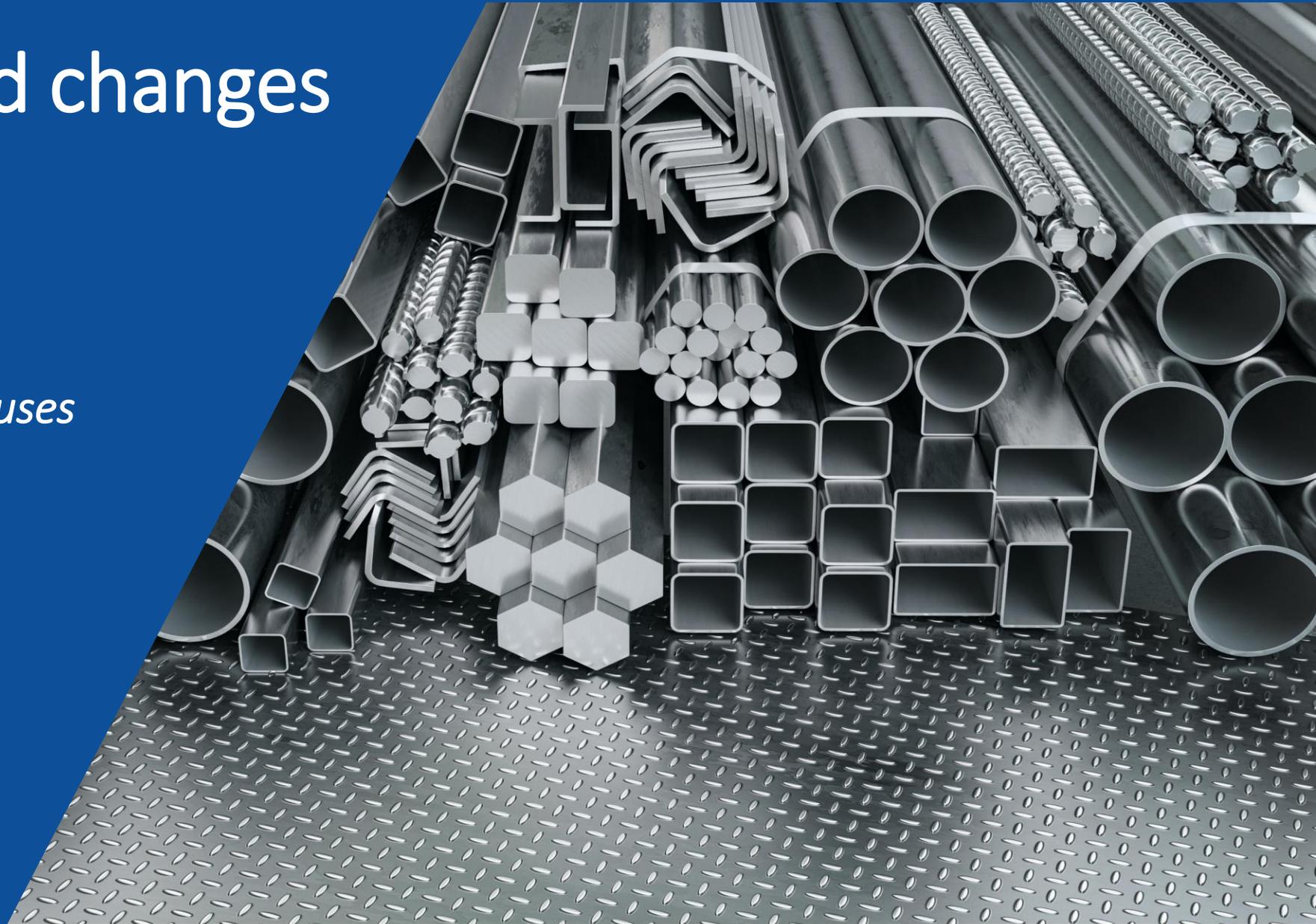


# Properties and changes of materials

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*Exploring properties and uses  
of materials*





# Properties and changes of materials

*Exploring properties and uses of materials*

## Key Learning

- Materials have different uses depending on their properties.
- Properties include hardness, flexibility, absorbency, strength, transparency, electrical and thermal conductivity and attraction to magnets.
- Key vocabulary learning

## I can...

- use Carroll diagrams to classify materials by their properties.

## Activities (pages 4-6): 30 - 40 mins

### Household items to support learning:

- 10-12 items made from different materials. See page 5 for suggestions.
- Use lined paper and a pencil for recording.



## Taking it further... (page 7): 20 - 30 mins

- You may like to investigate a household object, a toy or a piece of sports equipment made of two or more materials.

Word bank – properties of materials - can you explore what these mean online ? (Glossary at the end to check)



materials



elastic



waterproof



opaque



translucent



transparent



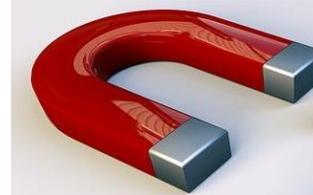
flexible



rigid



absorbent



magnetic



brittle



strong



smooth



rough



dull



thermal conductor



thermal insulator



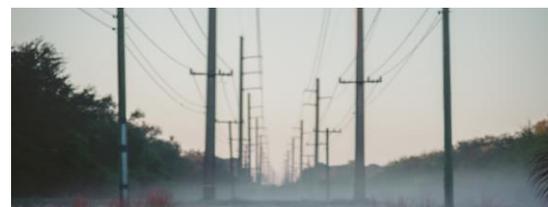
hard



soft



reflective



electrical conductor



electrical insulator



# Explore, review, think, talk...

*What do you already know about the properties of materials?*

- Look at these three cups which are made of different materials.
- Which do you think is the odd one out?



*metal*



*glass*



*plastic*

There are many possible answers. Think about the properties of the materials to explain your ideas. You can use the word bank on page 3 to help you.

- For example, you may have considered transparency to choose the odd one out.



The **properties** of materials help us to decide which materials are suitable to make a particular object.

- Which important properties do all three cups need to have?

Watch this clip to help you decide:

<https://www.bbc.co.uk/bitesize/topics/z4339j6/articles/zx8hhv4>



# Properties and uses of materials

*Exploring the materials of household objects*

- Find 10 - 12 items made of various materials. *For example:*



- Sort the objects into groups. You may like to use the word bank on page 3.

*For example:*

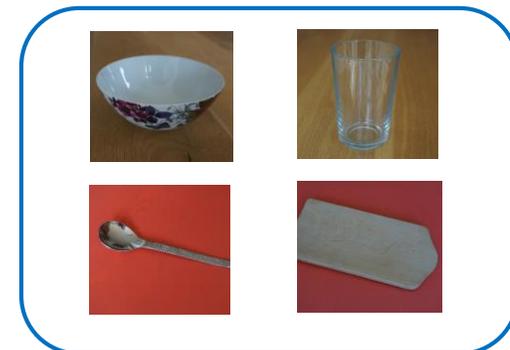
*flexible*



*slightly flexible*



*rigid*



- Try this three or four times for different properties.*

Classify your household items using two different Carroll diagrams.

You may like to use the example opposite for your first one.

Use what you have learnt and the word bank to help you.

- |                      |                      |
|----------------------|----------------------|
| waterproof           | absorbent            |
| rigid                | flexible             |
| strong               | brittle              |
| rough                | smooth               |
| reflective           | dull                 |
| elastic              | non-elastic          |
| hard                 | soft                 |
| magnetic             | non-magnetic         |
| thermal conductor    | thermal insulator    |
| electrical conductor | electrical insulator |
| transparent          | opaque               |
| translucent          |                      |

I can use Carroll diagrams to classify materials by their properties.

	rigid	not rigid
opaque		
not opaque		



# Taking it further...

*Investigate a household object made of two or more materials*

Many objects are made of more than one material because different parts need different properties.

*The non-stick coating inside stops the food sticking to the pan.*



*The **plastic** handle is a **thermal insulator** so it does not get too hot.*

*The **metal** pan is a **thermal conductor** so the heat can travel through it.*

Use DK Find Out to explore more materials:

<https://www.dkfindout.com/uk/science/materials/>

- Choose a household object, a toy or a piece of sports equipment which is made of two or more materials.
- For example, you might like to investigate a bicycle or a skateboard.



- Investigate each material to decide why it has been selected.
- Draw a labelled diagram to explain what you have found out.

## Glossary of terms

**Absorbent:** An **absorbent** material is able to soak up liquid easily.

**Brittle:** A **brittle** material is usually hard but can break easily, like china or glass.

**Electrical conductor:** An **electrical conductor** allows electricity to flow through it.

**Electrical insulator:** An **electrical insulator** does not allow electricity to flow through it.

**Flexible:** A **flexible** object or material can be bent easily without breaking.

**Material:** **Material** is the matter from which a thing is or can be made.

**Opaque:** Light cannot pass through **opaque** material.

**Property:** A **property** of an object or material is a feature that makes it suitable for a particular use.

**Reflective:** Light bounces off **reflective** material making it bright or shiny.

**Rigid:** A **rigid** object or material cannot be easily bent out of shape.

**Thermal conductor:** A **thermal conductor** allows heat to pass through it easily.

**Thermal insulator:** A **thermal insulator** does not allow heat to pass through it easily.

**Translucent:** Some light can pass through **translucent** material.

**Transparent:** Light can pass through **transparent** material.