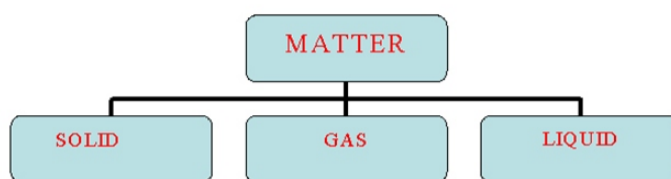


**Science 9**  
Unit 2: Chemical Reactions  
Worksheet 3: Chemical and Physical Properties



**Matter:** anything that occupies space and has mass.



**Physical Properties:** are characteristics of matter that are often observed or measured.

**Qualitative properties** are properties that can be described but not measured.

**Quantitative properties** are characteristics that can be measured numerically.

Physical Properties	Description
Qualitative	
State	Solid, liquid, gas
Colour	Colour
Malleability	Ability to be bent or beaten into sheets
Ductility	Ability to be drawn into wires
Texture	Appearance and feel of the surface
Magnetism	Tendency to be attracted to a magnet
Lustre	Degree to which the material reflects light
Quantitative	
Solubility	Ability to dissolve in water
Conductivity	Ability to conduct electricity or heat
Viscosity	Resistance to flow
Density	Ratio of a material's mass to its volume
Melting point	Temperature of melting/freezing
Boiling point	Temperature of boiling/condensing

**Chemical properties** characteristics that describe a substance's ability to react chemically with other substances to form new products.

Chemical Property	Description
Reactivity	Degree to which the substance combines chemically with other substances (water, acid, other substances)
Combustibility	Degree to which the substance burns (reacts with air or pure oxygen)
Toxicity	Degree to which the substance reacts in the body to produce harmful substances

## PART A: MULTIPLE CHOICE

- Which of the following is NOT a chemical property?
  - reactivity with oxygen
  - malleability
  - flammability
  - reactivity with acid
- Which of the following is NOT a physical property of matter?
  - ductility
  - color
  - thermal conductivity
  - reactivity to water
- A favorable chemical property of iron is its
  - malleability.
  - strength.
  - high melting point.
  - nonreactivity with oil and gasoline.
- You are given two samples and are told that one is plastic and the other is wax. If you had to distinguish between the two using ONLY chemical properties, you could
  - hit the samples with a hammer.
  - burn the samples.
  - determine the densities of the samples.
  - All of the above
- Color, odor, mass, and volume are \_\_\_\_ of an object.
  - chemical properties
  - physical properties
  - stationary properties
  - inertial properties
- Flammability, solubility, and reactivity are \_\_\_\_ of a substance.
  - chemical properties
  - physical properties
  - stationary properties
  - gravitational properties
- Being able to burn wood is an example of wood's
  - soluble properties.
  - physical properties.
  - chemical properties.
  - ductile properties.
- An old car's bumper that was coated with chromium does not rust because chromium is
  - malleable.
  - ductile.
  - not reactive with oxygen.
  - reactive with oxygen.

9. Metals are MALLEABLE. What does this mean?
- (A) You can melt metals
  - (B) You can pound metals into a sheet without them breaking
  - (C) Metals will break easily
  - (D) Metals are heavy
10. Metals are ductile. What does this mean?
- (A) Metals can be pounded into a sheet without breaking.
  - (B) Metals can be stretched into a wire without breaking.
  - (C) Metals are heavy
  - (D) Metals are more dense than air
11. "Paper is white." This is an example of WHAT PROPERTY?
- (A) physical
  - (B) chemical
  - (C) personal
  - (D) real estate
12. Paper is flammable (can burn)." This is an example of WHAT PROPERTY?
- (A) physical
  - (B) chemical
  - (C) personal
  - (D) real estate
13. "Water cannot burn." This is an example of WHAT PROPERTY?
- (A) physical
  - (B) chemical
  - (C) personal
  - (D) real estate
14. An example of a chemical property is:
- (A) density
  - (B) mass
  - (C) Combustibility
  - (D) solubility

**PART B : WRITTEN RESPONSE**

1. Classify the following as chemical or physical properties: **[6]**
- (a) Cotton balls are soft.  
\_\_\_\_\_
  - (b) Water boils at 100°C.  
\_\_\_\_\_
  - (c) Diamonds can be used to cut glass.  
\_\_\_\_\_
  - (d) Sugar dissolves in water.  
\_\_\_\_\_
  - (e) Propane is a gas.  
\_\_\_\_\_
  - (f) Propane burns in air.  
\_\_\_\_\_

2. How did you decide whether the properties listed in question #1 were chemical or physical? [2]

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3. Water and gasoline are both clear liquids at room temperature. Describe one physical property and one chemical property that might be used to distinguish between them. [3]

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