Marvellous micro-organisms unit overview

		SCIENCE OUTCOMES	LITERACY OUTCOMES	LESSON SUMMARY	ASSESSMENT OPPORTUNITIES
		Students will be able to	Students will be able to	Students	
ENGAGE	**Lesson 1** The Y factor ***Session 1*** Exploring bread ***Session 2*** The bread-making process ***Session 3*** Anton van Leeuwenhoek: microscope maker	• use their senses of sight, touch, smell and taste to make observations • represent what they think they know about the bread-making process as a flow chart • explain that yeast is an ingredient in some breads • describe Anton van Leeuwenhoek's contribution to the study of micro-organisms.	• contribute to discussions about different types of bread • use bread labels to locate ingredient information and synthesise understanding of bread ingredients • record information in a table • represent what they think they know about the bread-making process as a flow chart • understand the purpose, structure and features of a factual recount • read a factual recount about Anton van Leeuwenhoek and identify the key points.	***Session 1*** Exploring bread • observe, taste and record information about different types of bread • share and discuss observations. 'Observation record: Exploring bread' (Resource sheet 1) ***Session 2*** The bread-making process • use a flow chart to represent what they think they know about the bread-making process. ***Session 3*** Anton van Leeuwenhoek: Microscope maker • read and discuss a factual recount about Anton van Leeuwenhoek • discuss the words 'microscope' and 'micro-organism' • reflect on the lesson. 'Anton van Leeuwenhoek: Microscope maker' (Resource sheet 2)	**Diagnostic assessment** 'Observation record: Exploring bread' (Resource sheet 1) Flow chart Science journal entries

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EXPLORE	**Lesson 2** Yeast feast	• follow directions to investigate some ingredients that make yeast produce gas (carbon dioxide) • observe, record and interpret the results of their investigation • identify the features that made their investigation a fair test • explain that when water and sugar are added to yeast it produces a gas.	• follow a procedural text to complete an investigation • use oral, written and visual language to record and discuss investigation results • engage in discussion to compare ideas, and relate evidence from an investigation to explanations about yeast • demonstrate understanding of the effect of sugar and water on yeast activity through science journal entries.	• review what they think they know about yeast • read and discuss a procedural text • observe, record and deduce that yeast produces a gas when mixed with some ingredients. 'What happens when yeast is mixed with sugar and water?' (Resource sheet 3)	**Formative assessment** Science journal entries

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EXPLORE	**Lesson 3** Putting the heat on yeast	• plan an investigation, with teacher support, of the effect of temperature on the activity of yeast • observe, record and interpret the results of their investigation • identify the features that made their investigation a fair test • describe the effect of temperature on gas production by yeast.	• follow a procedural text to complete an investigation • use oral, written and visual language to record and discuss investigation results • engage in discussion to compare ideas, and use evidence from an investigation to explain how temperature affects the activity of yeast • demonstrate understanding of the effect of temperature on yeast activity through science journal entries.	• discuss conditions that promote yeast activity • read and discuss a procedural text • work in cooperative learning teams to investigate the best temperature to support yeast activity. 'What is the best temperature for yeast to be active?' (Resource sheet 4)	**Formative assessment** Science journal entries

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EXPLORE	**Lesson 4** Knead the loaf	• identify steps in the bread-making process • observe and describe the role of yeast in making bread rise.	• use oral, written and visual language to clarify their understanding of yeast • use writing and drawing to clarify their ideas and explanations of the role of yeast in the bread-making process.	• review what they know about yeast • discuss the role of yeast in the bread-making process • observe the bread-making process using a bread machine.	**Formative assessment** Science journal entries
EXPLAIN	**Lesson 5** Food observations	• describe the conditions needed for yeast to be active • explain that yeast makes a gas in the dough, which makes the bread lighter • use a flow chart to show the steps in the bread-making process.	• use oral, written and visual language to summarise their understanding of yeast • present a brief explanation or summary to peers • compare explanations and engage in argument • demonstrate understanding of how bread is made by revising their flow charts (from Lesson 1).	• work in teams to create summaries of their yeast investigations • review their flow chart from Lesson 1 • work in teams to generate a flow chart that represents their current understanding of the bread-making process • share their current understanding in teams.	**Formative assessment** Summary Flow chart

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ELABORATE	**Lesson 6** Mystery moulds ***Session 1*** A nightmare in my lunch box ***Session 2*** Investigating mould	• plan an investigation that is a fair test • conduct an investigation, make and record observations • interpret their observations and make a conclusion that answers their research question • describe the conditions that encourage the growth of food mould.	• understand the purpose, structure and features of an information report • read an information report about mould, and identify the main ideas • engage in discussion to compare ideas, and to develop an understanding of the conditions that affect the growth of food mould • use oral, written and visual language to design, implement and report on an investigation about food mould • demonstrate understanding of food mould through science journal entries.	***Session 1*** A nightmare in my lunch box • observe samples of mould • read and discuss an information report about mould 'Moulds' (Resource sheet 5) ***Session 2*** Investigating mould • work in teams to plan and set up an investigation to determine factors that affect mould growth on food • observe and record the results of their investigations. 'Mould growth investigation planner' (Resource sheet 6)	**Summative assessment** 'Mould growth investigation planner' (Resource sheet 6) Information report

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ELABORATE	**Lesson 7** Medical micro-organisms	• explain that penicillin is made by a mould and is used to treat infections • describe the role of Fleming and Florey in the discovery and development of penicillin • discuss how sometimes scientific discoveries happen by chance.	• understand the purpose, structure and features of a factual recount • read a factual recount about the history of penicillin, and identify the main ideas • use oral, written and visual language to develop understandings and clarify ideas and explanations of medical micro-organisms • use textual sources to locate information and compare ideas.	• review their food mould investigation • read a factual recount of the role of Fleming and Florey in the discovery and development of penicillin. 'Penicillin—the miracle mould' (Resource sheet 7)	Science journal entries

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EVALUATE	**Lesson 8** Micro-organisms experts	• explain that yeast obtains energy when it breaks down sugars, a process that releases a gas (carbon dioxide) • explain that yeast grows faster at warm temperatures than when it is cold or hot • explain that the gas produced by yeast forms pockets of gas in the dough and this makes bread rise • describe the conditions that affect the growth of mould on food.	• engage in discussion to compare ideas and generate explanations • demonstrate understanding of micro-organisms through representing ideas in a presentation • make a presentation to an audience about their understanding of micro-organisms.	• work in cooperative teams to prepare a presentation on the role of micro-organisms in their lives • make presentations to an audience.	**Summative assessment** Presentations Science journal entries