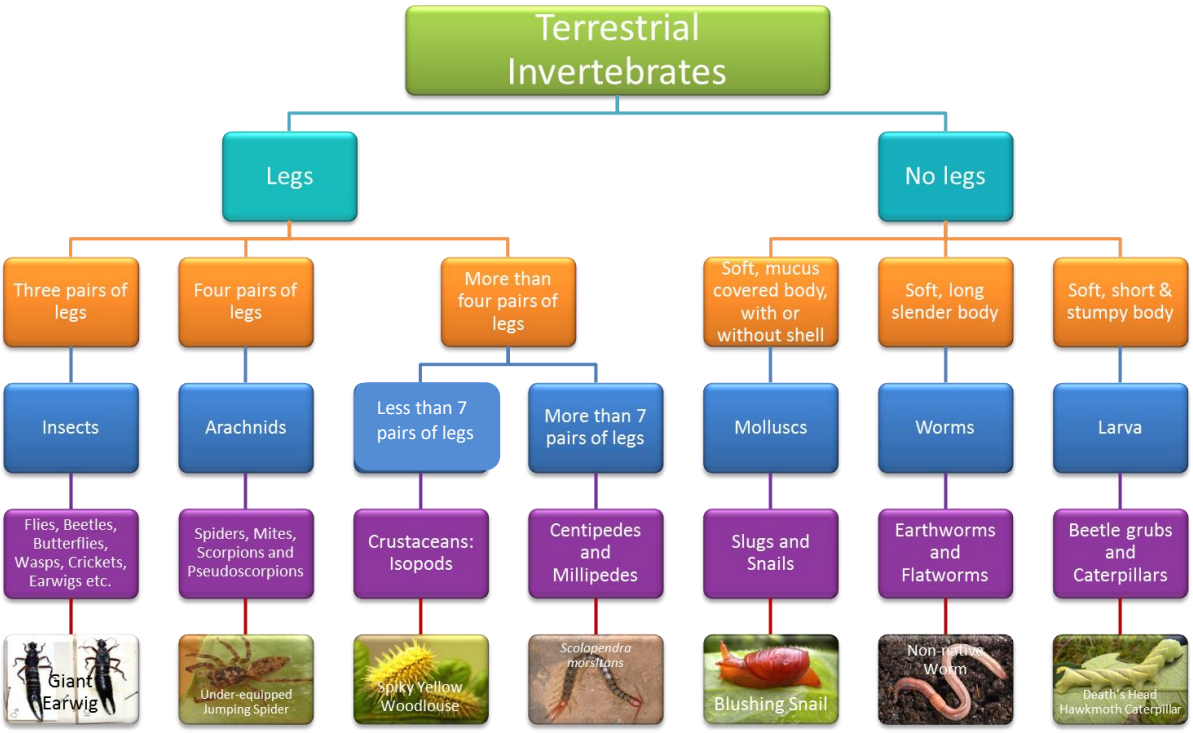
Classification

Simple classification

Use the generic key (in the Invertebrate education Pack) to identify the different groups.

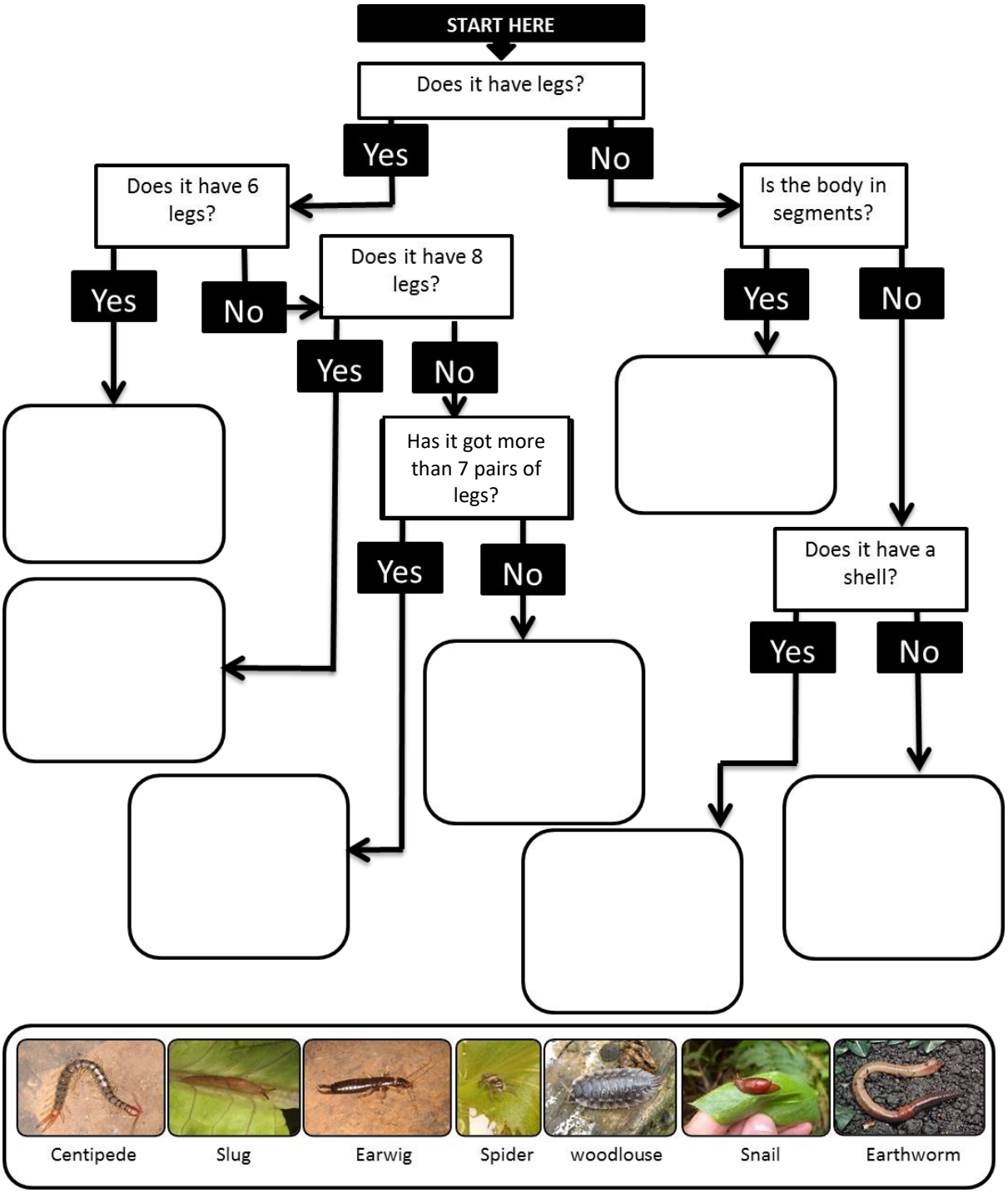


What does the terms endemic and invasive mean?

ENDEMIC – species that have evolved in one place and cannot be found anywhere else in the world e.g. on St Helena ancestry invertebrates arrived to the island naturally – usually a very long time ago – and evolved into the many different endemic species we see today for example the Spiky yellow woodlouse or the Blushing snail.

INVASIVE– an introduced species that becomes overpopulated and have a negative impact to its new environment for examples causing ecological, environmental, and/or economic damage like the common wasp. Although, some introduced species can be beneficial if deliberately introduced such as biocontrols.

Classification: Using Keys



Classification: Activity (1)

Can you identify the invertebrates in the samples given? Remember, look at the key features and use a hand lens if you need to. You could refer to the 'bug books' to help you identify the species.

You may want to identify the invertebrate to its family group, e.g. insect, and then to the species. A magnifying glass or a hand lens will help you to take a closer look and observe key features.

1. 	2. 	3. 
4. 	5. 	6. 

7. 	8. 	9. 
10. 	11. 	12. 

About The Common Wasp

The **Invasive Invertebrate Project** was designed to help endemic invertebrates recover from predatory species, like the Common wasp or European wasp (*Vespula vulgaris*). Part of the project is to find their **distribution and seasonality on the island.**

What we know:

- The Common wasp was first recorded in 2005 and has spread island-wide, becoming invasive by competing with and prey on our native and endemic invertebrates as well as having risk to human health if stung.
- They are generalist feeders (predating on all invertebrates), also feed on nectar for energy and collect protein and carbohydrate food for the larvae.
- The highest Common wasp population is located at Diana's Peak with food readily available with vegetation constantly throughout the year. Other nesting sites include Thompsons Wood, Fairyland, Scotland, Woody Ridge and Casons.
- The control method used for the trials is an active toxic bait containing Fipronil, the adult wasp carries the poison back to the nest and distributes it to the larvae and the queen; leading to the collapse of the colony.
- In 2019, SHG's ANRD (Agriculture &Natural Resources Department) and Public Health department treated 35 wasp nests, which decreased in 2021 to 22 nests treated.

IDENTIFICATION:

The **Common wasp or European wasp** can be identified by:

- black and yellow body with triangular markings on the abdomen
- black antennae and yellow legs
- black anchor like marking on their face
- workers are about the same size as the honeybee, and queen is slightly bigger but the wasp is less hairy

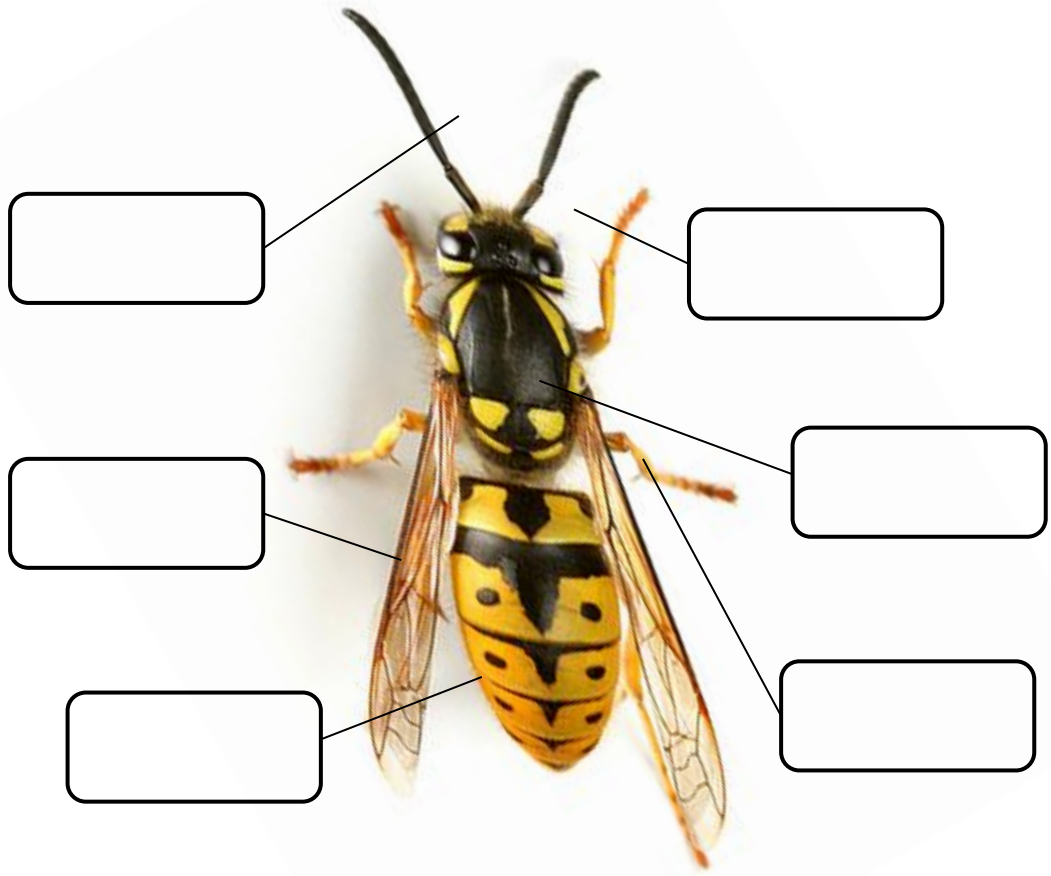
REPORT IT!

If you believe you have sighted a wasp nest, stay calm and do not interact with them as they could get aggressive and sting you. Contact the Trust Invertebrate Team for advice or treatment on 22224 or ANRD on 24724



Anatomy of The Common Wasp

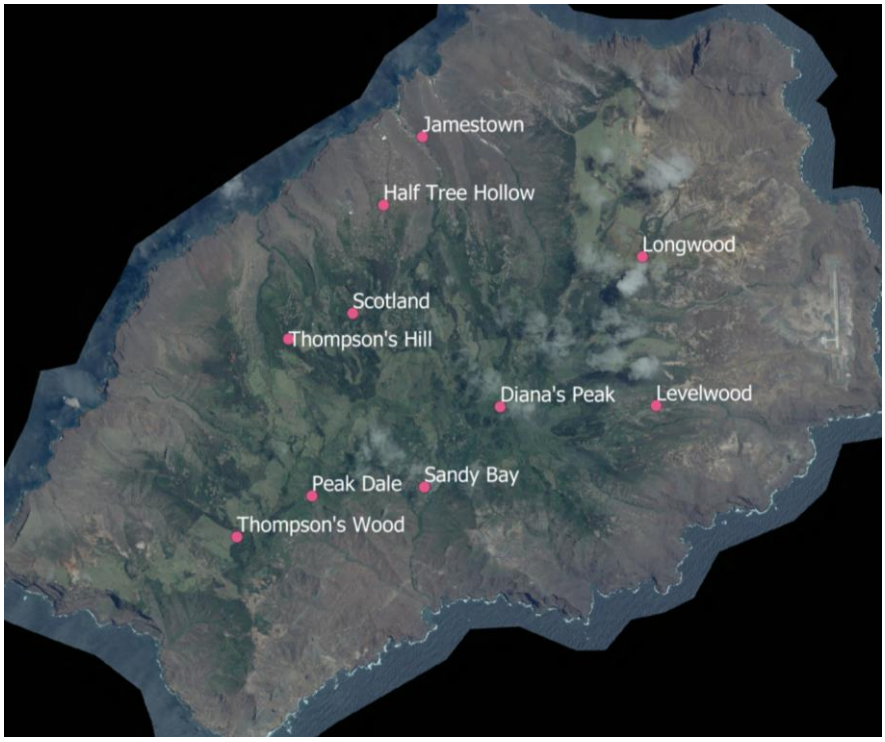
Use the word bank to fill in the diagram.



Word bank:

legs, head, thorax, abdomen, antennae, wings, jaws (mandibles)

Have you seen a wasp flying? Be a citizen scientist



Name (Optional):

Location:

Date/ month:

Other research projects

Invertebrate conservation projects are a good opportunity for other research questions:

1. Where did the data first come from? (History)
2. We know there are 455endemic species of invertebrates recorded, now find out how many native and non-native invasive species there are by using the species list. Make charts from your findings (Maths)
3. There are 320 insects, find out what kinds they are?
4. Research the causes of decreases and increases?
   - Habitat loss
   - Increase in predatory invertebrates
   - Habitat restoration
   - Climate change

5. From the species list, pick a name at random and research: It's taxonomy, Is it a carnivore, herbivores or omnivore?

6. What is the rarest species and when was it last seen?

Activity: How to build/make a wasp trap

You will need:

500ml water bottle
String
Scissors
Sellotape
Bottle
Monitoring sheet (given below)
A lure (anything sweet, e.g. beer, fruit scraps, meat scraps)

Method/How to:

			
1. Cut the top off the bottle	2. Make holes in the bottom piece on each side	3. Tie the ends of the string into each hole	4. Put the top upside down in the bottom half and Sellotape so it is secure

1. Pour your lure into the trap and hang in a tree and leave for 3 days to take it down
2. Remove the top and empty the lure and bugs into the bottle
3. Complete the monitoring sheet provided (approximation in fine)
4. Hand in your bottle of bugs and the monitoring sheet to the National Trust
5. We will return your bottle and another monitoring sheet

If you do identify a wasp around your area or in the trap, please be careful as they could sting you.

We are interested in what you have found! Please hand in your results to your teacher who will pass them on to the Bug Team at the National Trust.

Wasp trap monitoring sheet 

lure type used:		**Location:**	
Date put out:		**Weather:**	
Date collected:		**Weather:**	
Surveyors (name):		**Approx. number of wasps in trap:**	
Surrounding plants (if known):		**Flowering plants in area (if known):**	

.....

Wasp trap monitoring sheet 

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Date put out:		**Weather:**	
Date collected:		**Weather:**	
Surveyors (name):		**Approx. number of wasps in trap:**	
Surrounding plants (if known):		**Flowering plants in area (if known):**	

Day 2: Surveying methods

Collecting

Bug hunts are a great way to engage and understand the diverse range of invertebrates on St Helena - both for land (terrestrial) and aquatic habitats. There are many different ways to collect invertebrates; two of the methods are given here: sweep net collecting and pitfall trapping. The sweep net techniques issuitable to conduct a hunt in woodland or grassland habitats and pitfall trapping can be used anywhere.

		
Pooters allow you to safely look at bugs close up, for an even closer view you can use a handheld magnifying glass.	Looking under logs	Sweep nets are used for flying bugs.

Log and stone turning

There are many different types of invertebrates living under logs and stones and even in leaf litter. To collect these invertebrates, you can use a spoon to scoop up bigger species (for the younger children) or forceps (for the older students) and place them into magnifying pots, jars or the port a bug to have a better look. Always ensure to return the logs and stones back to how you found them, they are the bugs habitat (home).

Labelling samples

When observing invertebrates, it is important that the information gathered should be put on record, so that the knowledge base is built up that others have access to can be interpreted and used. This will make it easier to record them into the database and will help not to lose the collected information.

You have to write very neat and very small.

Species name
Location
Date
Collector

Vespula vulgaris (Common wasp)
PUBLIC GARDENS, JAMESTOWN
2020.04.27
COLL: S. BENJAMIN

Insect collecting back pack kit

You don’t need to go far to see invertebrates, bugs live everywhere your back garden is full of creatures and flowers are a great place to start. You don’t need a full kit to collect bugs, this kit is fun to carry wherever you go because you will find different bug in different habitats. Make sure to let the bugs go after observing them in the pooters or jars.

Resources:

Note book
Pencil
Insect net
Hand held magnifying glass
Tape measure or ruler
Camera
Collecting jars
Pooter
A guide to insects (if available)
Backpack

How to make

1) Pack the entire essentials into your backpack and don’t forget food and water.
2) Observe the bugs around you and make notes and drawings or take pictures of them.
3) Collect bugs with the net by sweeping it over grass or low branches; use the pooter to collect them from the net. Don’t try to suck large bugs up through the tube of the pooter, put them into the jars.
4) Use an identification guide books (if available) to help you identify your specimens.





Insect collecting resources (1)

Label the different part and write a brief description on how to use.

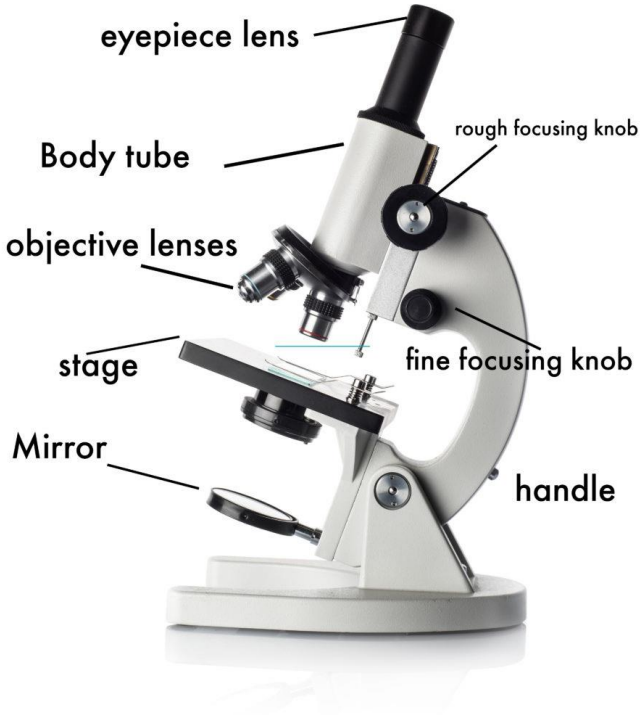
Pooter 	Sweep net 
Hand lens 	Folding magnifiers 

Insect collecting resources (2)

Label the different part and write a brief description on how to use.

USB microscope 	Specimen vials 
Bug tank 	Forceps 

Using a microscope



Microscopes help us see objects so small, that they would otherwise be unseen by the human eye. The word *microscope* is derived from the Greek words *micro* (small) and *scope* (look at), they are very delicate, so need to be treated carefully.

There are many worksheets that you could learn more about the different parts of the microscope. We just need to learn how to find our samples.



The specimen is placed in a slide, we use petri dish with the water (or preservative) using a syringe/pipette; forceps are used to locate and position the bug.

Finding the Specimen: Place the petri dish on the stand. Use the 'rough focus' lens to find the specimen. Once you have found the specimen, centre it by moving the slide very slowly.

⇧ To move toward the centre, you have to move the sample up.

⇦ If you want to move right you have to move the slide the opposite direction you want your specimen to go.

⇨ If you want to move left you have to move the slide the opposite direction you want your specimen to go.



Once you have found your specimen, you can begin to magnify it. Change to fine focus, you may have to attempt to find your specimen again.

Live specimens do not like light, so with less light, you are often more successful in finding the specimen.

Bug hunt Investigation

Complete the tables by ticking or writing where you found each invertebrate.

	 In the Sky	 On plants	 On bark	 In Soil	 Under stones
 Slugs					
 Bees					
 Ladybirds					
 Beetles					
 Woodlice					
 Caterpillars					
 Spiders					
 Ants					
 Millipedes					
 Earthworms					
 Centipedes					

About the Big-headed ant

The big-headed ant is a common household pest. They can be found in sugar bowls and even kettles!

Three major impacts observed:

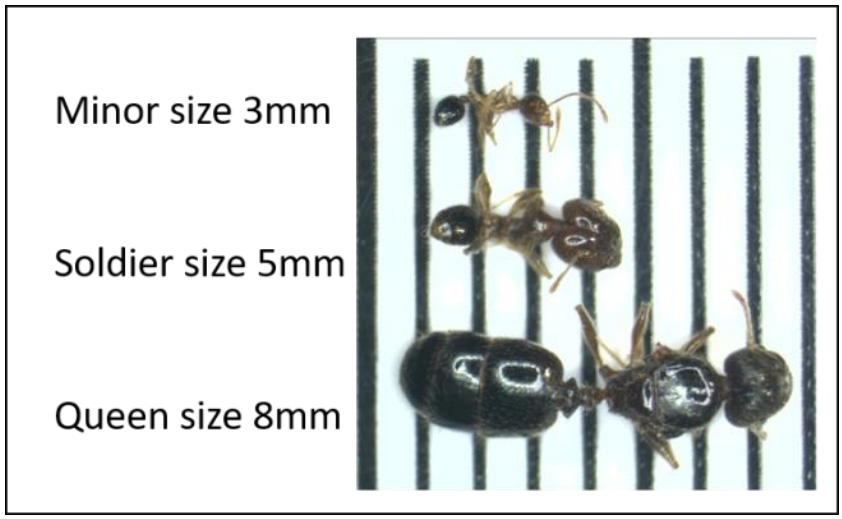
1. Despite their size, they are known to attack the endemic Wirebird eggs at the point of hatching.
2. They invade beehives to collect honey from the nest.
3. The Big-headed ant also impacts our endemic invertebrates, such as the False Gumwood leafhopper.

Did you know? These ants can interfere and destroy irrigation systems.

The Big-headed ant is more than likely in other areas than show on the map. Your data will help to plot additional locations to create a more complete map. Familiarise yourself with what the Big-headed ant looks like and if you see it, report it to the Invertebrate team.

Ants, how big are they?

There are three different sizes of the Big-headed ant, the minor, soldier and queen ants. Can you draw a line next to each of these species to show their actual size?



Big headed ant observation

Find a quiet spot where you might have observed ants, spend some time watching them. Do you think they are Big-headed Ants?

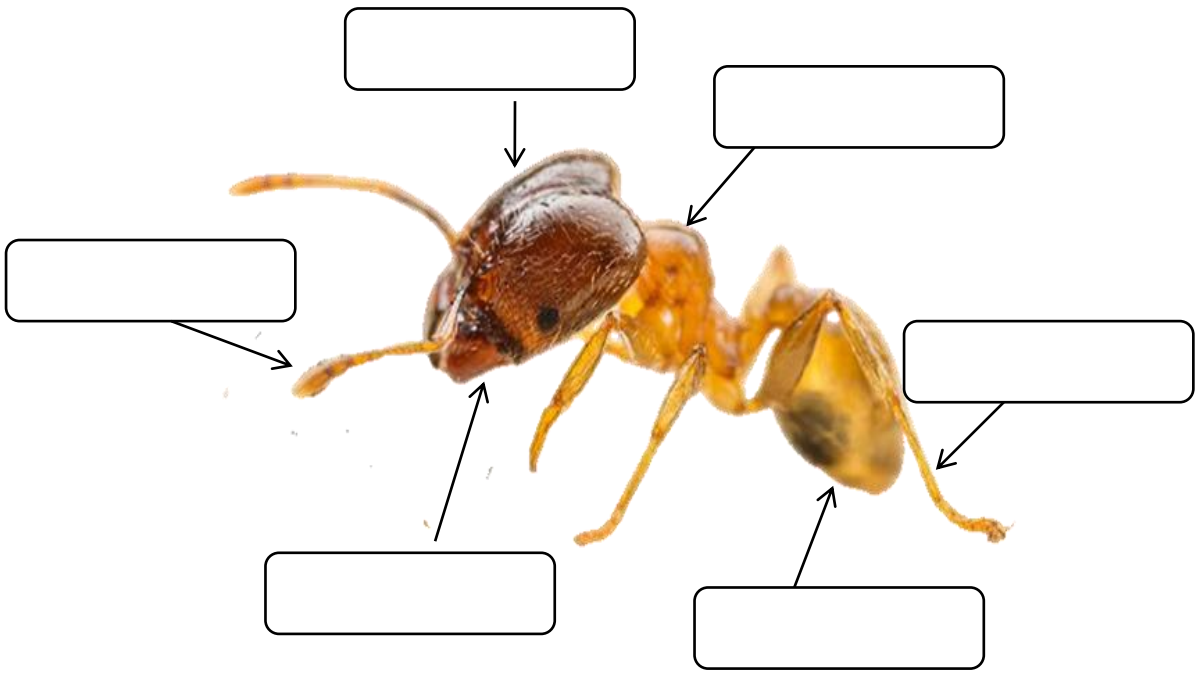
Big headed ant identification

From the photo, can you identify if these are minors, soldiers or the queen. Is there a queen in this photo?



Ant anatomy

Can you label the different parts of the ant?



Wordbank: jaws (mandibles), legs, head, thorax, abdomen, antennae

Ant Cafeteria Activity

Can you determine the food preferences for ants by designing an experiment where ants choose from several types of food?

Materials

- Assorted food items (5 different kinds)
- Dispensing container/bottle top
- Spoons/forceps- to dispense food items into small samples.
  (Note: With groups, you may want to ask your group to suggest food items to test on the day before the experiment. Good possibilities to start might include honey or a sugar solution, vegetable oil, tuna packed in oil, crackers or cookies, etc.)
- Magnifying glasses(optional).
- Data sheet group and one clipboard/group

How to:

1. Draw a sample cafeteria tray on a chart to show how the food items will be arranged (one food item/circle). You may choose to leave one circle empty or including only tap water as a "control."
2. Predict which food item will be preferred by the ants and WHY they think so. In a class setting you can compile the different predictions. How can preference for a particular food item be measured?
3. Locate sufficient number of ant colonies to carry out tests. Observe the ant colonies for a few minutes while you distribute the food items onto the cafeteria trays. Remember ants are small, so you'll only need to use a very small amount (about the size of a 5p).



4. Place the tray lengthwise alongside the entrance to the ant colony, about 5cm away. Be careful not to disturb the colony itself so they are interested in looking for food and not on home repairs.
5. Specify a time period for food preference observations (at least 30 minutes). It may take the ants 10-20 minutes to discover the new food source.

6. Tally results (report to the class), how does the actual results compare to the predictions? Can you propose reasons (nutritional or otherwise) for food preferences of the ants?
   Key questions:
   - Do ant food preferences differ for different species of ants?
   - Do ant food preferences differ with time of day, weather conditions, or season?
   - If many kinds of food were tested, can you begin to define the characteristics of foods that are attractive to your ants (e.g. sweet foods, salty foods, oily foods)?

Did you know? We did the cafeteria test with 14 different types of food in a circle to see what food the Big-headed Ant preferred. We found they are attracted to tin tuna, which we now use on all our sites.

