Louisiana Believes

TL Summit

Math isn't Magic. Math Makes Sense.

Grades K-5

DEPARTMENT of EDUCATION

Math Isn’t Magic…

Math Isn't Magic.

Math Isn't Magic. Math Makes Sense.

Math Isn't Magic.

Math Makes Sense.

Math Isn't Magic. Math Makes Sense.

Isn't Magic.

Makes Sense.

"Mathematics doesn't have a lot of facts...

Mathematics has incredibly dense connection between facts."

Edmund Harriss
Mathematics Professor, University of Arkansas

Math Isn't Magic. Math Makes Sense.

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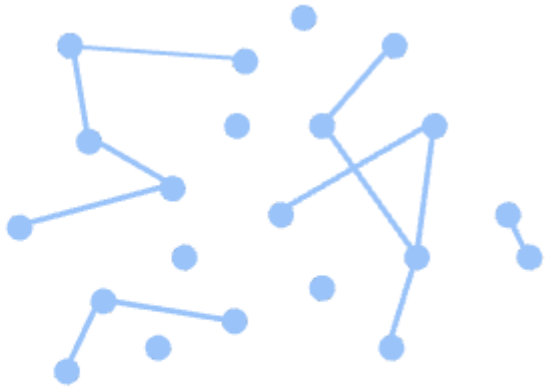

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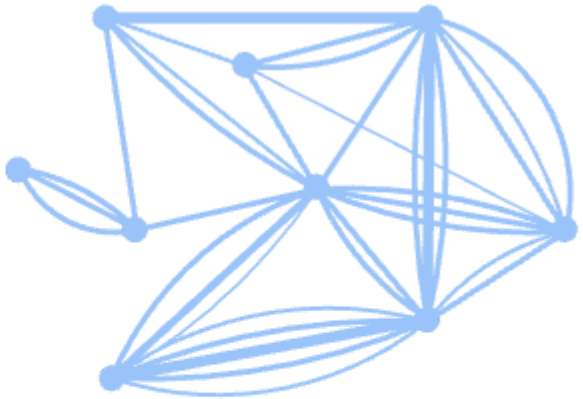

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Mathematics Professor, University of Arkansas

Shifts in Mathematics

Focus strongly where the standards focus.

Focus

Think across grades and link to major topics within grades.

Coherence

In major topics pursue: conceptual understanding, procedural skill and fluency, and application with equal intensity.

Rigor

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"Students are capable of developing rich conceptual understanding; do not rob them of the opportunity to experience the discovery of new concepts."

Tina Cardone in *Nix the Tricks*

Do you agree with this statement?

Have you ever "robbed" students in an attempt to help students? If so, why?

Some Kinds of Tricks

Rules that expire

Tricks students misinterpret

Algorithms that circumvent understanding

Rules that expire

"Adding always makes numbers bigger."

"Improper fractions should always be written as mixed numbers."

Tricks students misinterpret

"PEMDAS"

10 - 2 + 4 = ?

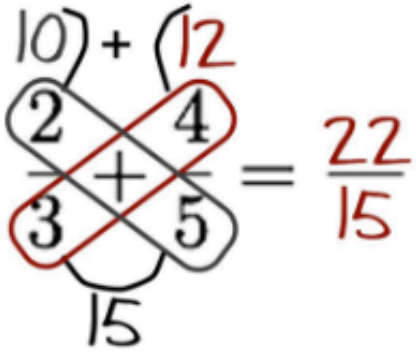
20 ÷ 5 x 2 = ?

7 + 8 + 5(2 + 3) = ?

"Cross Multiply"

$\frac{1}{2}+\frac{2}{3}$ $\frac{1}{2}\times\frac{2}{3}$ $\frac{1}{2}=\frac{c}{3}$

Algorithms that circumvent understanding



$$\frac{2}{3}+\frac{4}{5}=\frac{10}{15}+\frac{12}{15}$$

$$=\frac{22}{15}$$

Math Isn't Magic. Math Makes Sense.

Sense.

Make Math Make Sense

Connect new content to students' prior understanding.

Help students discover the connections between what they know and what they are learning.

Math Isn't Magic. Math Makes Sense.

In your groups...

"Always subtract the smaller number from the bigger number."

"When you see 'total' you know to add."

"Rectangles have two short sides and two long sides."

"When solving equations 'move' a term to the other side."

"Bigger Bottom, Better Borrow."

1. How could this seem like "magic"?
2. How could this undermine understanding?
3. How could this be reworked to promote understand and connections?

Math Isn't Magic. Math Makes Sense.

$$\frac{2x+10}{2} - x = \frac{2x}{2} + \frac{10}{2} - x$$
$$= x + 5 - x$$
$$= 5$$

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Math Isn't Magic.

Shifts in Mathematics

- Focus
- Coherence
- Rigor

A few more examples...

Solving equations

Math Makes Sense.

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Resources:

Nix the Tricks (free to download):

http://nixthetricks.com/

NCTM 12 Rules that Expire (free):

http://www.nctm.org/Publications/Mathematics-Teaching-in-Middle-School/2015/Vol21/Issue4/12-Math-Rules-That-Expire-in-the-Middle-Grades/

NCTM 13 Rules that Expire (purchase only):

http://www.nctm.org/Publications/teaching-children-mathematics/2014/Vol21/Issue1/13-Rules-That-Expire/