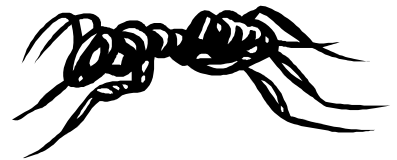
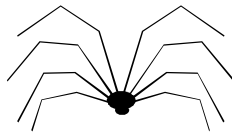
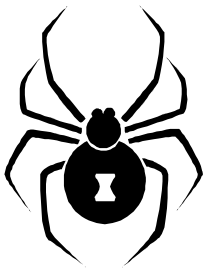
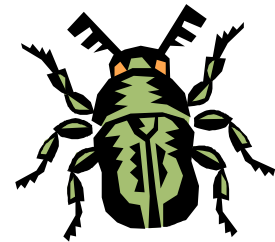
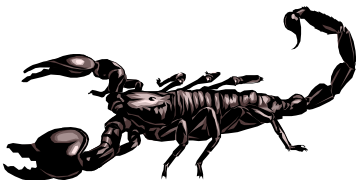


LIFE AND LIVING

Nasty Creepy Crawlies



Primary Module
Years 4-7



Abstract

The Gravity Discovery Centre is set in pristine bushland. In this ‘untouched’ state there are many mini beasts that can be studied and observed. The world of mini beasts is fascinating, because we can see them all around us in our daily lives and as humans we have much in common with them. Like humans mini beasts often live in communities, have leaders, workers and child-rearers. Because of their size they are relatively easy to observe.

One common ‘mini beast’ that is found at the GDC is the Kangaroo Tick. Students will have the opportunity to study the Life and Living and Investigating Scientifically Strand by studying this common invertebrate.



Teacher Use

These sheets are for teachers to use for background information or for students to access for research purposes.

The Gravity Discovery Centre is set in pristine bushland. In this 'untouched' state there are many mini beasts that can be studied and observed. The world of mini beasts is fascinating, because we can see them all around us in our daily lives and as humans we have much in common with them. Like humans mini beasts often live in communities, have leaders, workers and child rearers. Because of their size they are relatively easy to observe.



Mini beasts can be found just about anywhere you might look. They can be found in the city, the country, in deserts and in swamps, in mountains and lowlands, in wooded areas and in paddocks. They can be found in and near water, in yards and parks, in crops and gardens, in homes and buildings and on animals. No matter where you are, students should have no trouble locating mini beasts to catch, observe and study.



Most mini beasts have a favourite habitat or construct special homes for themselves. Most species are almost always in specific habitats because of their need for certain conditions – the need for a particular plant, flowing water, sandy soil, lots of sunlight or other such phenomena. Some mini beasts construct special homes for themselves and these are sure signs of an animal's presence. There are many other mini beasts that are collectively labelled as pests due to their large numbers, persistent behaviour and attraction often to the same food that humans grow or to the same location.



One very common mini beast found at the GDC site is the Kangaroo Tick. Ticks are not insects. They have eight legs and are related to spiders and mites. They can also be very small. The tick will attach itself to a living animal, bury its head under the skin and start drinking blood. The tick will feed for a couple of days until its body is full and swollen and then it will drop off the animal. The danger is that ticks can carry diseases and while they are feeding these diseases can be passed onto the victim. However ticks in WA are not known to carry disease. They will spend several hours walking around a body before finding a place to attach themselves.

There are about 800 species of ticks around the world. Often in the bush you will see lizards with ticks behind their ears. Kangaroos and other native animals play host to the ticks. They are also found on domestic animals such as sheep, cattle and dogs.

The tick has a hard leathery skin that is often reddish brown with white rings on the legs. The female is usually bigger than the male and can reach 25mm in length. The adults mate on the host animal and the female when engorged with blood, drops to the ground and lays thousands of eggs in a single batch. The young hatch with three pairs of legs but the adults have four pairs.

Mini beasts are necessary for the ecological balance of life, including the essential role they play in conditioning the soil, recycling and disposing of waste and are natural indicators of a healthy environment.

Most mini beasts are harmless but students need to be aware of those that can bite or sting and of course venomous creatures should be avoided.

Students need to be aware of their responsibility when collecting specimens. Discuss the purpose of collecting species is to create reference collections for study and appreciation, to document regional biodiversity, frequency and variability as well as representation in environments undergoing alteration by man or natural forces.

Collection of species should be limited to sampling not the depletion of populations. Caution and restraint should be exercised when the size of the population is unknown. The use of live traps is encouraged. All traps should be checked on a regular basis.

WARNING

Safety: Because ticks take a long time - several hours – to attach themselves there is no danger of tick bites if you check yourself all over within a few hours of exposure. Best of all is to have a hot shower before you go to bed. Ticks usually get on you by falling off bushes as you walk past. To avoid ticks, stay on the path. If a tick attaches itself it can cause irritation at the site of attachment. Very rarely people are allergic to tick bites. It is advisable to kill and remove the tick as soon as it is discovered. Application of methylated spirits to the site may make the tick withdraw. Many people use glycerine to asphyxiate the tick before pulling it out, but most people just remove it. Otherwise use tweezers to grab the head of the tick and gently pull away from the skin. Treat the bite with antiseptic. To avoid being bitten spray clothes with repellent sprays and roll ons.



Teacher Use

Overarching Major Learning Outcomes

(Curriculum Framework)

There are opportunities to assess students in the following outcomes when taking part in this program:

OLO 5. Students describe and reason about patterns, structures and relationships in order to understand, interpret, justify and make predications

OLO 6. Students visualise consequences, think laterally, recognise potential and are prepared to test options.

OLO 7. Students understand and appreciate the physical, biological and technological world and have the knowledge and skills to make decisions in relation to it

Science Major Learning Outcomes

Working Scientifically

- 1. Investigating:** students investigate to answer questions about the natural and technological world. They use the skills of scientific investigation, reflection and analysis to prepare a plan for their investigation; to collect, process and interpret data; to communicate their conclusions.
- 2. Communicating Scientifically:** Students communicate scientific understandings to different audiences for a range of purposes
- 3. Applying Science in Daily Life:** students apply and evaluate scientific knowledge, skills and understandings across a range of contexts
- 4. Using science in Society:** Students understand that science is a human activity which influences all people as part of their daily lives

Understanding Concepts

Life and Living: Students understand their own biology and that of other living things and recognise the interdependence of life.

Investigating Scientifically - Students investigate to answer questions about the natural and technological world, using reflection and analysis to prepare a plan; to collect and interpret data; to communicate conclusions; and to evaluate their plan, procedure and findings.

Progress Maps

The following will enable teachers to have a clear picture about the achievements required of students to demonstrate an outcome. Students typically in Years 4-7 will be performing at Levels 2-4. The following examples demonstrate outcomes for Level 3.

Investigating Scientifically

	Level 2 When given a focus question & a familiar situation contributes elementary ideas about variables & procedures, collects and makes limited records of data and can say if what happened was expected	Level 3 Shows some awareness of the need for fair testing, makes simple predictions, collects & organises numerical data & descriptive information using simple tables, diagrams & graphs & identifies main features, patterns and difficulties in an investigation	Level 4 Plans and conducts different types of investigations, takes into account the main variables, collects data using repeat trials; explains patterns in data; makes suggestions for improvement
Planning- plan investigations to test ideas about the natural and technological world	Identifies, given a focus question, some of the variables to be considered	Plans for investigations, shows some awareness of the for fair testing and makes simple predictions based on personal experience	Identifies the variables to be changed, the variables to be measured and at least one variable to be controlled
Conducting - collect and record a variety of information relevant to their investigations	Observes, classifies, describes and makes simple non-standard measurements and limited records of data	Uses simple equipment in a consistent manner; records data in simple tables, diagrams or observations	Uses equipment appropriately; recognises the need for safety equipment and precautions; takes care with data collection to ensure accuracy
Processing Data - translate and analyse information to find patterns and draw conclusions to extend their understandings	Makes comparisons between objects and events observed	Displays numerical data as tables or bar graphs, and identifies patterns in data; summarises the data	Calculates averages from repeated trials; plots data as line graphs where appropriate; makes conclusions which summarise and explain patterns in data
Evaluating Data - reflect on an investigation, evaluate the process and generate ideas	Comments on what happened and can determine if what happened was expected	Identifies difficulties experienced in conducting the experiment	Makes general suggestions for improving the investigation

Life and Living - Students understand their own biology and that of other living things and recognise the interdependence of life.

Student outcome Statement	Level 2 Students understand that the needs, features and functions of living things are related and change over time	Level 3 Students understand that living things have features that form systems which determine their interaction with the community	Level 4 Students understand that systems can interact and that such interactions can lead to change
All things in the environment are interdependent and changing one aspect will affect other organisms	Describes what ticks need to survive	Makes connections between ticks, other living things and the environment	Describes processes that connect ticks to the eco system they live in
The relationship between structure and function in living things is a basis for understanding life and maintaining processes	Identifies some functions related to features of ticks	Identifies some features of ticks, that form systems with particular functions	Describes the interactions of ticks with different systems with particular functions
Organisms grow, reproduce and change over generations	Describes the life cycle of a tick	Describes patterns and similarities between ticks and other familiar living things	Identifies a process of change to show that ticks may have changed over time



Teacher Use

The following activities and information will give students the opportunity to develop some understandings of ticks and mini beasts prior to their visit to the GDC

The following activities will require students to collect some mini beasts from their own environment.

Before keeping mini beasts in the classroom have students consider whether they will gain much by studying mini beasts out of their own environment. Students need to consider creature comforts. Keep beasts for a maximum of three days, put them back where they were found, clean their house every day, provide fresh food and water and don't mix mini beasts as they may eat each other.

Activity 1: Within the student's environment at school have them list different types of mini beasts that they have seen. If they don't know their names get them to draw a sketch. Good places to locate mini beasts are shaking the branch of a tree over a white sheet of paper, collecting leaf litter and carefully examining it. Have students classify what they have found according to their own criteria.

Activity 2: Each group claim their own tree or bush and predict what animals might live there. Allow a set time for predicting, observing and recording what they have found. Classify where the creature lives and what part of the tree it was found.

Activity 3: Team up with a child in their group and compare the mini beast they have found. List similarities and differences. Have students look beyond the physical characteristics.

Activity 4: Students peg out a metre square of land. Before choosing their site students predict the type and number of insects they think they will find. Observe and list all the creatures that they observe. Compare their findings with other groups. Discuss which area supports the most creatures and discuss why they think this is so.



Student Worksheet



Activity 1,2 & 3

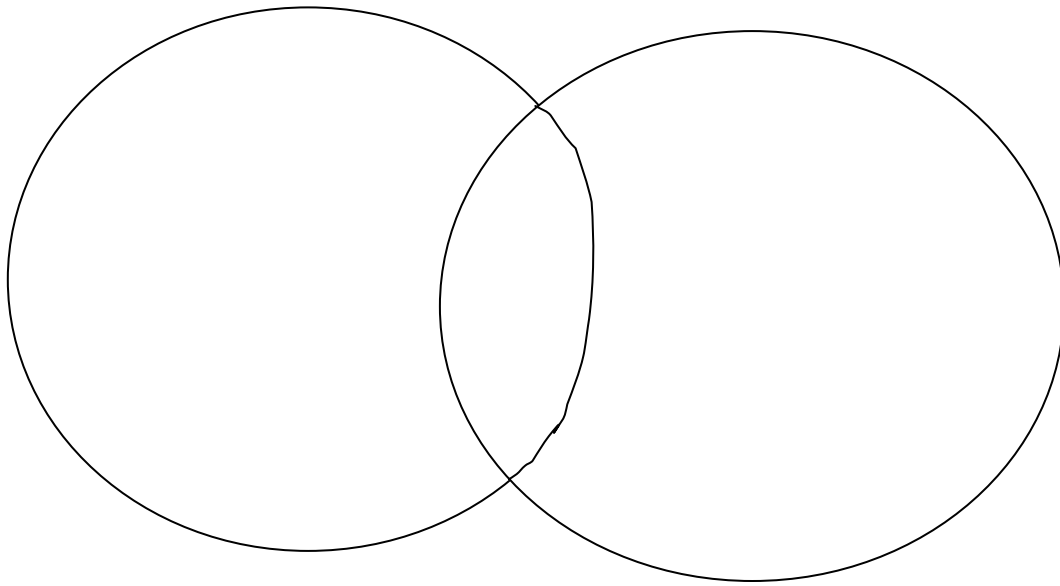
1. Mini beasts I found:

2. Use your own criteria to classify the mini beasts above.

3. Classify the mini beasts according to their habitat

Found on ground	Found under bark	Found under leaf	Found on branch	(Own choice)

4. List the similarities and differences using the Venn Diagrams below.



5. Predict what mini beasts you will find in your 1 square metre:

6. What did you actually find?

7. The best area to find mini beasts was:

8. This is the best area because:

What is a tick?

The Kangaroo Tick is an unusual animal. This activity will help you to find out more about this creature and will assist you in gaining some knowledge of this creature before your visit to the GDC. Read the information sheet and complete the activity – but before you do -

1. What do you know about the Kangaroo Tick?

2. To provide some structure for collecting and collating information about the ticks use the Structured Overview to categorise your information

Appearance	
Habitat	
Food	
Enemies	
Animals which are related	
Safety	
Reproduction	

3. Now decide how you would like to present your information:
 - Chart with illustrations and notes
 - Tape recording with illustrations
 - Picture book with illustrations
 - Diorama with labels
 - Model with notes
 - Booklet

You can now start to put your information together



Activities on Site

Nasty Creepy Crawlies

Task:

- To examine a mini beast (Kangaroo Tick) and take note of its characteristics
- To identify the stage of development of ticks and to discover the habitats at their different stages of development
- To use different methods to collect ticks and test for effective collection
- To test the effects of insect repellent on ticks

Materials:

Insect repellent, containers for collection of specimens, a pooter (mini beast collector), hand lens, digital camera, Life Cycle chart, worksheet

Procedure:

Task 1

1. Students take the pooter and collect ticks from pitfalls, kangaroo pads or by vegetation beating or simply by using yourself as a lure. Watch for them walking your way.
2. Observe the tick using the hand lens and locate its development on the Life Cycle chart
3. Sketch the tick on the grid provided and include all details showing special features of the tick
4. List any adaptations you have observed – big eyes, body shape etc and suggest reasons for this adaptation

Task 2

1. Working in groups the students can observe the ticks to obtain information using the hand lens. Use the worksheet to record as much information as they can.
 - How do ticks move?
 - What do you think they eat?
 - Where do they live?
 - What do you know about their life cycle?
 - Are they a native species?
 - Do they make a noise?
 - How do they protect themselves?
 - What part do they play in the food chain?

- Is the tick camouflaged?

Task 3

- Students use the insect repellent to create a barrier around the tick – 10cm square, 30 cm square and 100 cm square. Observe the mini beast to see if the repellent stops the tick from crossing the lines of repellent
- Use your worksheet to illustrate the path of the tick

Task 4

- Students predict at what distance the tick detects their presence and starts to move towards them. Record their prediction on the worksheet. Students test distances until the tick actually detects them.

Task 5 – Not for everyone!

- Place a tick on your hand and observe its behaviour. Record its walking paths. See where it goes. Make sure you remove it afterwards.

Task 6 - Optional

- Design yourself a tick race. A circular ring is the best with a central start circle and a finish circle. First to finish wins!

Ticks are seasonal. Most can be found in the autumn. If ticks are scarce then any other mini-beasts can be used as substitutes.

Digital Camera Imagery.

Take a digital camera photo or even a short video clip to illustrate your study. Put the digital imagery into a power point and send it back to school for further study.

6. Explain the reasons for any special adaptations you have noticed on the tick.

Task Two

1. Use your hand lens, Internet sites and the Life Cycle Chart to obtain information.
2. What do you think ticks eat?
3. Where do ticks live?
4. What can you tell me about the tick's life cycle?
5. Are ticks a native species?

6. Do they make a noise?

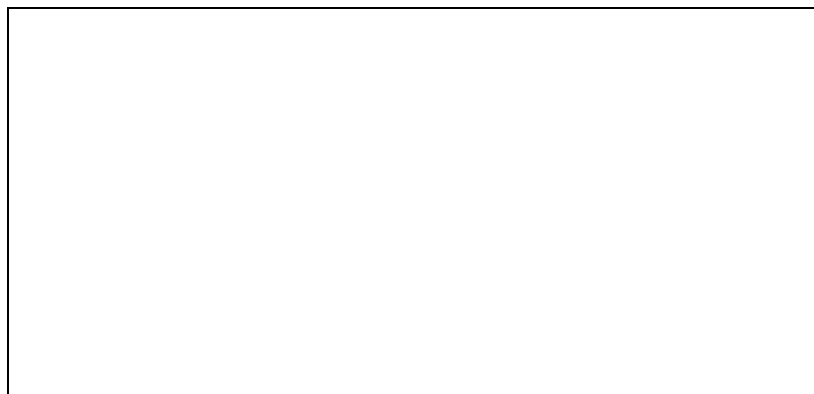
7. How do they protect themselves?

8. What part do they play in the food chain?

9. Is the tick camouflaged?

Task Three

1. This is a picture of the tick's path and the barrier of repellent I sprayed:



2. I think that the repellent caused the tick to:



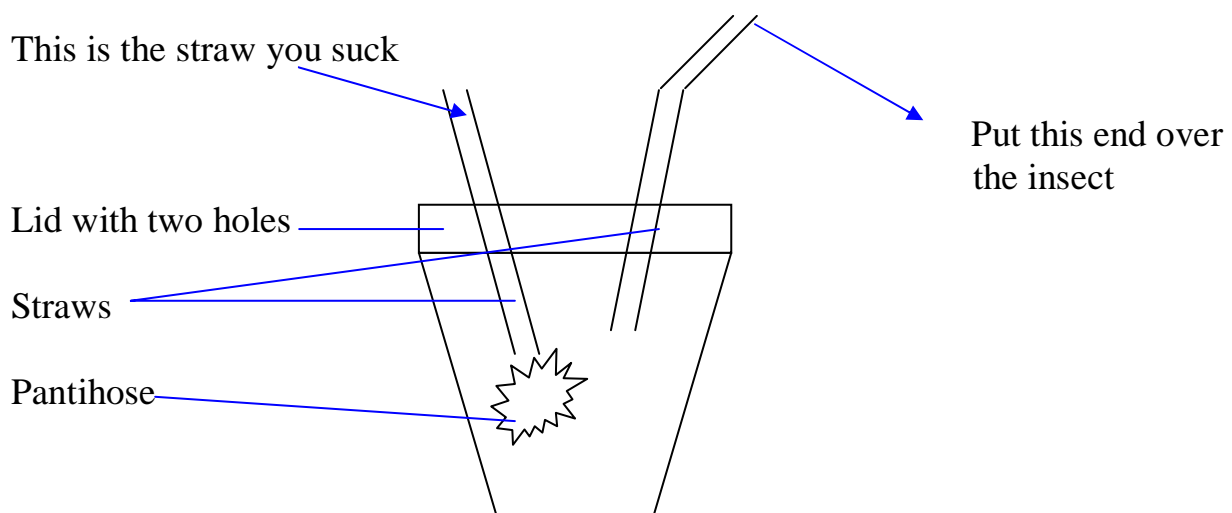
TEACHER USE

1. With your class discuss guidelines for the collection of insects and reasons for collection. Write a policy that will guide all members of your class in the collection of insects. Take into account:
 - purposes of collection
 - how many insects of any one species you should collect
 - consideration of the environment
 - responsibility for the collected specimens

2. Make a pooter (Insect Collector):

In order to catch your own insects for observation in class make your own pooter following the directions:

 - a) Get a small, clear jar with a lid, two fat flexible straws, some plasticine, a small piece of pantihose and some tape.
 - b) Punch two holes in the lid so the straws will fit through.
 - c) Stick the straws through the holes in the lid and seal them with plasticine. For your mouthpiece cut the outside end of one straw to about 6 cm. Tape the pantihose to the other end of this straw so the end is covered. Now screw the lid firmly in place.
 - d) To collect an insect, hold the long straw over the insect while you suck gently through the other straw. The insect will be drawn into the jar. See illustration for help.



3. Using the Internet, books and charts find as much information as you can about your selected insect.
 - a) Use the Graphic Overview to collect and collate your information. Use key words and place under the following headings to collect your information-: description, what it eats, where it is found, life cycle, protection, food chains
 - b) Present your information in any form you wish - power point, booklet, poster

Description	What it eats	Habitat	Life Cycle	Protection	Food Chain

4. Some websites for students to access that may be of use include:
 - [http:// Encarta.msn.com](http://Encarta.msn.com) (type tick or arachnid in the search fields)
 - <http://members.ozemail.com.au/~norbertf/anatomy.htm>
 - <http://www.ento.csiro.au/aicn/name-c/a-1421.html>
 - <http://medent.usyd.edu.au/fact/ticks.htm>