



YEAR 8
KNOWLEDGE ORGANISERS



BLOCK: DEVELOPING NUMBER

Number Sense

"MATHS OPENS DOORS"

YEAR 8 - DEVELOPING NUMBER... Number Sense

What do I need to be able to do?

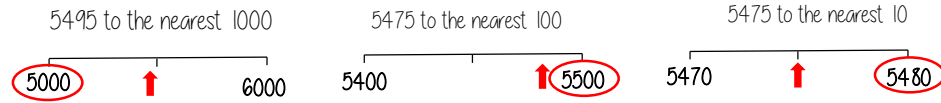
By the end of this unit you should be able to:

- Round numbers to powers of 10 and 1 sf
- Round numbers to any dp
- Estimate solutions
- Calculate using order of operations
- Calculate with money, units of measurement and time

Keywords

Balance: (1) in financial situations, balance means the amount of money in a bank account. (2) When both sides (of a scale or equation) have the same quantity or mass.
Decimal (number): a number that uses a decimal point followed by digits that show a value smaller than one.
Deposit: to put money into a bank account.
Metric: a decimal system of measurement based on 10, which is the most widely used system in the world. The base units of the metric system are gram (mass), metre (length) and litre (volume).
Overestimate: an estimate that is larger than the value it is estimating.
Round: to make a number simpler, but keeping its value close to what it was.
Significant figure: a digit that gives meaning to a number. The most significant digit (figure) in an integer is the digit on the left. The most significant digit in a decimal fraction is the first non-zero digit after the decimal point.
Underestimate: an estimate that is smaller than the value it is estimating.

Round to powers of 10 and 1 sig figure R If the number is halfway between we "round up"



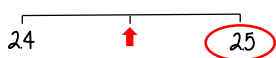
370 to 1 significant figure is 400
 37 to 1 significant figure is 40
 3.7 to 1 significant figure is 4
 0.37 to 1 significant figure is 0.4
 0.00037 to 1 significant figure is 0.0004

Round to the first non-zero number

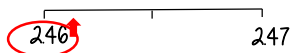
Round to decimal places

"To 1dp" - to one number after the decimal
 "To 2dp" - to two numbers after the decimal

2.46192 (to 1dp) - Is this closer to 2.4 or 2.5



2.46192 (to 2dp) - Is this closer to 2.46 or 2.47



Focus on the numbers after the decimal point

2.46192 This shows the number is closer to 2.5

2.46192 This shows the number is closer to 2.46

Estimate the calculation

Round to 1 significant figure to estimate

$$4.2 + 6.7 \approx 4 + 7 \approx 11$$

This is an **overestimate** because the 6.7 was rounded up more.

$$214 \times 3.1 \approx 20 \times 3 \approx 60$$

This is an **underestimate** because both values were rounded down.

It is good to check all calculations with an estimate in all aspects of maths - it helps you identify calculation errors.

Order of operations

Brackets Operations in brackets are calculated first

Other operations e.g powers, roots,

Multiplication/ Division

They are carried out in the order from left to right in the question

Addition/ Subtraction

They are carried out in the order from left to right in the question

Calculations with money

Debit - You have £0 or more in an account

Credit - You have less than £0 in an account



Using a calculator - ensure you are working in the correct units

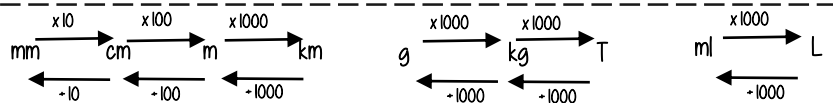
$$\begin{aligned} \text{£ } 1.30 + 50\text{p} &= 1.30 + 0.50 \text{ (in pence)} \\ &= 1.30 + 0.50 \text{ (in pounds)} \end{aligned}$$

Money calculations are to 2dp

$$\text{£ } 1 = 100\text{p}$$



Units are important: Useful Conversions



Metric measures of length

Kilo = 1000 x meter Centi = $\frac{1}{100}$ x meter

Milli = $\frac{1}{1000}$ x meter

Time and the calendar



1 Year - the amount of time it takes Earth to go around the sun **365** (and a quarter) days
Leap Year - 366 days (every 4 years)



12 Months - one year = 52 weeks
 31 days - Jan, March, May, July, Aug, Oct, Dec
 30 days - April, June, Sept, Nov
 28 days - Feb (29 leap year)

1 week - 7 days
 Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday

1 day - 24 hours
1 hour - 60 minutes
1 minute - 60 seconds

Use a number line for time calculations!

Units of weight/ capacity

Weight = g, kg, t
 Capacity (volume of liquid) = ml, L

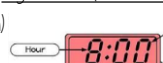
Analogue Clock



12-hour clock

- Use am (morning) and pm (afternoon)
- Only use hour times up to 12

Digital Clock (24-hour times)



24-hour clock

- 0-11 (morning hours)
- 12-23 (afternoon hours)