

4. Cutlery from ice



2 hours

Melting ice to remove plastic cutlery trapped inside.

OBJECTIVES

- To distinguish between an object and the material from which it is made.
- To identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock.
- To describe the simple physical properties of a variety of everyday materials.
- To compare and group together a variety of everyday materials on the basis of their simple physical properties.
- To use their observations and ideas to suggest answers to questions.

RESOURCES

(Per group of 4 children unless otherwise stated)

- Tall plastic beaker or yoghurt pot¹ (about the same height as the plastic cutlery) 1 plastic knife, fork, and spoon¹ (per child)
- Freezer compartment¹
- Source of hot water/radiator
- Stopwatch or egg-timer
- Pair of gloves
- Salt (optional)
- [Activity sheet 11](#), made into story cards and/or
- [Activity sheet 12](#), made into prompt cards² and/or
- [Activity sheet 13](#) (per child)

Safety note

It must be emphasised that children need close adult supervision when using hot water. The temperature of the water used should not exceed 60°C.

1 The teacher must freeze the sets of cutlery in the container of water prior to the lesson. They should be taken out of the freezer just before the children need them. Alternatively, 'lollipops' can be made by freezing lollipop sticks in water (mixed with food colouring) inside small yoghurt pots.

N.B. These 'lollipops' should not be eaten.

2 Denotes items required for a structured rather than an open-ended approach.

INTRODUCING THE ACTIVITY

The task is for each child in the group to get a knife, fork and spoon as quickly as possible, without breaking the ice.

The children will now be more familiar with looking for differences between the components in the mixture they are trying to separate. They should be thinking about the properties of ice and the fact that it will melt at room temperature, but the cutlery will not.

This task could be tackled at different levels and possible solutions are listed below. All these methods will enable the children to obtain their sets of cutlery from the cup, the first four methods being slower than the others:

- Waiting for the ice to melt
- Putting their hands around the container (wearing gloves, as the container is very cold)
- Putting the container on a radiator
- Putting the container in a sunny place
- Pouring out the cold water surrounding the ice as it melts
- Placing the container in a bowl of hand-hot water (the hot water can also be replaced at regular intervals)
- Holding the container under a tap of running hot water.

The first method is used as a control, to demonstrate how long the ice takes to melt if nothing is altered to accelerate the melting of the ice. This will take several hours and will be a great deal slower than any of the other methods.

Some methods used will allow children to begin filling in their record sheet whilst waiting for the ice to melt.

Children may suggest methods that will insulate the ice, e.g. wrapping the tub in a scarf, as children associate this with warmth. The teacher can allow children to try these ideas. After the test an explanation can be offered for the ice melting slowly, e.g. clothes slow down the movement of heat (energy) in order to keep our body warmth in.

The children time how long it takes to complete the task, so the fastest method of melting the ice can be determined. If using an egg-timer, a child can be responsible for seeing when the sand runs out and turning the timer over. Each time it is turned, the children put a tick or tally mark on their record sheet. Stopclocks could also be used by those children who can operate and read them.

EXTENSION ACTIVITY

The effect of sprinkling salt on top of the ice could be investigated. Adding salt to the surface of the ice will lower its melting point by several degrees Celsius, which accelerates the melting of the ice. As the ice melts, the layer of water could be poured away and fresh salt sprinkled on the surface of the ice.

The children can then discuss the reasons for spraying the roads with salt in winter, i.e. the salt prevents water on the roads from turning to ice, therefore reducing skidding and road accidents.

The effect of changing the temperature of warm water surrounding the ice can be investigated.