a WOW Lab BLUEPRINT

Milk Medley

Inquiry Approaches

Some of the following questions will only be relevant if all three parts of the activity are performed.

Initial Inquiry

What are some properties that an object can have?

An object can have many properties, including shape, size, colour, density, weight, texture, volume, hardness and buoyancy.

What is the difference between a chemical change and a physical change? Give examples for both types of change.

Physical changes are changes which do not alter the composition of the substance. Some examples of physical changes are melting ice cubes, shaping plasticine and cutting paper. A chemical change is a change which alters the molecules of an object to form a new substance. Examples of chemical changes include rust forming on cars, burning logs in a fire and cooking pancakes.

What is the difference between a reversible change and an irreversible change? What are some examples of each?

Reversible changes can be reversed, converting the end product back into the starting material. Some examples of reversible changes are water evaporating, ice melting and salt dissolving in water. Irreversible changes cannot be reversed. The end product cannot be changed back into the starting material. Some examples of irreversible changes are mixing vinegar and baking soda, cooking an egg and wood rotting.

Experimental Procedure Inquiry

Why do we add vinegar to the milk in the second and third activities?

Vinegar causes the milk to curdle and separate into curds and whey. In the second section of the activity, the curds will be converted into glue and in the third section, the cheese curds will be made.

In-Depth Inquiry

Is the changing of cream into butter a physical or chemical change? What about the changing of milk into glue? The changing of milk into cheese?

The conversion of cream into butter is a physical change as no new substance is created; the ingredients in the cream merely separate. The conversion of milk into glue is a chemical change as the chemical composition of the milk changes when vinegar is added. The conversion of milk into cheese is also a chemical change as the chemical composition is again changed by the addition of vinegar.

In the first section of the activity, it was demonstrated that converting cream to butter was a reversible change since the butter could be turned back into cream. Is it possible to convert the glue or cheese back into milk? Why or why not?

No, it is not possible to change the glue or cheese back into milk because these two changes are irreversible changes.