



Citizen Science – School Biodiversity Trail Lesson 3 – Years 7 & 8

Teacher Preparation

Learning intentions:

- Students are able to effectively research scientific and geographical issues.
- Students are able to communicate scientific and geographical information to their peers.

Success criteria: Students can...

- ... investigate which plants and animals found along their school biodiversity trail.
- ... observe, collect and record information for their field guides.
- ... represent research in a format suitable for a field guide.

TIP: CONSIDER MAKING THE LEARNING INTENTIONS AND SUCCESS CRITERIA VISIBLE TO STUDENTS THROUGHOUT THIS LESSON.

Teacher content information: [ClimateWatch](#) is a citizen science initiative developed by [Earthwatch](#) that seeks to educate people from across Australia on the issue of climate change and empower them to contribute to solutions. Through its ClimateWatch program, Earthwatch works with educators to help them bring their experiences back to the classroom to foster new generations of environmental leaders. By incorporating ClimateWatch into curriculum, students and teachers will



become more knowledgeable about climate change and its impacts, and inspired to contribute to scientific and environmental efforts in their daily lives or future career path. These actions could range from community efforts to protect biodiversity through to encouraging others to be more involved in such activities. Increasing appreciation for the environment and scientific literacy in communities will empower long-term climate action as well as the development of adaptation and mitigation strategies.

Hot tips:

- This lesson is the fourth lesson in a unit about creating a school biodiversity trail. The full unit of lessons can be found here: [Citizen Science - Geography and Science - Years 7 & 8](#).
- This unit has been designed to be taught in either Geography or Science. To further enhance the learnings from this unit for students, consider teaching this as a cross-curricula unit of work.
- In this unit students create a 'school biodiversity trail' inspired by Earthwatch's [ClimateWatch Trails](#) for use now and in the future. Once the trail is established, future cohorts of students can complete this lesson (Lesson 1) and participate in a single biodiversity survey along the trail in a single lesson. If you are interested in furthering this process and establishing an official ClimateWatch Trail, visit the Create a ClimateWatch Trail page. To discuss the use of ClimateWatch Trails data in classrooms, feel free to contact climatewatch@earthwatch.org.au

Teaching Sequence

5 minutes – Part A: Activating Prior Knowledge

30 minutes – Part B: What Information is Already Out There?

60+ minutes – Part C: Identifying Species (optional)

30+ minutes – Part D: Creating Field Guides

15+ minutes – Reflection



Work through this resource material in the following sequence:

Introduction: Remind your class that each student should take responsibility for collecting evidence and artefacts for the project, including drafts of everything they create as part of the project, as well as any records of opportunities they pursue (either successfully or unsuccessfully).

Part A: Activating Prior Knowledge

Step 1. If your class has completed any of the prior lessons in this unit, invite them to refresh their knowledge of phenology and share what they have already achieved in the creation of their school biodiversity trail, for example:

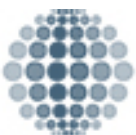
- What is phenology?
- Where is your school biodiversity trail?
- What are the features of the trail?
- How would others use your trail?
- What have they already learned about the trail?
- What plants and animals have they already identified along their trail?
- How might climate change impact the species along their trail?

You may choose to share a few of the class' school biodiversity trail maps from the [School Biodiversity Trail Lesson 2](#), to further prompt discussion.

Once complete, explain to students that in this lesson they will be finding out about the plants, animals and habitats along their school biodiversity trail.

Part B: What Information is Already Out There?

Step 1. Explain to students that an important part of creating a school biodiversity trail is finding out what information already exists about the area. Many bushland areas have management plans created by local or





state government departments, or have community groups that help to look after these areas. Local councils may also have information about common plants and animals in your area, which could help with identification.

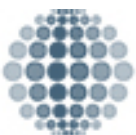
In the case of your school being the location of the trail, you should have a grounds person who will have information about what has been planted where and why. Consider inviting this person into your classroom and having your class design and conduct a class interview with them.

Invite students to work in the pairs or groups they created their school biodiversity trails in to conduct online research about which groups or agencies are already working in or around your trail. Some of these agencies will be working with the plants and animals that can be found at your site and may have information that will be useful to the identification of species and creation of field guides.

Students can use a digital curation tool such as [Storify](#), [Diigo](#) or [Scoopit](#), to collect their resources or may simply open a new document and hyperlink websites.

Suggested contact points:

- Local council – they may also have information about community groups
- State government – department of environment or parks
- Local catchment agencies
- [The Atlas of Living Australia](#)
- Research online, remembering the [Search Strategies for Googling](#).





Students can use the following questions to guide their research (also available on the Student Worksheet):

- What plants and animals are common to our area (including indigenous and introduced)?
- Are any of these plants or animals rare or endangered?
- Is any work being done to improve the biodiversity in the area where our trail is? How might this affect our trail?

TIP: ONCE YOU HAVE ESTABLISHED YOUR TRAIL, CONSIDER CONTACTING ANY GROUPS OR AGENCIES YOU IDENTIFIED TO LET THEM KNOW ABOUT YOUR TRAIL, AND INVITE THEM TO USE THE TRAIL.

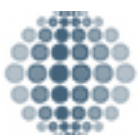
Step 2. Explain to your class that they will be cross referencing their species information they just found with the [ClimateWatch species](#). The aim of this activity is to find at least 5 plant and 5 animal species that others can use the ClimateWatch app to site when they visit your school biodiversity trail.

If you choose to visit your site again, in Part C invite your class to collect and print images of their 10 species.

Part C: Identifying Species (optional)

Step 1. In this part of the lesson, students will be heading outdoors to see further research the species on their school biodiversity trails. Remind your class about the concept of 'treading lightly'. Treading lightly means that you try your best to leave a natural environment in the same condition as you found it.

Following this, review your outdoor learning safety procedure. For example, you could adapt the following to the site you are visiting:





SUGGESTED SAFETY PROCEDURES FOR OUTDOOR LEARNING

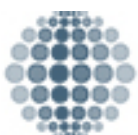
- * SHOW STUDENTS PICTURES OF POTENTIALLY DANGEROUS ANIMALS AND PLANTS.
- * IDENTIFY THE PRESENT SEASON AND WHAT RISKS ARE ASSOCIATED WITH THIS SEASON.
- * STAY CLOSE TO THE TEACHER (E.G. WITHIN EYE SIGHT).
- * WORK IN PAIRS OR SMALL GROUPS.
- * STICK TO THE TRACK AND LISTEN TO WARNINGS ABOUT OVERHANGING BRANCHES, SLIPPERY PARTS OF THE TRACK ETC.
- * BE CAREFUL WHAT YOU PICK UP AND WHERE YOU PUT YOUR HANDS (I.E. NEVER PUT YOUR HANDS ANYWHERE YOU HAVEN'T CHECKED WITH YOUR EYES).
- * WEAR STURDY BOOTS OR SHOES, AND ALWAYS WEAR A HAT AND SUNSCREEN.

Prepare to leave for your school biodiversity trail by having students collect their maps (created in lesson 2 of this unit), images of biodiversity along their trail, notebooks, digital cameras/devices capable of taking photos (optional) and devices with the ClimateWatch app loaded (optional).

Hot tip: Students and teachers wishing to repeat this activity over subsequent years are encouraged to contact the [ClimateWatch Program Manager](#) to arrange to have their school added to ClimateWatch as an organisation and add class groups each year.

Step 2. Once you arrive at your site explain to the class that they will have the chance to identify and record some of the plants and animals along their trails.

Invite students to walk their trails in their groups and either photograph or sketch some of the species that they site. These photos or sketches can be brought back to the classroom to be identified and used in their own field guides. To help connect students to the environmental condition driving species behaviour, encourage the class to take note of



the conditions around them – such as the weather – while taking photos.

TIP: THE CLIMATEWATCH APP MAY BE USEFUL IN IDENTIFYING SPECIES.

If you are using the ClimateWatch app during this visit, nominate a single student per group or a class representative to enter the species information. This will ensure that your class does not enter multiple observations of the same individual plant or animal species.

Part D: Creating Field Guides

Step 1. Back in your class, students will be creating field guides for the species they have selected/identified along the trail. Explain to students that a field guide is used to help people using their trails to identify the species before recording them using the ClimateWatch app. You could project the [Animals Field Guide Example](#), [Plant Field Guide Example](#) or one of the field guides provided on the [ClimateWatch Species page](#) (open the page on the species you are after and click 'download species guide') to help students picture what a good field guide looks like.

Step 2. Have your students revisit their species lists. If you chose to run Part C of this lesson, invite the class to research the species that they photographed or sketched using the internet and any field guides you may have access to.

NOTE: PLEASE BE AWARE THAT DIFFERENT ANIMALS ARE EASIER TO OBSERVE AT DIFFERENT TIMES OF THE DAY SO MULTIPLE TRIPS TO YOUR TRAIL SITE MIGHT BE REQUIRED.

If your class has selected/identified numerous plants along your trail, you may want to reduce the number of plants included in your field



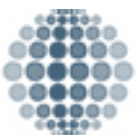
guide to between five and ten common, significant or frequently observed species. For example, if you have a dense population of a particular plant, you could include these. Or, if you have some large trees, you could include these. Or, if you have some flowering plants that appear to be particularly attractive to birds and insects, you could include these. Or, if you have a lake or watercourse that could attract species such as frogs and waterbirds, you could include these.

The information you provide in your field guides *for plants* should include (also available on the Student Worksheet):

- Name – Common and scientific (to Genus)
- A picture showing colour, leaf shape and flower shape and colour (these could be drawings by students, or photos taken from the trail – remind students that photos from the Internet are often subject to copyright laws)
- What types of habitats this species prefers (e.g. grassland, woodland, wetland, coastal, etc.)
- Flowering times
- Fruit, nuts or seeds
- Distribution

The information you provide in your field guides *for animals* should include (also included on the Student Worksheet):

- Name – Common and scientific (to Genus)
- A picture showing the animal with labels to help describe identifying features (these could be drawings by students, or photos taken from the trail – remind students that photos from the Internet are often subject to copyright laws)
- What types of habitats this species prefers (e.g. grassland, woodland, wetland, coastal, etc.)
- Behaviour and call (if relevant)
- Breeding times
- Distribution





Students will need to undertake research online or in guides/books to find this information.

TIP: IN TERMS OF THE INFORMATION PROVIDED IN YOUR FIELD GUIDES, USE THE CLIMATEWATCH APP TO GUIDE STUDENTS WITH THE VOLUME AND CONTENT THAT COULD BE PROVIDED. THE APP MAY ALSO HAVE INFORMATION THAT STUDENTS CAN USE IN THEIR FIELD GUIDES.

Step 3. Once groups have identified and collected the information on their species, invite them to begin designing the layout of their guides. Project the [Plant Field Guide Template](#) and the [Animal Field Guide Template](#), explaining that students can use this as a basis for their guides, or instead they could completely create their own.

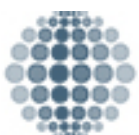
Step 4. Invite the class to begin designing their field guides, being sure to collect a digital version of each design for yourself once they are complete.

Reflection

Step 1. Allow students time to record their contributions and ideas in their workbooks, and to follow up on any further research required that stemmed from visiting their site and creating their trail (e.g. actions they could take to improve habitat areas along their site, information about seasonal behaviours of animals, how the site would respond to bushfires, etc.).

Step 2. Invite students to work independently and answer the following questions (also available on the Student Worksheet):

- I used to think...
- Now I think...





Students can then add these questions and their responses to their workbooks.

Teacher Reflection

TAKE THIS OPPORTUNITY TO REFLECT ON YOUR OWN TEACHING

- * WHAT DID YOU LEARN ABOUT YOUR TEACHING TODAY?
- * WHAT WORKED WELL?
- * WHAT DIDN'T WORK SO WELL?
- * WHAT WOULD YOU SHARE?
- * WHERE TO NEXT?
- * HOW ARE YOU GOING TO GET THERE?

Note: Cool Australia and Earthwatch have also partnered to create citizen science units of work for [maths](#) and [science](#). To further enhance students' learning, consider teaming up with teachers in these complementary faculties to run a cross-curricular project on phenology and citizen science.

