

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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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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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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				BELOW ACHIEVEMENT STANDARD	AT ACHIEVEMENT STANDARD	ABOVE ACHIEVEMENT STANDARD
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.

Earthquake hits New Zealand!

A large earthquake hit Christchurch on Tuesday the 22nd of February 2011 at lunchtime.

Lots of people were on the streets because it was lunchtime and so many people were killed.

Lots of buildings collapsed including old buildings like cathedrals.

The cost was of all the damage was \$4billion.

Scientists think that the earthquake was caused by plates shifting under the ground.



Year 6 Work samples

Earthquake explorers

Summative Assessment of Science Understanding

Below Achievement Standard

New Zealand Earthquake 2011

Where did it happen?

Christchurch, New Zealand

When did it happen?

On Tuesday the 22nd of February

What was the Richter scale reading?

6.3

What was the Modified Mercalli scale level?

Disastrous

Who was affected?

185 died and several thousand were injured. Most of the lives lost were in the six-storey Canterbury Television (CTV) Building which collapsed and caught fire.

Describe the damage caused

The earthquake caused the ground to lift by up to two metres in some places. Lots of old and new buildings were destroyed, walls crumbled and rock cliffs collapsed. Railway lines were buckled. The earthquake caused \$40 billion in damage.

What could have caused the earthquake?

New Zealand is on the middle of the Australian and the Pacific tectonic plates and the plates are shifting.



Year 6 Work samples

Earthquake explorers

Summative Assessment of Science Understanding

At Achievement Standard

LARGEST EARTHQUAKE TO HIT NEW ZEALAND IN 80 YEARS

On Tuesday the 22nd of February an earthquake struck the city of Christchurch in New Zealand.

The earthquake was 6.3 on the Richter scale and the 'Disastrous' level on the Modified Mercalli scale.

In total, 185 people lost their lives in the earthquake and several thousand were injured.



(www.cnn.com)



Many old buildings were damaged including many historic buildings because of the earthquake or the liquefaction that was caused afterwards. Liquefaction is when sludge from under the ground is forced up through cracks in the ground. Streets and properties were covered in thick layers of sludge, water and sewerage. Several thousand homes had to be demolished. It is estimated that 70 000 people left the city after the earthquake because their homes were damaged so badly.

The total estimated cost of the earthquake is estimated to be over \$40 billion.

The cause of the earthquake is because New Zealand is on the boundary between the Australian and the Pacific tectonic plates and is slowly being pulled apart as the plates shift.



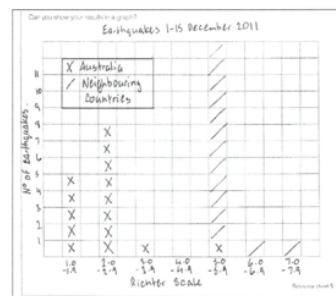
Year 6 Work samples

Earthquake explorers Summative Assessment of Science Understanding

Above Achievement Standard

Processing and analysing data and information

Earthquakes down under



1. What is the story of the column graph? What are the patterns?

The most earthquakes occurred in neighbouring countries between 5.0-5.9. Next was Australia (2.0-2.9) and third Australia (1.0-1.9). Last was no one (4.0-4.9).

2. How would you describe the difference in earthquake activity between Australia and neighbouring countries?

Neighbouring countries had more severe earthquakes.

3. Where do stronger earthquakes occur? Neighbouring countries.

4. Why do stronger earthquakes occur near plate boundaries?

Because the plates move where the boundaries are and that causes earthquakes.

5. Where would you choose to live if you wanted to be safe from strong earthquakes?

In Australia.

Year 6 Work samples

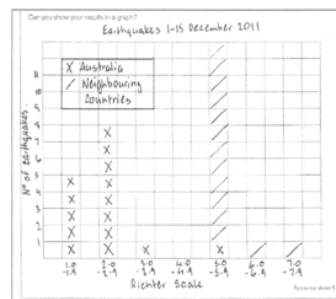
Earthquake explorers

Summative Assessment of Science Inquiry Skills

Below Achievement Standard

Processing and analysing data and information

Earthquakes down under



1. What is the story of the column graph? What are the patterns?

Australia had lots of minor earthquakes. The more severe earthquakes occurred in the neighbouring countries. Australia had more earthquakes than its neighbouring countries.

2. How would you describe the difference in earthquake activity between Australia and neighbouring countries?

Australia's earthquakes were less severe but there were more of them.

3. Where do stronger earthquakes occur? Neighbouring countries.

4. Why do stronger earthquakes occur near plate boundaries?

Because there is more pressure along the plate boundaries which causes lots of shaking.

5. Where would you choose to live if you wanted to be safe from strong earthquakes?

In Australia because the earthquakes are not very strong.

Year 6 Work samples

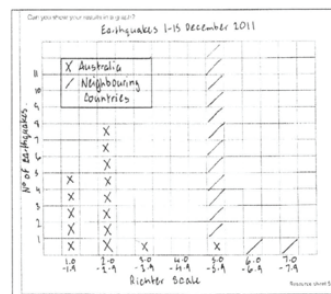
Earthquake explorers

Summative Assessment of Science Inquiry Skills

At Achievement Standard

Processing and analysing data and information

Earthquakes down under



- What is the story of the column graph? What are the patterns?
Australia's earthquakes were less severe than other countries. Most of the earthquakes in Australia were between 1.0 and 2.9 on the Richter scale. Neighbouring countries were between 5.0 and 5.9. Not many severe earthquakes occurred.
- How would you describe the difference in earthquake activity between Australia and neighbouring countries?
Australia's earthquakes were more frequent than its neighbouring countries but were less severe.
- Where do stronger earthquakes occur? Neighbouring countries
- Why do stronger earthquakes occur near plate boundaries?
Along the tectonic plate boundaries there is a lot of pressure as the plates collide with each other. This causes violent shaking on the Earth's surface especially along the plate boundaries.
- Where would you choose to live if you wanted to be safe from strong earthquakes?
In the Northern Territory in the middle of Australia as it only had one minor earthquake and it is far from a tectonic plate boundary.

Year 6 Work samples

Earthquake explorers Summative Assessment of Science Inquiry Skills

Above Achievement Standard

Student Self-Assessment

Earthquake explorers Year 6 Earth and Space 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 describe the causes and effects of earthquakes			
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			

Achievement Standard Class Checklist

Earthquake explorers Year 6 Chemical sciences

(This checklist is designed to be used in conjunction with the Assessment Rubric for the *Earthquake explorers* unit)

Date: _____

	Science Understanding	Science as a Human Endeavour			Science Inquiry Skills							
	Explains how natural events cause rapid change to the Earth's surface	Develops investigable questions and designs investigations into simple cause-and-effect relationships	Identifies contributions to the development of science by people from a range of cultures	Explains how scientific knowledge is used in decision making	Follows procedures to develop investigable questions	Designs investigations into simple cause-and-effect relationships	Identifies variables to be changed and measured	Describes potential safety risks when planning methods	Describes and analyses relationships in data using graphic representations	Collects, organises and interprets their data	Identifies where improvements to their methods or research could improve the data	Constructs multi-modal texts to communicate ideas, methods and findings
Example: Student A	AAS		AS	AS		AAS	AS		AS			

BAS – Below Achievement Standard This indicates that the student has a limited understanding of the concept and/or skill
AS – At Achievement Standard This indicates that the student has a good understanding of the concept and/or skill
AAS – Above Achievement Standard This indicates that the student has a detailed understanding of the concept and/or skill

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