LESSON MAKER PRO

Units That Cancel

Convert measurements and keep their precision.

HIGH SCHOOL · CHE.1.1

CHE.1.1 "Use dimensional analysis (factor/label) and significant figures to convert units and solve problems."

NAME _____ DATE _____

FACTOR, CANCEL, ROUND

Multiply by a conversion fraction that equals 1. Put the unit you want to remove opposite the starting unit so it cancels. Round to the number of significant figures in the measured values; defined conversions and counted objects are exact.

WORKED EXAMPLE

Convert 2.40 days to hours. Use 1 day = 24 hours.

1. Write 2.40 days x (24 hours/1 day).
2. Cancel days, then multiply: 2.40 x 24 = 57.6 hours.
3. Keep three significant figures because 2.40 has three. The defined conversion does not limit them.

Answer: 57.6 hours

PRACTICE 6 problems

1 Convert 36.0 cm to m. Use 1 m = 100 cm. Report the correct number of significant figures.

ANSWER _____

2 Convert 0.0450 kg to g. Use 1 kg = 1000 g. Report the correct number of significant figures.

ANSWER _____

3 Convert 8.0 mL to L. Use 1 L = 1000 mL. Report the correct number of significant figures.

ANSWER _____

4 Convert 3.25 min to s. Use 1 min = 60 s. Report the correct number of significant figures.

ANSWER _____

5 A solution has a concentration of 0.60 g/mL. Convert it to g/L. Use 1 L = 1000 mL. Report the correct number of significant figures.

ANSWER _____

6 Convert 0.0250 km to cm. Use 1 km = 1000 m and 1 m = 100 cm. Report the correct number of significant figures.

ANSWER _____

APPLY IT Show your work

1 You fill 3 water bottles with 0.750 L each. How many milliliters of water do the bottles hold in all? Use 1 L = 1000 mL. Show your conversion and report the correct number of significant figures.

WORK SPACE

ANSWER _____

2 At a school event, each of 2 cans of soda contains 0.045 g of sodium. How many milligrams of sodium are in the two cans? Use 1 g = 1000 mg. Show your conversion and report the correct number of significant figures.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A drink label lists 0.240 g of sugar per 100. mL. Convert this concentration to mg/L. Use 1 g = 1000 mg and 1 L = 1000 mL. Show factors that cancel the units, then report the correct number of significant figures.

WORK SPACE AND ANSWER

Units That Cancel

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Convert 36.0 cm to m. Use 1 m = 100 cm. Report the correct number of significant figures.	**0.360 m**
2	Convert 0.0450 kg to g. Use 1 kg = 1000 g. Report the correct number of significant figures.	**45.0 g**
3	Convert 8.0 mL to L. Use 1 L = 1000 mL. Report the correct number of significant figures.	**0.0080 L**
4	Convert 3.25 min to s. Use 1 min = 60 s. Report the correct number of significant figures.	**195 s**
5	A solution has a concentration of 0.60 g/mL. Convert it to g/L. Use 1 L = 1000 mL. Report the correct number of significant figures.	**6.0×10^2 g/L**
6	Convert 0.0250 km to cm. Use 1 km = 1000 m and 1 m = 100 cm. Report the correct number of significant figures.	**2.50×10^3 cm**

PART 2 · APPLY IT

1. **2.25×10^3 mL** Multiply 3 x 0.750 L x (1000 mL/1 L). The bottle count is exact, so the answer keeps three significant figures.
2. **9.0×10^1 mg** Multiply 2 x 0.045 g x (1000 mg/1 g). The can count is exact, so the answer keeps two significant figures.

CHALLENGE

(0.240 g/100. mL) x (1000 mg/1 g) x (1000 mL/1 L) = 2.40×10^3 mg/L

Accept equivalent notation only when it clearly preserves the stated number of significant figures. Conversion relationships and counts in this worksheet are exact.