

# Y9 Using Percentages

## What do I need to be able to do?

By the end of this unit you should be able to:

- Use FDP equivalence
- Calculate percentage increase and decrease
- Express percentage change
- Solve reverse percentage problems
- Solve percentage problems (calculator and non calculator problems)

## Keywords

- Percent:** parts per 100 – written using the % symbol  
**Decimal:** a number in our base 10 number system. Numbers to the right of the decimal place are called decimals.  
**Fraction:** a fraction represents how many parts of a whole value you have.  
**Equivalent:** of equal value.  
**Reduce:** to make smaller in value.  
**Growth:** to increase/ to grow.  
**Integer:** whole number, can be positive, negative or zero.  
**Invest:** use money with the goal of it increasing in value over time (usually in a bank).  
**Multiplier:** the number you are multiplying by.  
**Profit:** the income take away any expenses/ costs.

## FDP Equivalence R

**Percentage**  
 100% = a whole = 100 hundredths

One Whole = 100 hundredths  
 10 hundredths  
 10 out of 100  
 10%

$\frac{10}{100} = \frac{1}{10} = 0.10$  One hundredth (one whole split into 100 equal parts)

ones	tenths	hundredths
	•	•

## Converting FDP R

$\frac{70}{100}$  → This also means 70 - 100 → 70 out of 100 squares → 70 hundredths = 70% → 70 hundredths = 70%

Using a calculator →  $\frac{70}{100} = 0.7$  → 70 "hundredths" = 7 "tenths" = 0.7

Convert to a decimal →  $\frac{70}{100} = 0.7$  →  $\times 100$  converts to a percentage → 70%

Be careful of recurring decimals  
 eg  $\frac{1}{3} = 0.333333$   
 $\frac{1}{3} = 0.\dot{3}$   
 The dot above the 3

## Percentage Increase/ Decrease R

**Decrease**  
 100% → 42% → Decrease by 58%

**Increase**  
 100% → Increase by 12%

$100 - 0.58 = 0.42$  ← Multiplier Less than 1  
 $100\% + 12\% = 112\%$   
 $100 + 0.12 = 112$  ← Multiplier More than 1

## Percentage change R

I bought a phone for £200. A year later sold it for £125.

All values of change compare to the ORIGINAL value

Percentage loss  
 $\frac{75}{200} \times 100 = 37.5\%$

**Difference in values**  
 $\frac{\text{Difference in values}}{\text{Original value}} \times 100$

I bought a house for £180,000, I later sold it for £216,000

Percentage profit  
 Money made (profit value) →  $\frac{36000}{180000} \times 100 = 20\%$

## Reverse Percentages

40% of my number is 16. What am I thinking of?  
 Original Number (100%) → 4 4 4 4 4 4 4 4 4 4 4  
 16  
 $40\% = 16$   
 $10\% = 4$   
 $100\% = 40$

140% of my number is 84. What is the original number?  
 Original Number (100%) → 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6  
 84  
 $140\% = 84$   
 $10\% = 6$   
 $100\% = 60$

Try to scale down to 10% or 1% and then scale back up to 100%.