

6th Grade Science Key Concepts

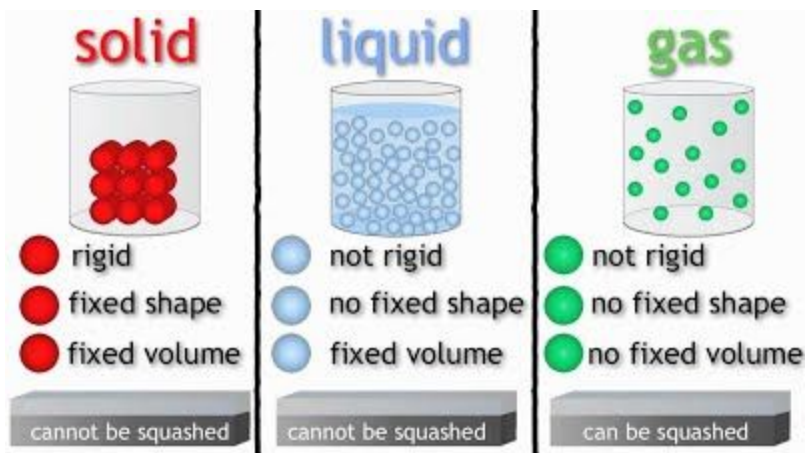
Matter: Properties and Change (6.P.2)

6.P.2.1 Matter

- **Matter** is anything that has **mass and volume**.
- Matter is composed of microscopic particles called **atoms**.
- **Atoms** have **mass** and take up space
- Atoms are the smallest part of an element and have the same chemical properties of the element
- An **element** is made up of the same kind of atoms. The atoms of one element are different from those of another element. Ex: Helium is made up of only Helium atoms, Oxygen is made up of only Oxygen atoms.

6.P.2.2 Phase changes

- **Physical properties of matter** can be observed or changed without changing what it is made up of. You can change size, shape, form or state of matter and it will not change what it is.
- As heat is added, the **molecules** move faster and are less tightly packed together. When heat is removed, **molecules** move more slowly and become more tightly packed together.
 - ❖ **Solid** - when heat is added to a solid, molecules move faster; solids can be changed into the liquid or gaseous state by heating; water becomes a solid at 0°C or 32°F
 - ❖ **Liquid**- when heat is added to a liquid, molecules move faster; liquids can be changed into a gaseous state by heating; liquids can be changed into a solid state when heat is removed
 - ❖ **Gas**- when heat is removed from a gas, the molecules move more slowly; gases can be changed into a liquid or a solid state by cooling; water becomes a gas at 100°C or 212°F
- Increased **temperature** indicates a greater average energy of motion so most substances expand when heated.



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6.P.2.3 Physical Properties of matter

Physical properties involve things that can be measured without changing the chemical properties.

Physical changes can involve changes in energy.

Physical Property	Description	Example
Density	Mass per unit volume Used to help identify known substances. Density = mass/volume	Sugar's density is 1.53 g/cm ³ no matter how much sugar you have. 10 grams of sugar has the same density as 100 grams.
Boiling Point	Temperature a liquid turns into a gas.	Water's boiling point is 100°C or 212°F no matter how much water you have
Melting point	Temperature a solid turns into a liquid.	Water's melting point is 0° C or 32°F no matter how much water you have
Solubility	The amount of solute that can be dissolved in a specific volume of solvent under certain conditions	100 g of table salt has the same solubility as 5 g of table salt

Solute- substance BEING dissolved. Examples include salt, sugar, powdered kool aid

Solvent - substance that is doing the dissolving. Examples: water, tea, coffee

Water is the most common solvent. It is sometimes called the **universal solvent**.