



# Changes in materials



## Let's find out:

- › What causes physical changes in materials?
- › What are temporary and permanent changes?
- › How can physical changes be useful?
- › What physical changes can cause dangers and how can we prevent them?





› The glass is broken. Its shape has changed.

- What could have happened to the glass?
- Can the glass return to its original shape?
- Is this glass still useful?

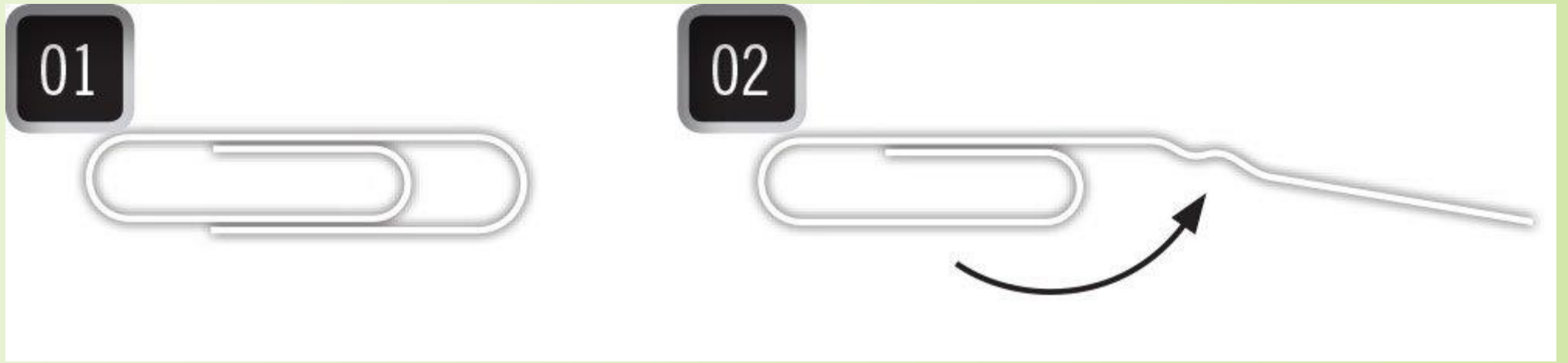
A decorative vertical arrangement of three balloons on the left side of the slide. The top balloon is green, the middle one is a lighter shade of green, and the bottom one is brown. Each balloon has a small green stem and a wavy line representing a string. There are several small, light purple triangles scattered around the balloons, some pointing towards them and some away, creating a festive, celebratory feel.

# How can cause materials to change?

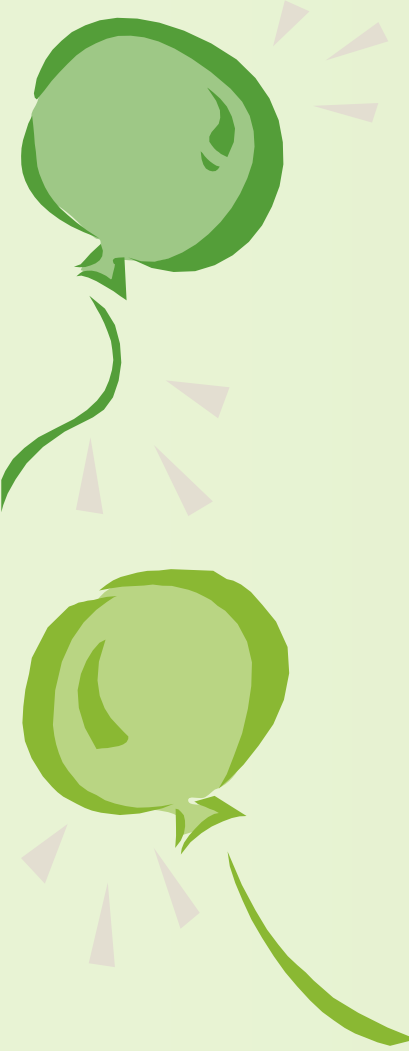
- › Materials can change when we press, twist, hammer, bend or pull them.
- › The materials of the following objects change when an action is done to them



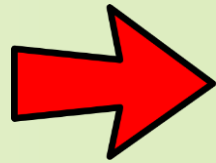
› Press a rubber ball → The shape of the rubber changes



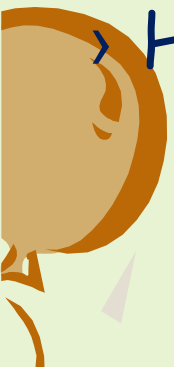
› Twist a metal paper clip → The shape of the metal changes

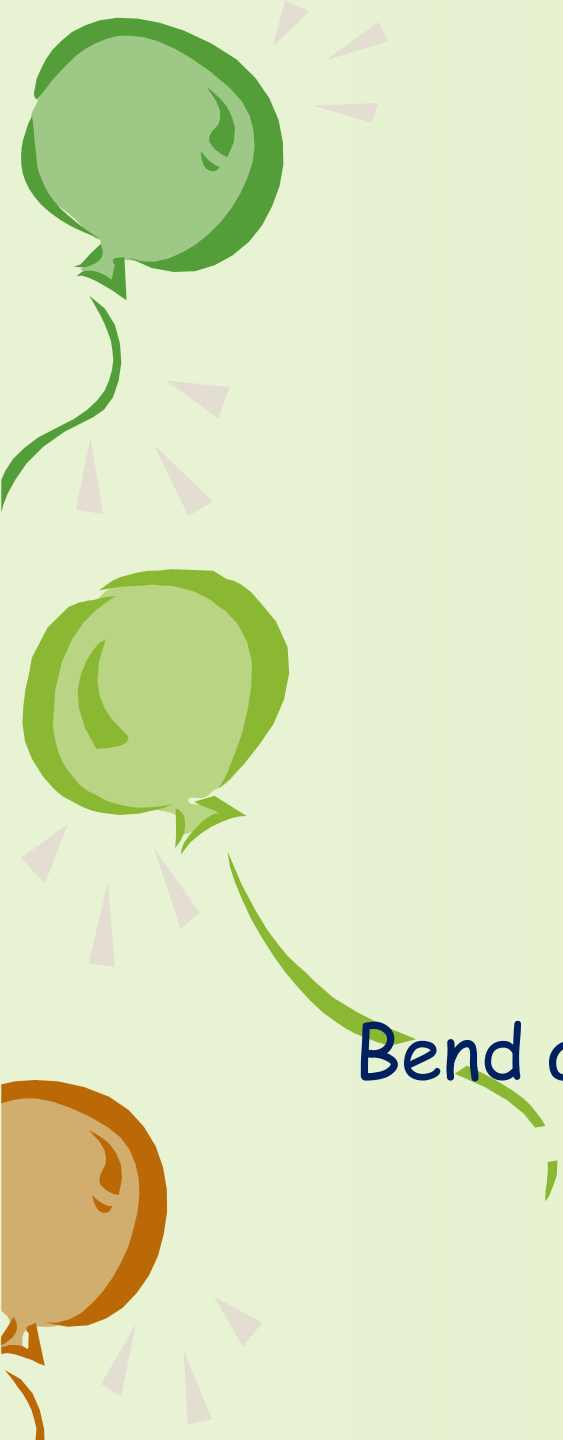


> Hammer a ceramic vase

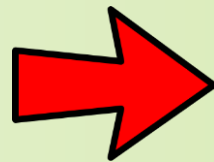


The shape of the ceramic vase changes



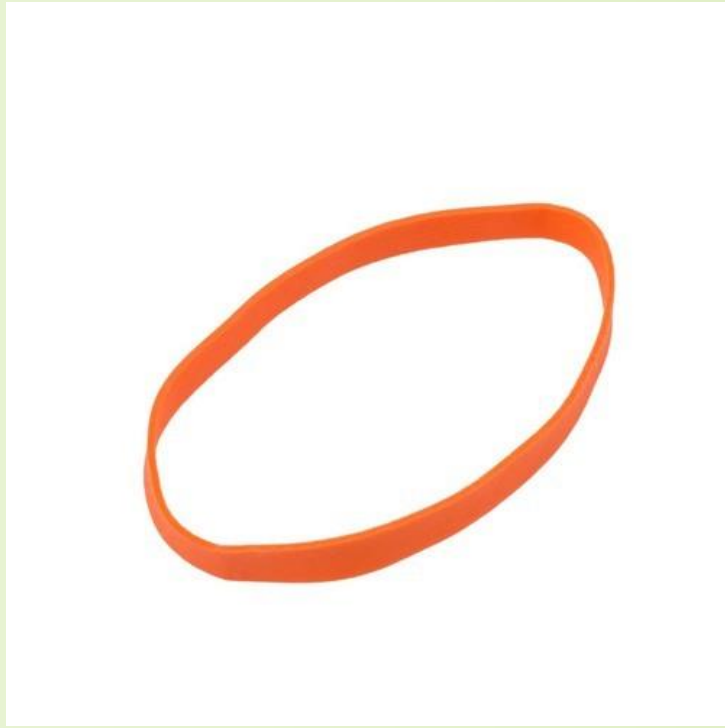


Bend a plastic spoon

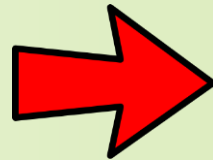


The shape of the plastic changes





Pull a rubber band



The size and shape of the rubber changes



# Temporary changes.

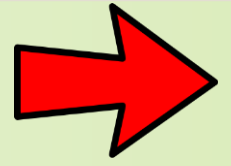
- › Some materials, after they have changed physically, they can easily return to their original size and shape. These changes are **temporary**.
- › **Examples of temporary changes:**

The plastic changes its shape when we bend the ruler gently.

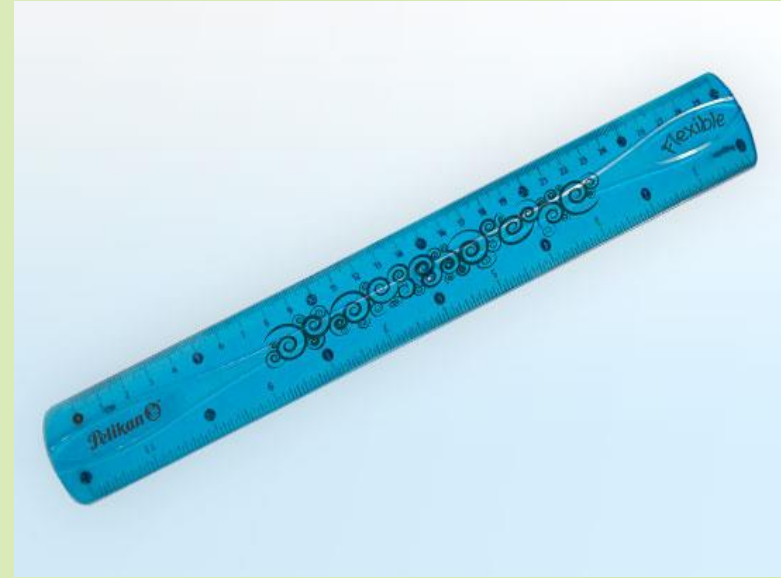


The ruler is curved.

Release the ruler

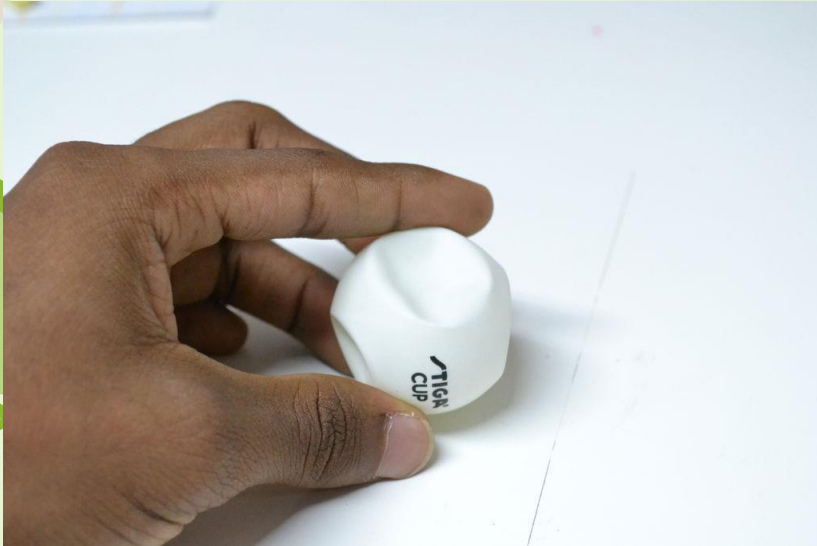


> The plastic returns to its original shape

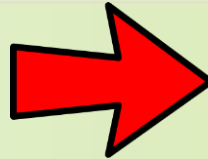


The ruler becomes straight again

The plastic changes its shape when we press the ping-pong ball



Place the ping-pong ball in hot water



> The plastic returns to its original shape



The ping-pong ball is dented

The ping-pong ball becomes round again



# Permanent changes.

- › Some materials, after they have changed physically, they cannot return to their original shape. These changes are **permanent**.
- › **Examples of permanent changes:**



If we hammer a piece of glass, it breaks into pieces and the shape of the glass changes. It cannot return to its original shape.

If we press a water bottle. It becomes **crumpled** and flattened. The shape of the plastic changes. It cannot return to its original shape



If we bend a wooden pencil too much, it breaks into two and the shape of the wood changes. It cannot return to its original shape.



# Using physical changes in materials .

Some objects are useful to us if the materials can change physically

## › Plastic.

Plastic wraps and plastic bags are useful. The plastic used to make these objects can bend and change its shape easily



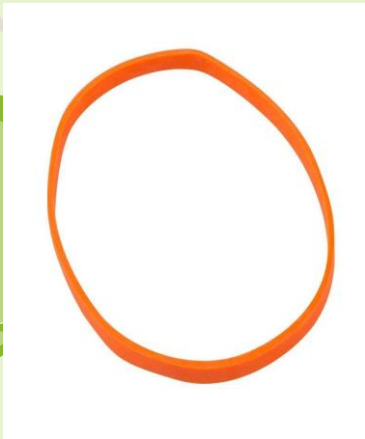
↑ This plastic wrap is used to wrap the apples.



↑ Plastic bags are used to hold groceries and other shopping items.

## › Clay and rubber

Rubber bands and clay pots are also useful. Rubber and wet clay are useful materials because they can change their size and shape easily



↑ The rubber band can be used to tie objects together because the rubber can change its size and shape.



↑ Wet clay can change size and shape to become clay pots and other useful objects.





**Physical changes in materials**

are

Changes in size and shape

Can occur when materials are

Permanent

Useful

Temporary

Harmful

Pressed

twisted

Hammered

Bent

Pulled

Heated

Cooled