

Some materials change when they are heated, some changes are reversible and some are not



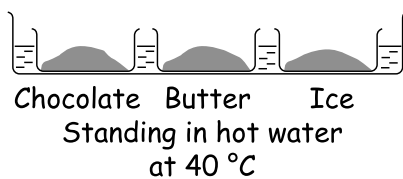
Word processing

- (a) Put small quantities of different substances eg chocolate, wax, butter, margarine, ice cube, cheese, pasta, plasticene into small, plastic 'mousse' pots or tin-foil pastry cases, and stand them or float them on hot water. The children can observe the substance melting. Do they all melt, if not, why not? Now put them in cold water and watch them solidify.
- (b) Children could **investigate** 'which melts the fastest?' To keep the test fair, compare the same quantities, eg equal cubes of margarine, butter and chocolate.
- (c) **Different materials melt at different temperatures** Older, more able children can **investigate** the fact that materials melt at different temperatures. This may be apparent to them from the outcome of activity (a). At primary level with simple equipment, this activity is limited to a few materials the children can melt. However, in a practical way it introduces the concept of materials melting at different temperatures. It may also lead to a discussion about the temperatures needed for other materials such as metals to melt and whether or not all materials will melt.

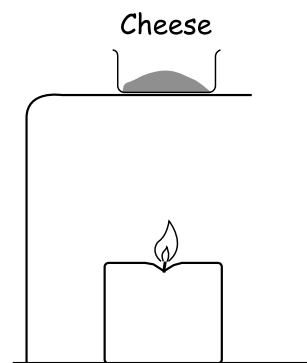
Safety!

- Care when handling any glass-ware.
- Spirit thermometers should be used.
- Care when handling hot water.

Which melts the fastest?



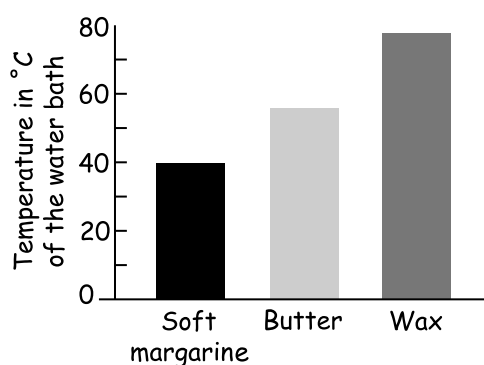
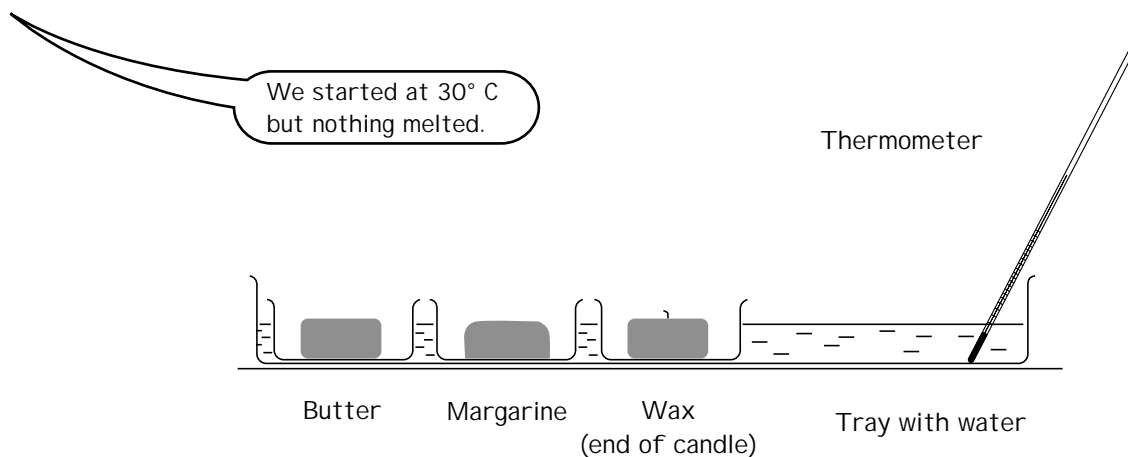
If it doesn't melt over hot water, try a candle.



Safety!

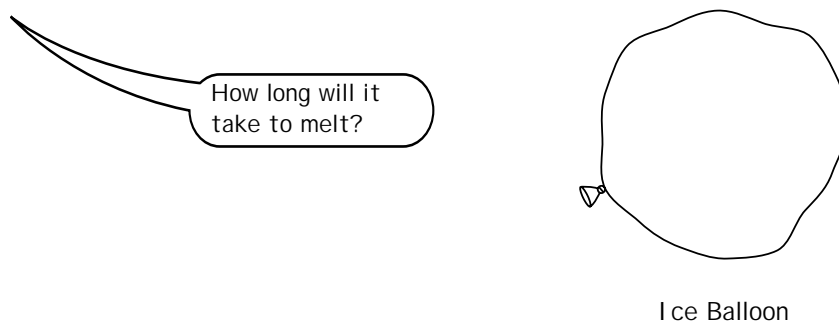
- Discuss the hazards and risks associated with this activity. The children doing this activity, should be well supervised.

Limit the children to a few materials that will melt at the temperature of very hot water (80 °C) or below, such as soft and hard fats, chocolate and wax. Use small, equal cubes of each substance and place each one into a dish. Place these into a large container of water with a thermometer. Begin the activity with warm water (30 °C) and see if any substance begins to melt. Remove the dishes, add hot water to the water bath, stir and take the water temperature. Replace the dishes to see which substance melts at the higher temperature. Record the water temperatures as different materials melt. A bar graph can be made of the results.



A graph to show the temperature at which materials begin to melt

- (d) **More melting ice** Great fun for younger children. Fill different containers with water eg balloons, rubber gloves, ice trays, yoghurt pots etc, freeze them and present them to the children to watch them melt during the day. You can peel the balloon away from the ice to leave the smooth, ice ball. Ask them how the process might be speeded up or slowed down (thermal insulation), and which they think will melt first. Float the balloons on warm water.





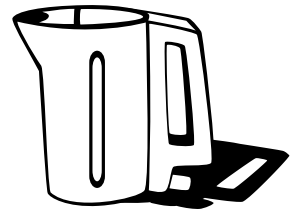
Making Chocolate Crispies



investigation 1

You will need:

a plastic drinks cup, a small bowl, a tea spoon, a kettle, 2 pieces of dark chocolate or cooking chocolate (milk chocolate does not work), 2 dessert spoons of breakfast cereal (e.g. rice crispies or cornflakes) cake cases.



Show what you have done with drawings. Label the ingredients as solids or liquids.

1. Put the chocolate in the cup.

2. Pour about 2cm of recently boiled water into the bowl.

3. Stand the cup in the bowl. Make sure no water splashes into the chocolate.

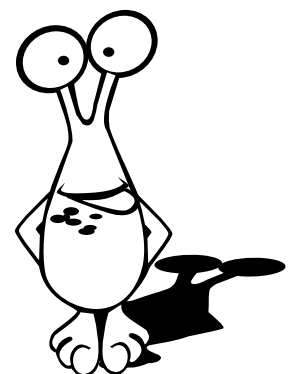
4. Wait for the chocolate to melt.

5. Add 2 dessert spoons of breakfast cereal and stir.

6. Scrape out the mixture into cake cases.

7. Put in the fridge to cool for 15 minutes.

8. Eat!!



investigation 2

What happens if you add more crispies ? Try 3 spoonfuls.

investigation 3

Does it make a difference if you put the chocolate in a expanded polystyrene cup? Why?

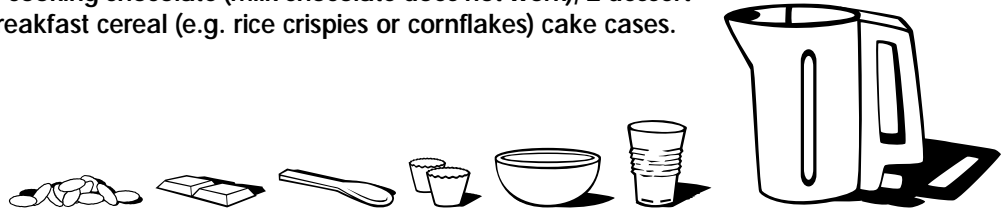
This worksheet is about changing solids into liquids and back again. Children should note how and when the materials change shape as well as temperature and texture. The concept of making predictions is introduced. It also shows that heat can be transferred.

Investigation 1

This experiment is a practical application of melting and solidifying.

EQUIPMENT NEEDED:

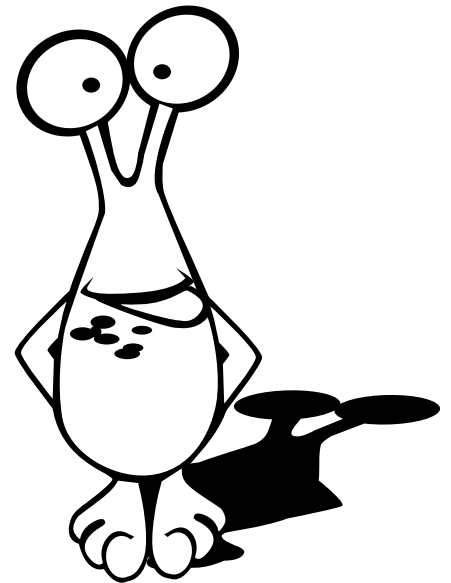
a plastic drinks cup, a small bowl, a tea spoon, a kettle, 2 pieces of dark chocolate or cooking chocolate (milk chocolate does not work), 2 dessert spoons of breakfast cereal (e.g. rice crispies or cornflakes) cake cases.



Show what you have done with drawings. Label the ingredients as solids or liquids.

This will help pupils focus on the changes of state.

1. Put the **chocolate (solid)** in the cup.
2. Pour about 2cm of recently boiled **water (liquid)** into the bowl.
3. Stand the cup in the bowl, making sure no **water (liquid)** splashes into the **chocolate (solid)**.
4. Wait for the **chocolate (solid/liquid)** to melt.
5. Add 2 dessert spoons of **breakfast cereal (solid)** to the **chocolate (liquid)** and stir.
6. Scrape out the **mixture (liquid/solid)** into cake cases on a tray.
7. Put in the fridge to cool for 15 minutes. (**solid**).
8. Eat!



Investigation 2

What happens if you add more crispies ? Try 3 spoonfuls.

Changing variables. This experiment is simply an extension which can give children an opportunity to make predictions.

Investigation 3

Repeat the experiment with the chocolate in an expanded polystyrene cup

Ask children to predict how this will change and why. The heat is travelling from the water to the chocolate.

Expanded polystyrene is a thermal insulator so the chocolate should take longer to melt.