Quiz 1 Practice—Fundamentals of Chemistry

Scientific notation: Put the following in correct scientific notation

1. 56 000 000 000 5.6×10^{10}
2. 0.000 98 9.8×10^{-4}
3. 0.198 765 1.98765×10^{-1}

Scientific notation: Answer each in correct scientific notation:

4. $(7.6 \times 10^{-11}) (6.1 \times 10^{9})$ 4.6×10^{-1}

5. $\dfrac{3.58 x 10^{-12}}{6.0 x 10^{8}}$ 6.0×10^{-21}

6. $8.9 \times 10^{7} - 2.1 \times 10^{5}$ 8.9×10^{7}

7. $3.29 \times 10^{4} + 1.21 \times 10^{5}$ 1.54×10^{5}

8. $(9.8 \times 10^{-34}) (7 \times 10^{14})$ 7×10^{-19}

9. $\dfrac{5.6 x 10^{8}}{3.19 x 10^{12}}$ 1.8×10^{-4}

Significant figures: How many sig figs are in the following numbers:

10. 608 cm 3
11. 200 kg 1
12. 0.007 00 m 3
13. 310.000 000 pg 9

Sig figs: Answer the following calculations with the correct sig figs:

14. 4.5m * 3.00 m 14 m^2
15. 8.700cm/3.2 cm 2.7
16. 7.80 m + 4 m + 78.2 m 90 m
17. 0.64 mm – 4.3 mm - 0.200 mm -3.9 mm

Conversions:

18. How many micrograms are in 45.6 kilograms? 4.56×10^{10} µg

19. How many meters are in 1050 cm? 10.5 m
20. Convert 35.38 mL to L. .03538 L
21. How many inches are in 4.5×10^{-4} miles? (5280 ft = 1 mi) 29 in
22. If I drive at 45 mi/hr, how many minutes will it take me to drive 60 miles? 80 min
23. How many seconds are in one century? (1 century = 100 years, 1 year = 365 days) 3×10^9 s

Measurement:

Practice measuring different objects with:

24. Graduated cylinders Measurements made with 100 mL, 50 mL grad cyl should have 1 decimal place. Measurements made with 10 mL grad cyl should have 2 decimal places; Measurements made with 50 mL and 100 mL grad cyl should have 1 decimal place; one estimated digit past what you know
25. Rulers Measurements should have 2 decimal places, one estimated digit past what you know
26. Triple beam balance 2 decimal places in mass, one estimated digit past what you know

Precision, accuracy, and observations

27. Describe the picture at right qualitatively and quantitatively.
28. Three different students collected the following data:

	Student A	Student B	Student C
Trial 1	1.54 g/cm^3	1.40 g/cm^3	1.70 g/cm^3
Trial 2	1.60 g/cm^3	1.68 g/cm^3	1.69 g/cm^3
Trial 3	1.57 g/cm^3	1.45 g/cm^3	1.71 g/cm^3
Average	1.57 g/cm^3	1.51 g/cm^3	1.70 g/cm^3

The accepted value should be 1.59 g/cm^3. Discuss each student's accuracy and precision.

Student C's measurements are most precise because they are closest to one another. Student A's measurements are most accurate, because their average is closest to the accepted value. Based only on the average, student B's measurements look fairly accurate, but the individual measurements for each trial are not accurate or precise.