

**PER (out of) CENT (100)**  
**A percentage is a fraction**  
**of 100, so 47% =  $\frac{47}{100}$**



**DON'T**  
**USE IT!!**

# PERCENTAGES

## Decimal Multiplier

To convert a % to a decimal, divide by 100  
 $47\% = 47 \div 100 = 0.47$   
 $9.2\% = 9.2 \div 100 = 0.092$

## Find the percentage of a quantity

1. Find the decimal multiplier
2. Multiply by the quantity

*Find 18% of £320*

Decimal Multiplier =  $18 \div 100 = 0.18$   
 $0.18 \times £320 = \mathbf{£57.60}$

## Increasing or decreasing by a percentage

Decimal multiplier:

100% = no change,

+ % to 100% for increase,

- % from 100% for decrease

÷ by 100 to get decimal multiplier

*Increase £120 by 12%*

$100\% + 12\% = 112\% \div 100 = 1.12$

$1.12 \times £120 = \mathbf{£134.50}$

*Decrease £420 by 13.6%*

$100\% - 13.6\% = 86.4\% \div 100 = 0.864$

$0.864 \times £420 = \mathbf{£362.88}$

## MENTAL PERCENTAGES

|     |                             |
|-----|-----------------------------|
| 50% | Half ( $\div 2$ )           |
| 25% | Quarter (Half & half again) |
| 10% | $\div 10$                   |
| 5%  | Find 10% and halve          |
| 1%  | $\div 100$                  |

Find 37% of £250

$37\% = (3 \times 10\%) + 5\% + (2 \times 1\%)$

$10\% = £250 \div 10 = £25$

$5\% = £25 \div 2 = £12.50$

$1\% = £250 \div 100 = £2.50$

$37\% = (3 \times £25) + £12.50 + (2 \times £2.50)$

$= £75 + £12.50 + £5 = \mathbf{£92.50}$



## Finding the percentage

1. Convert to a fraction

2. Turn to a decimal  
 (numerator  $\div$  denominator)

3. Turn decimal to % by  $\times 100$

*A light bulb produces 80J of energy from 110J of electrical energy – what percentage of electrical energy is converted?*

$\frac{80}{110}$  electrical energy is converted

$80 \div 110 \times 100 = \mathbf{73\%}$

## Finding the percentage change

Fraction:  $\frac{\text{Amount AFTER change}}{\text{ORIGINAL amount}}$

*The temperature of a liquid was 45°C. It increases to 61°C.*

*What is the percentage change?*

$\frac{61}{45} = 61 \div 45 \times 100 = 136\%$

$136\% - 100\% = \mathbf{36\% \text{ increase}}$

*The temperature of a liquid was 56°C. It decreases to 44°C.*

*What is the percentage change?*

$\frac{44}{56} = 44 \div 56 \times 100 = 79\%$

$100\% - 79\% = \mathbf{21\% \text{ decrease}}$