Matter: Properties and Change

Study Guide

Matter**:** Anything that has mass and takes up space. Everything around us is made of matter, even the air we breathe.

# Name the **3 States of Matter** and at least **3 properties for each**:

1. Solid
   1. Definite shape
   2. Definite volume
   3. Molecules are close together and vibrate slowly
2. Liquid
   1. NOT a definite shape
   2. Definite volume
   3. Molecules are further apart and vibrate more quickly
   4. Wet substance
3. Gas
   1. NOT a definite shape (spreads)
   2. NOT a definite volume (can’t be measured)
   3. Molecules are more spread out and move very quickly

Water Cycle

**Write how the following stages relate to changing stages of matter. Are you adding heat or taking it away?**

1. Evaporation: Changing from a liquid to a gas by adding heat.
2. Condensation:

**Define the following:**

1. Precipitation: Rain, snow, sleet, or hail.
2. Runoff: Water running off of land into a body of water such as an ocean.
3. Transpiration: The loss of water through a plant’s leaves or evaporation of water from a plant.

**Draw a diagram of the water cycle and label the main parts.**

How are a solution and a mixture different? Give at least one example of each.

A mixture can be easily separated (using filter paper) and a solution cannot be easily separated.

Mixture: Sand and water, salad, Chex Mix

Solution: Soda, salt and water

\*If something dissolves, it is a solution.

Give an example that proves this statement: *The sum of the parts equals the whole.*

Ex: If you take apart a bicycle and weigh the parts individually, the parts will add up to the weight of the whole bicycle.

Ex: sand (4 grams) + water (5 grams) = sandy water (9 grams)

Describe the main difference between mass and weight.

Weight depends on gravity, whereas mass is constant (always the same).

**Define the following and give an example for each**

Qualitative Observation: An observation made using your 5 senses.

Ex: red rose

Quantitative Observation: An observation made using numbers and data.

Ex: There were 5 elephants

Quantitative or Qualitative? Write the answer on the line

1. The candy tastes sour Qualitative
2. A pencil is 8 inches long Quantitative
3. The honey smells sweet Qualitative
4. The temperature outside is 55 degrees Fahrenheit Quantitative
5. The leaves feel very soft Qualitative

**Write the characteristics for each type of change below.**

|  |  |
| --- | --- |
| Physical Change | Chemical Change |
| • A change is size, shape, texture or state of matter.  • Can be changed back relatively easily  • A mixture | • Burning, fire  • A new state of matter is formed  • Cannot be changed back |

\*Some solutions are physical changes and some are chemical changes; it depends.

**Physical or chemical change? Write the answer on the line**

1. Butter melting physical change- Change in the state of matter
2. Wood rotting chemical change- cannot be changed back
3. Paper ripping physical change- Change in shape/size
4. Burning paper chemical change- A new substance is formed (ash)
5. A nail rusting chemical change-A new substance is formed (rust)
6. Mixing sugar with water physical change- No new state of matter is formed (still just sugar and water)
7. Slicing potatoes physical change- Change in size and shape
8. Melting cheese physical change- Change in state of matter
9. Burning sugar chemical change- A new substance is formed (burnt part)