

Year 6 Assessment Rubrics

Year 6 Achievement Standard

By the end of Year 6, students compare and classify different types of observable changes to materials. They analyse requirements for the transfer of electricity and describe how energy can be transformed from one form to another to generate electricity. They explain how natural events cause rapid change to the Earth's surface. They describe and predict the effect of environmental changes on individual living things. Students explain how scientific knowledge is used in decision making and identify contributions to the development of science by people from a range of cultures.

Students follow procedures to develop investigable questions and design investigations into simple cause-and-effect relationships. They identify variables to be changed and measured and describe potential safety risks when planning methods. They collect, organise and interpret their data, identifying where improvements to their methods or research could improve the data. They describe and analyse relationships in data using graphic representations and construct multi-modal texts to communicate ideas, methods and findings.

Organisers	CONTENT DESCRIPTIONS	ACHIEVEMENT STANDARD	EVIDENCE	LEVEL OF ACHIEVEMENT		
				BELOW ACHIEVEMENT STANDARD	AT ACHIEVEMENT STANDARD	ABOVE ACHIEVEMENT STANDARD
SCIENCE UNDERSTANDING						
Biological sciences	The growth and survival of living things are affected by the physical conditions of their environment (ACSSU094)	Describes and predicts the effect of environmental changes on individual living things	<i>Marvellous micro-organisms</i> Presentation	<ul style="list-style-type: none">Recalls the conditions that micro-organisms need to growLists the role of micro-organisms in food and medicine	<ul style="list-style-type: none">Explains the conditions that micro-organisms need to growDescribes the role of micro-organisms in food and medicine	<ul style="list-style-type: none">Provides detailed information about micro-organisms, how they are affected by the conditions of their environment, and the importance of the role they play in our lives

AC The Achievement standard and Content descriptions are sourced from the Australian Curriculum.

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				BELOW ACHIEVEMENT STANDARD	AT ACHIEVEMENT STANDARD	ABOVE ACHIEVEMENT STANDARD
SCIENCE UNDERSTANDING						
Chemical sciences	Changes to materials can be reversible, such as melting, freezing, evaporating; or irreversible, such as burning and rusting (ACSSU095)	Compares and classifies different types of observable changes to materials	<i>Change detectives</i> Report	<ul style="list-style-type: none">Identifies different changes to materials and suggests why they have occurred	<ul style="list-style-type: none">Identifies different changes to materials and explains why they have occurred	<ul style="list-style-type: none">Explains in detail the chemical and physical changes to materials, why they have occurred and if they are reversible or irreversible
Earth and space sciences	Sudden geological changes or extreme weather conditions can affect Earth's surface (ACSSU096)	Explains how natural events cause rapid change to the Earth's surface	<i>Earthquake explorers</i> Poster	<ul style="list-style-type: none">Lists the causes and effects of earthquakes	<ul style="list-style-type: none">Describes the causes and effects of earthquakes	<ul style="list-style-type: none">Describes and explains the causes and effects of earthquakes

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				BELOW ACHIEVEMENT STANDARD	AT ACHIEVEMENT STANDARD	ABOVE ACHIEVEMENT STANDARD
SCIENCE UNDERSTANDING						
Physical sciences	Electrical circuits provide a means of transferring and transforming electricity (ACSSU097)	Analyses requirements for the transfer of electricity	<i>It's electrifying</i> Report	<ul style="list-style-type: none">Describes non-scientific ideas about requirements for the transfer of electricity	<ul style="list-style-type: none">Describes how energy is transferred within an electric circuit	<ul style="list-style-type: none">Provides detailed information about how energy is transferred within an electric circuit and the role of each of its components
	Energy from a variety of sources can be used to generate electricity (ACSSU219)	Describes how energy can be transformed from one form to another to generate electricity	<i>Essential energy</i> Poster Flyer	<ul style="list-style-type: none">Recalls simple ideas about sources and uses of energy	<ul style="list-style-type: none">Describes how energy can be transformed from one form to another to generate electricity	<ul style="list-style-type: none">Describes and explains how energy from a variety of sources is transferred and transformed to generate electricity

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SCIENCE AS A HUMAN ENDEAVOUR						
Nature and development of science	Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena (ACSHE098)	Discusses how science involves developing investigable questions and collecting, organising and interpreting their data	<ul style="list-style-type: none">• <i>Marvellous micro-organisms</i>• <i>Change detectives</i>• <i>Earthquake explorers</i>• <i>It's electrifying</i>• <i>Essential energy</i>	Recalls that science involves asking questions and collecting data	Discusses how science involves developing investigable questions and collecting, organising and interpreting their data	Provides a detailed understanding of how science involves developing investigable questions, collecting data to test predictions, and analysing their data
	Important contributions to the advancement of science have been made by people from a range of cultures (ACSHE099)	Identifies contributions to the development of science by people from a range of cultures	<ul style="list-style-type: none">• <i>Marvellous micro-organisms</i>• <i>Change detectives</i>• <i>Earthquake explorers</i>• <i>It's electrifying</i>• <i>Essential energy</i>	Suggests how different cultures have contributed to the development of science knowledge	Identifies contributions to the development of science by people from a range of cultures	Has a detailed understanding of how different cultures have contributed to the development of science knowledge

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SCIENCE AS A HUMAN ENDEAVOUR						
Use and influence of science	Scientific understandings, discoveries and inventions are used to solve problems that directly affect people's lives (ACSHE100)	Explains how scientific knowledge is used in decision making	<ul style="list-style-type: none">• <i>Marvellous micro-organisms</i>• <i>Change detectives</i>• <i>Earthquake explorers</i>• <i>It's electrifying</i>• <i>Essential energy</i>	Makes suggestions about how scientific knowledge has affected people's lives	Explains how scientific knowledge is used in decision making	Describes in detail how scientific knowledge has affected people's lives and influenced their decision making
	Scientific knowledge is used to inform personal and community decisions (ACSHE220)					

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SCIENCE INQUIRY SKILLS						
Questioning and predicting	With guidance, pose questions to clarify practical problems or inform a scientific investigation, and predict what the findings of an investigation might be (AC SIS232)	Follows procedures to develop investigable questions	<i>Elaborate</i> phase in: <ul style="list-style-type: none">• <i>Marvellous micro-organisms</i>• <i>It's electrifying</i>• <i>Change detectives</i>• <i>Essential energy</i>	<p>Suggests questions to investigate</p> <p>Predicts what might happen in an investigation, without supporting evidence</p>	Follows procedures to develop investigable questions	Asks pertinent and investigable questions and predicts the outcomes of investigations, supported with detailed evidence based on their knowledge and experiences

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SCIENCE INQUIRY SKILLS						
Planning and conducting	With guidance, plan appropriate investigation methods to answer questions or solve problems (ACSIS103)	Designs investigations into simple cause-and-effect relationships	<i>Elaborate</i> phase in: <ul style="list-style-type: none"><i>Marvellous micro-organisms</i><i>Change detectives</i><i>Essential energy</i>	Follows procedures to plan an investigation	Designs investigations into simple cause-and-effect relationships	Demonstrates a detailed understanding of how to design and conduct science investigations to answer questions or solve problems
	Decide which variable should be changed and measured in fair tests and accurately observe, measure and record data, using digital technologies as appropriate (ACSIS104)	Identifies variables to be changed and measured	<i>Elaborate</i> phase in: <ul style="list-style-type: none"><i>Marvellous micro-organisms</i><i>Change detectives</i><i>Essential energy</i>	Lists ideas on variables in fair tests	Identifies variables to be changed and measured	Identifies variables and articulates why a test is fair or not
	Use equipment and materials safely, identifying potential risks (ACSIS105)	Describes potential safety risks when planning methods	<i>Elaborate</i> phase in: <ul style="list-style-type: none"><i>Change detectives</i>	Follows guidelines on how to safely use equipment to make and record observations	Describes potential safety risks when planning methods	Explains in detail the potential safety risks when planning methods

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SCIENCE INQUIRY SKILLS						
Processing and analysing data and information	Construct and use a range of representations, including tables and graphs, to represent and describe observations, patterns or relationships in data using digital technologies as appropriate (AC SIS107)	Describes and analyses relationships in data using graphic representations	<i>Elaborate</i> phase in: <ul style="list-style-type: none"><i>Marvellous micro-organisms</i><i>It's electrifying</i><i>Change detectives</i><i>Essential energy</i>	Follows simple procedures to use provided tables and graphs and describes relationships in data	Describes and analyses relationships in data using graphic representations	Independently constructs and uses tables and graphs to represent and analyse observations, patterns or relationships in data
	Compare data with predictions and use as evidence in developing explanations (AC SIS221)	Collects, organises and interprets their data	<i>Elaborate</i> phase in: <ul style="list-style-type: none"><i>Marvellous micro-organisms</i><i>It's electrifying</i><i>Essential energy</i>	Suggests reasons for findings that are obvious and follow explicitly from evidence	Collects, organises and interprets their data	Analyses data to explain findings and use as evidence in developing explanations

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SCIENCE INQUIRY SKILLS						
Evaluating	Suggest improvements to the methods used to investigate a question or solve a problem (ACSIS108)	Identifies where improvements to their methods or research could improve the data	<i>Elaborate</i> phase in: <ul style="list-style-type: none"><i>Marvellous micro-organisms</i><i>It's electrifying</i>	Demonstrates non-scientific ideas of a fair investigation	Identifies where improvements to their methods or research could improve the data	Articulates why a test is fair or not and suggests ways to improve the investigation
Communicating	Communicate ideas, explanations and processes in a variety of ways, including multi-modal texts (ACSIS110)	Constructs multi-modal texts to communicate ideas, methods and findings	<i>Elaborate</i> phase in: <ul style="list-style-type: none"><i>Earthquake explorers</i> <i>Evaluate</i> phase in: <ul style="list-style-type: none"><i>Essential energy</i>	Presents a limited report on findings	Constructs multi-modal texts to communicate ideas, methods and findings	Completes extended reports using claims and evidence to communicate their methods and findings

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GLOSSARY

Describe	Give an account of characteristics or features.
Identify	Establish or indicate who or what someone or something is.
Considered	Formed after careful thought.
Apply	Use, utilise or employ in a particular situation.
Explain	Provide additional information that demonstrates Understanding of reasoning and/or application.
Sequence	Arrange in order.
Familiar	Previously encountered in prior learning activities.
Discuss	Talk or write about a topic, taking into account different issues and ideas.
Compare	Estimate, measure or note how things are similar or dissimilar.
Analyse	Consider in detail for the purpose of finding meaning or relationships, and identifying patterns, similarities and differences.

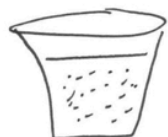
Acknowledgements

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Disclaimer

The views expressed herein do not necessarily represent the views of the Australian Government.

Mess Scene Report



Physical change

The salt in the glass is dissolved in the glass. Some people think that it has disappeared but it is still there because you can taste it.



Physical change

The candle burns the wax and the wax turns into a liquid and runs down the candle. Some of the candle evaporates.



Chemical change

The perfume spills out of the bottle and evaporates into the air.



Physical change

The chocolate melts and turns into a liquid. If you put the chocolate into the fridge it will go solid.

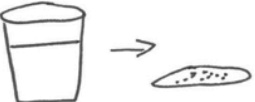
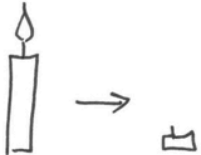
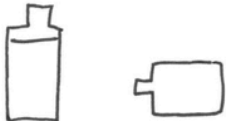

Year 6 Work samples

Change detectives

Summative Assessment of Science Understanding

Below Achievement Standard

Mess Scene Report

 <p>Physical change</p>	<p>When salt is put into a glass of water it disperses throughout the water. When you evaporate the water the salt particles will be left behind.</p>
 <p>Chemical change</p>	<p>The candle burns the wax which turns into a gas which becomes water and carbon dioxide. It can't be reversed.</p>
 <p>Physical change</p>	<p>Perfume has particles in it which escape from the bottle and evaporate. You can't recover it.</p>
 <p>Physical change</p>	<p>The chocolate melts and the chocolate particles heat up and move around quicker and become a liquid. If you cool the chocolate it will go back to a solid.</p>

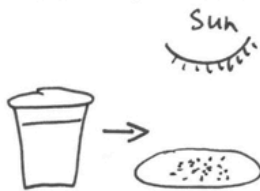
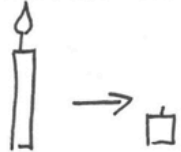


Year 6 Work samples

Change detectives

Summative Assessment of Science Understanding

At Achievement Standard

Mess Scene Report

 <p>Physical change</p>	<p>Salt is made up of small solids. When the salt is put into a glass of water it disperses throughout the water. To recover the salt particles you need to evaporate the water which turns it into a gas and leaves the salt behind.</p>
 <p>Chemical change</p>	<p>When the candle is burning the wax becomes a liquid and then turns into a gas and combines with the oxygen. This changes to water and carbon dioxide which is a new substance and can't be reversed.</p>
 <p>Physical change</p>	<p>Perfume has particles in it which escape from the liquid in the bottle and dispersed into the room and evaporates. You can't recover it because the particles have evaporated and are too far dispersed.</p>
 <p>Physical change</p>	<p>When chocolate is melted the chocolate particles have changed from being tightly packed together in a solid to heating up and having more energy to move around more freely and become a liquid. If the melted chocolate is cooled it will go back to a solid but won't have the same shape as before.</p>

Year 6 Work samples

Change detectives

Summative Assessment of Science Understanding

Above Achievement Standard

Questioning and predicting


<p>What are you going to investigate?</p> <p>Which water temperature will affect the fizzing of the tablet and which will not.</p> <p>Can you write it as a question?</p>	<p>What do you think will happen? Explain why.</p> <p>I predict that the hot water will make the tablet fizz faster.</p> <p>Give scientific explanations for your prediction</p>
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Year 6 Work samples

Change detectives Summative Assessment of Science Inquiry Skills

Below Achievement Standard

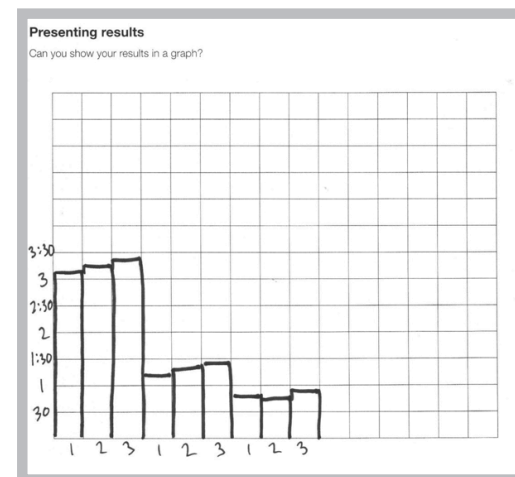
Planning and conducting

<p>Describe how you will set up your investigation.</p> <p>Observe & time each tablet</p>  <p>cold warm hot and how long it fizzes.</p> <p>Use drawings if necessary</p>	<p>What equipment will you need?</p> <ul style="list-style-type: none"> • 3 plastic cups • stopwatch • cold, warm & hot water • 3 tablets <p>Use dot points</p>
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To make the test fair, what things (variables) are you going to:		
<p>Change?</p> <p>The water that we use</p> <p>Change only one thing</p>	<p>Measure?</p> <p>Which water makes the tablet fizz the most</p> <p>What would the change affect?</p>	<p>Keep the same?</p> <ul style="list-style-type: none"> • the type of tablet • the amount of water <p>Which variables will you control?</p>

<p><u>Safety precautions</u></p> <p>Don't be silly because there is hot water.</p>
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Processing and analysing data and information



<p>Explaining results</p> <p>When you changed ...the water temp... what happened to the speed of the reaction?</p> <p>The fastest was the hot water and the slowest was the cold water.</p> <p>Did the result match your prediction? Explain why and how it was different.</p> <p>No, I thought it would be the cold water.</p>
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Evaluating

<p>Evaluating the investigation</p> <p>What challenges did you experience doing this investigation?</p> <p>Using the stopwatch</p> <p>How did you, or could you, overcome them?</p> <p>We got used to using it.</p> <p>How could you improve this investigation? (fairness/accuracy)</p> <p>Use different sized tablets and different water temperatures.</p>
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Questioning and predicting

<p>What are you going to investigate?</p> <p>What effect does water temperature have on the rate of the reaction of the water and the tablet?</p> <p>Can you write it as a question?</p>	<p>What do you think will happen? Explain why.</p> <p>I predict that the hot water will make the tablet fizz the fastest because the heat of the water will speed it up.</p> <p>Give scientific explanations for your prediction</p>
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Year 6 Work samples

Change detectives Summative Assessment of Science Inquiry Skills

At Achievement Standard

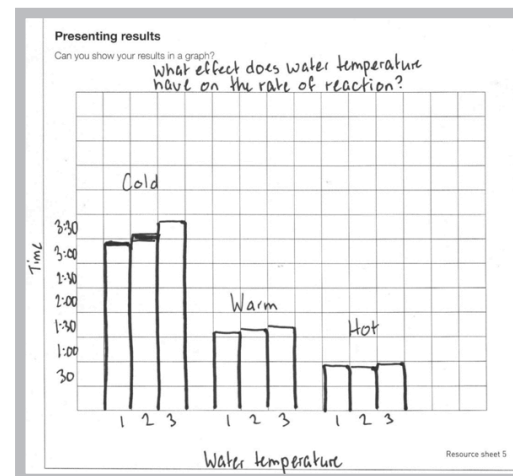
Planning and conducting

<p>Describe how you will set up your investigation.</p> <ol style="list-style-type: none"> 1. Get the water and put it in the glass 2. Put the tablet in and time how long it fizzes for. 3. Try the other water <p>Use drawing if necessary</p>	<p>What equipment will you need?</p> <ul style="list-style-type: none"> • cold water, hot water and warm water • 3 fizzy tablets • stopwatch • a container. <p>Use dot points</p>
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To make the test fair, what things (variables) are you going to:		
<p>Change?</p> <p>the temperature of the water</p> <p>Change only one thing</p>	<p>Measure?</p> <p>how long the tablet fizzes</p> <p>What would the change affect?</p>	<p>Keep the same?</p> <ul style="list-style-type: none"> • the type of tablet • the amount of water • the type of container <p>Which variables will you control?</p>

<p><u>Safety precautions</u></p> <ol style="list-style-type: none"> 1. Don't put your hand in the water. 2. Don't be silly around the water 3. Don't put the tablet in your mouth.

Processing and analysing data and information



<p>Explaining results</p> <p>When you changed... the water temp... what happened to the speed of the reaction?</p> <p>We found out that hot water was the fastest and cold water was the slowest. The averages were - hot water - 42s, warm water 1:15 mins and cold water - 3:14 mins.</p> <p>Did the result match your prediction? Explain why and how it was different.</p> <p>Yes I predicted the hot water would be the fastest. because the heat of the water would speed it up.</p>

Evaluating

<p>Evaluating the investigation</p> <p>What challenges did you experience doing this investigation?</p> <p>Knowing exactly when the tablet had stopped fizzing.</p> <p>How did you, or could you, overcome them?</p> <p>We all looked at the tablet and agreed when it had stopped.</p> <p>How could you improve this investigation? (fairness/accuracy)</p> <p>Do more trials to make sure our results are accurate.</p>
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Questioning and predicting

<p>What are you going to investigate?</p> <p>What effect does water temperature have on the rate of the reaction?</p> <p>Can you write it as a question?</p>	<p>What do you think will happen? Explain why.</p> <p>I predict that the hot water will have the fastest reaction with the tablet because hot water has more energy & will make it fizz faster.</p> <p>Give scientific explanations for your prediction</p>
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Year 6 Work samples

Change detectives Summative Assessment of Science Inquiry Skills

Above Achievement Standard

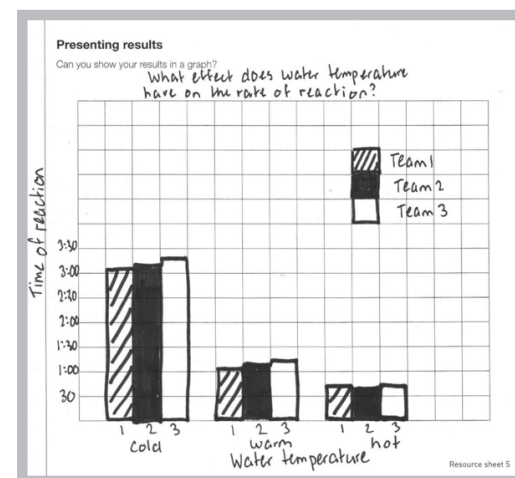
Planning and conducting

<p>Describe how you will set up your investigation.</p> <p>① Set up the three cups and measure & mark the equal level that the water will go to. ② Put water in each cup ③ Observe & time the fizz of the tablet.</p> <p>Use this space for notes</p>	<p>What equipment will you need?</p> <ul style="list-style-type: none"> • 3 plastic cups • marker • water - cold, warm, hot • 3 fizzy tablets • ruler • stopwatch <p>Use this space for notes</p>
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To make the test fair, what things (variables) are you going to:		
<p>Change?</p> <p>the temperature of the water</p> <p>Change only one thing</p>	<p>Measure?</p> <p>how long the tablet fizzes for</p> <p>What would the change affect?</p>	<p>Keep the same?</p> <ul style="list-style-type: none"> • the type of tablet • the amount of water • the type of container <p>Which variables will you control?</p>

<p><u>Safety Precautions</u></p> <ol style="list-style-type: none"> 1. Hot water burns so don't put your fingers into the cup 2. Be careful when you drop the tablet because the hot water might splash. 3. Don't eat or drink any of the investigation materials 	
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Processing and analysing data and information



<p>Explaining results</p> <p>When you changed... the water temp... what happened to the speed of the reaction?</p> <p>Our claim is that the hotter the temperature of the water the faster the speed of the reaction.</p> <p>Our evidence is: hot water averaged 45s, warm water averaged 1:15mins and cold water averaged 3:15mins</p> <p>Did the result match your prediction? Explain why and how it was different.</p> <p>Yes, I predicted that hot water would be the best at speeding up the reaction.</p>

Evaluating

<p>Evaluating the investigation</p> <p>What challenges did you experience doing this investigation?</p> <p>One of our challenges was putting the tablets into the water at the same time and same distance from the surface of the water.</p> <p>How did you, or could you, overcome them?</p> <p>Everyone could hold the tablet on the rim of the cup so when they drop it the distance would be the same.</p> <p>How could you improve this investigation? (fairness/accuracy)</p> <p>We could improve the investigation by making sure that the temperature of the water is measured so that they are all equal and it is more fair.</p>
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Student Self-Assessment

Change detectives Year 6 Chemical sciences

Name: _____ Date: _____

Strand	What I can do	I need help to do this	I can do this	I can do this very well
Science Understanding	I can compare and classify different types of observable changes to materials			
Science as a Human Endeavour	I can identify where science is used to ask questions and make predictions			
	I can describe how different cultures have contributed to the development of science knowledge			
	I can describe situations where scientific developments have affected people's lives			
Science Inquiry Skills	I can predict what might happen in an investigation			
	I can suggest ways to do an investigation			
	I can identify the variables in an investigation			
	I can describe how to use equipment safely			
	I can record my observations in a table			
	I can make a column or line graph			
	I can find patterns and relationships in my data			
	I can make claims based on my evidence			
	I can compare my results with my predictions			
	I can explain why a test is fair or not			
	I can describe where improvements could be made in my investigation			
	I can make a report about my claims and evidence from my investigation and share it with others			

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