

Cross-Cutting Concepts and Core Ideas of Chemistry

To help you support your explanations and arguments of phenomena

Cross-Cutting Concepts: Help to explain phenomena from any branch of science

Systems

1. A system is the matter you are choosing to look at during an investigation. Everything else is the surroundings. The universe consists of the system and its surroundings.
2. The matter in a system is made of atoms that have mass, occupy space, and are arranged in specific patterns.
3. Scale, quantities, and proportions help to define your system.

Patterns

1. Patterns are things you notice that repeat. They can be used as evidence for an argument, to make predictions, or to classify things.
2. All systems go through periods of stability and change. Some systems change quickly while others change slowly. Some systems go through repetitive cycles of change. Equilibrium represents a condition of stability where factors of a system balance each other out.

Causality

1. Cause and effect tells how and why something happens. It forms the premise of an explanation.
2. The shape, arrangement, and structure of a sample of matter determine its properties and ability to perform certain tasks or functions.
3. Matter cycles. It can change appearance and form, but never appears from nowhere or disappears into nothing. The total number of each type of atom remains constant after a physical or chemical change.
4. Energy flows. It is transferred when any kind of change happens and is often seen as movement, sound, light, or temperature changes. Energy flows when heating, working, or radiating takes place. Energy can be stored and converted between various forms as it flows, but it tends to become more spread out in the universe as it moves. Energy never appears from nowhere or disappears into nothing because the total amount of energy in the universe doesn't change.
5. Forces are a push or pull from interactions that occur between different pieces of matter. Most common phenomena can be connected to electromagnetic forces and/or gravitational forces.

Core Ideas of Chemistry: Help to explain phenomena that are related to Chemistry

Composition of Matter

- 1.
- 2.
- 3.
- 4.

Attractions in Matter

1.

2.

3.

Changes in Matter

1.

2.

3.

4.

5.