

Creators and destroyers 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 when generating electricity. They **explain how natural events cause rapid change to Earth's surface**. They describe and predict the effect of environmental changes on individual living things. **Students explain how scientific knowledge helps us to solve problems and inform decisions** and identify historical and cultural contributions.

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 appropriate representations, and construct multimodal texts to communicate ideas, methods and findings.

Note: The sections relevant to *Creators and destroyers* are bolded above. The full rubrics for all year levels are available on the PrimaryConnections website.

Organisers	CONTENT DESCRIPTIONS	ACHIEVEMENT STANDARD	EVIDENCE	LEVEL OF ACHIEVEMENT		
				BELOW ACHIEVEMENT STANDARD	AT ACHIEVEMENT STANDARD	ABOVE ACHIEVEMENT STANDARD
SCIENCE UNDERSTANDING						
Earth and space sciences	Sudden geological changes and extreme weather events can affect Earth's surface (ACSSU096)	Explains how natural events cause rapid change to Earth's surface	<ul style="list-style-type: none"> <i>Creators and destroyers</i> Poster 	<ul style="list-style-type: none"> Describes a volcano 	<ul style="list-style-type: none"> Describes how volcanoes are formed and the effect of a volcanic eruption 	<ul style="list-style-type: none"> Provides detailed information about the formation of a volcano, and the effect of a volcanic eruption on the surrounding area

 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 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, and reflects historical and cultural contributions (ACSHE098)	Discusses how science involves developing investigable questions and collecting, organising and interpreting their data Identifies contributions to the development of science by people from a range of cultures	<ul style="list-style-type: none"> • <i>Creators and destroyers</i> 	<ul style="list-style-type: none"> • Recalls that science involves asking questions and collecting data • Suggests how different cultures have contributed to the development of science knowledge 	<ul style="list-style-type: none"> • Discusses how science involves developing investigable questions and collecting, organising and interpreting their data • Identifies contributions to the development of science by people from a range of cultures 	<ul style="list-style-type: none"> • Provides a detailed understanding of how science involves developing investigable questions, collecting data to test predictions, and analysing their data • Has a detailed understanding of how different cultures have contributed to the development of science knowledge
Use and influence of science	Scientific knowledge is used to solve problems and inform personal and community decisions (ACSHE100)	Explains how scientific knowledge is used in decision-making	<ul style="list-style-type: none"> • <i>Creators and destroyers</i> 	<ul style="list-style-type: none"> • Makes suggestions about how scientific knowledge has affected people's lives 	<ul style="list-style-type: none"> • Explains how scientific knowledge is used in decision-making 	<ul style="list-style-type: none"> • Describes in detail how scientific knowledge has affected people's lives and influenced their decision-making

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SCIENCE INQUIRY SKILLS						
Questioning and predicting	With guidance, pose clarifying questions and make predictions about scientific investigations (ACSIS232)	Follows procedures to develop investigable questions	<i>Elaborate</i> phase in: <ul style="list-style-type: none"> <i>Creators and destroyers</i> 	<ul style="list-style-type: none"> Suggests questions to investigate Predicts what might happen in an investigation, without supporting evidence 	<ul style="list-style-type: none"> Follows procedures to develop investigable questions 	<ul style="list-style-type: none"> 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	Identify, plan and apply the elements of scientific investigations to answer questions and solve problems using equipment and materials safely and identifying potential risks (AC SIS103)	<p>Designs investigations into simple cause-and-effect relationships</p> <p>Describes potential safety risks when planning methods</p>	<p><i>Elaborate</i> phase in:</p> <ul style="list-style-type: none"> • <i>Creators and destroyers</i> 	<ul style="list-style-type: none"> • Follows procedures to plan an investigation • Follows guidelines on how to safely use equipment to make and record observations 	<ul style="list-style-type: none"> • Designs investigations into simple cause-and-effect relationships • Describes potential safety risks when planning methods 	<ul style="list-style-type: none"> • Demonstrates a detailed understanding of how to design and conduct science investigations to answer questions or solve problems • Explains in detail the potential safety risks when planning methods
	Decide variables to be changed and measured in fair tests, and observe, measure and record data with accuracy using digital technologies as appropriate (AC SIS104)	Identifies variables to be changed and measured	<ul style="list-style-type: none"> • <i>Creators and destroyers</i> 	<ul style="list-style-type: none"> • Lists ideas on variables in fair tests 	<ul style="list-style-type: none"> • Identifies variables to be changed and measured 	<ul style="list-style-type: none"> • Identifies variables and articulates why a test is fair or not

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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 (ACSIS107)	Describes and analyses relationships in data using appropriate representations	<i>Elaborate</i> phase in: <ul style="list-style-type: none"> <i>Creators and destroyers</i> 	<ul style="list-style-type: none"> Follows simple procedures to use provided tables and graphs and describes relationships in data 	<ul style="list-style-type: none"> Describes and analyses relationships in data using appropriate representations 	<ul style="list-style-type: none"> 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 (ACSIS221)	Collects, organises and interprets their data	<ul style="list-style-type: none"> <i>Creators and destroyers</i> 	<ul style="list-style-type: none"> Suggests reasons for findings that are obvious and follow explicitly from evidence 	<ul style="list-style-type: none"> Collects, organises and interprets their data 	<ul style="list-style-type: none"> Analyses data to explain findings and use as evidence in developing explanations

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				BELOW ACHIEVEMENT STANDARD	AT ACHIEVEMENT STANDARD	ABOVE ACHIEVEMENT STANDARD
SCIENCE INQUIRY SKILLS						
Evaluating	Reflects on and suggests improvements to scientific investigations (AC SIS108)	Identifies where improvements to their methods or research could improve the data	<ul style="list-style-type: none"> • <i>Creators and destroyers</i> 	<ul style="list-style-type: none"> • Demonstrates non-scientific ideas of a fair investigation 	<ul style="list-style-type: none"> • Identifies where improvements to their methods or research could improve the data 	<ul style="list-style-type: none"> • Articulates why a test is fair or not and suggests ways to improve the investigation
Communicating	Communicate ideas, explanations and processes using scientific representations in a variety of ways, including multimodal texts (AC SIS110)	Constructs multimodal texts to communicate ideas, methods and findings	<i>Evaluate</i> phase in: <ul style="list-style-type: none"> • <i>Creators and destroyers</i> 	<ul style="list-style-type: none"> • Presents a limited report on findings 	<ul style="list-style-type: none"> • Constructs multimodal texts to communicate ideas, methods and findings 	<ul style="list-style-type: none"> • 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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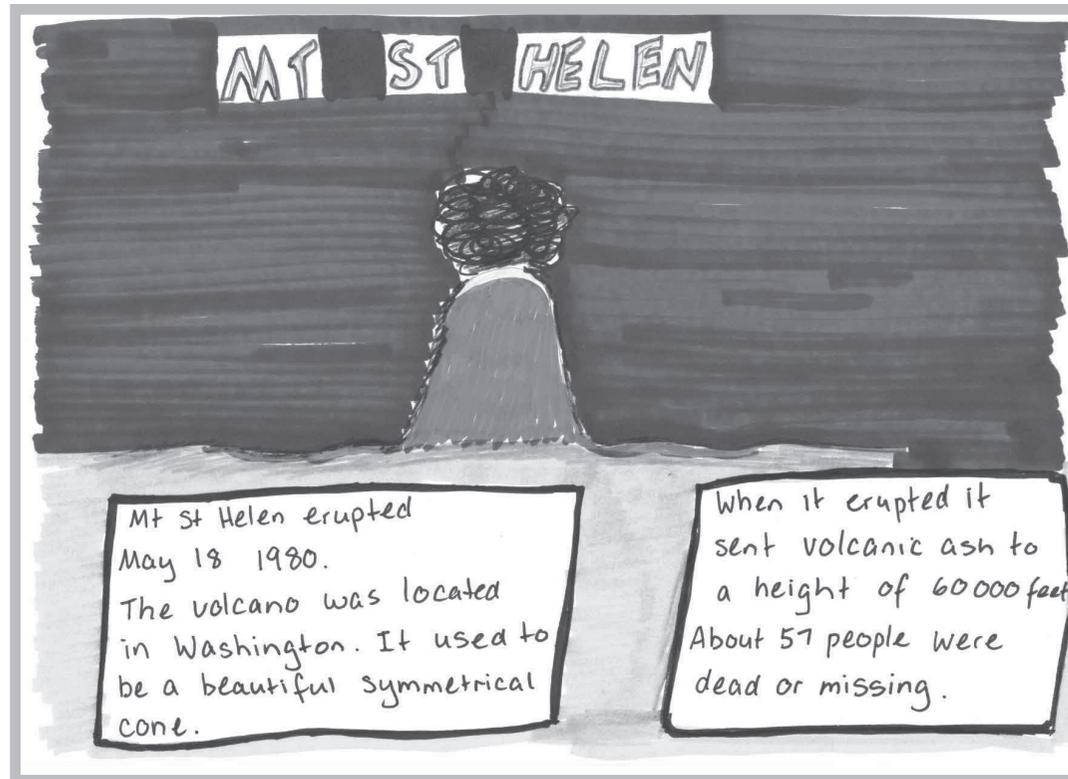
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Year 6 Work samples

Summative Assessment of Science Understanding

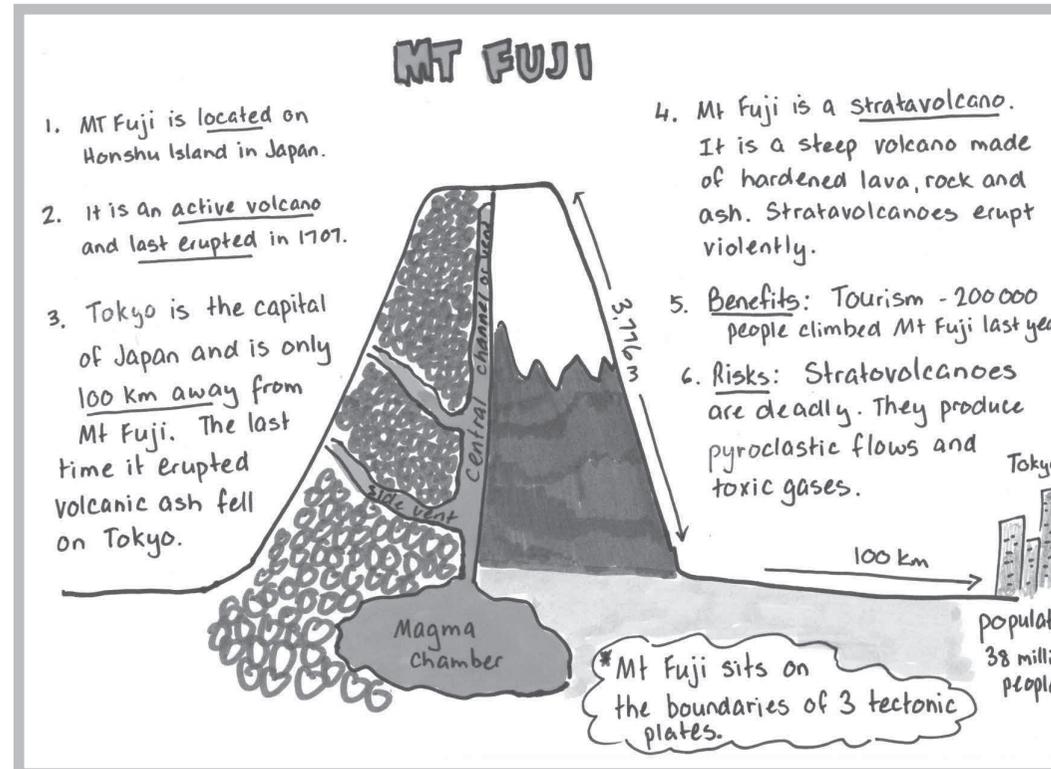
Below Achievement Standard



Year 6 Work samples

Summative Assessment of Science Understanding

At Achievement Standard



Year 6 Work samples

Summative Assessment of Science Understanding

Above Achievement Standard

Mount St Helens

Location: Mount St. Helens is an active volcano located in the United States' Pacific Northwest region. The nearest town to Mount St. Helens is Cougar, Washington, which is around 18 km from the mountain. About 6000 people live in the town.

Last major eruption May 18 1980

Fifty-seven people died. More than 200 homes were destroyed. Ash clogged sewage systems, damaged cars and buildings, and temporarily shut down air traffic.

Signs: For three weeks before earthquakes were recorded as many as three times a day. A "bulge" developed on the north side as magma pushed up within the peak. Measurements suggested the bulge was growing at a rate of up to 1.5 meters per day. By May 17, part of the volcano's north side had been pushed upward and outward more than 135 meters.

Other information:

Native Americans in the Pacific Northwest called the mountain "Louwala-Clough" or "Smoking Mountain."



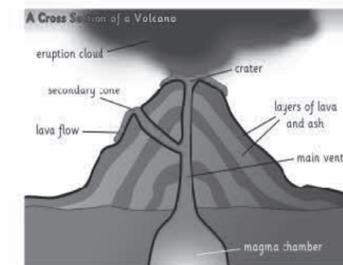
Benefits: The area around Mt St Helens has evolved into a rich and diverse habitat for plants and animals. Lots of tourists visit each day so there are lots of jobs for local people.

Risks: In the past 500 years, over 200,000 people have lost their lives due to volcanic eruptions. Dangers include pyroclastic flows, gases, volcanic earthquakes and lahars

Type of volcano

Mount St. Helens is an active stratovolcano. This volcano is well known for its ash explosions and pyroclastic flows.

A **stratovolcano** is a tall, conical volcano composed of layers of hardened lava and volcanic ash. These volcanoes have a steep shape and periodic, explosive eruptions. The lava that flows from them is highly viscous, and cools and hardens before spreading very far.



Year 6 Work samples

Summative Assessment of Science Inquiry Skills

Below Achievement Standard

Processing and analysing data and information

Earthquakes down under

Can you draw your own column graph?

Earthquakes 1-15 December 2011

Richter Scale	Australia (X)	Neighbouring Countries (/)
1.0	1	1
1.5	1	1
2.0	2	2
2.5	2	2
3.0	1	1
3.5	1	1
4.0	0	1
4.5	0	1
5.0	0	2
5.5	0	2
6.0	0	1
6.5	0	1
7.0	0	1

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

Summative Assessment of Science Inquiry Skills

At Achievement Standard

Processing and analysing data and information

Earthquakes down under

Can you show your results in a graph?

Earthquakes 1-15 December 2011

Richter Scale	Australia	Neighbouring Countries
1.0	1	0
1.5	1	0
2.0	1	0
2.5	1	0
3.0	1	0
3.5	0	0
4.0	0	0
4.5	0	0
5.0	0	0
5.5	0	0
6.0	0	1
6.5	0	0
7.0	0	1

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

Summative Assessment of Science Inquiry Skills

Above Achievement Standard

Earthquakes down under

Can you plot your own data on a graph?
Earthquakes 1-15 December 2011

Richter Scale	Australia	Neighbouring Countries
1.0	1	0
1.5	1	0
2.0	1	0
2.5	1	0
3.0	1	0
3.5	0	0
4.0	0	0
4.5	0	0
5.0	0	1
5.5	0	0
6.0	0	0
6.5	0	0
7.0	0	0

- 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 6.9. 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.

Processing and analysing data and information

Student Self-Assessment

Creators and destroyers Student checklist Year 6

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 effects of volcanoes and other natural hazards on Earth's surface.			
Science as a Human Endeavour	I can identify where science is used to ask questions and make predictions.			
	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 investigation and share it with others.				

