



Chemistry Connections to Our Changing World

Key

Worksheet on Significant Digits

Determine the number of significant digits in each of the following measurements;

- | | | | | | |
|-----|--------------------------|----------|-----|---------------|----------|
| 1. | 5.432 g | <u>4</u> | 11. | 40.319 g | <u>5</u> |
| 2. | 146 cm ³ | <u>3</u> | 12. | 3.284 000 cm | <u>7</u> |
| 3. | 0.189 kg | <u>3</u> | 13. | 429.03 g | <u>5</u> |
| 4. | 2 873.0 cm ³ | <u>5</u> | 14. | 99.9 mL | <u>3</u> |
| 5. | 0.000 235 g | <u>3</u> | 15. | 1.404 000 L | <u>7</u> |
| 6. | 2500 cm | <u>2</u> | 16. | 2 500.0 g | <u>5</u> |
| 7. | 48.571 93 m ³ | <u>7</u> | 17. | 3058 m | <u>4</u> |
| 8. | 300 000 240. km | <u>9</u> | 18. | 0.002 300 mg | <u>4</u> |
| 9. | 7.500 mg | <u>4</u> | 19. | 450 003.400 L | <u>9</u> |
| 10. | 1 003 L | <u>4</u> | 20. | 1.000 g | <u>4</u> |

Add or subtract the following measurements as indicated. Then round off the answer to the proper number of digits.

- | | | | | |
|-----|---|-----------------|---|------------------|
| 20. | 12 cm + 0.031 cm + 7.969 cm = | <u>20</u> | = | <u>20. cm</u> |
| 21. | 3.419 g + 3.912 g + 7.0518 g + 0.000 13 g = | <u>14.38243</u> | = | <u>14.383 g</u> |
| 22. | 0.085 cm + 0.062 cm + 0.14 cm = | <u>0.287</u> | = | <u>0.29 cm</u> |
| 23. | 143.0 cm + 289.25 cm + 7.051 8 cm = | <u>439.3018</u> | = | <u>439.3 cm</u> |
| 24. | 30.5 g + 16.82 g + 41.07 g + 85.219 g = | <u>173.609</u> | = | <u>173.6 g</u> |
| 25. | 29.49 cm + 83.46 cm + 107.05 cm + 26.617 cm = | <u>246.617</u> | = | <u>246.62 cm</u> |
| 26. | 0.065 3 g + 0.085 38 g + 0.076 54 g + 0.043 2 g = | <u>0.27042</u> | = | <u>0.2704 g</u> |
| 27. | 63.489 mL + 126.2 mL + 68.85 mL + 12.05 mL = | <u>270.589</u> | = | <u>270.6 mL</u> |
| 28. | 41.025 cm - 23.28 cm = | <u>17.745</u> | = | <u>17.75 cm</u> |
| 29. | 289 g - 43.7 g = | <u>245.3</u> | = | <u>245 g</u> |
| 30. | 145.63 mL - 28.9 mL = | <u>116.73</u> | = | <u>116.7 mL</u> |
| 31. | 62.47 g - 39.9 g = | <u>22.57</u> | = | <u>22.6 g</u> |
| 32. | 40.008 mL - 29.094 1 mL = | <u>10.914</u> | = | <u>10.914 mL</u> |
| 33. | 13.05 cm + 2.2 cm = | <u>15.25</u> | = | <u>15.3 cm</u> |
| 34. | 14 600 km + 325 km = | <u>14925</u> | = | <u>14900 km</u> |
| 35. | 55.47 g - 24.6 g = | <u>30.87</u> | = | <u>30.9 g</u> |

Multiply or divide as directed. Then round off your answer to the proper number of significant digits. Remember to include the proper unit of the answer.

36. $2.89 \text{ cm} \times 4.01 \text{ cm} = \underline{11.5889} = \underline{11.6 \text{ cm}}$
37. $3.08 \text{ m} \times 1.2 \text{ m} = \underline{3.696} = \underline{3.7 \text{ m}}$
38. $20.8 \text{ dm} \times 123.1 \text{ dm} = \underline{2560.48} = \underline{2560 \text{ dm}}$
39. $5.0 \text{ cm} \times 5 \text{ cm} = \underline{25} = \underline{30 \text{ cm}}$
40. $17.3 \text{ cm} \times 6.2 \text{ cm} = \underline{107.26} = \underline{110 \text{ cm}}$
41. $5.00 \text{ mm} \times 7.3216 \text{ mm} = \underline{36.608} = \underline{36.6 \text{ mm}}$
42. $5 \text{ cm} \times 5 \text{ cm} = \underline{25} = \underline{30 \text{ cm}}$
43. $5.0 \text{ cm} \times 5.0 \text{ cm} = \underline{25} = \underline{25 \text{ cm}}$
44. $150.0 \text{ m} \times 4.00 \text{ m} = \underline{600.} = \underline{600. \text{ m}}$
45. $8.071 \text{ cm}^2 \div 4.216 \text{ cm} = \underline{1.91437} = \underline{1.914 \text{ cm}}$
46. $4.23 \text{ m}^2 \div 18.941 \text{ m} = \underline{0.22332} = \underline{0.223 \text{ m}}$
47. $0.057 \text{ mL} \times \frac{760 \text{ mm}}{740 \text{ mm}} \times \frac{273 \text{ K}}{250 \text{ K}} = \underline{0.063926} = \underline{0.064 \text{ mL}}$
48. $142.0 \text{ mL} \times \frac{745 \text{ mm}}{785 \text{ mm}} \times \frac{300.0 \text{ K}}{295 \text{ K}} = \underline{137.0484} = \underline{137 \text{ mL}}$

49. The density of copper is 8.96 g/cm^3 . If a rectangular sheet of copper is 10.3 cm wide, 46.1 cm long, and 0.14 cm thick, what is the mass of the copper?

$$10.3 \frac{\text{cm}}{\text{cm}} \times 46.1 \frac{\text{cm}}{\text{cm}} \times 0.14 \frac{\text{cm}}{\text{cm}} \times \frac{8.96 \text{ g}}{1 \text{ cm}^3} = 595.6267 \text{ g}$$

596g

50. Chloroform is a liquid with a sticky sweet odour that was once used as a surgical anesthetic. If the density of chloroform is 1.49 g/mL , what is the volume of 25 g of chloroform?

$$25 \text{ g Chloro} \times \frac{1 \text{ mL}}{1.49 \text{ g}} = 16.778 \text{ mL}$$

17 mL

51. A brick used in the construction of pottery kilns is 11.0 cm wide, 6.0 cm tall, and 22.7 cm long. The brick has a mass of 2950 g. What is the density of the brick?

$$\frac{2950 \text{ g}}{(11.0 \text{ cm} \times 6.0 \text{ cm} \times 22.7 \text{ cm})} = 1.9690 \frac{\text{g}}{\text{cm}^3}$$

$\frac{2.0 \text{ g}}{\text{cm}^3}$

52. A friend shows you a gold ring and asks you to analyze it. You find its mass to be 58.21 g and its volume to be 3.64 cm^3 .

(a) Calculate the density of the ring.

$$\frac{58.21 \text{ g}}{3.64 \text{ cm}^3} = 15.99$$

$\frac{16.0 \text{ g}}{\text{cm}^3}$

(b) Is it really pure gold? Why or why not? (Hint: look on page 35 of your text)

No, density of pure gold is $\frac{19.3 \text{ g}}{\text{cm}^3}$. It must be an alloy.