

**As outcomes, Year 8 pupils should, for example:**

**Find the outcome of a given percentage increase or decrease.**

Understand that:

- If something increases by 100%, it doubles.
- If something increases by 500%, it increases by five times itself, and is then six times its original size.
- A 100% decrease leaves zero.
- An increase of 15% will result in 115%, and 115% is equivalent to 1.15.
- A decrease of 15% will result in 85%, and 85% is equivalent to 0.85.
- An increase of 10% followed by a further increase of 10% is not equivalent to an increase of 20%.

For example:

- An increase of 15% on an original cost of £12 gives a new price of  
 $£12 \times 1.15 = £13.80$   
 or  
 $15\% \text{ of } £12 = £1.80 \quad £12 + £1.80 = £13.80$
- A decrease of 15% on the original cost of £12 gives a new price of  
 $£12 \times 0.85 = £10.20$   
 or  
 $15\% \text{ of } £12 = £1.80 \quad £12 - £1.80 = £10.20$

Investigate problems such as:

- I can buy a bicycle for one cash payment of £119, or pay a deposit of 20% and then six equal monthly payments of £17. How much extra will I pay in the second method?
- A price is increased by 10% in November to a new price. In the January sales the new price is reduced by 10%. Is the January sale price more, less or the same as the price was in October? Justify your answer.
- At the end of a dinner the waiter added VAT of 17.5% and then a 12.5% service charge. The customer argued that the service charge should have been calculated first. Who was correct? Give mathematical reasons for your answer.

[Link to enlargement and scale \(pages 212–17\), and area and volume \(pages 234–41\).](#)

**As outcomes, Year 9 pupils should, for example:**

**Use percentage changes to solve problems,** choosing the correct numbers to take as 100%, or as a whole.

For example:

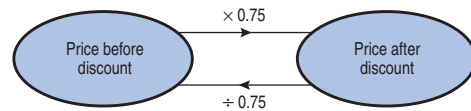
- There was a 25% discount in a sale. A boy paid £30 for a pair of jeans in the sale. What was the original price of the jeans?

**Using a unitary method**

£30 represents 75%.  
 $£30 \div 75$  represents 1%.  
 $£30 \div 75 \times 100$  represents 100%.

**Using inverse operations**

Let  $p$  be the original price.  
 $p \times 0.75 = 30$ , so  $p = 30 \div 0.75 = 40$



- An unstretched metal spring is 20 cm long. It is stretched to a length of 27cm. Find the percentage change in its length.

The increase is  $\frac{7}{20} = \frac{35}{100}$  or 35%.

Solve problems such as:

- A jacket is on sale at £45, which is 85% of its original price. What was its original price?
- I bought a fridge freezer in a sale and saved £49. The label said that it was a '20% reduction'. What was the original price of the fridge freezer?
- A stereo system has been reduced from £320 to £272. What is the percentage reduction?
- The number of people going to a cinema increased from 52 000 in 1998 to 71 500 in 2001. Calculate the percentage increase in the number of people going to the cinema from 1998 to 2001.
- 12 500 people visited a museum in 2000. This was an increase of 25% on 1999. How many visitors were there in 1999?
- When heated, a metal bar increases in length from 1.25 m to 1.262m. Calculate the percentage increase correct to one decimal place.
- A woman deposits £75 in a bank with an annual compound interest rate of 6%. How much will she have at the end of 3 years? (The calculation  $75 \times (1.06)^3$  gives the new amount.)

[Link to proportionality \(pages 78–9\), enlargement and scale \(page 212–17\), and area and volume \(pages 234–41\).](#)