

12. [Decimals / Fractions / Percents]

Skill 12.1 Illustrating fractions and percents.

MMBlue 1 1 2 2 3 3 4 4
MMGreen 1 1 2 2 3 3 4 4

To recognize a shaded **fraction** of a shape:

- Count the total number of equal parts in which the shape is divided.
- Use this number as the denominator of the fraction.
- Count the number of shaded parts.
- Use this number as the numerator of the fraction.
- Simplify the resulting fraction.
(see skill 9.1, page 39)

To recognize a shaded **percent** of a shape:

- Count the shaded parts.
- Relate the amount shaded to out of 100, by dividing the number of total parts into 100.

Hints: A percent is a fraction out of 100.

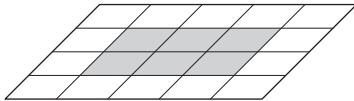
Compare to common fractions:

one half equals 50%

one quarter equals 25%

one tenth equals 10%.

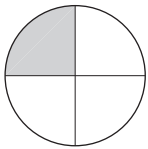
Q. What percent of the shape is shaded?



A. $6 \text{ out of } 20 \text{ parts} =$
 $\times 5 \left(\begin{array}{c} 6 \\ \times 5 \end{array} \right) = 30 \text{ out of } 100 \text{ parts}$
 $= 30\%$

6 out of 20 parts are shaded.
There are 5 lots of 20 in 100
so multiply 6×5 to get the
percent shaded.

a) What fraction of the shape is shaded?

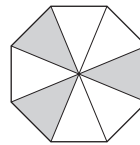


1 out of 4 parts

=

$$\boxed{\frac{1}{4}}$$

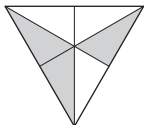
b) What fraction of the shape is shaded?



=

$$\boxed{\phantom{\frac{1}{4}}}$$

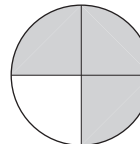
c) What fraction of the shape is shaded?



=

$$\boxed{\phantom{\frac{1}{4}}}$$

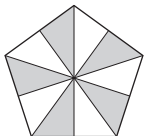
d) What fraction of the shape is shaded?



=

$$\boxed{\phantom{\frac{1}{4}}}$$

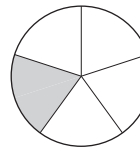
e) What percent of the shape is shaded?



=

$$\boxed{\phantom{\frac{1}{4}}}$$

f) What percent of the shape is shaded?



=

$$\boxed{\phantom{\frac{1}{4}}}$$

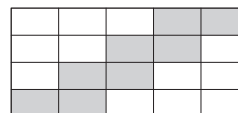
g) What percent of the shape is shaded?



=

$$\boxed{\phantom{\frac{1}{4}}}$$

h) What percent of the shape is shaded?



=

$$\boxed{\phantom{\frac{1}{4}}}$$

Skill 12.2 Simplifying fractions (1).

MMBlue 1 2 2 3 3 4 4
MMGreen 1 1 2 2 3 3 4 4

Greatest Common Factor (GCF) of two numbers

- Write all the factors of each number (the factors must divide exactly into the number).
 - Find the largest number that appears on both lists.
- Hint: The Greatest Common Factor is the largest number that divides evenly in both numbers.*

Examples:

Identical numbers

5	5	
1	1	
5	5	GCF of 5 and 5

Hint: 5 is the GCF of 5 and 5 because 5 is the largest number that divides into 5 and 5.

One number divides evenly into the other number

4	12	
1	1	
2	2	
4	3	
4	4	GCF of 4 and 12
	6	
	12	

Hint: 4 is the GCF of 4 and 12 because 4 is the largest number that divides into 4 and 12.

Numbers have other common factors

6	10	
1	1	
2	2	GCF of 6 and 10
3	5	
6	10	

Hint: 2 is the GCF of 6 and 10 because 2 is the largest number that divides into 6 and 10.

- Divide both the numerator and the denominator by their Greatest Common Factor (GCF).
- OR

- Divide both the numerator and the denominator by any common factor.
- Divide again by another common factor, until the common factor of the numerator and the denominator is 1.

*Hints: The fraction is in simplest form when it cannot be simplified.
If the numbers are both even then you can start with dividing by 2.*

Q. Simplify $\frac{20}{30}$

A. $\frac{20}{30} = \frac{20 \div 10}{30 \div 10}$ GCF of 20 and 30 is 10 OR **A.** $\frac{20 \div 2}{30 \div 2} = \frac{10 \div 5}{15 \div 5} = \frac{2}{3}$ Divide by 2 Divide by 5

a) Simplify $\frac{4}{10}$ GCF of 4 and 10 is 2
 $= \frac{4 \div 2}{10 \div 2} = \frac{2}{5}$

b) Simplify $\frac{3}{6}$
 $= \frac{3 \div 3}{6 \div 3} = \frac{\boxed{}}{\boxed{}}$

c) Simplify $\frac{4}{6}$
 $= \frac{4 \div 2}{6 \div 2} = \frac{\boxed{}}{\boxed{}}$

d) Simplify $\frac{3}{9}$
 $= \frac{3 \div 3}{9 \div 3} = \frac{\boxed{}}{\boxed{}}$

e) Simplify $\frac{2}{8}$
 $= \frac{2 \div 2}{8 \div 2} = \frac{\boxed{}}{\boxed{}}$

f) Simplify $\frac{2}{6}$
 $= \frac{2 \div 2}{6 \div 2} = \frac{\boxed{}}{\boxed{}}$

Skill 12.2 Simplifying fractions (2).

MMBlue 1 1 2 2 3 3 4 4
MMGreen 1 1 2 2 3 3 4 4

g) Simplify $\frac{9}{18}$

= $\frac{\quad}{\quad}$

h) Simplify $\frac{3}{30}$

= $\frac{\quad}{\quad}$

i) Simplify $\frac{12}{15}$

= $\frac{\quad}{\quad}$

j) Simplify $\frac{8}{12}$

= $\frac{\quad}{\quad}$

k) Simplify $\frac{5}{15}$

= $\frac{\quad}{\quad}$

l) Simplify $\frac{15}{20}$

= $\frac{\quad}{\quad}$

m) Simplify $\frac{6}{12}$

= $\frac{\quad}{\quad}$

n) Simplify $\frac{4}{40}$

= $\frac{\quad}{\quad}$

o) Simplify $\frac{10}{30}$

= $\frac{\quad}{\quad}$

p) Simplify $\frac{5}{25}$

= $\frac{\quad}{\quad}$

q) Simplify $\frac{8}{16}$

= $\frac{\quad}{\quad}$

r) Simplify $\frac{14}{21}$

= $\frac{\quad}{\quad}$

s) Simplify $\frac{9}{24}$

= $\frac{\quad}{\quad}$

t) Simplify $\frac{8}{20}$

= $\frac{\quad}{\quad}$

u) Simplify $\frac{24}{30}$

= $\frac{\quad}{\quad}$

v) Simplify $\frac{9}{15}$

= $\frac{\quad}{\quad}$

w) Simplify $\frac{9}{81}$

= $\frac{\quad}{\quad}$

x) Simplify $\frac{25}{35}$

= $\frac{\quad}{\quad}$

y) Simplify $\frac{20}{25}$

= $\frac{\quad}{\quad}$

z) Simplify $\frac{8}{28}$

= $\frac{\quad}{\quad}$

zz) Simplify $\frac{12}{20}$

= $\frac{\quad}{\quad}$

Skill 12.3 Finding equivalent fractions.

- Check if you need to multiply or divide the numerator or denominator of the first fraction to reach the numerator or denominator of the second fraction.
- Do the same operation to the top or the bottom of the fraction.

Example:

$$\frac{4}{5} = \frac{\boxed{?}}{15} \Rightarrow \frac{4 \times 3}{5 \times 3} = \frac{\boxed{12}}{15}$$

$\swarrow \times 3$

So $\frac{4}{5}$ and $\frac{12}{15}$ are equivalent fractions.

Q. Complete the equivalent fractions:

$$\frac{3}{5} = \frac{18}{\boxed{?}} = \frac{\boxed{?}}{90}$$

A.

$$\frac{3}{5} = \frac{18}{?} \Rightarrow \frac{3 \times 6}{5 \times 6} = \frac{18}{30}$$

$$\text{and } \frac{3}{5} = \frac{?}{90} \Rightarrow \frac{3 \times 18}{5 \times 18} = \frac{54}{90}$$

$$\Rightarrow \frac{3}{5} = \frac{18}{30} = \frac{54}{90}$$

a) Complete the equivalent fractions:

$$\frac{\boxed{35}}{42} = \frac{5}{6}$$

$$\frac{?}{42} = \frac{5}{6} \Rightarrow ? \div 7 = 5 \Rightarrow ? = 35$$

$\swarrow \div 7$

b) Complete the equivalent fractions:

$$\frac{3}{4} = \frac{27}{\boxed{?}}$$

$$\frac{3}{4} = \frac{27}{?} \Rightarrow \frac{3 \times 9}{4 \times 9} = \frac{27}{36}$$

c) Complete the equivalent fractions:

$$\frac{2}{5} = \frac{\boxed{?}}{35}$$

\Rightarrow

d) Complete the equivalent fractions:

$$\frac{4}{\boxed{?}} = \frac{28}{49}$$

\Rightarrow

e) Complete the equivalent fractions:

$$\frac{9}{10} = \frac{\boxed{?}}{60}$$

\Rightarrow

f) Complete the equivalent fractions:

$$\frac{48}{60} = \frac{12}{\boxed{?}}$$

\Rightarrow

g) Complete the equivalent fractions:

$$\frac{2}{3} = \frac{\boxed{?}}{15} = \frac{40}{\boxed{?}}$$

\Rightarrow

h) Complete the equivalent fractions:

$$\frac{3}{8} = \frac{12}{\boxed{?}} = \frac{\boxed{?}}{96}$$

\Rightarrow

i) Complete the equivalent fractions:

$$\frac{3}{\boxed{?}} = \frac{6}{8} = \frac{\boxed{?}}{64}$$

\Rightarrow

and \Rightarrow

and \Rightarrow

and \Rightarrow

Skill 12.4 Writing a decimal number as a percent.

- Multiply the decimal number by 100, by moving the decimal point two places to the right.
 - Add the percent sign.
- Hint: Zeros can be added at the end of any decimal number: $0.4 = 0.4000$*

Q. Write 0.07 as a percent.

A. $0.07 = 0.\overbrace{07}^{2 \text{ zeros, 2 places to the right}} \times 100\%$
 $= 7\%$

a) Write 0.4 as a percent.

$0.4 = 0.\overbrace{40}^{\text{Add a zero}} \times 100\%$ =

b) Write 0.2 as a percent.

..... =

c) Write 0.1 as a percent.

..... =

d) Write 0.9 as a percent.

..... =

e) Write 0.7 as a percent.

..... =

f) Write 0.12 as a percent.

..... =

g) Write 0.55 as a percent.

..... =

h) Write 0.48 as a percent.

..... =

i) Write 0.29 as a percent.

..... =

j) Write 0.35 as a percent.

..... =

k) Write 0.04 as a percent.

..... =

l) Write 0.05 as a percent.

..... =

m) Write 0.02 as a percent.

..... =

n) Write 0.38 as a percent.

..... =

o) Write 0.4 as a percent.

..... =

p) Write 0.25 as a percent.

..... =

q) Write 0.125 as a percent.

..... =

r) Write 0.345 as a percent.

..... =

Skill 12.5 Writing a percent as a decimal number.

- Write the percent as a fraction out of 100.
 - Divide the numerator of the fraction by 100, by moving the decimal point two places to the left.
- Hints: *Fractions are divisions.*

*There is a decimal point and zeros which are not written, at the end of any whole number:
27 = 27.00*

Zeros can be used as place holders before any whole number: 27 = 0027.00

Q. Change 8.6% to a decimal.

$$\begin{aligned} \text{A. } 8.6\% &= \frac{8.6}{100} \\ &= 8.6 \div 100 \\ &= \overbrace{00}8.6 \div 100 \quad \text{2 zeros, 2 places to the left} \\ &= \mathbf{0.086} \end{aligned}$$

a) Change 5% to a decimal.

$$5\% = \frac{5}{100} = \overbrace{00}5.0 \div 100 = \boxed{0.05}$$

b) Change 2% to a decimal.

$$2\% = \boxed{}$$

c) Change 88% to a decimal.

$$= \boxed{}$$

d) Change 42% to a decimal.

$$= \boxed{}$$

e) Change 60% to a decimal.

$$= \boxed{}$$

f) Change 40% to a decimal.

$$= \boxed{}$$

g) Change 0.5% to a decimal.

$$= \boxed{}$$

h) Change 1.8% to a decimal.

$$= \boxed{}$$

i) In Mali 72% of people earn less than \$1 each day. Write this percent as a decimal.

$$= \boxed{}$$

j) The August 2007 unemployment figure was 5.7%. Write this percent as a decimal.

$$= \boxed{}$$

k) The percent of Americans between 12 and 17 who play video games is 97%. Write this percent as a decimal.

$$= \boxed{}$$

l) The Sun accounts for 99% of the mass of the solar system. Write this percent as a decimal.

$$= \boxed{}$$

m) The United States has approximately 5% of the world's population. Write this percent as a decimal.

$$= \boxed{}$$

n) In the USA in 2007 McDonald's restaurant business accounted for 2.4% of the total number of restaurants. Write this percent as a decimal.

$$= \boxed{}$$

Skill 12.6 Writing a decimal number as a fraction in simplest form.

- Write the decimal number as the numerator of the fraction.
- Ignore any zeros at the start the number.
- Use the place value of the last digit of the decimal number to determine the size of the denominator.

Example:

units	tenths	hundredths
0	.	0
0	.	4

= 4 hundredths = $\frac{4}{100}$

Write the 4 as the numerator

4 in hundredths place, denominator = 100

- Write the fraction in simplest form. This means to divide both the numerator and the denominator by the same number.

Hint: For the denominator, write 1 followed by a zero for each digit after the decimal point.

Example: $0.\underline{04} = \frac{4}{\underline{100}}$

Q. Write 0.6 as a fraction in simplest form.

A. $0.\underline{6} = \frac{6}{10}$

$= \frac{6 \div 2}{10 \div 2}$

$= \frac{3}{5}$

Write 6 as the numerator

1 zero for 1 decimal place

Simplify: $\div 2$

a) Write 0.9 as a fraction.

$0.9 = \textit{nine tenths}$ =

b) Write 0.11 as a fraction.

$0.11 = \textit{eleven hundredths}$ =

c) Write 0.3 as a fraction.

=

d) Write 0.1 as a fraction.

=

e) Write 0.06 as a fraction in simplest form.

=

f) Write 0.02 as a fraction in simplest form.

=

g) Write 0.5 as a fraction in simplest form.

=

h) Write 0.28 as a fraction in simplest form.

=

i) Write 0.15 as a fraction in simplest form.

=

j) Write 0.8 as a fraction in simplest form.

=

Skill 12.7 Writing a fraction as a terminating decimal.

When the denominator **is** a power of 10:

- Divide the numerator by the power of 10 by moving the decimal point to the left.

Example: $\frac{15}{100} = 15 \div 100$
 $= 015.0 \div 100$ *(2 zeros, 2 places to the left)*
 $= 0.15$

Hints: Fractions are just divisions.

There is a decimal point and zeros which are not written, at the end of any whole number:
 $27 = 27.00$

Zeros can be used as place holders before any whole number: $27 = 0027.00$

The number of zeros in the denominator shows the number of digits after the decimal point. $\frac{27}{100} = 0.27$

When the denominator **is not** a power of 10:

EITHER

- Multiply both the numerator and denominator by the same number to make the denominator a power of 10. (e.g. 10, 100 or 1000).

Example: $\frac{3}{4} = \frac{3 \times 25}{4 \times 25} = \frac{75}{100} = 0.75$ *(power of 10)*

OR

- Divide the numerator by the denominator.

Example: $\frac{3}{4} = 3 \div 4 = 3.00 \div 4 = 0.75$

$$\begin{array}{r} 0.75 \\ 4 \overline{) 3.00} \\ \underline{4} \\ 30 \\ \underline{28} \\ 20 \\ \underline{20} \\ 0 \end{array}$$

Q. Change $\frac{3}{5}$ to a decimal.

A. $\frac{3}{5} = \frac{3 \times 20}{5 \times 20}$ *OR*

A. $\frac{3}{5} = 3 \div 5$
 $= 3.0 \div 5$
 $= 0.6$

$= \frac{60}{100}$ *(Make denominator a power of 10)*
 $= 60 \div 100$
 $= 060.0 \div 100$ *(2 zeros, 2 places to the left)*
 $= 0.60 = 0.6$

$$\begin{array}{r} 0.6 \\ 5 \overline{) 3.0} \\ \underline{3} \\ 0 \end{array}$$

a) Change $\frac{3}{10}$ to a decimal.

$= \frac{3 \times 10}{10 \times 10} = \frac{30}{100}$

$= 030.0 \div 100 = \boxed{0.3}$

b) Change $\frac{7}{20}$ to a decimal.

$= \dots = \boxed{}$

c) Change $\frac{9}{25}$ to a decimal.

$= \dots = \boxed{}$

d) Change $\frac{1}{2}$ to a decimal.

$= \dots = \boxed{}$

e) Change $1\frac{2}{5}$ to a decimal.

$= \dots = \boxed{}$

f) Change $2\frac{3}{4}$ to a decimal.

$= \dots = \boxed{}$

g) In 2008 a quarter of the Australian wheat exports went to Indonesia. Write this fraction as a decimal.

$= \dots = \boxed{}$

h) Approximately 9 out of 10 Nigerians attend church regularly. Write this fraction as a decimal.

$= \dots = \boxed{}$

i) People can smell one-twentieth as well as a dog. Write this fraction as a decimal.

$= \dots = \boxed{}$

Skill 12.8 Writing a percent as a fraction in simplest form.

MMBlue 11 22 3 44
MMGreen 11 22 3 44

- Write the percent as a fraction with the denominator of 100.
 - Simplify the fraction by dividing both the numerator and the denominator by the same number.
- Hints: Percent means “per hundred” or “out of a hundred”.*

A percent is another way of writing a fraction out of one hundred.

Example: 25% is said “25 percent” and means 25 out of 100.

Q. U.S. accounts for 24% of the European Union exports. Write this percent as a fraction in simplest form.

$$\begin{aligned} \text{A. } 24\% &= \frac{24 \div 4}{100 \div 4} \quad \text{Simplify: } \div 4 \\ &= \frac{6}{25} \end{aligned}$$

a) Write 47% as a fraction.

$$47\% = \frac{47}{100}$$

b) Write 9% as a fraction.

$$= \frac{\quad}{\quad}$$

c) Write 15% as a fraction in simplest form.

$$15\% = \frac{15 \div 5}{100 \div 5} \quad \text{Simplify: } \div 5 = \frac{3}{20}$$

d) Write 30% as a fraction in simplest form.

$$= \frac{\quad}{\quad}$$

e) Write 4% as a fraction in simplest form.

$$= \frac{\quad}{\quad}$$

f) Write 6% as a fraction in simplest form.

$$= \frac{\quad}{\quad}$$

g) The common metal for medals is 84% copper. Write this percent as a fraction in simplest form.

$$= \frac{\quad}{\quad}$$

h) About 14 percent of the U.S. population moves houses every year. Write this percent as a fraction in simplest form.

$$= \frac{\quad}{\quad}$$

i) India is home to 40% of the world’s poor. Write this percent as a fraction in simplest form.

$$= \frac{\quad}{\quad}$$

j) In Belgium, 55% of government ministers are female. Write this percent as a fraction in simplest form.

$$= \frac{\quad}{\quad}$$

k) The average person’s left hand does 56% of the typing. Write this percent as a fraction in simplest form.

$$= \frac{\quad}{\quad}$$

l) The pupil of the eye expands up to 45% when a person looks at something pleasing. Write this percent as a fraction in simplest form.

$$= \frac{\quad}{\quad}$$

Skill 12.9 Writing a fraction as a percent.

MMBlue 1 1 2 2 3 4 4
MMGreen 1 1 2 2 3 4 4

EITHER

- Find the equivalent fraction which has a denominator of 100.
- The numerator of this fraction is the equivalent percent.

Example: $\frac{7}{10} \times \frac{10}{10} = \frac{70}{100} = 70\%$

$$\frac{P}{100} = P\%$$

OR

- Multiply the fraction by $\frac{100}{1}\%$

Example: $\frac{7}{10} = \frac{7}{10} \times \frac{100}{1}\%$ *Simplify: $\div 10$*
 $= 70\%$

$$\text{Fraction} \times \frac{100}{1}\% = \text{Percent}$$

Q. Change $\frac{11}{20}$ to a percent.

A. $\frac{11}{20} = \frac{11 \times 5}{20 \times 5}$
 $= \frac{55}{100}$
 $= 55\%$

OR A. $\frac{11}{20} = \frac{11}{20} \times \frac{100}{1}\%$ *Simplify: $\div 20$*
 $= 11 \times 5\%$
 $= 55\%$

a) Change $\frac{1}{10}$ to a percent.

$$= \frac{1 \times 10}{10 \times 10} = \frac{10}{100} = \boxed{10\%}$$

b) Change $\frac{9}{50}$ to a percent.

$$= \frac{\quad}{\quad} = \boxed{\quad}$$

c) Change $\frac{7}{25}$ to a percent.

$$= \frac{\quad}{\quad} = \boxed{\quad}$$

d) Change $\frac{86}{100}$ to a percent.

$$= \frac{\quad}{\quad} = \boxed{\quad}$$

e) Change $\frac{1}{2}$ to a percent.

$$= \frac{\quad}{\quad} = \boxed{\quad}$$

f) Change $\frac{2}{5}$ to a percent.

$$= \frac{\quad}{\quad} = \boxed{\quad}$$

g) Change $\frac{3}{5}$ to a percent.

$$= \frac{\quad}{\quad} = \boxed{\quad}$$

h) Change $\frac{3}{4}$ to a percent.

$$= \frac{\quad}{\quad} = \boxed{\quad}$$

i) Change $\frac{1}{3}$ to a percent.

$$= \frac{\quad}{\quad} = \boxed{\quad}$$

j) Change $\frac{13}{20}$ to a percent.

$$= \frac{\quad}{\quad} = \boxed{\quad}$$

k) Change $\frac{1}{100}$ to a percent.

$$= \frac{\quad}{\quad} = \boxed{\quad}$$

l) Change $\frac{2}{3}$ to a percent.

$$= \frac{\quad}{\quad} = \boxed{\quad}$$

Skill 12.10 Ordering decimal numbers.

- Line up the decimal numbers at their decimal points.
- Compare digits in the same places, starting from the left, until you find the smallest digit.
Hint: The number with the smallest digit will be the smallest number.
- Look for the second smallest number.
- Continue in this way until you find the largest number.

Q. Place in ascending order:
0.27, 0.07, 0.207, 0.702

		units	tenths	hundredths	thousandths
	U	.	T	H	Th
3rd	0	.	2	7	
smallest 1st	0	.	0	7	
2nd	0	.	2	0	7
largest 4th	0	.	7	0	2

A. 0.07, 0.207, 0.27, 0.702

Find the smallest digits.
Work from left to right.

Units: all 0

Tenths: $0 < 2 < 7$

so 0.07 is the smallest

0.702 is the largest

either 0.207 or 0.27 is the
2nd smallest

Hundredths: $0 < 7$

so 0.207 is the 2nd smallest

0.27 is the 3rd smallest

a) Place in descending order:
0.096, 0.69, 0.609, 0.09

<u>U</u>	<u>T</u>	<u>H</u>	<u>Th</u>	
0	0	9	6	
0	6	9		the largest number
0	6	0	9	
0	0	9		the smallest number

b) Place in ascending order:
0.047, 0.74, 0.407, 0.074

<u>U</u>	<u>T</u>	<u>H</u>	<u>Th</u>

c) Place in ascending order:
0.508, 0.08, 0.085, 0.58

d) Place in descending order:
0.135, 0.53, 0.105, 0.513

e) Place in ascending order:
0.807, 0.07, 0.87, 0.087, 0.708

f) Place in ascending order:
0.364, 0.063, 0.63, 0.34, 0.043

g) Place in descending order:
0.239, 0.209, 0.093, 0.302, 0.3

h) Place in ascending order:
0.156, 0.105, 0.51, 0.016, 0.065

Skill 12.11 Comparing and ordering fractions.

- Find the least common denominator of the fractions, which is the Least Common Multiple (LCM) of the denominators.
- Change the fractions to equivalent fractions with the least common denominator.
- Arrange the fractions in order of the numerators (the smallest fraction has the smallest numerator and so on).

$$\frac{1}{6} < \frac{3}{6} < \frac{5}{6}$$

Annotations: "smallest numerator = smallest fraction" points to the first fraction; "same denominator" points to the denominators.

Hint: If unsure which is the LCM of the denominators, use their product as the common denominator. When the smaller denominators divide evenly into the biggest denominator, this biggest number becomes the common denominator.

Q. Place in order from smallest to largest:

$$\frac{3}{5}, \frac{1}{2}, \frac{2}{3}$$

A. $\frac{1}{2}, \frac{3}{5}, \frac{2}{3}$

$$\frac{3}{5}, \frac{1}{2}, \frac{2}{3}$$

LCM of 2, 5 and 3 is $2 \times 5 \times 3 = 30$

$$\frac{3 \times 6}{5 \times 6} = \frac{18}{30}$$

$$\frac{1 \times 15}{2 \times 15} = \frac{15}{30}$$

$$\frac{2 \times 10}{3 \times 10} = \frac{20}{30}$$

$$\Rightarrow 15 < 18 < 20, \text{ so } \frac{15}{30} < \frac{18}{30} < \frac{20}{30}$$

$$\text{or } \frac{1}{2} < \frac{3}{5} < \frac{2}{3}$$

a) Which fraction has greater value?

$$\frac{3}{8} \text{ or } \frac{2}{5}$$

LCM of 8 and 5 is 40

$$\frac{3 \times 5}{8 \times 5} = \frac{15}{40}, \quad \frac{2 \times 8}{5 \times 8} = \frac{16}{40} \Rightarrow \frac{15}{40} < \frac{16}{40} \Rightarrow \frac{2}{5}$$

$$\boxed{\frac{2}{5}}$$

b) Which fraction has greater value?

$$\frac{5}{8} \text{ or } \frac{5}{11}$$

$$\dots\dots\dots \boxed{\phantom{\frac{5}{11}}}$$

c) Which fraction has greater value?

$$\frac{3}{5} \text{ or } \frac{7}{10}$$

$$\dots\dots\dots \boxed{\phantom{\frac{7}{10}}}$$

d) Which fraction has greater value?

$$\frac{4}{9} \text{ or } \frac{5}{12}$$

$$\dots\dots\dots \boxed{\phantom{\frac{5}{12}}}$$

e) Place in order from smallest to largest:

$$\frac{1}{2}, \frac{5}{8}, \frac{3}{5}$$

LCM of 2, 8 and 5 is $8 \times 5 = 40$

$$\frac{1 \times 20}{2 \times 20} = \frac{20}{40}, \quad \frac{5 \times 5}{8 \times 5} =$$

$$\dots\dots\dots \boxed{\phantom{\frac{20}{40} < \frac{5 \times 5}{8 \times 5} < \frac{3 \times 8}{5 \times 8}}}$$

f) Place in order from largest to smallest:

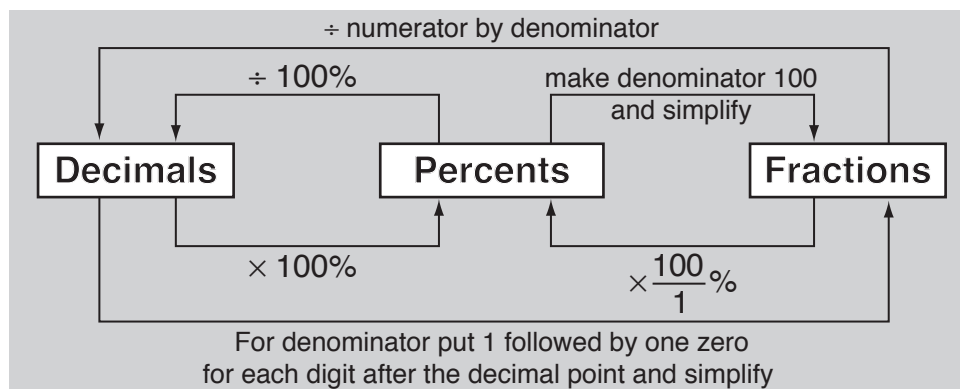
$$\frac{5}{6}, \frac{4}{5}, \frac{9}{10}$$

$$\dots\dots\dots \boxed{\phantom{\frac{5}{6} > \frac{4}{5} > \frac{9}{10}}}$$

Skill 12.12 Converting between decimals, fractions and percents (1).

MMBlue 1 1 2 2 3 3 4 4
MMGreen 1 1 2 2 3 3 4 4

- Convert between decimals, fractions and percents. (see skills 12.4 to 12.9, pages 79 to 84)



Q. Complete the table:

Decimal	Fraction	Percent
	$\frac{13}{50}$	

A.

$$\frac{13}{50} = \frac{13 \times 2}{50 \times 2} = \frac{26}{100}$$

$$= \overline{26} \div 100$$

$$= \mathbf{0.26}$$

Make denominator a power of 10

Decimal

$$\frac{13}{50} = \frac{13}{50} \times \frac{100^2}{1} \%$$

$$= 13 \times 2\%$$

$$= \mathbf{26\%}$$

Simplify: $\div 50$

Percent

Decimal	Fraction	Percent
0.26	$\frac{13}{50}$	26%

a) Complete the table:

Decimal	Fraction	Percent
0.05	$\frac{1}{20}$	5%

$$0.05 = \frac{5}{100} \xrightarrow{\text{Simplify: } \div 5} = \frac{1}{20}$$

$$0.05 = \overline{0.05} \times 100\% = 5\%$$

b) Complete the table:

Decimal	Fraction	Percent
		45%

c) Complete the table:

Decimal	Fraction	Percent
0.6		

d) Complete the table:

Decimal	Fraction	Percent
	$\frac{7}{20}$	

Skill 12.12 Converting between decimals, fractions and percents (2).

MMBlue 1 1 2 2 3 3 4 4
MMGreen 1 1 2 2 3 3 4 4

e) Complete the table:

Decimal	Fraction	Percent
0.07		

.....

.....

f) Complete the table:

Decimal	Fraction	Percent
		70%

.....

.....

g) Complete the table:

Decimal	Fraction	Percent
0.1		

.....

.....

h) Complete the table:

Decimal	Fraction	Percent
	$\frac{3}{10}$	

.....

.....

i) Complete the table:

Decimal	Fraction	Percent
0.4		

.....

.....

j) Complete the table:

Decimal	Fraction	Percent
		55%

.....

.....

k) Complete the table:

Decimal	Fraction	Percent
		90%

.....

.....

l) Complete the table:

Decimal	Fraction	Percent
	$\frac{17}{50}$	

.....

.....

Skill 12.13 Comparing decimals, fractions and percents (1).

MMBlue 11 22 33 44
MMGreen 11 22 33 44

- Convert the decimals, fractions and percents to the same form, by writing all as decimals, or as fractions, or as percents. (see skill 12.12, page 87)
- Compare the decimals, or the fractions, or the percents.
Hint: The most convenient form is the decimal form. Write the fractions and percents as decimals.

Q. Which is greater?

$\frac{1}{4}$ or 30%

A. $\frac{1}{4} = \frac{1 \times 25}{4 \times 25}$ *Write the fraction as a decimal*
 $= \frac{25}{100}$ *Make denominator a power of 10*
 $= \widehat{25} \div 100$
 $= 0.25$

Fraction

$30\% = \frac{30}{100}$ *Write the percent as a decimal*
 $= \widehat{30} \div 100$
 $= 0.3$

Percent

0.3 is greater than 0.25 , so $30\% > \frac{1}{4}$
30% is greater.

a) Which is greater?
0.07 or 70%

$70\% = \frac{70}{100} = \widehat{70} \div 100 = 0.7$

$0.7 > 0.07$

70%

b) Which is greater?
20% or 0.25

.....

c) Which is greater?
 $\frac{9}{10}$ or 9%

.....

d) Which is greater?
 $\frac{4}{5}$ or 45%

.....

e) Which is greater?
 $\frac{1}{10}$ or 1%

.....

f) Which is greater?
 $\frac{2}{5}$ or 25%

.....

g) Which is greater?
0.6 or $\frac{5}{6}$

.....

h) Which is greater?
0.4 or $\frac{1}{4}$

.....

Skill 12.13 Comparing decimals, fractions and percents (2).

MMBlue 1 1 2 2 3 3 4 4
MMGreen 1 1 2 2 3 3 4 4i) Which is greater?
 0.75 or 7.5%

.....

.....

.....

j) Which is greater?
 0.5 or 5%

.....

.....

.....

k) Which is greater?
 $\frac{3}{100}$ or 30%

.....

.....

.....

l) Which is greater?
 $\frac{3}{5}$ or 35%

.....

.....

.....

m) Which is greater?
 $\frac{8}{10}$ or 8%

.....

.....

.....

n) Which is greater?
 $\frac{1}{3}$ or 30%

.....

.....

.....

o) Which is greater?
 0.7 or $\frac{7}{8}$

.....

.....

.....

p) Which is greater?
 0.9 or $\frac{4}{5}$

.....

.....

.....

q) Which is greater?
 $\frac{3}{4}$ or 65%

.....

.....

.....

r) Which is greater?
 $\frac{1}{5}$ or 15%

.....

.....

.....

s) Which is greater?
 0.23 or $\frac{3}{20}$

.....

.....

.....

t) Which is greater?
 0.03 or $\frac{3}{10}$

.....

.....

.....