Buggin' Out
Camden Park EEC

Stage: 2	Syllabus: Science	Content Focus: Living World

Program Overview

An investigation into various "Minibeast" habitats around our centre, in search of the invertebrates that call them home. Using "real-world" sample collection equipment, students collect, identify and classify a range of insects and aquatic macroinvertebrates in a catch and release study.

Syllabus Outcomes

> ST2-4LW-S – Students compare features and characteristics of living and non-living things.

> ST2-1WS-S – Conduct scientific investigations, collect and summarise data and communicate using scientific representations.

Syllabus Inquiry Questions	Syllabus Content
 1. How can we group Living Things? 2. How are environments and living things interdependent?	*(Science)* Students: - collect data and identify patterns to group living things according to their external features, and distinguish them from non-living things - describe how living things depend on each other and the environment to survive

Equipment Checklist

1.Terrestrial Insect Collection	2.Dipnetting	3. Lab Session	Rotation
- Red short handle nets - Ziplock bags - Specimen jars - Shaker mats - Magnifying glasses	- Long handled dipnets - Buckets - Small glass specimen jars - Identification charts	-Binocular microscopes -Petri dishes -Identification charts and books -Glass specimens - Whiteboard/Table for recording data	- Session 1 and Session 2, with lunch in between - Tractor/wagon used for transporting students

Timetable

Time	Activity	
	Acknowledgement of Country /Housekeeping	
	"What is an Insect?" Power point and discussion Equipment check and collection technique demonstration	
	Rotations	
	Group 1	Group2
	Terrestrial insect collection	Macroinvertebrate collection/Dip netting Students travel by tractor/wagon
	Break	
	Agview Dam - Macro invertebrate collection/Dip netting Students travel by tractor/wagon	Terrestrial insect collection in area behind Office and Classroom
	Break	
	Lab Session Equipment demonstration Specimen study, classification and recording data	

Learning Activities

1. Arrival

- Welcome, Acknowledgement of Country and Introduction to day
- Lead discussion using PowerPoint that allows students to share what they know about insects, and what makes an insect.
- Outline activities as they relate to discussion and emphasise importance of collection and analysis of such data.
- Introduce entomological collection equipment and demonstrate best practice.

2.Terrestrial Specimen Collection Collection conducted in area behind classroom and office, with boundaries pointed out to students, as well as safety considerations of the site used. Working in pairs, students receive a Collection Kit, consisting of a net, specimen jars, a magnifying glass and Ziplock bags for specimen storage. Students conduct appropriate sample collection procedures, with the idea of sampling both grass and tree/shrub areas for various terrestrial insects. Captured samples are stored in Ziplock bags that identify the habitat the specimen was collected in. At the conclusion of the collection session, samples are placed in designated area in classroom for later study and identification. **Assessment** Recall of information: What is an insect? What is meant by classification and order? What are appropriate collection strategies that will ensure meaningful data?	**Learning intentions:** - Students successfully identify various habitats within a set area that they believe will yield different results -Students successfully collect a variety of specimens using real entomological equipment, supporting the collection of meaningful data **Success criteria:** -Each group has a collection of a variety of insects/harmless arachnids that represent the various habitats of the area and are stored in a way that identifies habitat origins. -Specimens are stored correctly in order to prevent harm.
3. Macroinvertebrate Collection - Using a tractor and wagon, students travel along the internal roads to one of the large dams on the property. -Correct dip netting technique and sample storage is demonstrated, with safety considerations of the site also discussed. - Different conditions around the waters edge are identified, with students given the opportunity to provide ideas on what impact vegetation in water may have on results. - Each team receives a Collection Kit containing dip nets, a bucket, identification chart and small specimen jars. -Students collect samples from the varying habitats around the waters edge, in open, bright sections and more shaded, weedy areas, in an attempt to gather a comprehensive cross section of life that exists in the dams on the property. - After 20minutes of collection, students then work at separating or "cutting out" individual species and carefully placing them into small specimen jars for observation. This will assist with identification. Ideally, students will leave the location with as many different species as they can manage. **Assessment** Recall of Information:	**Learning intentions:** -Students identify that quality of environment is directly related to a balance in biodiversity in the water -Students recognise different habitats in the water support different macroinvertebrates -Students manage to identify some of their specimens using identification charts **Success criteria:** - Each group has a collection of a variety of macroinvertebrates in small specimen jars that represent the various habitat conditions of the dam. - Each group is able to use correct terminology when discussing their specimens

What is a macroinvertebrate? How/Why does habitat impact upon specimens collected? How can our specimens be an indicator of water/environmental health? Practice: Teams followed collection techniques to successfully collect a variety of specimens from different aquatic habitats.	
4. Lab Session **-** Correct use of Binocular microscopes and petri dishes is demonstrated to assist students in their study and identification, whilst also emphasising techniques that can minimise harm to specimens. -Students then view magnified images of their specimens, noting features that will assist with identification and classification. This is done for both terrestrial insects and aquatic macroinvertebrates. -Specimens of particular interest placed under digital microscope and image represented on whiteboard for all students to view.	**Learning Intentions** -Identify specimens by correct name using characteristics of specimens to determine classification. **Success Criteria** -Students use correct terminology to justify classification, identifying body parts and other characteristics to assist in identification
5.Data Collection and Discussion **-** Students work with CPEEC staff to collate data through assisting with the completion of data tables representing the specimens and quantities they have gathered during the day. -Specimens will be referred to in discussions by their order name, and students will have the opportunity to discuss their results during the sharing session. -After all data collected, CPEEC staff take photographic evidence of data to add to archives. The importance of this type of data is once again emphasised to students, with a focus on insect life as an indicator of an Ecosystem in balance being presented. **Assessment** **Discussion Observation** Evidence of rich discussion, with students using scientific terminology in their dialogue and conclusions.	**Learning Intentions** -Participate in data sharing session using meta language and recognise habitat as one of the most influential factors driving species diversity and abundance. **Success Criteria** -Students have collected meaningful data that represents a real cross section of biodiversity of creatures around CPEEC and can participate in rich discussions around the results and their interpretation.