

ADAPTATIONS

TEACHING UNIT



CONTENTS

1. Unit Overview	2
2. Lesson Plans	7
3. Camouflage Capers investigation	15
4. Survival in Extreme Environments investigation.....	20
5. Investigation Planner	23
6. Digital Story Task	27
7. Guide to Making Judgements	
(a) investigation outcomes	31
(b) conceptual outcomes	32
8. Alien Attack Image	33
9. Other Resources	34

This unit was developed by:

Adriana Bauer
Senior Project Officer (Biodiversity)
Strategic Learning
Queensland Museum
2011

<p>Unit title: ADAPTATIONS</p>	<p>Strands: Science Understanding (Biological Sciences) Science Inquiry Skills Science as a Human Endeavour</p>	<p>Stage: 2 (Year 5 of Australian Science Curriculum)</p>	
<p>UNIT FOCUS</p>	<p>STRAND CONCEPTS</p>	<p>ELABORATIONS</p>	<p>UNIT LITERACY FOCUSES</p>
<p>What is the context?</p> <p>What features do organisms have to help them survive in their environment? Structural and behavioural adaptations and to a lesser extent, functional adaptations will be studied.</p> <p>What is the inquiry?</p> <p>How do animals survive in extreme environments? e.g very hot, very cold, very dry etc.</p> <p>How will students demonstrate their learning?</p> <p>Investigation – report – to display investigation outcomes</p> <p>Digital Story/ poster and oral presentation – to display conceptual outcomes</p>	<p>Science Understanding <i>Biological Sciences</i> Living things have structural features and adaptations that help them to survive in their environment.</p> <p>Science Inquiry Skills <i>Planning and conducting</i> With guidance, select appropriate investigation methods to answer questions or solve problems.</p> <p>Decide which variable should be changed and measured in fair tests and accurately observe, measure and record data, using digital technologies as appropriate.</p>	<ul style="list-style-type: none"> describe and list adaptations of living things suited for the Australian environment by relating form and function explore general adaptations for particular environments such as water conservation in deserts explain how particular adaptations help survival such as nocturnal behaviour, silver coloured leaves of dune plants compare types of adaptations such as behavioural and structural experience a range of ways of finding information and ideas, including internet research consider different investigation methods, including experimental testing, field work and conducting surveys discuss in groups how investigations can be made as fair as possible using the idea of an independent variable as something that is being investigated by changing it and measuring the effect of this change using familiar tools such as rulers, weighing scales and watches to measure objects and events in investigations adding information to tables, graphs and spreadsheets 	<p><u>Everyday literacies:</u> Cooperative small group work, whole class discussion, word walls and posters, PowerPoint presentations and Digital stories, charts, verbal reports.</p> <p><u>Literacies of science:</u> factual text, data tables, labelled diagrams, models, drawings.</p> <p><u>Scientific literacy:</u> knowledge and understanding of scientific concepts and processes and the application of such to everyday situations.</p> <p><u>Examples:</u> Annotated diagram, drawing, factual text, glossary, graph, labelled diagram, oral presentation, poster, procedural text, report, science journal, storyboard, summary, table, word wall. (These are outlined in red font in the next few pages.)</p>

	<p><u><i>Processing and analysing data and information</i></u> 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.</p> <p>Compare data with predictions and use as evidence in developing explanations.</p> <p><u><i>Evaluating</i></u> Suggest improvements to the methods used to investigate a question or solve a problem.</p> <p><u><i>Communicating</i></u> Communicate ideas, explanations and processes in a variety of ways, including multi-modal texts.</p> <p>Science as a Human Endeavour <u><i>Use and influence of science</i></u> Scientific knowledge is used to inform personal and community decisions.</p>	<ul style="list-style-type: none"> • identify similarities and differences in qualitative data in order to group items or materials • describe simple cause and effect relationships as shown by trends in quantitative data • share ideas as to whether observations match predictions, and discuss possible reasons for predictions being incorrect • Work collaboratively to suggest improvements to the methods used • use labelled diagrams, including cross-sectional representations, to communicate ideas • use a variety of communication modes such as reports, explanations, arguments, debates and procedural accounts, to communicate scientific ideas • understand how models can be used to represent scientific ideas and construct physical models to demonstrate an aspect of scientific understanding • consider how best to ensure growth of plants • consider how decisions are made to grow particular plants and crops or raise particular animals depending on environmental conditions 	
--	--	--	--

Unit title: ADAPTATIONS Strands: Science Understanding (Biological Sciences);
 Science Inquiry Skills; and Science as a Human Endeavour. Stage: 2 (Year 5)

Time: 9 weeks (90 mins per week)

PHASE	ACTIVITIES
<p style="text-align: center;">ENGAGE (Lesson 1)</p>	<p><i>How can we engage students and elicit their prior knowledge? Representations? Diagnostic assessment.</i></p> <p>Alien Attack: drawing of an unknown organism from another galaxy is presented to the class. Group work: What type of an organism is it? (plant, animal, other) In what type of habitat do you think it lived? What features does it have to support your suggestion? How do you think it moves, eats, breathes etc? Discuss results.</p> <p>Drawing activity: Draw a whale and an elephant. How are they similar? How are they different? How do their body parts help them to survive in their habitat? Draw a cactus and a tropical palm tree. How are they similar? How are they different? How does their body structure help them to survive in their environment?</p> <p>Class discussion: Brainstorming – Name some animals that live in water. What sorts of features do these animals have? How are they different from those that live on land? Name some types of plants that live in rainforests and deserts. How do they differ? Name some animals that live in polar or arctic regions. What features do they have to help them live in the extreme cold? (Students identify similarities and differences which enables them to group features for similar purposes.)</p> <p>Annotated Diagram: Homework exercise - Collect some magazines. Cut out images of three organisms. Paste them onto the left-hand of your science journal. Label each image pointing to any features may help it to survive. On the right-hand explain your reasoning.</p>
<p style="text-align: center;">EXPLORE (Lessons 2)</p>	<p><i>What hands-on, shared experiences of the phenomenon are appropriate? Representations? Formative assessment.</i></p> <p>Hands-on Activities: Borrow one of the Skulls kits from Queensland Museum Loans. (<i>How We Eat; How We Survive; Skulls: Queensland Birds; Skulls: Queensland Mammals</i>. Download the facts sheets (Skulls: How We Eat; Skulls: How We Survive, etc) from the Learning Resources section of the QM website; and the Skulls kits: Teacher and Student Notes http://www.qm.qld.gov.au/Learning+Resources/Resources Select some of the activities to do. (* See alternative activities listed at the end of this Explore section.) QM Loans kits can be borrowed online from: http://www.qm.qld.gov.au/Learning+Resources/QM+Loans</p> <p>Internet research: Students research terms and list organisms that engage in the following behaviours; they describe the habitats in which these organisms live; and note how the features of these organisms help with their survival. Add words to Word Wall and student Glossary: nocturnal; diurnal; migration; hibernation; camouflage.</p> <p>.....</p>

Investigation: Camouflage Capers. (Requires access to school grounds including a grassy area; and area under trees with some leaf litter.) Students can predict what they think will happen and see how their observations compare with their predictions. They will summarise data in tables and perform calculations. Students discuss and write up their answers to the Colour Adaptation investigation in **report** format. (Introduction; main body of information including **graphs** and **tables**; and a conclusion to communicate findings.)

Image/Specimen Collection: In groups students start to collect images of an organism they would like to investigate in detail. The images may be from Wikimedia Commons, Flickr or taken by the students themselves using a digital camera. (This will be for the Evaluate phase later.) Students can focus on an organism from their home or school grounds and they will need to produce a **labelled diagram** showing shape, size and features and include a title and scale.

Teacher questioning & class discussion: 1. What do organisms need to survive? (water, food (if animals), light (for plants to make food), suitable temperature, oxygen, CO₂ (plants, for photosynthesis), shelter or protection from the elements) **2. Types of adaptations.** Teacher selects examples to show the meaning of structural, behavioural and functional adaptations. Images from Wikimedia Commons or Flickr can be sourced. Teacher questions students about how they think each feature would help with survival. Suggestions: silvery leaves of dune plants (to reflect light and reduce overheating; structural); large flat leaves of rainforest plants (to increase the amount of light absorbed; structural); Spinifex leaves that roll up in dry environments (to reduce water loss; functional); stream-lined shape of sharks (to propel them through water and chase prey; structural); nocturnal activity of owls (hunting at night to easily catch sleeping prey; behavioural); humans sweating on hot days (to cool down and reduce body temperature, functional) + many more. (Get students to start a Glossary of terms.)

Viewing of documentaries: Each group views all 6 videos on Animal Adaptations accessed on <http://www.qm.qld.gov.au/Find+out+about/Behind+the+Scenes/Museum+Experts> i.e. Bee Flies, Carpet Pythons, Marine Mammals, Swimming Crabs, Tortoise Beetles, and Velvetfish. Then each group is allocated one animal and they have to list and describe the features of the animal and how they help it to survive in its habitat. (i.e. link form to function.) They need to classify the adaptations as structural; behavioural or functional. Keep **summaries** for a verbal report in the Explain phase later.

*** Alternative Activities for the Explore Phase:**

1. Take students on a school backyard excursion to collect and photograph interesting organisms. Use the videos shown in the *Wild Backyards* online learning resource (<http://www.qm.qld.gov.au/Learning+Resources/Resources>) that explain how to collect insects. View specimens under a hand lens or use a digital microscope plugged into a laptop or PC. Allow students to zoom in on interesting features and to capture images and/or draw specimens.
2. Visit QM South Bank to view the *Museum Zoo* exhibition (here until July 2011). Download the worksheet *Biodiversity in Museum Zoo* from the Learning Resources section of the QM website. <http://www.qm.qld.gov.au/Learning+Resources/Resources> Also, the *Name that Animal* worksheet is relevant.
3. Visit the Inquiry Centre at QM South Bank and download the *Observation and Classification Skills* and the *Bird Beaks and Feet* worksheets from the Learning Resources section.
4. Visit the Inquiry Centre at Cobb+Co Museum, Toowoomba and download the *Beaks and Feet* or *Cloaked in Camouflage* worksheets that complement the exhibits.
5. Borrow the *Micro Marvels* kits from QM Loans (produced during 2011). These contain a digital microscope, resin blocks of insect mouthpart adaptations - chewing & sucking; and leg adaptations - running (cockroach), jumping (grasshopper), grasping (mantid), digging (mole cricket), and swimming (water beetle); specimens from different invertebrate phyla and showing animal diversity; specimens showing different animal coverings, and so on.

<p style="text-align: center;">EXPLAIN (Lesson 5)</p>	<p><i>What are the current scientific explanations? How best can the students represent their understanding? Formative assessment.</i></p> <ol style="list-style-type: none"> Each group presents their summary as a short verbal report on the animal adaptations documentaries (from the Explore Phase) to the rest of the class. This should be no more than 2-3 mins per group. Relate the knowledge about animal adaptations to agricultural practices. i.e. the decisions about what crops to grow, what stock animals to raise, or what beasts of burden to use in certain habitats; explore general adaptations for particular environments such as water conservation in deserts or adaptations for polar regions. <ul style="list-style-type: none"> e.g. in groups investigate one of the following and write factual text in student journals: <ul style="list-style-type: none"> - use of rust-resistant wheat in Australia - introduction of Brahman cattle in the Northern Territory - water buffalo in northern Queensland - camels in outback Australia and desert regions - hummock grasses in arid regions - kangaroo rat or desert-hopping mouse (<i>Notomys sp.</i>) in desert regions - water-holding frog (<i>Cyclorana sp.</i>) in arid regions - Emperor penguins in Antarctic regions <p>Each report should include printed and visual text, text organisers such as titles, labels, diagrams and photographs. Students need to summarise the adaptations of the organism and how it is suited to the Australian environment. Suggestions (where applicable): original habitat; habitat in Australia; structural adaptations; behavioural adaptations; functional adaptations; photograph including arrows pointing to relevant features etc</p>
<p style="text-align: center;">ELABORATE (Lesson 6 & 7)</p>	<p><i>What student investigation/s or application of knowledge would extend their understanding? Representations? Summative assessment of the investigating outcomes.</i></p> <p>Planning an Investigation. Survival in Extreme Environments</p> <p>Teachers may decide to get students to complete Part A, Part B or both. Different groups could be assigned different parts. An Investigation Planner is provided to assist groups with planning their investigation. Students write up their responses in their science journals for homework and teachers may collect these for summative assessment. Students will write up their investigation in procedural text format. Student will use graphs and tables to communicate findings.</p>
<p style="text-align: center;">EVALUATE (Lesson 8 & 9)</p>	<p><i>What do you want the students to know? What representations will provide evidence that they understand the concepts?</i></p> <p><i>What do you want the students to be able to do? How will they demonstrate this? Summative assessment of the conceptual outcomes.</i></p> <p>Digital Story. Each group selects an animal and researches it to make a Digital Story as suggested in the Animal Adaptations worksheet found at http://www.qm.qld.gov.au/Find+out+about/Behind+the+Scenes/Museum+Experts</p> <p>A task sheet on <i>Making a Digital Story</i> is included. Each student group produces a 1½ -2 min digital story and these are shown to the rest of the class. Students will need to use a storyboard to sequence their images and information. Part of the presentation could include producing a poster that contains the labelled diagram of the specimen from Lesson 3 and other interesting information.</p> <p>(Students could create an interactive digital poster using 'edu glogster' - http://edu.glogster.com/)</p>

Lesson number: 1	Lesson title: <i>CREATURE FEATURES</i>		
ENGAGE	<ul style="list-style-type: none"> • To capture students' interest and find out what they think they know about the key concepts. • To elicit students' questions about the key concepts. 		
LESSON SUMMARY	RESOURCES	LITERACY FOCUSES	ASSESSMENT - DIAGNOSTIC
<p>Students:</p> <ul style="list-style-type: none"> • Discuss the features on an unknown organism; the habitat it may have lived in; how it moved, breathed, obtained food, and avoided predators • Explain their existing ideas and observations with supported statements • List the similarities and differences between an elephant and a whale; and between a cactus and a tropical palm tree • Explain their existing ideas about how these organisms meet their needs • Work in groups to list features of animals that live in water and how these features help them to meet their needs • Work in groups to list features of plants that live in deserts and those in rainforests and how these features meet their needs • Share ideas in a class discussion • Collect images of organisms from magazines and create annotated diagrams pointing out the features that help each to survive and explain their reasoning 	<ul style="list-style-type: none"> • Drawing of 'Alien Attack' creature (an organism from another galaxy; it has scales, wings, sharp canine teeth, webbed front feet, a sail along its back with green pigments for trapping light, hind limbs shaped like tree trunks that can grow extensions into the soil, a blow hole on top of its head, and a round club at the end of its tail) See Appendix. • Magazines • Scissors • Glue 	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Create labelled diagrams of a whale, elephant, cactus, and palm tree. • Record information and ideas about how the above organisms meet their needs • Record in their science journals their predictions, observations and explanations about features of organisms that meet their needs • Produce annotated diagrams 	<p><i>Find out what students already think they know and understand. This allows you to take account of students' existing ideas when planning future learning experiences.</i></p> <p style="text-align: center;">ASSESSMENT OPPORTUNITIES</p> <p>Diagnostic assessment</p> <p>Labelled diagram</p> <p>Science journal entries</p> <p>Annotated diagrams</p>

Lesson number: 2	Lesson title: <i>HANDS-ON STUFF</i>		
EXPLORE	<ul style="list-style-type: none"> • To provide hands-on, shared experiences. • To support students to investigate and explore ideas. 		
LESSON SUMMARY	RESOURCES	LITERACY FOCUSES	ASSESSMENT - FORMATIVE
<p>Students will:</p> <ul style="list-style-type: none"> • Examine the skulls, draw labelled diagrams of skulls and teeth, read the fact sheets and complete the student worksheet • Research terms using the internet and list organisms that engage in the following behaviours; describe the habitats in which these organisms live; and note how the features of these organisms help with their survival. <i>Nocturnal; diurnal; migration; hibernation; camouflage</i> • Add words to Word Wall and student Glossary <p>See Alternative Activities for the Explore Phase at the end of this table.</p>	<ul style="list-style-type: none"> • One of the Skulls kits which can be borrowed from Queensland Museum Loans. (<i>How We Eat; How We Survive; Skulls: Queensland Birds; Skulls: Queensland Mammals.</i>) • Facts sheets (Skulls: How We Eat; Skulls: How We Survive, etc) from the Learning Resources section of the QM website • Skulls kits: Teacher and Student Notes can be downloaded from: http://www.qm.qld.gov.au/Learning+Resources/Resources Select some of the activities to do. 	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Create a labelled diagram of a skull • Use oral language to represent scientific ideas about structural features linked to functions • Use writing and drawing to clarify ideas about adaptations • Add new words to a Word Wall • Create a glossary of terms in their science journals 	<p><i>Monitor students' developing understanding and give feedback that extends their learning.</i></p> <p>ASSESSMENT OPPORTUNITIES</p> <p>Labelled diagrams</p> <p>Verbal reports</p> <p>Student Skulls Worksheet</p> <p>Science Journals</p>

Lesson number: 3	Lesson title: CAMOUFLAGE CAPERS		
EXPLORE	<ul style="list-style-type: none"> • To provide hands-on, shared experiences. • To support students to investigate and explore ideas. 		
LESSON SUMMARY	RESOURCES	LITERACY FOCUSES	ASSESSMENT - FORMATIVE
<p>Students will:</p> <ul style="list-style-type: none"> • Read over the investigation • Make predictions about which coloured 'animal' will survive best in each of the habitats • Discuss how to make the investigation a fair test • Perform the investigation • Record data in data table provided • Calculate survival rate • Graph the results as bar graphs • Compare data with predictions and use as evidence in developing explanations • Draw conclusions • Discuss results with other groups • Suggest improvements to the experimental design • Collect images of a chosen organism from the school grounds or from Wikimedia Commons or Flickr under a Creative Commons licence (for later use with Digital Story Task) • Create labelled diagrams of the specimen showing shape, size, scale, and adaptive features <p>See Alternative Activities for the Explore Phase at the end of this table.</p>	<ul style="list-style-type: none"> • <i>Camouflage Capers</i> investigation sheet • 20 each of red, green, brown, and plain toothpicks per class group (These can be dyed using food dye.) • String • Meter rule or builder's tape measure • 4 wooden pegs or sticks per group • Stopwatch per group • Camera (optional) 	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Understand the purpose and features of a procedural text • Use a procedural text for investigations • Plan, conduct and represent a fair test to decide which 'animal' is best camouflaged to specific habitats • Summarise their findings using tables and graphs • Participate effectively in cooperative learning teams and class discussion • Write up their investigation under the report headings listed in the investigation sheet • Represent their ideas about camouflage in their science journals • Create labelled diagrams about a specific organism for later investigation (via a digital story) 	<p><i>Monitor students' developing understanding and give feedback that extends their learning.</i></p> <hr/> <p>ASSESSMENT OPPORTUNITIES</p> <p>Report</p> <p>Science journal</p> <p>Recording in tables</p> <p>Bar graphs</p> <p>Labelled diagram</p>

Lesson number: 4	Lesson title: <i>TYPES OF ADAPTATIONS</i>		
EXPLORE	<ul style="list-style-type: none"> • To provide hands-on, shared experiences. • To support students to investigate and explore ideas. 		
LESSON SUMMARY	RESOURCES	LITERACY FOCUSES	ASSESSMENT - FORMATIVE
<p>Students will:</p> <ul style="list-style-type: none"> • List the things that organisms need to survive • Engage in class discussion with the teacher as the teacher displays examples of the different types of adaptations • Write definitions and examples of structural, behavioural and functional adaptations and add to their glossary • View the documentaries of Animal Adaptations on the QM website • Summarise the adaptations of some of these animals and classify them into the three types of adaptations <p>See Alternative Activities for the Explore Phase at the end of this table.</p>	<ul style="list-style-type: none"> • Real-life specimens (where possible) or images from Wikimedia, Flickr or books etc, that show different types of adaptations: silvery leaves of dune plants such as Spinifex or white underside of leaves of Banksia; large flat leaves of rainforest plants; hairy or shiny leaves of plants; thick water-filled leaves of succulents like Agave, Aloe, pigface etc; spines of cactus; stream-lined shape of sharks; large eyes and nocturnal activity of owls; people sweating on hot days, etc. These can be used to explain structural, behavioural and functional adaptations • Access to computers & internet (or a computer and data projector) for students to view the following documentaries from QM website http://www.qm.qld.gov.au/ Go to Find out about> Behind the Scenes> Museum Experts <ul style="list-style-type: none"> - Bee Flies (a bit advanced) - Carpet Pythons - Marine Mammals - Swimming Crabs - Tortoise Beetles - Velvetfish • Download the transcripts of the videos 	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Contribute to discussions about adaptations • Read and view factual texts • Identify and recall key ideas in factual texts and videos • Create summaries for a verbal report 	<p><i>Monitor students' developing understanding and give feedback that extends their learning.</i></p> <hr/> <p>ASSESSMENT OPPORTUNITIES</p> <p>Glossary</p> <p>Factual Texts</p> <p>Summary</p>

Lesson number: 6 & 7	Lesson title: <i>SURVIVAL IN EXTREME ENVIRONMENTS</i>		
ELABORATE	<ul style="list-style-type: none"> • To challenge and extend students' understanding in a new context or make connections to additional concepts through a student-planned investigation. • To support students to plan and conduct an investigation. 		
LESSON SUMMARY	RESOURCES	LITERACY FOCUSES	ASSESSMENT – SUMMATIVE
<p>Students will:</p> <ul style="list-style-type: none"> • Select, with guidance, appropriate investigation methods to answer the question 'Which animal will stay the coolest in a hot environment' or 'which animal will stay the warmest in a cold environment' • Identify the variable to be changed and the one to be measured in fair tests • Make a prediction about the effect of a variable on temperature • Change an independent variable (colour of the cans or type of covering around the cans) • Identify the control in the investigation • Measure and record data • Add information to tables and graphs • Describe simple cause and effect relationships as shown by trends in quantitative data • Share ideas as to whether observations match predictions, and discuss possible reasons for any disparity • Work collaborative to suggest improvements to the methods used 	<ul style="list-style-type: none"> • <i>Survival in Extreme Environments</i> investigation sheet • 4 soft drink cans per group • 4 pieces of coloured paper – white, beige, brown and black • Stocky tape • 4 thermometers • Cotton wool • Measuring cup • Access to boiling water (can be in a vacuum flask) • 4 types of material – cotton, fur (or wool), paper, plastic or another suitable material 	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Use language and visual representations to design and record an investigation into the effect of an animal's external colour or covering on temperature • Produce annotated sketches of the experimental set-up • Record observations • Use scientific vocabulary appropriately in verbal and written forms • Summarise findings • Use reports and procedural accounts to communicate scientific ideas 	<p><i>Look for evidence of the extent to which students have achieved the investigating outcomes.</i></p> <hr/> <p>ASSESSMENT OPPORTUNITIES</p> <p>Scientific report</p> <p>Procedural text format</p> <p>Guide to making judgements – investigation outcomes</p>

Lesson number: 8 & 9	Lesson title: <i>DIGITAL STORY TASK</i>		
EVALUATE	• <i>To provide opportunities for students to review and reflect on their learning and represent what they know.</i>		
LESSON SUMMARY	RESOURCES	LITERACY FOCUSES	ASSESSMENT – SUMMATIVE
<p>Students will:</p> <ul style="list-style-type: none"> • Collect 8-16 images, including close-ups, of a specimen to produce a group digital story about the adaptations of the specimen • Research and summarise the adaptations of the specimen and classify them into structural, behavioural or functional • Create a storyboard of the images • Save the images on to a computer that has Microsoft Photostory downloaded onto it (free download from Microsoft site) • Add text to images to note features (using PowerPoint and images then saved again as a Jpeg file) and include arrows to make labelled diagrams (optional) • Import images into Photostory • Structure a verbal description to accompany the images • Add transitional effects and timing • Record the voice-over onto the Photostory using a computer microphone (or produce an oral account that can be read out with the Photostory) • Save the Photostory and then convert to a Windows Media file • View the digital Photostories produced by other groups 	<ul style="list-style-type: none"> • <i>Digital Story</i> Task sheet • Images taken earlier using a digital camera, or digital microscope, or sourced from Wikimedia Commons or Flickr under a Creative Commons licence • Microsoft Photostory 3 which can be downloaded free from Microsoft for Windows XP and Windows 7. Just Google 'Microsoft Photostory' and click on the link and choose the Photostory for your school computers. (The Keynote program can be used for Apple Mac computers. It comes in the iWork package which can be bought for under \$100.) • (Students could create an interactive digital poster using 'edu glogster' - http://edu.glogster.com/) • Large sheets of A3 paper for students to produce their storyboard • Computer microphones (optional – student groups can simply read out their voiceover rather than incorporate the voice-over into the Photostory) • (If access to computers is a problem then student groups could produce a poster with the labelled images sequenced like a storyboard and explained with an oral presentation) 	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Make a presentation to communicate their understanding of adaptations • Use multi-modal formats that incorporate the use of ICTs • Reflect on their learning through a science journal entry 	<p><i>Look for evidence about the extent to which students have achieved the conceptual outcomes.</i></p> <p><i>Literacy products developed in this lesson provide useful work samples for assessment.</i></p> <p><i>Provide an opportunity for students to reflect on their learning journey.</i></p> <hr/> <p style="text-align: center;">ASSESSMENT OPPORTUNITIES</p> <p>Digital Story which may include verbal commentary (if not, then an oral presentation will accompany the visuals on the Digital Story)</p>

Alternative Activities for the Explore Phase:

- Take students on a school backyard excursion to collect and photograph interesting organisms. Use the videos shown in the *Wild Backyards* online learning resource (<http://www.qm.qld.gov.au/Learning+Resources/Resources>) that explain how to collect insects. View specimens under a hand lens or use a digital microscope plugged in to a laptop or PC. Allow students to zoom in on interesting features and to capture images and/or draw specimens. (These can be used later for their digital story task)

Resources:

- Nets
 - Beating stick and old umbrella
 - Pitfall trap
 - Hands lens and/or digital microscope
 - Camera (optional)
 - Laptop or PC (to download images)
 - *Micro Marvels* kit which can be borrowed from QM Loans (produced in 2011)
- Visit QM South Bank to view the *Museum Zoo* exhibition (here until July 2011). Download the worksheet *Biodiversity in Museum Zoo* from the Learning Resources section of the QM website. <http://www.qm.qld.gov.au/Learning+Resources/Resources> The *Name that Animal* worksheet is also relevant. Complete worksheets during the visit as well as pre and post-visit activities.
 - Visit the Inquiry Centre at QM South Bank and download the *Observation and Classification Skills* and/or the *Bird Beaks and Feet* worksheets from the Learning Resources section. Complete worksheets during the visit as well as pre and post-visit activities.
 - Visit the Inquiry Centre at Cobb+Co Museum, Toowoomba and download the *Beaks and Feet* or *Cloaked in Camouflage* worksheets that complement the exhibits

General Comment:

If students finish any of the tasks early, they can be working on their digital story task. i.e. collecting images of the specimen they will use for their story; researching and classifying the types of adaptations the organism has; relating these adaptations to survival in the organism's habitat.

CAMOUFLAGE CAPERS

Aim: To model the effect of colour on the survival of organisms in different habitats.

Materials:

- 20 plain toothpicks or cream-coloured plastic discs
- 20 red toothpicks or plastic discs
- 20 green toothpicks or plastic discs
- 20 brown toothpicks or plastic discs
- String
- Metre ruler or builder's tape measure
- 4 wooden pegs or sticks
- Stopwatch



(Toothpicks can be dyed with food colouring. Mix red, blue and yellow dyes together to get a mid-dark brown colour. This should be done in advance so they are dry for the start of the experiment.)

Experimental Design:

Work in groups of three. One group member will be the scatterer and the other two will be the predators.

Select at least three different surfaces or 'habitats' in your school environment. For example: green grass; drier grassy area; dirt; sandy ground; concrete; carpet; area under a tree with lots of leaf litter, etcetera.

Predict what coloured toothpick or 'animal' would have a better chance of surviving in each of your three habitats. Write these predictions down in your science journal.

Read through the method and results sections and discuss how you will set up your data tables. (Hint: Think of the need for repeat trials, and leaving space for averages and survival rates.)

Discuss how you will make sure that this is a fair test.

Method:

1. Measure out a 3m x 3m area on your selected surface. Mark the corners of the square with the wooden pegs or sticks. Put string around the corner pegs to map out your square or plot.
2. Tell the 'predators' to look away while the scatterer randomly throws the toothpicks over the marked area.
3. Start the stopwatch and allow the 'predators' 15 seconds to collect as many toothpicks as they can.
4. Count the number of each colour of toothpick left behind in the plot (i.e. the 'survivors'). Alternatively subtract the number collected from 20 to find the number of 'survivors'. Record this in your data table.
5. Collect all the toothpicks and repeat steps 2 – 4.
6. Repeat steps 2-5 using other surfaces or 'habitats'.

Results:

1. Complete data tables for each of the surfaces used.
2. Calculate averages for each colour on each surface.
3. For each coloured toothpick on each surface, work out the survival rate as a percentage of the original 20.

$$\% \text{ survival rate} = \frac{\text{number of survivors}}{20} \times 100$$

4. Draw three bar graphs of the percentage survival rates, one for each of your three different surfaces.

Analysis:

1. Compare the survival rates for the different surfaces.
2. Give reasons for the differences in survival rates.
3. Compare the survival rates with those of other groups. Your teacher may pool the data from all the groups.
4. Imagine that the four different coloured toothpicks were part of one large toothpick population in a particular 'habitat'. Assume the same 'predators' are present. Predict what might happen to this population over a long period of time. Give reasons for your prediction.
5. Using the results of your model, make a generalisation about the effect of colour on the survival of organisms in a particular habitat.

Conclusion:

1. Were your original predictions at the start of the investigation supported or not?
2. How could you improve the design of your investigation?

DATA TABLES

Surface:

Colour of Toothpick	Number of toothpicks left in sample plot			% Survival Rate
	Trial 1	Trial 2	Average	
Plain				
Green				
Red				
Brown				

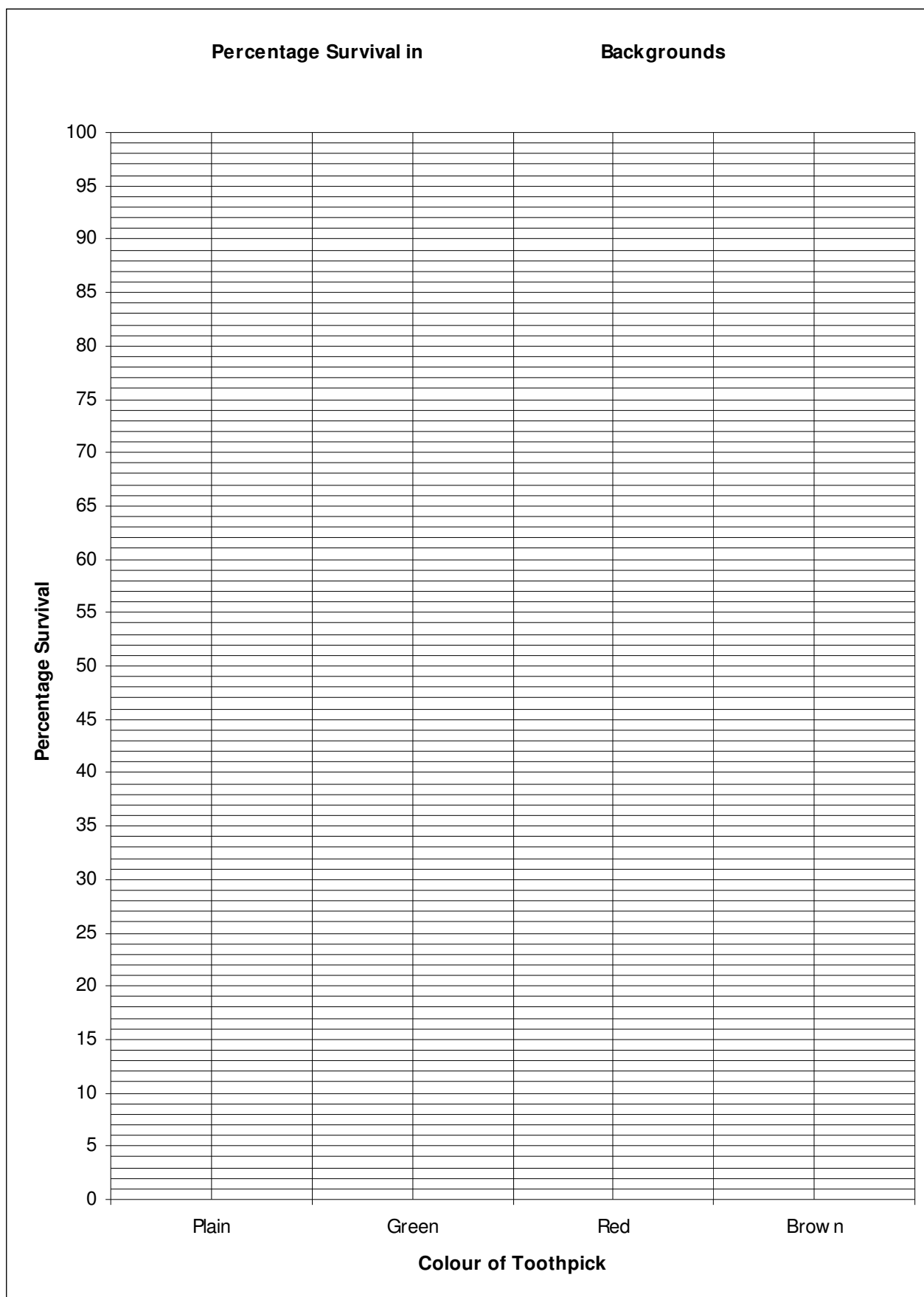
Surface:

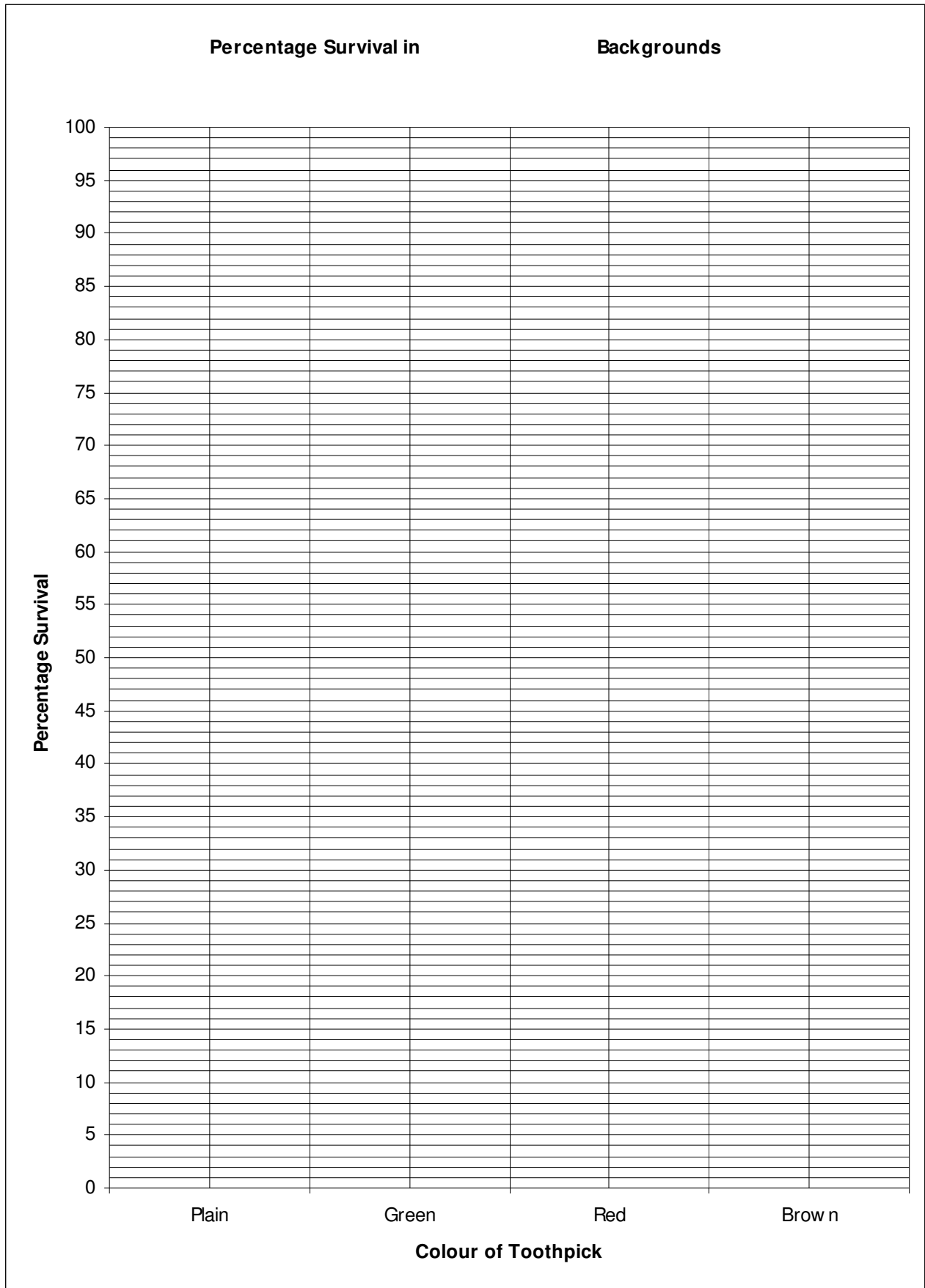
Colour of Toothpick	Number of toothpicks left in sample plot			% Survival Rate
	Trial 1	Trial 2	Average	
Plain				
Green				
Red				
Brown				

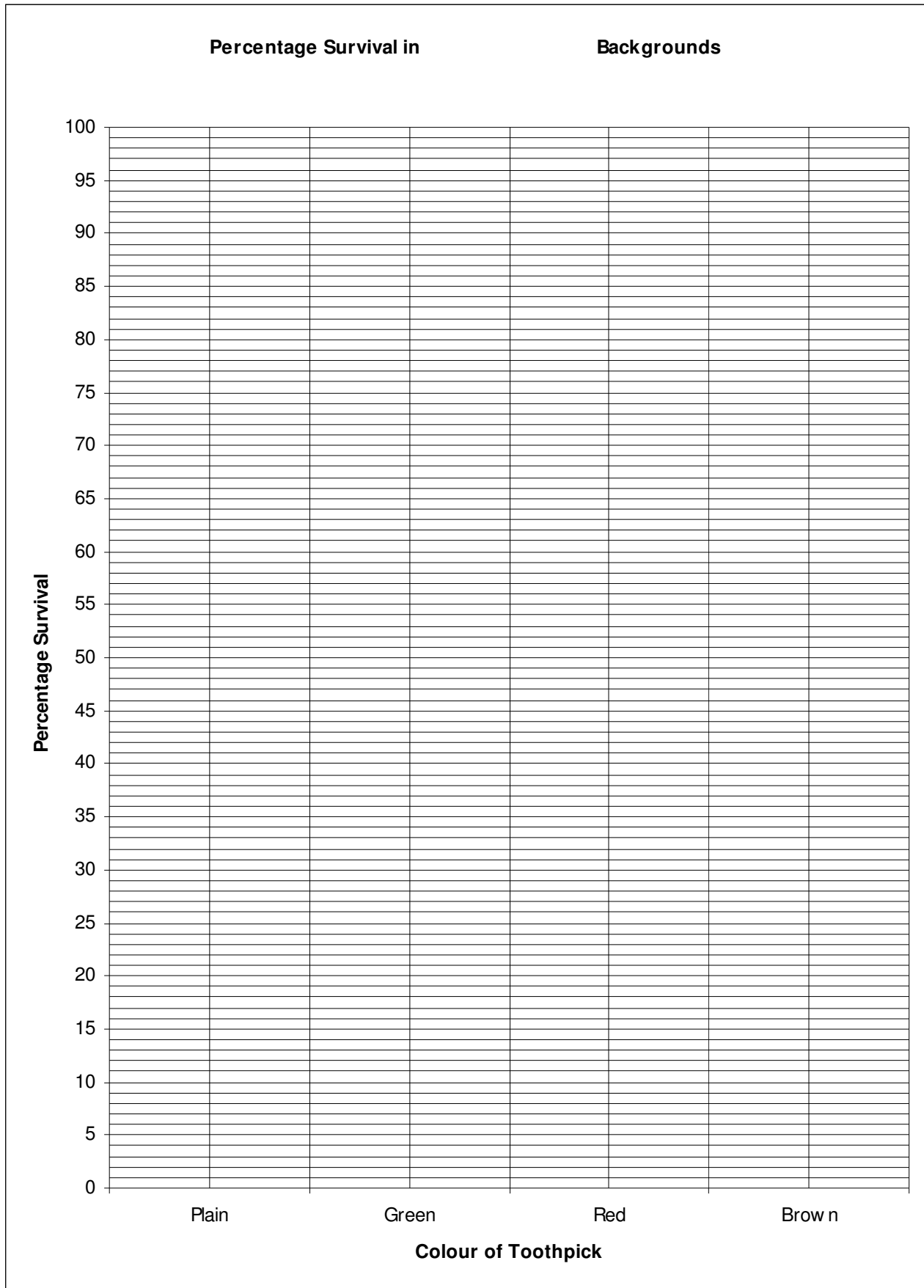
Surface:

Colour of Toothpick	Number of toothpicks left in sample plot			% Survival Rate
	Trial 1	Trial 2	Average	
Plain				
Green				
Red				
Brown				

Graphs:

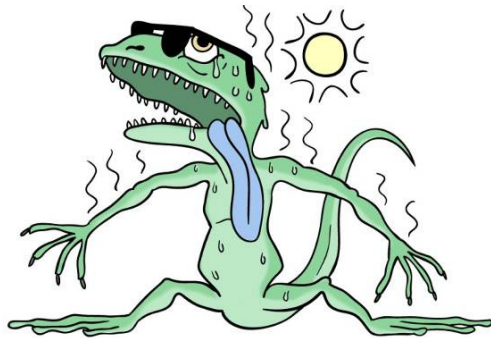






SURVIVAL IN EXTREME ENVIRONMENTS

Aim: To see (a) which 'animal' will stay the coolest in a very hot environment and (b) which one will stay the warmest in a very cold environment.



Illustrations by J. T. Bauer,
Creative Commons licence,
BY-NC-SA.

Materials:

Part A

5 soft drink cans
4 pieces of coloured paper – white; beige; brown
and black
Sticky tape
4 thermometers
Cotton wool

Part B

5 soft drink cans
4 materials – cotton, fur (or wool), paper,
plastic
Sticky tape
4 thermometers
Measuring cup
Boiling water
Cotton wool

Experimental Design: Part A - Hot Environments

1. The soft drink cans are going to represent 'animals' of different colour. These animals will be placed outside in the sun. For a fair test, list what we need to consider when choosing the soft drink cans for this investigation.
2. Each drink can will be covered with different coloured paper which is secured in place with sticky tape. For a fair test, list what we need to consider when attaching the paper to the cans.
3. Each can is to be placed in direct sunlight to simulate a very hot environment. Thermometers will be placed inside each can. How will you stop heat from escaping from the opening at the top of the can? How will you make the bulb of the thermometer rest half-way inside the can, and not rest on the bottom of the can?
4. How often will you need to take temperature readings?
5. Which can is the control? (i.e. the one most like the normal situation in nature; or the one with nothing added to it.)
6. Predict which of the four cans you think will stay the coolest and therefore will be better adapted to a hot environment. Explain why you think that will be?
7. Which will be the hottest?

Experimental Design: Part B - Cold Environments

1. The soft drink cans are going to represent 'animals' with different outer coverings. The animals have to face very cold conditions. How will you make them warm at the start? What will you need to consider so this is a fair test?
2. How will you simulate a cold environment?
3. How many different set-ups will you have? How will you stop heat from escaping from the opening at the top of the can?
4. How often will you need to take temperature readings?
5. Which can is the control? (i.e. the one against which you can compare the effects of the coverings.)
6. Predict which of the four cans you think will stay the warmest and therefore will be better adapted to a cool environment. Explain why you think that will be?
7. Which will be the coldest?

Write your answers to the experimental design questions in your science journals.

Method:

Write a *procedural text* account of how you performed the investigation. Number each step. Write down what the group did using the past tense. Include a list of materials and annotated sketches of your set-ups.

Results:

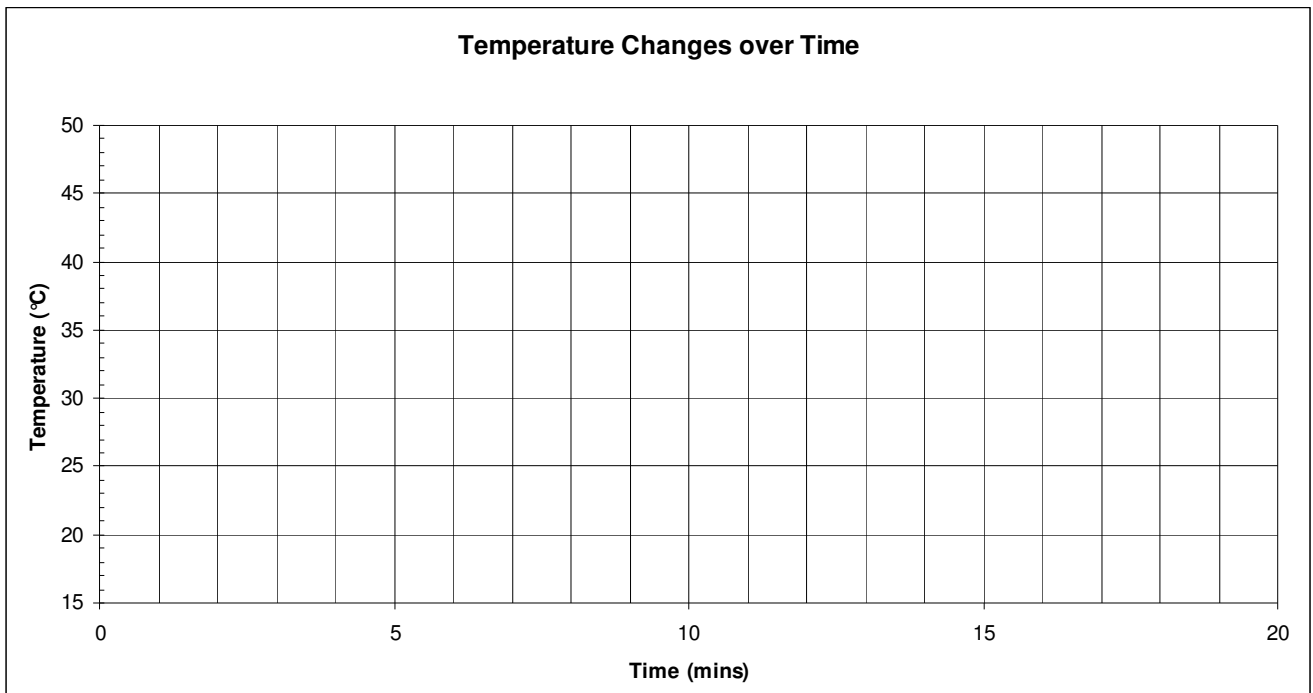
Record measurements in the data tables provided on the next page.

Make a line graph for each data table to see any trends in the data. Use a different coloured pencil for each type of coloured paper (for Part A). On the second graph also use a different coloured pencil for each type of material used (for Part B). Put a legend under your graph to show what each coloured line represents.

PART A: Temperature of the air in cans wrapped with different coloured paper when placed in sunlight

Time (mins)	Temperature (°C)				
	White	Beige	Brown	Black	None
0					
Temp difference					

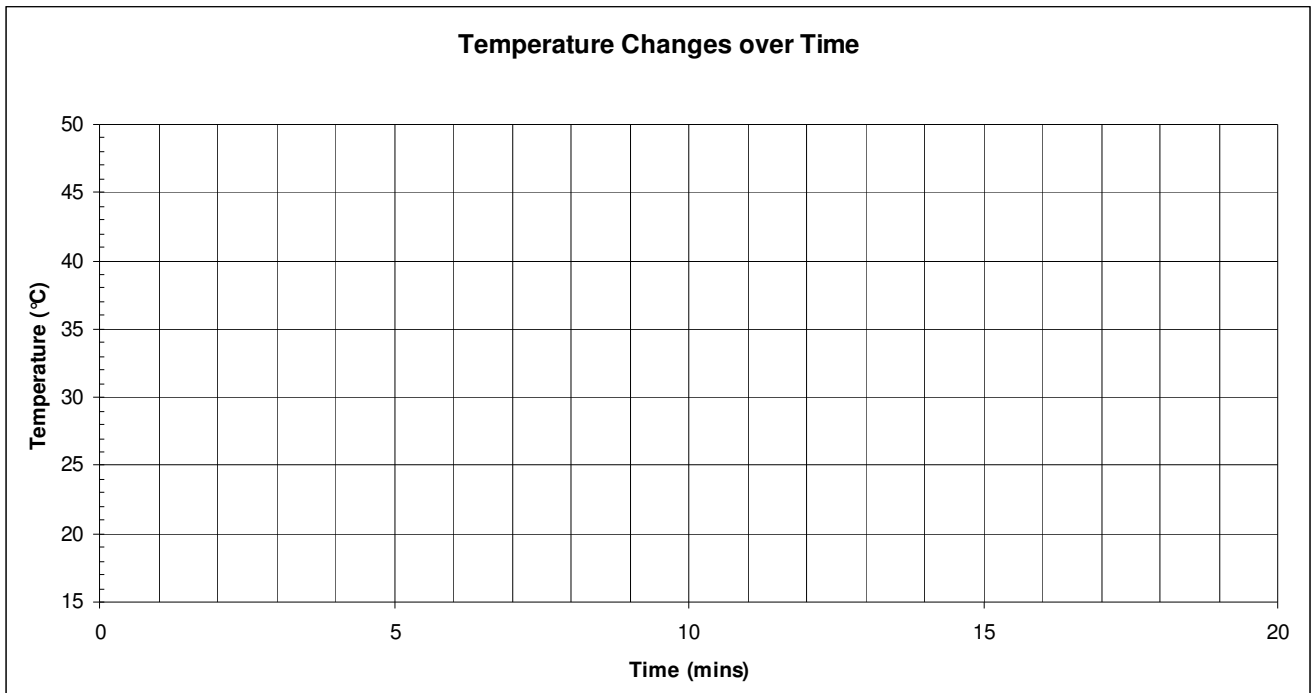
Temperature of the air in cans wrapped with different coloured paper when placed in sunlight



PART B: Temperature of the water in cans with different wrapping when placed in a refrigerator

Time (mins)	Temperature (°C)				
	Paper	Cotton	Plastic	Wool	None
0					
Temp difference					

Temperature of the water in cans with different wrapping when placed in a refrigerator



Analysis: (Part A)

1. Which of the cans covered with the different coloured paper got the hottest? Which one was the coolest? Explain your reasoning.
2. If you were an animal living in a desert environment, what colour would be best for you?
3. Polar bears live in cold, tundra habitats and they are white. Why is this colour an advantage for the animal?
4. The fur of a Polar Bear is white, yet its skin is black. How does this adaptation help with the polar bear's survival?
5. The Arctic fox and Arctic hare that live in Polar Regions change their coat colour. They are a tawny brown in summer and white in winter. How does this help with their survival? Are there any disadvantages in doing this?

Analysis: (Part B)

1. Which of the cans covered with the different types of material got the coldest? Which one remained the warmest? Explain your reasoning.
2. If you were an animal living in a cold habitat, what type of material covering would be best for you?
3. Rank the coverings from the one that would be best for keeping an animal warm to the one that would be the worst.
4. Some animals that live in cold regions grow a thicker coat over winter. Why would this be an advantage?

Conclusion:

1. Did the results of the experiments support your predictions?
2. Are there any ways that you could improve the investigation?
3. From what you have learned in this investigation, write a statement about how the external colour of an animal helps with its survival.
4. Write a statement about how the type of body covering helps with an animal's survival.

Further Research

Investigate another animal that lives in an extreme environment (such as very hot, cold, dry, salty or windy) and list and explain two or three adaptations that help it to survive in this habitat. e.g. tundra regions, deserts, sand dunes, hot springs, arctic waters with temperatures well below freezing, etcetera.

Investigation planner

Name: _____ Date: _____

Your Role: Director Manager Speaker

Your team: 1. _____ D, M, S. _____ D, M, S

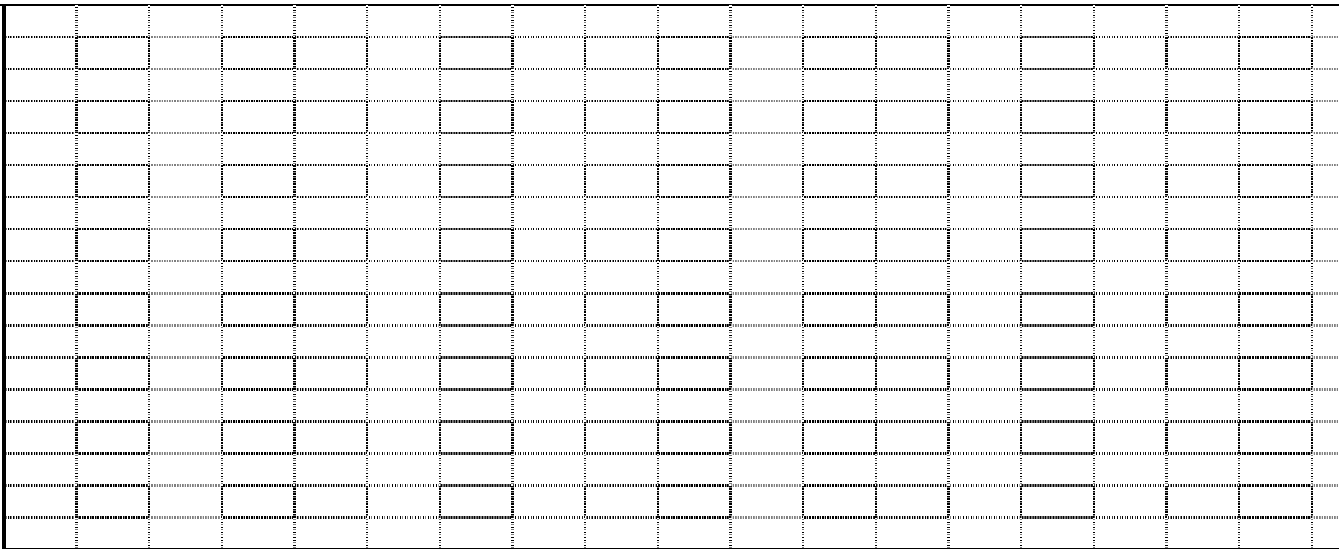
<i>Planning the investigation</i>		
(1) Question for investigation (Testable Question)	(2) What do you predict will happen? Explain why. (Hypothesis)	
(3) Things (variables) you are going to:		
(3.1) What will you <u>Change</u> Independent Variable	(3.2) What will you <u>Measure</u> Dependant Variable	(3.3) What will you <u>Keep the same</u> Controlled Variables
(4) What equipment will you need?	(5) Diagram of how you will set up the equipment. 	
(6) Method:		

Recording results

(7.1) Record your results using the table below or use another method and attach the sheet.

Material/subject tested:	What are you measuring? Write it here:			
	1st trial	2nd trial	3rd trial	Average

(7.2) Represent your results in a graph or attach another form of visual representation.



Explaining results

(8) Write a statement to summarise your findings.

.....

.....

.....

.....

.....

.....

.....

<p>(9) Why did this happen?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>(10) Did the results match your prediction? Why or why not?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>
---	---

Evaluating the investigation

(11)

Features of the Investigation.	WHAT DID I? (tick a box for each feature)		
	Change	Measure	Keep the Same

(12) Was this a fair test? YES NO (Circle one)

Explain the reasons for your answer:

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

Make a digital story about your plant or animal

What's your favourite organism? One way to tell people about it is to make a digital story. This is a mini-documentary, which informs, convinces, questions and can even be funny.



Left: **Moth, *Agape chloropyga***. Photo: Jeff Wright, © QM.



Right: **Wall Skink, *Cryptoblepharus vigatus***. Photo: Jeff Wright, © QM

A digital story contains photos, text and text slides and sometimes a voice-over telling the story. Digital story software is used to place the photos in sequence, to add motion, transitions and text, and record a voice-over using a computer microphone.

In this activity you will make a digital story about your organism, its adaptations, and how these help it to survive in its environment. You can use a simple software package, Microsoft Photo Story, which is free to download at:

Microsoft Photo Story 3 Download Page

<http://www.microsoft.com/photostory>

Useful website tutorials about Photo Story

Create your first photo story at:
<http://www.microsoft.com/windowsxp/using/digitalphotography/photo-story/tips/firststory.mspx#ERD>

Making photo stories at:

<http://www.learningplace.com.au/deliver/content.asp?pid=36049>

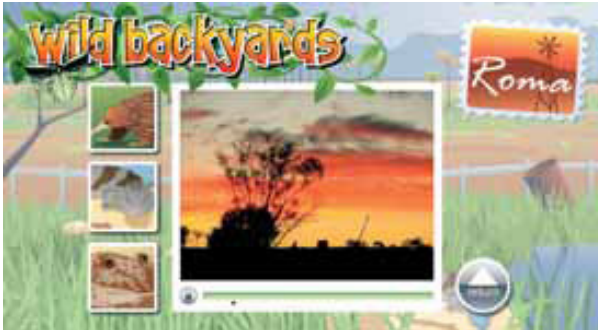
This tutorial is aimed at Early Phase teachers, but it demonstrates Photo Story features, and is easy for beginners to follow.

Look at some digital stories on our Queensland Museum website in the *Wild Backyards* and *Journey of Understanding* sections available at:

<http://www.qm.qld.gov.au/en/Learning+Resources/Resources>

Five steps to making your own digital story

Work in small groups of two or three people. The time of any digital story should be no more than **1½ - 2 minutes**, so its file size is not too big. Your story should be good enough to show to the rest of your class, or to the general public.



Excerpts from the *Wild Backyards* digital stories.

(available at

<http://www.qm.qld.gov.au/microsites/wild/wild-backyards.asp>)



1. Collect images and close-ups of your specimen

In your story you will show and explain how your specimen is adapted to its environment.

- Photograph or collect images of an interesting plant or animal that you have studied over some weeks. Use zoom-ins to show features in detail. **Take a number of photos.**
- Select from 8 to 16 of these photos to make your story. Try to show the context of the animal by taking a photo of its habitat.
- Save these photos.
- Transfer them to a folder called Specimen_photosERB (Specimen+photos+group initials) in the same drive. (Instead of 'specimen' you will have your organism's name.)

To do this in Windows Explorer, go to File>New>Folder, then name the folder. Drop and drag your photos into this folder.

Refer to our fact sheet on *Tips on how to take great wildlife photos.*

2. Make a storyboard

Storyboards are plans of digital stories to help make them more cohesive and save time. They allow you to think about the titles, the narrative of your slides and the transitions in your story.

- Select the photos you want to use. You could create a proof sheet of them using the Picture toolbar in Word (Click on insert picture icon).
- Fold an A4 sheet into 8 or 16 parts, so each part represents one of your photos.
- Draw the outline of your story on this A4 sheet.
- Add text and labels to each photo.

3. Create an interesting story

Good digital stories are personal, and should be based on your experience and interests. What is interesting and special about your specimen? If possible, classify the adaptations of your specimen as structural, behavioural or functional.

4. Finish it off

- Open Photo Story. Choose new story, and import photos from your folder in the sequence you want. Drag and drop them in order. Edit and
- add effects using the next and back buttons.
 - Write the script of your voice-over (no more than 300 words).
 - Record your voice-over using a computer microphone.
 - Plan your transitions between slides to be punctuation marks for your voice-over.

5. Be a critic

Show your digital story to your family. What works, what doesn't? Write a short critique of your story based on the audience response.

Other hints

1. Make a text graphic

You can add titles to your pictures in Photo Story, but you may also want to write more text to explain some of the objects in your story's pictures. Photo Story will import text as a graphic or picture file (JPEG), after it has been created in PowerPoint.

- Open PowerPoint. Choose a slide layout that allows you to write text. Change the font size to suit the amount of text you are writing, and be economical with the words you use.
- Change text colour or use textboxes to add labels.
- To save the text graphic:
File>Save as>File type (JPEG)>Write file name >Save.

Choose Current slide only.
This file is now ready to import into your digital story.

2. How to name animals

Add the common name or scientific names to the titles of your pictures. Check correct names in guides and handbooks such as *Wildlife of Greater Brisbane* (Queensland Museum). Conventions apply when naming plants and animals.

- **Common names:** For a recognised common name, the first letter of each name is capitalised.
- **Scientific names:** Scientific names are species names, so they are precise. They consist of two names, both written in italics. A capital is used for the first letter of the first name (genus name), with all lower case letters for the second name (descriptive name). This is the internationally-recognised Linnaean system. For example:

Common name:
Blue-tongued Skink

Scientific name:
Tiliqua scincoides

i

What makes a good story?

- Live your story; tell it in the first person.
- Show something you learned about your organism.
- Develop creative tension in a story, by using motion wisely; for example, motion across a beetle says much about the beauty of organisms.
- Show, don't tell.
- Don't use too much narrative.
- Polish your digital story so its photos, transitions and voice-over produce the meaning you want.



Blue-tongued Skink (*Tiliqua scincoides*) basking in the Roma sun.

Photo: C. Eddie.

Tips on how to take great photos

Queensland Museum photographer Jeff Wright gives you some tips on how to improve your photos.



Banksia aemula. Image: © Jeff Wright.



Macleay Island. Image: © Jeff Wright.

Light

Strong sunlight casts hard shadows, which may or may not be a feature you want in your photographs. So, either move the object into the shade or photograph it at a different time of day.

It is usually a good idea to switch off your camera's flash because it is often hard and direct.

To avoid 'camera shake', hold your camera still, preferably using a tripod.

Use a **reflector** if one side of the object appears a little dark.

Reflectors can be made from everyday materials of any shape and size, such as white polystyrene foam, white cardboard or a card covered with aluminium foil.

Landscapes

Take pictures of landscapes early or late in the day. You need to check to see how the landscape looks at these times before you take a photo.

Composition

Two main things affect the way a subject in a photo looks: framing and camera angle. For example, if photographers want to show cities as bustling, crowded places, they would frame a street scene rather than a single person in the street.

Framing

A frame is what you see in the camera's viewfinder or on its screen. You can place the subject in different places in the frame if you move it to the side or centre of the frame when you take the photo. You can also change your subject's size in the frame if you move in closer, step back a little or use the camera's zoom.

Camera angle

Most people take photographs from eye height, so to vary the camera angle, get down lower or look at your subject from above.

Take lots of photos

Study your photos to see which compositions, lightning and camera settings work best.

Composition

Check that your camera batteries are fully charged and there is plenty of space on the memory card. You might also need water, hat, sunscreen, raincoat, and a plastic bag or case to keep your camera clean and dry for outside photos.

Final tips

Reduce background clutter to make your composition strong and simple.

Keep the eyes of people in focus.

Jeff Wright

Adaptations: Investigation task Guide to Making Judgements

Group Members:

Purpose: Students investigate and develop reports to explain the survival of living things in extreme environments.

	Skills	Skills	Knowledge	Skills
	Planning and conducting: Propose questions, predict outcomes and assist in planning investigations	Analysing and evaluating: Describe patterns in results, report on findings and reflect on methods	Biological Science: Understands the links between form and function, and organisms and their surroundings	Documents and explains findings using labelled diagrams, procedural accounts and models
A	<ul style="list-style-type: none"> Lists and explains all the relevant variables that need to be controlled for a fair test and explains the need for repeat trials 	<ul style="list-style-type: none"> Suggests improvements to the experimental method. 	<ul style="list-style-type: none"> Lists and explains at least two adaptations possessed by an animal living in an extreme habitat. 	<ul style="list-style-type: none"> Uses scientific language correctly when writing procedural texts, representing findings, and drawing conclusions.
B	<ul style="list-style-type: none"> Assists in planning investigations: Identifies the control set-up, the variable to be changed, and the measured variable in the investigation 	<ul style="list-style-type: none"> Produces a generalisation about how the colour (and/or type of body covering) affects animal survival. 	<ul style="list-style-type: none"> Applies the results of the investigation to explain how the structural and functional features of some animals adapt them for extreme habitats. 	<ul style="list-style-type: none"> Presents clear, logical explanations and predictions throughout the report.
C	<ul style="list-style-type: none"> Proposes questions, records results accurately in data tables, and calculates averages correctly. 	<ul style="list-style-type: none"> Compares data with predictions and uses data from tables and graphs as evidence to support explanations. 	<ul style="list-style-type: none"> Explains how camouflage and/or the type of exterior covering of an animal are linked to survival. 	<ul style="list-style-type: none"> Constructs physical models to demonstrate scientific understanding. Produces accurate line graphs with labels and legend.
D	<ul style="list-style-type: none"> Predicts the outcome of the investigation. 	<ul style="list-style-type: none"> States the effect of colour (and/or surface coverings) on temperature. 	<ul style="list-style-type: none"> Explains how colour and/or type of body surface affects body temperature. 	<ul style="list-style-type: none"> Makes use of scientific language and formats.
E	<ul style="list-style-type: none"> Collects data. 		<ul style="list-style-type: none"> Identifies features of organisms and habitats. 	<ul style="list-style-type: none"> Uses labelled diagrams to communicate ideas.

Feedback:

.....

Adaptations: Digital Story Task or Poster and Oral Presentation Guide to Making Judgements Group Members

Purpose: Students develop a Digital Story or Poster and Oral Presentation on the adaptations of a chosen organism.

	Skills	Knowledge	Skills
	Researches using the internet and other forms, to answer questions and solve problems..	Understands the relationship between form and function, and organisms and their surroundings. Compares types of adaptations such as behavioural and structural.	Communicates ideas, explanations, and conclusions in multi-media format.
A	<p>Documents evidence from observation and secondary sources and uses this to explain conclusions based on scientific concepts. Suggests practical questions for further investigation.</p>	<p>Provides detailed, accurate understanding of the external structures of the organism and how these, as well as behavioural and functional responses, assist with survival in its habitat. Notes the organism's suitability to the Australian environment.</p>	<p>Uses accurate and detailed picture annotations; explanations are developed with multiple pieces of evidence. Produces a well-sequenced digital story or poster and oral presentation.</p>
B	<p>Links observations and reflections to their wider application.</p>	<p>Demonstrates understanding of how features are linked to habitat. Correctly classifies the organism's adaptations as structural, behavioural or functional.</p>	<p>Produces digital story or poster and oral presentation that clearly explains scientific ideas.</p>
C	<p>Makes detailed observations of the organism, documenting features and linking them to what the organism does and where it lives.</p>	<p>Applies knowledge of the organism and its habitat to observations.</p>	<p>Uses annotated diagrams and relevant scientific terminology to document and explain findings.</p>
D	<p>Carries out investigation; findings are related to scientific concepts.</p>	<p>Links features of the organism to functions.</p>	<p>Creates a digital story or poster and oral presentation using images and close-ups of the specimen.</p>
E		<p>Lists some features of the organism.</p>	<p>Uses everyday vocabulary in description.</p>

Feedback:.....

.....

ALIEN ATTACK

Zirgog is a creature from another galaxy. This creature has some strange features. It has a retractable sail on its back that contains large green structures similar to the green pigment, chlorophyll, found in plants. It also has: wings on its back; webbed front feet; a blow-hole on top of its head; eyes on retractable stalks; and hind limbs that can grow extensions into the soil.

Can you work out some things about Zirgog?

- Is Zirgog a plant or an animal?
- How do you think this creature moves?
- How does it breathe?
- How does it get its food?
- How does it defend itself from predators



Illustration by J. T. Bauer, Creative Commons licence, BY-NC-SA.

Further Resources relevant for a teaching unit on ADAPTATIONS

Name	Location	Description
Adaptations Activity booklet (7 pages)	The Learning Place	In this activity students use their existing knowledge to match a number of adaptations to the desert dwelling animals to which they apply. It is the first in a set of three investigations examining a number of aspects of adaptations of animals to the terrestrial environment. (Education Queensland teachers can log on to TLP using their Ed Qld username and password.)
Adaptations of organisms Activity booklet (2 pages)	The Learning Place	This activity was designed for students to examine the adaptations of a number of Australian animals and in particular, the whale. It is the third in a set of five investigations introducing the concepts of environments, habitats and adaptations of organisms.
Adaptations of Australian animals Activity sheet (1 page)	The Learning Place	In this activity students use their existing knowledge to describe the adaptations of some familiar Australian animals. It is the fifth in a set of five investigations introducing the concepts of environments, habitats and adaptations of organisms.
Adaptations of desert plants and animals	Internet	http://www.kidcyber.com.au/topics/biomedes2.htm
Adaptations of Mangroves	Internet Redland City Council	http://indigiscapes.redland.qld.gov.au/Plants/Mangroves/Pages/Adaption.aspx
Animals of Queensland	QM Website	Go to http://www.qm.qld.gov.au/ and then Find out about > Animals of Queensland
Animal Science Links	Internet4classrooms	http://www.internet4classrooms.com/science_elem_animals.htm
Create a Creature Learning objects L1124; L1125; L755	The Learning Place	Create a Creature: Match a Creature; Create a Creature: My Creature; Create a Creature: Find a Home Have a close look at body parts of small creatures such as a wolf spider, a beetle or a bull ant. Explore descriptions of each body part and its uses. For example, examine a scorpion's long tail to see how it is adapted to stinging prey. Match body parts for a range of invertebrates and select a suitable habitat for each animal. This learning object is one in a series of three objects.
Functions of Animal Adaptations	Interactive Assessment Worksheets	http://www.vtaide.com/png/edu/Animal-Adaptations.pdf
Reptile Adaptations	Discovery Education	http://www.discoveryeducation.com/teachers/free-lesson-plans/reptile-adaptations.cfm
Spotlight on insects	QCAT - QSA website, Assessment bank - Year 5	Students investigate insects and explain how their features suit their habitat. (Queensland Studies Authority. Queensland Comparable Assessment Tasks.) http://www.qsa.qld.edu.au/index.html
Biodiversity in Museum Zoo	Worksheets found on QM website	http://www.qm.qld.gov.au/Learning+Resources/Resources
Cloaked in Camouflage	“	http://www.qm.qld.gov.au/Learning+Resources/Resources
Beaks and Feet	“	http://www.qm.qld.gov.au/Learning+Resources/Resources
Bird Beaks and Feet	“	http://www.qm.qld.gov.au/Learning+Resources/Resources
Name that Animal	“	http://www.qm.qld.gov.au/Learning+Resources/Resources

Name	Location	Description
Observations and Classification Skills	“	http://www.qm.qld.gov.au/Learning+Resources/Resources
Skulls: Teacher notes and Student worksheet	“	http://www.qm.qld.gov.au/Learning+Resources/Resources
Who Am I?	“	http://www.qm.qld.gov.au/Learning+Resources/Resources