TURTLES IN SCHOOLS

TERM 2 WORKBOOK

1 Million Turtles

COMMUNITY CONSERVATION PROGRAM

Teaching Resource

TEACHING RESOURCE

Welcome to the teaching resource document for the Turtles in Schools Program.

To aid your teaching experience, we have provided:

1. Background information, activities and worksheets for each lesson - all of which align with the content provided to your students in the student workbook.
2. An overview of how each lesson addresses the Australian Curriculum. This is to ensure our content integrates seamlessly with your existing educational framework.
3. Answers to assessments and student worksheets.
4. Teaching slides for each lesson, which are available to download from the 1 Million Turtles Community Conservation website.

We have endeavoured to cater to each learning style in the lessons. However please feel free to adapt and customise the activities to best suit the needs and dynamics of your class.

If you have any feedback or ideas to enhance the teaching process for yourself or your colleagues, we encourage you to share them with us at **1millionturtles@1millionturtles.com** Your input helps us refine and improve the Turtles in Schools Program.

Thank you for your dedication and commitment to nurturing young minds through the Turtles in Schools Program.

Photo credit: Dr James Van Dyke

TURTLES IN SCHOOLS

Produced by the
1 Million Turtles Community
Conservation Program
and funded by
The Foundation for National
Parks and Wildlife.

In the pages that follow, you will find a comprehensive set of lesson plans. Our initiative is not just about imparting knowledge but fostering a deep connection between students and their natural environment and instilling a sense of responsibility and awareness of freshwater turtles and their conservation.

As we embark on this educational venture, we extend our gratitude to educators, students, and all those who champion the cause of conservation. The Turtles in Schools Program is not just a curriculum; it is a movement to inspire the next generation of environmental custodians.

Thank you,

1 Million Turtles Community Conservation Program

Test your Understanding

Read the following passage and answer the questions on the following page:

Citizen science involves members of the public actively contributing to scientific research projects. Through citizen science initiatives, individuals from diverse backgrounds, ages, and locations collaborate with scientists to collect, analyse, and interpret data across various fields of study. By engaging in hands-on activities such as data collection, observation, and experimentation, citizen scientists play a vital role in advancing scientific knowledge and addressing complex challenges facing society.

Citizen science projects encompass a wide range of topics, including biodiversity monitoring and environmental conservation. Participants may contribute to projects by recording wildlife sightings or monitoring water quality. The benefits of citizen science extend beyond scientific research, fostering public engagement with science, promoting environmental stewardship, and empowering communities to address local issues. Citizen science also enhances scientific literacy, critical thinking skills, and collaboration among participants. It provides opportunities for lifelong learning and meaningful contributions to the environment.

Test your Understanding

Questions:

Q1: What is citizen science?

Citizen science involves members of the public actively contributing to scientific research projects by collecting, analysing, and interpreting data across various fields of study, in collaboration with scientists.

Q2: What activities might citizen scientists be involved in?

Citizen scientists might be involved in hands-on activities such as data collection, observation, and experimentation. They may contribute to projects by recording wildlife sightings, monitoring water quality, conducting biodiversity surveys, or participating in environmental conservation efforts.

Q3: What are the benefits of citizen science?

The benefits of citizen science include fostering public engagement with science, promoting environmental stewardship, empowering communities to address local issues, enhancing scientific literacy and critical thinking skills among participants, and providing opportunities for lifelong learning and meaningful contributions to the environment.

Test your Knowledge

Questions:

Q1: Which of the following are threats to freshwater turtles?
(a) Invasive species, urbanisation, boat strikes
(b) Disease, habitat destruction, climate change
(c) Road kill, hybridisation, construction of dams
(d) All of the above.

Q2: Which of the following are the most prevalent predator of freshwater turtle eggs?
(a) Ravens
(b) European red foxes
(c) Echidna
(d) Water rat

Q3: Which of the following lists the conservation statuses in order?
(a) Critically endangered, vulnerable, near threatened, endangered
(b) Vulnerable, near threatened, critically endangered, endangered
(c) Critically endangered, endangered, vulnerable, near threatened
(d) Endangered, Critically endangered, vulnerable, near threatened

Q4: Which of the following is a benefit of citizen science? Circle all that apply.
(a) Increase in public awareness
(b) Increase in data collection
(c) Feeling of empowerment of participants
(d) Increase in participant knowledge

Q5: How does citizen science contribute to the study of freshwater turtle populations?
(a) Collecting data on turtle sightings and locations.
(b) Helping monitor nesting sites
(c) Raising awareness about freshwater turtle conservation.
(d) All of the above.

Test your Knowledge

Questions:

Q6: Explain how human activities can impact freshwater turtle populations.

Human activities can impact freshwater turtle populations in various ways. For example, habitat destruction and alteration due to urban development, agriculture, and infrastructure projects can result in a loss of aquatic habitat and nesting sites. Pollution from runoff and chemical contaminants can degrade water quality and affect the availability of food sources, turtle health and dive duration in some species. Additionally, direct threats such as vehicle strikes and incidental capture in fishing gear can lead to morbidity and mortality.

Q7: Why is it important to involve citizen scientists in scientific research?

1. Allows for the collection of data over larger geographic areas and longer time periods.
2. Aids scientists in collecting data that would otherwise be difficult or impossible for scientists to collect on their own.
3. Fosters public engagement with science, promotes environmental stewardship, and empowers communities to address local environmental issues.

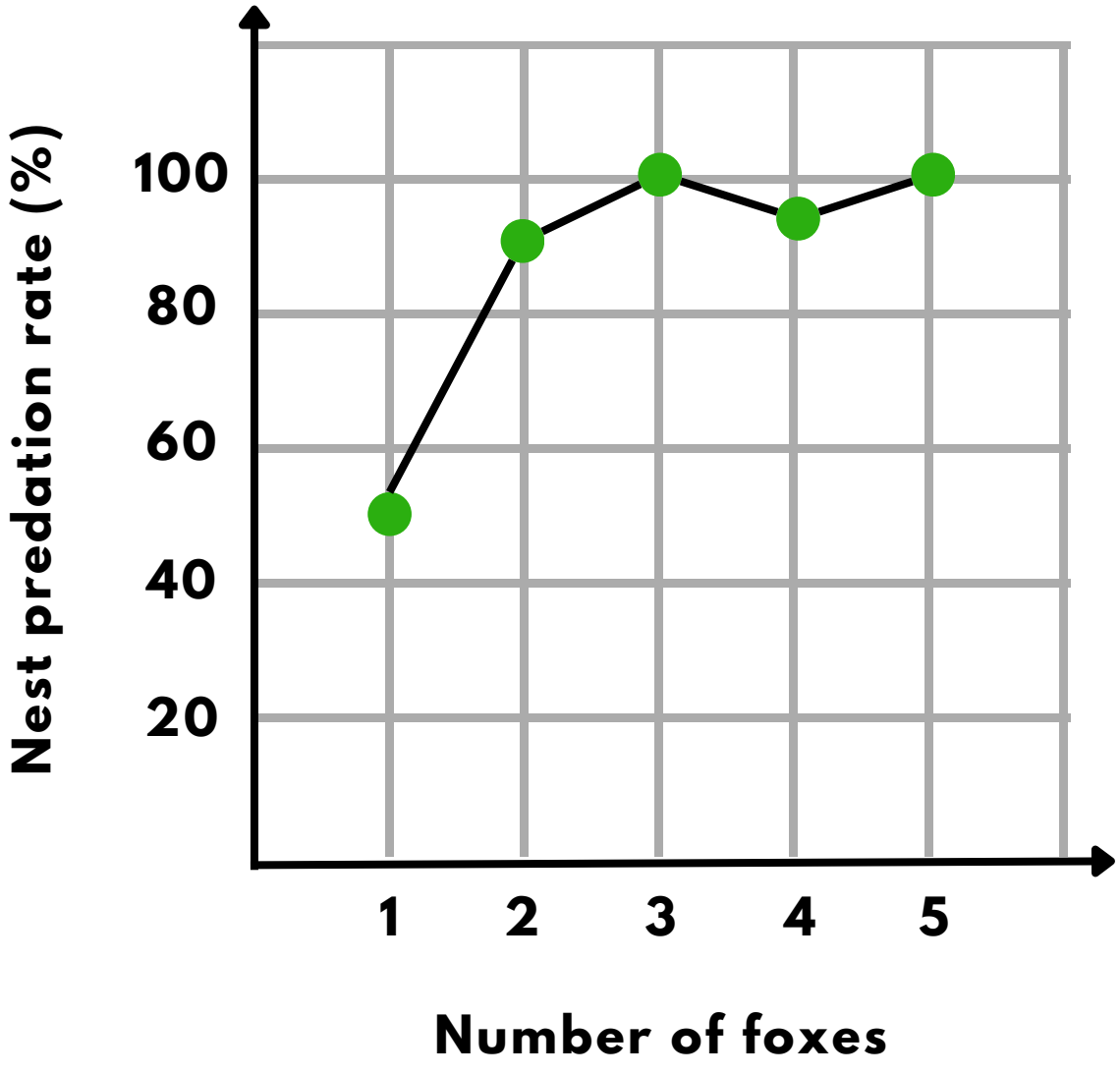
Q8: Imagine you are a citizen scientist participating in a freshwater turtle conservation project. Describe one task you might perform to help protect turtle habitats.

One task I might perform to help protect turtle habitats is monitoring and documenting nesting activity. This could involve conducting regular surveys along water bodies to locate turtle nesting sites and recording the number of nests found.

Test your Skills

European red foxes are one of the main predators of freshwater turtle nests. Draw a line graph below to represent the following nest predation data.

Number of foxes	1	2	3	4	5
Nest predation rate (%)	50	90	100	95	100



Test your Skills

Explain the trend of the line graph above. Describe what the trend means in the context of freshwater turtle nests and fox predation.

The line graph depicts the relationship between the number of European red foxes and nest predation rates of freshwater turtle nests. Initially, with just one fox present, the nest predation rate is 50%. However, as the fox population doubles to two, the nest predation rate sharply escalates to 90%.

The trend continues to demonstrate consistently high nest predation rates when fox numbers exceed two, with nest destruction ranging between 90% and 100%. This implies a significant threat to the survival of turtle nests in the presence of even a small number of foxes.

The data underscores an intriguing observation: while a solitary fox may leave some nests intact, the chances of nest survival dramatically diminish as fox numbers rise. In instances where more than two foxes are present, the likelihood of any nests surviving becomes exceedingly slim, jeopardising the recruitment of turtles into these populations.

Classroom Activities

ACTIVITY

What I Know (K), What I Want to Know (W), What I Learnt (L)

Materials:

- Large chart paper divided into 3 sections labeled "K" (Know), "W" (Want to Know), and "L" (Learnt).
- Markers or pens

Instructions:

(1A) Brainstorm what you Know (K) about freshwater turtles, their threats and citizen science. Write them in the “What I Know” column.

(1B) Write questions of “What I Want to Know” in the Want to Know (W) column.

What I Know (K)	Want to Know (W)	What I Learnt (L)
		

Additional Resources

Below is a list of resources that you may find helpful this Term:

- **Department of Climate Change, Energy, the Environment and Water.** SPRAT Profiles (https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl). Offers information on species listed under the EPBC Act and management measures.
- **Department of Climate Change, Energy, the Environment and Water.** Threat abatement plan for the European red fox. https://www.dcceew.gov.au/environment/biodiversity/threatened/publications/tap/predation-european-red-fox
- **Santori C et al. (2020)** Changes in participant behaviour and attitudes are associated with knowledge and skills gained by using a turtle conservation citizen science app. *People & Nature.* (https://besjournals.onlinelibrary.wiley.com/doi/epdf/10.1002/pan3.10184)

Photo credit: Dr Donald McKnight

LESSON

TERM TWO

THREATS TO FRESHWATER TURTLES

- Learning Intentions
- Background
- Activities
- Curriculum Mapping

Photo credit: Dr Donald McKnight

Australian Curriculum addressed in this Lesson

Science

Strand: Science Understanding (Year 5)
Sub-strand: Biological Sciences
AC9S5U01: examine how particular structural features and behaviours of living things enable their survival in specific habitats.

Strand: Science Understanding (Year 6)
Sub-strand: Biological Sciences
AC9S6U01: investigate the physical conditions of a habitat and analyse how the growth and survival of living things is affected by changing physical conditions.

English

Strand: Literacy (Year 5)
Sub-strand: Analysing, interpreting and evaluating
AC9E5LY04: navigate and read texts for specific purposes, monitoring meaning using strategies such as skimming, scanning and confirming.

AC9E5LY05: use comprehension strategies such as visualising, predicting, connecting, summarising, monitoring and questioning to build literal and inferred meaning to evaluate information and ideas.

Australian Curriculum addressed in this Lesson

English (continued)

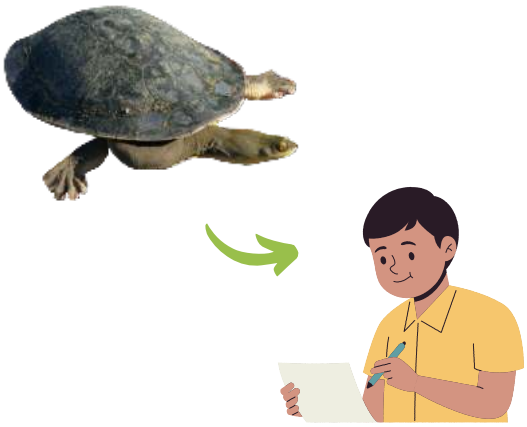
Strand: Literacy (Year 6)
Sub-strand: Analysing, interpreting and evaluating
AC9E6LY04: select, navigate and read texts for a range of purposes, monitoring meaning and evaluating the use of structural features; for example table of contents, glossary, chapters, headings and subheadings.

AC9E6LY05: use comprehension strategies such as visualising, predicting, connecting, summarising, monitoring and questioning to build literal and inferred meaning and to connect and compare content from a variety of sources.

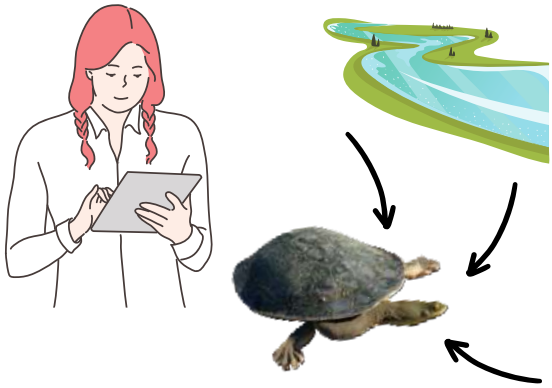
Learning Intentions

(1) Identify the threats to freshwater turtle species;

(2) Describe how the threats impact turtle populations.



Describe



Identify

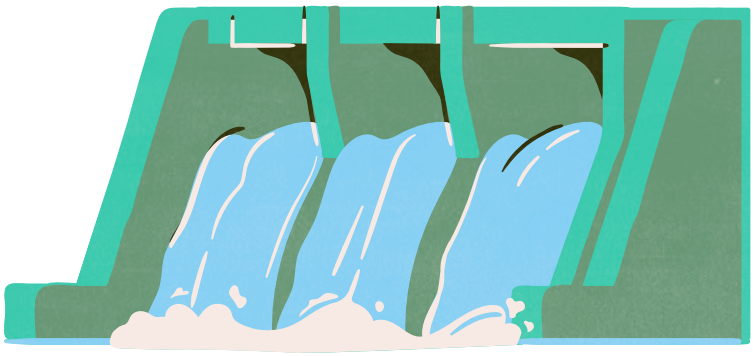
Photo credit (turtle): Dr Donald McKnight

Background Information
Freshwater turtle declines

There are approximately 26 species of freshwater turtle in Australia. Of these, almost half are listed as vulnerable, endangered or critically endangered. Freshwater turtles face a range of threats that contribute to declining populations. Common threats include:

Habitat loss and degradation:

1. Urbanisation: Rapid urban development often results in the loss and fragmentation of freshwater turtle habitats. Wetlands, rivers, and creeks are converted into urban areas, leading to the destruction of nesting sites, feeding areas, and essential habitat features.
2. Agricultural Expansion: Agriculture, particularly intensive farming practices such as irrigation, land clearing, and drainage, can lead to an increase in sedimentation, reduce the availability of suitable habitat for turtles and alter water temperatures through a loss of shade.
3. Pollution: Pollution from industrial runoff, sedimentation, and chemical contaminants can degrade water quality and influence the availability of food.
4. Habitat Fragmentation: Habitat fragmentation resulting from human activities, such as dam construction and river regulation can isolate turtle populations and reduce genetic diversity. Fragmented habitats can impede turtle movement, migration, and dispersal, leading to population declines and increased vulnerability to other threats such as predation and disease.



Background Information
Freshwater turtle declines

Predation by introduced predators: Introduced predators, such as European red foxes and feral pigs, pose a significant threat to freshwater turtles and their eggs.

Predation Pressure:

1. Eggs: Foxes and feral pigs are opportunistic predators known to prey upon freshwater turtle eggs. Turtle nests, particularly those located on sandy riverbanks or beaches, are vulnerable to predation by these invasive species. Foxes and feral pigs can easily locate and excavate turtle nests. In some areas, nest predation rates by foxes can be greater than 93%, per year.
2. Nesting Females: Female turtles that leave the water to lay their eggs are also vulnerable to predation by foxes and feral pigs. These predators may intercept nesting females as they move between the water and nesting sites, posing a threat to both the adult turtles and their eggs.

Impact on Turtle Populations:

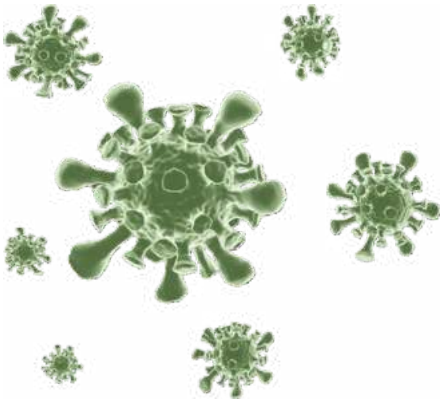
Reduced Reproductive Success: Predation by invasive species can significantly reduce the reproductive success of freshwater turtles by reducing nest survival rates and hatchling recruitment. High levels of nest predation can lead to population declines and hamper the recovery of threatened turtle species.

Freshwater turtle declines

Disease: Freshwater turtles are susceptible to various diseases and infections. The introduction of novel pathogens can have devastating impacts on turtle populations.

Types of Diseases:

- Bacterial
- Fungal
- Viral



Impact on Turtle Populations:

- Mortality and Morbidity: Disease outbreaks can result in significant mortality and morbidity among freshwater turtle populations, particularly in cases of highly virulent or widespread diseases.
- Population Declines: Disease outbreaks can lead to population declines and local extinctions of freshwater turtle populations, particularly in fragmented or isolated habitats with limited genetic diversity and resilience.

Management and Conservation:

- Health Monitoring: Regular health monitoring and surveillance of freshwater turtle populations can help detect disease outbreaks early, allowing for timely intervention and management. Monitoring efforts may include field surveys, health assessments, and disease screening of wild and captive populations.
- Quarantine and Biosecurity: Implementing quarantine protocols and biosecurity measures in captive breeding facilities, wildlife rehabilitation centres, and conservation reserves can help prevent the introduction and spread of diseases among freshwater turtle populations.

Freshwater turtle declines

Climate change: Climate change poses a significant and complex threat to freshwater turtles in Australia.

- Droughts: may lead to decreased water levels, drying of wetlands, and loss of habitat for freshwater turtles. Reduced water availability can restrict turtles' access to essential resources, such as food.
- Flood events can inundate nesting sites along river banks and wetlands, destroying turtle nests.
- Increased frequency and severity of bushfires: bushfires can increase the amount of sedimentation entering waterbodies and impact water quality. Freshwater turtle species that undergo overland movements may be particularly susceptible.

Road mortality:

Australia's extensive road network intersects with many freshwater habitats, including rivers, streams and wetlands, creating barriers to turtle movement and dispersal. Roads with high traffic density, such as major highways, pose greater risks to turtles, as they intersect with critical habitat areas and migration routes. Roads adjacent to nesting locations pose a significant risk to nesting females, as they may be struck by vehicles while attempting to move between the aquatic environment and nesting sites. The Eastern long-neck turtle (*Chelodina longicollis*) is particularly impacted by road mortality as individuals often travel overland.

International Union for Conservation of Nature (IUCN) - Red List of Threatened Species

The IUCN Red List of Threatened Species™ is one of the most comprehensive and widely recognised tools for assessing the conservation status of species worldwide. The Red List provides information on the extinction risk of thousands of species. The primary purpose of the IUCN Red List is to evaluate the conservation status of species and provide information to guide conservation actions and policy decisions.

Species assessments for the IUCN Red List are conducted by a global network of experts, including biologists, ecologists, taxonomists, and conservationists. The assessment process involves evaluating the available scientific evidence on a species' population size, distribution, habitat requirements, threats, and trends over time.

Based on this information, species are categorised into one of several Red List categories. The Red List categories are defined by specific criteria that consider factors such as population decline, habitat loss, and fragmentation, as well as the severity and immediacy of threats.

The IUCN Red List Categories are:

- Extinct.
- Extinct in the Wild.
- Critically Endangered.
- Endangered.
- Vulnerable.
- Near Threatened.
- Least Concern.

IUCN Red List Conservation Status symbols

Image sourced from:
https://commons.wikimedia.org/wiki/File:Status_iucn3.1.svg

Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act, or Environment Protection and Biodiversity Conservation Act 1999, is a key piece of environmental legislation in Australia. Under this act, the Australian Government has the authority to identify and protect species and ecological communities that are threatened with extinction or are otherwise at risk. The EPBC Act maintains a list of threatened species and ecological communities known as the "EPBC Act List of Threatened Species." This list categorises species and ecological communities according to their conservation status, reflecting the level of threat they face and the urgency of conservation action required.

Conservation Implications:

Species listed under the EPBC Act receive legal protection and are subject to specific conservation measures and management actions aimed at preventing further decline and promoting recovery.

The EPBC Act List of Threatened Species serves as a valuable tool for informing conservation planning, policy development, and decision-making at the national level, helping to ensure the long-term survival of Australia's threatened species and ecological communities.

Environment Protection and Biodiversity Conservation Act 1999

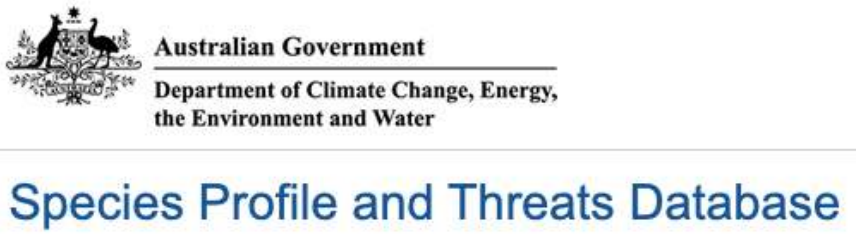
Categories of Threatened Species under the EPBC Act 1999:

- Extinct (EX): Species that are believed to no longer exist.
- Extinct in the Wild (EW): Species that only exist in captivity with no remaining populations in the wild.
- Critically Endangered (CR): Species facing an extremely high risk of extinction in the wild.
- Endangered (EN): Species facing a very high risk of extinction in the wild.
- Vulnerable (VU): Species facing a high risk of extinction in the wild.
- Conservation Dependent (CD): Species that depend on conservation management for their survival.
- Data Deficient (DD): Species for which there is insufficient information to assess their conservation status.

Conservation Advice Documents:

Under the EPBC Act, conservation advice documents play a crucial role in guiding the conservation and management of threatened species and ecological communities. These documents provide detailed information and guidance on the conservation status, threats, and management requirements of listed species and ecological communities, helping to inform decision-making and conservation actions at the national level.

You can search current listings and conservation advice documents through **SPRAT (Species Profile and Threats Database).**



http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl

Classroom Activity

ACTIVITY 1

(1A) Select an Australian freshwater turtle species and identify and describe the main threat to the species, using available literature and search engines. Include references and/or a bibliography.

(1B) Outline the current conservation strategies for the species and present your findings to the class.

Research

Present

ACTIVITY 2

(2A) Categorise the turtle species from Activity 1 based on their conservation status under the EPBC Act 1999 and IUCN Red List.

(2B) For each turtle species, identify the main threat to the species.

Australian Freshwater Turtles

Fill in the information below about your assigned turtle species.

Example below.

Common name: Bell's turtle, Western Sawshelled turtle

Scientific name: *Myuchelys belli*

Species distribution:

Bell's turtle species occurs in upland streams of the Namoi, Gwydir and Border Rivers catchments in the Murray-Darling Basin. In NSW it occurs in the Namoi River, Gwydir River, Severn River and Deepwater River. In Queensland it is restricted to a section of Bald Rock Creek.

Conservation status (IUCN Red List and EPBC Act):

EPBC Act - listed as Endangered
IUCN Red List - listed as Endangered

Main threat to the species:

Predation by the European red fox (*Vulpes vulpes*).
Foxes destroy Bell's turtle nests, with nest predation rates as high as 97%. Across the species range, the population is skewed towards older individuals, suggesting that fox predation is limiting recruitment.

Current conservation strategies:

- Nest Protection: Programs like Turtles Forever use wire mesh enclosures and fox exclusion fences to protect nests and boost hatchling survival.
- Headstarting: This involves collecting eggs from the wild, raising hatchlings in captivity and then releasing them back into their natural habitat.
- Monitoring and Research: Scientists and conservation groups are actively monitoring Bell's Turtle populations, tracking their numbers and distribution.

Australian Freshwater Turtles

Fill in the information below about your assigned turtle species.

Example below.

References:

Chessman B (2015) Distribution, abundance and population structure of the threatened western saw-shelled turtle, *Wollumbinia bellii,* in New South Wales, Australia. Australian Journal of Zoology 63, 245-252.

Department of Climate Change, Energy, the Environment and Water (2023). Conservation Advice for Myuchelys belli (western saw-shelled turtle). Canberra: Department of Climate Change, Energy, the Environment and Water. Available from: EPBC Act - listed as Endangered IUCN Red List - listed as Endangered. In effect under the EPBC Act from 15-Mar-2023.

Fielder D Chessman B & Georges A (2015) Myuchelys bellii (Gray 1844) – Western Saw-shelled Turtle, Bell's turtle. In: Rhodin AGJ Pritchard PCH van Dijk PP Saumure RA Buhlmann KA Iverson JB & Mittermeier RA (Eds), Conservation Biology of Freshwater Turtles and Tortoises: A Compilation Project of the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group

Paras J (2024) Twin Bell's turtles hatch during research project to repopulate the species in the NSW New England region. ABC New England. Viewed 30th April 2024. https://www.abc.net.au/news/2024-02-21/belles-turtle-repopulation-program-produces-twin-hatchlings-une/103485442

Australian Freshwater Turtles

Allocate the turtle species from the previous activity to one of the six conservation statuses below. Identify one threat for each species listed.

Example below.

	IUCN Red List	EPBC Act 1999
CR Critically Endangered		
EN Endangered	Bell's Turtle - foxes	Bell's Turtle - foxes
VU Vulnerable		
NT Near Threatened		
LC Least Concern		
DD Data Deficient		

LESSON 2

TERM TWO

INTRODUCTION TO CITIZEN SCIENCE

- Learning Intentions
- Background
- Activities
- Curriculum Mapping

Photo credit: Dr Donald McKnight

Australian Curriculum addressed in this Lesson

Science

Strand: Science Understanding (Year 5)
Sub-strand: Biological Sciences
AC9S5U01: examine how particular structural features and behaviours of living things enable their survival in specific habitats.

Strand: Science as a human endeavour (Year 5)
Sub-strand: Nature and development of science
AC9S5H01: examine why advances in science are often the result of collaboration or build on the work of others.

Sub-strand: Use and influence of science
AC9S5H02: investigate how scientific knowledge is used by individuals and communities to identify problems, consider responses and make decisions.

Strand: Science inquiry (Year 5)
Sub-strand: Communicating
AC9S5I06: write and create texts to communicate ideas and findings for specific purposes and audiences, including selection of language features, using digital tools as appropriate.

Australian Curriculum addressed in this Lesson

Science (continued)

Strand: Science Understanding (Year 6)
Sub-strand: Biological Sciences
AC9S6U01: investigate the physical conditions of a habitat and analyse how the growth and survival of living things is affected by changing physical conditions.

Strand: Science as a human endeavour (Year 6)
Sub-strand: Nature and development of science
AC9S6H01: examine why advances in science are often the result of collaboration or build on the work of others.

Sub-strand: Use and influence of science
AC9S6H02: investigate how scientific knowledge is used by individuals and communities to identify problems, consider responses and make decisions.

Strand: Science inquiry (Year 6)
Sub-strand: Communicating
AAC9S6I06: write and create texts to communicate ideas and findings for specific purposes and audiences, including selection of language features, using digital tools as appropriate.

Australian Curriculum addressed in this Lesson

English

Strand: Literacy (Year 5)

Sub-strand: Creating texts

AC9E5LY06: plan, create, edit and publish written and multimodal texts whose purposes may be imaginative, informative and persuasive, developing ideas using visual features, text structure appropriate to the topic and purpose, text connectives, expanded noun groups, specialist and technical vocabulary, and punctuation including dialogue punctuation.

Strand: Literacy (Year 6)

Sub-strand: Creating texts

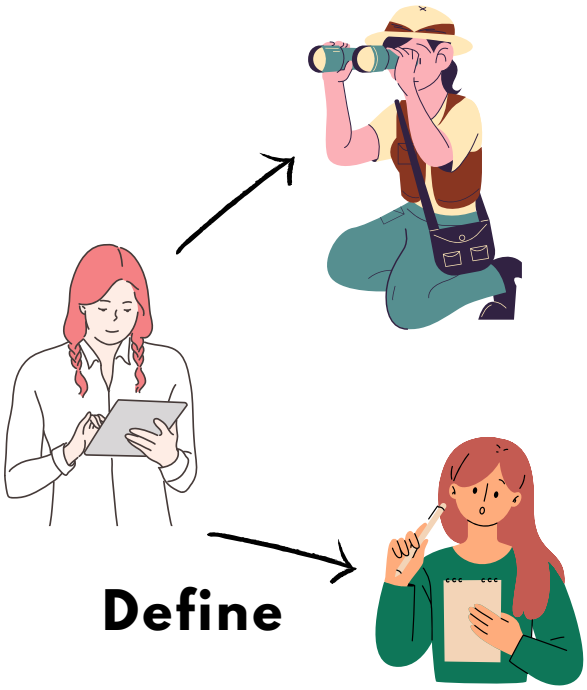
AC9ELY06: plan, create, edit and publish written and multimodal texts whose purposes may be imaginative, informative and persuasive, using paragraphs, a variety of complex sentences, expanded verb groups, tense, topic-specific and vivid vocabulary, punctuation, spelling and visual features.

Learning Intentions

(1) Define citizen science;

(2) Explain the benefits of citizen science to both researchers and the public;

(3) Create a conservation action plan for freshwater turtles, with a focus around citizen science.



Define

Create

Background Information:

Citizen Science

Citizen science refers to the involvement of the public in scientific research, usually by collecting data. For scientists, citizen science can provide access to large amounts of data that would be otherwise difficult or expensive to collect on their own. Citizen science can also help scientists engage with the public and communicate their research in a more accessible way.

Citizen science can provide opportunities to learn about science and contribute to scientific research. Citizen science can also promote a sense of community and empowerment, as participants can see the results of their contributions and feel like they are making a meaningful impact.

Conservation Action Plan

Conservation action plans are strategic documents that outline specific goals, objectives, and actions aimed at protecting and preserving biodiversity, ecosystems, and natural resources. These plans are developed by organisations, government agencies, conservation groups, and other stakeholders to address environmental threats, mitigate human impacts, and promote sustainable management practices. Conservation action plans are used to guide and coordinate conservation efforts, allocate resources effectively, and monitor progress towards conservation goals.

Conservation Action Plan

Purpose of Conservation Action Plans:

- Identify Priorities: Conservation action plans help identify priority species, habitats, and ecosystems in need of protection and management. By assessing the status and threats facing biodiversity, these plans prioritise conservation actions where they are most needed.
- Set Goals and Objectives: Conservation action plans establish clear and measurable goals and objectives for conservation efforts.
- Guide Action: Conservation action plans outline specific strategies and actions needed to achieve conservation goals.
- Mobilise Resources: Conservation action plans help mobilise financial, human, and technical resources to support conservation activities. By articulating the importance and urgency of conservation priorities, these plans facilitate funding and support from government agencies, donors, and other stakeholders.
- Promote Collaboration: Conservation action plans foster collaboration and partnerships among diverse stakeholders, including government agencies, non-profit organisations, local communities, and indigenous groups. By bringing together stakeholders with different expertise, resources, and perspectives, these plans encourage coordinated and collective action towards shared conservation goals.

Classroom Activity

ACTIVITY

(1) In groups develop a simple conservation action plan to address one of the threats to freshwater turtles. Consider awareness campaigns and community involvement in your planning.

Group work

Conservation Action Plan

Threat:

Conservation Goals and Objectives:

Brainstorm conservation strategies for your threat

Outline how ONE of the strategies will be implemented:

Conservation Action Plan

How will you raise public awareness about the threat?

Create a slogan and logo for your awareness campaign

Photo credit: Dr James Van Dyke

COMPETITION

Objective: create short films that communicate information about freshwater turtles and their conservation in a creative and engaging way.

Competition Guidelines:

- Film Duration: Films should be no longer than 3 minutes.
- Theme: Films should focus on topics related to freshwater turtles, their threats and conservation strategies.
- Creativity: Participants are encouraged to use creative storytelling, visuals, and narration to effectively communicate their message.
- Accuracy: Information presented in the films should be factual and accurate.
- Submission: Films should be submitted electronically via the 1 Million Turtles Community Conservation Program website.
- Judging Criteria: Entries will be judged based on creativity, clarity of message, effectiveness in communicating information, and overall impact.
- Prizes: Prizes will be awarded to the top entries.
- Announcement of Winners: Winners will be announced via the 1 Million Turtles Community Conservation Program website and social media channels in November (Turtle Month).

LESSON

TERM TWO

PREPARATION FOR THE NATIONAL NEST PREDATION SURVEY

- Learning Intentions
- Background
- Activities
- Curriculum Mapping

Photo credit: Dr Donald McKnight

Australian Curriculum addressed in this Lesson

Science

Strand: Science as a human endeavour (Year 5)

Sub-strand: Nature and development of science

AC9S5H01: examine why advances in science are often the result of collaboration or build on the work of others.

Sub-strand: Use and influence of science

AC9S5H02: investigate how scientific knowledge is used by individuals and communities to identify problems, consider responses and make decisions.

Strand: Science inquiry (Year 5)

Sub-strand: Planning and conducting

AC9S5I02: plan and conduct repeatable investigations to answer questions, including, as appropriate, deciding the variables to be changed, measured and controlled in fair tests; describing potential risks; planning for the safe use of equipment and materials; and identifying required permissions to conduct investigations on Country/Place.

Australian Curriculum addressed in this Lesson

Science

Strand: Science as a human endeavour (Year 6)

Sub-strand: Nature and development of science

AC9S6H01: examine why advances in science are often the result of collaboration or build on the work of others.

Sub-strand: Use and influence of science

AC9S6H02: investigate how scientific knowledge is used by individuals and communities to identify problems, consider responses and make decisions.

Strand: Science inquiry (Year 6)

Sub-strand: Planning and conducting

AC9S6I02: plan and conduct repeatable investigations to answer questions including as appropriate, deciding the variables to be changes, measured and controlled in fair tests, describing potential risks, planning for the safe use of equipment and materials; and identifying required permissions to conduct investigations on Country/Place.

Learning Intentions

(1) Define an experimental design;

(2) Explain the 3 R's Principle and how it is used in scientific research;

(3) Participate in the National Nest Predation Survey.

Define

Explain

Particpate

Background Information
Experiment design and the 3 R Principle

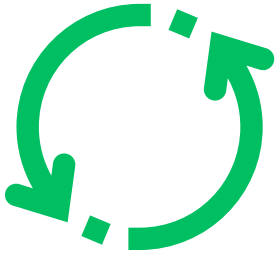
Experimental Design:
Experimental design refers to the process of planning and organising an experiment in order to gather data and draw conclusions to answer a research question.

The 3 R Principle:
The 3Rs is a concept that refers to the guiding principles for the ethical use of animals in scientific research. The 3Rs stand for Replacement, Reduction, and Refinement. These principles aim to minimise the use of animals in research, reduce their suffering, and improve their welfare.

1) Replacement – the principle of replacement aims to find alternative scientific methods that can replace the use of animals in research where possible.

2) Reduction – the principle of reduction focuses on minimising the number of animals used in research.

3) Refinement – the principle of refinement aims to improve the welfare of the animals used in research, through refining experimental procedures and protocols to minimise pain, distress or suffering.



Replace

Reduce

Refine

Photo credit (turtle): Dr Donald McKnight

National Nest Predation Survey (NNPS)

The National Nest Predation Survey encourages communities to measure nest predation rates. Nest predation rates on turtle nests are very high in many parts of the country. Introduced foxes are the major predator. By conducting the National Nest Predation Survey throughout Australia the 1 Million Turtles Community Conservation Program, aims to develop a national interactive 'hotspot' map to determine region specific estimates of predation rates.

As part of the National Nest Predation Survey, users will be trained as citizen scientists conducting the survey in their region. The survey involves the creation of artificial nests by placing chicken eggs underground and monitoring predation rates. The NNPS must be done on private land or under the guidance or approval from local land management agencies (e.g., Local Council). Ideally the survey is done near a wetland (e.g. river, creek, lagoon, pond) and outside of the month of November.

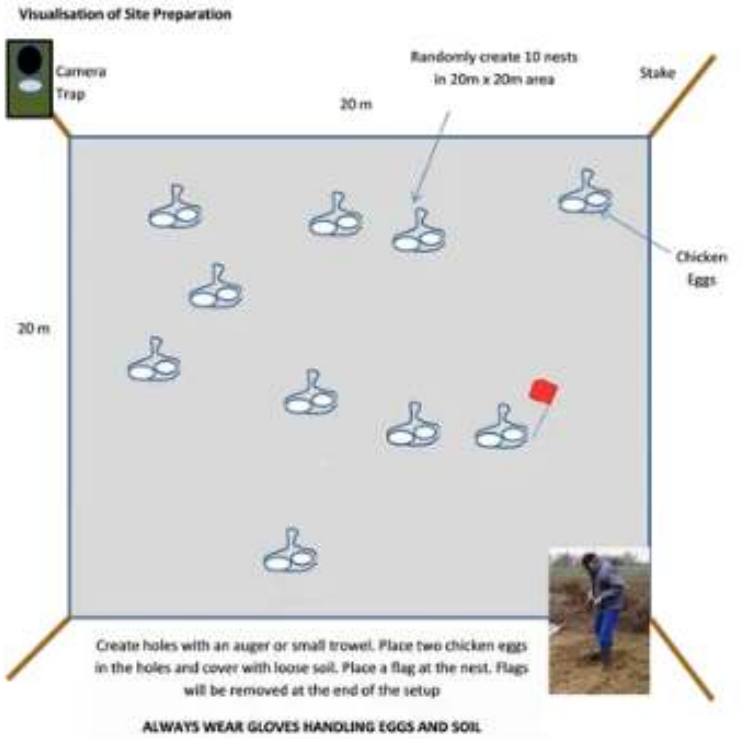


Photo credit (turtle): Dr Donald McKnight

Classroom Activities

ACTIVITY 1

(1A) Complete the Experimental Design worksheet to test your knowledge on experimental designs and the 3R principle.

Worksheet

ACTIVITY 2

(2A) Coordinate with the local council to organise class involvement in the NNPS. This is a requirement of participating in the NNPS.

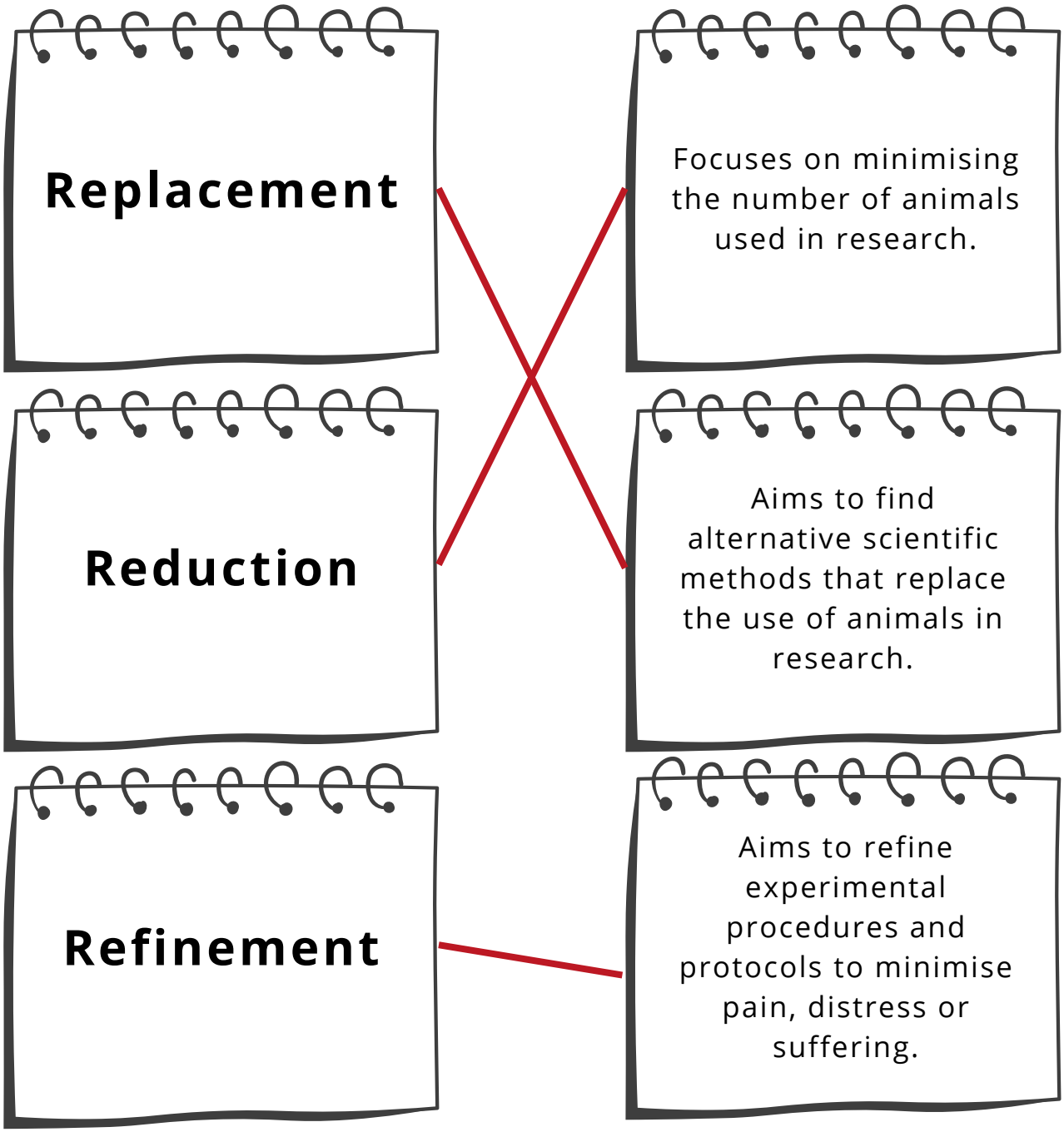
Coordinate

Experimental Design & 3R's

Define an experimental design:

The process of planning and organising an experiment in order to gather data and draw conclusions to answer a research question.

Draw a line to connect the words with their definitions



Classroom Activities

ACTIVITY 3

(3A) Complete a risk assessment, as per the 1Million Turtles website.

(3B) Complete the National Nest Predation Survey quiz prior to participating in the survey.

Link to risk assessment and survey on the website: [Copy and paste into browser] https://1millionturtles.com/nnp-survey).

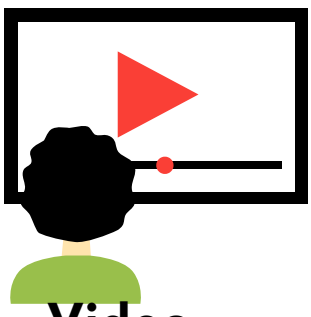
ACTIVITY 4

(4A) Watch the following videos -

Video 1 provides an overview of how to conduct the National Nest Predation Survey.
Link to video: [https://youtu.be/624skxfMhYM] (Copy and paste into browser)

Video 2 explains how to dig artificial nests.
Link to video: [https://www.youtube.com/watch?v=4C1nvkzylq4&t=2s] (Copy and paste into browser).

(4B) Reflect on the information in the two videos and complete the Video Reflection Handout.



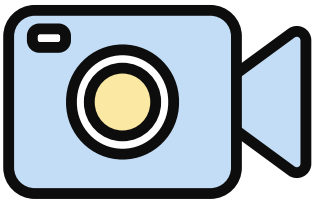
Video

Reflect

Video Reflection

3

Three things I learnt while watching



2

Two questions I have from the video

1

One fact I found most interesting

LESSON 1

TERM TWO

INTRODUCTION TO TURTLESAT

- Learning Intentions
- Background
- Activities
- Curriculum Mapping

Photo credit: Dr Donald McKnight & Marilyn Connell

Australian Curriculum addressed in this Lesson

Science

Strand: Science inquiry (Year 5)

Sub-strand: Planning and conducting

AC9S5I03: use equipment to observe, measure and record data with reasonable precision, using digital tools as appropriate.

Strand: Science inquiry (Year 6)

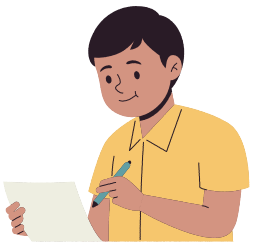
Sub-strand: Planning and conducting

AC9S6I03: use equipment to observe, measure and record data with reasonable precision, using digital tools as appropriate.

Learning Intentions

(1) Explain how TurtleSAT can be used by the public to collect data;

(2) Understand the role of technology in scientific data collection and the importance of digital tools and databases.



Explain

Background Information TurtleSAT

TurtleSAT is a citizen science mapping tool produced by the 1 Million Turtles Community Conservation Program. TurtleSAT allows communities to map the location of freshwater turtles in waterways and wetlands across the country.

The TurtleSAT app collects important information relating to the distribution and abundance of freshwater turtles. Participants submit sightings of turtles and their nests, with the app recording data such as the geographic location, species of turtle, individuals demographic, turtle behaviour (i.e. nesting, basking, crossing the road) and turtle and nest fate (i.e. alive or dead).

The data collected through TurtleSAT contributes to a broader understanding of freshwater turtle ecology and population health. It aids researchers, conservationists, and policymakers in making informed decisions to protect and manage freshwater turtle populations and habitats.

TurtleSAT emphasises public engagement and education, encouraging people of all ages and backgrounds to participate in the project. It promotes awareness about the importance of freshwater turtle conservation and the role that individuals can play in contributing to scientific knowledge.

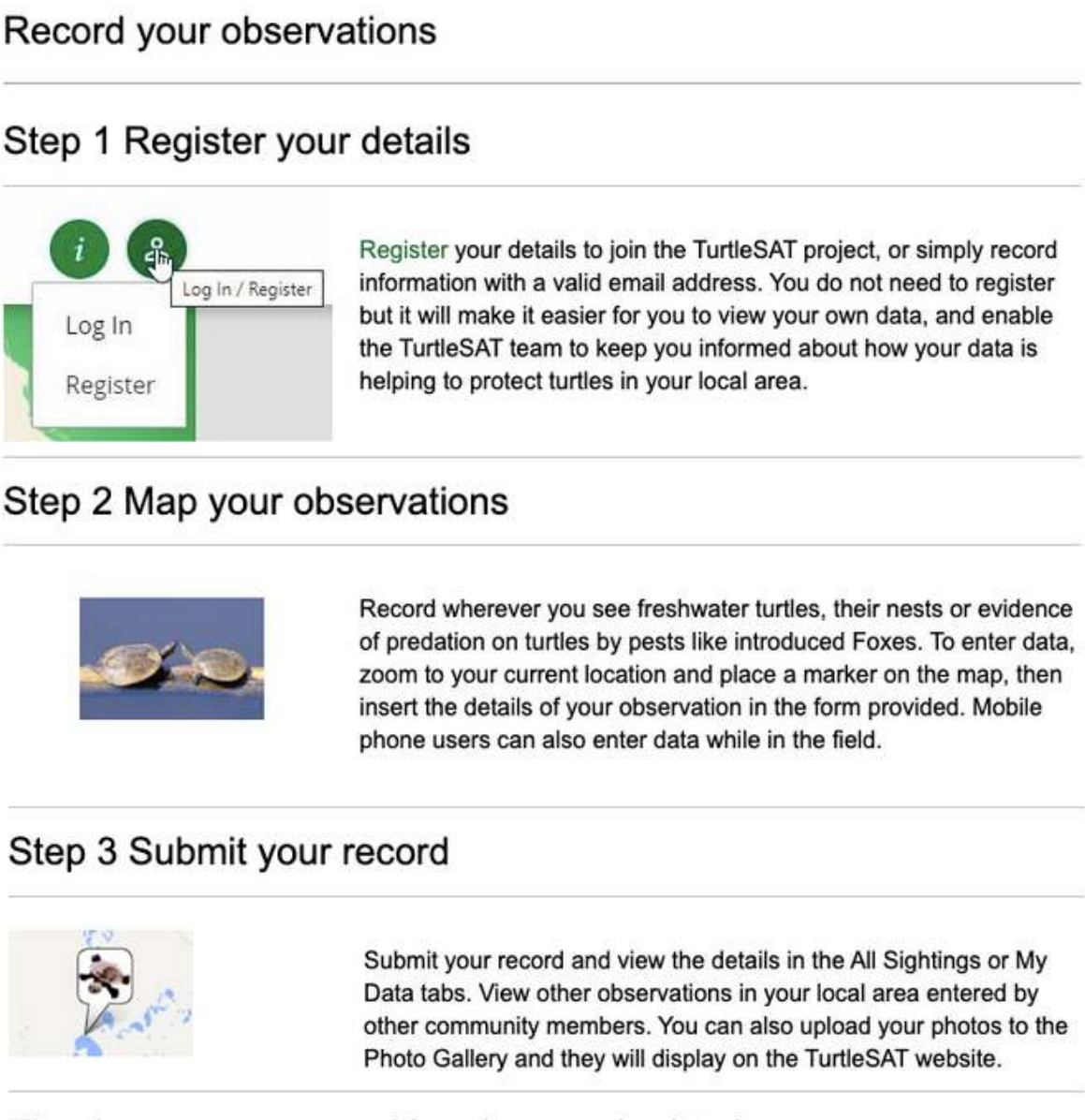
Classroom Activity

ACTIVITY

(1) Visit the TurtleSAT website and explore the information presented.

Link to website: https://www.turtlesat.org.au/turtlesat/ [Copy and paste into browser]

(2) Learn about the types of data TurtleSAT collects and how to enter it.



TurtleSAT

Imagine you are a citizen scientist using TurtleSAT to record turtle sightings in your local area. Provide two hypothetical scenarios where you might encounter a turtle and describe what data you would record for each scenario using TurtleSAT.

LESSON

TERM TWO

THE NATIONAL NEST PREDATION SURVEY

- Learning Intentions
- Background
- Activities
- Curriculum Mapping

Photo credit: Dr Donald McKnight

Australian Curriculum addressed in this Lesson

Science

Strand: Science inquiry (Year 5)

Sub-strand: Planning and conducting

AC9S5I03: use equipment to observe, measure and record data with reasonable precision, using digital tools as appropriate.

AC9S5I02: plan and conduct repeatable investigations to answer questions, including, as appropriate, deciding the variable to be changed, measured and controlled in fair tests; describing potential risks; planning for the safe use of equipment and materials; and identifying required permissions to conduct investigations on Country/Place.

Strand: Science inquiry (Year 6)

Sub-strand: Planning and conducting

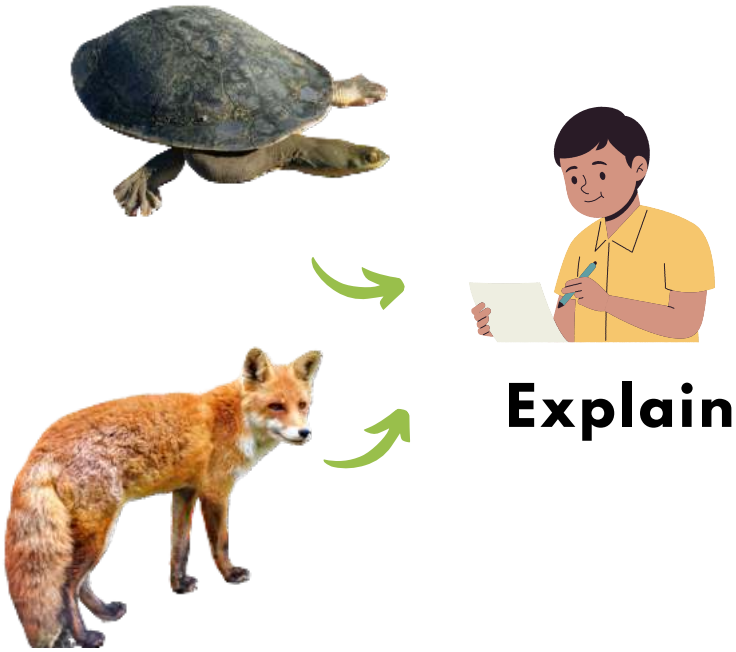
AC9S6I03: use equipment to observe, measure and record data with reasonable precision, using digital tools as appropriate.

AC9S6I02: plan and conduct repeatable investigations to answer questions including, as appropriate, deciding variables to be changed, measured and controlled in fair tests; describing potential risks; planning for the safe use of equipment and materials; and identifying required permissions to conduct investigations on Country/Place.

Learning Intentions

(1) Explain why the National Nest Predation Survey is important;

(2) Apply their skills as a citizen scientist in the implementation of the National Nest Predation Survey.



Explain

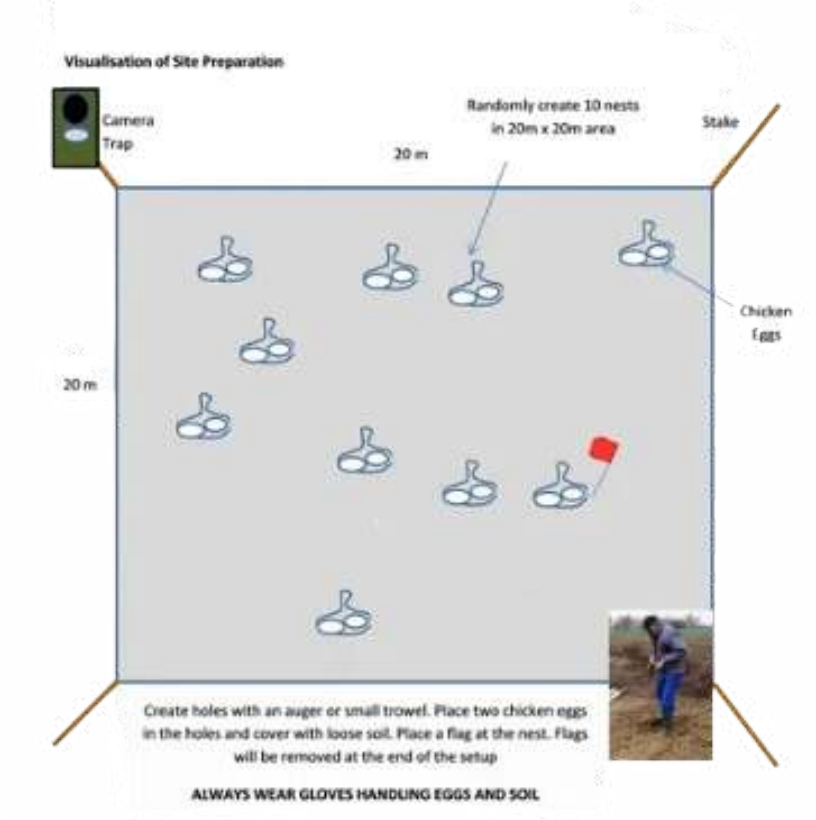
Apply and Implement

Photo credit (turtle): Dr Donald McKnight

Background Information
National Nest Predation Survey (NNPS)

Importance of the National Nest Predation Survey:
Nest predation rates on turtle nests are very high in many parts of the country. Introduced foxes are the major predator. By participating in the NNPS, you will be monitoring the impacts of predation on turtle nests in your area and be part of a powerful citizen science network providing data to improve conservation actions for our freshwater turtles. The data collected in the National Nest Predation Survey will be used to develop a national interactive 'hotspot' map to determine region specific estimates of predation rates.

How to conduct the National Nest Predation Survey:
The following instructions are taken from the 1 Million Turtles Community Conservation Program website (Copy and paste into browser: https://1millionturtles.com/nnp-survey).



National Nest Predation Survey (NNPS)

Equipment:

For your personal safety

- Gloves (e.g., disposable gloves)
- Alcohol wipes
- 1 × First aid kit

To set up the survey site

- 2 x Carton of dozen eggs
- 1 × 15 cm Hand auger or a hand trowel
- 1 X 30 metre Tape (or you may also use shorter tape measures if available)
- 10 × Steel flags (it could be any bright colours for easy identification when taking photos upon completion of the site set-up) (1#) - If you don't have any steel flags and would like some, please contact us at 1millionturtlesprogram@gmail.com to request for a set (10 flags) and we will mail it out to you.
- 3 x Wooden stakes (or 4 if you are not setting up a wildlife camera) (2#)
- Your phone or a camera to take photos of your site (before removing the steel flags)
- 1 X Garbage bag (to carry back any rubbish)

If you are setting up a wildlife camera (optional)

- 1 × Star post plus cap
- 1 × Star dropper or Star picket
- 1 × Hammer or Mallet
- 2 × Cable ties (to secure the camera to the star dropper or picket)
- 1 × Wildlife camera trap (aka remote sensor camera or motion sensor camera)
- Alcohol wipes (to wipe down the camera

before you leave the site).

National Nest Predation Survey (NNPS)

Setting Up a Wildlife Camera (Optional)

- You may use a star picket or any existing sturdy structures such as a fence post, or tree trunk. If you are strapping the camera to a tree, check that your camera strap is large enough to go around the trunk.
- Generally, it is not recommended to mount your camera on trees that are thin as this may cause your camera to sway during windy conditions causing the camera to trigger falsely.
- If your camera doesn't come with a mounting strap, you may also use a cable tie to mount the camera.
- Another important consideration is minimising the effect of grass waving in the wind. If possible, please try and set up your cameras in areas with short grass.
- Mount the camera facing in the southerly direction to avoid strong sun glare.
- Tilt the camera slightly so that it faces downwards. This ensures that the camera sensor's detection zone or field of view (FOV) width is maximised when it hits the ground. This helps to detect the movement of any wildlife on the ground that are visiting the nests.
- It is likely that some of the nests may be outside of the camera's FOV. This is ok, as long as one or more nests are within the FOV.
- You may opt to set up your camera once the survey site has been selected and do the necessary test to ensure your camera is working well. Once you finish testing the camera, you may it switch off.
- Once the nests set-up is complete (and all the flags are removed), switch the camera on before leaving the survey site and leave it switch on for the duration of the survey (i.e., 3 weeks). Please wipe down the camera's exterior before leaving the site (using the alcohol wipes). This ensures that you minimise any scent trails from the handling of the camera.

National Nest Predation Survey (NNPS)

Select a Survey Site:
Freshwater turtles are present in most wetlands throughout mainland Australia. Ideally the NNPS is done near a wetland (e.g., river, creek, lagoon, pond). It can also be done anywhere if you have enough space and have the right permissions in place (e.g., on private land or in conjunction with local management agencies).

It is best to conduct your nest predation survey within 100m from shore. Turtles come out of the water and generally nest in habitats that are open and away from trees. Some species, like Eastern Long-Neck turtles, may walk long distances but most turtles nest relatively close to shore.

You can often find dug up nests and eggs shells on the ground while walking around your wetland. Don't forget to record those dug up nests into TurtleSAT.org.au. Sites close to these nesting grounds make ideal areas to conduct your survey.

Turtles dig a hole that is up to 30cm deep and will deposit 10-30 small eggs per nest. We will use 2 larger chicken eggs in our artificial nests. Turtle eggs will incubate underground for 2-3 months for most species, but some like the Broad-Shelled Turtle, have eggs that remain underground for up to 12 months before hatching. The NNPS can take place at any time of year, except during Turtle Month (November), to make sure we avoid encountering and disturbing turtles actively nesting.

TIP: We do not recommend setting up the survey on land with cattle present as they destroy the set up. Sheep don't appear to do as much damage.

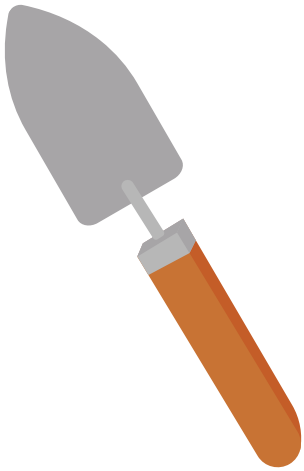
One site is sufficient for this survey.

National Nest Predation Survey (NNPS)

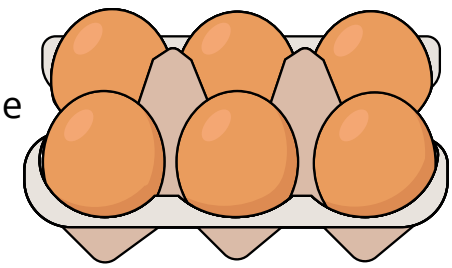
Setup Your 20m x 20m Survey Plot:
It is best to have at least 2 people setting up a site. Measure out a 20m x 20m square plot using the tape measures in your kit and at each of the four corners hammer in a small wooden stake or star post. If possible, use a marker pen or paint to number each corner wooden stakes.

Place your wildlife camera (if you are using one) on one corner star picket facing southerly towards the middle of your plot securing it with cable ties. Remember to switch on the camera before leaving your site. We recommend to set the camera to capture three still shots with a 1-minute delay. Record the GPS the location of your site. Please use decimal degrees (e.g., -34.04214, 151.05211).

Creating Nests:
Ensure you are wearing gloves at this point. You can use an auger or a trowel to create 10 holes. The holes are created randomly and are not evenly spaced. We recommend using an auger to create a round nest. If you don't have an auger, trowels (e.g., garden trowels) can also be used. However, please don't use a shovel as the hole may end up being too large.



Dig the hole approximately 10-15cm wide and 15-20cm deep. In each hole, bury two chicken eggs. Please ensure that you are wearing gloves at all times while undertaking these tasks. This ensures that you don't leave your scent trail on the eggs. After placing the eggs into each hole, cover them with the loose soil so that it is flush with the ground and place one brightly coloured flag (or other visible marker) at each hole.



National Nest Predation Survey (NNPS)

Leaving the Site:
Before you leave, go to each corner of the site and take a photo. Take as many photos as needed from each corner point while the coloured flags or visible markers are still in place. Please ensure that the photo captures sufficient details of the surrounding (e.g., clear visibility of the coloured flags and the corner stakes such as the wooden stakes) to help you identify and locate the nests when you return. Once you are done with taking the photos, please remove all coloured flags/visible markers from the nests. Again, it is important that you are wearing gloves to carry out all these tasks.

You need to return to the site in three weeks and locate the nests. Finding the nests can be difficult, this is why your photos are important. You may also opt to print out the photos and bring them along to use as a reference to help you find the nests in three weeks.

TIP: Printing the photo on A3 works the best, but iPads can be effective as they allow you to zoom in when guiding people to find nests.

Once you are done with taking the photos, please remove all coloured flags/visible markers from the nests. Again, it is important that you are wearing gloves to carry out all these tasks.

If you are setting up a wildlife camera, before you leave - ensure that it is switched on and wiped down the camera with alcohol wipes to remove any scent trails.

Wetland Activity

ACTIVITY

(1) Participate in the National Nest Predation Survey. Follow the instructions on how to set up the survey plot and create artificial nests.

LESSON 6

TERM TWO

THE NATIONAL NEST PREDATION SURVEY- DATA COLLECTION

- Learning Intentions
- Background
- Activities
- Curriculum Mapping

Photo credit: Dr Donald McKnight

Australian Curriculum addressed in this Lesson

Science

Strand: Science inquiry (Year 5)

Sub-strand: Planning and conducting

AC9S5I03: use equipment to observe, measure and record data with reasonable precision, using digital tools as appropriate.

Strand: Science inquiry (Year 6)

Sub-strand: Planning and conducting

AC9S6I03: use equipment to observe, measure and record data with reasonable precision, using digital tools as appropriate.

Mathematics

Strand: Statistics (Year 5)

AC9M5ST03: plan and conduct statistical investigations by posing questions or identifying a problem and collecting relevant data; choose appropriate displays and interpret the data; communicate findings within the context of the investigation.

Strand: Statistics (Year 6)

AC9M6ST03: plan and conduct statistical investigations by posing and refining questions or identifying a problem and collecting relevant data; analyse and interpret the data and communicate findings within the context of the investigation.

Learning Intentions

(1) Collect and accurately record data.

Collect

Record

Background Information

National Nest Predation Survey (NNPS) - Data collection

Data collection:

We recommend returning to your National Nest Predation site, 3 weeks after the artificial nests were created to collect data.

Data collection requires two people. The first person will stand at each wooden stake with the relevant photo and guide the 2nd person to each nest location. If the nest has been dug up, egg shells and a hole will be present and easy to find. If it has not been dug up, it may require some time and effort to find. Once you have located all 10 nests, record how many nests have been dug up. Remove or destroy any remaining eggs within intact nests. Once you are done, collect your wooden stakes (or star posts) and wildlife camera.

If you have used a wildlife camera, you need to look through all the images captured on the SD card. Please record the number of days that a fox was observed (not the number of fox images). For example, if a fox was captured 6 times in one night, it still gets recorded as a "1". Similarly, if a fox is observed once over a 24h period it also gets a "1". If no fox was observed over a 24h period, then it is given a "0". Tally the number of "1s" recorded and that will be recorded into the online survey. You will also need to record the number of nights that the camera was out there.

Wetland Activity

ACTIVITY

(1) Return to the site of the NNPS, approximately 3 weeks after the chicken egg nests were created and record the number of nests predated.

Classroom Activity

ACTIVITY 1

(1) Write a short reflection piece on what you observed during data collection for the National Nest Predation Survey. Comment on how your findings and involvement in the survey made you feel.

ACTIVITY 2 - If a wildlife camera was deployed.

(2A) Sort through the photos from the wildlife camera.

(2B) Record the number of day/nights at least one fox was seen on camera.

(2C) Record the number of day/nights other animals (i.e. ravens, kangaroos etc) were seen on camera.

Reflection

Write a short reflection piece on what you observed during data collection for the National Nest Predation Survey.

Wildlife Camera Data

Complete the table below with data collected from your wildlife camera. Add additional pages as needed. You can also enter your data straight into an Excel file.

Date	Time	Species	Number of animals observed	Notes

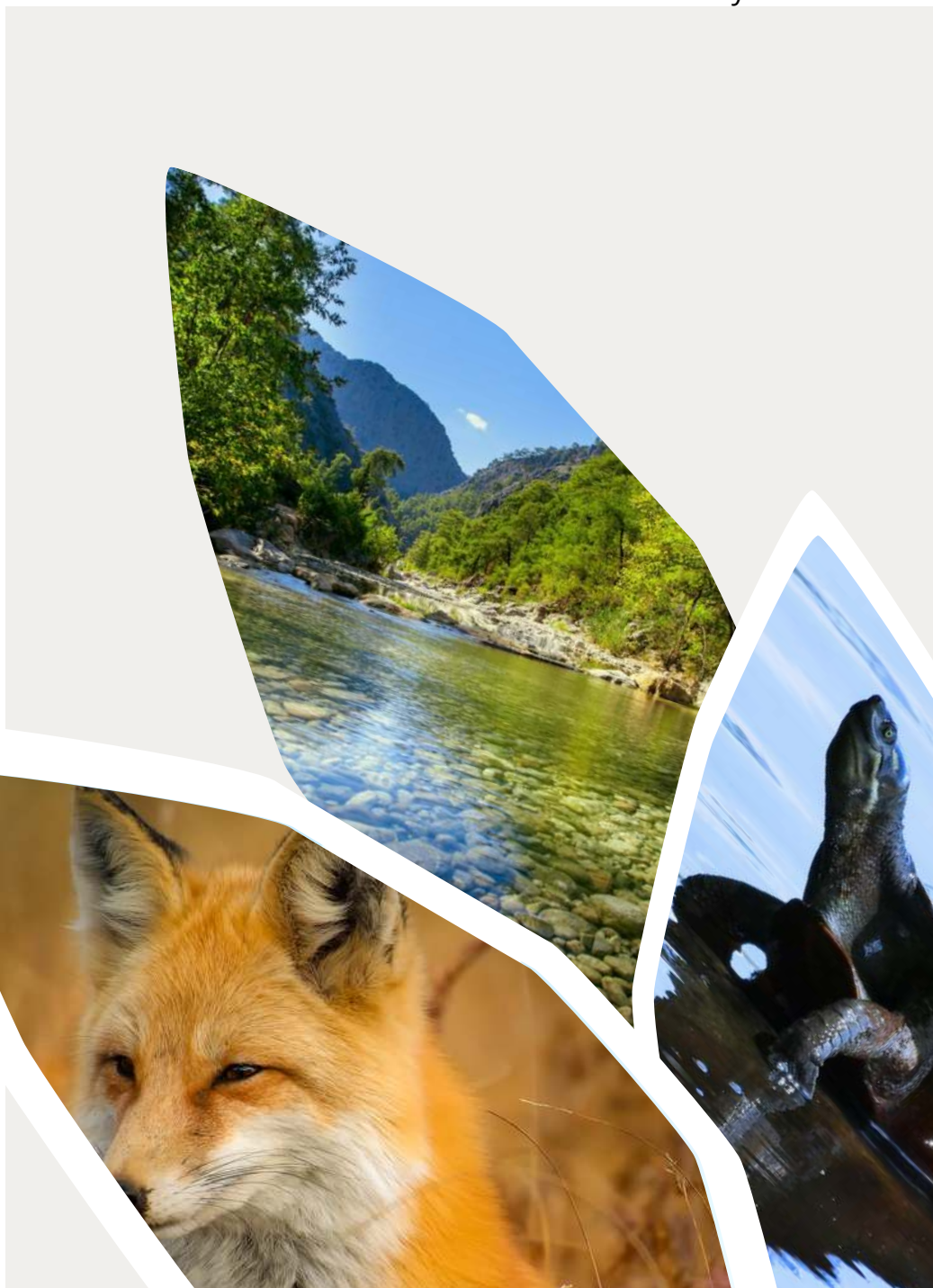
LESSON 7

TERM TWO

UPLOADING NNPS DATA TO TURTLESAT

- Learning Intentions
- Background
- Activities
- Curriculum Mapping

Photo credit: Marilyn Connell



Australian Curriculum addressed in this Lesson

Science

Strand: Science inquiry (Year 5)

Sub-strand: Processing, modelling and analysing

AC9S5I04: construct and use appropriate representations, including tables, graphs and visual or physical models, to organise and process data and information and describe patterns, trends and relationships.

Sub-strand: Evaluating

AC9S5I05: compare methods and findings with those of others, recognise possible sources of error, pose questions for further investigation and select evidence to draw reasoned conclusions.

Strand: Science inquiry (Year 6)

Sub-strand: Processing, modelling and analysing

AC9S6I04: construct and use appropriate representations, including tables, graphs and visual or physical models, to organise and process data and information and describe patterns, trends and relationships.

Sub-strand: Evaluating

AC9S6I05: compare methods and findings with those of others, recognise possible sources of error, pose questions for further investigation and select evidence to draw reasoned conclusions.

Australian Curriculum addressed in this Lesson

Mathematics

Strand: Statistics (Year 5)

AC9M5ST02: interpret line graphs representing change over time; discuss the relationships that are represented and conclusions that can be made.

Strand: Statistics (Year 6)

AC9M6ST01: interpret and compare data sets for ordinal and nominal categorical, discrete and continuous numerical variables using comparative displays or visualisations and digital tools; compare distributions in terms of mode, range and shape.

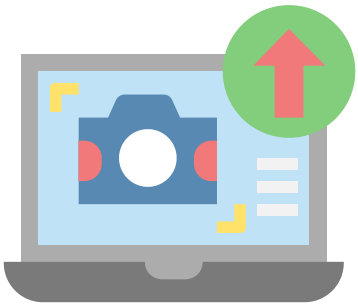
Learning Intentions

(1) Upload the data collected from the National Nest Predation Survey to TurtleSAT;

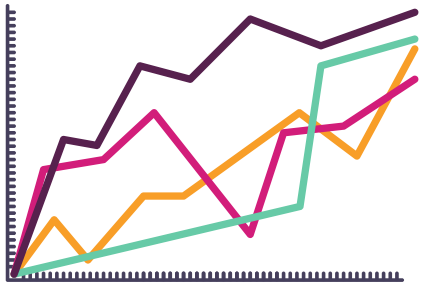
(2) Graph dependent and independent variables in a line graph and discuss the relationship between the two;

(3) Interpret findings from the National Nest Predation Survey data;

(4) Appreciate the role citizen scientists and apps play in collecting broad-scale scientific data and how this data can be used by researchers, stakeholders and policy makers in decision making around conservation policies and environmental management.



Upload

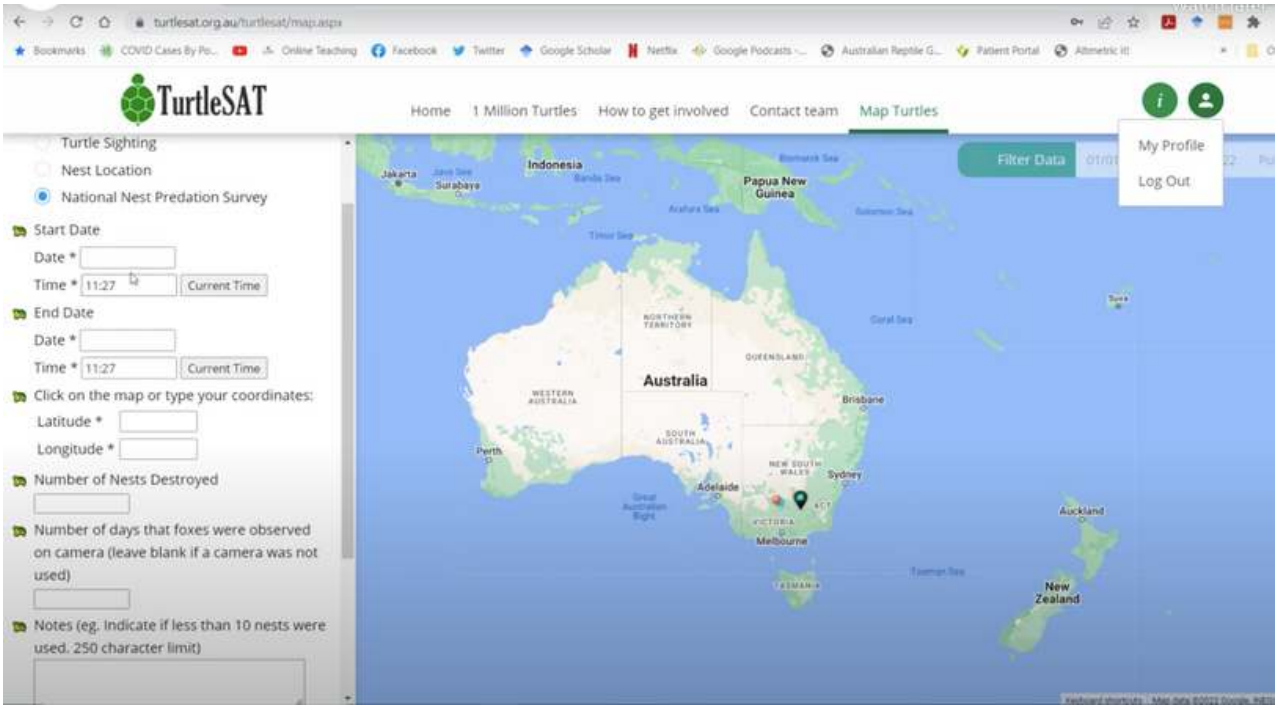


Graph

Appreciate

Background Information
Uploading NNPS Data to TurtleSAT

Citizen scientists like you have been collecting valuable data on nest predation rates through the NNPS. By uploading your data to TurtleSAT you contribute to a broader database used by researchers, conservationists, and policymakers to inform conservation strategies and management decisions. Your efforts play a crucial role in enhancing our understanding of turtle populations and ecosystems.

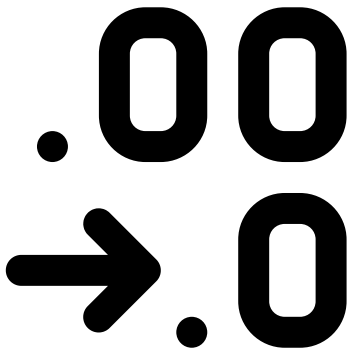


Background Information

Fractions, decimals and percentages

In science, we often use fractions, decimals, and percentages to describe parts of a whole or compare quantities. These mathematical tools help us analyse data, interpret results, and draw conclusions from experiments and observations.

Fractions in Science: In science, fractions are used to represent parts of a whole or parts of a group. For example, if we have a total of 10 turtle nests and 3 of them are predated, we can write this as 3/10. This fraction tells us that 3 out of the total 10 nests were predated.



Decimals in Science: Decimals are another way to express parts of a whole in science. They are used when we need to be more precise about measurements or quantities. Decimals are useful for recording and comparing measurements in experiments, such as measuring lengths, volumes, or weights of substances.

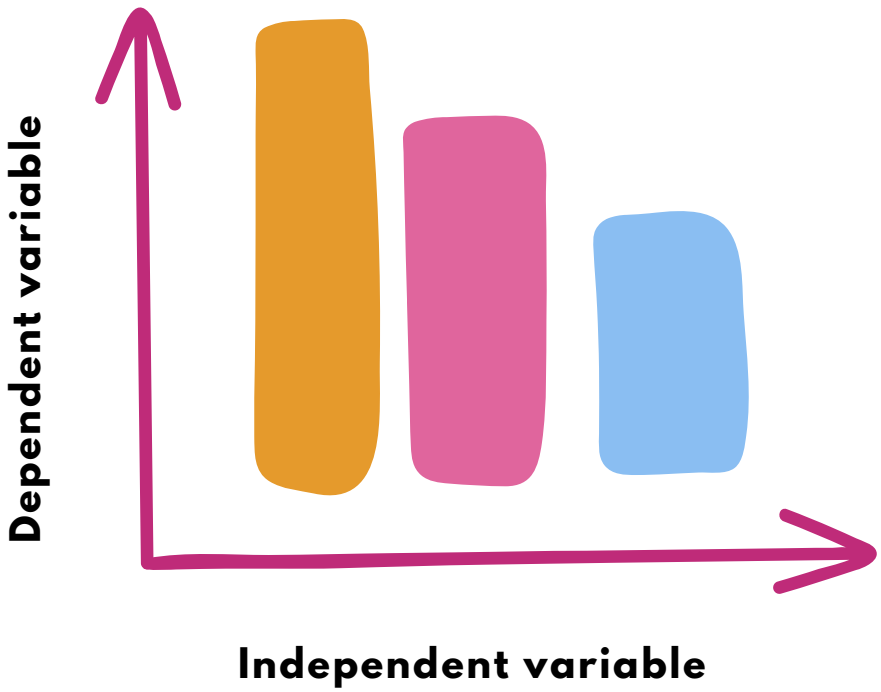
Percentages in Science: Percentages are widely used in science to show proportions. For example, if we conduct the NNPS experiment with 100 fake nests, and find that 75 out of 100 nests were predated, we can say that the nest predation rate is 75%. Percentages are essential for interpreting results, communicating findings, and making comparisons in scientific studies and experiments.

Background Information Variables

A variable is something that can change or vary in an experiment or investigation. It's like a piece of the puzzle that can be different from one situation to another. Scientists use variables to understand how things work and to solve problems.
There are two main types of variables: independent variables and dependent variables.

Independent variable: *a variable that is unchanged by other variables being measured.*

Dependent variable: *the variable that changes as a result of the independent variable.*



Classroom Activities

ACTIVITY 1

(1A) In the worksheet below, calculate the number of nests destroyed and write each as a fraction, decimal and percentage.

(1B) Fill in the blank box with your nest predation data. Write the value as a fraction, decimal and percentage.

ACTIVITY 2

(2A) Watch the following video on how to enter data from the NNPS into TurtleSAT.

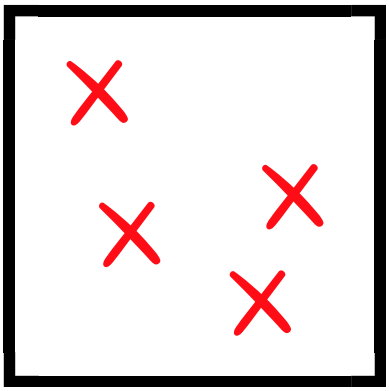
Link to video: [https://www.youtube.com/watch?v=v8xerXL-v3A&t=182s] (Copy and paste into browser)

(2B) Enter your data from the NNPS into TurtleSAT. Check your data to ensure you have documented the following, as per the NNPS guidelines:

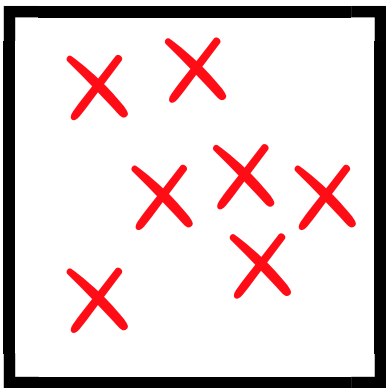
a. Number of nests destroyed
b. Number of nights that the camera was deployed (if you used a camera)
c. Number of day/nights that at least one fox was observed on camera
d. Dates when you started and ended the survey
e. Location (your GPS coordinates) or you can tap on the site location on the TurtleSAT map.

Percentage of Nests Destroyed

Calculate the number of nests predated (X) in the plots below and write the value as a fraction, decimal and percentage. Assume each plot started with 10 nests. The first has been started for you.

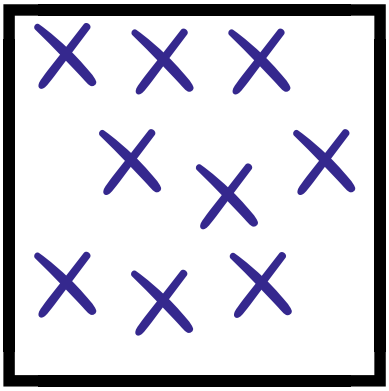


Fraction	Decimal	Percentage
$\frac{4}{10}$	0.4	40%



Fraction	Decimal	Percentage
$\frac{7}{10}$	0.7	70%

In the box below, plot your nest predation data from the NNPS. Write the value as a fraction, decimal and percentage. **Example only.**



Fraction	Decimal	Percentage
$\frac{9}{10}$	0.9	90%

Classroom Activities

ACTIVITY 3

(3A) Identify independent and dependent variables from the NNPS.

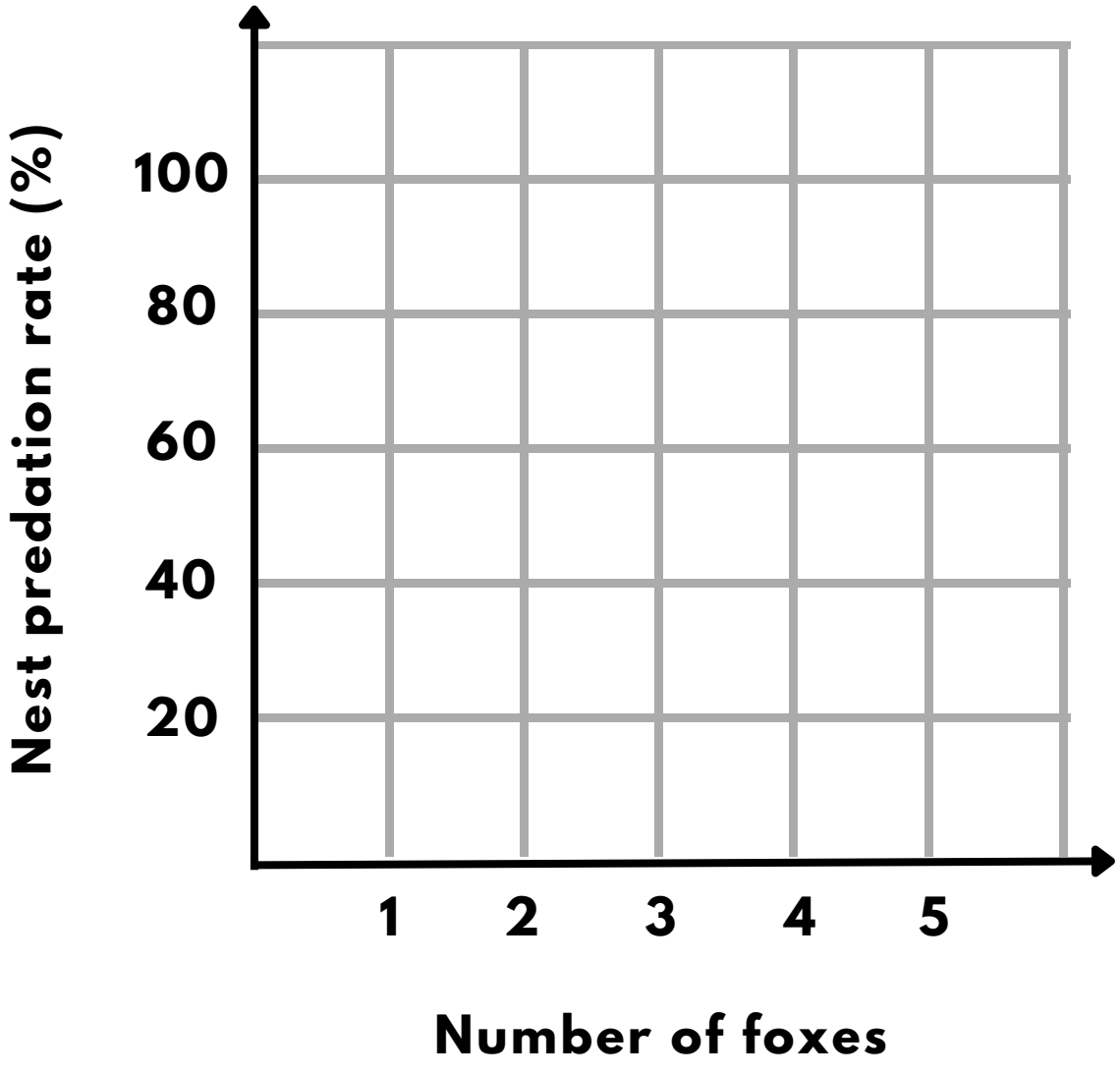
(3B) In the worksheet, graph the number of foxes and the nest predation rate. Students may also choose to graph their own nest predation data if wildlife cameras were deployed.

(3C) Interpret the line graph. Describe what the trend of the line means in the context of freshwater turtle nests and fox predation.

Graphing Data

Below is nest predation data. Draw a line graph of the data.

Number of foxes	1	2	3	4	5
Nest predation rate (%)	50	90	100	95	100



Interpret your findings

Explain the trend of the line graph above. Describe what the trend means in the context of freshwater turtle nests and fox predation.

Classroom Activities

ACTIVITY

What I Know (K), What I Want to Know (W), What I Learnt (L)

Materials:

- Large chart paper divided into 3 sections labeled "K" (Know), "W" (Want to Know), and "L" (Learnt).
- Markers or pens

Instructions:

(1A) Revisit your Know, Want to Know and Learnt chart and complete the Learnt (L) column.

What I Know (K)	Want to Know (W)	What I Learnt (L)
		

Photo credit (turtle): Dr Donald McKnight