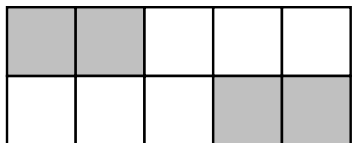


## Describing percentages

Eg what percentage is shaded?



$$\frac{6}{10} = \frac{60}{100} = \mathbf{60\%}$$

% means out of 100

## Simplifying fractions

Eg simplify  $\frac{8}{12}$

$$\text{HCF} = 4 \quad \swarrow \searrow \quad \frac{8}{12} = \frac{2}{3}$$

Divide by HCF of numerator and denominator

## Fractions of an amount

Eg find  $\frac{3}{5}$  of 30

$$\frac{1}{5} \text{ is } 6$$

$$\frac{3}{5} \text{ is } 18$$

Easy!

## Improper fractions and mixed numbers

Eg write  $\frac{15}{6}$  as a mixed number

$$\frac{15}{6} = 2\frac{3}{6} = 2\frac{1}{2}$$

How many times does the denominator go into the numerator?

Eg write  $3\frac{4}{5}$  as an improper fraction

$$3\frac{4}{5} = \frac{5 \times 3 + 4}{5} = \frac{19}{5}$$

## Multiplying and dividing fractions

Eg what is  $\frac{3}{4} \times 2\frac{1}{2}$  ?

$$= \frac{3}{4} \times \frac{5}{2} = \frac{15}{8} = 1\frac{7}{8}$$

Multiply numerators and denominators

Eg what is  $2\frac{2}{3} \div 1\frac{5}{7}$

$$= \frac{8}{3} \div \frac{12}{7} = \frac{8}{3} \times \frac{7}{12} = \frac{56}{36} = 1\frac{5}{9}$$

Reverse second fraction and multiply

## Adding and subtracting fractions

Eg what is  $\frac{3}{4} + \frac{1}{2}$  ?

$$= \frac{3}{4} + \frac{2}{4} = \frac{5}{4} = 1\frac{1}{4}$$

Find LCM of denominators, then add/subtract numerators

Eg what is  $1\frac{1}{3} - \frac{3}{8}$  ?

$$= \frac{4}{3} - \frac{3}{8} = \frac{32}{24} - \frac{9}{24} = \frac{23}{24}$$

## Percentages to fractions

Eg what is 60% as a fraction?

$$60\% = \frac{60}{100} = \frac{3}{5}$$

Write out of 100,  
then simplify

## Fractions to percentages

Eg what is  $\frac{12}{40}$   
as a percentage?

$$\frac{12}{40} = \frac{3}{10} = 30\%$$

Use equivalent fractions  
to write out of 100

## % of an amount

Eg what is 35% of £40?

$$\begin{array}{lcl} 10\% = 4 & \begin{array}{l} \nearrow \times 3 \\ \searrow \div 2 \end{array} & \begin{array}{l} 30\% = 12 \\ 5\% = 2 \end{array} \\ & & \hline & & 35\% = 16 \end{array} +$$

Split into easy  
percentages and add

## One amount as a % of another

Eg what is £15 as a  
percentage of £60?

$$\frac{15}{60} = \frac{75}{100} = 75\%$$

Write as a fraction,  
then proceed as above

## Percentage increase & decrease

Eg increase 60 by 12%

$$10\% = 6$$

$$2\% = 1.2$$

$$12\% = 7.2$$

$$60 + 7.2 = 67.2$$

Add percentage to  
original amount

## Describing percentage change

Eg a sale item is  
reduced by £5 to £35.  
By what percentage  
has the price changed?

$$\frac{5}{40} = \frac{1}{8} = 12.5\%$$

Write change as a  
fraction of the original  
amount, then convert  
to a percentage