



Investigate and Innovate with CSIRO

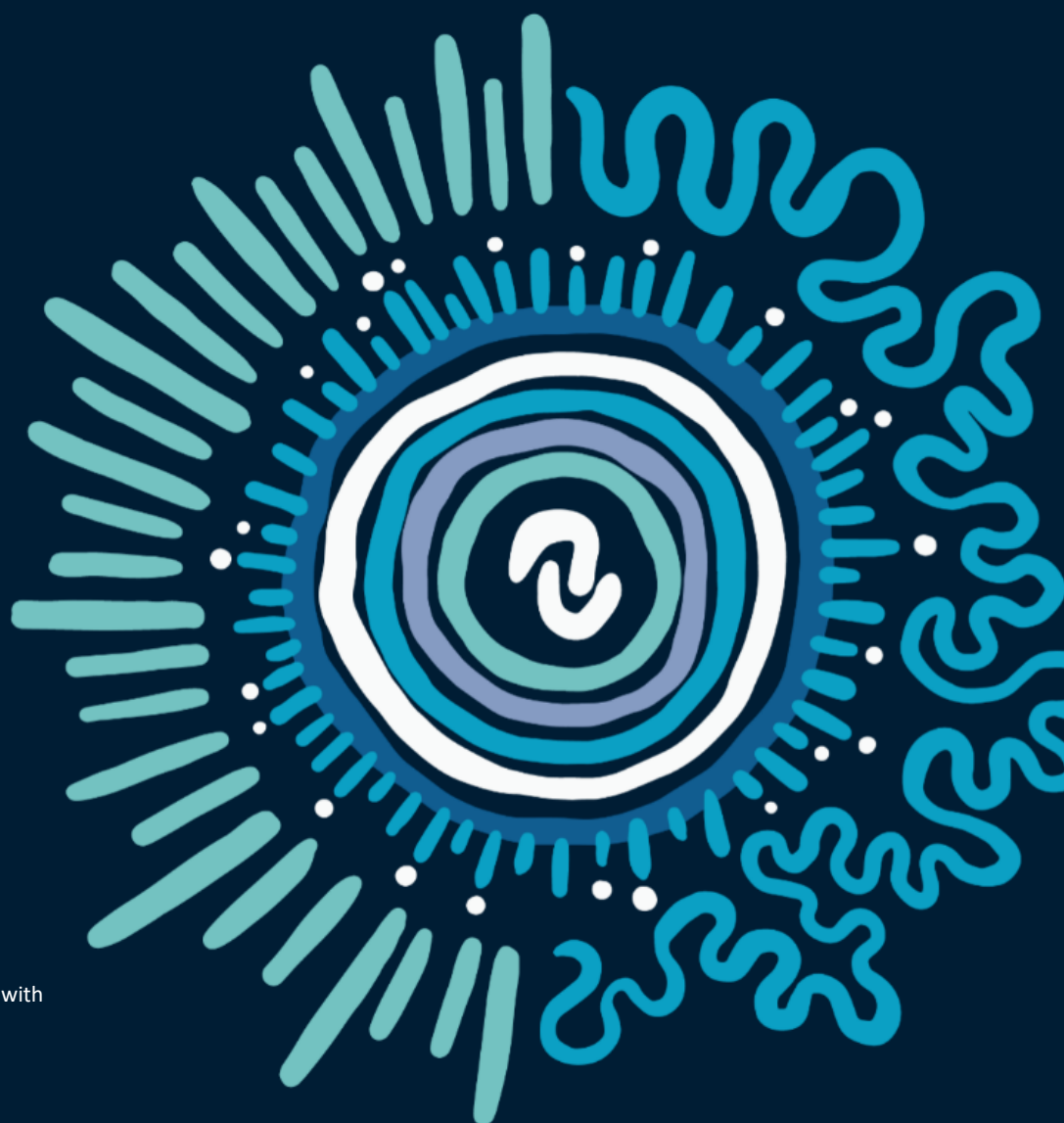
Syllabus outcomes and rubrics

- Australian Curriculum (V9) links
- NSW Curriculum links (2024)
- Assessment rubrics



Acknowledgement of Country

CSIRO acknowledges the Traditional Owners of the lands, seas and waters of the area that we live and work on across Australia. We acknowledge all Aboriginal and Torres Strait Islander peoples and their continuing connection to their culture and pay our respects to Elders past and present. CSIRO is committed to reconciliation and recognises that Aboriginal and Torres Strait Islander peoples have made contributions to all aspects of Australian life including culture, economy and science.



**'Eternal Wisdom,
Infinite Innovation'**
artwork by Rachael Sarra, working with
Gilimbaa.

Contents

Contents.....	2
Food waste and packaging	3
<i>NSW curriculum links</i>	3
<i>Australian curriculum links</i>	4
<i>Assessment rubric: Food Waste and Packaging</i>	5
Sun protection	6
<i>NSW curriculum links</i>	6
<i>Australian curriculum links</i>	7
<i>Assessment rubric: Sun protection</i>	9
Thermal energy storage	10
<i>NSW curriculum links</i>	10
<i>Australian curriculum links</i>	11
<i>Assessment rubric: Thermal Energy Storage</i>	12
Indigenous Research Methodology (IRM) – Water	13
<i>NSW curriculum links</i>	13
<i>Australian curriculum links</i>	13
<i>Assessment rubric: IRM Water</i>	15
Indigenous Research Methodology (IRM) – Biodiversity	16
<i>NSW curriculum links</i>	16
<i>Australian curriculum links</i>	17
<i>Assessment Rubric: IRM Biodiversity</i>	19
<i>Assessment Rubric: Generic Science Investigation</i>	20

Food waste and packaging

NSW curriculum links

Stage 3

Science

ST2-PQU-01

Poses questions to create fair tests that investigate the effects of energy on living things and physical systems.

ST2-DDT-01

Uses a design process to create products to address user needs or opportunities.

Stage 4

Science

SC4-WS-02

Identifies questions and makes predictions to guide scientific investigations.

SC4-WS-03

Plans safe and valid investigations.

SC4-WS-04

Follows a planned procedure to undertake safe and valid investigations.

SC4-WS-06

Uses data to identify trends, patterns and relationships, and draw conclusions.

SC4-WS-07

Identifies problem-solving strategies and proposes solutions.

SC4-WS-08

Communicates scientific concepts and ideas using a range of communication forms.

Australian curriculum links

Year 5 and 6

Processes and Production Skills: Investigating and defining

Design and Technologies

AC9TDE6K05

Explain how characteristics and properties of materials, systems, components, tools and

equipment affect their use when producing designed solutions.

AC9TDE6P01

Investigate needs or opportunities for designing, and the materials, components, tools, equipment and processes needed to create designed solutions.

Year 7 and 8

Processes and Production Skills: Investigating and defining

Design and Technologies

AC9TDE8K01

Analyse how people in design and technologies occupations consider ethical and sustainability

factors to design and produce products, services and environments.

AC9TDE6P01

Investigate needs or opportunities for designing, and the materials, components, tools, equipment and processes needed to create designed solutions.

Assessment rubric: Food Waste and Packaging

Aligned to Australian Curriculum (Version 9), NSW Syllabus (2024)

LIA Framework	Australian Curriculum	NSW Curriculum	Criteria	Emerging	Developing	Proficient	Advanced
Launch Engage & Connect	AC9TDE8K01	ST2-PQU-01 SC4-WS-02	Questioning & Prediction	Responds to a teacher-provided question with limited understanding of the problem. Prediction is vague or unsupported.	Explains the investigation question and makes a simple prediction with some reasoning.	Refines the investigation or design question and makes a logical prediction based on prior knowledge or observations.	Independently poses a meaningful, investigable question and justifies a prediction using scientific and real-world reasoning.
			Making connections to science in society	Identifies that food waste is a problem but gives limited explanation.	Describes how damaged food contributes to waste and environmental issues.	Explains how packaging design influences food waste, sustainability, and consumer behaviour.	Analyses food packaging and waste as part of a broader system (production, transport, consumption) and considers sustainability and circular economy impacts.
Inquire Plan, Test & Analyse	AC9TDE6P01	ST2-DDT-01 SC4-WS-03 SC4-WS-04	Planning and reproducible investigations	Follows a provided method with significant support. Limited understanding of variables.	Uses a teacher-provided method and identifies some variables with guidance.	Plans and conducts a fair, safe investigation, clearly identifying independent, dependent, and controlled variables.	Independently designs or adapts a reproducible investigation, justifying choices to improve validity and reliability.
	AC9TDE6K05 AC9TDE8K06	SC4-WS-07	Data Collection & Mathematical Accuracy	Collects limited or incomplete data with errors. Requires support to record results.	Collects data with minor errors and records results in tables with guidance.	Collects accurate qualitative and quantitative data, including counts and percentages, using appropriate units and tables.	Collects precise, consistent data across multiple trials and applies mathematical calculations accurately to compare designs.
	AC9TDE6P01	SC4-WS-05	Use of scientific reasoning and representations	Uses basic descriptions with limited scientific language or representations.	Uses simple scientific terms and basic graphs or diagrams with support.	Uses correct scientific and design language, tables, graphs, and diagrams to explain results.	Selects and applies appropriate representations (graphs, percentages, annotated images) to clearly support scientific claims.
Act Apply, Reflect & Communicate	AC9TDE8K01 AC9TDE6P01	SC4-WS-06	Analysis & Interpretation	Describes what happened with little reference to evidence.	Identifies simple patterns (e.g. "less damage") with limited explanation.	Analyses data to explain how and why certain packaging features reduced damage.	Critically interprets data, evaluates limitations, reliability, and trade-offs, and links findings to real transport conditions.
	AC9TDE8K01	SC4-WS-08	Conclusion & Scientific Communication	States a simple conclusion with limited clarity. Communication is basic.	Writes a conclusion that answers the question using some evidence. Communicates findings in a simple format.	Communicates a clear, evidence-based conclusion using appropriate scientific structure and visuals.	Communicates findings persuasively to a real audience, proposing justified improvements or sustainable actions (e.g. circular economy solutions).

Sun protection

NSW curriculum links

Stage 3

Science

ST3-SCI-01

Uses evidence to explain how scientific knowledge can be used to develop sustainable practices.

ST3-PQU-01

Poses questions to identify variables and conducts fair tests to gather data.

Stage 4

Science

SC4-WS-02

Identifies questions and makes predictions to guide scientific investigations.

SC4-WS-07

Identifies problem-solving strategies and proposes solutions.

SC4-OTU-01

Explains how observations are used by scientists to increase knowledge and understanding of the Universe.

Stage 4

Mathematics

MAO-WM-01

Develops understanding and fluency in mathematics through exploring and connecting mathematical concepts, choosing and applying

mathematical techniques to solve problems, and communicating their thinking and reasoning coherently and clearly.

Australian curriculum links

Year 5

Science Inquiry

Questioning and Predicting

AC9S5I01

Pose investigable questions to identify patterns and test relationships and make reasoned predictions.

Communicating

AC9S5I06

Write and create texts to communicate ideas and findings for specific purposes and audiences,

including selection of language features, using digital tools as appropriate

Science Understanding

Physical sciences

AC9S5U03

Identify sources of light, recognise that light travels in a straight path and describe how shadows are formed and light can be reflected and refracted.

Year 6

Science Inquiry

Questioning and Predicting

AC9S6I01

Pose investigable questions to identify patterns and test relationships and make reasoned predictions.

Evaluating

AC9S6I05

Compare methods and findings with those of others, recognise possible sources of error, pose

questions for further investigation and select evidence to draw reasoned conclusions.

Science Understanding

Earth and space sciences

AC9S6U02

Describe the movement of Earth and other planets relative to the sun and model how Earth's tilt, rotation on its axis and revolution around the sun relate to cyclic observable phenomena, including variable day and night length.

Year 7

Science Understanding

Earth and space sciences

AC9S7U03

Model cyclic changes in the relative positions of the Earth, sun and moon and explain how these cycles

cause eclipses and influence predictable phenomena on Earth, including seasons and tides.

Year 8, 9 and 10

Maths - Measurement

AC9M8M01

Solve problems involving the surface area and volume of composite objects using appropriate units.

AC9M9M01

Solve problems involving the surface area and volume of composite objects using appropriate units.

AC9M10M01

Solve problems involving the surface area and volume of composite objects using appropriate units.

Assessment rubric: Sun protection

Aligned to Australian Curriculum (Version 9), NSW Syllabus (2024)

LIA Framework	Australian Curriculum (V9)	NSW Curriculum	Criteria	Emerging	Developing	Proficient	Advanced
Launch Engage & Connect	AC9S5I01 AC9S6I01	ST3-PQU-01 SC4-WS-02	Questioning & Prediction	Needs significant support to form a question; prediction is missing, vague, or unrelated.	Selects or uses a given question; prediction is basic and relies on everyday observations.	Adapts or refines a teacher-given question into a testable one and provides a logical prediction using some scientific ideas.	Independently poses a clear, original investigable question and develops a well-reasoned scientific prediction.
			Making connections to science in society	Recognises that science is used in the real world.	Describes how science helps solve real-world problems.	Explains how science contributes to sustainability, technology, or innovation.	Critically evaluates how science and research impact society and the environment.
Inquire Plan, Test & Analyse	AC9S5I03 AC9S6I03	ST3-PQU-01, SC4-WS-02 SC4-OTU-01	Planning and reproducible investigations	Requires explicit guidance to follow a provided method; variables not recognised or controlled.	Completes a partly scaffolded plan; identifies some variables but may not fully control them.	Designs a repeatable investigation with teacher guidance; identifies key variables and outlines workable steps.	Independently develops a repeatable investigation with well-controlled variables and a detailed method fit for purpose.
	AC9M8M01 AC9M9M01 AC9M10M01	MAO-WM-01	Data Collection & Mathematical Accuracy	Data is incomplete or inaccurate; relies on teacher direction to record observations.	Collects basic data but with inconsistencies; requires scaffolds to complete tables or graphs.	Collects mostly accurate data with some guidance; tables/graphs are correct but may lack detail.	Collects complete, reliable data independently; uses measurement tools and formulas correctly with minimal error.
			Use of scientific reasoning and representations	Uses basic scientific language.	Applies correct terms and symbols with support.	Communicates reasoning clearly with correct scientific conventions.	Applies abstract reasoning, models, and representations effectively.
Act Apply, Reflect & Communicate	AC9S5I05 AC9S6I05	ST3-SCI-01 SC4-OTU-01	Analysis & Interpretation	Struggles to identify patterns; interpretations are missing or incorrect.	Identifies simple observations with limited explanation; requires scaffolds to interpret results.	Describes trends with teacher prompts; explanations reference UV ideas but may lack depth.	Independently interprets data, identifies trends, and provides logical explanations for sunscreen/material performance.
	AC9S5I06 AC9S6I06	ST3-SCI-01 SC4-WS-07	Conclusion & Scientific Communication	Conclusion incomplete or unrelated; minimal or no communication of findings.	Provides a simple conclusion with everyday language; limited reference to data.	Provides a conclusion using some scientific terminology; includes evidence when prompted.	Presents a clear conclusion with relevant scientific terms and evidence from the investigation.

Thermal energy storage

NSW curriculum links

Stage 3

Science and technology

ST3-SCI-01

Uses evidence to explain how scientific knowledge can be used to develop sustainable practices.

ST3-PQU-01

Poses questions to identify variables and conducts fair tests to gather data.

Stage 4

Science and technology

SC4-WS-01

Uses scientific tools and instruments for observations.

SC4-WS-04

Follows a planned procedure to undertake safe and valid investigations.

Stage 5

Science and technology

SC5-EGY-01

Evaluates current and alternative energy use based on ethical and sustainability considerations.

SC5-WS-01

Selects and uses scientific tools and instruments for accurate observations.

Australian curriculum links

Year 7

Science understanding:

Chemical Sciences

AC9S7U05

Use particle theory to describe the arrangement of particles in a substance, including the motion of and attraction between particles, and relate this to the properties of the substance.

Science inquiry

Planning and conducting

AC9S7I03

Select and use equipment to generate and record data with precision, using digital tools as appropriate.

Processing, modelling and analysing

AC9S7I05

Analyse data and information to describe patterns, trends and relationships and identify anomalies.

Communicating

AC9S7I08

Write and create texts to communicate ideas, findings and arguments for specific purposes and audiences, including selection of appropriate language and text features, using digital tools as appropriate.

Year 8

Science understanding:

Physical sciences

AC9S8U05

Classify different types of energy as kinetic or potential and investigate energy transfer and transformations in simple systems.

Science inquiry

Planning and conducting

AC9S8I03

Select and use equipment to generate and record data with precision, using digital tools as appropriate.

Year 9

Science understanding:

Physical sciences

AC9S9U04

Use wave and particle models to describe energy transfer through different mediums and examine the usefulness of each model for explaining phenomena.

Physical sciences

AC9S9U05

Apply the law of conservation of energy to analyse system efficiency in terms of energy inputs, outputs, transfers and transformations.

Assessment rubric: Thermal Energy Storage

Aligned to Australian Curriculum (Version 9), NSW Syllabus (2024) & LIA Framework

LIA Framework	Australian Curriculum	NSW Curriculum	Criteria	Emerging	Developing	Proficient	Advanced
Launch Engage & Connect	AC9S7U05 AC9S8U05 AC9S9U05	ST3-PQU-01	Questioning & Prediction	Responds to a teacher-provided question about heating with limited understanding. Prediction is vague or unsupported.	Explains the investigation question and makes a simple prediction about heating using sunlight.	Refines the investigation question and makes a logical prediction comparing concentrated and ambient solar heating.	Independently poses a meaningful investigable question related to thermal energy storage and justifies predictions using scientific reasoning.
			Making connections to science in society	Recognises that solar energy can be used to produce heat.	Describes how solar thermal energy can be used to generate electricity.	Explains the role of thermal energy storage in supporting renewable energy systems.	Analyses how thermal energy storage contributes to Australia's energy transition, including sustainability and reliability considerations.
Inquire Plan, Test & Analyse	AC9S7I03 AC9S8I03 AC9S7I05 AC9S7I08	ST3-PQU-01 SC4-WS-04	Planning and reproducible investigations	Follows a provided method with support. Limited understanding of variables.	Uses a teacher-provided method and identifies some variables with guidance.	Plans and conducts a fair, safe investigation, clearly identifying independent, dependent and controlled variables.	Independently designs or adapts a reproducible investigation, justifying method choices to improve reliability and validity.
			Data Collection & Mathematical Accuracy	Collects limited temperature data with errors or omissions.	Records temperature data accurately with some guidance.	Collects accurate temperature data at regular intervals and calculates changes over time.	Collects precise data across multiple trials and applies calculations (e.g. averages, rates of change) to compare heating methods.
Act Apply, Reflect & Communicate	AC9S7I08	SC4-WS-01 SC5-WS-01	Use of scientific reasoning and representations	Uses basic descriptions with limited scientific language.	Uses simple scientific terms and basic tables or graphs with support.	Uses appropriate scientific language, tables, and graphs to explain energy transfer and temperature change.	Selects and applies appropriate representations (graphs, annotations, models) to support explanations of thermal energy storage.
		ST3-SCI-01 ST3-PQU-01 SC4-WS-01 SC4-WS-04 SC5-EGY-01 SC5-WS-01	Analysis & Interpretation	Describes what happened with little reference to evidence.	Identifies simple patterns (e.g. "it got hotter") with limited explanation.	Analyses data to explain why concentrated solar energy caused greater temperature change.	Critically interprets results, evaluating reliability, limitations, and implications for real-world thermal energy storage systems.
			Conclusion & Scientific Communication	States a simple conclusion with limited clarity.	Writes a conclusion that answers the question using some evidence.	Communicates a clear, evidence-based conclusion explaining differences between heating methods.	Communicates findings persuasively to a real audience, linking results to thermal energy storage and Australia's renewable energy future.

Indigenous Research Methodology (IRM) – Water

NSW curriculum links

Stage 3

ST3-SCI-01

Uses evidence to explain how scientific knowledge can be used to develop sustainable practices.

Stage 4

SC4-WS-01

Uses scientific tools and instruments for observations.

SC4-WS-04

Follows a planned procedure to undertake safe and valid investigations.

SC4-WS-06

Uses data to identify trends, patterns and relationships, and draw conclusions.

SC4-WS-08

Communicates scientific concepts and ideas using a range of communication forms.

Australian curriculum links

Year 5

Science Understanding

Earth and space sciences

AC9S5U02

Describe how weathering, erosion, transportation and deposition cause slow or rapid change to Earth's surface.

Science inquiry

Questioning and predicting

AC9S5I01

Pose investigable questions to identify patterns and test relationships and make reasoned predictions.

Planning and conducting

AC9S5I02

Plan and conduct repeatable investigations to answer questions, including, as appropriate,

deciding the variables to be changed, measured and controlled in fair tests; describing potential risks; planning for the safe use of equipment and materials; and identifying required permissions to conduct investigations on Country/Place.

Year 6

Science Understanding

Earth and space science

AC9S6U02

Describe the movement of Earth and other planets relative to the sun and model how Earth's tilt, rotation on its axis and revolution around the sun relate to cyclic observable phenomena, including variable day and night length.

Science inquiry

Questioning and predicting

AC9S6I01

Pose investigable questions to identify patterns and test relationships and make reasoned predictions.

Year 7

Science Understanding

Biological sciences

AC9S7U02

Use models, including food webs, to represent matter and energy flow in ecosystems and predict the impact of changing abiotic and biotic factors on populations.

Science inquiry

Questioning and predicting

AC9S7I01

Develop investigable questions, reasoned predictions and hypotheses to explore scientific models, identify patterns and test relationships.

Planning and conducting

AC9S7I02

Plan and conduct reproducible investigations to answer questions and test hypotheses, including identifying variables and assumptions and, as appropriate, recognising and managing risks, considering ethical issues and recognising key considerations regarding heritage sites and artefacts on Country/Place.

Assessment rubric: IRM Water

Aligned to Australian Curriculum (Version 9), NSW Syllabus (2024) and Indigenous Research Methodology (IRM)

Criterion	Australian Curriculum	NSW Curriculum	Emerging	Developing	Proficient	Advanced
1. Connection to Country & Indigenous knowledges	AC9S5I01 AC9S6I01 AC9S5H02	<i>ST3-SCI-01</i>	Needs support to explain what Country means beyond “land”. Limited or no reference to Indigenous knowledges, or references are vague/general.	Shows a basic understanding that Country includes land and water and that Aboriginal Peoples have strong connections and knowledge. Refers to Dreaming stories or quotes when prompted.	Explains key ideas about Country and refers to Dreaming stories and Aboriginal knowledge when describing water movement. Shows respect and can describe how Indigenous and western science both contribute to understanding water on Country.	Demonstrates a deep, respectful understanding of Country as land, water, sky and relationships. Independently draws clear connections between Dreaming stories, on-Country observations and water movement/groundwater. Explicitly acknowledges Indigenous knowledges and explains how they guided the investigation and recommendations.
2. Questioning, planning & reproducible investigations	AC9S5I01 AC9S6I01 AC9S7I01	<i>ST3-SCI-01 SC4-WS-01 SC4-WS-04</i>	Relies almost entirely on teacher-directed steps. Has difficulty explaining the purpose of the investigation or the role of variables.	Uses a teacher-provided question and method. Can name some variables but may confuse them or not fully control them.	Refines a class question and helps plan a fair test with guidance. Can identify most variables and contribute to writing a workable method that others can follow.	Poses a meaningful, investigable question about water movement or groundwater in their own context. Independently designs or adapts a reproducible investigation (surface water or ground-cover investigation), clearly identifying independent, dependent and controlled variables and recording a logical method.
3. Collecting, representing & using data	AC9S5I02 AC9S6I02 AC9S7I02		Limited data collected or recorded. Needs significant support to complete tables/graphs or to describe what occurred.	Data is incomplete or inconsistent. Needs scaffolds to record results or complete representations. Descriptions are mainly descriptive rather than analytical.	Collects generally reliable data with minor errors. Completes tables and simple graphs or maps with some support. Uses representations to describe what happened in the investigation.	Collects accurate qualitative and quantitative data (maps, tables, photos, timings, volumes) with care and consistency. Chooses suitable ways to represent data (annotated maps, graphs, photo stories) and uses them to support claims about water flow and/or infiltration.
4. Analysis, recommendations & Caring for Country	AC9S5U02 AC9S7U02 AC9S7I02	<i>ST3-SCI-01</i>	Provides minimal explanation of what results mean. Recommendations are vague, unrealistic or missing.	Offers simple explanations (e.g. “plants slow water down”) with limited reference to specific data. Suggestions for improvement are general or teacher prompted.	Explains how water movement or ground cover affected results, using some evidence from their data. Suggests practical actions to improve water management or plant cover at school, with some link to Caring for Country.	Provides thoughtful, evidence-based explanations of how water moves on their school Country and how ground cover/vegetation affects groundwater recharge. Proposes realistic, well-justified recommendations for managing water and Caring for Country (e.g. planting, erosion control, design changes), clearly linking these to Indigenous knowledges and their own data.
5. Reflection on IRM, positionality & process	AC9S7I02 AC9S7H01	<i>SC4-WS-06 SC4-WS-08</i>	Very brief or superficial reflection; little recognition of IRM or their own changing understanding.	Gives a simple reflection on what they liked or found challenging. Mentions one or two IRM elements when prompted.	Describes some aspects of IRM used (e.g. yarning, story, observing Country) and reflects on what they learned about their own view of water and Country. Identifies at least one next step or action.	Thoughtfully reflects on their own perspective and relationship to Country. Can describe how IRM principles (relationships, reciprocity, story, on-Country learning) shaped the way they investigated. Identifies next questions or how they might “give back” to Country or community.

Indigenous Research Methodology (IRM) – Biodiversity

NSW curriculum links

Stage 3

ST3-SCI-01

Uses evidence to explain how scientific knowledge can be used to develop sustainable practices.

Stage 4

SC4-WS-01

Selects and uses scientific tools and instruments for accurate observations.

SC4-WS-04

Follows a planned procedure to undertake safe, ethical, valid and reliable investigations.

SC4-WS-06

Analyses data from investigations to identify trends, patterns and relationships, and draws conclusions.

SC4-WS-07

Selects suitable problem-solving strategies and evaluates proposed solutions to identified problems.

Australian curriculum links

Year 5

Science understanding

Biological sciences

AC9S5U01

Examine how particular structural features and behaviours of living things enable their survival in specific habitats.

Science inquiry

Questioning and predicting

AC9S5I01

Pose investigable questions to identify patterns and test relationships and make reasoned predictions.

Planning and conducting

AC9S5I02

Plan and conduct repeatable investigations to answer questions, including, as appropriate, deciding the variables to be changed, measured and controlled in fair tests; describing potential risks; planning for the safe use of equipment and materials; and identifying required permissions to conduct investigations on Country/Place.

Science as a Human Endeavour

Nature and development of science

AC9S5H01

Examine why advances in science are often the result of collaboration or build on the work of others.

Year 6

Science understanding

Biological sciences

AC9S6U01

Investigate the physical conditions of a habitat and analyse how the growth and survival of living things is affected by changing physical conditions.

Science inquiry

Questioning and predicting

AC9S6I01

Pose investigable questions to identify patterns and test relationships and make reasoned predictions.

Planning and conducting

AC9S6I02

Plan and conduct repeatable investigations to answer questions, including, as appropriate, deciding the variables to be changed, measured and controlled in fair tests; describing potential risks; planning for the safe use of equipment and materials; and identifying required permissions to conduct investigations on Country/Place.

Science as a Human Endeavour

Nature and development of science

AC9S6H01

Examine why advances in science are often the result of collaboration or build on the work of others.

Science understanding

Biological sciences

AC9S7U01

Investigate the role of classification in ordering and organising the diversity of life on Earth and use and develop classification tools including dichotomous keys.

Science inquiry

Questioning and predicting

AC9S7I01

Develop investigable questions, reasoned predictions and hypotheses to explore scientific models, identify patterns and test relationships.

Planning and conducting

AC9S7I02

Plan and conduct reproducible investigations to answer questions and test hypotheses, including identifying variables and assumptions and, as appropriate, recognising and managing risks, considering ethical issues and recognising key considerations regarding heritage sites and artefacts on Country/Place.

Assessment Rubric: IRM Biodiversity

Aligned to Australian Curriculum (Version 9), NSW Syllabus (2024) and Indigenous Research Methodology (IRM)

Criterion	Australian Curriculum	NSW Curriculum	Emerging	Developing	Proficient	Advanced
1. Connection to Country & Indigenous knowledges	AC9S5I01 AC9S6I01 AC9S5H01	ST3-SCI-01	Needs support to explain what Country means beyond “land”. Limited or no reference to Indigenous knowledges, or references are vague/general.	Shows a basic understanding that Country includes land and water and that Aboriginal Peoples have strong connections and knowledge. Refers to Dreaming stories or quotes when prompted.	Explains key ideas about Country and refers to Dreaming stories and Aboriginal knowledge when describing water movement. Shows respect and can describe how Indigenous and western science both contribute to understanding water on Country.	Demonstrates a deep, respectful understanding of Country as land, water, sky and relationships. Independently draws clear connections between Dreaming stories, on-Country observations and biodiversity. Explicitly acknowledges Indigenous knowledges and explains how they guided the investigation and recommendations.
2. Questioning, planning & reproducible investigations	AC9S5I01 AC9S6I01 AC9S7I01	SC4-WS-01 SC4-WS-04	Relies almost entirely on teacher-directed steps. Has difficulty explaining the purpose of the investigation or the role of variables.	Uses a teacher-provided question and method. Can name some variables but may confuse them or not fully control them.	Refines a class question and helps plan a fair test with guidance. Can identify most variables and contribute to writing a workable method that others can follow.	Poses a meaningful, investigable question about biodiversity in their own context. Independently designs or adapts a reproducible investigation, clearly identifying independent, dependent and controlled variables and recording a logical method.
3. Collecting, representing & using data	AC9S5I02 AC9S6I02	SC4-WS-07	Limited data collected or recorded. Needs significant support to complete tables/graphs or to describe what occurred.	Data is incomplete or inconsistent. Needs scaffolds to record results or complete representations. Descriptions are mainly descriptive rather than analytical.	Collects generally reliable data with minor errors. Completes tables and simple graphs or maps with some support. Uses representations to describe what happened in the investigation.	Collects accurate qualitative and quantitative data (maps, tables, photos, timings, volumes) with care and consistency. Chooses suitable ways to represent data (annotated maps, graphs, photo stories) and uses them to support claims about biodiversity.
4. Analysis, recommendations & Caring for Country	AC9S5U01 AC9S6U01 AC9S7U01 AC9S7I02	ST3-SCI-01	Provides minimal explanation of what results mean. Recommendations are vague, unrealistic or missing.	Offers simple explanations (e.g. “there is a lot of biodiversity in my school”) with limited reference to specific data. Suggestions for improvement are general or teacher prompted.	Explains how biodiversity affected results, using some evidence from their data. Suggests practical actions to improve and preserve biodiversity at school, with some link to Caring for Country.	Provides thoughtful, evidence-based explanations of biodiversity on their school site. Proposes realistic, well-justified recommendations for managing biodiversity a Caring for Country, clearly linking these to Indigenous knowledges and their own data.
5. Reflection on IRM, positionality & process	AC9S7I02 AC9S7H01	SC4-WS-06	Very brief or superficial reflection; little recognition of IRM or their own changing understanding.	Gives a simple reflection on what they liked or found challenging. Mentions one or two IRM elements when prompted.	Describes some aspects of IRM used (e.g. yarning, story, observing Country) and reflects on what they learned about their own view of biodiversity and Country. Identifies at least one next step or action.	Thoughtfully reflects on their own perspective and relationship to Country. Can describe how IRM principles (relationships, reciprocity, story, on-Country learning) shaped the way they investigated. Identifies next questions or how they might “give back” to Country or community.

Assessment Rubric: Generic Science Investigation

Aligned to Australian Curriculum (Version 9), NSW Syllabus (2024)

Assessment criteria	Australian Curriculum	NSW Curriculum	Emerging	Developing	Proficient	Advanced
Understanding of scientific concepts	Science Understanding	Working Scientifically	Identifies simple facts or examples related to the topic.	Describes key concepts and begins to link them to real-world contexts.	Explains scientific ideas accurately and connects them to everyday or local examples.	Analyses and applies scientific principles to explain complex systems or emerging research.
Making connections to science in society	Science as a Human Endeavour		Recognises that science is used in the real world.	Describes how science helps solve real-world problems.	Explains how science contributes to sustainability, technology, or innovation.	Critically evaluates how science and research impact society and the environment.
Planning and repeatable investigations		Working Scientifically Planning Investigations Conducting Investigations	Follows a provided procedure.	Identifies variables and follows steps with some independence.	Designs and conducts a repeatable investigation, identifying variables and controls.	Develops and refines a valid and repeatable investigation with independent variables.
Collecting and analysing data	Science Investigation Skills	Working Scientifically	Collects limited data with assistance.	Accurately records and organises data in tables and graphs.	Analyses data to identify patterns and draw logical conclusions.	Interprets data critically, identifies anomalies, and uses evidence to justify conclusions.
Use of scientific reasoning and representations			Uses basic scientific language.	Applies correct terms and symbols with support.	Communicates reasoning clearly with correct scientific conventions.	Applies abstract reasoning, models, and representations effectively.
Application of learning			States what was learned.	Explains what was discovered and how it relates to the investigation question.	Applies findings to explain broader scientific principles.	Extends findings to new contexts or proposes innovative real-world applications.
Reflection and evaluation	Science as a Human Endeavour	Working Scientifically	Describes what worked well.	Suggests improvements to method or data collection.	Evaluates reliability, accuracy, and limitations of the investigation.	Critically evaluates processes and evidence, proposing ways to enhance validity or scale research.
Communication of ideas		Communicating	Presents results using simple sentences or visuals.	Communicates results using labelled tables or graphs.	Presents findings clearly using scientific format (report, poster, or presentation).	Communicates findings creatively and persuasively using multimodal or professional formats.

As Australia's national science agency, CSIRO is solving the greatest challenges through innovative science and technology.

CSIRO. Creating a better future for everyone.

Contact us

1300 363 400
+61 3 9545 2176
csiro.au/contact
csiro.au

For further information

CSIRO Education and Outreach
1300 363 400
education@csiro.au
csiro.au/education