



SCIENCE FORWARD PLANNING DOCUMENT

Year 5 / Biological Sciences / Animal Adaptations

ABSTRACT

This forward planning document (FPD) is based on Primary Connection 5 E's teaching and learning model for science. It is based around the Year 5 biological science curriculum. A rationale precedes the FPD, addressing the issue of STEM education in Australia. The intention of this document is for it to be used as the basis for a unit of work.

[Keagan Holmes](#)

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Rationale

Introduction

STEM education has become a focal point for educators, as the demand for STEM educated students is increasing exponentially. This has caused problems in Australia as it has lacked a quality STEM education program. Other developed nations are already ahead of Australia as they have implemented national STEM programs. This rationale will state what STEM education is, its place in Australian education and its relation to the Science Learning Area.

What is STEM Education?

STEM is an acronym for science, technology, engineering and mathematics. STEM education focuses on educating students in the domains listed, providing students with STEM related skills and STEM content knowledge. STEM education was developed as the Australian Government recognised the need to support the development of skills such as critical and creating thinking, problem solving and proficiency with digital technologies. These were identified as essential skills that are required for 21st century occupations (*National Stem School Education Strategy*, 2015). STEM education integrates a variety of skills and concepts, which were usually taught in different classes, and applies them to real-life scenarios. STEM has a strong emphasis on project-based learning, as students work together to form solutions.

Goals of STEM Education

The *National Stem School Education Strategy* (2015) identified 2 goals for STEM education, to:

1. Ensure all students finish school with strong foundational knowledge in STEM and related skills
2. Ensure that students are inspired to take on more challenging STEM subjects

These overarching goals will ensure that all school leavers are competent in their STEM content knowledge, have acquired STEM related skills and are willing to undertake STEM subjects at higher education facilities. The *Education Council* has identified that they have to implement a national action plan, in order to provide a quality STEM education to students.

These areas of action include:

- I. Increasing student STEM ability, engagement, participation and aspiration
- II. Increasing teacher capacity and STEM teaching quality
- III. Supporting STEM education opportunities within school systems
- IV. Facilitating effective partnerships with tertiary education providers, business and industry
- V. Building a strong evidence base

Through the goals and action plan, the *Education Council* hope to produce a strong STEM program in Australian Schools.

The Importance of STEM Education in Australia

The importance of STEM education was first recognised by the *Melbourne Declaration on Educational Goals for Young Australians* in 2008. It was driven by a report from the 'Australian Bureau of Statistics [that] estimated that some STEM-related jobs, such as ICT professionals and engineers, have grown at about 1.5 times the rate of other jobs in recent years' (*National Stem School Education Strategy*, 2015, pg. 4). The Education Council recognised this significant change and so 'a

renewed national focus on STEM in school education' became a critical focus to ensure 'all young Australians are equipped with the necessary STEM skills and knowledge that they will need to succeed' in the future (*National Stem School Education Strategy*, 2015, pg. 4). STEM education promotes the importance of skills and knowledge required for an increasing number of future occupations.

Issues with STEM Education in Australia

Despite a general enthusiasm for the new program, the *Education Council* has taken some backlash from the public on their renewed focus on STEM education. Uren (2016) stated that after Malcolm Turnbull offered \$48 million to promote STEM subjects, a report from the Productivity Commission of Australia came out and said 'STEM graduates fare poorly in the job market'. This has called into question the importance of STEM education. Those who oppose STEM education are advocating that a surplus of STEM educated students will be created, as there are currently not enough STEM jobs. In response to this Finkel (2016) stated that increasingly 'STEM skills are needed for traditionally non-STEM jobs', so reiterating the importance of STEM education in our schools. Despite these minor claims, there is a general consensus between educators that STEM education is an important part of 21st century schooling.

STEM and the Learning Area of Science

STEM education is a broad term that is concerned with equipping students with STEM related skills and teaching them STEM content. STEM is partially focused on science, and despite this new acronym, the importance of science has not been diminished. Aubusson (2011) provides a comprehensive outlook on how the Australian science curriculum has been influenced and changed due to a number of factors that have included; population and workforce mobility, making most of limited resources, quality control and more. Although Aubusson (2011) doesn't recognise STEM, he does recognise that there is 'a renewed interest in science in years K–10 lead[ing] to high participation in science'. Aubusson (2011) shows that through the implementation of Australian curriculum there has been a renewed focus on the learning area of science, STEM education just reaffirms this importance. Therefore, STEM education compliments the science curriculum by providing students with the necessary skills to excel in the Science Learning Area.

Conclusion

STEM education is an important step forward for the *Australian Education Department*, as it provides students with the skills to succeed in the 21st century, while also reinvigorating an interest into the Learning Area of Science. STEM education should not be neglected in the classroom, instead teachers should be upskilled and encouraged to implement STEM education more regularly. It is an important step forward to renewing students interest in mathematic in science, by providing contextual projects where they can apply STEM skills.

Science Forward Planning Document

Outline of Forward Planning Document

General Outline:

TEACHER: Keagan Holmes	YEAR LEVEL: 5
LEARNING AREA: Science	TOPIC/UNIT TITLE: Biological Science
YEAR: 2016	TERM/WEEKS: Term 2 – Week 1 to 5

Week 1 - 5 Outline:

WEEK 1: Engage	WEEK 2: Explore	WEEK 3: Explain	WEEK 4: Elaborate	WEEK 5: Evaluate
<p><u>Beaks and Claws</u> Students will watch a video on the different types of birds. As an 'explorer' they must investigate the different types of beaks and claws the birds have on the island. They must match this to the types of food available and justify their answers.</p>	<p><u>Plant Adaptations</u> Students will conduct an investigation into the adaptations of some Australian plants to their natural habitat. Students will rotate through four stations completing an investigation worksheet.</p>	<p><u>Desert Survival Poster</u> Explicit teaching will occur on what adaptations are in relation to desert plants and animals. Groups will then be given a particular plant and animal. They must produce a poster explaining what adaptations their organisms have.</p>	<p><u>Australian Animal Documentary</u> Students will conduct a research investigation into an Australian animal. Students will present the information about their animal in the form of a video documentary.</p>	<p><u>Plant Investigation</u> Student will bring to school a plant from their garden. On an A3 poster paper they must draw their plant then label and describe the specific adaptations of their plant.</p>
<p>Safety Considerations:</p> <ul style="list-style-type: none"> • If live birds are used, do not let students touch the birds, only let them observe the birds. • Get students to carefully move around the room and not crowd QR code stations. • Ensure students access appropriate website when using their iPads. 	<p>Safety Considerations:</p> <ul style="list-style-type: none"> • Ensure students do not consume any of the plants. Get students to wash their hands before and after handling the plants. • Explicitly say that students should not use their sense of taste. • Demonstrate how 'smell' should be conducted in a science classroom (wafting). 	<p>Safety Considerations:</p> <ul style="list-style-type: none"> • Ensure students stay seated at their desks and don't crowd around tables. • Ensure students access appropriate websites. • Ensure movement around the room is only conducted by a few students at any one time. 	<p>Safety Considerations:</p> <ul style="list-style-type: none"> • Ensure students film appropriately and use appropriate images/content from the internet. • Ensure students are within direct eye contact while filming. • Do not allow students to conduct themselves in an inappropriate manner while filming. 	<p>Safety Considerations:</p> <ul style="list-style-type: none"> • Ensure students do not consume any of the plants. Get students to wash their hands before and after handling the plants. • Remind students to use the wafting technique to smell the plant and not to consume the plant. • Send a note home to ensure non-poisonous plants are brought.

AUSTRALIAN CURRICULUM

General Capabilities:

Literacy	Numeracy	ICT	Critical and Creative Thinking	Ethical Behaviour	Personal and Social Competence	Intercultural Understanding
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Content Descriptors:

Science Understanding	Science as a Human Endeavour	Science Inquiry Skills
Living things have structural features and adaptations that help them to survive in their environment (ACSSU043).	Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena and reflects historical and cultural contributions (ACSHE081).	Construct and use a range of representations, including tables and graphs, to represent and describe observations, patterns or relationships in data using digital technologies as appropriate (AC SIS090).
		Compare data with predictions and use as evidence in developing explanations (AC SIS218).
		Communicate ideas, explanations and processes using scientific representations in a variety of ways, including multi-modal texts (AC SIS093).

Concept Map – Integration into other Learning Areas

English

Report Writing

Students require an understanding about how scientific reports are written and presented. The Explore Lesson (L2) can be an introductory lesson to scientific report writing. This lesson provides the introduction to planning and writing reports. Students can then conduct English writing lessons on how to properly construct a report. They can use the worksheet from this lesson as their planning page and produce an actual scientific report.

Plan, draft and publish imaginative, informative and persuasive print and multimodal texts, choosing text structures, language features, images and sound appropriate to purpose and audience (ACELY1704).

Documentary Analysis

Students also require an understanding about how visual texts such as documentaries are constructed. Using the Elaborate Lesson as a 'final piece', students could have conducted a study in English on documentaries. This documentary can then be used as the creative element of the unit.

Use a range of software including word processing programs with fluency to construct, edit and publish written text, and select, edit and place visual, print and audio elements (ACELY1707).

Digital Technologies

Online Planning & Documentary Creation

Students require an understanding of how Digital Technologies are used to create a visual representation of information. Using the documentary tasks as the foundation of this, students can use online collaboration tools such as wikis or Google Docs, to plan and create their documentaries. Students need to be taught the skills of collaborating online through various programs. This is the perfect task to introduce this concept.

Plan, create and communicate ideas and information, including collaboratively online, applying agreed ethical, social and technical protocols (ACTDIP022).

Mathematics

Measurement of Water

An important element of mathematics is the application aspect. During Explain Lesson students investigate the adaptations animals have to store water. This can lead onto a maths lesson about the capacity and volume of water that animals/plants have. Students can conduct experiments such as squeezing the juice out of succulents (or fruits). They can then determine the appropriate units of measurement and conduct an investigation on the volume of water that was excreted, comparing this to other plants.

Choose appropriate units of measurement for length, area, volume, capacity and mass (ACMMG108).

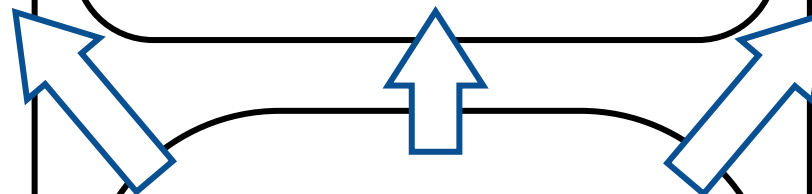
Constructing Data Displays

The Engage Lesson can be turned into an investigation that take place outside. Students can tally different birds and identify what they eat. Students can use this data to create a variety of different tables and graphs to represent their findings. This can then in turn feed back into the investigation. This can be a contextual way of introducing the topic of graphs to students in mathematics.

Construct displays, including column graphs, dot plots and tables, appropriate for data type, with and without the use of digital technologies (ACMSP119).

SCIENCE YEAR 5 Biological Sciences

Living things have structural features and adaptations that help them to survive in their environment (ACSSU043).



TERM/WEEKS: 5 Weeks

YEAR LEVEL: 5

LEARNING AREA/TOPIC: Science – Biological Sciences

AUSTRALIAN CURRICULUM

General Capabilities:

Literacy	Numeracy	ICT	Critical and Creative Thinking	Ethical Behaviour	Personal and Social Competence	Intercultural Understanding
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Cross-curriculum priorities:

Aboriginal and Torres Strait Islander Histories and Cultures	Asia and Australia's Engagement with Asia	Sustainability
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WEEK/ LESSON	AUSTRALIAN CURRICULUM LINKS	SPECIFIC LESSON OBJECTIVES	ASSESSMENT (What & How)	TEACHING & LEARNING EXPERIENCES (Include Learner Diversity)	KEY QUESTIONS	RESOURCES
Engage Lesson – Beaks and Claws	<p>Science Understanding Living things have structural features and adaptations that help them to survive in their environment (ACSSU043).</p> <p>Science as a Human Endeavour Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena and reflects historical and cultural contributions (ACSHE081)</p> <p>Science Inquiry Skills Compare data with predictions and use as evidence in developing explanations (AC SIS218).</p>	<p>As a result of this lesson students will be able to:</p> <ol style="list-style-type: none"> Identify how the structural features of birds have adapted to meet their needs. Gather data about the bird's structural features. Make and justify predictions about the birds food sources, based on the data found on the structural features of the bird. 	<p>Checklist (Diagnostic)</p> <p>The worksheets will be gathered by the teacher after the investigation has been conducted. Students will be marked using a checklist and a scale of:</p> <ul style="list-style-type: none"> - proficient - developing - not proficient 	<p>Introduction – Introducing the Task and Demonstrating the Activity</p> <ul style="list-style-type: none"> Get students settled and then give them an outline of the lesson. As a class watch the following video on bird adaptations as a class (https://youtu.be/8vL_2rF8JHU). Brainstorm as a class the structural differences between bird species. Introduce the activity by setting the scene: "You are all explorers on your way to a mysterious Island... Here you will find many different types of birds... etc." <p>Procedure – Conducting the Activity</p> <ul style="list-style-type: none"> Prior to starting the class/activity set up the following: <ul style="list-style-type: none"> Stations for different birds and different types of food. QR codes that lead to images and pre-prepared information slides on the specific birds. Information will be comprehensive but will not link birds to relative food. Students will be paired with their shoulder partners. They will be given an investigation sheet and instructions on how to complete the activity. Students must investigate individually the birds present. They must identify the birds – scientific name, general structure, specific beak and claw structure. Using the information found from the birds, students must investigate the plants and predict which bird's food source it is. They must then predict justify their answers. Use proximity and questioning to ensure students stay on task. <p>Diversity – Extending, enabling & catering for diversity</p> <ul style="list-style-type: none"> Extension: Students who require an extension to the activity, will tasked with investigating other structural features that differ between the birds. Students will be tasked to create a Venn diagram to show differences between particular structural features. This task will be given to students through prompt cards. Enabling: Students who require assistance to access the content will be given examples of specific structural features and how they relate to particular attributes (i.e. large eyes for nocturnal animals). Students will be asked to use the same method to determine the answers for the investigation. Prompt cards will hold this information. <p>Conclusion – Consolidating Student's Understanding</p> <ul style="list-style-type: none"> Students will be randomly selected to share their findings with the class. They must explain why they had matched up a bird to a particular food source. The term adaptation will be introduced to describe 'changes to structural features of an animal to meet certain requirements' (very simplistic definition). Students will conduct a KAHOOT quiz to consolidate their understanding on the topic. 	<p>Discussion questions:</p> <ul style="list-style-type: none"> - What is different between the birds? - Why do you think these birds differ? - How having different ____ help this particular bird? - Can you think of other animals with a similar structure/feature? - Why do only these birds have it? - What does this beak/claw allow the bird to do or eat? 	<p>https://youtu.be/8vL_2rF8JHU</p> <p>Projector/TV</p> <p>Student iPad's</p> <p>QR Code Scanner</p> <p>QR Codes and Relative Information (alternatively envelopes with information inside can be used)</p> <p>Bird and Plant Cut-outs</p> <p>Investigation Worksheet</p> <p>Explorer Outfits</p> <p>Jungle Décor</p> <p>KAHOOT! Quiz</p> <p>Prompt Cards for Extension & Enabling Student</p>

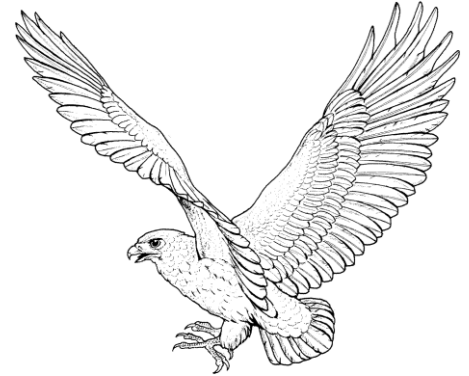
BIRD 'BEAKS & CLAWS' INVESTIGATION



Instructions: Explorer, you must investigate all the birds found on this Mystery Island. Provide the team at HQ with the scientific name of the bird, a description/sketch of the bird's beak & claws, and predict what the bird's food source is.

SCIENTIFIC NAME: _____

<i>Beak Description</i>	<i>Claws Description</i>	<i>Food Source Prediction</i>

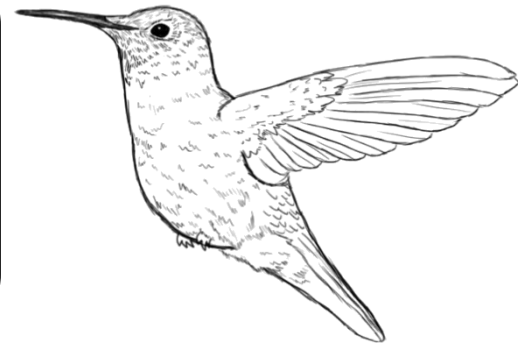


SCIENTIFIC NAME: _____

<i>Beak Description</i>	<i>Claws Description</i>	<i>Food Source Prediction</i>

SCIENTIFIC NAME: _____

<i>Beak Description</i>	<i>Claws Description</i>	<i>Food Source Prediction</i>



SCIENTIFIC NAME: _____

<i>Beak Description</i>	<i>Claws Description</i>	<i>Food Source Prediction</i>

Engage Lesson Assessment – Checklist

Students Name	Objective 1: Identify how the structural features of birds have adapted to meet their needs.			Objective 2: Gather data about the bird's structural features.		Objective 3: Make and justify predictions about the birds food sources, based on the data found on the structural features of the bird.		Notes – Strengths and Weaknesses
	Related the birds BEAK structure to relative food source.	Related the birds CLAWS structure to relative food source.	Identified there is a difference in the birds structural features, depending on its food.	Identified the unique structural feature of the birds BEAKS .	Identified the unique structural feature of the birds CLAWS .	Predicted what food source belongs to what bird.	Justified answers using the data found from structural features.	
Student 1								
Student 2								
Student 3								
Student 4								
Student 5								

Key

Proficient

Developing

Not Proficient

TERM/WEEKS: 5 Weeks

YEAR LEVEL: 5

LEARNING AREA/TOPIC: Science – Biological Sciences

General Capabilities:

Literacy	Numeracy	ICT	Critical and Creative Thinking	Ethical Behaviour	Personal and Social Competence	Intercultural Understanding
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Cross-curriculum priorities:

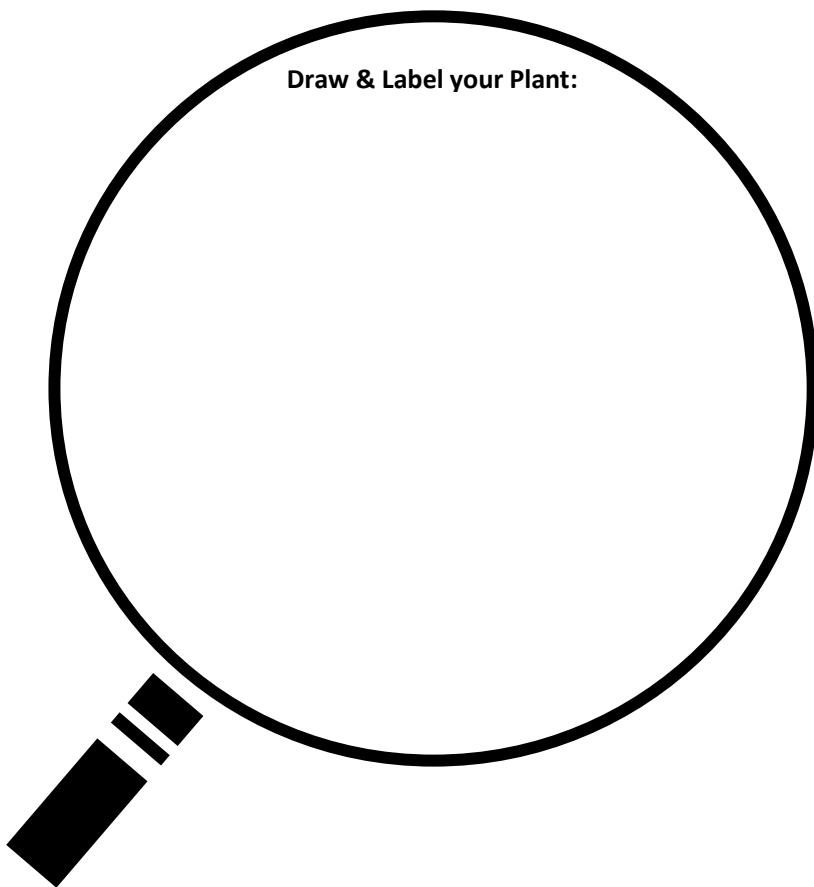
Aboriginal and Torres Strait Islander Histories and Cultures	Asia and Australia's Engagement with Asia	Sustainability
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WEEK/ LESSON	AUSTRALIAN CURRICULUM LINKS	SPECIFIC LESSON OBJECTIVES	ASSESSMENT (What & How)	TEACHING & LEARNING EXPERIENCES (Include Learner Diversity)	KEY QUESTIONS	RESOURCES
Explore Lesson – Plant Adaptations	<p>Science Understanding Living things have structural features and adaptations that help them to survive in their environment (ACSSU043).</p> <ul style="list-style-type: none"> Describing and listing adaptations of living things suited for particular Australian environments. <p>Science Inquiry Skills Construct and use a range of representations, including tables and graphs, to represent and describe observations, patterns or relationships in data using digital technologies as appropriate (ACIS090).</p>	<p>As a result of this lesson students will be able to:</p> <ol style="list-style-type: none"> Identify and describe the adaptations of a plant that is suited to a particular Australian environment. Demonstrate their scientific understanding by constructing labelled scientific diagrams, making observations and drawing conclusions. 	<p>Self-Assessment (Formative)</p> <p>Worksheets will be collected, marked and returned to students. Note will be taken on student understanding. Students will conduct a self-assessment to reflect on their experience and what they have learnt. This will be collected with the worksheet.</p>	<p>Introduction – Introducing the Task and Demonstrating the Activity</p> <ul style="list-style-type: none"> Welcome students to the classroom. Reflect on the previous lesson's content. Brainstorm as a class what 'adaptation' is (define and examples). Introduce the task to the students by conducting a demonstration (see procedure) using a Venus Fly Trap. Use 'think-alouds' to model what students will need to be doing. Question students to ensure they understand the task. Get students into their house faction groups. Assign each group to a station. Allow each of the four groups 5 minutes at each station. <p>Procedure – Conducting the Activity</p> <ul style="list-style-type: none"> Students will conduct an investigation on a particular plant using a black pen, they will: <ul style="list-style-type: none"> Identify and describe the unique characteristics of the plant. Construct a labelled, scientific diagram of the plant & describe its environment. Relate the characteristics of the plant to the environment and provide a relative explanation of why they think these characteristics have developed. Students will complete the above at each of the four different environment stations (desert/outback, bushland, beach, tropical rainforest). Use proximity during this time to ensure students are staying on task. Question students on their finding and conclusions. After students have gone through each of the stations they will be told to swap to a blue pen. Students will then get their iPads and use a QR code scanner to further investigate the plants and record their findings. <p>Diversity – Extending, enabling & catering for diversity</p> <ul style="list-style-type: none"> Extension: Students who require an extension of the activity will be given the option to research a carnivorous plant. They will conduct the same investigation on this plants stating the environment, adaptations and constructing a diagram. Enabling: Student who require assistance with the task will be grouped together and worked with individually. A branching chart will be given to these students to help them identify characteristics and their associated value. <p>Conclusion – Consolidating Student's Understanding</p> <ul style="list-style-type: none"> Call all the students to gather on the mat. Consolidate what students had learnt by going through each of the plants and their environments, getting students to verbally share what they had found out. Students will conduct a self-assessment. Pack up all equipment, collect work & assign them a bonus questions (<i>homework</i>). 	<p>Discussion questions:</p> <ul style="list-style-type: none"> What is adaptation? Why do plants adapt? What adaptations does this plant have? Why do you think it has these adaptations? What other plants can you think of that have the same or similar adaptations? <p>Bonus Question:</p> <ul style="list-style-type: none"> What plant (name one) has adapted to eat animals? 	<p>https://youtu.be/C11b0-BIBKU</p> <p>http://goo.gl/kOFOOS</p> <p>http://goo.gl/AQaYa8</p> <p>http://goo.gl/MZ1ctf</p> <p>Plant Dioramas with plants (one for each of the environments, i.e. eucalyptus tree for the bushland)</p> <p>Self-assessment</p> <p>Student iPads</p> <p>QR codes with relative webpages</p> <p>Handouts</p> <p>Marking Rubric</p>

Explore Lesson Worksheet – Plant Investigation

Scientific Name of the Plant: _____

Draw & Label your Plant:



OBSERVATIONS:
(Plant & Environment)

How does your observation relate to the plants adaptations?

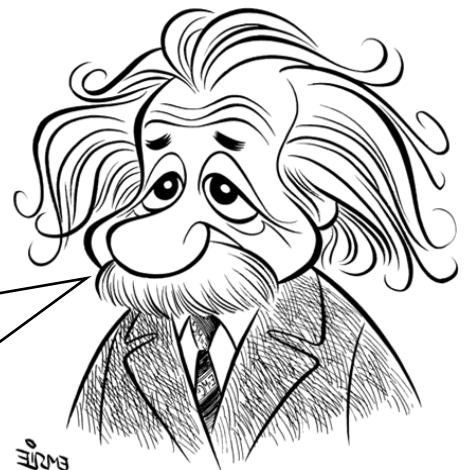
Specific Observations	Possible Adaptations (Hypothesis)	Adaptations (Research)



CONCLUSION

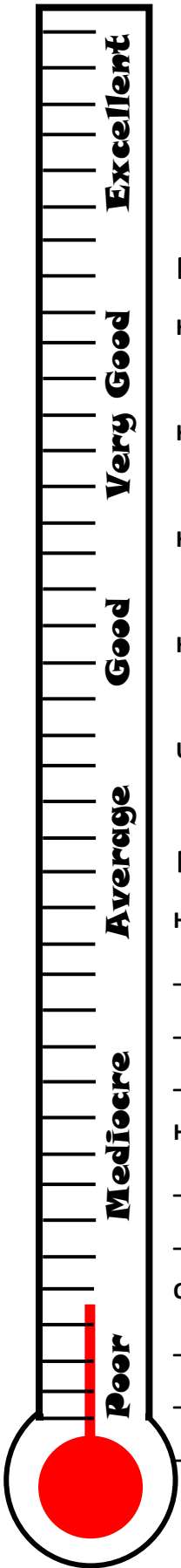
In your own words, explain the adaptations of this plant using information from your observations and research.

Explore Lesson Assessment – Self Assessment



Hello: _____

This is a self-assessment... To complete this follow the instruction for each of the sections very carefully. Think about how you conducted yourself throughout the lesson and choose an appropriate response.



Rate yourself below on the scale with 0 being poor and 10 being excellent

How would you rate your behaviour this lesson?

0 1 2 3 4 5 6 7 8 9 10

How would you rate your work ethic (how well you worked) this lesson?

0 1 2 3 4 5 6 7 8 9 10

How would you rate the final product that you produced?

0 1 2 3 4 5 6 7 8 9 10

How would you rate your concentration this lesson?

0 1 2 3 4 5 6 7 8 9 10

Using the thermometer on the side rate your overall input to the lesson?

← Use thermometer on the side

Provide a Short Answer for the Following

How could you improve next lesson? (Behaviour, work ethic, final product, concentration, etc.)

How could the lesson be improved?

One thing I learnt and found interesting was...

AUSTRALIAN CURRICULUM

General Capabilities:

Literacy	Numeracy	ICT	Critical and Creative Thinking	Ethical Behaviour	Personal and Social Competence	Intercultural Understanding
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Cross-curriculum priorities:

Aboriginal and Torres Strait Islander Histories and Cultures	Asia and Australia's Engagement with Asia	Sustainability
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WEEK/ LESSON	AUSTRALIAN CURRICULUM LINKS	SPECIFIC LESSON OBJECTIVES	ASSESSMENT (What & How)	TEACHING & LEARNING EXPERIENCES (Include Learner Diversity)	KEY QUESTIONS	RESOURCES
Explain Lesson - Desert Survival Poster	<p>Science Understanding Living things have structural features and adaptations that help them to survive in their environment (ACSSU043).</p> <ul style="list-style-type: none"> Exploring general adaptations for particular environments such as adaptations that aid water conservation in deserts. 	<p>As a result of this lesson students will be able to:</p> <ol style="list-style-type: none"> Explain what an adaptation is and provide a relative example of one. Identify how plants and animals have adapted to meet the needs of their environment. Construct an informative poster depicting particular adaptations of organisms. 	<p>Peer Assessment (Formative)</p> <p>As groups present their posters, another group will be conducting a peer assessment. The scribe and moderator will discuss the positives, negatives and interesting elements of the other group's presentation. The scribe will then fill out the PMI chart and hand it to the group.</p>	<p>Introduction – Introducing the Task and Demonstrating the Activity</p> <ul style="list-style-type: none"> Reflect on previous lessons content by brainstorming what an adaptation is. Explicitly teach students what an adaptation is. Provide students with some examples of adaptations and relate them to the environment the organisms live in. Watch the following video (https://youtu.be/hTfBSIYTG4k) on plant and animal adaptations to desert environments. Question students on the video. <p>Procedure – Conducting the Activity</p> <ul style="list-style-type: none"> Inform students that they will be tasked to investigate an Australian desert plant and animal. Explain to them that they must investigate the organism's adaptations that it has developed to meet the requirements of its environment. Tell students that they will be required to present their information (text and diagrams/pictures) on a poster. Group students by their tables. Assign each student a role at the table (scribe, gatherer, moderator and speaker). Call the gatherer to get a sachet with relative task information and resources in it. Ask if students require any clarifying question, establish time goals for research and production then set students on task. Get student's attention using a rhythm clap at each time interval. Check on groups progress and use positive reinforcement to get them on track, <p>Diversity – Extending, enabling & catering for diversity</p> <ul style="list-style-type: none"> Extension: Students who require extension to the activity will be tasked with identifying other organisms with the same adaptation. Students will be required to infer why they think the organism has the same or similar adaptation. Enabling: Students who are struggling to complete the task will be shown some YouTube videos that explain how adaptation has come about for desert organism. They will be questioned afterwards to ensure they understand the concepts being presented. <p>Conclusion – Consolidating Student's Understanding</p> <ul style="list-style-type: none"> Allow the speaker of each group to present the poster to the class. Ask clarifying questions to the group to check for understanding. Get another group to conduct a peer assessment (PMI Chart). Have the present what they wrote down on their reflection on the group's poster. Consolidate students understanding through using a 'what stuck with me' sticky note exit slip. 	<p>Discussion questions:</p> <ul style="list-style-type: none"> What adaptations do _____ have to conserve water? Why do _____ have these adaptations? How does this adaptation help _____ to live in the desert? Could this animal survive in Antarctica? Why? 	<p>https://youtu.be/hTfBSIYTG4k</p> <p>Projector/TV</p> <p>Variety of Australian Desert Animals and Plants (Information with relative web links)</p> <p>Whiteboard</p> <p>Markers</p> <p>Student iPads</p> <p>Sachet Contents:</p> <ul style="list-style-type: none"> Task Outline Plant and Animal Card Poster Paper <p>Enabling Videos</p> <p>https://youtu.be/AZzCLEDR7Mo</p> <p>https://youtu.be/Nq-dw1nsX3Y</p>
	<p>Science Inquiry Skills Construct and use a range of representations, including tables and graphs, to represent and describe observations, patterns or relationships in data using digital technologies as appropriate (ACSI090).</p> <p>Communicate ideas, explanations and processes using scientific representations in a variety of ways, including multi-modal texts (ACSI093).</p>					

Explain Lesson Assessment – Peer Assessment (Plus, Minus & Interesting Chart)

Students are required to assess their fellow students using the plus, minus and interesting chart. For plus they will discuss all the positive aspects of the poster and the information presented. In minus they will comment on things they didn't like and give constructive feedback, on how they will be able to improve next time. For interesting, they will need to write down all the things they thought were interesting in the presentation.

 INTERESTING	 PLUS
	Group Members: _____ Assessors: _____
	 MINUS

TERM/WEEKS: 5 Weeks

YEAR LEVEL: 5

LEARNING AREA/TOPIC: Science – Biological Sciences

AUSTRALIAN CURRICULUM

General Capabilities:

Literacy	Numeracy	ICT	Critical and Creative Thinking	Ethical Behaviour	Personal and Social Competence	Intercultural Understanding
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Cross-curriculum priorities:

Aboriginal and Torres Strait Islander Histories and Cultures	Asia and Australia's Engagement with Asia	Sustainability
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WEEK/ LESSON	AUSTRALIAN CURRICULUM LINKS	SPECIFIC LESSON OBJECTIVES	ASSESSMENT (What & How)	TEACHING & LEARNING EXPERIENCES (Include Learner Diversity)	KEY QUESTIONS	RESOURCES
Elaborate Lesson – Aussie Animal Doco	<p>Science Understanding Living things have structural features and adaptations that help them to survive in their environment (ACSSU043).</p> <ul style="list-style-type: none"> Describing and listing adaptations of living things suited for particular Australian environments. 	<p>As a result of this lesson students will be able to:</p> <ol style="list-style-type: none"> Identify and describe what adaptations their animal has to survive in their environment. Create a storyboard and script that will form a solid basis for filming a documentary. Produce a documentary that identifies and describe the chosen animal, its environment and relative adaptations it has to survive. 	<p>Rating Scale (Summative)</p> <p>Student's documentaries will be marked using a rubric that has identified the key items students needed for the task.</p> <p>Checklist (Formative)</p> <p>Students will show their planning to the teacher who will not their progress.</p>	<p>Introduction – <i>Introducing the Task and Demonstrating the Activity</i></p> <ul style="list-style-type: none"> Brainstorm as a class about what an adaptation is, recapping previous lessons content. Get students to identify what causes adaptations to occur in particular environments and what are the resulting adaptations of organisms (i.e. large leaves to catch sunlight). Watch a short documentary on adaptations. Discuss how the documentary was constructed, specifically the sequence. Discuss and brainstorm specific features of documentaries. <p>Procedure – <i>Conducting the Activity</i></p> <ul style="list-style-type: none"> Introduce the lesson objectives and the task to students. Task: students are to create a two minute documentary on their given Australian animal. They are to identify the physical features of their chosen animals and relate them to how it helps them survive in their environment. Students will investigate their animal, produce a script and a storyboard prior to commencing filming. Students will need to ensure they include the features of a documentary to get optimal marks. Students will be placed into pairs and given an animal that they need to investigate. Proximity and questioning will be used throughout the lesson to identify if students are staying on task. Check student's storyboards and scripts, ensuring that students are on task and have the right idea. Allow students to start filming their documentaries. <p>Diversity – <i>Extending, enabling & catering for diversity</i></p> <ul style="list-style-type: none"> Extension: Pairs who require extension will be given animals with more complex adaptations. These animals will have very specialised adaptations that have developed to make them a dominant species in their environment. Enabling: Pairs who require extra assistance will be given animals whose adaptations are extremely obvious and aren't as complex. They will only be required to make limited connections and will be given more time to complete their tasks. Tutorial: provide student with an iMovie tutorial to learn the basics. Offer extra assistance to those students who are struggling to complete the task. <p>Conclusion – <i>Consolidating Student's Understanding</i></p> <ul style="list-style-type: none"> Get students to airdrop their documentaries to my iPad. Present a few of the documentaries at the start of each science lesson during the term. Get students to reflect on the experience by questioning what they had learnt from the presentation and what they had enjoyed. 	<p>Discussion questions:</p> <ul style="list-style-type: none"> - What is an adaptation? - Why do animals adapt? - What is your chosen animal's adaptation? Why do they have this adaptation? - Is your animals adaptation unique or do other animals have it too? - Have you met all the requirements on the rubric? Can you improve your work to meet those requirements? 	<p>https://youtu.be/45GqKPUvKEI</p> <p>Appropriate web links for Australian animals</p> <p>List of Australian Animals that can be given to students</p> <p>Storyboard</p> <p>Projector</p> <p>Apple TV</p> <p>iPad</p> <p>iMovie</p> <p>Checklist</p> <p>Marking Rubric</p>
	<p>Science Inquiry Skills Construct and use a range of representations, including tables and graphs, to represent and describe observations, patterns or relationships in data using digital technologies as appropriate (ACSI090).</p> <p>Communicate ideas, explanations and processes using scientific representations in a variety of ways, including multi-modal texts (ACSI093).</p>					

Elaboration Lesson Worksheet – *Storyboard Template*

Production Name:

Page No:

Shot: _____

Action: _____

Sound/Time: _____

Shot: _____

Action: _____

Sound/Time: _____

Shot: _____

Action: _____

Sound/Time: _____

Shot: _____

Action: _____

Sound/Time: _____

Shot: _____

Action: _____

Sound/Time: _____

Shot: _____

Action: _____

Sound/Time: _____

Elaborate Lesson Assessment – Rating Scale

Here is the rubric for your documentary task. Make sure you have checked off all the sections to ensure that you have completed the task to a high standard.

Have you worked on your targets??

Assignment: Australian Animal Adaptation Documentary

Tasks:	A	B	C	D	E
Provide a brief description of the animal (<i>diet, habitat, behaviour, features, interesting facts, etc</i>).					
Correctly identify the environment that the animal lives in.					
State the SPECIFIC adaptation/s that relate to the animals environment.					
Identify why you think these adaptations have occurred (<i>relate to the animals environment</i>).					
Produce a plan of the documentary that contains all of the information stated above.					
Produce a high quality storyboard.					
Produce a documentary that reports on the information gathered.					
Engage the audience through using a variety of editing (<i>music overlay, voice over, images, etc</i>) and filming techniques (<i>costumes, props, setting, etc</i>).					

A = Above and beyond, really high standard of work. Congratulations!

B = Good work standard, just above average. Well Done!

C = You have done just enough. You can do better!

D = Your task needs more work. You haven't reached your potential!

E = You have not produced an appropriate standard of work.

TERM/WEEKS: 5 Weeks

YEAR LEVEL: 5

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Aboriginal and Torres Strait Islander Histories and Cultures	Asia and Australia's Engagement with Asia	Sustainability
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WEEK/ LESSON	AUSTRALIAN CURRICULUM LINKS	SPECIFIC LESSON OBJECTIVES	ASSESSMENT (What & How)	TEACHING & LEARNING EXPERIENCES (Include Learner Diversity)	KEY QUESTIONS	RESOURCES
Evaluate Lesson – Plant Investigation	<p>Science Understanding Living things have structural features and adaptations that help them to survive in their environment (ACSSU043).</p> <p>Science Inquiry Skills Communicate ideas, explanations and processes using scientific representations in a variety of ways, including multi-modal texts (ACSI093).</p>	<p>As a result of this lesson students will be able to:</p> <ol style="list-style-type: none"> Identify and describe the adaptations of a plant without the assistance of digital technologies. Construct a comprehensively labelled scientific diagram of a plant. 	<p>Marking Rubric (Summative)</p> <p>Plant investigation sheets will be collected and marked using the rubric. Students will be given an A-E grade and a relative badge that corresponds to their grade.</p>	<p><i>Prior to the lesson, send a letter home to parents asking them to send a plant, from their garden, to school. Explain the task to the parents in the letter.</i></p> <p>Introduction – Introducing the Task and Demonstrating the Activity</p> <ul style="list-style-type: none"> Brainstorm with students what an adaptation is. Get students to provide examples. Introduce the task to students by demonstrating what they are required to do. Bring in a plant from home, draw a quick sketch of it on the whiteboard and label its adaptations (providing a 'comprehensive description'). Explain to students that they must draw their plant, label the specific adaptations of their plant, describe the adaptations and relate them to the environment they have adapted to. Ask students clarifying questions to ensure they understand what is required of them. Explain to students that they are not allowed to use digital technologies, and they must work at a whisper noise level (use 'Bouncing Balls' - noise level controller app). <p>Procedure – Conducting the Activity</p> <ul style="list-style-type: none"> Ask one student to hand out A3 pages and another the marking rubric. Allow one table at a time to get their plant from the shelf and then get them started on the task. Use proximity and questioning to ensure students stay on task. Set time goals for students to complete certain aspects of the task. Ensure students are providing comprehensive descriptions of the adaptations and that they are relating them to the plants environment. Encourage students to just have a go if they are stuck. <p>Diversity – Extending, enabling & catering for diversity</p> <ul style="list-style-type: none"> Extension: Students who require an extension to the activity will be required to identify what behavioural adaptations are. They must present their findings as a podcast to the teacher. Enabling: Students who are struggling with the activity will be shown how to identify certain adaptations on other plants. They will then be prompted to identify similar adaptations on their own plant. <p>Conclusion – Consolidating Student's Understanding</p> <ul style="list-style-type: none"> Get one person from each group table to collect their groups A3 sheets, ensuring all their collected work has names on them. Ask students to stand and point out an adaptation of their plant. Conduct a true or false game, relating to adaptation, with the students. 	<p>Discussion questions:</p> <ul style="list-style-type: none"> What adaptation does your plant have to survive in its environment? Is your plants adaptation shared by other student's plants? <p>Bonus Question:</p> <ul style="list-style-type: none"> What is a behavioural adaptation? How does it differ from a structural adaptation? Can plants have behavioural adaptations? 	<p>Student's individual plants</p> <p>A3 Paper</p> <p>Pencils</p> <p>Rulers</p> <p>Marking Rubric</p> <p>Whiteboard</p> <p>Markers</p> <p>Projector</p> <p>Bouncing Balls</p> <p>Web App</p> <p>Laptop</p> <p>Teacher's Plant</p>

Evaluate Lesson Assessment – *Marking Rubric*

Plant Investigation Marking Rubric

Judging Standards		Excellent Achievement A	High Achievement B	Satisfactory Achievement C	Limited Achievement D	Very Low Achievement E	Grade
Communication	Scientific Language	Predominantly uses relevant scientific terminology in the correct context.	Uses some simple scientific terminology correctly.	Uses everyday language and some familiar scientific words.	Predominantly uses everyday language.	Uses everyday language in brief, unscientific comments.	
	Presentation	Writing and diagrams are neat and appropriate; very limited amount of mistakes.	Writing and diagrams are neat and appropriate; limited amount of mistakes.	Writing and diagrams are neat and appropriate; acceptable amount of mistakes.	Writing and diagrams are relatively neat with quite a few mistakes made.	Writing and diagrams are relatively neat with many mistakes made.	
Science Understanding	Biological Sciences	Accurately identifies and describes almost all the adaptations of the plant.	Accurately identifies and describes most of the adaptations of the plant.	Identifies and describes some of the adaptations of the plant.	Identifies some of the adaptations of the plant.	Identifies a limited amount or none of the adaptations of the plant.	
		Accurately relates the adaptations to the environment of the plant.	Relates the adaptations to the environment of the plant.	Relates some adaptations to the environment of the plant.	Relates an adaptation to the environment of the plant.	Does not relate the adaptation to the environment of the plant.	
Science Inquiry Skills	Diagram	Diagram is comprehensive, drawn with a ruler and a pencil.	Diagram is comprehensive and with a pencil.	Diagram is comprehensive but is drawn without using a pencil.	Diagram is drawn without using a pencil.	Diagram is very poorly constructed.	
	Labels	Labels are comprehensive and accurately drawn with a ruler.	Labels are comprehensive and accurately drawn.	Labels are accurately drawn.	Labels are not accurately drawn.	Labels are not drawn.	

Overall Badges – These badges will be awarded to you as you complete each stage. Read the descriptions to ensure you are pushing for the next badge.

<p>A – Excellent Achievement Like Einstein you are excelling in science working at a really high standard.</p> 	<p>B – High Achievement You have mastered the basics and you are working at a high standard.</p> 	<p>C – Satisfactory Achievement You are starting to develop an understanding of scientific knowledge.</p> 	<p>D – Limited Achievement You are at the beginning stages of your science journey.</p> 	<p>E – Very Low Achievement Like a magnifying glass you need to look closer at what is around you.</p> 
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Feedback – Read the following to help you understand what you did well and how you may improve in the next task

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