

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	<p>Living things have life cycles (ACSSU072)</p> <p>Living things, including plants and animals, depend on each other and the environment to survive (ACSSU073)</p>	Describes relationships that assist the survival of living things and sequence key stages in the life cycle of a plant or animal	<p><i>Friends or foes?</i></p> <p>‘Tomato troubles’ (Resource sheet 1)</p> <p>‘How does it grow?’ (Resource sheet 2)</p>	<ul style="list-style-type: none"> Identifies that bees help flowering plants grow Identifies that ants help plants disperse seeds Lists the life stages of a flowering plant 	<ul style="list-style-type: none"> Describes the interactions between flowering plants, bees and ants Describes the process of pollination and seed dispersal Explains 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 both Provides extended information about the process of pollination and seed dispersal Independently constructs and explains in detail each stage of a flowering plant’s life cycle

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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 erosion Describes 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 activity Describes how the landscape might change over time 	<ul style="list-style-type: none"> Provides extended information about the processes that cause landscapes to change Demonstrates 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 motion Describes simple ideas about forces and how they act Requires help with the representation of arrows in force-arrow diagrams 	<ul style="list-style-type: none"> Identifies and describes different forces and motion Explains that forces can act through direct contact or at a distance Represents different-sized forces using different arrow lengths 	<ul style="list-style-type: none"> Explains scientific ideas, with evidence, about different forces and motion Has a detailed understanding of forces and how they act in different situations Explains 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"> • <i>Plants in action</i> • <i>Friends or foes?</i> • <i>Material world</i> • <i>Package it better</i> • <i>Beneath our feet</i> • <i>Smooth moves</i> 	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"> • <i>Plants in action</i> • <i>Friends or foes?</i> • <i>Material world</i> • <i>Package it better</i> • <i>Beneath our feet</i> • <i>Smooth moves</i> 	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 (AC SIS064)	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 (AC SIS065)	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	<p><i>Elaborate</i> phase in:</p> <ul style="list-style-type: none"> • <i>Beneath our feet</i> 	Follows guidelines on how to safely use equipment to make and record observations	<p>Safely uses equipment to make and record observations</p> <p>Uses formal measurements and digital technologies as appropriate</p>	Independently uses equipment safely to make and record observations using formal measurements and digital technologies, as appropriate
	Processing and analysing data and information	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	<p><i>Elaborate</i> phase in:</p> <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
Compare results with predictions, suggesting possible reasons for findings (ACSIS216)		Suggests explanations for observations and compare their findings with their predictions	<p><i>Elaborate</i> phase in:</p> <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"> Plants in action Material world 	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"> Beneath our feet Friends or foes? 	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.

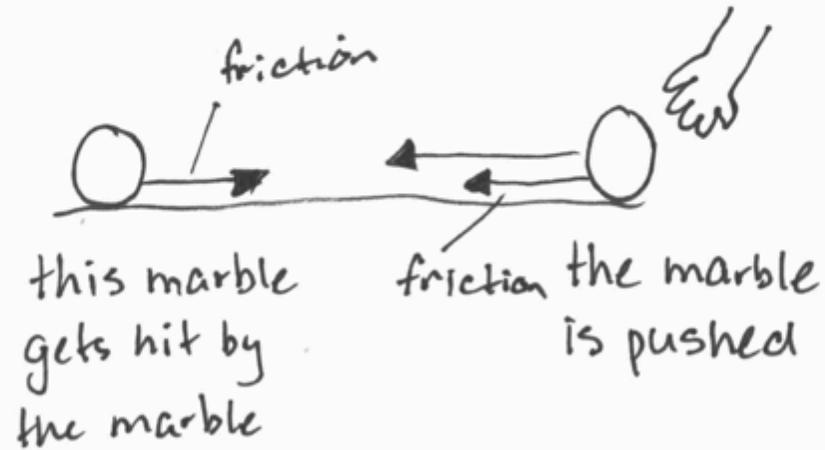
Acknowledgements

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Disclaimer

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

Playing marbles



Year 4 **Work samples**

Smooth moves

Summative Assessment of Science Understanding

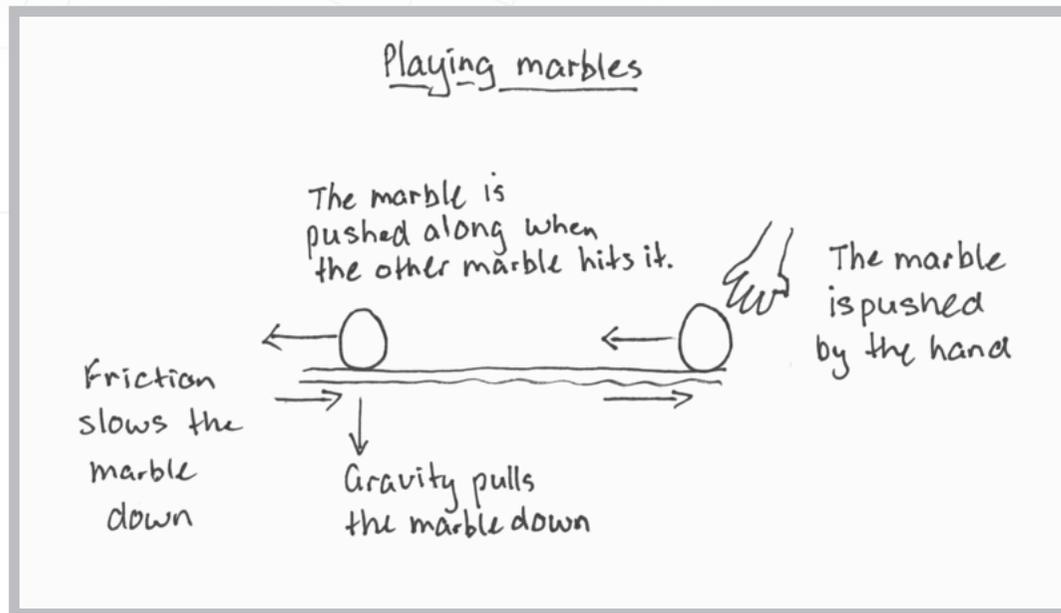
Below Achievement Standard

Year 4 Work samples

Smooth moves

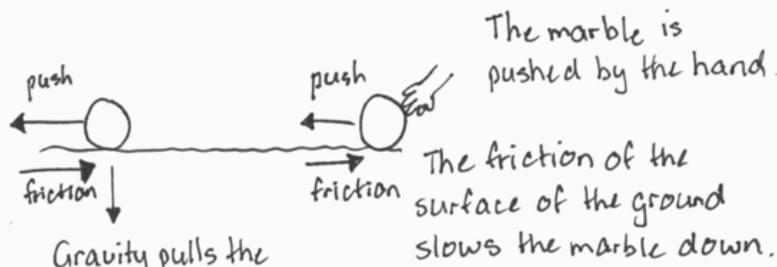
Summative Assessment of Science Understanding

At Achievement Standard



Playing marbles

When the first marble hits the second marble it will be pushed along the ground until friction slows it down.



Gravity pulls the marble towards the centre of the Earth and keeps the marble on the ground.

The marble is pushed by the hand.

The friction of the surface of the ground slows the marble down.

The harder the first marble is pushed the further it will travel. and the further the second marble will go.

Year 4 Work samples

Smooth moves

Summative Assessment of Science Understanding

Above Achievement Standard

Year 4 Work samples

Smooth moves Summative Assessment of Science Inquiry Skills

Below Achievement Standard

Questioning and predicting

<p>What are you going to investigate?</p> <p>How far the matchbox goes</p> <p>Can you write it as a question?</p>	<p>What do you predict will happen? Why?</p> <p>I predict the elastic band will push the matchbox far.</p> <p>Give scientific explanations for your prediction.</p>
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Processing and analysing data and information

PrimaryConnections® Smooth moves

Forces investigation planner

Recording and presenting results

Record your results in a table.

Finding out about forces	
Position	Distance the matchbox moved (cm)
A	5
B	30
C	120

Present your results in a column graph.

The effect of different-sized forces on the distance a matchbox moves

Distance the matchbox moved (cm)

How far the elastic band was pulled back (Position)

Resource sheet 1

Evaluating

Explaining results

What happened to the matchbox when you changed how far the elastic band was pulled back?

The matchbox moved further.

Why did this happen?

The elastic band pushed it.

Did the result match your prediction? If not, how was it different?

Yes it did.

Year 4 Work samples

Smooth moves Summative Assessment of Science Inquiry Skills

At Achievement Standard

Questioning and predicting

<p>What are you going to investigate?</p> <p>What happens to the distance the matchbox moves when you change the size of the force acting on it?</p> <p>Can you write it as a question?</p>	<p>What do you predict will happen? Why?</p> <p>I predict that by pushing the matchbox harder will make the matchbox go further.</p> <p>Give scientific explanations for your prediction.</p>
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Processing and analysing data and information

Forces investigation planner

Recording and presenting results

Record your results in a table.

Position	Distance the matchbox moved (cm)
A	10
B	40
C	140

Present your results in a column graph.

The effect of different-sized forces on the distance a matchbox moves

Position	Distance the matchbox moved (cm)
Position A	10
Position B	40
Position C	140

How far the elastic band was pulled back (Position)

PrimaryConnections®
Linking science with literacy

Resource sheet 1

Evaluating

Explaining results

What happened to the matchbox when you changed how far the elastic band was pulled back?

The further back we pulled the elastic band the further forward the matchbox went

Why did this happen?

The further the elastic band was pulled back the bigger the force on the matchbox.

Did the result match your prediction? If not, how was it different?

Yes. I predict the matchbox would go further each time as the elastic band's position was changed.

Year 4 Work samples

Smooth moves Summative Assessment of Science Inquiry Skills

Above Achievement Standard

Questioning and predicting

<p>What are you going to investigate?</p> <p>What happens to the distance the matchbox moves when you change the size of the force acting on it?</p> <p>Can you write it as a question?</p>	<p>What do you predict will happen? Why?</p> <p>I predict that each time we change the position of the elastic band the further the matchbox will go because there will be more force acting on it.</p> <p>Give scientific explanations for your prediction.</p>
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Processing and analysing data and information

Forces investigation planner

Recording and presenting results

Record your results in a table.

Position	Distance the matchbox moved (cm)
A	10
B	40
C	140

Present your results in a column graph.

The effect of different-sized forces on the distance a matchbox moves

PrimaryConnections®
Resource sheet 1

Evaluating

Explaining results

What happened to the matchbox when you changed how far the elastic band was pulled back?

The further back we pulled the elastic band the further distance the matchbox moved.

Why did this happen?

The greater the force on the matchbox caused by the elastic band the greater the distance the matchbox travels.

Did the result match your prediction? If not, how was it different?

Yes. I predicted that the matchbox would go further each time the force was increased by the position of the elastic band.

Student Self-Assessment

Smooth moves Year 4 Physical 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 and draw different forces and motion such as pushes, pulls and friction			
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			

