

Science and Technology unit: Things Change

Stage 1

Duration: 10 weeks

Term 2

Booragul Public School



Unit context

Students made predictions, test and observe change in foods resulting from heating and cooling.

Target outcomes

Stage 1 A student:

ST1-4WS investigates questions and predictions by collecting and recording data, sharing and reflecting on their experiences and comparing what they and others know.

ST1-5WT uses a structured design process, everyday tools, materials, equipment and techniques to produce solutions that respond to identified needs and wants.

ST1-3VA develops informed attitudes about the current and future use of science and technology based on reason.

ST1-15I describes a range of familiar information sources and technologies and how their purpose influence their design.

Unit overview

This unit links science with literacy in the classroom. Students observe change and discuss the diversity of materials in their world. Students explore change through the context of food and learn about how heating and cooling food can change its properties. They will investigate whether these changes can be reversed or not. Students will draw conclusions about how fast or slow changes can happen and the consequences of change.



Content	Teaching and learning	Eval/Reg
<p>ST1-4WS ST1-3VA</p> <p>Students question and predict by:</p> <ul style="list-style-type: none"> -responding to and posing questions. -making predictions about familiar objects and events and the outcomes of investigations. <p>Students plan investigations by:</p> <ul style="list-style-type: none"> -identifying the purpose of the investigation suggesting some types of activities that need to be undertaken during the processes of Working Scientifically <p>Students conduct investigations by:</p> <ul style="list-style-type: none"> -working cooperatively and individually when participating in different types of guided investigations to explore and answer questions. - using a range of methods to gather data and/or information, including using their senses to make observations safely and carefully, using simple tools and equipment. <p>Students process and analyse data and information by:</p> <ul style="list-style-type: none"> -describing changes in objects and events 	<p>CHANGE MYSTERY</p> <p>1 Lesson</p> <p>Learning Objective- <i>Students will investigate the changes that occur to an object which melts. They will participate in class discussions about the properties of the object before and after the changes are applied.</i></p> <ul style="list-style-type: none"> - Teacher prepares 'mystery object' by allow an icy pole to melt while still in its wrapper. - Prepare/scan /'What happened?' and 'think, pair share' resource sheets. - Prepare a 'spot the difference' chart for wall/class science journal. - Students are introduced to prepared mystery object and enlarged copy of 'what happened?' Read through and discuss each question. - Introduce 'think, pair, share', read through and discuss chart. - Organise students into pairs to do the 'think, pair, share' activity. - Teacher scaffolds scientific questioning. - Using the 'spot the difference' chart, ask students what word describes what happened 'before' and 'after'. - Encourage students to consider how the object was changed from one to the other. - Add 'mel' to the chart using a different colour. - Ask students to think about what the mystery object was before it changed and add these words to the 'before' column. - Introduce the frozen icy pole and ask for any further words to describe the icy pole in the before section. - Brainstorm words or phrases about change and record them on a word wall. - Students complete their own 'what happened?' sheet. 	



<p>observed in investigations.</p>		
<p>ST1-4WS ST1-3VA</p> <p>Students question and predict by:</p> <ul style="list-style-type: none"> -responding to and posing questions. -making predictions about familiar objects and events and the outcomes of investigations. <p>Students plan investigations by:</p> <ul style="list-style-type: none"> -identifying the purpose of the investigation suggesting some types of activities that need to be undertaken during the processes of Working Scientifically <p>Students conduct investigations by:</p> <ul style="list-style-type: none"> -working cooperatively and individually when participating in different types of guided investigations to explore and answer questions. -using a range of methods to gather data and/or information, including using their senses to make observations safely and carefully, using simple tools and equipment <p>Students process and analyse data and</p>	<p>SPAGHETTI SCIENTISTS- Spaghetti Fun</p> <p>1-2 Lessons</p> <p>Learning Objective: <i>Students participate in guided investigations to discover the differences between cooked and raw spaghetti. They will discuss how the spaghetti is changed and if this change can be reversed.</i></p> <ul style="list-style-type: none"> - Review previous lesson and information recorded in science journals. - Read/listen to spaghetti poem. - Explain to students that they will be making a spaghetti picture but first they need to find out more about spaghetti. - Introduce and discuss the 'Spaghetti spot the difference' chart. Explain that students will be working in cooperative learning teams using their senses to investigate cooked spaghetti. Ask students to think about what they can do with spaghetti, eg bend, stretch and twist. Ask one team member to keep a record of the words used to describe what spaghetti can do. - Remind students not to eat spaghetti for allergy and hygiene reasons. - If students are using cooperative learning teams for the first time, introduce and explain the team skills chart and the team roles chart. Explain that students will wear role badges to help them (and you) know which role each team member has. - Draw students' attention to the equipment table and discuss its use. Explain that this table is where the team managers will collect and return equipment. - Form teams and allocate roles. Ask managers to collect team equipment. - When teams have completed the activity, ask the teams to share their observations. - Write the words on the right hand side of the 'Spaghetti spot 	



<p>information by:</p> <ul style="list-style-type: none"> -describing changes in objects and events observed in investigations. 	<p>the difference' chart.</p> <ul style="list-style-type: none"> - Revisit the poem and ask students which part of the poem they might like to illustrate. Or they might like to think of another spaghetti scene. - Ask students why cooked spaghetti could be used to make a picture. Refer students to the 'Spaghetti spot the difference' chart. Ask students to think about how they will stick the spaghetti to the paper. - Model for students, how to create an annotated drawing using the strands of spaghetti and words. Encourage students to draw their picture and write the words before adding the spaghetti. - Update the word wall with words and the science wall with images. 	
<p>ST1-4WS ST1-3VA</p> <p>Students question and predict by:</p> <ul style="list-style-type: none"> -responding to and posing questions <p>Students conduct investigations by:</p> <ul style="list-style-type: none"> -working cooperatively and individually when participating in different types of guided investigations. -using a range of methods to gather data and/or information. <p>Students process and analyse data and information by:</p> <ul style="list-style-type: none"> -describing changes in objects and events observed in investigations -comparing observations 	<p>SPAGHETTI SCIENTISTS- Spaghetti Towers</p> <p>1 Lesson</p> <p>Learning Objective: <i>Students participate in guided investigations to establish if spaghetti tower can be built using marshmallows. Students will collaborate with others to present a tower to the class and investigate word chains.</i></p> <ul style="list-style-type: none"> - Review the previous session and information collected in the class science journal. - Show students some cooked spaghetti and marshmallows and explain that you are going to build a tower with them. Model an attempt at connecting materials and building a tower. - Ask students if they notice any problems with the technique. Ask students why the spaghetti isn't suitable. Refer students back to the 'Spaghetti spot the difference' chart from the previous session. Ask students what would be better to use. - Explain that students will be working in cooperative learning teams and use uncooked spaghetti and small marshmallows to create the tower. - Form teams and allocate roles. Ask managers to collect team equipment. - Ask each team to present their tower to the class. Ask speakers to talk about how they used the spaghetti to create the tower and encourage them to talk about the properties of 	



<p>with those of others to identify similarities and differences in the findings of their investigations</p> <p>ST1-5WT Students produce solutions by:</p> <ul style="list-style-type: none"> -suggesting simple steps for production -using a range of everyday tools, equipment, materials and techniques -working cooperatively and safely 	<p>materials.</p> <ul style="list-style-type: none"> - Add descriptive words about the uncooked spaghetti to the 'Spaghetti spot the difference' chart. Ask students if they can think of any other words they could add. - Discuss with students questions about their explorations with spaghetti. - Introduce students to a word chain. Discuss the purposes and features of a word chain. - Update the word wall with words and images. 	
<p>ST1-4WS ST1-3VA Students question and predict by:</p> <ul style="list-style-type: none"> -responding to and posing questions. -making predictions about familiar objects and events and the outcomes of investigations. <p>Students plan investigations by:</p> <ul style="list-style-type: none"> -identifying the purpose of the investigation suggesting some types of activities that need to be undertaken during the processes of Working Scientifically <p>Students conduct investigations by:</p> <ul style="list-style-type: none"> -working cooperatively and individually when participating in different types of guided investigations to explore 	<p>HOT AND COLD 1 Lesson Learning Objective: <i>Students will learn about how foods change when they are heated or cooled and discuss if these changes can be reversed or not.</i></p> <ul style="list-style-type: none"> - Review previous lessons using journals and word wall. - Show students a slice of bread and ask the following questions: <ul style="list-style-type: none"> • Why do we toast bread? • How can we tell if bread has been toasted? • What are the differences between bread and toast? • Can we change toast back into bread? Why/not? - Record responses on IWB. - Introduce enlarged copy of 'Heat and Cool'. Discuss the purpose and features of a table. - Model how to complete the table using the prepared page in the class science journal. Demonstrate how to use comparative language. - Show students each of the foods they will be using to compare. Explain that they will be working in cooperative learning teams to observe what happens to each food when it is heated then cooled again. - Explain that students will need to melt the chocolate bud to 	



<p>and answer questions., -using a range of methods to gather data and/or information, including using their senses to make observations safely and carefully, using simple tools and equipment.</p> <p>Students process and analyse data and information by: -describing changes in objects and events observed in investigations.</p> <p>ST1-5WT Students produce solutions by: -suggesting simple steps for production -using a range of everyday tools, equipment, materials and techniques working cooperatively and safely</p> <p>Students: -use a range of information technologies to communicate with others</p>	<p>observe how it changes. Ask students for ideas about how they may be able to do that. List student suggestions in the class science journal. If a suggestion is to melt in their hands, ask students how they can do that without getting melted chocolate on their hands.</p> <ul style="list-style-type: none"> - Remind students not to eat the chocolate. - Discuss with students how they will know if the chocolate bud is melted when it is in their hands. Students might need to test the chocolate by pushing it to see if it is melted. Discuss how students will decide if it is fully melted. - Form teams and allocate roles. Ask managers to collect team equipment. Allow time for the teams to observe and compare samples and complete the 'before heating' sections of the resource sheet. - Allow time for the samples to cool. - Allow times - Display the enlarged copy of 'Heat and Cool'. Ask team managers to report to the class on their team's findings. - Complete the enlarged resource sheet using the team reports. - Discuss with students the similarities and differences between the different sections of the resource sheet. - Ask students if they can think of other foods that are very different after heating and stay like that after they have cooled. Ask students if they can think of any foods which seem to change back to what they were after heating and cooling. Ask students how knowing about how food changes helps us. - Update the word wall with words and images. 	
<p>ST1-5WT ST1-3VA Students: -use a range of information technologies to communicate with others</p> <p>ST1-15I - Students explore and define a task by:</p>	<p>LOOKING FOR A CHANGE <u>**Be aware of students who may have an allergy to eggs!</u></p> <p>1 Lesson Learning Objective: <i>Students working collaboratively in groups investigate and gather information about the changes to eggs when they are cooked.</i></p> <ul style="list-style-type: none"> - Ask students to brainstorm all of the different things they know about eggs, their properties, how they can change and different ways of cooking them. Write students' responses on the IWB. 	



<p>-identifying needs and wants of users/audiences</p> <p>ST1-4WS</p> <p>Students communicate by:</p> <p>-representing and communicating observations and ideas using oral and written language</p> <p>Students process and analyse data and information by:</p> <p>-using a range of methods to sort information, including drawings and provided tables, to match objects and events based on easily</p> <p>-describing changes in objects and events observed in investigations</p> <p>comparing observations with those of others to identify similarities and differences in the findings of their investigations</p>	<ul style="list-style-type: none"> - Introduce 'Silly Eggs' scan and discuss each picture with the class. Tell students that each picture has something incorrect in it about eggs and how they change. - Explain to students that they will be working in cooperative learning groups to identify the problem, discuss it and draw a picture that is more appropriate. Discuss the purposes and features of a drawing. - Explain that students will draw a more appropriate picture for each situation in the box next to it and write an explanation underneath. Model the activity using the first picture. - Form teams and allocate roles. Ask managers to collect team equipment. Allow time for teams to complete the activity. - Invite selected teams to report back to the class, by explaining the problem they identified in the picture and why it needed to be changed. - Write students' responses in the class journal. Compare different responses and how each response relates to scientific understanding. 	
<p>ST1-4WS</p> <p>ST1-3VA</p> <p>Students plan investigations by:</p> <p>-identifying the purpose of the investigation suggesting some types of activities that need to be undertaken during the processes of Working Scientifically</p> <p>Students conduct investigations by:</p>	<p>MELTING MOMENTS</p> <p>1 Lesson</p> <p>Learning Objective: <i>The students will work in collaborative team to investigate and test if dark or light chocolate buds melt fastest when heat is applied.</i></p> <ul style="list-style-type: none"> - Show students a white chocolate bud in a plastic resealable bag and ask them to describe it. Ask students to predict how they could change the chocolate bud. <ul style="list-style-type: none"> • What changes do you think could happen to the chocolate? • Why do you think that? • What does the chocolate need to melt? • How can we do that? - Ask students if they know if they type of chocolate will make a difference to the time it takes to melt it. Show students 	



*-working cooperatively and individually when participating in different types of guided investigations to explore and answer questions.
-using a range of methods to gather data and/or information.*

*Students process and analyse data and information by:
-describing changes in objects and events observed in investigations comparing observations with those of others to identify similarities and differences in the findings of their investigations
-comparing observations with predictions through discussion, as to whether observations were expected and related to their questions and/or predictions .*

*Students communicate by:
-displaying data and information in a variety of ways.*

ST1-5WT

*Students produce solutions by:
-using a range of everyday tools, equipment, materials and techniques
-working cooperatively and safely*

the dark and light chocolate buds and ask them to predict which would melt the fastest. Record student results.

- Explain that students will be working in cooperative learning teams to investigate 'what type of chocolate melts the fastest?' Explain to students that they will be using plastic resealable bags to hold the chocolate bud in while it melts. Model how to melt the chocolate bud in the resealable bag. Discuss with students how they might be able to tell when the chocolate bud has melted.
- Introduce the investigation planner in the class science journal. Read the question for investigation. Discuss and record on the investigation planner what teams will:
 - CHANGE: the type of chocolate.
 - OBSERVE: which type of chocolate melts the fastest.
 - Keep the same: the size of the piece of chocolate, the number of chocolate buds, the way in which it is held, the time the melting starts.
- Discuss why it is important to change the type of chocolate but keep everything else the same.
- Explain that the managers will have a dark chocolate bud and the speakers will have a white chocolate bud for their investigations. Remind students that both team members should begin melting their buds at the same time and both should check at the same time to see if their bud has melted.
- Form teams and allocate roles. Ask managers to collect team equipment and allow time for students to complete the activity.
- Ask students to write in their journal, which type of chocolate melted fastest.
- Invite teams to report and discuss their results to the class. Ask questions.
- Add observations and results to the investigation planner.



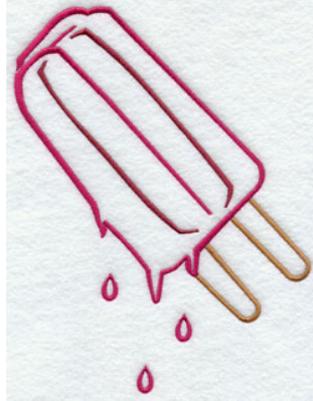
<p>ST1-4WS ST1-3VA Students question and predict by: -responding to and posing questions Students process and analyse data and information by: -using a range of methods to sort information. -identify similarities and differences in the findings of their investigations comparing observations with predictions through discussion, as to whether observations were expected and related to their questions and/or predictions -sharing their ideas about the need for safety, care and honesty in observing, recording, displaying and interpreting data and/or information Students communicate by: representing and communicating observations and ideas. ST1-15I displaying data and information in a variety of ways</p>	<p>CHANGE CHAMPIOMS 1 Lesson Learning Objective: <i>Students communicate with others the information they have gathered about the effects of materials on sound.</i></p> <ul style="list-style-type: none"> - Review the unit using the class and student science journals, particularly the descriptive and comparative language. - Read through the enlarged copy of 'Food Changes'. Remind students about word chains by looking at the word chains they created when exploring spaghetti. Discuss how the word chains started with the food and showed what changes happened to the spaghetti as well as what caused the changes. - Explain to students that they will be cutting the sheet into boxes then making three word chains that show how three foods change. Each food chain should have one on each number from one to six. Once the students have sorted the words they then paste them into their science journal. Remind students to draw arrows between the words. - Model an example of a word chain on the board using bread and toast. - Allow students time to complete the activity. - Ask students to share their completed word chains with the class and discuss the answers. - Review the unit with the class posing the following questions; <ul style="list-style-type: none"> • Which activity did you most enjoy? Why? • What ideas about food changes have you changed? Why? What made you change your ideas? • What new ideas have you developed? 	
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Resources	Assessment overview
<p>Lesson 1:</p> <ul style="list-style-type: none"> - Large 'what happened' sheet. - Large 'think, pair, share' sheet. - Melted icy pole. - 'Spot the difference' sheet. <p>Lesson 2:</p> <ul style="list-style-type: none"> - Uncooked spaghetti - Cooked spaghetti - Small marshmallows - Large marshmallows - Word cards <p>Lesson 3:</p> <ul style="list-style-type: none"> - Bread and toast - Plastic resealable bag - Chocolate bud - Uncooked popcorn kernels - Cooked popcorn - Prepare A sample of cooled melted chocolate and cooled popcorn for each team to use for the 'after cooling' section of the resource sheet. <p>Lesson 4:</p> <ul style="list-style-type: none"> - Silly eggs sheet (primary connections book). <p>Lesson 5:</p> <p><u>One of each per team:</u></p> <ul style="list-style-type: none"> - White chocolate bud in a plastic resealable bag. - Dark chocolate bud in a plastic resealable bag. <p>Lesson 6:</p> <ul style="list-style-type: none"> - Food changes sheet in journal 	<p>Lesson 1: WILF discussion about the properties of food.</p> <p>Lesson 2: contribution to spaghetti word chain.</p> <p>Lesson 3: students' descriptions of changes in the properties of food when heated or cooled.</p> <p>Lesson 4: WILF, evidence that students are developing an understanding of materials and changes to the properties of materials.</p> <p>Lesson 5: Are students are to follow directions to conduct a simple investigation about how materials can change?</p> <p>Lesson 6: Are students able to identify everyday materials and their properties and observe and describe changes to the properties of everyday materials.</p>



What happened?



Can you help solve the mystery?

What was it before? Can you describe it?

Why did it change?

Did it change slowly or quickly?

Could you make it go back to how it was before? Why? Why not

Think, Pair, Share

- 1) **THINK** about the question without speaking. Think of as many answers as you can.
- 2) **PAIR** up with a partner and take turns to listen to each others' ideas. Are your ideas different or the same? Agree on one answer.
- 3) **SHARE** your answer with the rest of the group.



Spot the difference

Uncooked spaghetti	Cooked spaghetti



Heat and Cool

	Before heating	After heating	After cooling
Chocolate			
Popcorn			

LESSON 4

Silly Eggs

*** See sheet in folder

LESSON 6





Food Changes

 1 melted ice pole	 1 popcorn kernels	 1 chocolate
2 smooth yummy	2 runny sticky	2 small hard
4 popped popcorn	4 frozen ice pole	4 melted chocolate
5 cold hard	5 white fluffy	5 runny yummy
6 It can be changed back	6 It can't be changed back	6 It can be changed back

Cut out the boxes to make word chains about changing these three foods.

Food changes

Spot the difference



