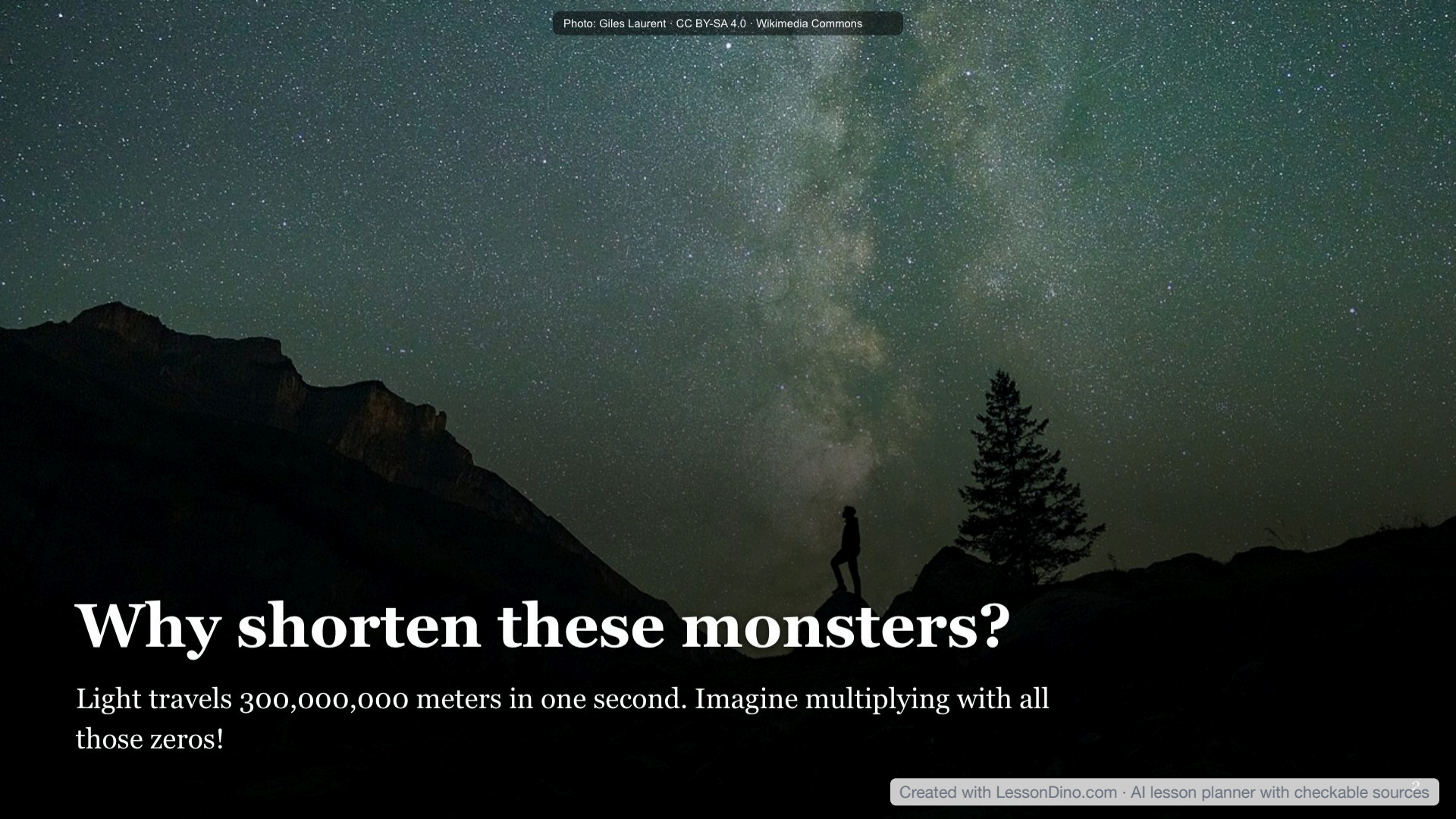
Huge or Tiny? Let's Compute It!

Operations with scientific notation, decimals included

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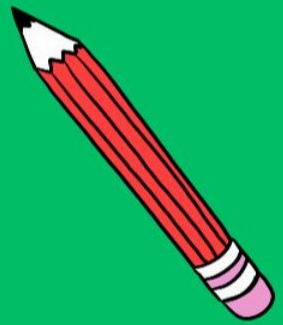
Why shorten these monsters?

Light travels 300,000,000 meters in one second. Imagine multiplying with all those zeros!

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

What makes scientific notation tick?



🔢 Coefficient

A number from 1 to less than 10.

🔟 Base 10

Always 10, shifts the decimal point.

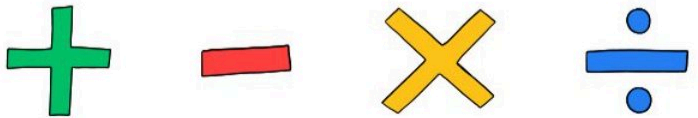
🚀 Exponent

Positive for big, negative for tiny.

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Multiply and divide in 4 steps

1. Split it: coefficients together, powers of 10 together.
2. Multiply coefficients and add exponents; divide and subtract.
3. Fix it: shift decimal so coefficient is 1 to less than 10.
4. Check size: does the exponent make sense?



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

What could this be?

This gem hides a number with 21 zeros. How would scientists write it short?

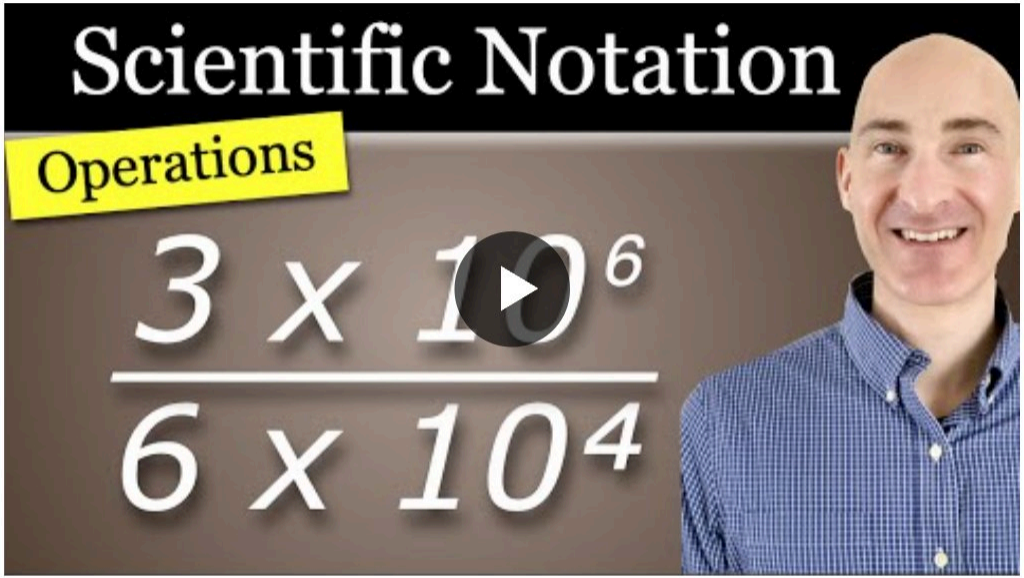


Photo: Stephen Durham from Pine Bluff, AR, USA · CC BY 2.0 · Wikimedia Commons



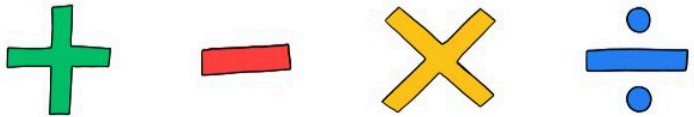
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Video: Operate in scientific notation



▶ 0:00 – 5:00

- Watch how numbers split into coefficient and power.
- Listen for when to add or subtract exponents.



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

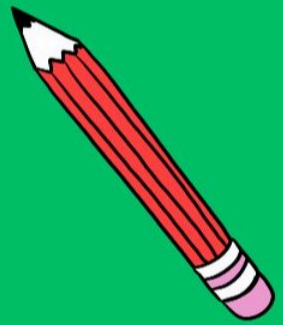
Same form, different moves

Add and Subtract

- First match the exponents exactly.
- Add coefficients, keep the power.

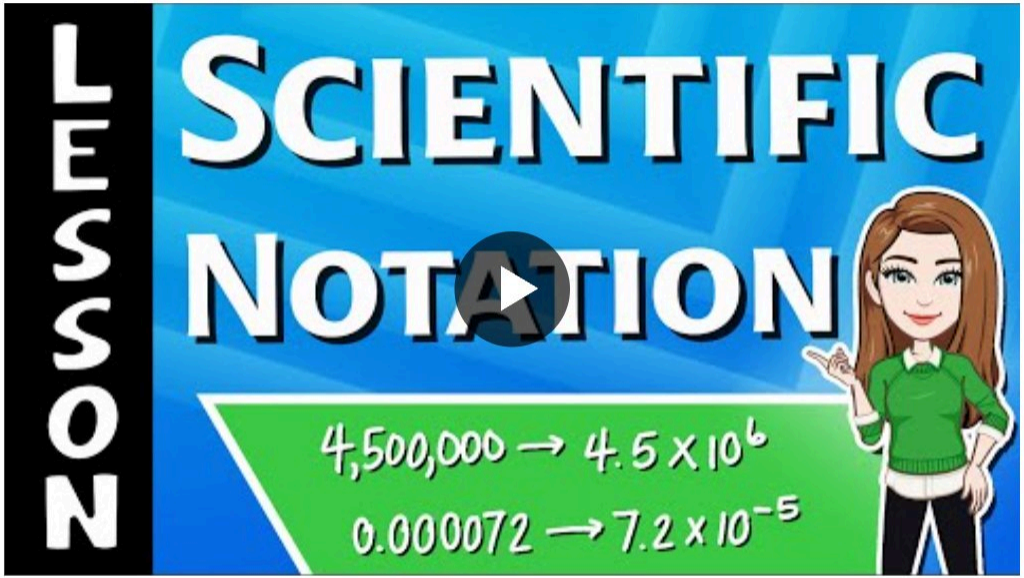
Multiply and Divide

- Work coefficients and exponents separately.
- Multiply: add exponents. Divide: subtract.



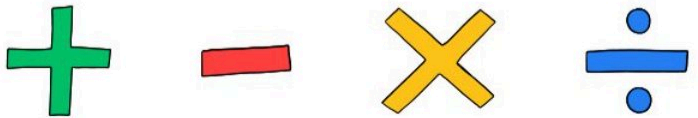
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Video: Decimals meet scientific notation



▶ 0:00 – 4:56

- Spot turning 0.000467 into scientific notation.
- Check how mixed answers return to proper form.



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

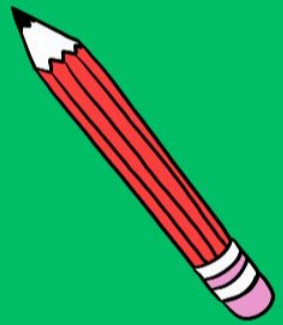
Your task

In pairs, solve three mixed decimal + scientific notation problems.

1. A) 0.000467 + 5.43 x 10^-3 = ?
2. B) (4.5 x 10^3) x 2,000 = ?
3. C) 32,000,000 / (4 x 10^6) = ? Fix proper form.
4. Compare: which result is biggest? How do you know?

12 min

In pairs



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BIG IDEA

Coefficients do the arithmetic, exponents track the size.

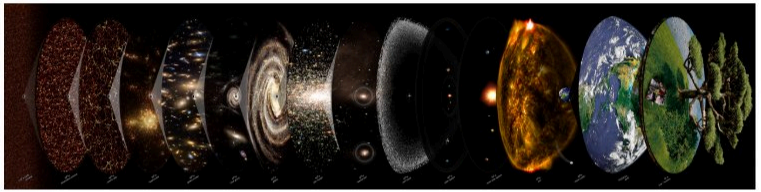
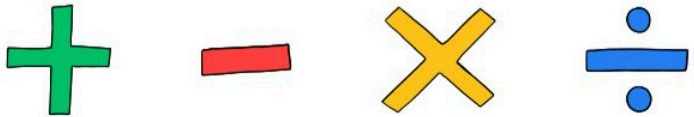
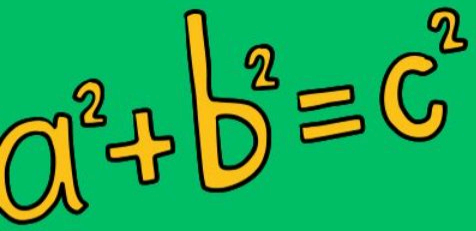


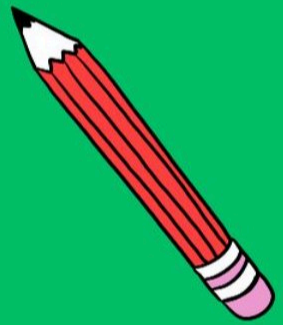
Diagram: Pablo Carlos Budassi · CC BY-SA 4.0 · Wikimedia Commons





Which form wins?

Sun is about 150,000,000 km away. Which display helps you grasp size fastest?



A 150,000,000 km

B 1.5 x 10^8 km

C 1.5E8 calculator form

Vote with your hands, then explain why.

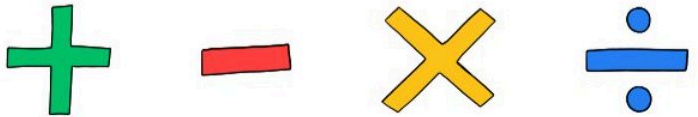
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Exit ticket

1. One operation I can now do is...

2. One mixed problem I still find tricky is...

3. One question I still have is...



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