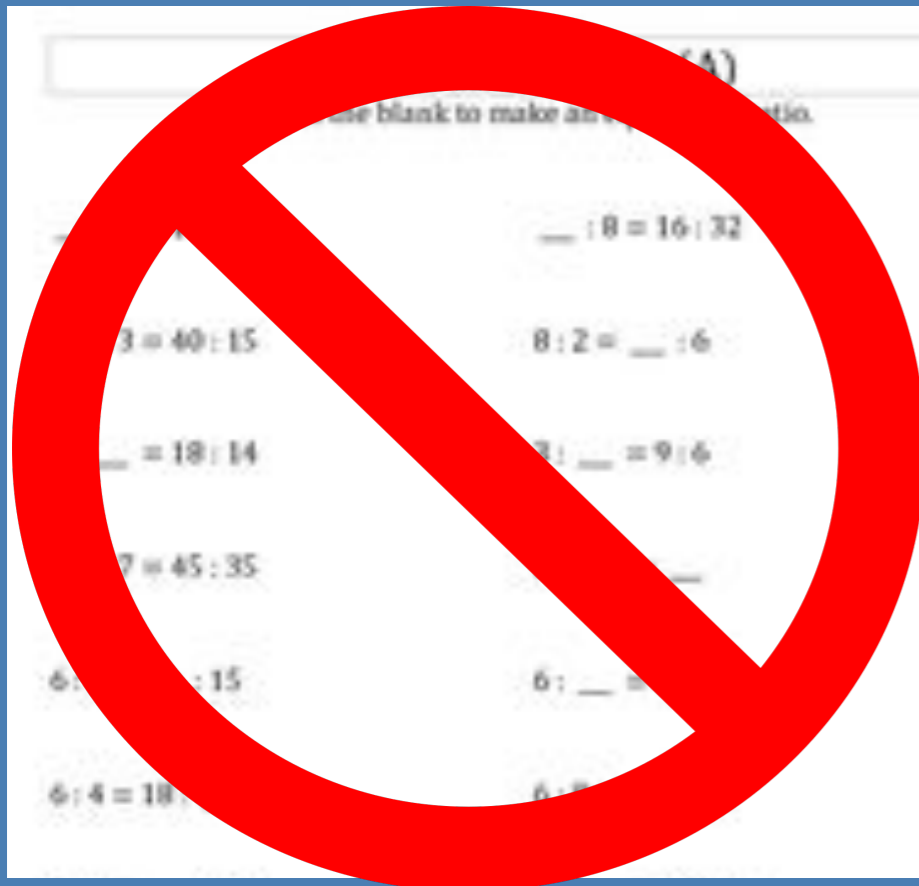
Source: Paul Goldenberg



Why?

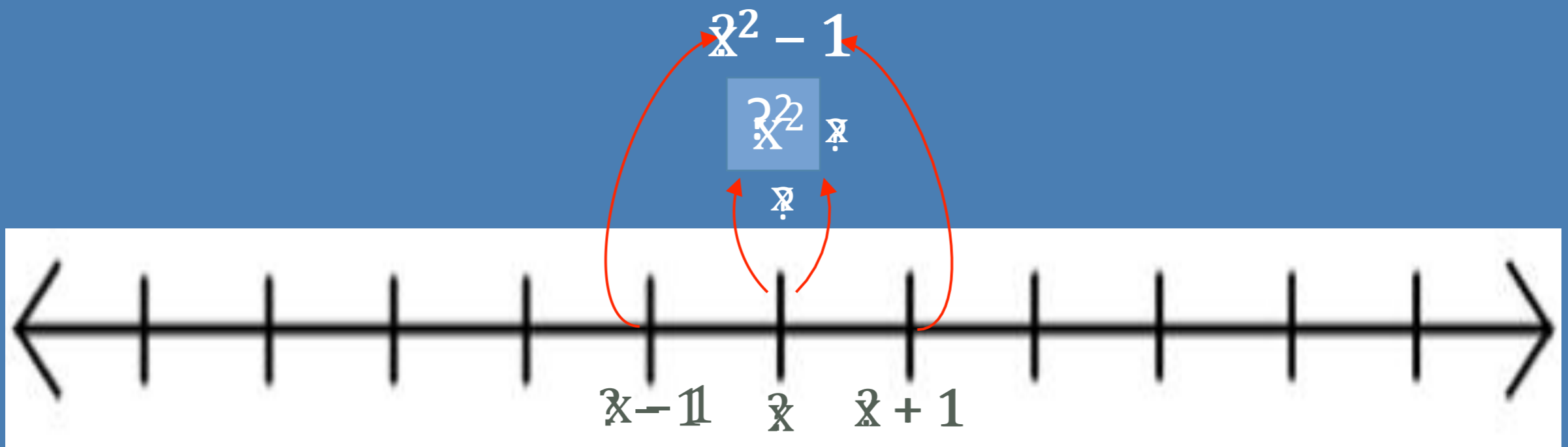


How does it work?



What about the Algebra?

- So, students discover it works with any number... really!
- That means it's time to generalize ... with symbols.





Source: [TeachingChannel.org](https://www.teachingchannel.org)





It's not always
WHAT we do...

HOW we do it is
more important!

Knowledge vs. Understanding



Resources from this presentation can be found here:

<http://mikewiernicki.com/griffin-resa-interventions-conference>

or

<https://goo.gl/1fN8UX>

or



