

Name _____

Date _____

Unit 4 · Decimals — revision sheet

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

4.1 Ordering decimals

- Compare the **whole-number parts** first.
- If they are equal, compare the **tenths**; then the **hundredths**; then the **thousandths**.
- Work from the **left**, one place at a time — stop as soon as they differ.
- More digits does **not** mean bigger: $2.816 < 2.82$.
- Filling with zeros makes the columns line up: $4.6 = 4.60$, so $4.60 < 4.66$.
- A zero on the end never changes the value: $0.5 = 0.50 = 0.500$.
- Convert to the same unit before comparing measurements: $450 \text{ g} = 0.45 \text{ kg}$.

Key words: compare · order · decimal number · whole-number part · tenths · hundredths · thousandths

8.9, 14.639, 6.45

Whole-number parts: 8, 14, 6

In order: 6.45, 8.9, 14.639

2.82, 2.6, 2.816 — all have 2 units

Tenths: 8, 6, 8 — so 2.6 is smallest

Hundredths of the other two: 2 and 1

In order: 2.6, 2.816, 2.82

4.2 Adding and subtracting decimals

- In a written method, **line up the decimal points** — that lines up the place values.
- Fill any gaps with zeros: 10 becomes 10.00 before subtracting 4.83.
- **Mental method 1 — partition.** Add the whole-number parts and the decimal parts separately, then combine: $2.3 + 7.8 = (2 + 7) + (0.3 + 0.8) = 9 + 1.1 = 10.1$.
- **Mental method 2 — round and adjust.** $6.9 + 12.4 = 7 + 12.4 - 0.1 = 19.3$.
- For subtraction, round and adjust the other way: $13.3 - 5.8 = 13.3 - 6 + 0.2 = 7.5$.
- Decimal parts can carry into the units: $0.3 + 0.8 = 1.1$, not 0.11.
- Always estimate first — $2.3 + 7.8$ must be about 10.

Key words: decimal part · whole-number part · mental method · written method · partition

10.00

– 4.83

5.17

2.3 + 7.8

= (2 + 7) + (0.3 + 0.8)

= 9 + 1.1

4.3 Multiplying decimals

- **Step 1.** Do the multiplication **ignoring the decimal point**.
- **Step 2.** Count the decimal places in the **question**.
- **Step 3.** Put the same number of decimal places in the **answer**.
- 0.002×4 : $2 \times 4 = 8$, and the question has 3 decimal places, so the answer is 0.008.
- 30×0.06 : $30 \times 6 = 180$, and the question has 2 decimal places, so the answer is $1.80 = 1.8$.
- You can drop a zero at the **end** of the answer, but never one in the middle.
- Multiplying by a number **less than 1 makes the answer smaller**: $0.4 \times 0.7 = 0.28$.
- Estimate first to check the point is in the right place.

Key words: decimal place · product · estimate

0.002×4
 $2 \times 4 = 8$
 3 decimal places in the question
 So the answer is 0.008
 $30 \times 0.06 \rightarrow 0 + 2 = 2$ places
 $30 \times 6 = 180 \rightarrow 1.80$
 $4.76 \times 3.7 \rightarrow 2 + 1 = 3$ places

4.4 Dividing decimals

- Set the division out so the decimal point in the answer sits **directly above** the point in the question.
- Then divide exactly as you would with whole numbers.
- If there is a remainder, **add zeros after the decimal point** and carry on: $7 = 7.00$, so $7 \div 4 = 1.75$.
- Some divisions never stop, such as $2 \div 3 = 0.6666\ldots$ — those must be rounded.
- When an answer must be rounded, work to **one more decimal place** than you need, then round.
- $8.46 \div 7 = 1.208\ldots$, so to 2 decimal places the answer is 1.21.
- Dividing by a whole number greater than 1 always makes the answer smaller.

Key words: divide · remainder · degree of accuracy · decimal place

$2 \overline{) 8.4}$
 $8.4 \div 4 = 2.1$
 $7 \div 4$
 $7 = 7.00$
 $7.00 \div 4 = 1.75$
 $2 \div 3 = 0.666666\ldots$

4.5 Making decimal calculations easier

- A decimal can be rewritten as a **division**: $0.06 = 6 \div 100$.
- Then reorder the calculation: $0.06 \times 3500 = 6 \times (3500 \div 100) = 6 \times 35 = 210$.
- Multiplication and division may be done in **any order**, so choose the easy order.
- **Partition** a number: $1.5 \times 48 = 48 + 24 = 72$.
- **Round and compensate**: $8.2 \times 9 = 8.2 \times 10 - 8.2 = 73.8$.
- **Double and halve**: $2.5 \times 16 = 5 \times 8 = 40$. The product does not change.
- Learn the common ones: $0.5 = \frac{1}{2}$, $0.25 = \frac{1}{4}$, $0.75 = \frac{3}{4}$, $0.125 = \frac{1}{8}$, $0.1 = \div 10$.
- Dividing by a number less than 1 makes the answer **bigger**: $45 \div 0.5 = 90$.

Key words: equivalent fraction · place value · partitioning · compensate

$$\begin{aligned}
 &0.06 \times 3500 \\
 &= 6 \div 100 \times 3500 \\
 &= 6 \times (3500 \div 100) \\
 &= 6 \times 35 = 210 \\
 &0.5 = \frac{1}{2} \rightarrow \text{halve it} \\
 &0.25 = \frac{1}{4} \rightarrow \text{divide by 4} \\
 &0.75 = \frac{3}{4} \rightarrow \text{divide by 4, then } \times 3
 \end{aligned}$$