

Name _____

Date _____

Unit 3 · Place value and rounding — revision sheet

Everything you need from every section. Read it before the end-of-unit test.

3.1 Multiplying and dividing by powers of 10

- $10^1 = 10$, $10^2 = 100$, $10^3 = 1000$, $10^4 = 10\,000$ — the **index** is the number of zeros.
- **Multiplying** by 10^n moves every digit **n places to the left**. The number gets bigger.
- **Dividing** by 10^n moves every digit **n places to the right**. The number gets smaller.
- It is the **digits** that move, not the decimal point — but moving the point the other way gives the same result, so either picture works.
- Fill any empty places with zeros: $4.5 \times 10^3 = 4500$, and $47 \div 10^3 = 0.047$.
- “Crossing off zeros” only works if the number has enough zeros to cross off, so it is safer to move the digits.
- Always sanity-check: should the answer be bigger or smaller than you started with?

Key words: power of 10 · index · place value · decimal point · digit

$$10^1 = 10$$

$$10^2 = 100$$

$$10^3 = 1000$$

$$10^6 = 1\,000\,000$$

$$3.7 \times 10^3 \rightarrow \text{digits move 3 left} \rightarrow 3700$$

$$0.39 \times 10^5 \rightarrow \text{digits move 5 left} \rightarrow 39\,000$$

$$80\,000 \div 10^4 \rightarrow \text{digits move 4 right} \rightarrow 8$$

3.2 Rounding

- The method is the **same for every degree of accuracy**.
- Find the digit in the rounding position, then look at the digit **immediately to its right**.
- If that digit is **5 or more**, increase the rounding digit by 1.
- If it is **less than 5**, leave the rounding digit as it is.
- Then drop everything after the rounding position.
- Rounding up can carry: 9.999 to 2 d.p. is 10.
- For a division, work out **one more decimal place** than you need, then round.
- Round once, from the original number — rounding in stages can give the wrong answer.

Key words: round · degree of accuracy · decimal place · significant figures

$$8.46 \div 7 = 1.2085714285714...$$

To 2 decimal places that is 1.21

Close enough for almost any purpose

4.27 to 1 d.p. → look at 7 → round up → 4.3

8.53 to 1 d.p. → look at 3 → leave it → 8.5

3.146 to 2 d.p. → 3.15

0.0752 to 2 d.p. → 0.08