

Year 4 Assessment Rubrics

Year 4 Achievement Standard

By the end of Year 4, students apply the observable properties of materials to explain how objects and materials can be used. They use contact and non-contact forces to describe interactions between objects. They discuss how natural and human processes cause changes to the Earth's surface. They describe relationships that assist the survival of living things and sequence key stages in the life cycle of a plant or animal. They identify when science is used to ask questions and make predictions. They describe situations where science understanding can influence their own and others' actions.

Students follow instructions to identify investigable questions about familiar contexts and predict likely outcomes from investigations. They discuss ways to conduct investigations and safely use equipment to make and record observations. They use provided tables and simple column graphs to organise their data and identify patterns in data. Students suggest explanations for observations and compare their findings with their predictions. They suggest reasons why their methods were fair or not. They complete simple reports to communicate their 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	Living things have life cycles (ACSSU072)	Describes and sequences key stages in the life cycle of a plant or animal	<i>Plants in action</i> ‘Plant life stages jumble’ (Resource sheet 1)	<ul style="list-style-type: none">• Provides simple observations of the stages of the life cycle of a flowering plant• Lists the sequence of the plant life cycle• Lists easily identifiable conditions that help plants to grow	<ul style="list-style-type: none">• Describes and explains the relationships between the stages and processes of the life cycle of a flowering plant• Recognises that the stages in a plant’s life form a cycle rather than a linear sequence• Describes conditions plants require for growth	<ul style="list-style-type: none">• Provides extended information about the sequence of events and processes of the life cycle of a flowering plant• Has a detailed understanding of the life cycle of a plant• Explains in detail the conditions plants require for growth

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SCIENCE UNDERSTANDING						
Biological sciences	Living things have life cycles (ACSSU072)	Describes relationships that assist the survival of living things and sequence key stages in the life cycle of a plant or animal	<i>Friends or foes?</i> ‘Tomato troubles’ (Resource sheet 1) ‘How does it grow?’ (Resource sheet 2)	<ul style="list-style-type: none">Identifies that bees help flowering plants growIdentifies that ants help plants disperse seedsLists the life stages of a flowering plant	<ul style="list-style-type: none">Describes the interactions between flowering plants, bees and antsDescribes the process of pollination and seed dispersalExplains the stages in the life cycle of a flowering plant	<ul style="list-style-type: none">Explains in detail the relationship between flowering plants and insects, and how this is beneficial to bothProvides extended information about the process of pollination and seed dispersalIndependently constructs and explains in detail each stage of a flowering plant’s life cycle
	Living things, including plants and animals, depend on each other and the environment to survive (ACSSU073)					

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SCIENCE UNDERSTANDING						
Chemical sciences	Natural and processed materials have a range of physical properties; These properties can influence their use (ACSSU074)	Applies the observable properties of materials to explain how objects and materials can be used	<i>Material world</i> ‘Material matters’ (Resource sheet 9)	<ul style="list-style-type: none">• Lists the properties and uses of everyday properties• Identifies simple observations of the properties and uses of a material	<ul style="list-style-type: none">• Describes the properties and uses of everyday properties• Explains why the properties of a material make it suitable for a particular use	<ul style="list-style-type: none">• Uses scientific terminology to describe properties and uses of materials• Explains in detail, using scientific terminology, why the properties of a material make it suitable for a particular use

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SCIENCE UNDERSTANDING						
Chemical sciences	Natural and processed materials have a range of physical properties; These properties can influence their use (ACSSU074)	Applies the observable properties of materials to explain how objects and materials can be used	<i>Package it better</i> Report	<ul style="list-style-type: none">• Makes simple observations of how their package meets design criteria• Identifies properties and uses of materials• Describes the performance of their package	<ul style="list-style-type: none">• Analyses feedback to evaluate their package against design criteria• Explains how properties of materials influence their use• Describes reasons for the performance of their package	<ul style="list-style-type: none">• Explains, justifies and proposes ways to improve their package against design criteria• Demonstrates a detailed understanding of the properties and uses of materials in design• Explains and justifies the criteria for choosing the materials used for their package, and relates this to its performance

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SCIENCE UNDERSTANDING						
Earth and space sciences	Earth’s surface changes over time as a result of natural processes and human activity (ACSSU075)	Discusses how natural and human processes cause changes to the Earth’s surface	<i>Beneath our feet</i> Map Report	<ul style="list-style-type: none">Describes simple ideas about weathering and erosionDescribes non-scientific ideas of how the landscape might change over time	<ul style="list-style-type: none">Identifies things that cause landscapes to change, including weathering, erosion and human activityDescribes how the landscape might change over time	<ul style="list-style-type: none">Provides extended information about the processes that cause landscapes to changeDemonstrates skills in showing patterns of weathering and erosion that cause the landscape to change
Physical sciences	Forces can be exerted by one object on another through direct contact or from a distance (ACSSU076)	Use contact and non-contact forces to describe interactions between objects	<i>Smooth moves</i> Annotated diagram	<ul style="list-style-type: none">Describes non-scientific ideas of different forces and motionDescribes simple ideas about forces and how they actRequires help with the representation of arrows in force-arrow diagrams	<ul style="list-style-type: none">Identifies and describes different forces and motionExplains that forces can act through direct contact or at a distanceRepresents different-sized forces using different arrow lengths	<ul style="list-style-type: none">Explains scientific ideas, with evidence, about different forces and motionHas a detailed understanding of forces and how they act in different situationsExplains and represents the use of force-arrow diagrams

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SCIENCE AS A HUMAN ENDEAVOUR						
Nature and development of science	Science involves making predictions and describing patterns and relationships (ACSHE061)	Identifies when science is used to ask questions and make predictions	<ul style="list-style-type: none">Plants in actionFriends or foes?Material worldPackage it betterBeneath our feetSmooth moves	Identifies that science involves asking questions and making predictions	Identifies when science is used to ask questions and make predictions	Provides a detailed understanding of when science is used to ask questions and make predictions
Use and influence of science	Science knowledge helps people to understand the effect of their actions (ACSHE062)	Describes situations where science understanding can influence their own and others’ actions	<ul style="list-style-type: none">Plants in actionFriends or foes?Material worldPackage it betterBeneath our feetSmooth moves	Makes suggestions about where they use science knowledge influence their own and others’ actions	Describes situations where science understanding can influence their own and others’ actions	Describes in detail where people use science understanding in their lives and in the wider world to influence their actions

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SCIENCE INQUIRY SKILLS						
Questioning and predicting	With guidance, identify questions in familiar contexts that can be investigated scientifically and predict what might happen based on prior knowledge (ACSIS064)	Follows instructions to identify investigable questions about familiar contexts and predict likely outcomes from investigations	<i>Elaborate</i> phase in: <ul style="list-style-type: none"><i>Plants in action</i><i>Material world</i><i>Smooth moves</i><i>Package it better</i>	Predicts what might happen in an investigation without supporting evidence	Follows instructions to identify investigable questions about familiar contexts and predict likely outcomes from investigations	Asks pertinent and investigable questions and predicts the outcomes of investigations supported with detailed evidence based on their knowledge and experiences
Planning and conducting	Suggest ways to plan and conduct investigations to find answers to questions (ACSIS065)	Discusses ways to conduct investigations	<i>Elaborate</i> phase in: <ul style="list-style-type: none"><i>Beneath our feet</i>	Suggests ways to conduct investigations	Discusses ways to conduct investigations	Demonstrates a detailed understanding of how they can conduct science investigations to respond to questions

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SCIENCE INQUIRY SKILLS						
Planning and conducting	Safely use appropriate materials, tools or equipment to make and record observations, using formal measurements and digital technologies as appropriate (ACSIS066)	Safely uses equipment to make and record observations	<i>Elaborate</i> phase in: <ul style="list-style-type: none"><i>Beneath our feet</i>	Follows guidelines on how to safely use equipment to make and record observations	Safely uses equipment to make and record observations Uses formal measurements and digital technologies as appropriate	Independently uses equipment safely to make and record observations using formal measurements and digital technologies, as appropriate
	Use a range of methods including tables and simple column graphs to represent data and to identify patterns and trends (ACSIS068)	Uses provided tables and simple column graphs to organise their data and identify patterns in data	<i>Elaborate</i> phase in: <ul style="list-style-type: none"><i>Plants in action</i><i>Friends or foes?</i><i>Beneath our feet</i><i>Smooth moves</i>	Follows simple procedures to use provided tables and simple column graphs	Uses provided tables and simple column graphs to organise their data and identify patterns in data	Independently constructs tables and simple column graphs to organise data
Processing and analysing data and information	Compare results with predictions, suggesting possible reasons for findings (ACSIS216)	Suggests explanations for observations and compare their findings with their predictions	<i>Elaborate</i> phase in: <ul style="list-style-type: none"><i>Plants in action</i><i>Material world</i><i>Smooth moves</i>	Suggests reasons for findings that are obvious and follow explicitly from evidence	Suggests explanations for observations and compare their findings with their predictions	Applies scientific concepts and knowledge, and constructs claims based on evidence to explain findings and compare findings with predictions

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SCIENCE INQUIRY SKILLS						
Evaluating	Reflect on the investigation, including whether a test was fair or not (ACSIS069)	Suggests reasons why their methods were fair or not	<i>Elaborate</i> phase in: <ul style="list-style-type: none"><i>Plants in action</i><i>Material world</i>	Demonstrates non-scientific ideas of a fair investigation	Suggests reasons why their methods were fair or not	Identifies variables and articulates why a test is fair or not, and suggests ways to improve the investigation
Communicating	Represent and communicate ideas and findings in a variety of ways such as diagrams, physical representations and simple reports (ACSIS071)	Completes simple reports to communicate their methods and findings	<i>Elaborate</i> phase in: <ul style="list-style-type: none"><i>Beneath our feet</i><i>Friends or foes?</i>	Presents a limited report on findings	Completes simple reports to communicate their 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.

Acknowledgements

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Disclaimer

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

Year 4 Work samples

Beneath our feet

Summative Assessment of Science Understanding

Below Achievement Standard

Burying a time capsule



Where I would bury my time capsule

The landscape where I would bury the time capsule is under the mountain.

I chose to bury it here because it would take a very long time for the mountain to erode and people would find it there in a thousand years.

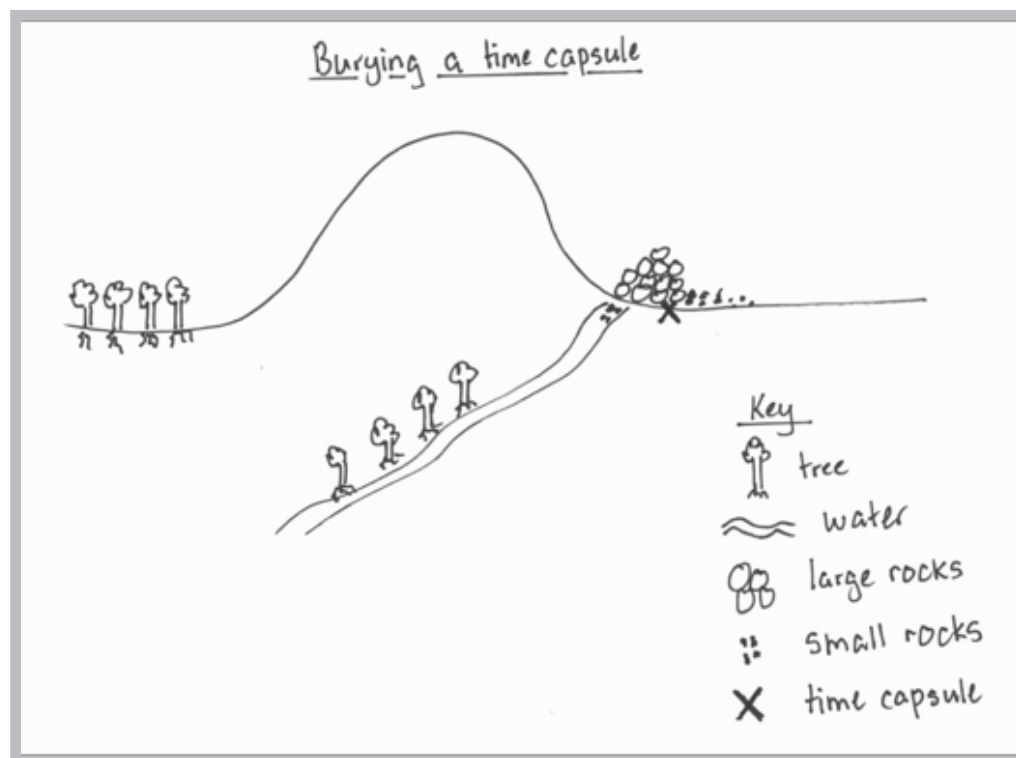
The landscape might change in several ways, for example, the mountain would be smaller and there might be more rocks because of erosion. Also stones in the river might be smooth because the water makes them smooth.

Year 4 Work samples

Beneath our feet

Summative Assessment of Science Understanding

At Achievement Standard



Where I would bury my time capsule

The landscape where I would bury the time capsule is under large rocks that would take a long time to erode.

I chose to bury it here because large rocks that are made of a hard material would take a very long time to erode from water. The large rocks would also take a long time to be weathered down by the wind so the time capsule will still be there in a thousand years for people to find.

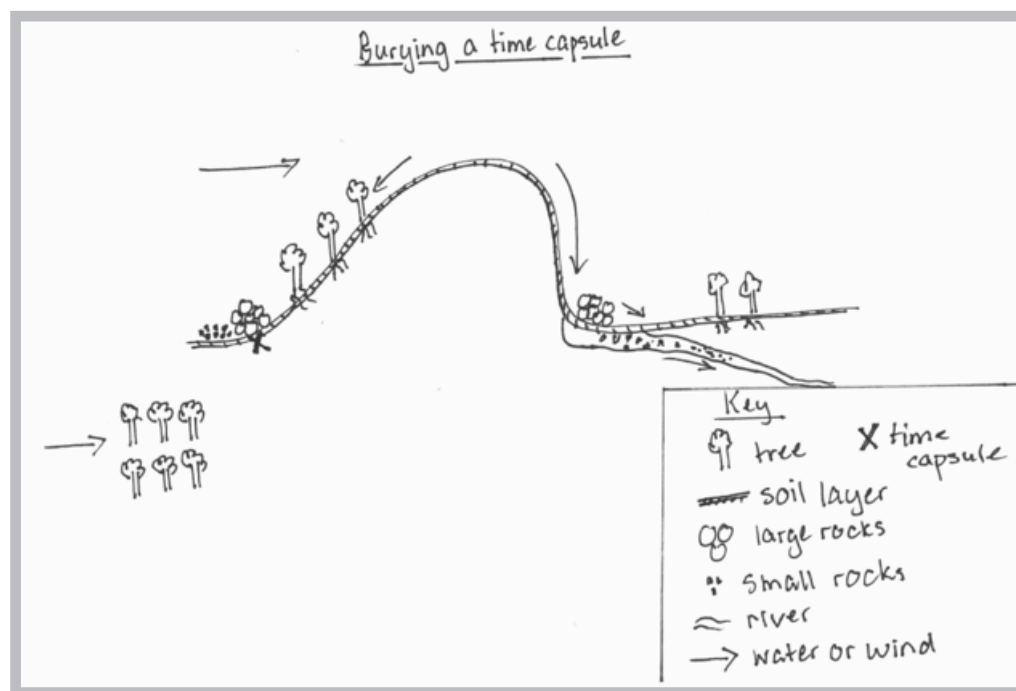
The landscape might change in several ways, for example, if the trees were cut down their roots wouldn't be there and the soil would be affected by wind erosion. If there is a drought the river might dry up and the soil would be blown away by the wind. Or if there is a flood then the river might become wider because the soil would be washed further down the river taking small rocks with it or making rocks smooth by the water flowing.

Year 4 Work samples

Beneath our feet

Summative Assessment of Science Understanding

Above Achievement Standard



Where I would bury my time capsule

The landscape where I would bury the time capsule is under large boulders made of hard materials.

I chose to bury it here because large boulders that are made of a hard material would take a very long time to erode, maybe thousands or millions of years. I buried the time capsule at the bottom of the mountain as it would be protected by the mountain and trees from weathering by the wind. I buried it away from the waterfall on the other side of the mountain because the water will fall quite hard onto the rocks because of the angle of the slope which is very steep. This water erosion might speed up the erosion of the large rocks. Where I buried it is at the bottom of the mountain where trees are growing and they would help stop water coming down and washing the soil away and eroding the large rocks quicker as well.

The landscape might change in several ways, for example, the area where lots of trees are growing would not be there in a thousand years. When the trees die or if farmers clear the trees, their roots wouldn't be there to stop wind erosion and the soil might expose more rocks. The landscape where the waterfall and river are might change as the water will erode the rocks and wash the smaller rocks down the river. The mountain would still look the same because the rock it is made from is very hard and it would take many millions of years for it to be weathered down.

Year 4 Work samples

Beneath our feet

Summative Assessment of Science Inquiry Skills

Below Achievement Standard

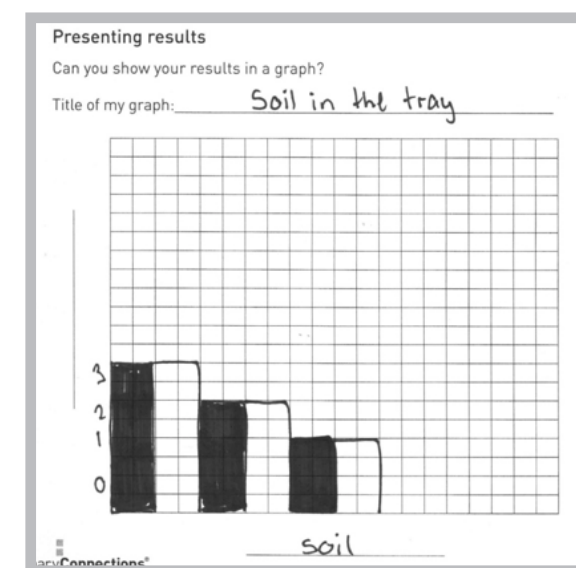
Planning and conducting

What are you going to investigate?		What do you think will happen? Explain why.	
How much soil moves down the tray		I think some + then lots of sand will go down the tray	
To make the test fair, what things (variables) are you going to:			
Change?	Measure/Observe?	Keep the same?	
books	the soil	the soil	
Change only one thing. What would the change affect? Which variables will you control?			
How will you set up your investigation?		What equipment will you need?	
put soil in a tray and pour water in it		a tray a bucket a jug	
Use drawings if necessary		Number points	

Planning and conducting

Recording results			
Depth of soil at the start at the top end: 3			
Depth of soil at the start at the bottom end: 3			
Depth of the soil			
Trial	Top end	Bottom end (near notch)	Observation of the water in the bucket
0 books	3	3	
1	2	2	
2	0	1	

Processing and analysing data and information



Year 4 Work samples

Beneath our feet

Summative Assessment of Science Inquiry Skills

At Achievement Standard

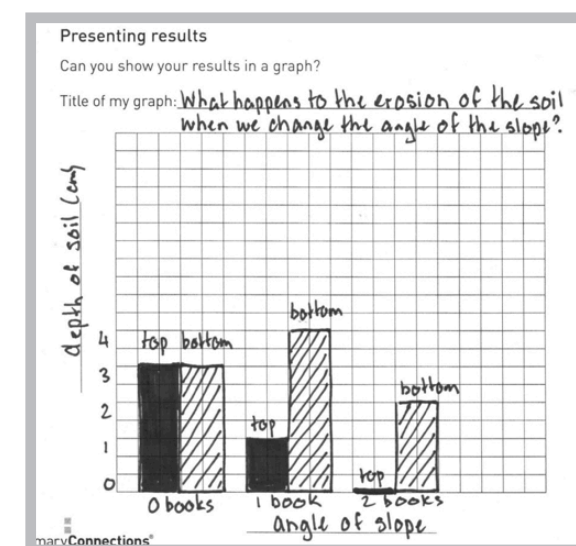
Planning and conducting

<p>What are you going to investigate?</p> <p>What happens to the erosion of soil when we change the angle of the slope?</p>		<p>What do you think will happen? Explain why.</p> <p>The higher the angle of the slope the more soil will be washed to the bottom of the tray and into the bucket.</p>
<p>To make the test fair, what things (variables) are you going to:</p>		
<p>Change?</p> <p>the angle of the slope</p>	<p>Measure/Observe?</p> <p>how deep the soil is at the bottom of the tray</p>	<p>Keep the same?</p> <ul style="list-style-type: none"> the type of soil the amount of water the amount of soil
<p>How will you set up your investigation?</p> <p>Use drawings if necessary</p>		
<p>What equipment will you need?</p> <ul style="list-style-type: none"> water jug water soil tray 2 books ruler bucket 		

Planning and conducting

Recording results			
Depth of soil at the start at the top end: 3cm			
Depth of soil at the start at the bottom end: 3cm			
Depth of the soil			
Trial	Top end	Bottom end (near notch)	Observation of the water in the bucket
0 books	3cm	3cm	no soil
1 book	1cm	4cm	some soil
2 books	0cm	2cm	lots of soil

Processing and analysing data and information



Year 4 Work samples

Beneath our feet

Summative Assessment of Science Inquiry Skills

Above Achievement Standard

Planning and conducting

<p>What are you going to investigate?</p> <p>What happens to the erosion of the soil when we change the angle of the slope?</p>		<p>What do you think will happen? Explain why.</p> <p>As we increase the angle of the slope more soil will go the bottom of the tray and into the bucket. because the water will flow faster & stronger.</p>
<p>To make the test fair, what things (variables) are you going to:</p>		
<p>Change?</p> <p>the angle of the slope</p>	<p>Measure/Observe?</p> <p>the depth of the soil moved by the water</p>	<p>Keep the same?</p> <ul style="list-style-type: none"> the type of soil the amount of soil the amount of water how the water is poured
<p>How will you set up your investigation?</p>		
<p>What equipment will you need?</p> <ul style="list-style-type: none"> water jug water soil tray 2 books ruler bucket 		

Planning and conducting

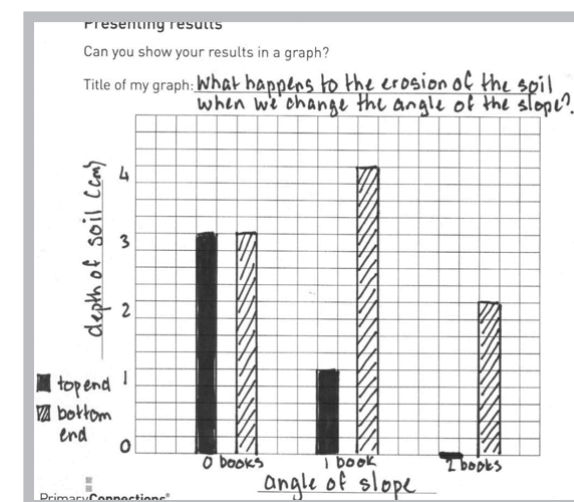
Recording results

Depth of soil at the start at the top end: 3 cm

Depth of soil at the start at the bottom end: 3 cm

Trial	Top end	Bottom end (near notch)	Observation of the water in the bucket
0 books	3 cm	3 cm	clear with no soil
1 book	1 cm	4 cm	a little soil in the bucket
2 books	0 cm	2 cm	murky more soil

Processing and analysing data and information



Student Self-Assessment

Beneath our feet **Year 4 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 how natural processes and human activity change the landscape			
Science as a Human Endeavour	I can see that science is about asking questions and making predictions			
	I can see where my science knowledge helps me make changes in my actions			
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 use equipment safely			
	I can use centimetres when I measure things			
	I can record my observations in a table			
	I can make a column graph			
	I can find patterns in my graph			
	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 make a report about my claims and evidence from my investigation and share it with others			

RUBRICS *Beneath our feet* **2**