

ANSWER KEY

Worksheet answers

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High school · 28 questions. Each line gives the answer, then the one-line working. Round to 3 significant figures unless the answer is exact. Where asked, give scientific notation ($a \times 10^n$ with $1 \leq a < 10$).

A. All the prefixes

1 **$2.69 \times 10^{11} \mu\text{L}$** 1 kL = $10^9 \mu\text{L}$, so $269 \text{ kL} = 2.69 \times 10^{11} \mu\text{L}$ 2 **$8.23 \times 10^5 \text{ ng}$** 1 $\mu\text{g} = 10^3 \text{ ng}$, so $823 \mu\text{g} = 8.23 \times 10^5 \text{ ng}$ 3 **$4.87 \times 10^{-6} \mu\text{m}$** 1 pm = $10^{-6} \mu\text{m}$, so $4.87 \text{ pm} = 4.87 \times 10^{-6} \mu\text{m}$ 4 **$1.15 \times 10^3 \text{ nL}$** 1 $\mu\text{L} = 10^3 \text{ nL}$, so $1.15 \mu\text{L} = 1.15 \times 10^3 \text{ nL}$ 5 **$4.07 \times 10^{-4} \text{ ML}$** 1 L = 10^{-6} ML , so $407 \text{ L} = 4.07 \times 10^{-4} \text{ ML}$

B. Scientific notation

6 **700,000** $7 \times 10^5 = 700,000$ 7 **$2.5 \times 10^0 \text{ Mm}$** 1 m = 10^{-6} Mm , so $2,500,000 \text{ m} = 2.5 \times 10^0 \text{ Mm}$ 8 **4×10^5** $400,000 = 4 \times 10^5$ 9 **$1.4 \times 10^0 \text{ nm}$** 1 $\mu\text{m} = 10^3 \text{ nm}$, so $0.0014 \mu\text{m} = 1.4 \times 10^0 \text{ nm}$

C. Long conversions

10 **1,890 mL** $0.5 \text{ gal} \times 3.785411784 \text{ L/1 gal} \times 1000 \text{ mL/1 L} \approx 1,890 \text{ mL}$ 11 **12,700 μm** $0.5 \text{ in} \times 2.54 \text{ cm/1 in} \times 10000 \mu\text{m/1 cm} = 12,700 \mu\text{m}$ 12 **946 mL** $1 \text{ qt} \times 2 \text{ pt/1 qt} \times 473.176473 \text{ mL/1 pt} \approx 946 \text{ mL}$ 13 **1,810,000 mg** $4 \text{ lb} \times 0.45359237 \text{ kg/1 lb} \times 1000000 \text{ mg/1 kg} \approx 1,810,000 \text{ mg}$ 14 **183 cm** $2 \text{ yd} \times 0.9144 \text{ m/1 yd} \times 100 \text{ cm/1 m} \approx 183 \text{ cm}$

D. Area and volume

15 **1,640 mL** $100 \text{ in}^3 \times 16.387064 \text{ mL/1 in}^3 \approx 1,640 \text{ mL}$ 16 **28.3 L** $1 \text{ ft}^3 \times 28.316846592 \text{ L/1 ft}^3 \approx 28.3 \text{ L}$ 17 **25.9 km²** $10 \text{ mi}^2 \times 2.589988110336 \text{ km}^2/\text{mi}^2 \approx 25.9 \text{ km}^2$ 18 **1,890 cm³** $0.5 \text{ gal} \times 3785.411784 \text{ cm}^3/\text{gal} \approx 1,890 \text{ cm}^3$ 19 **2.02 ha** $5 \text{ acre} \times 0.40468564224 \text{ ha/1 acre} \approx 2.02 \text{ ha}$

E. Rates and density

20 **10 m/s** $36 \text{ km/h} \times 1000 \text{ m/1 km} \times 1 \text{ h/3600 s} = 10 \text{ m/s}$ 21 **1.03 kg/cm²** $14.7 \text{ lb/in}^2 \times 0.45359237 \text{ kg/1 lb} \times 1 \text{ in}^2/6.4516 \text{ cm}^2 \approx 1.03 \text{ kg/cm}^2$ 22 **7.5 L/h** $125 \text{ mL/min} \times 1 \text{ L/1000 mL} \times 60 \text{ min/1 h} = 7.5 \text{ L/h}$ 23 **26.8 m/s** $60 \text{ mi/h} \times 1.609344 \text{ km/1 mi} \times 1000 \text{ m/1 km} \times 1 \text{ h/3600 s} \approx 26.8 \text{ m/s}$ 24 **49.7 mi/h** $80 \text{ km/h} \times 1 \text{ mi/1.609344 km} \approx 49.7 \text{ mi/h}$ 25 **37.9 L/min** $10 \text{ gal/min} \times 3.785411784 \text{ L/1 gal} \approx 37.9 \text{ L/min}$

F. Word problems

26 **2 L** $500 \text{ mL/h} \times 4 \text{ h} = 2,000 \text{ mL} = 2 \text{ L}$ 27 **2,700 kg/m³** $2.7 \text{ g/cm}^3 \times 1 \text{ kg/1000 g} \times (100 \text{ cm/1 m})^3 = 2,700 \text{ kg/m}^3$ 28 **$1.44 \times 10^8 \text{ mm}^2$** $12 \text{ m} \times 12 \text{ m} = 144 \text{ m}^2; \times (1000 \text{ mm/1 m})^2 = 1.44 \times 10^8 \text{ mm}^2$