



Jane Goodall's
roots&shoots

Nature's Tricks

How animals and plants use disguises and deception

Teacher Resources



Jane Goodall Institute
Australia



Petaurus
EDUCATION GROUP



Jane Goodall's
**roots &
Shoots**



All images from Nature's Tricks. See image credits page 2 for details.

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The Jane Goodall Institute Australia and Petaurus Education Group acknowledge with deep respect the First Nations of this land we now call Australia.

We recognise their continuing connection to Country, and acknowledge that they never ceded sovereignty. We thank them for caring for our living landscapes since time immemorial.

We acknowledge and respect the continuation of cultural, spiritual and educational practices. We pay our respects to Elders past and present and emerging, and extend that respect to all First Nations people reading this resource.

About The Roots & Shoots Program

Congratulations for being a Roots & Shoots school!

Roots & Shoots is a global community action program founded by Dr. Jane Goodall in 1991. The program aims to inspire, empower and encourage young people all over the world.

It shows them how to follow their passions, take actions together and become the change our world needs. That way, we can all ensure a better future for people, animals and the environment.

About the Resource Box

The Roots & Shoots Resource Box is designed for teachers and students in primary schools, or by homeschoolers. As well as the four stunning books within, the Box offers several exciting learning opportunities and competitions to further foster optimism for our future.

R&S are excited to be partnering with WOODiWILD to increase biodiversity. Woodiwild enables schools to join a national tree planting program – creating habitat and carbon storage - while also raising funds for their own school needs! To learn more about this fantastic initiative visit woodiwild.org

rootsandshoots.org.au



This Teacher Resource

This resource aims to more deeply engage teachers and students with the amazing and inspiring content of the 2022Roots & Shoots Resource Box. Moving beyond simply reading and viewing the beautiful pages of these books, through these learning sequences it is hoped all can feel more purposefully connected to nature and inspired to take action towards a better future.

The Nature's Tricks book is authored by experts and is an important teacher professional learning resource. It supports teachers towards achieving Australian Professional Standards for **Teachers Standard 2: Know the content and how to teach it.**

Teachers can choose to undertake part, or all, of these learning sequences, however it is recommended to follow the complete sequence in order to achieve the best outcomes. Completing the activities in these Learning Sequences will enable students:

- to achieve outcomes in upper primary Geography and Science courses – see **Pg. 6** for details. Specific links are listed for each lesson
- to engage with the content of the Nature's Tricks book
- to think creatively and engage with alternative perspectives about their environment.

These learning sequences loosely apply the 5 E's instructional model and the 8 Ways of Learning – see below for a more complete summary of these pedagogical approaches.

A digital edition of
Nature's Tricks
can be accessed here:

janegoodall.org.au/australian-programs/resourcebox

TEACHER NOTE



This symbol indicates where teachers can take opportunities to differentiate and tailor learning to their students. This is also a chance to adapt content up and down learning years and stages.

Pedagogical approaches applied in these resources

These learning sequences loosely follow inquiry-based learning into a modified 5Es instructional model (Bybee, 1997), with the five phases: Engage, Explore, Explain, Elaborate and Evaluate.

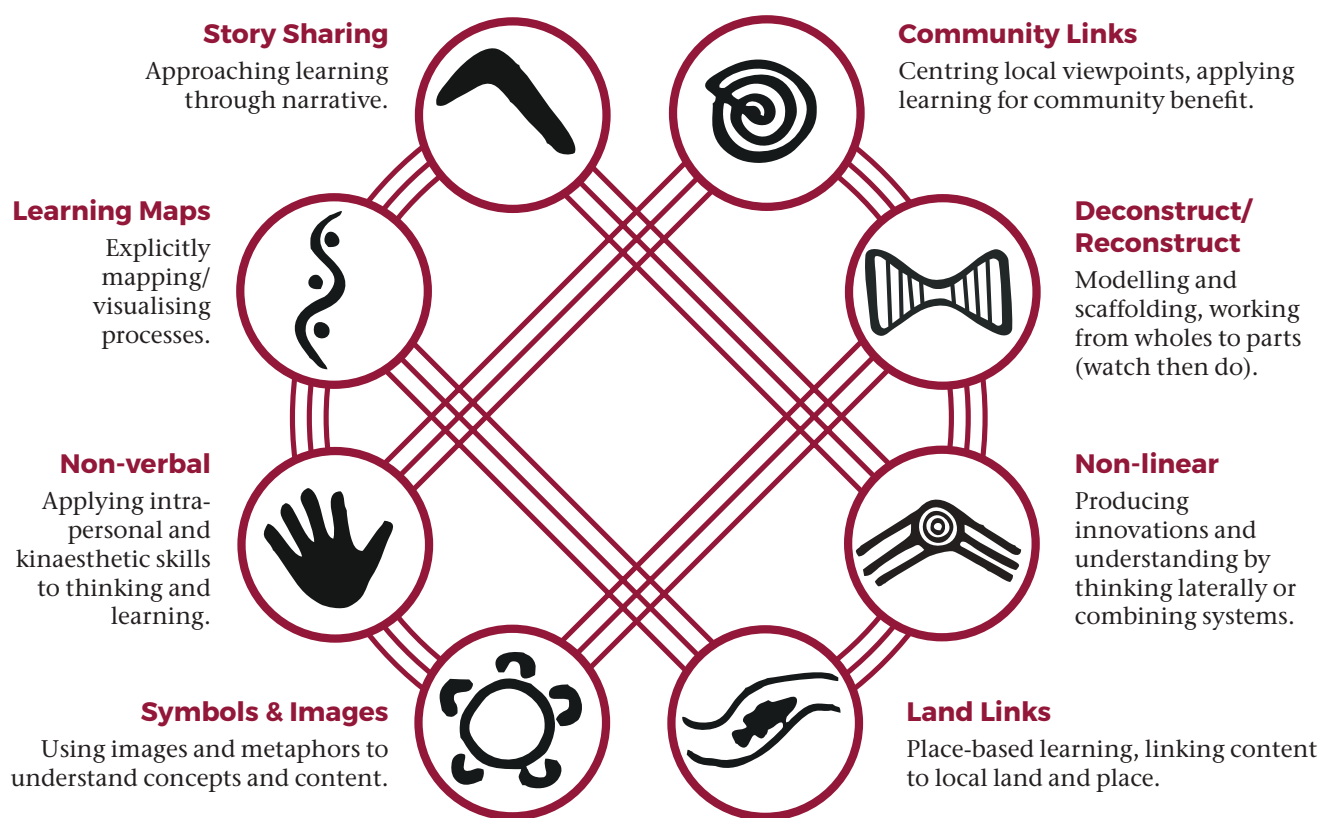
	5E's	Main ideas / skills
	Engage	Identifying and defining Connect past with present Create interest
	Explore	Researching and planning Encourage creative thinking Give common set of experiences Challenge own ideas
	Explain	Apply new vocabulary
	Elaborate	Producing and implementing Apply to new experiences
	Evaluate	Testing and evaluating. Have you changed your thinking?

8 Ways of Learning Aboriginal Pedagogy Approach

We acknowledge the Traditional Owners of western New South Wales, where this pedagogy was developed.

For the best understanding of this pedagogy, and its value in applying it here and in your teaching, head to www.8ways.online. The following summary is from that website.

Throughout this resource you will see the symbols in this picture below. These indicate where these practises are incorporated into the learning sequences.



This is a pedagogy framework that allows teachers to include Aboriginal perspectives by using Aboriginal learning techniques.

This Aboriginal pedagogy framework is expressed as eight interconnected pedagogies involving narrative-driven learning, visualised learning processes, hands-on/reflective techniques, use of symbols/metaphors, land-based learning, indirect/synergistic logic, modelled/scaffolded genre mastery, and connectedness to community.

Throughout this resource, you will see the following symbols. These indicate where these practices are incorporated into the learning sequences.

The meaning of each symbol is summarised simply above – for a more complete understanding, head to the [8ways](http://www.8ways.online) website.

About Petaurus Education Group

This Teacher Resource is written by Petaurus Education Group.

Petaurus Education Group Inc. is a not-for-profit organisation based in Albury (on Wiradjuri Country) in southern NSW. Initiated by the local community, Petaurus is named after the threatened squirrel glider (*Petaurus norfolcensis*) that lives around Albury.

Established in late-2014, Petaurus aims to connect communities, schools and individuals with natural resource management topics such as land, water, biodiversity, productive and sustainable farming, and cultural awareness.

Petaurus creates on-ground, hands-on and local nature-based opportunities for schools to engage with their communities to promote and instil a sense of local pride and ownership in young people. Innovation and creativity are encouraged, as well as linking students to real-life community issues and challenges.

With hubs in Albury, Hay and Gol Gol, Petaurus staff and board members bring a range of experiences including teaching, science, community development, media and the arts, with the goal of developing and delivering quality engagement, education and communication that promotes positive change.

Petaurus works with a range of government and non-government groups and has an extensive network of contacts across the Murray-Darling Basin. Where possible, Petaurus aligns its teaching and learning activities to relevant state and national curriculum outcomes.

Petaurus works across the Basin, engaging and collaborating with communities to create balanced, productive and resilient regional landscapes and communities.

Learn more about our work and to download resources from our extensive library: www.petaurus.org.au



Petaurus
EDUCATION GROUP



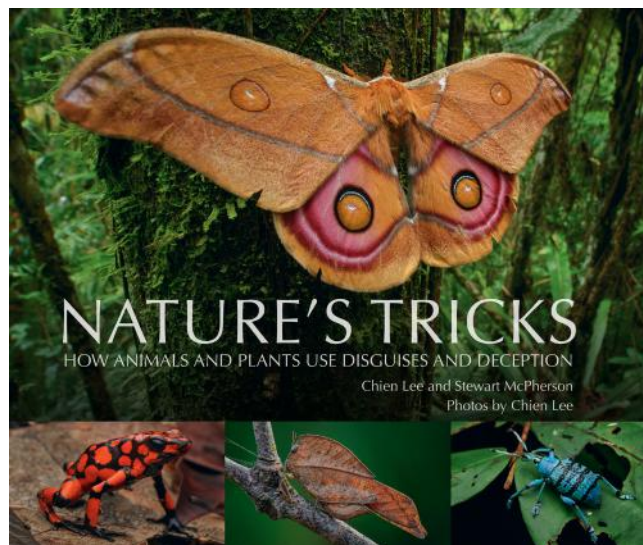
Introduction to Nature's Tricks

Seeing may be believing, but in nature not everything you see is always what it seems.

From cryptic concealments to masquerades and flashy warnings, countless organisms utilise disguises to gain an advantage in their never-ending bid for survival. These remarkable adaptations, crafted by the uncompromising paintbrush of natural selection, have resulted in some of the most extravagantly detailed outfits, some designed to deceive and others to dazzle.

In Nature's Tricks, we journey through the amazing strategies of animals and plants around the world to discover how disguises and deception are used in the natural world. The book is divided into four main chapters: Defensive Camouflage, Hunting Camouflage, Mimicry, and Warning Displays.

Many species presented in this book face threats to their continuing survival in the wild, and each description is accompanied by a generalised conservation indicator as follows:



- THREATENED**
- EX** Extinct
 - EW** Extinct in Wild
 - CR** Critically Endangered
 - EN** Endangered
 - VU** Vulnerable
 - NT** Near Threatened
 - LC** Least Concern

To learn more about how conservation status is assigned please see the lesson on our [website](#)

INTRODUCTION

Seeing may be believing, but in nature not everything you see is always what it seems. From cryptic concealments to masquerades and flashy warnings, countless organisms utilise disguises to gain an advantage in their never-ending bid for survival. These remarkable adaptations, crafted by the uncompromising paintbrush of natural selection, have resulted in some of the most extravagantly detailed outfits, some designed to deceive and others to dazzle.

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Many species presented in this book face threats to their continuing survival in the wild, and each description is accompanied by a generalised conservation indicator as follows:

- NE** Not Evaluated
- LC** Least Concern (not threatened)
- NT** Near Threatened
- VU** Vulnerable
- EN** Endangered
- CR** Critically Endangered

NATURE'S TRICKS

INTRODUCTION

Useful Links and Professional Learning

Roots & Shoots

If you've an idea to benefit animals, people and environment – no matter how big or small – we want to help you. Across Australia, our Roots & Shoots local leaders are ready to guide our members in planning, creating and realising your activity. Whether you're an individual, youth group or school we provide the skills, tools and mentoring to make your activity a success.

Australian Curriculum

These Learning Sequences are designed to be used by teachers and students across Australia and are therefore linked to Australian Curriculum outcomes. For latest developments and additional resources to support the teaching of Australian Curriculum, head to that website.

Australian Association of Environmental Educators (AAEE)

Australia's peak professional body for environmental educators.

- Advocate for Environmental Education and promote best practice.
- Provide a network for cross-sector environmental educators.
- Promote the effective use of education to help people to live more sustainably.
- Support members via professional development.
- Build strong local networks that facilitate collaboration and skill sharing.

Petaurus Education Group online resource library

This not-for-profit education group has been working across the Murray Darling Basin since 2014. Specialising in creating resources with kids, for kids, on a variety of topics related to living in the Murray Darling basin. Access their amazing, easy-to-use on-line library that includes interactive presentations, films and books that will excite and support your learners.

Summary of Learning Sequences

Learning Sequence	Learning intentions	Main ACARA V9 curriculum links	Main learning experiences	Page
Natures Tricks Estimated 7 lessons*		Year 5 Science: Biological Science: examine how particular structural features and behaviours of living things enable their survival in specific habitats (AC9S5U01) Communicating: Write and create texts to communicate ideas and findings for specific purposes and audiences, including selection of language features, using digital tools as appropriate (AC9S5I06) General Capabilities: Critical and Creative Thinking Generating Create possibilities Inquiring Identify, process and evaluate information	See Think Wonder Exploring habitats using imagery or the outside environment Deep diving into the Nature's Tricks book and recording information in a table Simulating a scene from a nature documentary Scripting and narrating a scene from a nature documentary Optional: Filming a scene from a nature documentary	8

Learning Sequence:

Nature's Tricks

Overarching Inquiry Question:

What are some of the tricks animals have to disguise themselves and deceive their predators and prey?

Learning Intentions:

Explain how animals use structural features and behaviours to survive in a particular habitat.

Use language features to communicate ideas about form and behaviour suited to a nature documentary.

Success Criteria:

I can explain how an animal's form and features allow it to survive.

I can explain through a nature documentary how an animal uses structural features to enable survival in their particular habitat using new language.

I can explain through a nature documentary how multiple animals use various structural features and behaviours to survive in particular habitats.

Main Outcomes

Year 5:

Science: Examine how particular structural features and behaviours of living things enable their survival in specific habitats (AC9S5U01)

Communicating: Write and create texts to communicate ideas and findings for specific purposes and audiences, including selection of language features, using digital tools as appropriate (AC9S5I06)

KEY VOCABULARY

Behaviour

Crypsis

Decoration

Defensive camouflage

Habitat

Hunting camouflage

Iridescence

Masquerade

Mimicry

Survival strategies

Transparency

Warning displays

TEACHER NOTES

This sequence supports a deep dive into the amazing imagery of the Nature's Tricks book through a guided exploration which can be recorded using a worksheet. Not all of the amazing examples in the book have been captured in this worksheet. Consider allowing students to explore their playground in the EXPLORE phase activity, or use the classroom based alternative.

Before commencing, consider what resources, including time, you are able to dedicate to supporting the nature documentary making. Opportunities exist to work cross-curricular with creative arts. If it is not possible to film, it is just as good to organise a tour of various habitats where the 'narrators' act as the tour guides instead.

** These learning sequences are not prescriptive lesson plans, but rather offer activities and experiences to support teachers to implement flexible, hands-on programs tailored for their students. Feel free to dive in and use one, or all, of these activities!*

SPECIAL NOTES

Icons like this:



indicate opportunity for differentiation, including up and down learning stages



indicate how this relates to the 8 ways of learning pedagogy



indicate a page number in the Living Landscapes book

Learning Sequence: Nature's Tricks

Lesson 1

Content	Teaching learning and assessment	Resources
ENGAGE	What is happening in these photos? Students collaborate on the following questions: • What is camouflage? • Have you seen any animals that are good at hiding in their environment? • Why do you think animals need to camouflage? See Think Wonder Show a selection of images from the book (bookmark these for the EVALUATE phase of this learning sequence) and guide students through the following visible thinking task without affirmations or corrections: What do you SEE? Prompts: look at animal AND environment; describe colour, textures, behaviour, shape, features. What do you THINK is happening? Prompt: How is it helping the animal? What does it make you WONDER about? Prompts: how, what, when, where, why, which. Note questions on a Wonder Wall to revisit later. Explain to students how animals use camouflage to blend in with their environment, and why it is important for their survival. Students will watch a short video about camouflage, and the teacher will provide additional examples and explanations. Students will work in pairs to select an ecosystem from the Amazing Ecosystems book and create their own animal with unique adaptations to blend in with the environment. They will draw and label their animals and describe how their animal is adapted to their environment. Students to share their drawings and explain how their animal is adapted to its environment. The teacher will assess the students' understanding of camouflage and their ability to apply their knowledge to create their own animal. Extension for physical adaptations - peppered moth: • Begin by showing students pictures of the light and dark forms of the peppered moth. • Ask students if they notice any differences between the two forms of the moth, and if so, what are they. • Explain that during the Industrial Revolution in the UK, factories produced a lot of soot that covered the tree trunks and walls of the peppered moth's habitat, making it easier for the dark form of the moth to blend in and avoid predators. • Show students pictures of tree trunks and walls that are both clean and soot-covered. • Give each student a white paper and ask them to draw a picture of a peppered moth on the paper, using both black and white coloured pencils or crayons. • After they have drawn their moth, ask students to choose either the light or dark form of the moth and colour their drawing accordingly. • Once all students have completed their drawings, ask them to hold up their drawings and explain why they chose the form of the moth they did and how it would help the moth survive in its environment.	Teacher Resources: A selection of incredible images from the book – keep these for the EVALUATE phase Resources Required: Chosen images for projection or print Video about camouflage (source online) Online search for peppered moth

Learning Sequence: Nature's Tricks

Lessons 1-2

Content	Teaching learning and assessment	Resources
EXPLORE	Where could I belong? Predicting which habitats are best for which animal Display a list of various animals – Appendix A.  Working in pairs, students select a habitat that one or all of the animals shown can survive in based on their own reasoning – allow creative thought.  Revise the key words “habitat” and “thrive” and ensure a basic understanding. Teachers can allow exploration for environments within or outside the classroom. (E.g.. On trees in playground; on dry grass; on soil) or provide images of different environments – see Appendix B. Record thinking in Columns 2 and 3 of the worksheet Appendix C if it suits – extract below. Columns 4 and 5 will be completed later in this sequence.	Resources Required: Appendix A Appendix B Appendix C

ANIMAL	HABITAT WHERE IT CAN THRIVE	TWO REASONS IT WILL THRIVE HERE
Crab		
Hunting mammal		
Butterfly / Moth		
Beetle		
Bird		
Snake		
Fish		
Frog		
Stick insect / Mantis		
Spider		
Gecko		

Learning Sequence: Nature's Tricks

Lessons 3-4

Content	Teaching learning and assessment	Resources
EXPLAIN General Capabilities: Literacy ICT	What are some of the tips and tricks to survive in a habitat? Nature's Tricks Each student pair presents their choice of habitat for an animal and explains why they chose that location/environment/habitat for that animal. Teacher then leads a class discussion on some or all of the structural features and behaviours that animals use as outlined in the Nature's Tricks book, and how these help them to survive. Class discusses which student ideas fit into either the behavioral or structural features category. (see table on following page) After or during this discussion, students record this explanation for their choice of animal plus others in columns 4 and 5 of the worksheet (Appendix C) Optional Extension: Structural Feature or Behaviour? The Nature's Tricks book provides a focus on structural features, rather than behaviours. Students and teachers can research some of the other behaviours these animals have to thrive in their habitats.	Teacher Resources: Each of these adaptations are explained in the corresponding chapter of Nature's Tricks Resources Required: Completed Appendix A, Appendix B, Appendix C



Learning Sequence: Nature's Tricks

Lessons 3-4 (continued)

Defensive camouflage - hiding for survival (Nature's Tricks, info page 8)

Type (Nature's Tricks page ref.)	Animal	Nature's Tricks page number	Method
Crypsis (10)	Frog Gecko Spider Mantis Bird Crab	11, 19, 23, 33 16-17 13, 15, 30 15, 18, 29, 31 36, 37 40	Structural and Behavioural
Disruptive colouration (44-45)	Moth/butterfly Beetle	44-45	Structural
Iridescence (46)	Snake Beetle	47	Structural
Silvering (48)	Beetle		Structural
Masquerade (52)	Bird Gecko Mantis Spider	53, 64-65 55 63 68-69	Structural and Behavioural
Decoration (70)	Crab	74-75	Behavioural
Colour change (80-82)	Fish	85	Behavioural
Hunting camouflage Page 88	Hunting mammal Snake Mantis Spider Fish	89-93 94-97 98-99 99 102-103	Structural and Behavioural
Mimicry Page 104	Beetle Butterfly Snake Mantis Spider	107 106, 113 110, 120 111 111, 117, 118-119, 120, 122	Structural and Behavioural
Auto mimicry Page 126	Snake	126	Structural
Warning displays Page 136	Frog Beetle Snake	Page 141-143 145 149	Structural
Startle displays Page 150	Moth Stick insect/mantis	150 157	Behavioural

Learning Sequence: Nature's Tricks

Lessons 4-6+

Content	Teaching learning and assessment	Resources
EXPLAIN General Capabilities: Literacy Critical & Creative Thinking	Who uses that trick and why? Nature Documentary Makers: In pairs or small groups, students will simulate a scene from a nature documentary to showcase some of nature's tricks. Students create a physical simulation of the animal surviving in its habitat using one of the structural features and/or behaviours discussed and use a script to narrate a voiceover. Show a nature documentary as an example. Part 1: Casting Call and Scene Script Writing Choose an animal to showcase from the list used above. Suitable animals are those you can simulate using the time and resources available. Using the Nature's Tricks book and other sources including films, research more about that animal and how it uses structural feature and/or behavioural features to thrive in its habitat. Draft a script for your scene that explains to viewers what they are looking at. Use the image descriptors from the book as the script and consider incorporating the status of the species (E.g. Vulnerable). Part 2: Set Design and Costumes Support students by offering the following strategies and equipment: • Found objects such as sticks, leaves, sand, for both animal and their set • Bark rubbings with charcoal or coloured crayons or chalk • Silver foil for iridescence and silvering • Coloured textas • Cardboard or modeling clay that can be easily shaped, cut and coloured to craft the animal Part 3: Lights! Camera! Action! Direct students to experiment with moving the camera, rather than just one static shot. Consider where the narrator will stand as the camera is rolling to get the best voiceover recording.	Teacher Resources: A nature documentary "Making Of" a nature documentary Resources Required: Nature documentary Writing materials Craft materials for making animals and their habitats (see list) Video cameras, ipads or smart phones Optional: film editing software (iMovie or the like)

Learning Sequence: Nature's Tricks

Lesson 7

Content	Teaching learning and assessment	Resources
EXPLAIN General Capabilities: Personal & Social Capability Critical & Creative Thinking	Part 4: Opening Night Share your learnings with the class. When watching other students work ask them to take note of the animal, its habitat and its structural and behavioral features. How did it differ to theirs? Have a think about if you changed your animal to match the environment of another group what would happen? Optional: Edit scenes together to create a full documentary. Consider an opening to introduce what the film is about (use the introduction from the Natures Tricks book) and a closing scene to summarize the key messages (your learnings). Please share your documentary with us! rootsandshoots@janegoodall.org.au How has my thinking changed? Revisit the images you used in the ENGAGE phase. Consider the camouflage strategies you thought of back in this phase of your learning. Have you deepened your awareness of other strategies that animals can use to survive in their habitat?	Resources Required: Images collated for ENGAGE phase Wonder Wall Questions



Appendix A:

Where Could I Belong?

Suggested animals for this activity

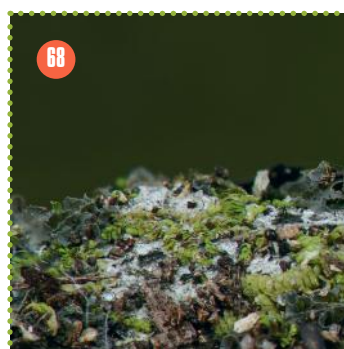
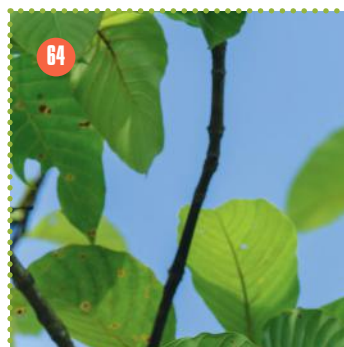


Appendix B:

Habitats

Images of habitats from Nature's Tricks book

Page Number in *Amazing Ecocystems* indicated in orange circle #



Appendix C:

My Home

ANIMAL	HABITAT WHERE IT CAN THRIVE Draw, describe in words, or paste picture	TWO REASONS WHY I THINK IT WILL THRIVE HERE	Example from book	Structural Feature or Behaviour Used
Crab				
Hunting mammal				
Small ant				

Appendix C:

My Home (continued)

ANIMAL	HABITAT WHERE IT CAN THRIVE Draw, describe in words, or paste picture	TWO REASONS WHY I THINK IT WILL THRIVE HERE	Example from book	Structural Feature or Behaviour Used
Bright red flower				
Snake				
Butterfly				

Appendix C:

My Home (continued)

ANIMAL	HABITAT WHERE IT CAN THRIVE Draw, describe in words, or paste picture	TWO REASONS WHY I THINK IT WILL THRIVE HERE	Example from book	Structural Feature or Behaviour Used
Beetle				
Bird				
Fish				



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