

- 1a. The method that scientists use to explain nature is called?
 - 1b. An initial, tentative explanation of nature is called?
 - 1c. A thoroughly tested and validated explanation of nature is called?
 - 1d. When a thoroughly tested and validated explanation of nature can be measured or explained by a mathematical relationship, it is called what?
 - 1e. Which branch of chemistry studies compounds containing carbon?
 - 1f. Which branch of chemistry studies compounds that do not contain carbon?
 - 1g. Biochemistry is the study of which systems?
 - 1h. Chemistry (or chemists) study what?
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- 2a. What are the parts (or components) of a measurement?
 - 2b. What is the metric symbol for the unit of length?
 - 2c. What is a significant digit?
 - 2d. What is an exact number?
 - 2e. Mass and weight can be used interchangeably in sciences (true or false)?
 - 2f. Give an example of lab equipment that can measure a volume of liquid?
 - 2g. Which of these measurements has the greatest precision: 1.1g, 1.02g, 1g, 10g, 100g?
 - 2h. Which of these measurements has the greatest uncertainty: 1.1g, 1.02g, 1g, 10g, 100g?
 - 2i. Which thermometer has the greatest precision: oven thermometer $\pm 5^{\circ}\text{C}$, body temperature thermometer $\pm 0.1^{\circ}\text{C}$, outdoor thermometer $\pm 1^{\circ}\text{C}$?
 - 2j. Which thermometer has the greatest uncertainty: oven thermometer $\pm 5^{\circ}\text{C}$, body temperature thermometer $\pm 0.1^{\circ}\text{C}$, outdoor thermometer $\pm 1^{\circ}\text{C}$?
 - 2k. Which thermometer has the greatest accuracy: oven thermometer $\pm 5^{\circ}\text{C}$, body temperature thermometer $\pm 0.1^{\circ}\text{C}$, outdoor thermometer $\pm 1^{\circ}\text{C}$?
 - 2l. Numbers in a properly recorded measurement are called?

- 2m. How many significant digits are in this mass measurement: 500g?
- 2n. How many significant digits are in this volume measurement: 48.00mL?
- 2o. How many significant digits are in this length measurement: 0.05cm?
- 2p. How many significant digits are in this length measurement: 0.050mm?
- 2q. What is the uncertainty (or precision) of this length measurement: 0.050mm?
- 2r. What is the uncertainty (or precision) of this mass measurement: 500g?
- 2s. What is the uncertainty (or precision) in the number: 1 dollar 25 cents?
- 2t. The method to get rid of nonsignificant digits from calculations is called?
- 2u. (true or false) One rule of rounding is, "If a calculated answer has lots of digits, report the answer to one or two significant digits so that it looks right."
- 2v. Round this calculated answer to three significant digits: 9.9967g/cm^3
- 2w. Add 3.3333g to 3.333g to 3g and report the answer to the correct number of significant digits and units.
- 2x. Calculate $10.000\text{g} - 0.1\text{g}$ and report the answer to the correct number of significant digits and units.
- 2y. Calculate $40.0\text{g} / 4\text{cm}^3$ and report the answer to the correct units and number of significant digits.
- 2z. Report this number in scientific notation as an ordinary number: 1.23×10^8 .
- 2A. Report this number in scientific notation as an ordinary number: 1.23×10^{-8} .
- 2B. Report this ordinary number in scientific notation: 123000
- 2C. Report this ordinary number in scientific notation: 0.00012300
- 2D. Convert 3.4 cups to ounces using $1\text{ cup} = 8\text{ oz}$.
- 2E. Convert 36 hours to days.
- 2F. Convert 1.2 miles to feet using $1\text{ mile} = 5280\text{ft}$.
- 2G. A sample is 35% iron and contains 35g of iron. Calculate the mass of the sample.

2H. A sample is 35% nickel and contains 35g of nickel. Calculate the mass for the sample that is not made of nickel

2I. A sample contains 24.0g of silver and 10.5g of gold. What is the percent silver in the sample.

2J. A sample is 35% nickel and contains 65g of material that is not nickel. Calculate the mass of nickel in the sample.

3a. Give the metric abbreviation for nanoseconds.

3b. Convert 355nm to km.

3c. Convert 3.2Mm to mm

3d) Convert 87.2 inches to meters (given 1 inch=2.54cm)

3e) Convert 76.2kg to pounds (given 1kg = 2.204pounds)

3f) Convert 46 miles/hour into m/s (given 1 mile=1.61km)

3g) Calculate the volume of a rectangular solid measuring 45.2cm by 35.1cm by 0.5mm.

3h) Convert 45in³ into cm³ (given 1 inch=2.54cm)

3i) Polonium metal has a density of 9.30g/mL. What volume of water would be displaced by 23.1g of polonium?

3j) A metal sample has a mass of 46.2g, and the volume of water displaced by the metal sample is 5.00mL. What is the density of the sample in g/mL?

3k) A metal sample with a density of 9.30g/mL displaces 15.0mL of water. What is the mass of the sample in g?

3l) Convert 32°F to °C

3m) Convert 100°C to °F

3n) Convert 298K to °C

3o) Define heat

3p) Define specific heat

Chapter 4 is a Study Guide – Research answers in book, online notes or class notes

- 4a) Give the properties of a solid, liquid, and gas in terms of volume, shape, compressibility and energy.
- 4b) Provide the names for the phase changes of matter from solid to liquid to gas, and for the names for the phase changes in the reverse direction.
- 4c) Provide the names for the phase changes of matter between solid and gas.
- 4d) Give an example of a homogenous mixture
- 4e) Give an example of a heterogeneous mixture
- 4f) Give names for the two types of pure substances
- 4g) Give an example of a pure substance
- 4h) Provide the name or atomic mass of an element given its symbol or atomic number
- 4i) Provide the symbol of an element given its name or atomic number
- 4j) Describe the physical properties of metals and nonmetals
- 4k) Describe the chemical properties of metals and nonmetals
- 4l) Be able to find metals, nonmetals, semimetals and state of matter of elements using the periodic table.
- 4m) Be able to write chemical formulas from atomic composition: 4 carbon atoms, 10 hydrogen atoms, 1 oxygen atom
- 4n) Be able to write atomic composition from chemical formulas: $\text{HC}(\text{OH})_2\text{CH}(\text{OH})_2$
- 4o) Describe and differentiate between physical and chemical processes and changes
- 4p) Describe the types of physical evidence for chemical change