

Physical properties of materials (2)

Name: _____

Name the **six physical properties** that are considered when choosing materials for manufacturing products.

Electrical conductivity

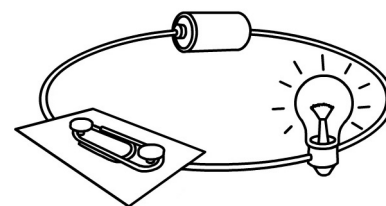
Electric current is the **flow of electrical energy** through a conductor. A conductor allows electrical energy to pass through it. An insulator is the opposite of a conductor and does not allow electrical energy through it.

Why would you need to know if a material is an electrical conductor or insulator?

Conduct this experiment:

Aim: To test which materials are able to conduct electricity.

Apparatus: two cells (battery), connectors, a light bulb, a piece of metal, wood, aluminium foil, plastic, glass and cardboard.



Method: Connect a basic circuit, as in the picture alongside. Connect in each material, at a time, and observe whether the light bulb lights up.

Explain why a bulb is connect in the curcuit.

Results: _____

<u>Material</u>	<u>Light on / off</u>	<u>Conductor?</u>
Metal		
Wood		
Aluminium foil		
Plastic		
Glass		
Cardboard		

Which materials conduct electricity? Which materials do not conduct electricity?

Heat conductivity

If “electrical conductivity” is how well electricity can flow through a material, then **heat conductivity** is how well _____ can flow through a material.

Materials with poor heat conductivity don’t allow heat to pass through them and are called **thermal insulators**. Materials that allow heat to flow through them are called **thermal conductors**.

Conduct this experiment:

Aim: To test which materials are able to conduct heat.

Apparatus: A bowl or water trough, a stainless steel spoon, roll of aluminium foil, wooden spoon, plastic spoon, warm (not boiling) water.

Method: Pour the warm water into the trough. Rest the spoons in the water for a few minutes. Take them out, dry them and feel them.

Results: Which spoons were warm? _____

Which were not warm? _____

The thermal **conductors** are: _____

The thermal **insulators** are: _____

Answer sheet

Name the **six physical properties** that are considered when choosing materials for manufacturing products.

Melting point

Flexibility

Strength

Boiling point

Electrical conductivity

Heat conductivity

Electrical conductivity

Why would you need to know if a material is an electrical conductor or insulator?

The product may need to conduct electricity in which case it is important for certain materials to be able to also conduct electricity.

The product may also need to be resistant to electrical flow, in which case we need to test if it does or does not conduct electricity.

Conduct this experiment:

Explain why a bulb is connect in the curcuit.

The light bulb acts as an indicator to show whether or not electricity is flowing through the circuit.

Results:

<u>Material</u>	<u>Light on / off</u>	<u>Conductor?</u>
Metal	On	Yes
Wood	Off	No
Aluminium foil	On	Yes
Plastic	Off	No
Glass	Off	No
Cardboard	Off	No

Which materials conduct electricity?

Metal

Aluminium foil

Which materials do not conduct electricity?

Wood

Plastic

Glass

Cardboard

Heat conductivity

If “electrical conductivity” is how well electricity can flow through a material, then **heat conductivity** is how well heat can flow through a material.

Conduct this experiment:

Results: Which spoons were warm? Stainless steel, aluminium foil

Which were not warm? Wooden and plastic spoons

The thermal **conductors** are: Metal and Aluminium

The thermal **insulators** are: Wood and Plastic