

B4 ACTIVITY 4 (I): CONVECTION IN WATER

Background

Like air, liquid becomes less dense when warmed, and will rise. These two activities illustrate this in a colourful way. It is advisable to practise the first one beforehand. The alternative activity is just as spectacular.

Equipment required (per group):

- Two identical clear drinks bottles (plastic or glass)
 - Hot and cold water from the tap
 - A piece of card (4 cm × 4 cm)
 - Two different food colourings
 - An absorbent towel (to catch spills)
-

What to do:

1. Fill one bottle with cold water and one with hot water (tap hot water at approx. 60°C is suitable).
2. Add a different food colouring to each of the bottles as shown in Figure 21.
3. Place the piece of card on top of the bottle of cold water and hold it firmly in position.
4. Holding it over the towel, carefully turn the bottle of cold water upside down and put it on top of the bottle of hot water, leaving the card in place between both bottles.
 - ② *What do you predict will happen when the card separating the two bottles is removed?*
5. Making sure the necks of the bottles are lined up, carefully remove the piece of card.

Describe what you observe.

 - ② *Were you correct in your prediction?*
 - ② *Can you explain why this happened?*
6. Empty the bottles and repeat steps 1 and 2, but this time place the piece of card on top of the bottle of **hot water** and hold it firmly in place.
7. Turn the bottle upside down and put it on top of the bottle with cold water.
 - ② *What do you think will happen when the card is removed?*
8. Again making sure that both bottles are lined up, remove the card.
 - ② *Can you explain why this happened?*
 - ② *Were you correct in your prediction?*
 - ② *Is the explanation different to the one offered when you placed the bottle with the cold water on top?*

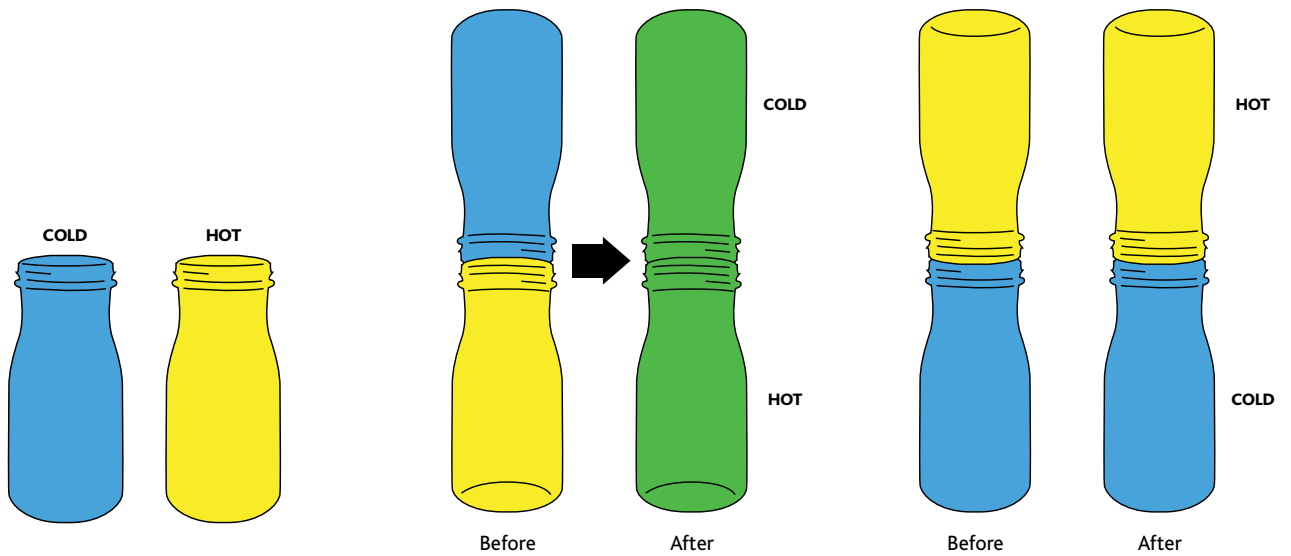


Figure 21

Figure 22

Figure 23

Resources:

- This activity is available on page 71 of Science on Stage 1 & 2. Visit their [resources page](#) for the full experiment.

B4 ACTIVITY 4 (II): CONVECTION IN WATER [ALTERNATIVE ACTIVITY]

Equipment required:

- Paper cup or similar
- Kitchen aluminium foil or clingfilm
- Tall jar, vase, or large soft drinks bottle (at least 1.5 litre) with the top cut off
- Hot and cold water from the tap
- Food colouring

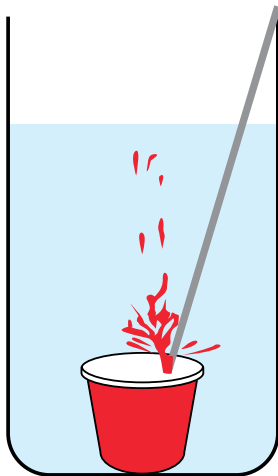


Figure 24

What to do:

1. Fill a cup with coloured hot water.
2. Cover the cup with aluminium foil or clingfilm.
3. Set the cup into a large clear jar or vase.
4. Pour cold water into the jar until the water goes over the top of the cup and nearly to the top of the jar.
 - ② *What might happen if you poke a hole in the foil/clingfilm?*
5. Use a stick to poke a hole in the foil/clingfilm.
 - ② *Was your prediction in line with what happened?*
 - ② *What might be the explanation?*