Among the gum trees 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 describe how contact and non-contact forces affect interactions between objects. They discuss how natural processes and human activity cause changes to 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 understand the effect of their actions.**

Students follow instructions to identify investigable questions about familiar contexts and make predictions based on prior knowledge. They describe ways to conduct investigations and safely use equipment to make and record observations with accuracy. They use provided tables and column graphs to organise data and identify patterns. Students suggest explanations for observations and compare their findings with their predictions. They suggest reasons why a test was fair or not. They use formal and informal ways to communicate their observations and findings.

Note: The sections relevant to *Among the gum trees* are bolded above. The full rubrics for all year levels are available on the Primary**Connections** website.

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) Living things depend on each other and the environment to survive (ACSSU073)	Describes relationships that assist the survival of living things and sequences key stages in the life cycle of a plant or animal	• *Among the gum trees* Letter to future students	• Provides simple observations of stages of the life cycle of a eucalypt or a bee • Notes a relationship between eucalypts and bees • Lists easily identifiable conditions that help eucalypts to grow	• Sequences key stages of the life cycle of a eucalypt or a bee • Describes and explains the relationship between eucalypts and bees that assists in their survival • Describes conditions eucalypts require for growth	• Provides extended information about the sequence of events and processes of the life cycle of a eucalypt and a bee • Has a detailed understanding of the relationships between eucalypts, bees and other animals to survive • Explains in detail the conditions eucalypts require for growth

Organisers	CONTENT DESCRIPTIONS	ACHIEVEMENT STANDARD	EVIDENCE	LEVEL OF ACHIEVEMENT		
				BELOW ACHIEVEMENT STANDARD	AT ACHIEVEMENT STANDARD	ABOVE ACHIEVEMENT STANDARD
SCIENCE AS A HUMAN ENDEAVOUR						
Nature and development of science	Science involves making predictions and describing patterns and relationships (ACSHE061)	Makes predictions based on prior knowledge Describes relationships and identifies patterns	• *Among the gum trees*	• 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)	Identifies when science can be used to understand the effect of their actions	• *Among the gum trees*	• Makes suggestions about when science can be used to understand the effect of their actions	• Identifies when science can be used to understand the effect of their actions	• Describes in detail where people use science understanding in their lives and in the wider world to influence their actions

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

Organisers	CONTENT DESCRIPTIONS	ACHIEVEMENT STANDARD	EVIDENCE	LEVEL OF ACHIEVEMENT		
				BELOW ACHIEVEMENT STANDARD	AT ACHIEVEMENT STANDARD	ABOVE ACHIEVEMENT STANDARD
SCIENCE INQUIRY SKILLS						
Questioning and predicting	With guidance, identify questions in familiar contexts that can be investigated scientifically and make predictions based on prior knowledge (ACSIS064)	Follows instructions to identify investigable questions about familiar contexts and makes predictions based on prior knowledge	*Elaborate* phase in: • *Among the gum trees*	• Predicts what might happen in an investigation without supporting evidence	• Follows instructions to identify investigable questions about familiar contexts and makes predictions based on prior knowledge	• 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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Organisers	CONTENT DESCRIPTIONS	ACHIEVEMENT STANDARD	EVIDENCE	LEVEL OF ACHIEVEMENT		
				BELOW ACHIEVEMENT STANDARD	AT ACHIEVEMENT STANDARD	ABOVE ACHIEVEMENT STANDARD
SCIENCE INQUIRY SKILLS						
Planning and conducting	With guidance, plan and conduct scientific investigations to find answers to questions, considering the safe use of appropriate materials and equipment (ACSIS065)	Describes ways to conduct investigations	*Elaborate* phase in: • *Among the gum trees*	• Suggests ways to conduct investigations	• Describes ways to conduct investigations	• Demonstrates a detailed understanding of how they can conduct science investigations to respond to questions
	Consider the elements of fair tests and use formal measurements and digital technologies as appropriate, to make and record observations accurately (ACSIS066)	Safely uses equipment to make and record observations with accuracy	*Elaborate* phase in: • *Among the gum trees*	• Follows guidelines on how to safely use equipment to make and record observations	• Safely uses equipment to make and record observations with accuracy	• Independently uses equipment safely to make and record observations with accuracy

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Organisers	CONTENT DESCRIPTIONS	ACHIEVEMENT STANDARD	EVIDENCE	LEVEL OF ACHIEVEMENT		
				BELOW ACHIEVEMENT STANDARD	AT ACHIEVEMENT STANDARD	ABOVE ACHIEVEMENT STANDARD
SCIENCE INQUIRY SKILLS						
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 column graphs to organise data and identify patterns	*Elaborate* phase in: • *Among the gum trees*	• Follows simple procedures to use provided tables and column graphs	• Uses provided tables and column graphs to organise data and identify patterns	• Independently constructs tables and column graphs to organise data. Identifies and explains patterns
	Compares results with predictions, suggesting possible reasons for findings (ACSIS216)	Suggests explanations for observations and compares their findings with their predictions	*Elaborate* phase in: • *Among the gum trees*	• Suggests reasons for findings that are obvious and follow explicitly from evidence	• Suggests explanations for observations and compares their findings with their predictions	• Applies scientific concepts and knowledge, and constructs claims based on evidence to explain findings and compares findings with predictions

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Organisers	CONTENT DESCRIPTIONS	ACHIEVEMENT STANDARD	EVIDENCE	LEVEL OF ACHIEVEMENT		
				BELOW ACHIEVEMENT STANDARD	AT ACHIEVEMENT STANDARD	ABOVE ACHIEVEMENT STANDARD
SCIENCE INQUIRY SKILLS						
Evaluating	Reflect on investigations, including whether a test was fair or not (ACSIS069)	Suggests reasons why a test was fair or not	*Elaborate* phase in: • *Among the gum trees*	• Demonstrates non-scientific ideas of why a test was fair or not	• Suggests reasons why a test was 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 observations, ideas and findings, using formal and informal representations (ACSIS071)	Uses formal and informal ways to communicate observations and findings	*Elaborate* phase in: • *Among the gum trees*	• Presents a limited report on findings	• Uses formal and informal ways to communicate observations and findings	• Completes extended reports using claims and evidence to communicate their observations and findings

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

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.

PrimaryConnections®
Linking science with literacy

**Summative Assessment of
Science Understanding**

Below Achievement Standard
Letter to future students

Dear future students and teachers

As part of science project we planted and grew a gumtree behind the basketball court. By the time you read this the tree will be 25 metres tall. It will need a lot of care like water to keep it alive as a seedling but as it gets bigger it will need less care. There might be bees visiting the tree when it has flowers.

I hope the tree is in good care and hands.

Tony
15 September 2015

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Summative Assessment of Science Understanding

At Achievement Standard
Letter to future students

Dear future students to our school,

Look at the eucalyptus tree behind the amphitheatre, that tree was planted by us in 2015. It started as a seed that we got from another eucalyptus tree. We needed to water the seeds and make sure that leaves didn't keep out the light to help them germinate. Then after 4 weeks it started to germinate and after that we waited for a couple of weeks to plant it. It will have a huge white trunk and flowers will grow every year. The flowers will turn into woody fruit that will have lots of tiny seeds.

It's good if bees are on the tree because they will spread the pollen from the flowers while they are collecting nectar. It's ok if birds are on it even though they pull the flowers off because they need something to eat and some birds help spread the pollen too. Some birds will make their nest in the tree.

From Chloe
15 September 2015

Summative Assessment of Science Understanding

Above Achievement Standard
*Letter to future students*

Dear future students,

I'm writing about our eucalyptus tree that has been planted in our school. We did a science project on eucalyptus trees and that is how the tree got where it is now.

How this tree grew:

First we harvested the seeds from the fruit of a fully grown eucalyptus tree and put the seeds in the oven. Then we took the seeds out of the oven and put them in pots. The seeds that germinated were the ones that had water and light because they didn't have leaves covering them.

We waited 4 weeks till the seeds finished germinating then the seeds started to grow. Once the plants had grown 10 cm high we planted them in the ground and watched them grow. This is how the eucalyptus tree grew.
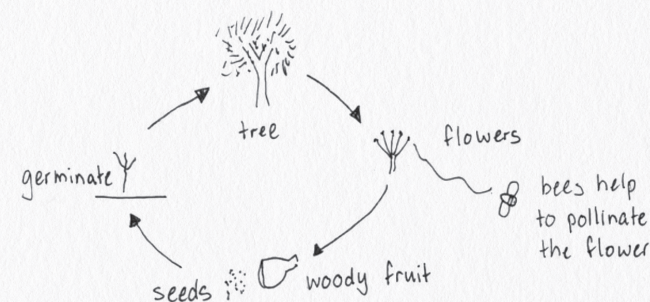
This is its life cycle:

You might see other animals that help pollinate the flowers too like birds and possums. They might also make nests in the tree. The tree will have big bushy branches with lots of leaves on it. It will look amazing.

P.S. If there is a bushfire it might be ok because the seeds like the heat to help them germinate that's why we put the seeds in the oven.

From Adelaide
15 Sept 2015

Summative Assessment of Science Inquiry Skills

Below Achievement Standard

PrimaryConnections®
Linking science with literacy   *Among the gum trees*

Eucalyptus oil investigation planner

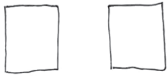**Name:** _____ **Date:** _____

Other members of your team: _____

What are you going to investigate?

Does mould grow on bread?

Can you write it as a question?

What do you predict will happen? Why?

Yes, mould will grow.

Give scientific explanations for your prediction

To make this a fair test what things (variables) are you going to:

Change?	Measure?	Keep the same?
oil or water	the mould	the bread
Change only one thing	*What would the change affect?*	*Which variables will you control?*

Describe how you will set up your investigation?

What equipment will you need?

bread
oil
water

Use drawings if necessary

Use dot points

Write and draw your observations in your science journal

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PrimaryConnections®
Linking science with literacy   *Among the gum trees*

Eucalyptus oil results

Name: _____ **Date:** _____

Explaining results

Question: What was your investigation question?

Can mould grow on bread?

Claim: What claim can you make after completing the investigation?

Yes it can but only sometimes

Evidence: What data did you collect to support your claim?

We counted the squares

Reasoning: Why do you think this happened? Give scientific explanations.

Because mould grows on vegetable oil.

Evaluating the investigation

What problems did you have? How might you improve the investigation (fairness, accuracy)?

None that I can think of.

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Processing and analysing data and information

Summative Assessment of Science Inquiry Skills

At Achievement Standard

Eucalyptus oil investigation planner

Name: _____ Date: _____
Other members of your team: _____

What are you going to investigate?
What happens to the amount of mould on bread if we change the oil we spray it with?
Can you write it as a question?

What do you predict will happen? Why?
I think that mould will grow on the bread sprayed with vegie oil.
Give scientific explanations for your prediction

To make this a fair test what things (variables) are you going to:

Change?	Measure?	Keep the same?
the type of oil	mould on the bread	the bread the light the temperature the number of sprays.
Change only one thing	*What would the change affect?*	*Which variables will you control?*

Describe how you will set up your investigation?
We will spray the bread with the two oils and see how much mould grows

What equipment will you need?
bread, oils, bags.

Use drawings if necessary — *Use dot points*

Write and draw your observations in your science journal

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Eucalyptus oil results

Name: _____ Date: _____

Explaining results

Question: What was your investigation question?
What happens to the amount of mould on bread if we change the oil we spray it with?

Claim: What claim can you make after completing the investigation?
When we sprayed eucalyptus oil on the bread there is less mould.

Evidence: What data did you collect to support your claim?
The vegie oil had $15\,cm^2$ of mould and the eucalyptus oil had none.

Reasoning: Why do you think this happened? Give scientific explanations.
I think this happened because vegie oil is like vegies and vegies go off and mouldy really quickly.

Evaluating the investigation
What problems did you have? How might you improve the investigation (fairness, accuracy)?
We could get better bags because the zip locks didn't work.

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Processing and analysing data and information

Summative Assessment of Science Inquiry Skills

Above Achievement Standard

Processing and analysing data
and information

Primary**Connections**®
Linking science with literacy
Among the gum trees

Eucalyptus oil investigation planner

Name: _____ **Date:** _____

Other members of your team: _____

What are you going to investigate?

What happens to how much mould grows on bread when we change the type of oil the bread is sprayed with?

Can you write it as a question?

What do you predict will happen? Why?

I predict that the bread sprayed with eucalyptus oil won't grow mould because it kills germs.

Give scientific explanations for your prediction

To make this a fair test what things (variables) are you going to:

Change?	Measure?	Keep the same?
the type of oil	the amount of mould that grows	• the type of bread • the number of sprays • the location of the bags
Change only one thing	What would the change affect?	Which variables will you control?

Describe how you will set up your investigation?

1. Spray each slice of bread with the same number of sprays (8) but different oil.
2. Put the bread in the bags + seal.
3. Put the on the sill.

What equipment will you need?

• 2 slices of bread
• 4 clear ziplock bags
• tape
• eucalyptus oil
• vegetable oil
• 2 spray bottles

Use dot points

Write and draw your observations in your science journal

Resource sheet 7

Primary**Connections**®
Linking science with literacy
Among the gum trees

Eucalyptus oil results

Name: _____ **Date:** _____

Explaining results

Question: What was your investigation question?

What happens to how much mould grows on bread when we change what type of oil it is sprayed with?

Claim: What claim can you make after completing the investigation?

Eucalyptus oil stops mould growing on bread.

Evidence: What data did you collect to support your claim?

The bread that was sprayed with vegetable oil grew 9 squares of mould.
The bread that was sprayed with eucalyptus oil grew 0 squares of mould.

Reasoning: Why do you think this happened? Give scientific explanations.

I think that eucalyptus oil must have something in it that kills mould or stops mould from growing.

Evaluating the investigation

What problems did you have? How might you improve the investigation (fairness, accuracy)?

We sometimes forgot to do the same number of sprays of oil on the bread. Next time we would make sure we do the same number of sprays to make it a fair test.

Resource sheet 8

Student Self-Assessment

Among the gum trees Student checklist Year 4

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 draw and describe the life cycle of a eucalypt or a bee.			
	I can describe how eucalypts and bees rely on each other to survive.			
Science as a Human Endeavour	I can see that science is about identifying patterns and making predictions.			
	I can see where science helps me to understand the effect of my actions.			
Science Inquiry Skills	With my teacher's help, I can identify questions that we can investigate in the classroom.			
	I can predict what might happen in an investigation.			
	I can suggest ways to do an investigation.			
	I can use equipment safely.			
	I can record my observations accurately in a table.			
	I can make a column graph from the data.			
	I can make claims based on my evidence.			
	I can compare my findings with my predictions.			
	I can say if I think a test was fair or not.			
	I can report on my observations and findings to others.			
	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.			

Achievement Standard Class Checklist

Year 4 Biological sciences

(This checklist is designed to be used in conjunction with the Assessment Rubric for the *Among the gum trees* unit.)

	Science Understanding	Science as a Human Endeavour		Science Inquiry Skills						
	Biological sciences	Nature and development of science	Use and influence of science	Questioning and predicting	Planning and conducting		Processing and analysing data and information		Evaluating	Communicating
	Describes relationships that assist the survival of living things and sequence key stages in the life cycle of a plant or animal	Describes relationships and identifies patterns. Makes predictions based on prior knowledge	Identifies when science can be used to understand the effect of their actions	Follows instructions to identify investigable questions about familiar contexts and makes predictions based on prior knowledge	Describes ways to conduct investigations	Safely uses equipment to make and record observations with accuracy	Uses provided tables and column graphs to organise data and identify patterns	Suggests explanations for observations and compares their findings with their predictions	Suggests reasons why a test was fair or not	Uses formal and informal ways to communicate observations and findings
Example: Student A	AAS	AS	AS	AS	AS	AS	AAS	AS	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.