

# Exemplar 42

Solids, liquids and gases

third and fourth classes

**Initial problem:** What are solids, liquids and gases?

## Background

Many children will not use these terms, and in particular they will have difficulty with the idea of gases. The purpose of these activities is to help them to identify the properties of solids, liquids and gases.

**Assessment:** Among the techniques that may be used are

- teacher observation: willingness to try different ideas; willingness to work with others
- portfolio: annotated drawings of work
- concept maps.

## Resources

A range of materials, which include examples of solids, liquids and gases, (for example balloons and tyres, which contain gases when inflated), fizzy drinks, bubbles, the air in the classroom.

## Starting points

## Development of lesson

sorting and grouping  
comparing

inferring

## Solids, liquids and gases

Most children have drinks in their lunch boxes. Introduce them to the term 'liquid'. Ask them to think of other liquids and to make a list of liquids that they can find at home and in school.

Observation can be encouraged by asking the children to describe different liquids. They should consider:

- *How are they the same/different?*
- *How do we know that orange juice is a liquid?*
- *Do all liquids pour?*

## Solids

Children can make a collection of different solids. Encourage them to include:

- solids that are made from soft materials, such as cotton wool or a sponge
- solids that are transparent, such as glass and plastics.

The children's ideas about solids can be refined through questioning:

- *Are all these solids the same?*
- *Can a soft material like cotton wool be a solid?*
- *How can solids be identified?*

The children might compare solids with liquids. Some solids change shape and pour like liquids. As a result, some children find it difficult to distinguish between some soft solids (flour, powder, icing sugar) and liquids.

The children can consider:

- *What happens to materials when they are turned upside down?*
- *Do any materials change shape or spread about?*

Some liquids, such as oil, treacle and honey, can also pose problems for children. They may describe these liquids as solids, because they do not pour as easily as other liquids, such as water.

## Gas

When asked about gas, children often think of gas used for cooking and fires. The following experiences can help them to think about other gases.

- *Blow up a bag or a balloon. Push the balloon. What can you feel?*
- *Observe a mobile suspended over a radiator*
- *Record wind direction and speed.*
- *Open a bottle of perfume. What happens?*