



Backyard Mini-Beasts



Years: Prep - 7

Overview:

Think you know your backyard pretty well?? Think again! Let's zoom in and explore. There are so many little critters who share your backyard and call it their home. They all have a role to play in your backyard environment so let's get outside in the fresh air and discover who lives there! Children can collect and observe samples of bugs in a variety of ways – whatever suits your backyard, equipment availability and personal preference.

Core alignment to Australian Curriculum:

Prep

Biological sciences

- Living things have basic needs including food and water

Year 1

Biological sciences

- Living things have a variety of external features
- Living things live in different places where their needs are met

Year 2

Biological sciences

- Living things grow, change and have offspring similar to themselves

Year 3

Biological sciences

- Living things can be grouped on the basis of observable features and can be distinguished from non-living things

Year 4

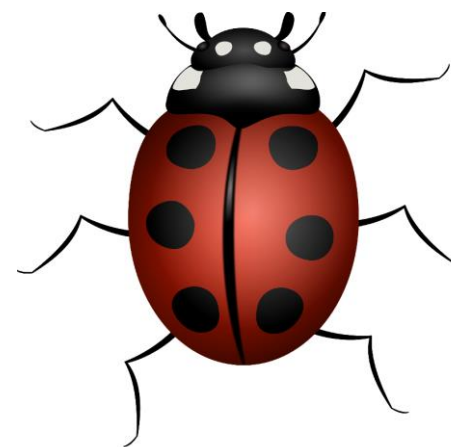
Biological sciences

- Living things have life cycles
- Living things depend on each other and the environment to survive

Year 5

Biological sciences

- Living things have structural features and adaptations that help them to survive in their environment



Year 6

Biological sciences

- The growth and survival of living things are affected by physical conditions of their environment

Year 7

Biological sciences

- Classification helps organise the diverse group of organisms
- Interactions between organisms, including the effects of human activities can be represented by food chains and food webs

Preliminary Learning:

What is an invertebrate? Invertebrates are animals without backbones, including land invertebrates, such as insects, spiders, worms and beetles, and water-based invertebrates, such as snails, crabs and coral (more information on invertebrates here: <https://australianmuseum.net.au/learn/teachers/learning/what-are-invertebrates>). Invertebrates, especially on land (where there's no water to support their body weight), are usually a lot smaller than animals with a backbone (vertebrates). Because bigger bodies weigh more, they need more support and, since invertebrates don't have a backbone (or any bones inside their body at all), they're limited with how big they can grow.

After discussing the above with your children, ask them "What would happen to you if you didn't have a skeleton?"

Game: take turns thinking of an animal and have the children decide whether it is a vertebrate (with a backbone) or an invertebrate and why they think so.

Stimulus discussion questions:

- What types of invertebrates/bugs do you think will live in our backyard?
- Where in our yard might these invertebrates be found?
- What might these different types of invertebrates eat?
- What animals might eat these invertebrates?
- What are some of the jobs or roles these invertebrate animals might have in our backyard/why are these animals important?



Safety, Equipment and Methodology:

Choose one or more methods of collecting and observing your backyard critters (why not try a different method each day?!), ensuring constant adult supervision and assistance.



	Collecting from plants	Collecting from ground trap	Collecting from leaf litter/compost
SAFETY	<ul style="list-style-type: none"> Recently, South East Queensland has seen an increase in fire ant activity. Learn how to identify fire ants here https://www.business.qld.gov.au/industries/farms-fishing-forestry/agriculture/land-management/health-pests-weeds-diseases/pests/fire-ants-qld/identifying in case they are residing in your backyard. If fire ants are suspected when conducting this activity, do not disturb them, move all participants away and notify Biosecurity Queensland as soon as possible by calling 13 25 23 or visiting https://ants.daf.qld.gov.au/table-of-contents/report-fire-ants/ Parents, please supervise children throughout the duration of the activity Ensure personal protective equipment is always worn by all participants – gloves, sun protection (hat, sunscreen, sunglasses, long sleeved shirt), enclosed shoes Avoid touching any creatures to minimise risk of bites and stings If any participant has known allergies to insect bites/stings, ensure EpiPen/medication is on hand Ensure any pets are safely contained elsewhere or are under parent control during activity to reduce possibility of insect bites/stings to pets Ensure all participants understand methodology and expectations for safety before commencing activity Ensure all participants wash hands thoroughly on completion of outdoor component 		
Equipment list	<ul style="list-style-type: none"> Protective gloves (e.g. gardening gloves OR washing up gloves) for all participants Rigid stick – e.g. broom handle White/light-coloured sheet OR several pieces of white paper taped together OR large, flat white/light container/tray Magnifying glass (if available) Camera (e.g. smart phone) Multiple smaller containers for viewing critters – optional Garden trowel or large spoon - optional 	<ul style="list-style-type: none"> Protective gloves (e.g. gardening gloves OR washing up gloves) for all participants 1 or 2 containers with lids – e.g. ice cream container/takeaway container Scissors/Stanley knife Trowel/shovel White/light-coloured sheet OR several pieces of white paper taped together OR large white/ light tray/ container Magnifying glass (if available) Camera (e.g. smart phone) Multiple smaller containers for viewing critters - optional 	<ul style="list-style-type: none"> Protective gloves (e.g. gardening gloves OR washing up gloves) for all participants Garden trowel or large spoon White/light-coloured sheet OR several pieces of white paper taped together OR large, flat white/light container/tray Magnifying glass (if available) Camera (e.g. smart phone) Multiple smaller containers for viewing critters - optional
Collecting instructions	<ul style="list-style-type: none"> Put on all personal protective equipment 	<ul style="list-style-type: none"> Put on all personal protective equipment 	<ul style="list-style-type: none"> Put on all personal protective equipment

	<p>including sun protection, gloves and enclosed shoes</p> <ul style="list-style-type: none"> • Place white/light sheet, paper, umbrella or tray beneath a bush or the branch of a tree • Beat the foliage of the bush/branch of tree with the stick (bugs will fall onto white sheet) 	<p>including sun protection, gloves and enclosed shoes</p> <ul style="list-style-type: none"> • The supervising adult is to cut a large hole in the centre of each of the container lids (this can be done in advance) • Select a suitable location in your yard to dig holes large enough for your container/s (consider where people or pets will walk; try and separate containers by at least a metre; locations amongst or under plants will have better results) • Place your container/s into the hole/s ensuring the lid of the container is level with or a little deeper than the surrounding soil leave the trap for several hours, e.g. overnight • Remove containers and pour contents onto white sheet tray 	<p>including sun protection, gloves and enclosed shoes</p> <ul style="list-style-type: none"> • Use the trowel to collect a sample of leaf litter OR compost from your backyard and place it on the white sheet/tray • If using leaf litter, leave the sheet/tray in the sun for approx. 15 minutes then give the sheet/tray a jostle to encourage bugs to the bottom of the leaf pile • With gloves on, remove the leaves so just the bugs are left behind • If using compost, gently spread the sample out over the sheet/tray using the back of the trowel
<p>Observing instructions</p>	<ul style="list-style-type: none"> • Slide white sheet/tray to somewhere (outdoors) visible by all participants • If you have very mobile creatures or would like to separate the different types of creatures as you identify them, you can (still wearing gloves) gently use the trowel or a spoon to scoop the bugs into smaller containers (please be considerate of air holes for the bugs) • Work together to identify what types of creatures you have caught (this website is very helpful and easy to use http://www.ento.csiro.au/education/key/couplet_01.html) • Observe and write down the features of each creature (alternatively children can draw and label a diagram) – e.g. how many legs they have, what their mouth parts look like, what colour/s they are, how their body is arranged (e.g. different segments – how many?), how big/small are they, any special features • As you observe and identify each creature, take some photos of it for use with activities later • Once you’ve finished observing and identifying your bugs, please return them to their habitat in your backyard • Have the children help to clean/pack away equipment and ensure all participants thoroughly wash their hands once finished • Upload photos onto a computer for use with later activities 		

Follow-up Questions:



Following the backyard observation and identification activity, have the children examine their drawings, notes and photographs to answer the following questions:

- Which of the creatures you found was your favourite and why?
- What were the most common bugs/invertebrates found from your sampling?
- What are some possible reasons for finding so many of these types of bugs?
- Do you think you found any baby/juvenile bugs?
- How might you tell if the bugs were immature or fully grown?

If you used different methodologies/sampled different habitats in your backyard (e.g. in plants vs. on ground vs. in compost):

- Were different or similar types of invertebrates found in different areas? Why do you think this was the case?
- Which collection method gave you the highest diversity/number of different types of invertebrates? Why do you think that is?
- Which collection method gave you the highest number of invertebrates in total? Why do you think that is?



Consolidation Activities:

Below are some resources and additional activities to help children continue their learning about invertebrates.

All years

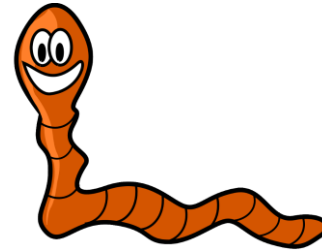
- Make a bug hotel for your new backyard friends (parent supervision necessary for younger ages)!
<https://www.redtedart.com/simple-bug-hotel-for-kids//>
- <https://www.minibeastwildlife.com.au/resources/>

Prep

- Draw a picture showing your favourite bug from your exploration in its backyard home (alternatively, children can make a model of their chosen bug in its habitat out of playdough – easy recipe here: <https://www.thebestideasforkids.com/playdough-recipe/>). Think about including what your bug might like to eat, where it might rest and seek shelter.
- <https://www.minibeastwildlife.com.au/resources/colouring-sheets/>

Year 1

- Use a pencil and ruler to divide a piece of paper (landscape orientation) into three (3) roughly equal sections. On the left third of the paper, draw a picture of your favourite bug from your backyard exploration and label any special body features it has that helps it survive in its natural home. Surrounding this animal, write words that describe its natural home, what it likes to eat, and who might like to eat it!



On the right third of the paper, draw any animal in the world that you like. Label any special body features it has that helps it survive in its natural home. Surrounding this animal, write words that describe its natural home, what it likes to eat, and who might like to eat it!

- In the middle third of the paper, write words that explain how the two animals you've drawn are similar or different – e.g. What body features do they have in common? What body features are different? How are their homes similar or different? How is their diet similar or different?
- <https://www.minibeastwildlife.com.au/resources/colouring-sheets/>

Year 2

- Watch this video <https://www.youtube.com/watch?v=O1S8WzwLPIM> and then teach someone in your family about the life cycle of a butterfly (egg, caterpillar, pupa, butterfly) either by explaining a drawing you make, acting it out, writing a story or creating a dance!
- <https://www.minibeastwildlife.com.au/resources/activity-sheets/>

Year 3

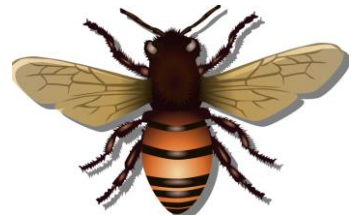
- Continue exploring your backyard. This is the home of the bugs you found. They depend on all the living and non-living parts of this habitat to survive. Find and record three other living things in your back yard and three non-living things. Can you find an example of something that was once living or used to be part of a living thing?
- Using the photos you took during your backyard mini-beast activity, create a digital collage (or print and do on paper) grouping the animals together with other closely related bugs. For example, organise photos so all the beetles are together, all worms are together, spiders are together, etc. For each group that you have, add text to your collage explaining some of the main features of that group (e.g. number of legs). This website will help provide some useful information: <https://www.dkfindout.com/us/animals-and-nature/insects/types-insects/>
- <https://www.minibeastwildlife.com.au/resources/activity-sheets/>

Year 4

- Select one of the bugs you found in the backyard and conduct an internet search to find information about this animal's life cycle. Draw a diagram to show the life cycle of your chosen animal. Label the diagram with the name of each stage and any information you can find about how long each life

stage lasts, what habitat is important for each life stage and what this animal's diet is at each life stage.

- For your chosen animal, use the information you gathered in your life cycle diagram and your answers to the following questions to write a story about this creature from the beginning of its life to adulthood.
 - What is this animal's habitat?
 - What is this animal's role in its habitat? E.g. consumer, decomposer, herbivore, carnivore, omnivore (can be more than one of these – e.g. consumer and carnivore)
 - What does this animal eat?
 - What creatures might eat this animal?
 - How does this animal get shelter/protection?
 - What human activities could harm this animal?
 - What would change in your backyard if this animal disappeared?
- <https://www.minibeastwildlife.com.au/resources/activity-sheets/>



Year 5 and 6

- Draw a diagram of one of the invertebrates you found in your back yard. Label your diagram with the various body features. The diagram on this website will provide an example <https://www.qm.qld.gov.au/Find+out+about/Animals+of+Queensland/Insects#.Xnr1aS1L1QJ>). You can search for other diagrams specific to your chosen animal. Next to each labelled body feature in your diagram, describe what this feature looks like and how this adaptation helps your chosen animal survive in your backyard habitat (how does this feature help the animal get what it needs for survival). E.g. Jaws – specialised for chewing plants (caterpillar) OR piercing mouth for sucking blood (mosquito).
- Add to the bottom of your diagram any behavioural adaptations your chosen animal exhibited when you observed it in your backyard (e.g. did it try to camouflage, escape, defend itself)?
- On a separate piece of paper, answer the following about your chosen invertebrate (you will need to conduct research online):
 - Describe your chosen animal's habitat?
 - What does this animal eat?
 - What creatures might eat this animal?
 - How does this animal get shelter/protection?
- Based on what you learned in the above activities, write predictions for how the following changes to physical conditions in your yard might affect your chosen invertebrate.
 - Severe drought (including water restrictions for watering your garden)
 - Flooding
 - Weed-killing chemicals sprayed over some of the plants in your yard
- <https://www.minibeastwildlife.com.au/resources/activity-sheets/>

Year 7

Dichotomous keys help scientists organise and understand life. These keys can demonstrate how things are similar or different to one another by organising them according to presence or absence of certain features. Dichotomous keys can be presented as a list or as a branching diagram. The identification guide you used to classify your backyard bugs is an example of a dichotomous key, though it was displayed just one step at a time for easy use.

- Practice using another dichotomous key by completing the two activities on this sheet http://scienceweb.asta.edu.au/verve/resources/asta_5-2-3_ws2_classification_yr7_v1-2.pdf
- View this website to see more examples of dichotomous keys and to gain more information about their use and creation <https://creately.com/blog/diagrams/what-is-a-dichotomous-key/>
- Create a similar (branching) dichotomous key either digitally or by hand that incorporates at least five (5) of the invertebrates you found in your backyard. Remember to start by listing out the characteristics of each of your invertebrates. How is each similar or different to each other? Separate your chosen invertebrates out by posing one question at a time about their features (e.g. legs/no legs). Refer to the CSIRO invertebrate key you used in your backyard (http://www.ento.csiro.au/education/key/couplet_01.html) for ideas of body features you could use to separate your animals
- Select three invertebrates you found in your backyard and research their diet as well as any animals that may prey upon them. Based on this information, construct a simple food chain for each animal (three food chains in total). Remember that every food chain should start with a producer and the arrows point towards the organism receiving the energy (the animal doing the eating). Here is some more information about, and an example of food chains (and food webs).

<https://www.khanacademy.org/science/biology/ecology/intro-to-ecosystems/a/food-chains-food-webs>

- Challenge: create a food web for your backyard based on the information you gathered while making food chains.

