Calculators: To use or not to use?

That is the question

SIX KEYS

A Maths Starter Of The Day

The challenge is to make 20 on your calculator using only six keys.

4	7	-	2	7	=	20
5	+	7	+	8	=	20
1	2	0	÷	6	=	20
						20

How many different ways can you do this? You could try making a different total. Is there a limit to the possible totals? What if you could use seven keys or five keys?

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Do calculators have a place in the elementary classroom?

Essential Question

How do calculator investigations **enhance** my classroom instruction and **improve** student achievement through exploration?

Let's talk!

How are calculators currently used in your classroom?

How can we repurpose its use as a tool of inquiry?

Four Gone!

The four button has dropped off!

How can you do these calculations using this calculator?

$$59994 + 8003$$

$$559 - 254$$

$$255 \times 34$$

$$25\% \text{ of } 540$$

$$\frac{1}{7} + \frac{1}{4}$$

$$0.14 \times 23.44$$

$$244^4$$

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Mathematical Practices

1. Make sense of problems and persevere in
   ing them.

" They make conjectures about the **form and meaning** of the solution and plan a solution pathway rather than simply jumping into a solution attempt. "

plaining to themselves the meaning of a
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understand the
correspondences between

Number Sense

Mathematical Practices

5. Use appropriate tools strategically

Mathematically proficient student
mathematical pro

"These tools might include pencil and paper, concrete models, a ruler, a protractor, a **calculator**, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software."

such as digital
pose or solve problems. They are
to explore and deepen their understanding of

Using appropriate tool

Mathematical practices

6. Atten

Mathe communicate precisely
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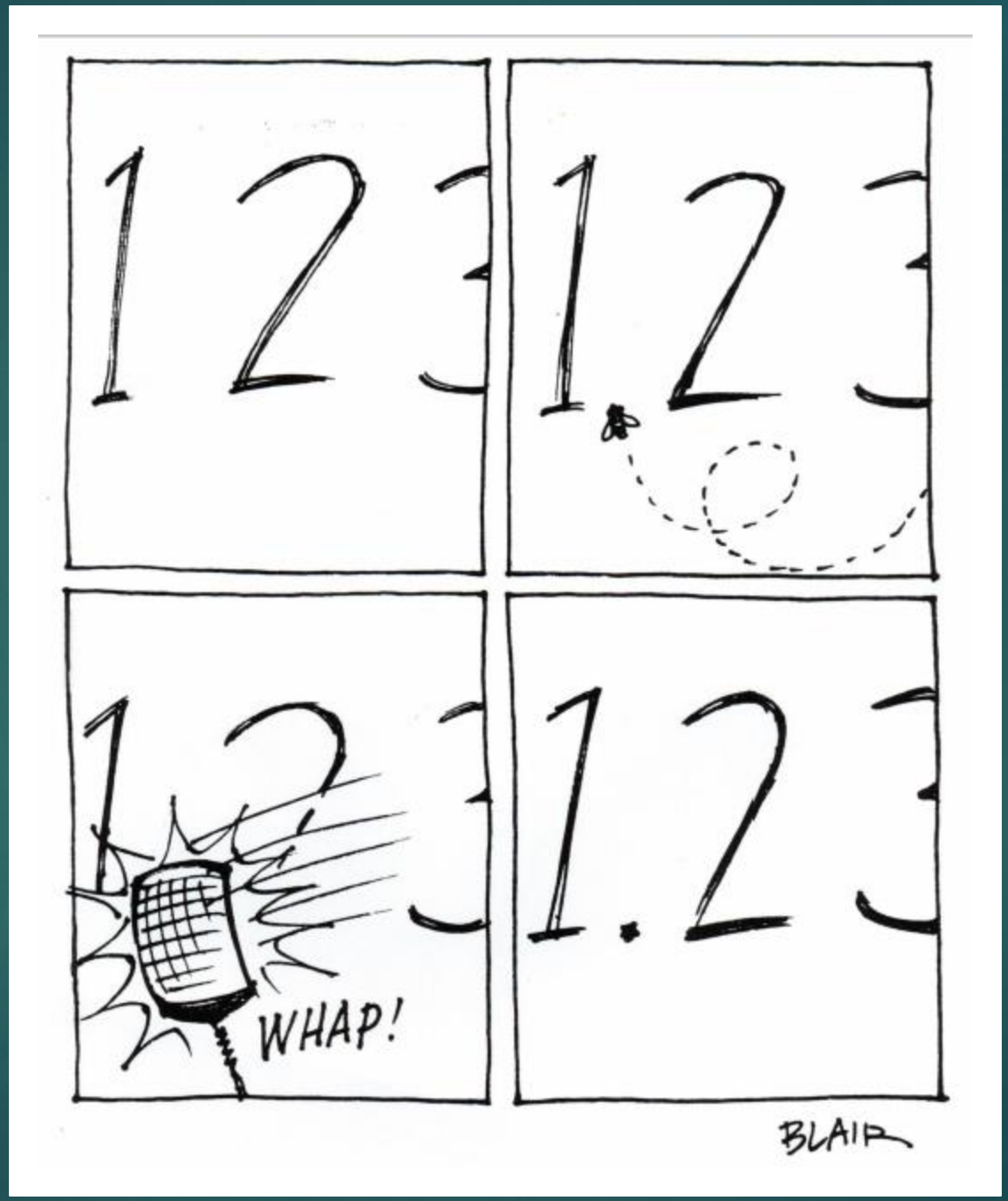
students give carefully formulated
By the time they reach high school they have
examine claims and make explicit use of definitions

They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately.

Equivalence


1 2 3
1 2 3
1 2 3
WHAP!
1 2 3
BLAIR

Number Sense

Calculator Challenges

Some of the keys on the calculator do not work. Can you make all the numbers from **1 to 20** using the following keys:

2, **3**, **+**, **-**, **=** and the clear button?

Calculator Challenges

The **0** key is out of bounds. Can you make:

260, 206, 2062 and 20602

using the other keys?

Calculator Challenges

Using only the **3**, **7**, **+**, **-** **and** **=** keys can you make

20, 57, 93 and 109?

Calculator Challenges

Can you make the answers **1 to 20** using only

2, 4 and the +, -, x and ÷

keys?

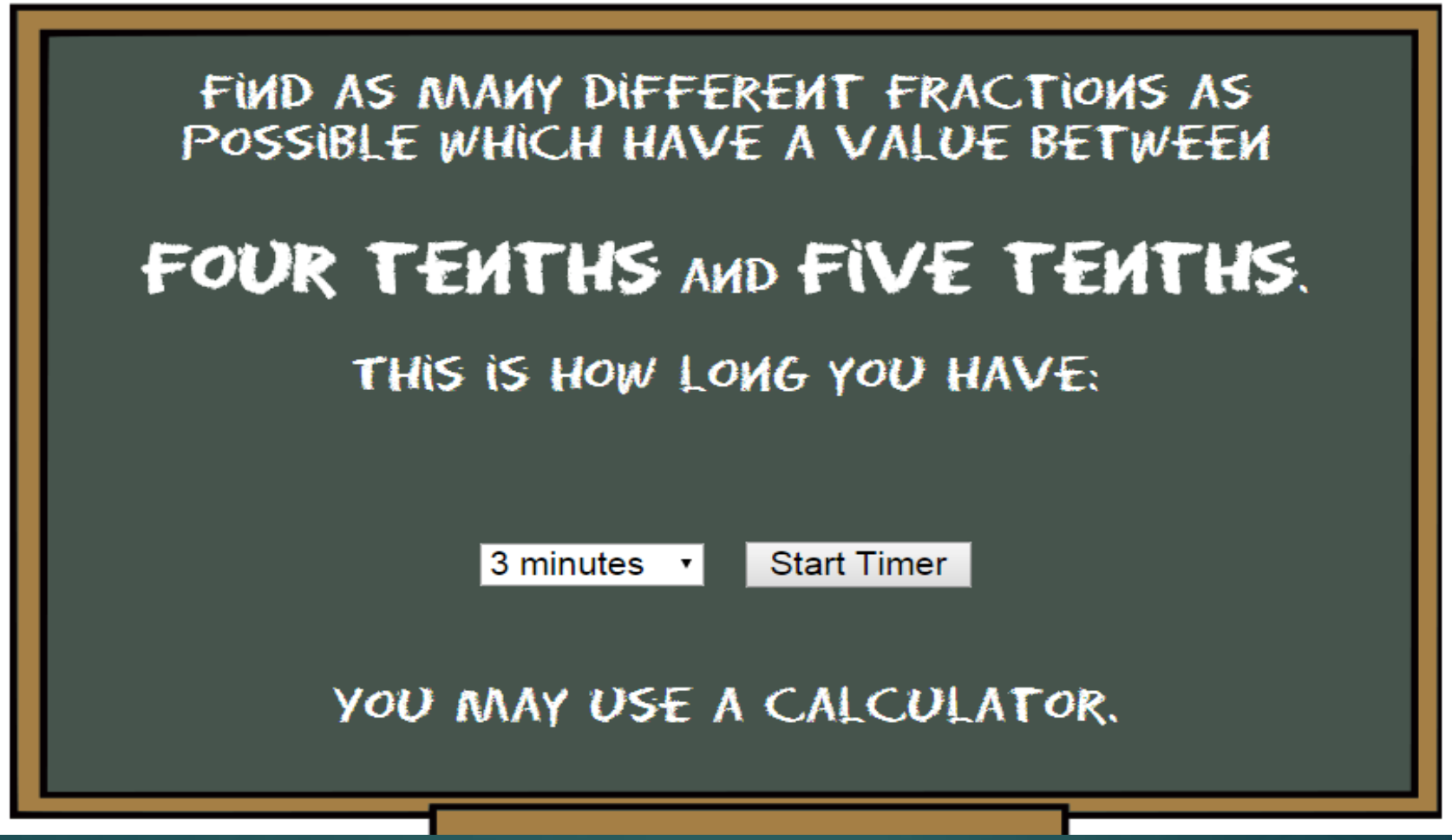
Knowing your Place

- Enter three hundred sixty-nine
- In one operation, remove the "6" from the number without changing any of the other digits.

Knowing your Place

- Enter four hundred, two
- In one operation, remove the change the 4 to a 6 without changing any of the other digits.

> Inbetweens >



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Equivalence


32

8 x 4

16 + 16

30 + 2

40-8

15 x 2 + 2


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Vol.1
MATHEMATICS
for Elementary School
1
Study with Your Friends
Vol.1
MATHEMATICS
for Elementary School
2
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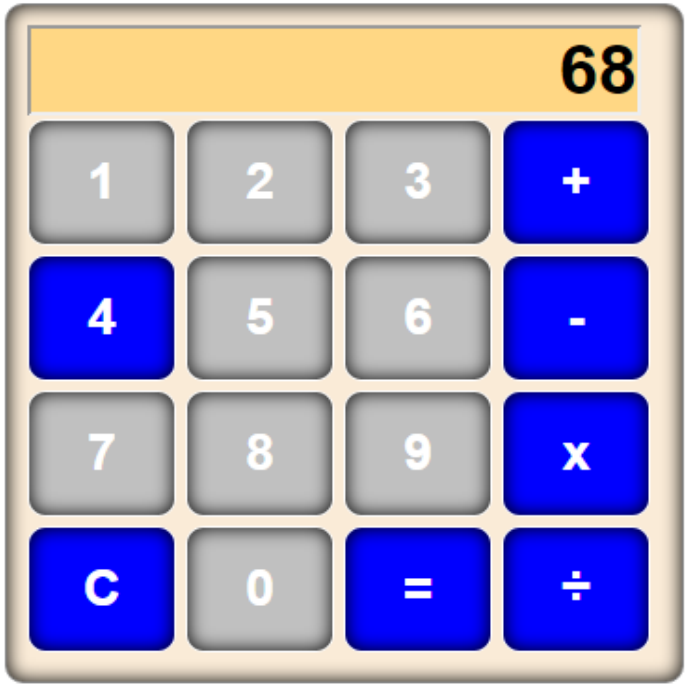
3

Equivalence

$$3 + 4 = 7$$

$$3 + 4 = 5 + 2$$

Only One Number



68 can be reduced to 1 by using only the number four key and any of the operation keys.

For example:

```
68 - 4 = 64
64 ÷ 4 = 16
16 ÷ 4 = 4
 4 ÷ 4 = 1
```

How many other numbers can be reduced to 1 using only the four key and any of the operation keys?

Starting number: 50 ▾ Calculator button: 2 ▾ Start

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Equivalence

A teacher gave a box of crayons to each of her 9 students. Each box had two dozen crayons in it. How many crayons did they have in all?

Equivalence

9 students, two dozen crayons per box

2 x12 = 24 x 9 = 216

Misconception!!!

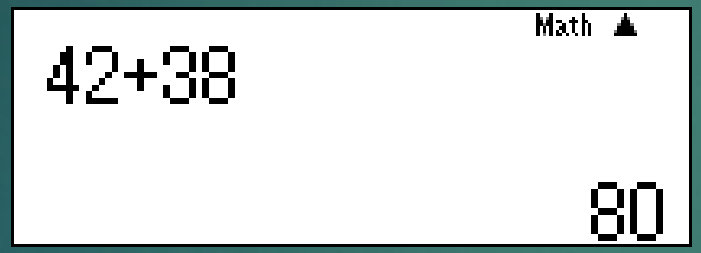
Equivalence

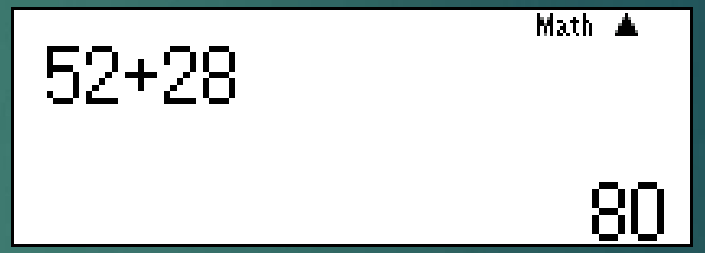
How is adding 42+38 like adding 52+28?

How is it different?

Equivalence

$$42 + 38 = 52 + 28$$





Equivalence

How can you represent 342 another way?

Equivalence

$$342 = 300 + 40 + 2$$

Equivalence

Subtract 32 from 227.

Equivalence

What is 227 – 32?

$227 = 200 + 20 + 7$

$227 = 190 + 30 + 7$

$227 - 32 = 195$


CASIO
fx-55 PLUS
TWO WAY POWER
Math
1/4+1/3
7/12
SHIFT
CLR
SET UP
ON
REPLAY
%
Rnd
Ran#
π
√
x²
(
)
x■
10■
F⇔D
Simp
x⁻¹
(−)
STO M
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M+
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Equivalence

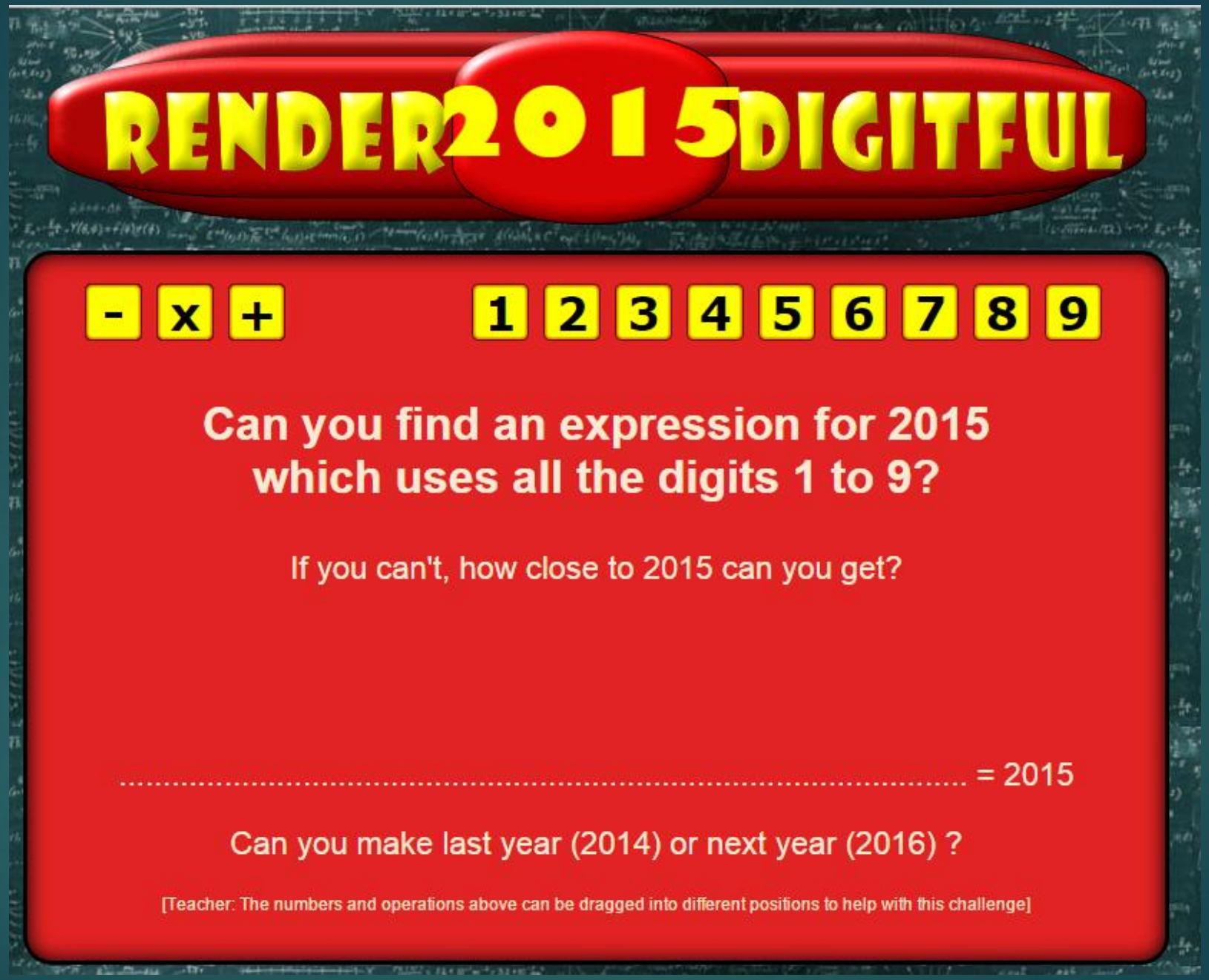
What is the relationship between $3\frac{2}{3}$ and $\frac{11}{3}$?

Equivalence

Which is closer to 1?

$$\frac{5}{4} \text{ or } \frac{4}{5}$$

Using appropriate tool



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Let's talk!

What makes 5 a special number?

Inquiry

First to 50!

1st Player: Enter **1, 2, or 3**

2nd Player: **Add 1, 2, or 3**

Continue adding 1, 2, or 3

Winner: Student who **first displays 50** on the calculator.

Switch who goes first.

If we want to use tools of technology as tools of inquiry, we must do two things…

1. Ask better questions
2. Ask students to create

Inquiry

You multiply 2 numbers and the result is 24,000. What two numbers might you have multiplied?

Inquiry

Are there more multiples of 3 or more multiples of 4 between 1 and 100?

Inquiry

Jennifer added two different 2-digit numbers. She multiplied the same numbers. About how much do you think the difference is between those answers?

Inquiry

You divide two numbers and the answer is 2.5. What two numbers might you have divided?

Let's talk!

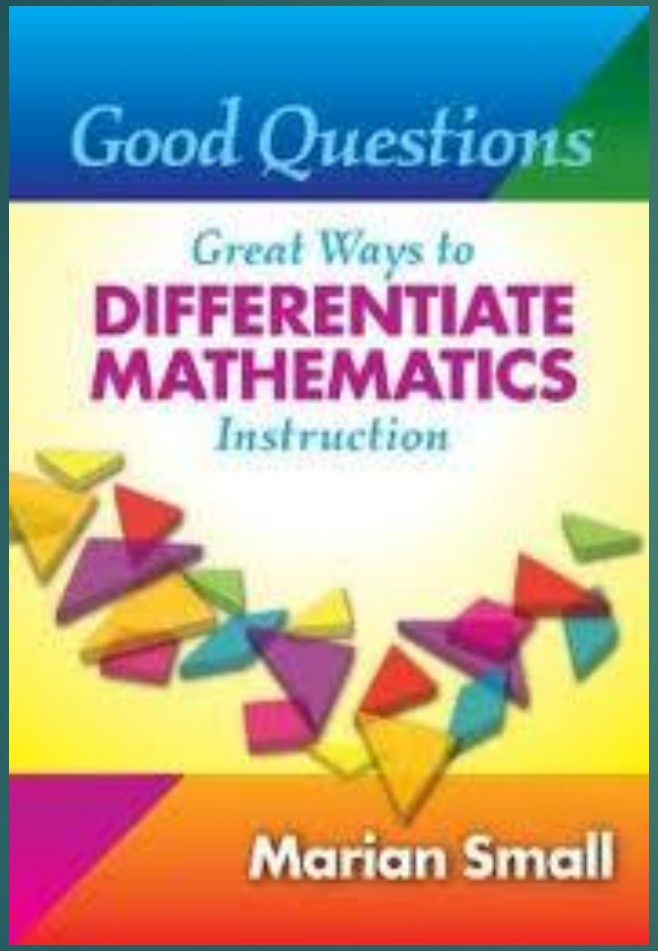
How does technology, specifically a calculator, fit into an inquiry lesson?

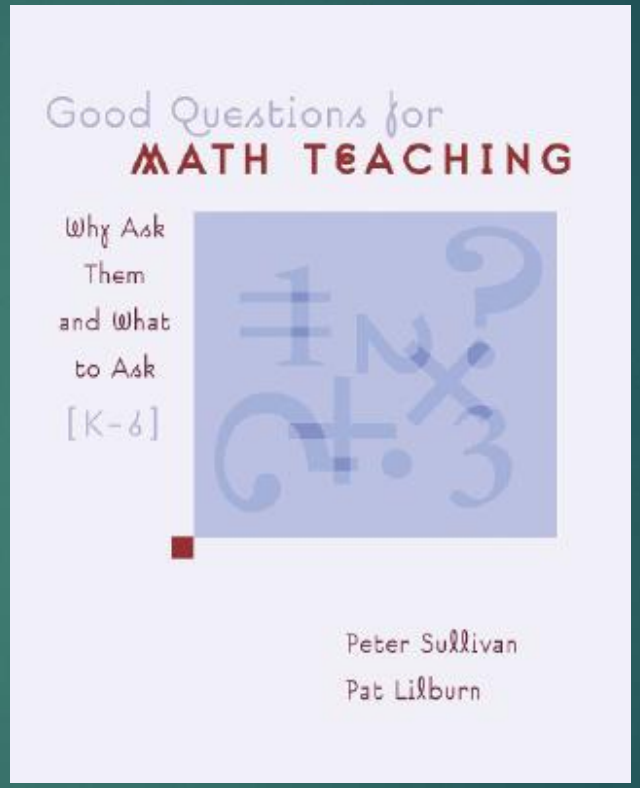
Inquiry

Create a sentence that uses each of these numbers and words:

5, 3995, share, almost

Print Resources





Inquiry

If you cant find a good question, re-write one!

Inquiry

Original: I have 45 cents. What coins might I have?

New: I have two coins in one hand and one coin in the other. The coins in each had are worth the same amount. What could the coins be?

Let's talk!

Essential Question

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APPLAUSE

Thank you!

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