

General Science Mid-Term Exam Study Guide

Chapters 1 and 2

- A. hypothesis
- B. experimental group, control group
- C. matter
- D. mass
- E. volume
- F. density
- G. solid
- H. liquid
- I. gas
- J. melting point
- K. freezing point
- L. boiling point
- M. evaporation
- N. condensation
- O. solute, solvent
- P. saturated solution
- Q. physical change
- R. chemical change
- S. combustion

1. Be able to describe the steps in the scientific method.
2. Know the units used to measure mass, volume, and density.
3. Know how to calculate density using the following formula:

$$D = \frac{m}{V}$$

4. Know how to convert between Celsius and Fahrenheit temperature scales using the following formulas:

$$^{\circ}\text{F} = \frac{9}{5}^{\circ}\text{C} + 32 \quad \quad \quad ^{\circ}\text{C} = \left(^{\circ}\text{F} - 32\right) \frac{5}{9}$$

5. Be able to describe examples of evaporation and condensation.
6. Be able to name 2 compounds.
7. Be able to describe an example of a physical change, and be able to describe an example of a chemical change.

Chapters 3 and 4

- A. nucleus (of an atom)
- B. protons, neutrons, electrons
- C. element
- D. atomic number
- E. atomic mass (mass number)
- F. isotopes
- G. compound
- H. covalent bond
- I. single bond, double bond, triple bond
- J. molecule
- K. ionic bond
- L. ion
- M. reactants, products
- N. malleable

1. Be able to describe the structure of an atom.
2. Be able to recognize how many elements and how many atoms of each element there are in a compound.
3. Be able to draw the electron arrangements of individual atoms, and know what makes atoms stable.
4. Be able to draw the electron arrangements of molecules (covalent elements and compounds).
5. Be able to explain the difference between covalent and ionic bonding.
6. Be able to draw a diagram illustrating the formation of an ionic compound.
7. Be able to balance chemical equations and label the reactants and products.
8. Be able to describe properties of metals, nonmetals, and metalloids.
9. Be able to name a metal, a nonmetal, and a metalloid.
10. Be able to name a noble gas, a halogen, and an alkali metal.
11. Be able to explain why carbon is such a significant element.

Chapter 5

- A. exothermic reaction
- B. endothermic reaction
- C. oxidation
- D. reduction
- E. catalyst
- F. synthesis reactions
- G. decomposition reactions
- H. single-displacement reactions
- I. double-displacement reactions
- J. acid
- K. base
- L. neutralization
- M. pH scale

1. Be able to identify exothermic and endothermic reactions.
2. Be able to determine whether an atom or ion has undergone oxidation or reduction.
3. Be able to describe how each of the following factors affect the rates of reactions:
 - a. temperature
 - b. amounts of reactants and products
 - c. size and surface area of reactants
 - d. the presence of a catalyst
4. Be able to write the general form of each of the following types of reactions: synthesis, decomposition, single-displacement, and double-displacement.
5. Be able to name an example of an acid, and name an example of a base.
6. Be able to explain how the products of a neutralization reaction are formed.
7. Be able to identify the acid, base, and salt in a neutralization reaction.
8. Know the range of the pH scale, know where acids and bases are on the scale, and be able to determine relative strengths based on pH values.

Pollution

- A. fossil fuels
- B. smog
- C. acid rain
- D. ozone layer
- E. pesticides
- F. refuse
- G. landfill
- H. incineration
- I. conservation

1. Know what the main source of air pollution is.
2. Name 3 chemicals released in the incomplete burning of fossil fuels.
3. Explain how smog is formed. Be specific!
4. Explain how acid rain is formed. Be specific!
5. Name 3 sources of water pollution.
6. Be able to name 3 disposable products that you use regularly.
7. Describe 2 ways in which acid rain affects living things.
8. Explain what CO does in our body and how it may harm living things.
9. Describe the risks associated with decreased ozone protection.
10. Describe 3 ways in which you can reduce pollution.

Study Guide: Renewable Energy Sources

1. Know the definitions of the following terms:

- A. renewable energy sources
- B. biomass
- C. hydropower
- D. geothermal energy
- E. wind power
- F. solar power
- G. biogas
- H. biofuels
- I. wind farms
- J. photovoltaic (PV) devices, solar cells

2. Describe how the use of renewable energy sources is generally better for the environment than the use of fossil fuels.

3. Describe the 2 main ways biomass can be used as an energy source.

4. Describe a positive aspect and a negative aspect of using biomass.

5. Describe a positive aspect and a negative aspect of using hydropower.

6. Describe a positive aspect and a negative aspect of using wind power.

7. Describe a positive aspect and a negative aspect of using solar power.

Chapter 7

- A. speed
- B. velocity
- C. acceleration
- D. force
- E. inertia
- F. friction
- G. mass
- H. gravity
- I. weight
- J. centripetal force

1. Know the units used to measure the following:

- | | |
|-------------|-----------------|
| A. speed | E. acceleration |
| B. distance | F. force |
| C. time | G. mass |
| D. velocity | H. weight |

2. Be able to calculate speed, distance, and time using the following formula:

$$S = \frac{d}{t}$$

3. Be able to calculate average acceleration using the following formula:

$$a = \frac{V_f - V_i}{t}$$

4. Be able to explain Newton's 3 laws of motion, and describe examples illustrating each one.

5. Be able to calculate mass, force, and acceleration using the following formula:

$$F = ma$$

6. Be able to calculate weight on Earth and on the moon using the following formulas:

$$wt_E = m \times 9.8 \qquad wt_{moon} = \frac{wt_E}{6}$$