Physical Properties of Matter





In the course of your studies, you have likely encountered the term **matter** as it relates to science. In science, matter is the term used for any material that has mass and takes up space. For something to be classified as matter it must be made up of at least one subatomic particle such as a proton or neutron. Other examples of matter include atoms, molecules, compounds, plants, animals, etc. In this activity you will learn about some of the properties of matter and the physical changes that matter can undergo.

Examples of Matter









All matter can be described by its different properties. These properties relate to how matter is structured, how it looks, how it behaves and many other different descriptors. The properties of matter can be divided into two groups, **physical properties** and chemical properties. To begin you will learn about the physical properties of matter and the physical changes that matter can undergo. Lets begin by discovering the various different physical properties that can be used to describe matter.

Click for Examples of Physical Properties



A **physical property** is any property that can be observed or measured without changing the composition of matter. These properties can be used to **describe** matter. Examples of physical properties include: texture, colour, smell (odour), melting point (i.e. 10 °C), boiling point (i.e. 100 °C), state and many others.



Click for Categories of Physical Properties The physical properties of matter can be described in two different ways: **qualitatively** or **quantitatively**. Click on "Quantitative" to learn about quantitative properties







Quantitative physical properties are properties that can be measured, and generally include numbers such as temperature, mass, height, boiling point, etc. For example "the mass of that sample of copper is 10 grams" or "the melting point of water is 0 °C."



Click on "Qualitative" to learn about qualitative properties



Qualitative physical properties are observations that can be made without measurement. These describe properties that can be observed with our 5 senses (sight, hearing, smell, touch, taste) without measuring them. For example: "bacon has a reddish colour and a strong odour" or "that sample of water is in its gaseous state."



One very important qualitative property of matter is known as its state. Matter can exist in one of 3 states: solid, liquid or gas. To indicate the state of matter scientists typically use symbols in chemical formulae to convey this important information as seen in the table below.



State	Symbol	Example
Solid	(s)	H ₂ O (s) - ice
Liquid	(I)	H ₂ O (I) - water
Gas	(g)	H ₂ O (g) – water vapour



Summary

- Matter is any material that has mass and takes up space.
- Matter can be described by its qualitative and quantitative physical properties
- Quantitative properties are observations of matter that require measurement and include numbers such as boiling point.
- Qualitative properties are observations of matter that can be made without measurement such as appearance or state.
- State of matter refers to its form such as liquid: (I), solid: (s) or gas: (g).



Success!

You have reached the end of this activity. You will know that you have achieved the goals for this activity when you can define matter and describe different the types of physical properties of matter.



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