

Unit 1: Introduction to Chemistry

Name: _____
Text Questions from Corwin

1. Why is chemistry sometimes referred to as the central science?

1.1

2. What did Thales suggest?

3. What did Empedocles speculate about all substances?

4. For how long did Aristotle's influence dominate our understanding of nature?

5. What did Boyle state about scientific speculation?

6. A. What is the scientific method?

B. What does the scientific method require?

7. What are the three possible "fates" of a hypothesis?

8. A. What is a theory?

B. What does a natural law state?

9. A. What question can we ask to distinguish between a theory and a law?

B. List the possible answers to the question above AND the conclusion you can draw from each answer.

1.2

10. Alchemists believed in the existence of a magic potion that would allegedly do what two things?

11. Who is considered the founder of modern chemistry?

12. Define chemistry.

13. What is the difference between organic and inorganic chemistry?

14. What is the difference between qualitative and quantitative analysis?

1.3

15. Perception is often affected by what?

16. We should NOT confine our concept of chemistry to what?

2.1

17. What is a measurement?

18. A. Why is an exact measurement impossible?

B. In other words, every measurement has _____.

19. As precision increases, uncertainty _____; as precision decreases, uncertainty _____.

20. What is the difference between mass and weight?

21. WHAT is constant, no matter where it is measured?

22. What is meant by the term volume?

2.2

23. In a measurement, what do significant digits express?

24. A. What will we assume about all place-holder zeroes?

B. How many significant digits do each of the following have? 0.0250 g 50.00 mL 1000 s

25. A. The rules of significant digits do NOT apply to what?

B. The rules DO apply to what?

2.3

26. When do we often generate nonsignificant digits?

2.4

27. A. When adding or subtracting measurements, the answer is limited by...

B. In adding 5 g + 5.0 g + 5.00 g, the correct answer is _____ because...

2.5

28. A. When multiplying or dividing measurements, the answer is limited by...

B. In multiplying 5.15 cm X 2.3 cm, the correct answer is _____ because...

2.6

29. What is a power of 10?

2.7

30. In scientific notation, where is the decimal placed?

31. What does a... positive exponent indicate? ...negative exponent indicate?

2.8

32. What is an equivalent relationship?

33. Following the pattern shown in the text, write the two unit factors (or conversion factors) for the equivalent relationship 1 meter = 3.28 feet.

2.9

34. What is Step 3 in applying the unit analysis method?

2.10

35. Write the equation used to calculate a percent.

3.1

36. Copy down the information from Table 3.1. Physical Quantity Basic Unit Symbol

37. What does the metric system use prefixes to do?

38. The SI system is _____ to the metric system, but SI is more _____ and _____.

Unit 1 Practice Problems

How many significant digits are in each of the following measurements?

- | | |
|------------|----------------|
| A. 4.55 g | E. 800 mL |
| B. 0.130 L | F. 12.433 mg |
| C. 5600 s | G. 0.006536 cm |
| D. 35 kg | H. 6012.0 g |

Perform the following calculations. Include the correct number of significant digits and units on your answer.

- I. $35 \text{ L} + 13.4 \text{ L} + 205 \text{ L} + 64.13 \text{ L} =$
- J. $3.24 \text{ cm} (1.7 \text{ cm}) (23.09 \text{ cm}) =$
- K. $250 \text{ m} / 10.6 \text{ s} =$
- L. $165.7 \text{ feet} - 9.35 \text{ feet} =$

Write the following in proper scientific notation. NOTE: The number before the "x 10" should have the same number of significant digits as the quantity given.

- | | |
|--------------|-----------------|
| M. 10,200 kg | P. 0.000385 mol |
| N. 0.08060 L | Q. 130 kPa |
| O. 1250 cm | R. 0.000600 N |

Write the following in standard notation. Again, maintain the given number of significant digits.

- | | |
|----------------------------------|------------------------------------|
| S. $1.02 \times 10^5 \text{ mg}$ | V. $2 \times 10^{-2} \text{ atm}$ |
| T. $9.602 \times 10^7 \text{ m}$ | W. $5.20 \times 10^{-3} \text{ M}$ |
| U. $7.25 \times 10^3 \text{ s}$ | X. $6.004 \times 10^4 \text{ m}^2$ |

Perform the following conversions, using ONE of your conversion factors from Question 33 above for each. Your answer should have the same number of significant digits as the given quantity. Show your work.

- Y. ? meters = 43.5 feet
- Z. ? feet = 1600 meters