



GRADE 7 · RATIOS & PROPORTIONAL RELATIONSHIPS

MULTI-STEP PERCENT PROBLEMS

Today's goal: I can solve multi-step percent problems, including by using proportional relationships.



Tan



Digit



Blaze



Pi



WARM-UP

Turn & talk · 1 min

\$100 rises 20%, then falls 20%

1 Where do you end up?

TURN & TALK

back at \$100, or not?



WATCH OUT!

One multiplier, not two steps

- 1 Up $p\%$: multiply by $1 + p/100$.
- 2 Down $p\%$: multiply by $1 - p/100$.



BIG IDEA 2

\$100 → \$120 → \$96

1 $100 \times 1.2 = 120$. Then $120 \times 0.8 = 96$.

REMEMBER

Not \$100. And never \$100, for any percent.



BIG IDEA 3

Because the WHOLE changed

- 1 The rise was 20% of \$100 = \$20.
- 2 The fall was 20% of \$120 = \$24. Bigger.

REMEMBER

Percents only cancel when taken of the same whole.



BIG IDEA 4

So what DOES undo a 50% rise?

- 1 Up 50% multiplies by 1.5. Undo it by dividing by 1.5.
- 2 Dividing by 1.5 is multiplying by $\frac{2}{3}$ — a $33\frac{1}{3}\%$ cut.

REMEMBER

Use the reciprocal, not the mirror image.



Something went wrong here...

THE PROBLEM

Increase 40 by 10%.

WHAT A STUDENT DID

Answered 4, giving the increase rather than the new amount.

YOUR MISSION

What went wrong? What's the right answer?



Increase 40 by 10%.

- 1 $40 \times 1.1 = 44$. Or $10\% \text{ of } 40 = 4$, then $40 + 4 = 44$.

Answer: 44



YOUR TURN

Whiteboards up!

Pick your pepper!



☛ MILD

Find 30% of 50.

#1 on your practice sheet



☛☛ MEDIUM

Decrease 90 by 30%.

#3 on your practice sheet



☛☛☛ SPICY

You started at 200 and finished at 150. Explain why the two 50% changes did not cancel.

#7 on your practice sheet



How's it going?



3 • Got it!

I could teach it



2 • Almost

One more example, please



1 • Not yet

I need some help



MATH WITH MR DJ

NOW YOU!

Practice sheet: everyone does Mild & Medium, then climb the peppers.

Stuck? Look back at Mr DJ's example at the top of the sheet.

Need it again? Watch "Finding Percent of a Number: Step by Step Guide" on YouTube @MathWithMrDJ

Brain break: 3 new daily puzzles at puzzles.mathwithmrdj.com

