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Author(s)	Tng Sai Tin
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Cooking as a Science

TNG SAI TIN

Pupils see cooking going on at home every day of their lives. Every time we cook we are directly involved in science, often without realising it. Through food preparation and cooking pupils can experience important science processes in an exciting and practical way, and challenge them with problems that need to be solved by practical investigation and experiment. Cooking appeals to all the senses, and there is the added pleasure of sharing food together in the end!

Why do changes occur? How do we use the changes? Can they be reversed? How do we know a change has taken place?

Use the scientific approach in planning lessons and keep it in mind whilst you are teaching. It can help you pose the right question and lead the pupils from step to step, encouraging them to tackle problems in a scientific way.

Observation

Looking, touching, tasting, smelling, and listening to explore properties of food and changes that occur through cooking.

Looking at eggs:

Take a freshly bought egg, and an egg which is about two weeks old and lower each into a bowl of water in turn.

Does the egg float? Does the egg sink, lie on its side or stand on end? If so which end is uppermost? Why is this so?

Break each of the eggs you used for the experiment on a small white plate and describe:

- the size of the air cell
- the shape and size of the egg yolk and its position in the white;

- the area of the plate the egg covers.

Toasting Bread:

Observe the colour and texture of fresh bread. Describe the changes as bread is toasted.

Heating milk:

Warm a sample of milk slowly in a saucepan. Observe the changes and where possible, note the temperature at which a change occurs:

- steam rising from the surface
- the formation of a skin on the surface
- bubbles forming under the skin
- the temperature at which milk boil
- the precipitate on the base of the pan

Answering Questions By Practical Investigation and Experiment

Looking at eggs:

Put a tablespoon of oil into the frying pan and turn on the heat, observe oil as it is heated. What happens to the oil? Slide the egg into the pan and let the pupils see the immediate change in the white of the egg. Remove the cooked egg and place it alongside the raw egg.

How or why do properties change? Describe the changes that take place when an egg is fried? Suggesting an explanation.

Toasting bread:

Place bread on a grill pan, put the pan under the hot grill. Observe the colour changes. When bread is toasted on one side, remove pan, turn slices over and compare the two sides.

Boiling Milk:

100ml milk
100ml water

2 small saucepans
Thermometer, -10 to 110° C

Put the milk and water into separate saucepans.

Heat it gently.

Record any changes that occur, and the temperatures when they happen.

Remove the milk from the heat when it is boiling.

You probably had to take the milk off the heat to stop it from boiling over.

Did the water boil over? What happens to the bubbles when they reach the surface of the water?

What happens to the bubbles when they reach the surface of the milk? What effect does the skin have on the bubbles of air reaching the surface? Explain why milk boils over.

Making A Deduction Or Decision On The Basis Of What You Have Seen**Looking at eggs:**

Heat causes the egg to coagulate.

Predicting what might happen on the basis of this experiment.

What do you think might happen when you boil an egg for five minutes, ten minutes?

What causes the dark-green ring around the yolk of hard-boiled eggs?

Toasting bread:

Why do we put toast in a toast rack?

What happens to the toast if we pile it all up on a plate instead of standing each slice up separately?

What do you think might happen if you leave the bread under the grill for too long?

Boiling Milk:

What do you think will happen when you boil milk unattended?

What happens when milk boils and cools?

Our pupils need a wide range of skills for competent living, beside learning science concepts, this approach fosters skill development by increasing knowledge and stimulating thinking. Given the emphasis on nutrition and healthy eating in Singapore, teaching our pupils to enjoy cooking is a good way of laying the foundations for healthy eating, food preparation help give pupils the confidence they need to become self sufficient adults, able to feed themselves economically, easily and healthily. If pupils are going to be able to make sound nutrition judgements in later life, it helps if they are able to cook a variety of balanced meals.

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