Year 6

Knowledge Organiser Decimals and Percentages

THIRD SPACE LEARNING

Key vocabulary

tenth, hundredth, thousandth, decimal, percentage, equivalent, ascending, descending, rounding

Rounding decimals

When rounding to the nearest whole number (in the 'ones' column), look at the digit in the tenths column. If this digit is 0 to 4, round to the previous 'one'; if this digit is 5 to 9, round to the next 'one'.

e.g. 4.56 rounded to the nearest whole number = 5.

When rounding to the nearest tenth, look at the digit in the hundredths column. If this digit is 0 to 4, round to the previous tenth; if this digit is 5 to 9, round to the next tenth.

e.g. 4.71 rounded to the nearest tenth = 4.7

When rounding to the nearest tenth, the number will have one decimal place, even if there are 0 tenths.

Fraction, decimal and percentage equivalence

Percentage = 'out of one hundred'

Percentage	Fraction	Decimal
1%	$\frac{1}{100}$	0.01
2%	$\frac{2}{100}$ or $\frac{1}{50}$	0.02
4%	$\frac{4}{100}$ or $\frac{1}{25}$	0.04
5%	$\frac{5}{100}$ or $\frac{1}{20}$	0.05
10%	$\frac{10}{100}$ or $\frac{1}{10}$	0.1
20%	$\frac{20}{100}$ or $\frac{1}{5}$	0.2
25%	$\frac{25}{100}$ or $\frac{1}{4}$	0.25
40%	$\frac{40}{100}$ or $\frac{2}{5}$	0.4
50%	$\frac{50}{100}$ or $\frac{1}{2}$	0.5
75%	$\frac{75}{100}$ or $\frac{3}{4}$	0.75
80%	$\frac{80}{100}$ or $\frac{4}{5}$	0.8
100%	$\frac{100}{100}$ or $\frac{1}{1}$	1.0

Dividing with decimal remainders

Follow the same process as short division. When there is a decimal point in the number being divided, put a decimal point in the answer, directly above where it is in the number being divided

e.g. 2.46 ÷ 6

$$6 \overline{)\, 2.^{2}4\ 6} = 0.41$$

If the number being divided is a whole number and the answer isn't a whole number, add 0s as decimal place value holders to the number being divided to calculate the decimal remainder.

e.g. 487 ÷ 4

$$4 \overline{)\, 4\ 8\ 7.^{3}0\ ^{2}0} = 121.75$$

Read and write numbers with decimals

Th	H	T	O	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$

When reading a number with decimals, we say each decimal digit separately.

Multiplying decimals

Follow the same process as short multiplication. When there is a decimal point in the number being multiplied, put a decimal point in the answer – line it up with the decimal point in the number being multiplied. e.g.

$$\begin{array}{r} 2.4\ 6 \\ \times\quad\ 3 \\ \hline 7.3\ 8 \\ 1\ 1 \end{array}$$

Multiply and divide numbers by 10, 100 and 1000

When multiplying a number by 10, 100 or 1,000, the digits move to the left. When dividing a number by 10, 100 or 1,000, the digits move to the right.

Th	H	T	O	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$

Multiplying

× 10	digits move LEFT **1** space
× 100	digits move LEFT **2** spaces
× 1000	digits move LEFT **3** spaces

Dividing

÷ 10	digits move RIGHT **1** space
÷ 100	digits move RIGHT **2** spaces
÷ 1000	digits move RIGHT **3** spaces

Order and compare decimals

Always look at the biggest place value first when ordering and comparing decimals. Using a place value chart when ordering and comparing decimals can be helpful, as shown below.

Ones	Tenths	Hundredths	Thousandths
3	2	3	4
3	1	6	
3	2	0	8
3	1	4	5

We can see here that in ascending order, the decimals are:
3.145, 3.16, 3.208, 3.234

A common misconception is that 3.4 < 3.22 because 4 < 22. However, 0.4 means 40 hundredths, and 40 hundredths is bigger than 22 hundredths. It may be easier to view it as 3.40 > 3.22.

Thousandths

One thousandth = $\frac{1}{1000}$ = 0.001

One hundredth ($\frac{1}{100}$) = ten thousandths ($\frac{10}{1000}$) = 0.01, or 0.010

One tenth ($\frac{1}{10}$) = one hundred thousandths ($\frac{100}{1000}$) = 0.1, or 0.100

Decimal fraction equivalents

A fraction is a division – for example, $\frac{3}{8}$ = 3 ÷ 8. We can therefore use short division to calculate decimal equivalents for fractions.

e.g. $\frac{3}{8}$ = 0.375

$$8 \overline{)\, 3.^{3}0^{6}\ 0^{4}\ 0} = 0.375$$