

Physical properties of materials (1)

Name: _____

Physical properties are characteristics of certain materials. Here are some properties we consider when manufacturing materials:

- Matter – It makes up everything that takes up space and has mass
- Strength
- Boiling point
- Melting point
- Electrical conductivity
- Flexibility
- Heat conductivity

Material chosen for a product must suit its purpose and what it is. Think of a window:

What is the purpose of a window?

Based on its purpose, what should a window be made of?



Image: Creative Commons

Strength

A strong material will not bend, break, shatter or deform when forces are applied to it. These forces may include pushing and pulling forces.

Can you think of some **strong** materials?

Melting and boiling points

What do you think a “melting point” and a “boiling point” is?

What is the **melting point** of water? _____

What is the **boiling point** of water? _____

Solid → Melting → Liquid → Evaporation → Gas

Why is it important to know the melting and boiling points of materials?

Flexibility

What does it mean if something is flexible?

Flexible materials are used when a little “give” is required. For example, the plastic lid on a deodorant can needs to stretch a little to fit over the top.

How could you test the flexibility of different materials?

When testing the flexibility and strength of wood, plastic, metal and cardboard.

Which would be the **strongest** material? _____

Which would be the **most flexible** material? _____



Answer sheet

Strength

Can you think of some **strong** materials?

Steel, metal, bricks, some types of wood, hard plastics and so forth

Think of a window: What is the purpose of a window?

Lets light and fresh air in, lets stuffy air out, protects against dust, wind, etc. Safety – protects us and our property inside our houses.

Based on its purpose, what should a window be made of?

Strong, clear, transparent glass with a strong metal frame designed to open and close.

Melting and boiling points

What do you think a “melting point” and a “boiling point” is?

Melting point is the temperature at which a solid melts and becomes a liquid. Boiling point is the point at which a liquid evaporates and becomes a gas.

What is the **melting point** of **water**? 0°C

What is the **boiling point** of **water**? 100°C

Why do you think its important to know the melting and boiling points of materials? When manufacturing and processing materials it may be necessary to melt them or boil them – so it is important to know what their melting and boiling points are.

Flexibility

How could you test the flexibility of different materials?

Have the same size peice of different materials. Hang a weight of the same mass on each and observe what happens. The more flexible a material is, the more it can bend without breaking, the less flexible it is, the more likely it is to snap or simply not bend at all.

When testing the flexibility and strength of wood, plastic, metal and cardboard.

Which would be the STRONGEST material? Metal, Wood

Which would be the MOST FLEXIBLE material? Cardboard