Percent Increase and Decrease

Percent change compares the change to the original. Find the change, divide by where you started. To find a new amount, multiply by one number: more than 1 to grow, less than 1 to shrink.

1 THE VOCABULARY

Words we use

Percent increase, decrease the change as a percent of the original.

Original the starting amount, always the thing you divide by.

Change new minus original, or original minus new.

- Watch out for these.
- Dividing by the new amount. Always the original.
- Thinking the same amount of change is the same percent. It depends on the start.
- Multiplying by 0.10 for a 10 percent increase. That is the change; the new amount is times 1.10.
- Comparing end sizes instead of growth.

2 THE METHOD

Percent change, both directions

1. FIND THE PERCENT CHANGE change divided by the original, then to a percent. Say increase or decrease.
2. FIND THE NEW AMOUNT original times (1 plus the rate) to grow, times (1 minus the rate) to shrink.
3. FIND THE ORIGINAL the new amount is the percent after the change; build back to 100 percent, or divide by the multiplier.
4. SENSE CHECK the same jump is a bigger percent from a smaller start.

WHY DIVIDE BY THE ORIGINAL

A percent is a percent of a specific whole. For a change, that whole is where you started. The new amount already has the change inside it.



Elle, math-speak: A proportional relationship always multiplies by the same number, the unit rate.



Finn, plain English: Percent means out of 100. A percent is a unit rate for 100 instead of for 1: 30 percent means 30 for every 100.

3 TOWN A AND TOWN B

Same amount, different percent

Town A: $\frac{3{,}000}{5{,}000} = 60\%$; Town B: $\frac{3{,}000}{6{,}000} = 50\%$	same change, different starts
$\frac{15}{50} = 30\%$ decrease	a game from $50 to $35
$\frac{10}{40} = 25\%$ increase	a plant from 40 cm to 50 cm
$70 \times 1.10 = 77$	10 percent growth
$70 \times 0.80 = 56$	20 percent decrease
$77 \div 1.10 = 70$	backward to the original

THE EXIT TICKET

40 cm to 50 cm: the change is 10, and 10 out of 40 is 25 percent.

SAY IT OUT LOUD

Divide by where you started.