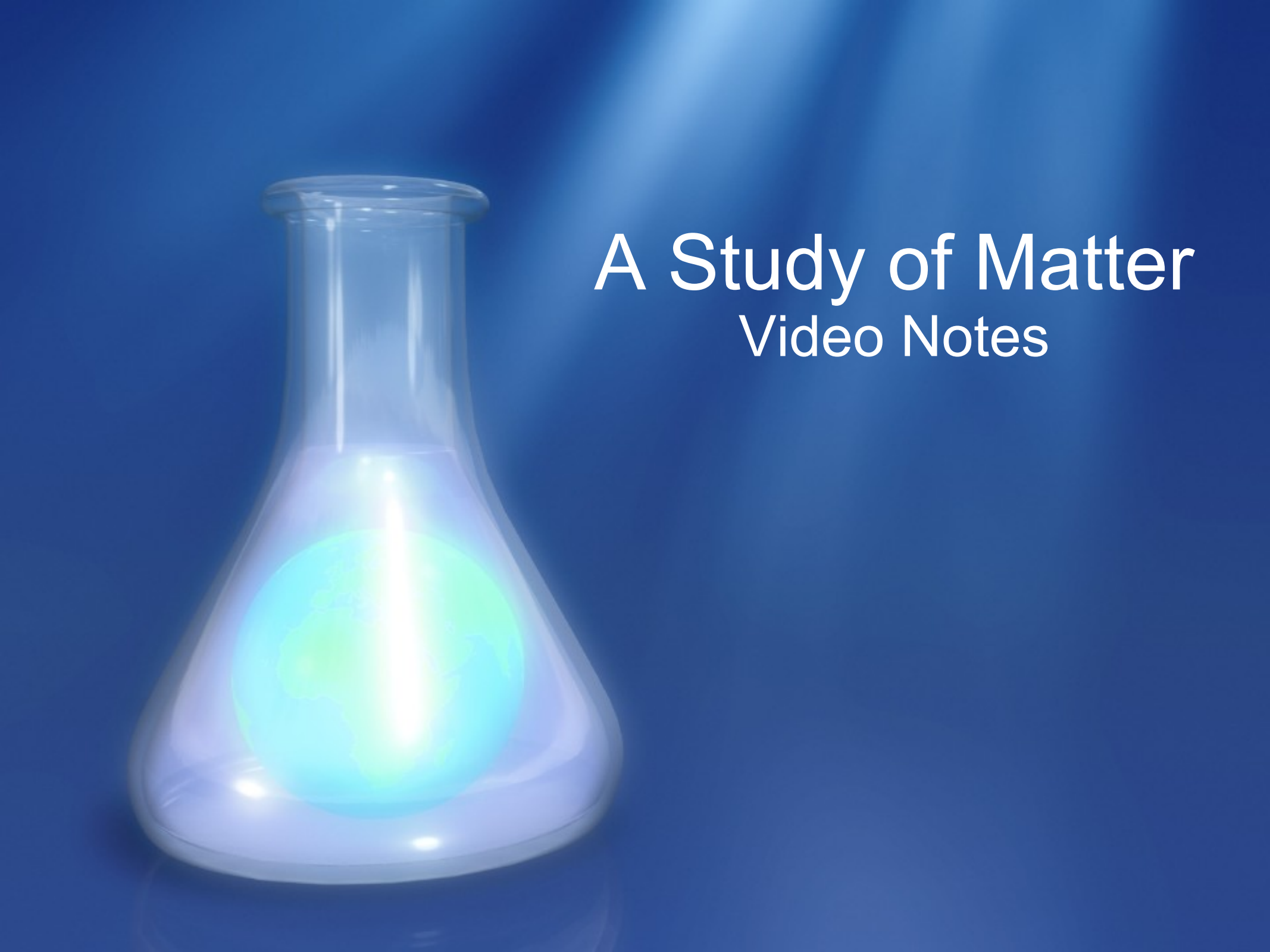
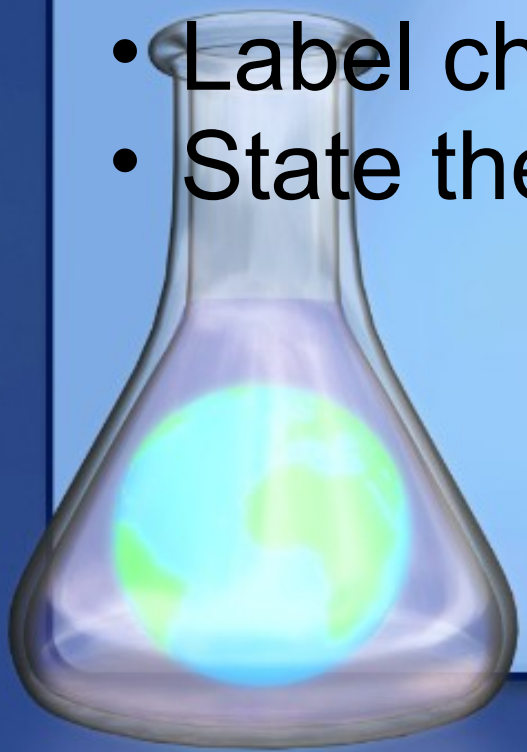


A Study of Matter

Video Notes

In this lesson you will:

- Define physical property, chemical property and chemical change.
- Describe the phases of matter.
- Label properties as physical or chemical.
- Label changes as physical or chemical.
- State the Law of Conservation of Mass.



Physical properties

- Can be observed without chemically changing matter.
- We do not have to perform a chemical experiment to observe physical properties.

Physical properties

- Malleability- how easy a metal's shape can be changed.
- Density- the amount of matter in a given volume
- Color
- Shape
- Texture

Chemical Properties

- Describe how a substance interacts with other substances.
- Need to perform experiments to observe chemical properties.

Chemical Properties

- Reactivity- interact with other substances (corrosion of metals is an example)
- Combustibility-if it will burn
- Flammability-will ignite easily and burn vigorously.

Physical vs Chemical properties

Chemical Properties	Physical Properties
Reactivity	Malleability
Combustibility	Density
Flammability	Color
Acidity	Texture
Ability to rust	Solubility (able to mix without changing substance)
	Mass
	Phases of matter

Phases of Matter

- Solid, liquid, or gas

Solids

- Definite shape
- Definite volume
- Particles packed closely together

Liquid

- Indefinite shape
- Definite volume
- Particles have room to move although they are relatively close together

Gases

- Indefinite shape
- Indefinite volume
- Fill whatever container they occupy
- Particles are far apart and have a lot of room to move

Physical Change

- No change in identity of the substance.

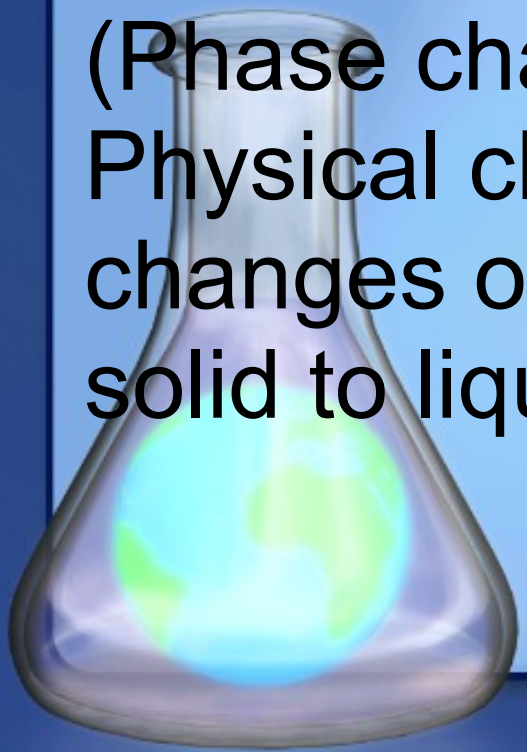
Chemical Change

- One or more new substances are produced

Changes

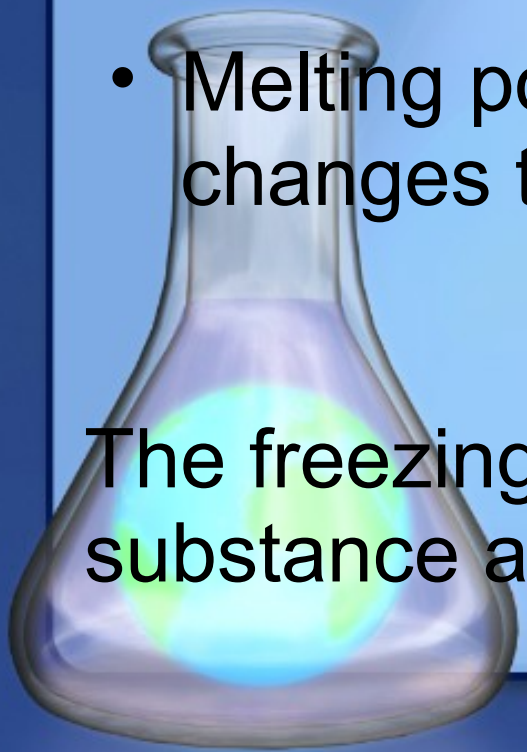
- Ripping paper- P
- Crushing aspirin- P
- Melting ice cube- P

(Phase changes are a special type of Physical change where no chemical changes occur but the state changes from solid to liquid to gas.)



Phase changes

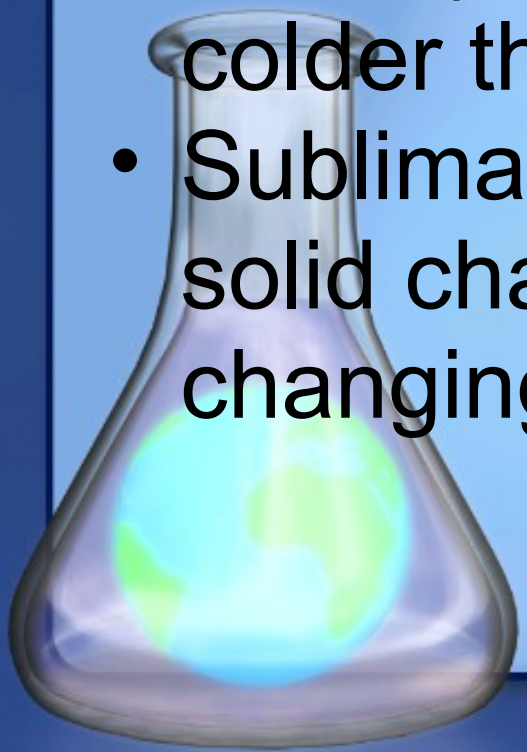
- Are physical changes
- Freezing point is the temperature where liquid changes to solid
- Melting point is the temperature where a solid changes to a liquid.



The freezing point and the melting point for a substance are the exact same!!

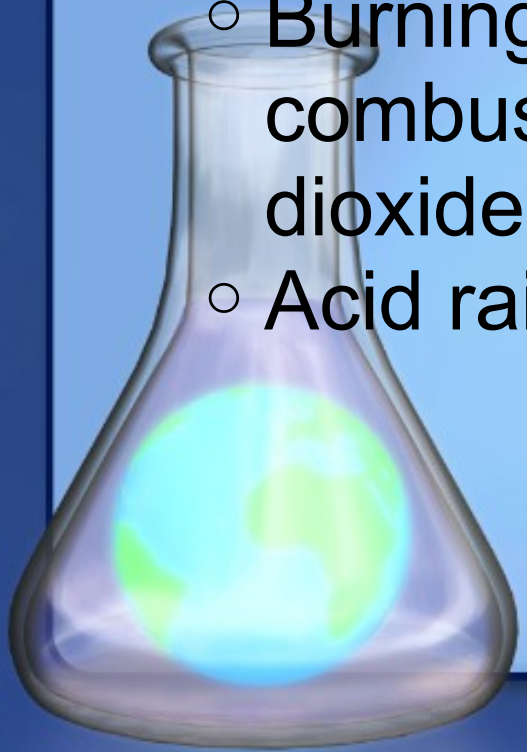
Phase changes

- Boiling point- liquid turns to a gas (water to water vapor)
- Condensation- where a gas turns to a liquid (the sweating on a glass that is colder than it's environment)
- Sublimation point- temperature at which a solid changes directly to a gas without first changing into a liquid. (dry ice)



Examples of changes

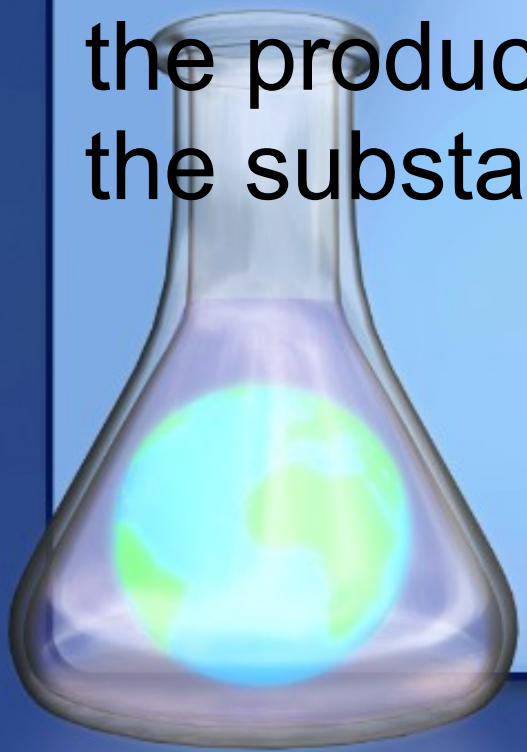
- Physical
  - Tearing, crushing, phase changes
- Chemical
  - Combustion, acid rain
  - Burning gas in cars is converted by combustion to carbon monoxide, carbon dioxide, water vapor, etc.
  - Acid rain is created by burning in factories



Law of conservation of mass

Mass cannot be created or destroyed

The mass of the substances will be the same before and after the reaction, even if the product of the reaction is different from the substance you started with.



Chemistry Quiz

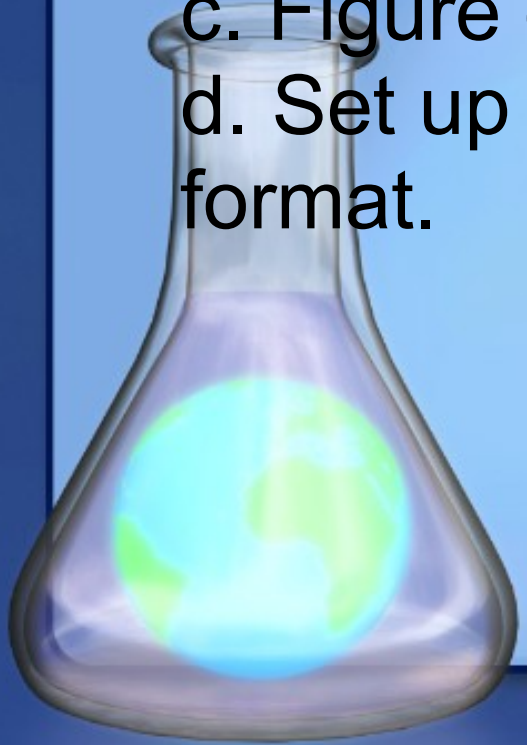
CR1. The instrument used to measure mass is the …

- A. graduated cylinder
- B. ruler
- C. balance
- D. stopwatch

Chemistry Quiz

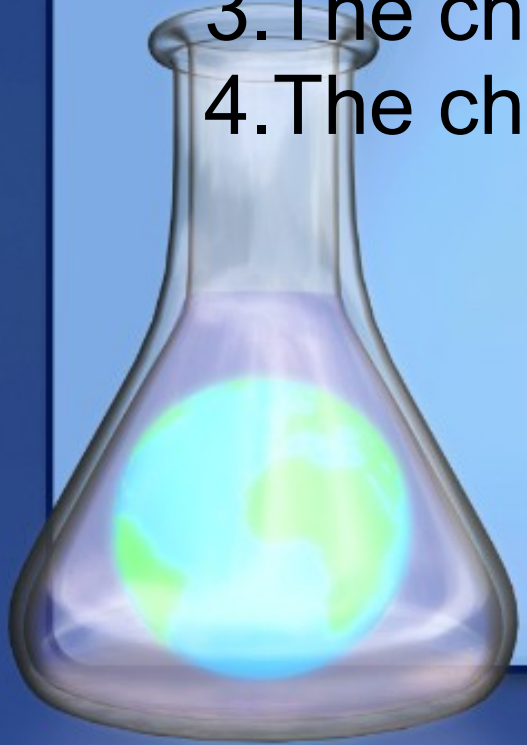
CR2. What is the first thing you do in any conversion question?

a. Figure out which conversion facts you need
b. Punch numbers into the calculator
c. Figure out if you need to multiply or divide
d. Set up the problem in the question mark format.



Chemistry Quiz

1. Which of the following is NOT a physical property of the a wooden chair?
    1. The chair is blue
    2. The chair is made of wood
    3. The chair will burn
    4. The chair has four legs



Chemistry Quiz

2. A solid has a _____ shape and a _____ volume.

1. definite, definite
– Definite, indefinite
– Indefinite, definite
– Indefinite, indefinite

Chemistry Quiz

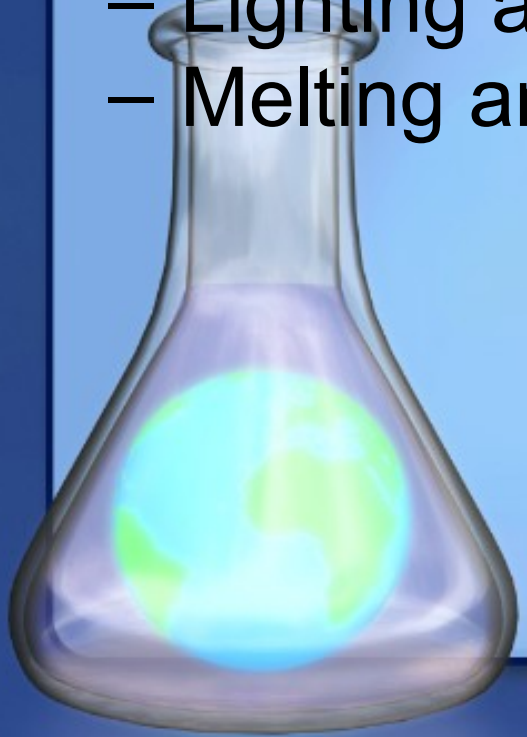
3. What is it called when a solid turns directly into a gas?

1. Melting
– Boiling
– Freezing
– sublimation

Chemistry Quiz

4. Which of the following would be classified as a chemical change?

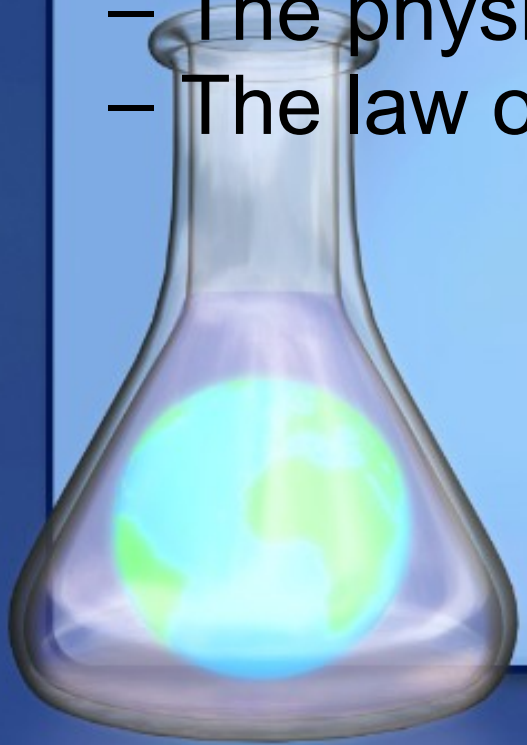
1. Getting a haircut
– Painting a picture
– Lighting a campfire
– Melting an ice cube



Chemistry Quiz

5. Which of the following states that matter cannot be created or destroyed?

1. The matter law
– The law of conservation of mass
– The physical change law
– The law of chemical changes



Chemistry Quiz Answers

CR1—c
CR2—d
1—c
2—a
3—d
4—c
5—b