Key Vocabulary

Approximate	A rough value or to find a rough answer. E.g. 3,198 is approximately 3,000.
Round	To give a value "to the nearest …" E.g. "round 18 to the nearest 10". This is 20 as 18 is closer to 20 than it is to 10.
Decimal place	A digit after the decimal point. The first decimal place is the first digit after the decimal point.
Check	Verify that an answer is correct or of the right size.
Accurate / Accuracy	How correct an answer is. As an example, when you use a ruler to measure a line, you can be accurate to the nearest mm.
Operation	Something that can be done to a number. The four basic operations are +. -, x, ÷.
Inverse	An operation that does the opposite of another, e.g. the inverse of + is -.
Order of Magnitude	An indication of the largest element of a value, e.g. the biggest part of 2,407,984 is two million. The order of magnitude of this number is millions.
≈	This symbol is like an "=" but means "is roughly equal to".

Key facts / Diagrams

0.2608	2 is in the first decimal place
0.2608	6 is in the second decimal place
0.2608	0 is in the third decimal place
0.2608	8 is in the fourth decimal place

When rounding look at the "next digit" along. If it is 0, 1, 2, 3, or 4 the number stays as it is. If it is 5, 6, 7, 8, or 9 the number rounds up. Always round from the original number.

The usual approach to estimating is to round each number in the sum to and then do the calculation. This will give an approximate solution. E.g. an estimate for 488 + 523 would be 500 + 500 = 1,000.

When dividing we might choose to round to a nearby number that we know works.
e.g. 46 ÷ 6. Rounding to 50 ÷ 6 doesn't help, but 48 ÷ 6 works.
An estimation for 46 ÷ 6 is 48 ÷ 6 = 8

4,000,000 ÷ 2,000 =   400,000 ÷ 200 =
40,000 ÷ 20 =   4,000 ÷ 2 = 2,000

40 x 200 =
4 x 2 = 8 then add 3 zeroes for the zeroes in the question. 40 x 200 = 8,000

Common misconceptions

- When answering multiple rounding questions, sometimes people use a previous answer to get the next answer.
- 0.449 to 2 dec pl = 0.45. This number rounded to 1 dec pl = 0.5, BUT 0.449 rounded to one decimal place = 0.4 because the next digit is a 4.
- Don't just get rid of digits when rounding. 241 to the nearest hundred is 200 NOT 2.

Worked examples

Round 24,503 to the nearest thousand. 4 is in the thousands column, so check the next digit. 5 tells us to "round up" to 25,000.

Round 0.56298 to two decimal places. 6 is the second decimal place, so check the next digit. 2 means the number stays the same ("rounds down") and so it is 0.56.

Estimate 463 x 193. 500 x 200 = 100,000
Estimate 590,000 ÷ 2984. 600,000 ÷ 3,000.
This simplifies as follows 600,000 ÷ 3,000 = 60,000 ÷ 300 = 6,000 ÷ 30 = 600 ÷ 3 = 200
Estimate 38.97 ÷ 0.0513 = 40 ÷ 0.05 = 400 ÷ 0.5 = 4,000 ÷ 5 = 800
Estimate 421,960 ÷ 6.954 ≈ 420,000 ÷ 7 = 60,000
Careful with rounding.
0.99999 to 2 dec pl = 1.00
0.90245 to 2 sig fig = 0.90