



Te Kura

TE AHO O TE KURA POUNAMU  
THE CORRESPONDENCE SCHOOL



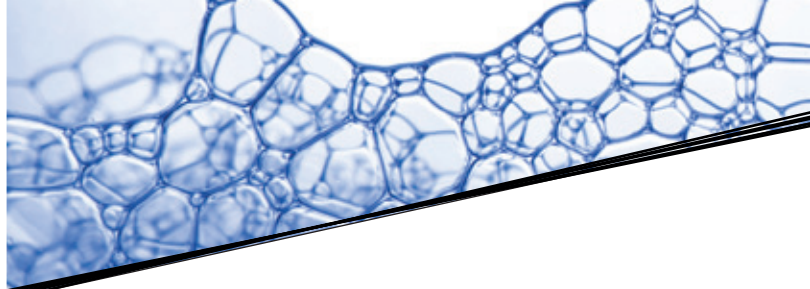
# Let's keep it in the kitchen!

SUPERVISOR RESOURCE

INT105  
CURRICULUM LEVEL 1



INT105



Let's keep it in the kitchen! is designed for students to explore how everyday materials that are found in the kitchen can be changed by heating, cooling or mixing.

This booklet is written to be a shared experience with your student.

You will write for the younger students and the older students as needed.

## Introduction

This topic is in three parts.

### PART ONE

Learning about solids, liquids and gases by carrying out a variety of experiments.

### PART TWO

Selecting two areas to study using the scientific method.

### PART THREE

Writing an explanation using the results from the experiments in part two.

## How long the unit should take

This unit should take 3–4 weeks.

Each part may take different lengths of time.

Continue to do your daily guided reading and mathematics while you are doing this work.

## You will need:

- materials you will find in your kitchen such as baking soda, milk, potatoes, jelly crystals, eggs and bread
- containers from the kitchen such as jars, glasses and bowls
- kitchen implements such as spoons, stirrers, pots and measuring tools.

During this unit, you and your student could use a digital camera or cell phone camera to record experiments – either as photos or video.



Please ensure that experiments are closely supervised as many of them involve heating and cooling of materials. Care is also needed with materials that may fizz, explode or expand. Follow all instructions carefully and use only the ingredients specified.



## Purpose of the unit

In this unit your student will learn about the effects of heating, cooling and mixing on common materials.

## Learning Outcome

At the end of this unit your student will be able to tell others about some of the changes that happen to solids, liquids and some gases when they are heated, cooled and mixed.

## Learning Intentions

Discuss these learning intentions with your student.

### PART ONE

I am learning:

- about solids, liquids and gases
- that solids and liquids can change when they are heated or cooled
- what happens to some foods when they are exposed to air (a gas).

### PART TWO

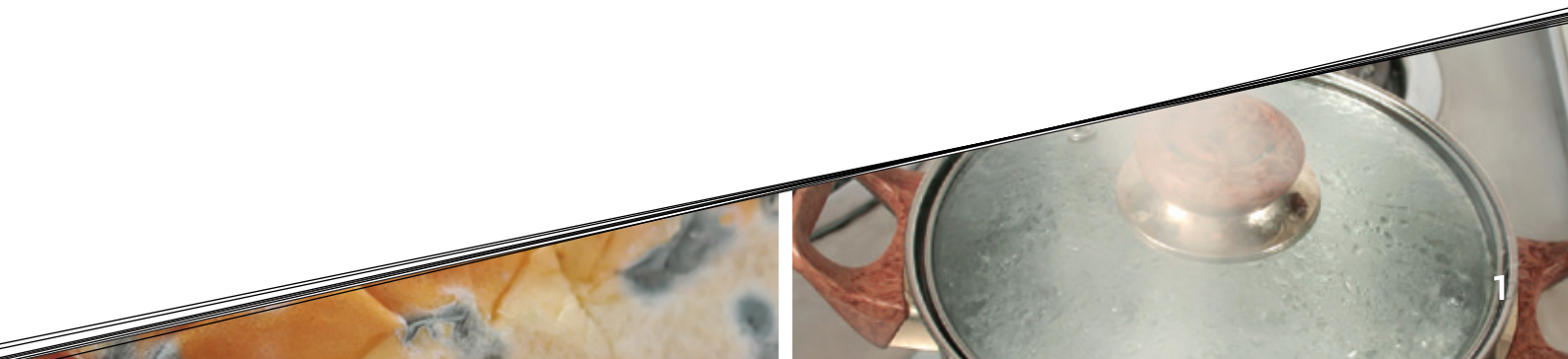
I am learning to:

- carry out experiments using the scientific method
- observe and explain what happens when solids and liquids are heated or cooled
- observe how exposure to air (gas) causes change.

### PART THREE

I am learning to:

- write an explanation
- use my flowchart results to help plan my explanation
- use a text organiser to help me write my explanation.







## Support information

Here is some information on solids, liquids and gases that you need to know before you start.

### SOLIDS, LIQUIDS AND GASES

#### WHAT IS A SOLID?

Solids are objects that can hold their own shape. Solids are usually hard things that will keep their shape when you hold them.

Examples of everyday solids in the kitchen are a block of cheese and ice.

Solids have definite shapes and hold their shape, even when you change the container.



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#### WHAT IS A LIQUID?

A liquid is wet, flows and can be poured.

A liquid will fill up the shape of a container. If you pour some water in a cup, it will fill up the bottom of the cup first and then fill the rest.

The water will take the shape of the cup. If the cup breaks the water will spread into a puddle, because there is nothing to hold its shape. It remains a liquid.



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#### WHAT IS A GAS?

Gases are everywhere even when we can't see them. An everyday example of a gas is air.

A gas has no fixed shape. It fills the container it is in. Carbon dioxide is the gas produced when baking soda is added to water, sugar and lemon juice.



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## PART ONE

# Learning about solids, liquids and gases

This should take about five days. The activities include a range of experiments to get you started. They should get you thinking and give you some basic understanding of the topic.

## Learning Intentions

I am learning:

- about solids, liquids and gases
- that solids and liquids can change when they are heated or cooled
- what happens to some foods when they are exposed to air (a gas).

## Success Criteria

I will show my learning by:

- talking and writing about what a solid is
- talking and writing about what a liquid is
- talking and writing about what a gas is
- talking and writing about what happens when solids and liquids are heated or cooled
- talking and writing about what happens when some foods are exposed to air.

## ACTIVITY ONE

### SOLIDS, LIQUIDS AND GASES FOUND IN THE KITCHEN

#### Supervisor

Discuss with your student:

- what solids can you find in the kitchen?
- what liquids can you find in the kitchen?
- where would you find gases in the kitchen?
- what are gases and liquids kept in to hold their shape?

Did you know that liquids and solids can change? Talk about how this might happen.

Help your student to develop their understanding of solids, liquids and gases by cutting out and sorting the kitchen items in the student workbook, Part One: Activity One.



## ACTIVITY TWO

### CHANGING A SOLID TO A LIQUID – MELTING ICE CUBES



#### YOU WILL NEED:

- 10 ice cubes from the freezer
- 5 containers – such as a cup or plastic glass.

#### WHAT TO DO:

1. Place two ice cubes in each container.
2. Place the containers in five different places around the house and garden.
3. Guess which will melt first and which last.
4. Record the time it takes for the ice in the different containers to melt.
5. Enter the results on the changing a solid to a liquid chart in the student workbook, Part One: Activity Two.
6. Discuss what happened and why?

#### Did you know?

Putting a container with ice in it in a sunny place or near a heater or fire will make the ice melt quicker. If the container is put in a dark, cool place the ice will take longer to melt.



### ACTIVITY THREE

#### COOLING DOWN A LIQUID – MAKING JELLY

##### YOU WILL NEED:

- a packet of jelly crystals
- hot water
- three jugs or bowls
- a cup or measuring jug
- a large stirring spoon.

##### Did you know?

Jelly crystals contain gelatine. Gelatine is a translucent, colorless, brittle (when dry), tasteless solid substance, derived from collagen. When in contact with hot water it dissolves. As it cools down it solidifies (sets).



##### WHAT TO DO:

1. Supervisor to boil water.
2. Empty contents of jelly crystals into a bowl or jug.
3. Supervisor to measure hot water needed for jelly into a measuring cup.
4. Help your student pour the hot water over the jelly crystals.
5. Stir the crystals until dissolved.
6. Pour the dissolved jelly into the three bowls or jugs.
7. Put one bowl in the fridge, one bowl in the freezer and leave the other bowl on the bench.
8. Guess which will set first. (Complete the My prediction sentence on the student recording page, Part One: Activity Three).
9. After one hour, check to see what has happened and record the results.
10. Wait until all the jellies are set.
11. What has happened to the liquid and why? Complete the sentences in the student workbook.





#### ACTIVITY FOUR

#### EVAPORATION – USING THE SUN TO CREATE COLOURFUL CRYSTALS

This will take a few days.

##### YOU WILL NEED:

- 4 teaspoons of sugar
- 20 teaspoons of water
- a few drops of food colouring
- a bowl
- a sunny spot.

##### Did you know?

The heat from the sun will cause the water in the bowl to evaporate and leave behind the coloured sugar.



##### WHAT TO DO:

1. Put the sugar and water into the bowl.
2. Stir until the sugar dissolves. (You will know when it is dissolved when there is no more sugar at the bottom of the bowl.)
3. Add a few drops of food colouring.
4. Leave the bowl in a sunny spot for a few days.
5. Discuss what you think might happen and why? Complete the My prediction sentence in the student workbook, Part One: Activity Four.
6. Draw what happens after a few sunny days on your recording page.

#### ACTIVITY FIVE

#### EXPOSURE TO AIR – BROWN APPLES

##### YOU WILL NEED:

- an apple
- lemon juice
- a knife
- a clean paint or pastry brush.

##### Did you know?

Air has a gas called oxygen in it. Oxygen reacts with some foods, like cut apples, and makes them brown. This is called oxidisation. Some chemicals such as lemon juice (citric acid) slow down this reaction. Lemon juice is also useful when added to fruit salads to keep the fruit from going brown.



##### WHAT TO DO:

1. Cut the apple in half.
2. Using the brush, spread lemon juice over one cut half.
3. Leave the other cut half untouched.
4. Discuss what you think might happen to the apple halves and why. Complete the My prediction sentence in the student workbook, Part One: Activity Five.
5. Leave both halves uncovered on the bench.
6. Check every 15 minutes to see what happens.
7. Draw and label each half of the apple to show what has happened on your recording page.



## ACTIVITY 6

### COOKING CHANGES – APPLYING HEAT

Poached egg and toast

#### YOU WILL NEED:

- an electric fry pan or pan
- an egg
- water (enough to cover the egg)
- a slice of bread (and butter if you like)
- a toaster
- a plate, knife and fork.

#### WHAT TO DO:

1. Heat water in fry pan or pan until it simmers.
2. Gently break the egg into the simmering water.
3. Watch as your egg cooks.
4. Talk about what changes might happen when the egg is cooking. Encourage your student to use words such as those in the word list to describe what is happening.
5. Put the bread in the toaster and toast it in the usual way.
6. Talk about what will happen to the bread.
7. Take out the toast and put it on the plate. Butter it if you like.
8. Place the cooked egg on the toast.
9. Enjoy eating your egg and toast.
10. Draw or glue in photos to show what happened to the egg and the bread before and after they were cooked and complete the cooking changes chart in the student workbook, Part One: Activity Six.

## EXTRA FOR EXPERTS

Activities showing heat changes in food through boiling, frying, baking and roasting.

Use some of the recipes that follow to try different ways of using heat to change food from raw to cooked.

Record what you did for one of the recipes on the extra for experts page in the student workbook, Part One: Activity Six.

Use digital photos or drawings to show what you did.

Word list to describe what happens when the egg and bread are cooked.

You may think of some others:

poached

toasted

cooked

burnt

white

runny

yolk

soft

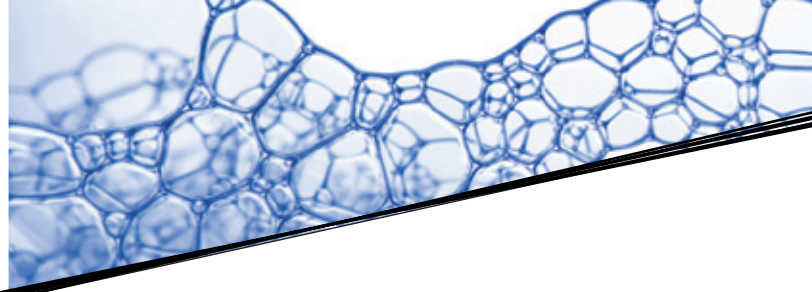
clear

hard

crisp

heat

raw.



## SOFT-BOILED EGG

### YOU WILL NEED:

- an egg at room temperature
- water
- saucepan
- an egg or kitchen timer.

### WHAT TO DO:

1. Fill saucepan with enough water to cover the egg.
2. Bring the water to the boil and then let it simmer.
3. Gently lower the egg into the water using a tablespoon.
4. Cook for three minutes for a soft egg and ten minutes for a hard boiled egg.
5. Remove egg from water and place in egg cup – enjoy.

(Another way is to remove the pan from the heat after a minute, put a lid on it and time it for 6 minutes for a soft egg and 7 minutes for an egg that is less runny.)



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## PIKELETS

### YOU WILL NEED:

- a bowl
- a pan
- something to turn the pikelets over with
- a spoon
- 1 cup flour
- pinch of salt
- 3 tablespoons sugar
- 1 teaspoon baking powder
- 1 egg
- ½ cup milk
- butter for cooking
- ¼ cup sultanas (optional).

### WHAT TO DO:

1. Put all the dry ingredients and the sultanas into a bowl.
2. Mix in the eggs and milk.
3. Grease a hot pan with butter.
4. Put a spoonful of the mixture into the pan.
5. Turn the pikelets over when you see little bubbles on the top.
6. Try making different shaped pikelets.



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## ROAST VEGETABLES

### YOU WILL NEED:

- 6–8 potatoes or kūmara, or pieces of pumpkin
- 1 tablespoon oil.

### WHAT TO DO:

1. Turn the oven on to 200°C.
2. Cut the vegetables into medium sized pieces.
3. Put the vegetables into an oven dish.
4. Pour the oil over all the vegetables and mix.
5. Cook for half an hour.
6. Take the vegetables out of the oven and turn them over.
7. Cook for about another half an hour until the vegetables are golden brown.



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## HAPPY FACE BISCUITS

### YOU WILL NEED:

- 100 g butter
- ½ cup sugar
- 1 egg
- 1 tablespoon grated orange rind
- 1¼ cups flour
- 1 teaspoon baking powder
- ½ cup coconut
- sultanas for eyes.

(You can leave out the orange rind and coconut. Put in ¼ teaspoon of vanilla instead.)

### WHAT TO DO:

1. Turn the oven on to 180°C. Grease 2 oven trays.
2. Cream butter and sugar until smooth.
3. Add egg and orange rind. Beat well.
4. Sift in the flour and baking powder.
5. Add coconut. Mix it all together well.
6. Roll teaspoonful lots into balls.
7. Place on trays. Flatten the biscuits. Make happy faces.
8. Bake for about 15 minutes.



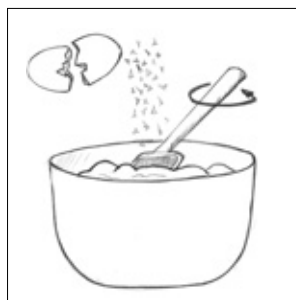
**1**

TURN OVEN TO 180 C.  
GREASE 2 OVEN TRAYS.



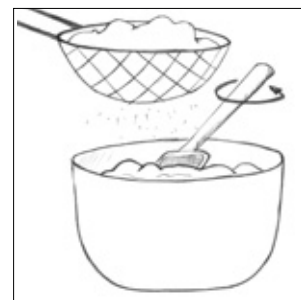
**2**

CREAM BUTTER AND  
SUGAR UNTIL SMOOTH.



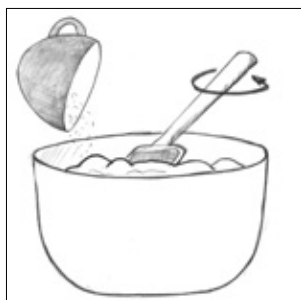
**3**

ADD EGG AND ORANGE  
RIND. BEAT WELL.



**4**

SIFT IN THE FLOUR AND  
BAKING POWDER.



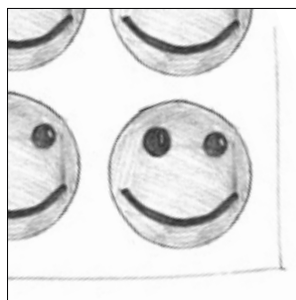
**5**

ADD COCONUT. MIX IT ALL  
TOGETHER WELL.



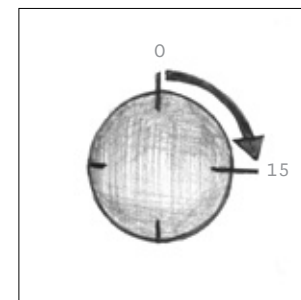
**6**

ROLL TEASPOONFUL LOTS  
INTO BALLS.



**7**

PLACE ON TRAYS.  
FLATTEN THE BISCUITS.  
MAKE HAPPY FACES.



**8**

BAKE FOR ABOUT 15 MINUTES.



## PART TWO

# Using the scientific method to investigate food changes

When scientists want to test an idea they work through a process.

In this section, you will learn to think like a scientist.

You will find out about the scientific method and use it in two experiments.

## Learning Intentions

I am learning to:

- carry out experiments using the scientific method
- observe and explain what happens when solids and liquids are heated or cooled
- observe how exposure to air (gas) causes change.

## Success Criteria

I can:

- carry out an experiment and say what happened
- observe how solids and liquids change when they are heated or cooled
- explain what happens when solids and liquids are heated or cooled
- explain what happens when matter is exposed to air.

## The Scientific Method

The scientific method is a way to ask and answer scientific questions by making observations and doing experiments.

THE STEPS YOU NEED TO FOLLOW ARE:

1. Ask questions.
2. Find out what you know.
3. Say what you think will happen (predict).
4. Test the hypothesis and observe what happens (experiment).
5. Record the results and check against your prediction.
6. Was I right? Why/why not?
7. Report results.

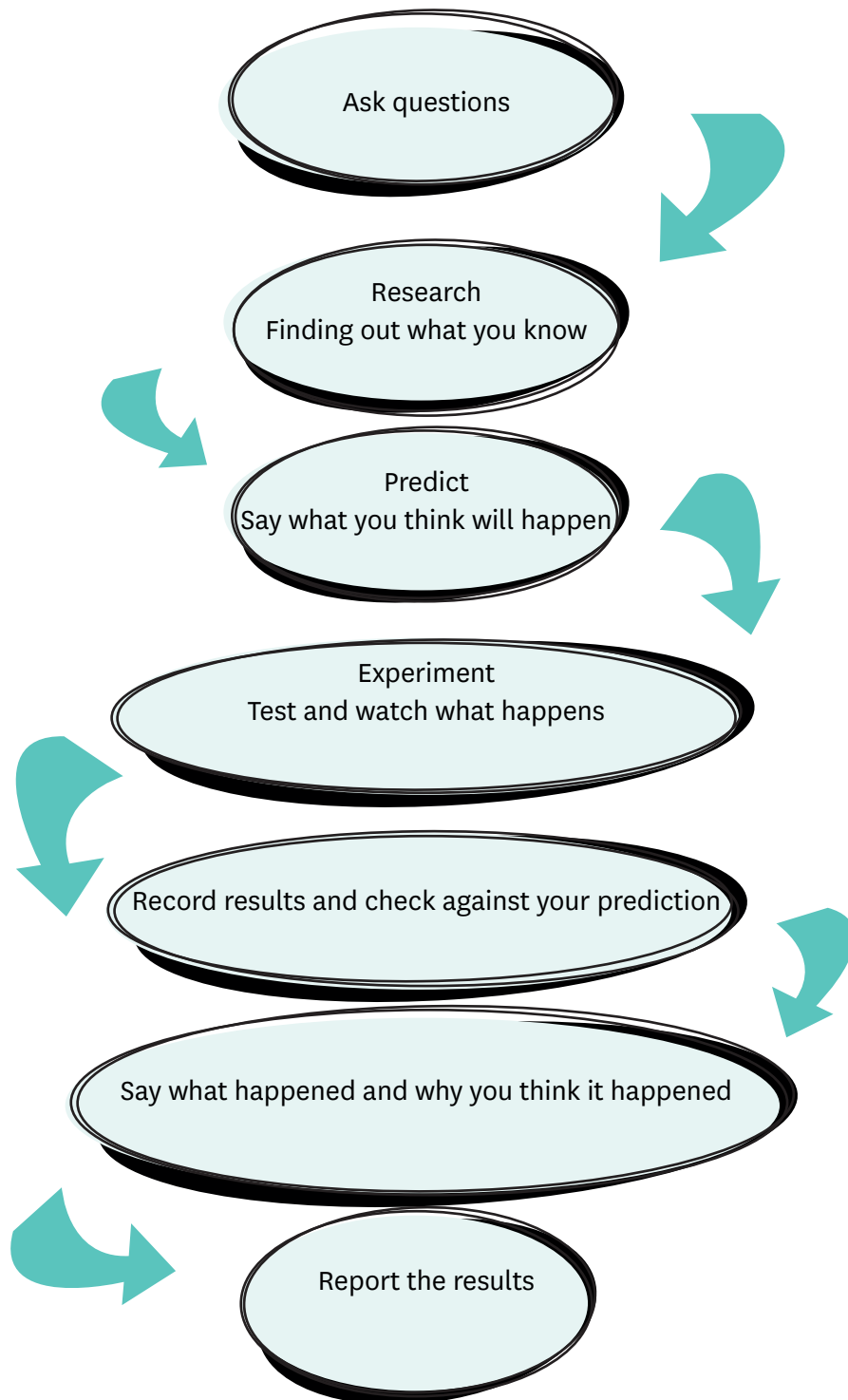
I WILL KNOW THAT I HAVE FOLLOWED THE SCIENTIFIC METHOD BY:

1. Talking about what I am going to do.
2. Talking about what I already know.
3. Predicting what will happen.
4. Testing and observing what happened.
5. Recording the results and checking against my prediction.
6. Saying if my prediction was right.
7. Reporting results.

The flowchart on the next page shows the steps of the scientific method in a visual form.

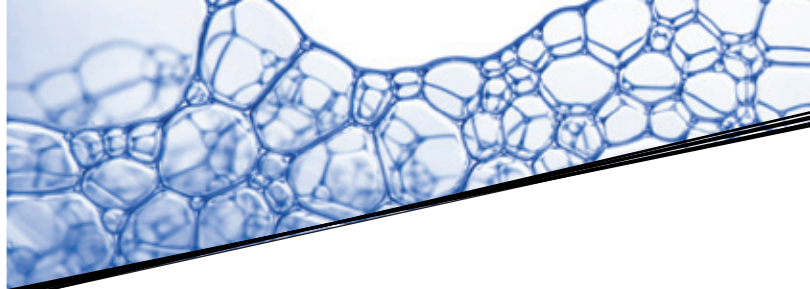


## THE SCIENTIFIC METHOD FLOWCHART



## SCIENTIFIC METHOD: EXAMPLE

1. Ask the question	How can you make ice change to water?
2. What I know	An ice-block melts on a sunny day.
3. Prediction: What might happen?	I think: heat is needed to melt ice.
4. Test my prediction and observe what happens by doing the experiment	Test the melting time in two different places and watch what happens.
5. Results	I found the ice outside melted fastest. The ice inside took longer.  My prediction was that an ice-block melts on a sunny day.
6. Say what happens	The ice in the warmer place took less time to melt because it was hotter.
7. Report the results	Heat is needed to melt ice, the hotter the temperature the quicker it melts.



## ACTIVITY ONE

### USING THE SCIENTIFIC METHOD – BOTTLED FUN

Here are the instructions for carrying out an experiment using the scientific method.

Read it through, do the experiment and get your student to record what happened in the student workbook, Part Two: Activity One.

#### YOU WILL NEED:

- one plastic soft drink bottle
- a cork to fit the bottle
- vinegar
- baking soda
- measuring spoons.

#### WHAT TO DO:

1. Pour vinegar into the bottle until it is one third full.
2. Add 2 teaspoons of baking soda.
3. Quickly and firmly push the cork into the bottle top.
4. Stand well back and watch.



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Safety warning: Do this experiment outside. The cork might injure someone nearby, stand well clear.

Go to the student workbook, Part Two: Activity One, and complete the chart.



## ACTIVITY TWO

Choose two of the following experiments to investigate using the scientific method.

Read through all the experiments before you choose, as some will need time to complete.

Fill in the scientific method flowcharts in the student workbook, Part Two: Activity Two and Activity Three as you work through the experiments.

### SALTY ICE

YOU WILL NEED:

- 2 ice cubes
- salt
- 2 bowls.

WHAT TO DO:

1. Place each ice cube into a separate bowl.
2. Sprinkle a teaspoon of salt on to one of the ice cubes.
3. Watch and see which ice cube melts faster.

#### Did you know?

Salt lowers the freezing temperature of water. So ice in salted water takes longer to melt. However, salt makes ice melt faster. So it is used on icy roads in winter to make them safe.



### POPCORN

YOU WILL NEED:

- a cup of popping corn (from the supermarket) or a microwave packet
- butter or oil (1 tablespoon)
- saucepan with lid.

WHAT TO DO:

1. Put butter or oil in saucepan and melt.
2. Add popping corn and stir to coat with butter or oil.
3. Cover saucepan with lid.
4. Leave lid on till the popping stops.
5. Add flavouring of your choice, this could be honey, salt, brown or white sugar and butter.

If you are using a microwave packet, follow the instructions on the packet.

Think about what caused the corn to change.



## WATER IN THE AIR

### YOU WILL NEED:

- a large glass jam jar with lid
- ice cubes
- salt
- tissues.

### WHAT TO DO:

1. Fill the jar with ice cubes.
2. Add two tablespoons of salt.
3. Screw on the lid, shake and leave on the bench.
4. Wrap the tissues around the jar and leave.
5. Test the tissues after 15 minutes. What has happened to the tissues?

## EXTRA FOR EXPERTS

Get two small mirrors. Put one in the fridge until it is cold, leave the other one at room temperature. Breathe on each of the mirrors and see what happens.

## COOLING DOWN

### YOU WILL NEED:

- water
- vinegar
- tomato sauce
- bread
- rice or lentils or dried peas
- milk
- a variety of small containers, including plastic bags
- freezer.

### WHAT TO DO:

1. Place some of each material into a container or plastic bag. Draw or photograph each one and describe how it feels/looks. For example, rice will feel hard but squishy in a plastic bag.
2. Place all the containers in the freezer overnight.
3. The next day, take them out of the freezer and describe what they look and feel like now.
4. Explain how each material has changed and why.

### Did you know?

The salted ice quickly makes the glass sides of the jar very cold. The water that exists in the air cools down and changes to a liquid when it hits the cold sides of the jar. This process is called condensation. It allows you to see the water that is usually invisible in the air. You can collect the water using the tissues. This is the same process that happens to the windows inside your house when it is cold.



### Did you know?

Cooling materials can change them. Some liquids will change into a solid, such as water into ice. Other materials such as the rice may not change at all, or very little.



## MOULDY BREAD

### YOU WILL NEED:

- 4 pieces of bread
- 4 jars with lids
- vinegar
- water
- salt.

### WHAT TO DO:

1. Place a piece of bread into each jar.
2. Add water to one jar so it just covers the bread.
3. Add vinegar to the next jar so it just covers the bread.
4. Dissolve a few teaspoons of salt in some water. Add this to the bread in another jar so it just covers the bread.
5. Leave the last piece of bread in its jar with nothing on it.
6. Put the lids on all the jars tightly and number each jar.
7. Leave all the jars for several days. Each day check to see if any mould has grown.

### Did you know?

Foods contain yeasts and bacteria which after a while can grow and make food go mouldy and inedible. Vinegar and salt act as preservatives and prevent mould growing by killing the bacteria or yeasts. The bread that is soaked in the vinegar and salt mixtures should go mouldy last or not at all.

Make a daily chart to record results and attach it to your flowchart.



## MAKE AN EGG GO RUBBERY

### YOU WILL NEED:

- one egg
- a glass or jar
- vinegar.

### WHAT TO DO:

1. Carefully put the egg into the glass or jar.
2. Pour the vinegar over the egg so it completely covers it.
3. Wait for two or three days and take the egg out of the glass and feel the shell.

### Did you know?

Vinegar reacts with the calcium in the eggshell making it dissolve. This is what gives the eggshell its rubbery feeling.



## INVISIBLE INK

### YOU WILL NEED:

- lemon juice
- a cotton bud
- a piece of white writing paper
- an iron.

### WHAT TO DO:

1. Put the cotton bud into the lemon juice and use it to write a message on the piece of paper.
2. Put the paper in a warm place and let it dry.
3. Help your student to iron the piece of paper with the iron on medium heat.

### Did you know?

Heat changes the lemon juice and causes it to oxidise – similar to the brown apples.





### EXTRA FOR EXPERTS

Try this experiment again using other acidic substances from the kitchen.

HERE ARE SOME IDEAS:

- any acidic fruit juice (apple or orange)
- onion juice
- baking soda
- vinegar
- coke or cola
- milk.

After you have chosen your two experiments, use the flowcharts in the student workbook, Part Two: Activity Three, to record what happens.

Label each chart with the name of the experiment then fill out the seven stages.



## PART THREE

# Conclusion

Presentation and explanation of results from Part Two.

## Learning Intention

I am learning to:

- write an explanation.

## Success Criteria

I will show my learning by:

- writing an explanation of what happened during an experiment and why it happened
- using flowchart results to plan my writing
- using a text organiser to write my explanation.

## An Explanation

An explanation is used to write about how and why something is or how and why something happens.

YOU WILL NEED:

- a completed flowchart from part two of your workbook
- the text organiser in the student workbook, Part Three: Activity One.

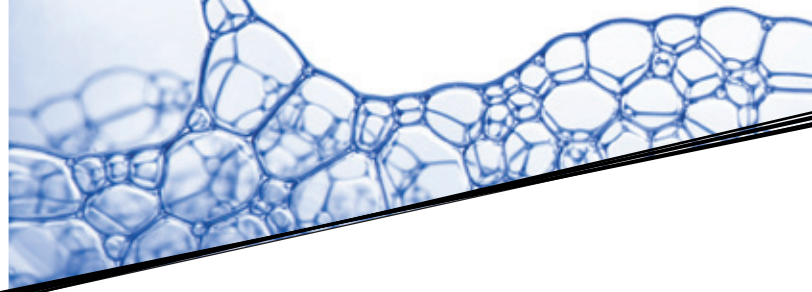
WHAT TO DO:

1. Choose one completed flowchart from part two for the information to write your explanation.
2. Using the text organiser as a guide, talk through the steps of writing the explanation.

For example:

- the title
- the introduction (what did you do?)
- the explanation of what happened, how it happened and why
- the conclusion (did the results match the prediction and why/why not?)
- digital pictures and observational drawings may be used to illustrate the explanation.





## Title

Use the title to tell the readers what the explanation is about.

Bottled Fun

## Introduction

Introduction: What the explanation is about.

I wanted to know what happened when I put vinegar and baking soda together in a drink bottle with a cork.

## Explanation

The steps in the process.  
What to do.

First I put the vinegar in the drink bottle. Next I put in the baking soda. I did not know what would happen but I guessed that it might pop the cork. Then I put a cork in the bottle and ran back.

## Conclusion

What happened.

Suddenly the mixture fizzed like crazy and the cork blew off! I found out that I was right. Mixing the vinegar and baking soda in the bottle made the cork blow off. This happened because the baking soda added to the vinegar made a gas.

Go to the text organiser in the student workbook, Part Three: Activity One to write your explanation.

WHEN YOU HAVE WRITTEN YOUR EXPLANATION:

- check it with your supervisor – have you said all you need to?
- make any changes needed.

WHEN YOU HAVE FINISHED, COMPLETE IN THE STUDENT WORKBOOK:

- the success criteria checklist
- the assessment pages.

Return the completed INT105B Student Workbook and any material/recordings for comment, to your teacher.









## Acknowledgements

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