

*Please have pen/pencil and paper.
You'll be solving a few math problems*



DEMYSTIFYING “NEW” MATH

SEAMAN PTA MEETING
11/18/2020

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n a s s a u
BOCES



Disney · PIXAR
INCREDIBLES 2

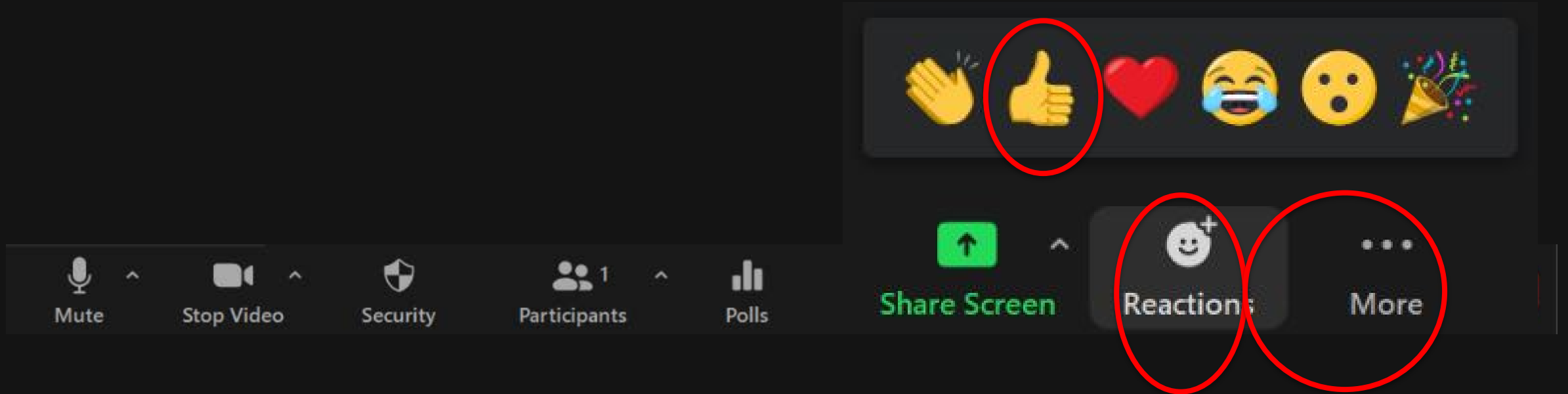
<https://youtu.be/3QtRK7Y2pPU>



How many of you can relate to feeling that way?



How to show an Emoji Reaction in Zoom



Click the Thumbs Up Icon  if you can relate.

Why is math being taught the way it is?

You will get an overview of the WHY behind some new math teaching methods and tools.

$\frac{a}{\sqrt{b}}$

$\sin(-\alpha) = -\sin \alpha$

$y = x^2$

$y = x^2$

$\sin\left(\frac{\pi}{2} - \alpha\right) = \cos \alpha$

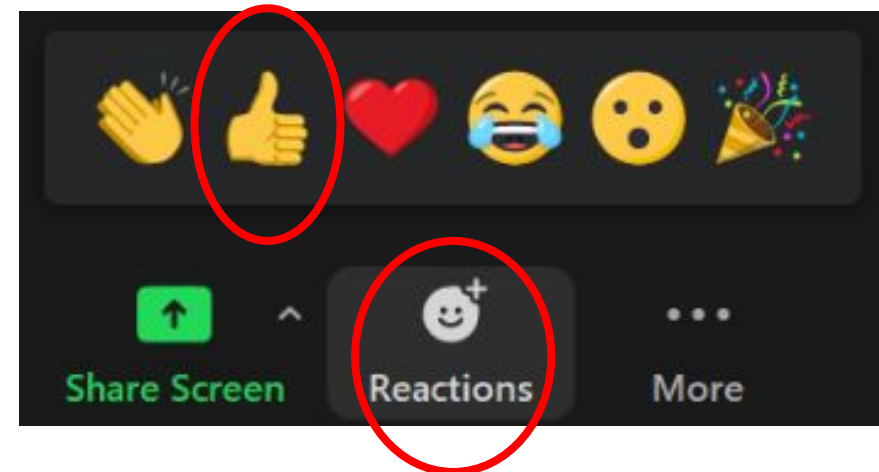
KEEP CALM and LOVE MATH

Solve

$$\begin{array}{r} 5,000 \\ - 2,384 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \quad 9 \quad 9 \\ \cancel{5}, \cancel{0} \cancel{0}^1 0 \\ - 2,384 \\ \hline 2,616 \end{array}$$

←



Instead of:

$$\begin{array}{r} 4 \overset{9}{\cancel{10}} \overset{9}{\cancel{10}} \overset{10}{} \\ 5, \overset{9}{\cancel{000}} \\ - 2,384 \\ \hline \end{array}$$



Subtract
one from
both #'s

$$\begin{array}{r} 5,000^{-1} \\ - 2,384^{-1} \\ \hline 2,616 \end{array}$$



$$\begin{array}{r} 4,999 \\ - 2,383 \\ \hline 2,616 \end{array}$$

No regrouping!!

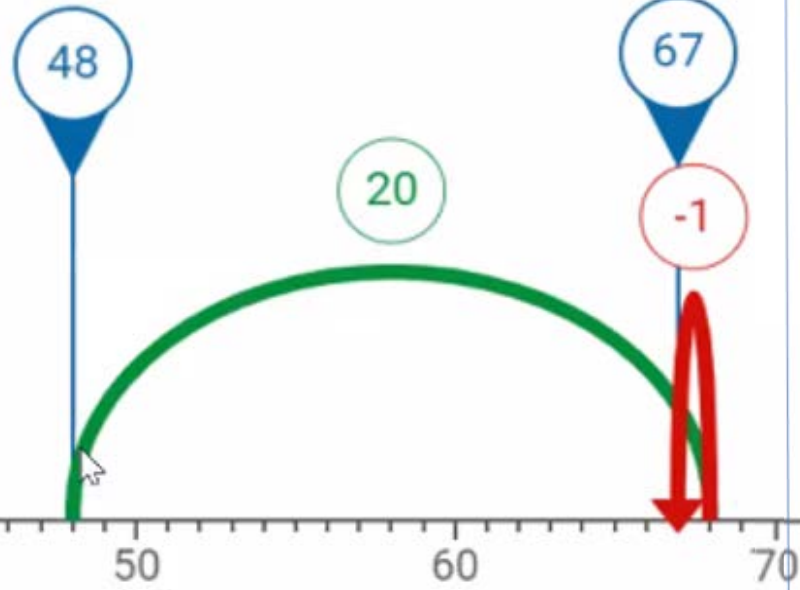
Solve

$$48 + 19$$

$$\begin{array}{r} 1 \\ 48 \\ + 19 \\ \hline 67 \end{array}$$

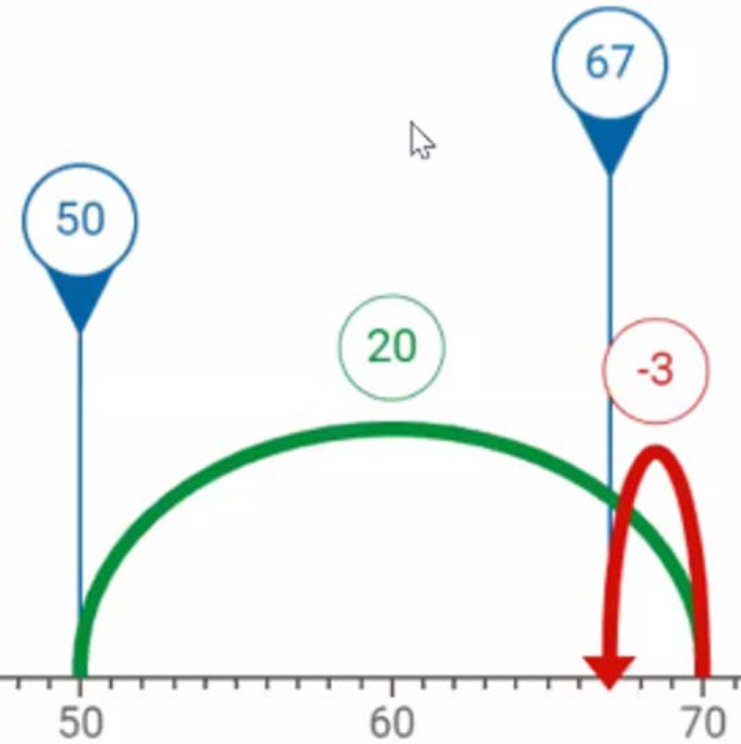
Round and Adjust

$$48 + \overset{\textcircled{19}}{\underset{20}{}}$$



Round and Adjust

$$\overset{\textcircled{48}}{\underset{50}{}} + \overset{\textcircled{19}}{\underset{20}{}}$$



Solve this problem in your head
by first turning this into a friendlier expression

$$98 + 57$$

- Please write in Chat:
 - What did you do? What was your friendlier expression?
 - How did that feel?

It is about
—becoming a—
MATHEMATICAL
thinker

—NOT A—

CALCULATOR

Paraphrased by: Mr. Crawford

History

▶ 2011 NYS Board of Regents adopts Common Core Math Learning Standards

2013	First administration of NYS Grades 3-8 ELA and Math assessments aligned to Common Core
2014	First administration of Algebra I Regents Exam aligned to Common Core
2015	First administration of Geometry Regents Exam aligned to Common Core
2016	First administration of Algebra II Regents Exam aligned to Common Core

▶ 2017 NYS Board of Regents adopts Next Generation Math Learning Standards (NGMLS)

- School year '21-'22 full implementation for grades 3-8 begins

2022	First administration of NYS Grades 3-8 ELA and Math assessments aligned to the NYS NGMLS
2023	First administration of Algebra I Regents Exam aligned to the NYS Next Generation Mathematics Learning Standards
2024	First administration of Geometry Regents Exam aligned to the NYS Next Generation Mathematics Learning Standards. Last administration of Algebra I CC Regents exam
2025	First administration of Algebra II Regents Exam aligned to the NYS Next Generation Mathematics Learning Standards. Last administration of Geometry CC Regents exam
2026	Last administration of Algebra II CC Regents exam

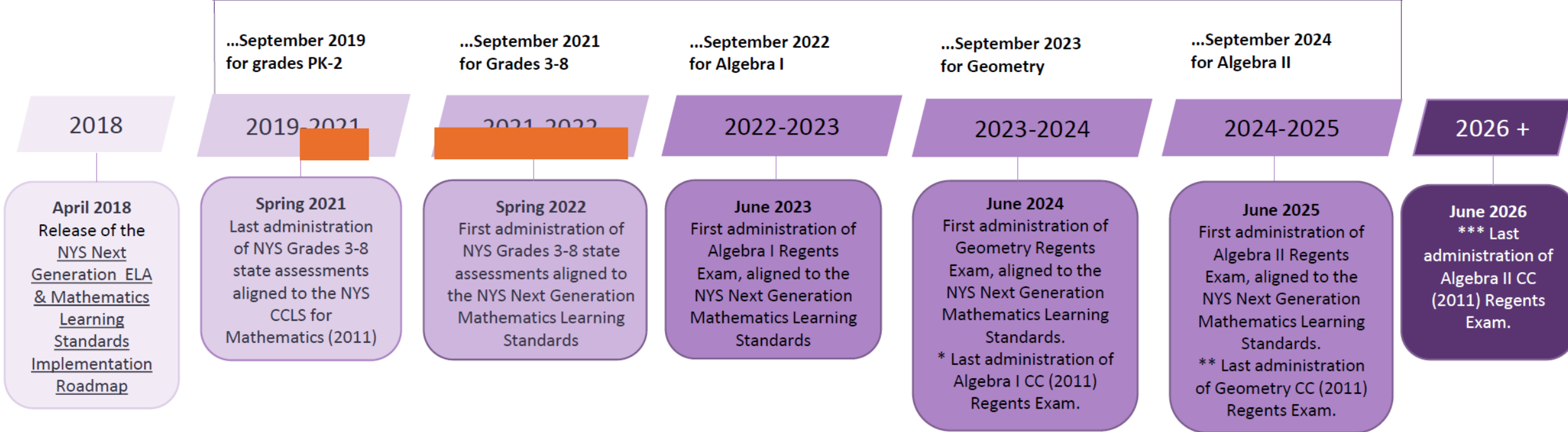
New York State Next Generation Mathematics Learning Standards Instruction and Assessment Implementation Timeline

Phase I
Raise Awareness

Phase II
Build Capacity

Phase III
Implementation & Sustainability

Instruction aligned to NYS Next Generation Mathematics Learning Standards begins...



State Level Mathematics Assessment Development & Implementation

*Algebra I CC (2011) will be administered June 2023, August 2023, Jan 2024 and June 2024.
 **Geometry CC (2011) will be administered June 2024, August 2024, Jan 2025 and June 2025.
 ***Algebra II CC (2011) will be administered June 2025, August 2025, Jan 2026 and June 2026.

The Ten Dumbest Common Core Problems

By ALEC TORRES | March 20, 2014 7:49 PM



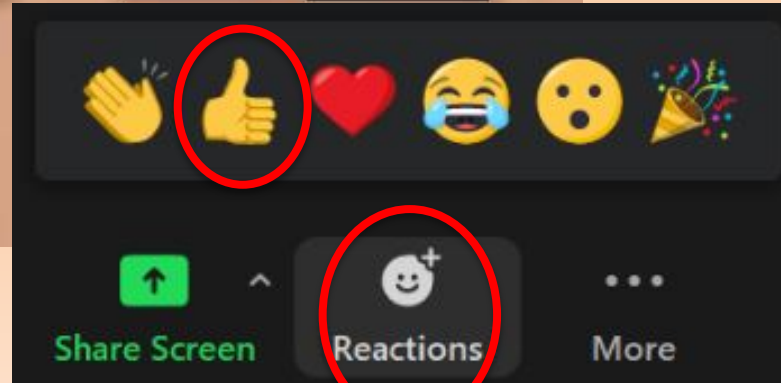
Sample questions guaranteed to make your brain hurt in all the wrong places.

The Common Core State Standards Initiative is widely denounced for imposing confusing, unhelpful experimental teaching methods. Following these methods, some have created problems that lack essential information or make no sense whatsoever.

Here are eleven Common Core-compliant problems that have caused parents, students, and even teachers to scratch their heads or respond in outrage:

1. Starting with an easily solvable problem, New York takes the simple “7+7” and complicates it with something called “number bonds.”

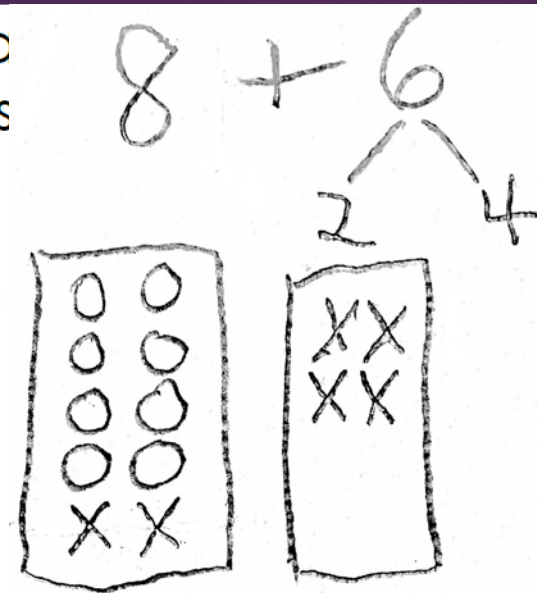
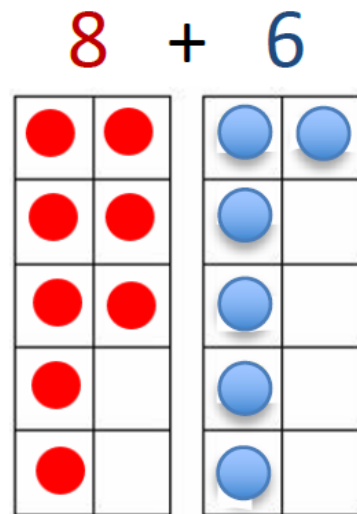
$$(a) \quad 7 + 7 = \frac{10}{3} + \frac{4}{4} =$$



Story: Eight red tulips and six blue tulips are in the garden.
How many tulips are there in all?

Eight red tulips and six blue tulips are in the garden.

Visual:



$10 + 4 = 14$

$8 + 6$

2 4

$10 + 4 = 14$

What does Making 10 Look Like?

Concrete → Pictorial → Abstract

Extending Making 10: Beyond Basic Facts

Making 10 might be the *most useful* reasoning strategy beyond the basic facts. Using *Making 10* can eliminate the need to regroup or use other error-prone and more time-consuming steps. Compare the before and after of these four examples to see how the strategy creates an easier-to-solve problem.

Making 10s

"Move 1 over."

$$29 + 15$$

$$30 + 14$$

Making 100s

"Move 4 over."

$$278 + 496$$

$$274 + 500$$

Making 1s Fractions

"Move $\frac{1}{4}$ over."

$$3\frac{3}{4} + 5\frac{3}{4}$$

$$4 + 5\frac{2}{4}$$

Making 1s Decimals

"Move 0.1 over."

$$21.56 + 42.9$$

$$21.46 + 43$$

Number Bonds

$$997 + 338$$

$$\begin{array}{c} \swarrow \quad \searrow \\ 3 \quad 335 \end{array}$$

$$997 + 3 = 1000$$

$$1000 + 335 = 1335$$

whole

part

part

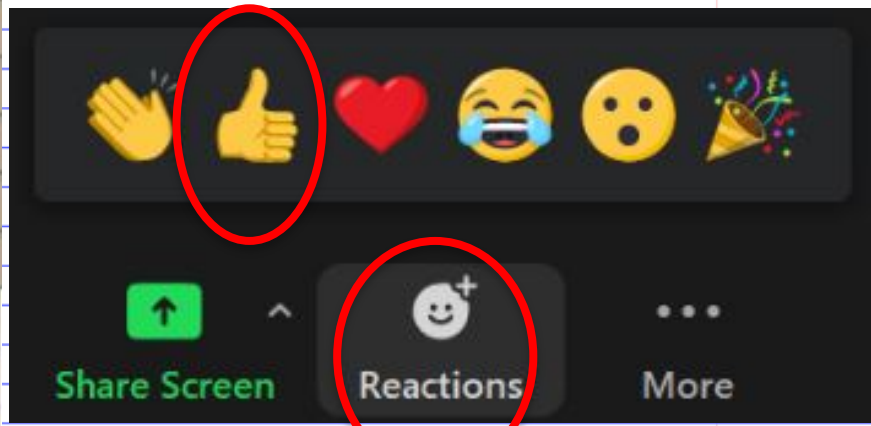
$$312 \times 23 = X$$

Before the pandemic

300	10	2		
6000	200	40	20	6000
400	30	6	3	900
				200
				30
				40
				6
				<hr/>
				7176

$$\begin{array}{r} 312 \\ \times 23 \\ \hline 936 \\ 6240 \\ \hline 7176 \end{array}$$

After being homeschooled by an 'essential' employee!!!
#idont havetime to learn new things



45 x 23

MULTIPLYING 2 DIGIT BY 2 DIGIT

$$\begin{array}{r} \overset{1}{} \overset{1}{} \\ 45 \\ \times 23 \\ \hline 135 \\ + 900 \\ \hline 1035 \end{array}$$

Algorithm

$$\begin{array}{r} \text{x} \quad 941 \\ \hline 2823 \end{array}$$

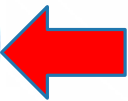
The Turtle Head Method

- Draw the turtle's head.
- Multiply by the number in its neck.
- 3 Steps: **check** off carried numbers, draw a **collar**, & lay a turtle **egg** (zero).
- Multiply by the other number.



45 x 23

MULTIPLYING 2 DIGIT BY 2 DIGIT

$$\begin{array}{r} \\ \\ 45 \\ \times 23 \\ \hline 135 \\ + 900 \\ \hline 1035 \end{array}$$


Algorithm

OBJECTIONS TO AREA MODEL

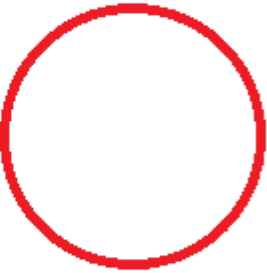
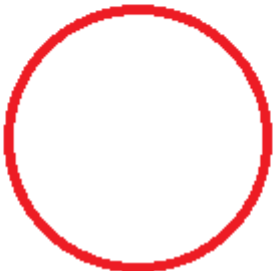


Speed (takes too long)



Useless / Impractical

~~$4\frac{1}{2} \times 5\frac{1}{3} = 20\frac{1}{6}$~~

	4	$\frac{1}{2}$
5	20	
$\frac{1}{3}$		$\frac{1}{6}$

~~$(a + b)^2 = a^2 + b^2$~~

	a	b
a	a^2	ab
b	ab	b^2

Multiplying Polynomials in Algebra II

Multiply: $(2x^2 - 3x + 5)(x^3 - 3x^2 + 2x + 7)$

	x^3	$-3x^2$	$+2x$	$+7$
$2x^2$	$2x^5$	$-6x^4$	$4x^3$	$14x^2$
$-3x$	$-3x^4$	$9x^3$	$-6x^2$	$-21x$
$+5$	$5x^3$	$-15x^2$	$10x$	35

$-9x^4$
 $18x^3$ $-7x^2$ $-11x$

$2x^5 - 9x^4 + 18x^3 - 7x^2 - 11x + 35$



“Do the best you can until
you know better. Then
when you know better, do
better.”

-Maya Angelou

Number Talks

just use your





please just think

no calculators

no paper

no pencils

just your brain

(and don't use the standard algorithm!)



Solve 18×5

no calculators

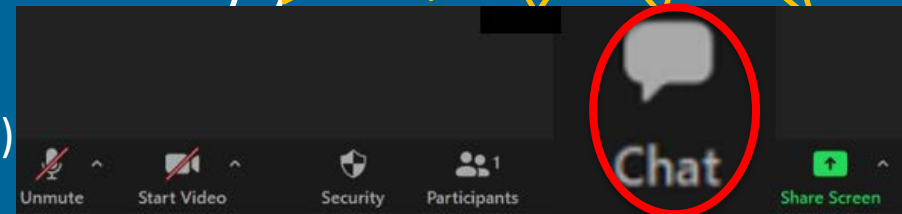
no paper

no pencils

just your brain

(and don't use the standard algorithm!)

Write your
method for
solving this in
Chat



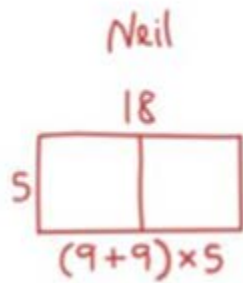
What is Visual Mathematics?



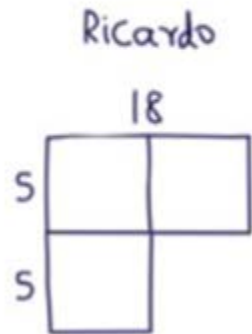
For example, consider how you might solve 18×5 and ask others how they would solve 18×5 . Here are some different visual solutions of this problem.

Each of these visuals highlights the mathematics inside the problem and helps students develop understanding of multiplication. Pictures help students see mathematical ideas, which aids understanding. Visual mathematics also facilitates higher-level thinking, enables communication and helps people see the creativity in mathematics.

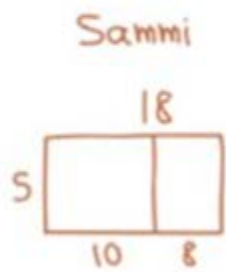
Mental ways to Solve 18×5 via problem-solving, aided by visuals



$$45 + 45 = 90$$

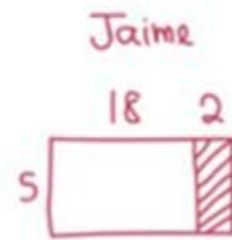


$$18 \times 5 = 9 \times 10$$



$$(10 \times 5) + (8 \times 5)$$

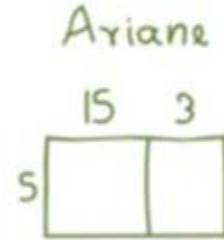
$$50 + 40 = 90$$



$$20 \times 5 = 100$$

$$2 \times 5 = 10$$

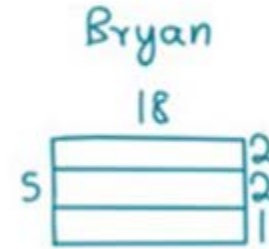
$$100 - 10 = 90$$



$$15 \times 5 = 75$$

$$3 \times 5 = 15$$

$$75 + 15 = 90$$



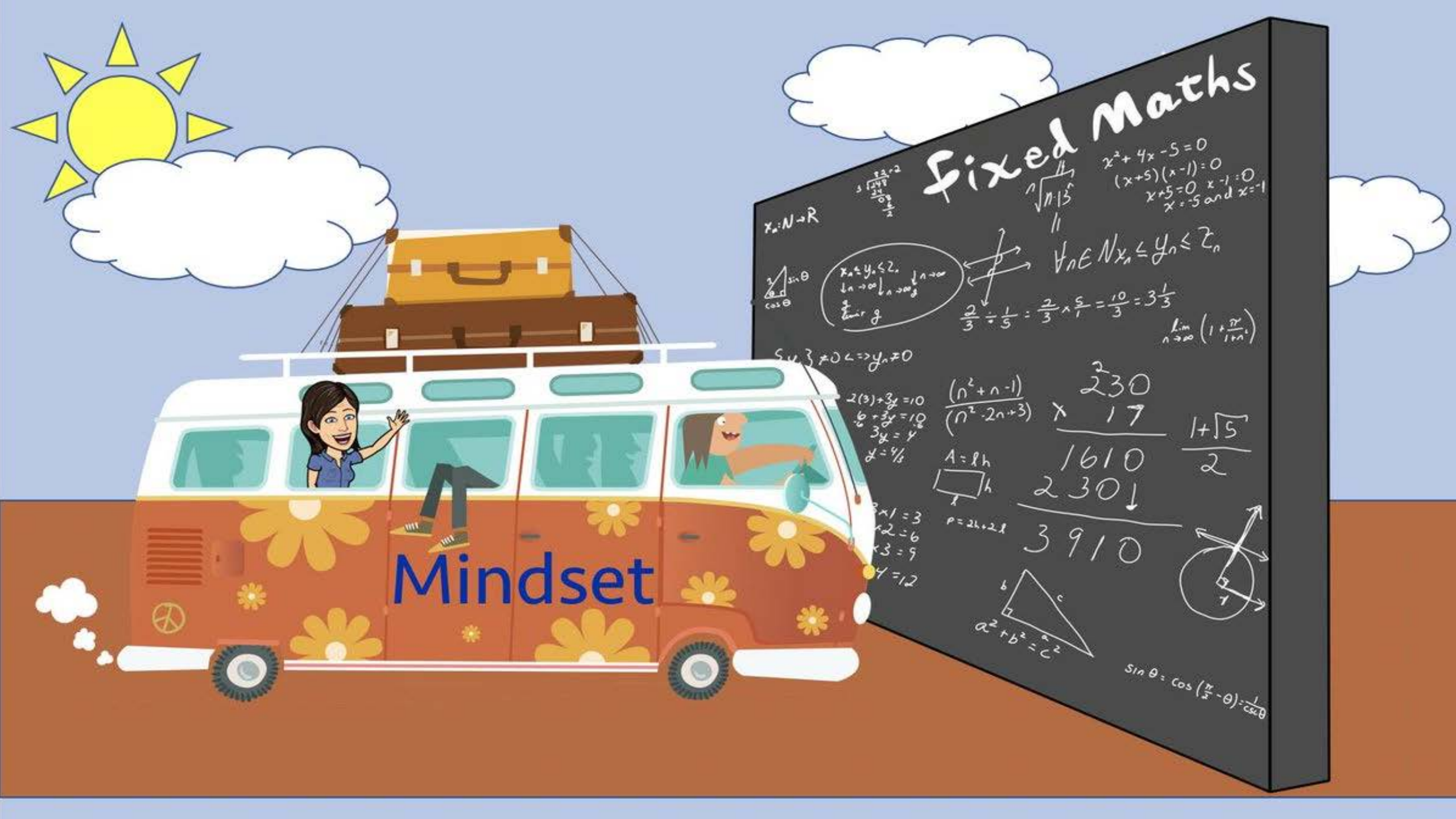
$$(18 \times 2) + (18 \times 2) + 18$$

$$36 + 36 + 18 = 90$$

Doubling strategy

Putting together (adding) strategy

Subtraction strategy



Mindset

Fixed Maths

$$x: \mathbb{N} \rightarrow \mathbb{R}$$

$$\frac{2x-2}{x^2+1}$$

$$x^2 + 4x - 5 = 0$$
$$(x+5)(x-1) = 0$$
$$x+5=0 \quad x-1=0$$
$$x=-5 \text{ and } x=1$$

$$\frac{2}{\cos \theta}$$

$$x_n + y_n \leq 2$$
$$\downarrow n \rightarrow \infty \quad \downarrow n \rightarrow \infty$$
$$\frac{2}{\cos \theta} \leq g$$



$$\forall n \in \mathbb{N} \quad x_n \leq y_n \leq z_n$$

$$\frac{2}{3} \div \frac{1}{5} = \frac{2}{3} \times \frac{5}{1} = \frac{10}{3} = 3\frac{1}{3}$$

$$\lim_{n \rightarrow \infty} \left(1 + \frac{\pi}{1+n}\right)$$

$$5 \vee 3 \neq 0 \Rightarrow y_n \neq 0$$

$$2(3) + 3y = 10$$
$$6 + 3y = 10$$
$$3y = 4$$
$$y = \frac{4}{3}$$

$$\frac{(n^2 + n - 1)}{(n^2 - 2n + 3)}$$

$$\begin{array}{r} 230 \\ \times 17 \\ \hline \end{array}$$

$$\begin{array}{r} 1610 \\ 230 \downarrow \\ \hline 3910 \end{array}$$

$$\frac{1 + \sqrt{5}}{2}$$

$$A = bh$$

$$p = 2b + 2h$$

$$3910$$



$$a^2 + b^2 = c^2$$

$$\sin \theta = \cos \left(\frac{\pi}{2} - \theta\right) = \frac{1}{\csc \theta}$$

FOX

ARE YOU SMARTER THAN A 5TH GRADER



Solve the following:

$$6 \times 3\frac{5}{8}$$

$$6 \times 3\frac{5}{8}$$

$$6 \times \frac{29}{8}$$

$$\frac{174}{8}$$

21 x 8 is 168 so = $21\frac{6}{8} = 21\frac{3}{4}$

OR

$$\frac{6}{1} \times \frac{29}{8}$$

$$\frac{87}{4}$$

21 x 4 is 84 so = $21\frac{3}{4}$



Vs. Fraction Multiplication
using Number Sense

$$6 \times 3\frac{5}{8}$$

		$\frac{4}{8}$	$\frac{5}{8}$	$\frac{1}{8}$
		$\frac{4}{8}$	$\frac{5}{8}$	$\frac{1}{8}$
x	3	3	6	8
	6	18	3	$\frac{6}{8}$

$$21\frac{6}{8}$$

The line plot shows the number of bags of grapes, grouped by weight, to the nearest $\frac{1}{8}$ pound.



How many bags of grapes had a weight of $\frac{3}{8}$ pound or less?

Answer 8 bags

What was the total weight of the grapes in the bags that had a weight of $\frac{3}{8}$ pound or less?

Show your work.

$$\frac{3}{8} \times 3 = \frac{9}{8} = 1\frac{1}{8} + \frac{1}{8} = 2\frac{2}{8}$$

$$\frac{1}{4} \times 4 = \frac{4}{4}$$

Answer $2\frac{2}{8}$ pound(s)

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The answer for the number of bags is correct and fractions are correctly multiplied and added to determine the solution. The response is complete and correct.

Here's an actual question on NYSED's 5th grade state assessment from 2018, and a sample student response:

The line plot shows the number of bags of grapes, grouped by weight, to the nearest $\frac{1}{8}$ pound.



How many bags of grapes had a weight of $\frac{3}{8}$ pound or less?

Answer 8 bags

What was the total weight of the grapes in the bags that had a weight of $\frac{3}{8}$ pound or less?

Show your work.

$$\frac{9}{8} + \frac{8}{8} + \frac{1}{8} = \frac{18}{8}$$

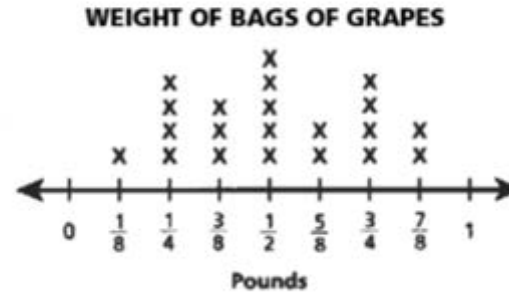
Answer $\frac{18}{8}$ pound(s)

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts in the task. The answer for the number of bags is correct and fractions are correctly added to determine the solution. The response is complete and correct.

Here's an actual question on NYSED's 5th grade state assessment from 2018, and a sample student response:

The line plot shows the number of bags of grapes, grouped by weight, to the nearest $\frac{1}{8}$ pound.



How many bags of grapes had a weight of $\frac{3}{8}$ pound or less?

Answer 2 bags

What was the total weight of the grapes in the bags that had a weight of $\frac{3}{8}$ pound or less?

Show your work.

$$\frac{10}{8} + \frac{15}{8} + \frac{12}{8} + \frac{4}{4} + \frac{2}{4} + \frac{1}{4} + \frac{3}{4} + \frac{1}{8}$$

This $\frac{18}{8}$ is correct

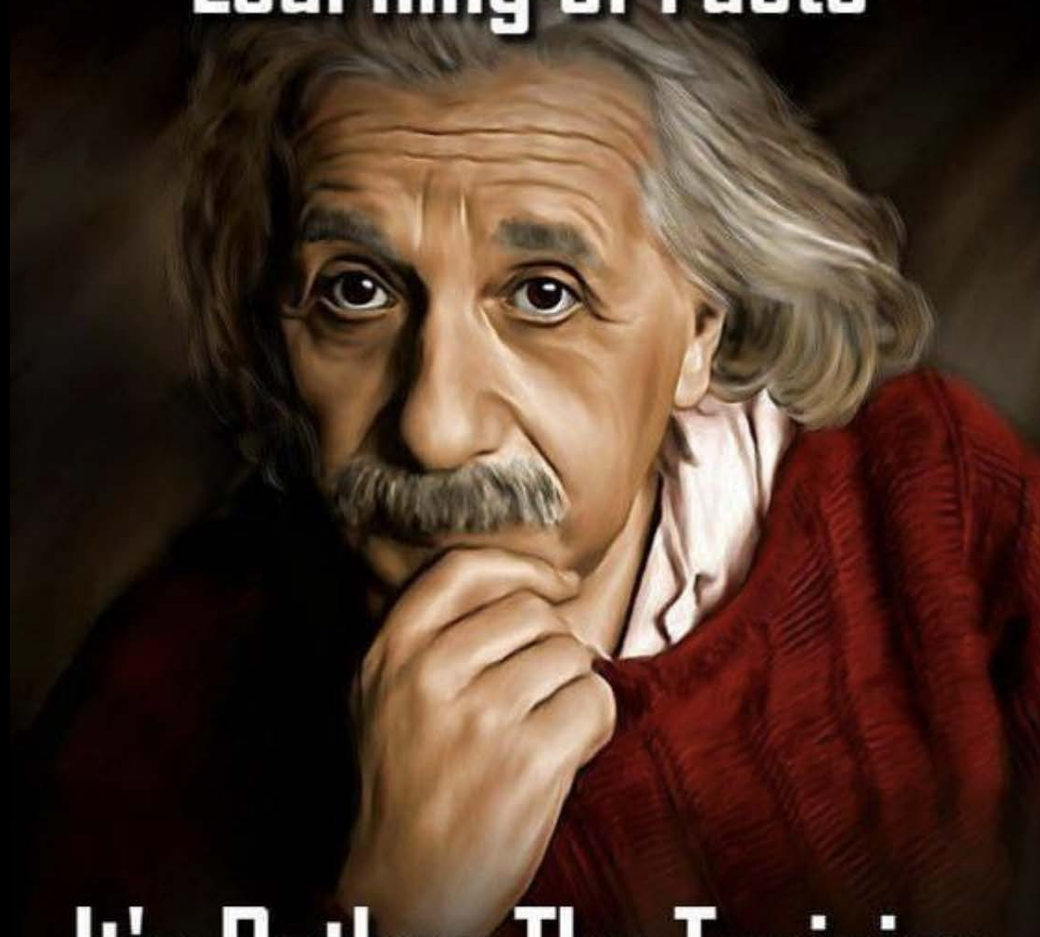
$$\frac{18}{8}$$

Answer 2 pound(s)

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts in the task. The answer for the number of bags is correct and fractions are correctly added to determine the total weight; however, the result is incorrectly simplified. The response contains an incorrect solution but applies a mathematically appropriate process.

**Education is Not The
Learning of Facts**



**It's Rather The Training
of The Mind To Think**



<https://tinyurl.com/y5oo8s4r>

↑
letter O, not number

Will get you to my shared folder containing numerous Parent Resources for grades K-5

FLUENCY entails:

- Flexibility
- Efficiency
- Appropriate strategy use
- Accuracy

Q & A



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