

THROUGH THE EYES OF A SCIENTIST

Stage 2 and 3: Science & Technology

ST2-1WS, ST2-4LW-S, ST2-2DP-T, ST3-1WS, ST3-4LW-S, ST3-2DP-T



Curiosity drives scientific discovery by bringing learners to knowledge. Curiosity is about exploring and interacting with ones surroundings. Through applying the process of Working Scientifically, students will use scientific inquiry to develop an understanding of the world around them and the importance of scientific evidence. Taronga Zoo's immersive classrooms are the perfect environment to ignite curiosity and scientific investigation skills.

OUTLINE

AT SCHOOL

Tune in your students' senses to learn about their environment and begin scientific investigation. Explore sound maps, data recording techniques and technology that supports this process and prepares students to be a scientist at the Zoo.

AT THE ZOO

Students can choose their favorite animal at the zoo to carry out an Ethogram. Use this data to form an inquiry questions they would like to explore further.

ZOO WORK SHOP

Curiosity drives scientific discovery by bringing learners to knowledge. Students will become a scientist, exploring the scientific process through our amazing immersive classroom habitats. They will conduct experiments observing and learning about animal behaviours and characteristics help them survive in the wild.

BACK AT SCHOOL

Review science skills applied at the zoo by considering the animals that live around their school. Choose one animal and consolidate their observation, data collecting and scientific questioning skills. Use these observations to plan and conduct a scientific investigation.

Share their investigation and results with their budding scientists at school



AT SCHOOL - BEFORE THE ZOO

Learn how to use your senses to learn about your environment

PREPARING TO BE A SCIENTIST

WHAT IS THE SCIENTIFIC METHOD?

The scientific method is a process for experimentation that is used to explore observations and answer questions, it comprises of five main steps

1. Observation
2. Questioning
3. Forming a hypothesis
4. Experimenting
5. Data analysis and conclusion

The foundation of being a successful scientific investigator are using your powerful senses as an observation tool. We often observe with our eyes, but our other senses help to gain a deeper understanding of the world around us and find connections. Complete these activities at school to hone your non-visual senses.

SOUND MAP

Use the scaffold found over the page, to complete a Sound Map in your local environment or school (or click [HERE](#) to download a copy). Once you have positioned yourself, close your eyes and listen. Record all of the sounds that you hear and where they are coming from on your map, relative to your position. Faint sounds could be further away, and loud noises can be drawn larger. Consider what is making each sound and why. Are these sounds natural? What clues do they tell us about this environment and its inhabitants?

SOUND CAPTURE

Using a device such as iPad, the voice recording feature can be a powerful tool in capturing and analyzing sounds within environments. Your students can use a device with this function to record a short sound clip from a space near you. Students can then analyze and record their findings. This can also be a powerful stimulus for writing tasks, poetry and art.

YOUR STUDENTS CAN BE A SCIENTIST IN ACTION WITH THESE DIGITAL RESOURCES!

Get Involved with FrogID



[Frog ID](#) is an amazing app that is all about using scientific investigation skills to help identify and learn more about one of the most incredible animals in your local ecosystems: FROGS! Using Frog ID actually helps support others in their quest to protect these amazing amphibians.

Out in the field



Download the FrogID app, create a FrogID account, find, record and help validate your frog calls.

[Discover & Download](#)

Back at your desk



Begin or join a local group. Become an Audio DNA expert - help validate frog recordings from the field.

[Learn More](#)

iNaturalist

<https://www.inaturalist.org/>

[iNaturalist](#) is a global community conservation app that uses people power to identify plants and animals in environments all over the world. Users can see what other budding scientists have observed in your local environment, or contribute to the wealth of ecological knowledge of your local areas through your own discoveries and photographs.



SOUND MAP

Our senses are our most powerful scientific observation tool. We often rely heavily on our sight to observe visual characteristics of the world around us, but now we are honing in our auditory senses, to close our eyes and *listen*. Use the Sound Map below to record the sounds that you can hear in your environment. Draw where the sounds are coming from, how loud or faint they are, and what you think might be making that sound.



AT THE ZOO

A guided (or self-guided) exploration)

WHAT IS AN ETHOGRAM?

An ethogram is a chart which displays a list of possible behaviors as well as a timeline. Using this tool, researchers can quickly document the minute-by-minute actions and behaviors of an observation subject. Researchers also rely on sketching and drawing or photography to supplement their notes. Practicing backyard animal observations is a great way to introduce kids to conservation science. This activity promotes critical thinking, math, curiosity, creativity and most of all, patience!

ETHOGRAM OF YOUR FAVORITE ZOO ANIMAL

(self guided)

Your goal today is to learn something about the behaviour of your favourite animal in the zoo. by formulating a question and collecting data to answer that question.

1. Walk around and appreciate the variety of animals in the zoo.
2. Working with a partner, choose an animal, or group of animals, that you will observe for the next 5 minutes. Keep in mind that large charismatic animals are often very less active to watch, birds and small mammals are often more active.
3. Watch everything they do, where they move to, who they interact with, whether they like to be in high places or low places.
4. Formulate a question with your partner that you would like to answer e.g. What is the most common activity Chimpanzees like to do ?
5. Using the ethogram template provided, complete the details about your animal at the top and allocate roles. Who will be the time keeper, who will record, both will need to observe.
6. With your partner begin collecting and recording data in your 5 minute ethogram.
7. Analyse your data to assess whether you can answer your scientific question.
8. Did the data collected answer your scientific question?
9. As a scientist what would be your next step?



CONNECT (self guided)

Explore the Zoo to find your favorite animal, make it your goal to formulate a scientific question and collect data to answer that question. Use the instructions and Ethogram template provided to guide your investigation.

CONNECT AND UNDERSTAND (workshop)

Curiosity brings learners to knowledge! In this workshop students will channel their curiosity and use their senses for effective scientific animal observations and data collection. Their observations will generate questions that then form the basis for formulating hypotheses, making predications and drawing valid conclusions that are evidence-based. Students will work authentically like a scientist!

ACT (workshop)

Discover your inner scientist! Use all your senses to carry out fieldwork in the immersive classroom habitats.. Through observing animals students will make predictions, collect data and be enticed into the wonder of the natural world around them.

FIVE MINUTE ETHOGRAM

In the table below record the most demonstrated behaviour using tallies.

Date _____ Location _____ Start Time _____ End Time _____

Species name _____

Description of animal _____

Description of habitat _____

Minutes/ seconds	Resting/ sleeping	Eating/ drinking	Grooming	Travelling	Hunting/ Gathering (food)	Social Interaction	Not Visible
0:00:00							
0:00:30							
0:01:00							
0:01:30							
0:02:00							
0:02:30							
0:03:00							
0:03:30							
0:04:00							
0:04:30							
0:05:00							

Prediction: _____ **i.e.** Can you predict what Chimpanzees spend most of their time doing?

Question: _____ **E.g.** How much time do chimpanzees spend resting and sleeping?

BACK AT SCHOOL - AFTER THE ZOO

INVESTIGATE BIODIVERSITY IN YOUR SCHOOL BY TRYING A TREE SHAKE INVESTIGATION!

TREE SHAKE INSTRUCTIONS

Equipment:

gloves, white sheet, plastic sheet, collection jars (preferably magnified), paint brush or stick (to pick up insects with), a piece of paper and a pencil, something to take photos with (optional)

Method:

1. Put on your gloves
2. Lay out the white sheet under the branches of a bush or low tree
3. Shake the branches of the tree to dislodge mini beasts
4. Observe what insects have fallen on your sheet and choose 1 to place in your magnifying jar (using the paintbrush)
5. Use your observation skills learnt at the Zoo to (don't forget to harness all your senses) begin recording what you have noticed about this animal.
6. Write 1 scientific question you would like to explore further about this animal.
7. Write 1 predication about this animal
8. Take a photo of your animal
9. Return your animal to the bush and pack up all your equipment



ACTIVITY



<https://www.ranger.vision/australasia>

Ranger Vision is one of many free exciting resources developed as part of the WilderQuest program by the NSW National Parks and Wildlife Service. It includes curriculum linked programs for primary students and teachers.

TAKE ACTION!

CREATE A SCHOOL HABITAT GARDEN

All you need is

1. A collection of native plants, ground cover, small shrubs and 1 or 2 larger plants (ask your local council for help providing these).
2. A birdbath, a small dish or a little pond to provide a water source for native wildlife that live in your school (don't forget to keep it topped up).



3. A nest box in one of your schools biggest, strongest trees!