

# Junior Explorer Activity



Activity Sheet 5.

## BIODIVERSITY BUSINESS

opportunity » growth » lifestyle



There are plenty of cool natural places to explore in Frankston. Some of them are featured in our booklet “Natural Reserves within Frankston City” which you can find on Council’s website. Check out a Bush Reserve near your place and look out for BIODIVERSITY.

### HEADING OUT

Before you start out, here are some tips for keeping you and your park safe:

#### Know before you go!

Dress for the weather. Take a rain jacket or hat and wear sturdy covered shoes.



Let someone know where you are and stay with an adult.

#### Keep Our Parks Wild

Respect animal homes by leaving rocks, logs and vegetation as you find them and stay on the tracks. Remember nature’s treasures belong in the bush, not in your pockets.



#### Leave No Trace

The best souvenirs are your memories and photographs or drawings. Leave only footprints and always take your rubbish home.

### BIODIVERSITY IS:

A Big Word: You don’t have to go to Uni**VERSITY** to learn about Biodi**VERSITY**.

Bio = Life and Diversity = Many

Biodiversity = Variety of Life



It means “nature” and all things that support it. Scientists measure Biodiversity in 3 ways:

**All Life Forms:** All Earth’s living things (species), no matter how big or small are part of our Biodiversity. **More species = better biodiversity.**

**Genetic information:** Each living thing is unique with its own set of DNA. The bigger the population of a plant or animal, the greater the genetic diversity. **Bigger populations = better biodiversity.**

**Ecosystems:** Different types of environments (ecosystems) support different types of plants and animals. **More ecosystems = better biodiversity**

# THE WEB OF LIFE

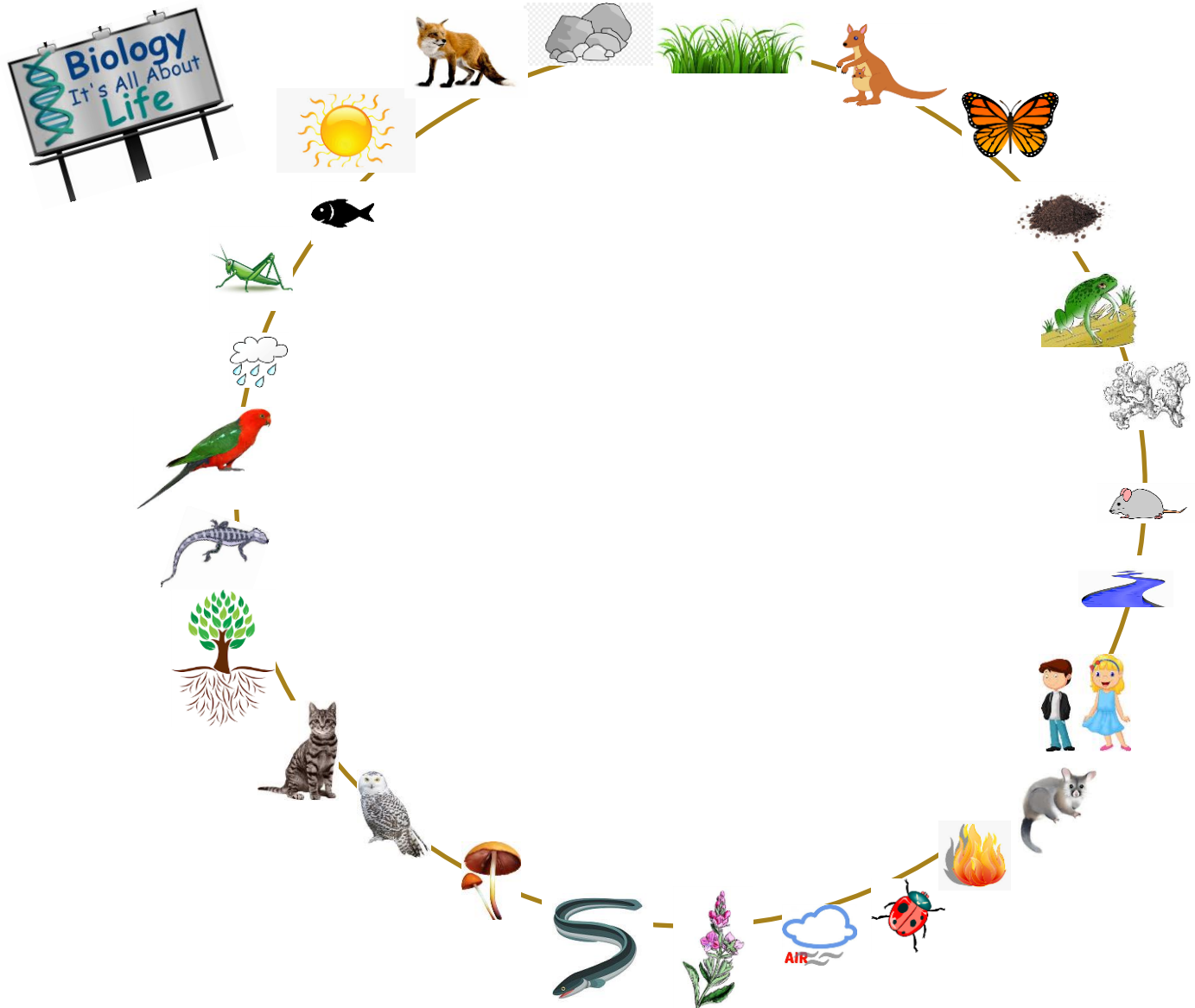
Frankston’s biodiversity includes all living things as well as all the things here that keep them alive. All things in our environment (ecosystem) are connected in a kind of web.



Equipment: Pencil & this page.

Instructions:

- Draw lines across the circle to connect the various parts of the ecosystem that rely on each other for survival
- Clue: Start with the Sun and follow the “flow of energy”. “The Sun is the source of energy for all living things!”



Which two things in our web of life don't belong in the bush and can upset the delicate balance of nature? 1. 2.

Clue: they were both introduced to Australia from overseas

## PLANT QUADRATS



Counting the number of plant types in an area is one way of measuring Biodiversity.

**Equipment:** four tent pegs; 4 metre length of rope or twine; tape measure; pen and notebook

**Instructions:**

- Push a tent peg into the ground along the edge of a bush track
- Measure 1 metre along the track and push another peg into the ground
- Use another 2 pegs to form a square with 1 metre sides (a 1m<sup>2</sup> quadrat) and join the pegs with your twine
- Keep the twine along the ground so you don't trip over it.
- Now count the number of different types of plants in your 1 m<sup>2</sup> quadrat and record the number in the table below.

Quadrat number	Number of plant types
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
Total	per 10m <sup>2</sup>
Population	per 100m <sup>2</sup>

**Tips:**

- Try this in different bushland reserves to see which has the most biodiversity.
- Learn to recognize two types of plants and repeat the activity, counting how many of each type you find in each quadrat. (use our indigenous plant guide)

## BIRD TRANSECTS



When counting animals, scientists use "line transects" and record what they see or hear while walking a set distance from A to B.

**Equipment:** note book and pen; bird guide; binoculars

**Instructions:**

- Select a bush area with a track that is at least 200metres long.
- Start by standing quietly while listening and watching for birds in the surrounding area.
- Take note of what you see or hear in your notebook
- Move 20 metres (20 giant steps) along the track and stop again to listen and watch.
- Repeat 10 times to cover 200metres.
- Record your findings in the table below.



Transect station	No. seen	No. heard	Total numbers
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Totals			

## 5 KINGDOMS OF LIFE

Biologists group living things that have common features into 5 main groups.



5 Kingdoms:	Estimated types Worldwide	Australia	Victoria's Gippsland Plains
Monera bacteria	5-10 mil		?
Protista protozoa & algae	1 mil	160,000	?
Fungi – e.g. mushrooms	1.5 mil	50,000	?
Plants	250,000	21,000	1,376
Animals			
- invertebrates	10-30 mil	320,000	
- fish	40,000	5,750	
- amphibians	15,000		26
- reptiles	10,000	2,470	48
- birds	10,000		421
- mammals	5,500		89

## CITIZEN SCIENTISTS

Keeping track of all plants and animals is a huge task. Scientists can't do it all on their own, so they rely on us "citizen scientists" to help out. Here's just a few ways:

- **Museum Victoria Backyard BioBlitz** - could lead you to some amazing discoveries close to home!

<https://museums victoria.com.au/melbournemuseum/at-home/play/backyard-bioblitz/>

Learn more here: <https://youtu.be/mFNjDxDVhyQ>

- **Museum Victoria Forest Secrets** – 5 activities to help you learn about forests in Victoria

<https://museums victoria.com.au/museum-at-home/learning/forests-and-their-secrets/>



Learn more here <https://youtu.be/vAjFMa1x2UQ>

- **BirdLife Australia** - Aussie Backyard Bird Count, one of Australia's biggest citizen science events, during National Bird Week in October. Get practicing now. <http://www.aussiebirdcount.org.au/>

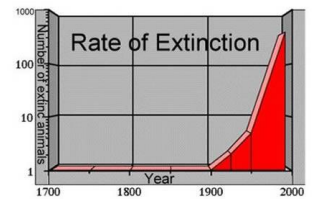
- **Melbourne Water** – Frog census. Frogs are an important indicator of a healthy environment. Help keep a watch on their health.

<https://www.melbournewater.com.au/water-data-and-education/get-involved/be-citizen-scientist/frog-census>



## BIODIVERSITY THREATS

The diversity of life on this planet is decreasing all the time. As many as 24 species become extinct every day, mainly due to the activities of humans.



Its not just dinosaurs that are extinct. Some of our local animals have become extinct in the last 185 years.

The main threats to our local biodiversity are:

- habitat loss, change and fragmentation
- pest plants (weeds) and animals
- changed fire and water patterns
- the effects of climate change.

Our ground dwelling animals have suffered most from predation by foxes, dogs and cats. 76% of our original native mammals in Frankston are extinct or endangered. Sugar gliders are still fairly common because they rarely come to the ground.

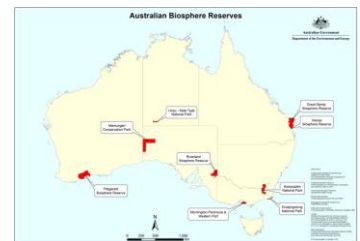
You can help by keeping pets under control, planting more indigenous plants and composting garden waste so weeds don't spread into the bush.

Watch this video to learn more about Victoria's Biodiversity. <https://youtu.be/1Ad9dudt-Ms>

## WESTERN PORT BIOSPHERE

Biosphere reserves are recognised by the United Nations 'Man and the Biosphere' (MAB) Program which aims is to achieve a balance between keeping biological diversity and maintaining our standard of living.

The Mornington Peninsula and Western Port is one of only 9 Biosphere Reserves in Australia and includes 2 wetlands of international significance.



Frankston City is a proud supporter of the Western Port Biosphere

<https://www.biosphere.org.au/>



## OCEAN BIODIVERSITY

Over 70% of our planet is covered by ocean. It probably should be called "Ocean" instead of Earth.



The oceans hold amazing biodiversity, much of which we rarely see.

- 30% of life forms are exclusively marine
- tiny ocean plants produce half the oxygen on earth
- these plants form the basis of the ocean food chain, feeding fish, marine mammals, and humans
- ocean plants absorb carbon 50 times faster than tropical forest, and hold 5 times more carbon
- Coral reefs are biodiversity hot spots, with up to 1,000 species / m<sup>2</sup>.
- Only 1% of the world ocean is protected

<https://www.nationalgeographic.com/environment/habitats/ocean/>

Our very own Port Phillip Bay has amazing biodiversity in a very small area. Check this website to watch short videos on underwater habitats in our Bay.

<https://portphillipmarinelife.net.au/>

Plastic in our oceans is a serious risk to marine animals that can mistake it for food. They can die trying to digest it.

Nurdles are an increasing problem for our wildlife. These plastic pellets, smaller than your little fingernail, are melted down to make new plastic products. They often get spilt and then wash into drains and creeks, ending up floating in the oceans where they look just like fish eggs. Fish can easily mistake them for food but can't digest them. Unfortunately, most of our beaches have lots of different coloured nurdles mixed in with the sand grains.



## BEACH LITTER ACTIVITY.

Frankston Rangers and the Beach Patrol volunteers spend a lot of time keeping our beaches clean. You may have seen the tractor towing a "beach cleaner", collecting larger pieces of rubbish from the sand.



Next time you visit the beach, collect and record the litter you find.

**Equipment:** Collection bag or bucket; pair of tongs; gloves; record sheet and pen; sun hat; sunscreen

**Directions:**

- Walk along the beach near the water's edge
- Collect litter as you go & place in your bag / bucket
- Stop when you have filled it or walked 100 metres
- Tip the rubbish out and sort it into categories on your record sheet, counting them as you go
- Repeat by returning along the top of the beach
- Make sure your rubbish goes into the correct bins when you have finished. Some things will be recyclable. Find out more here:



[https://www.frankston.vic.gov.au/Environment\\_and\\_Waste/Waste\\_and\\_Recycling/A - Z Waste and Recycling Directory](https://www.frankston.vic.gov.au/Environment_and_Waste/Waste_and_Recycling/A-Z_Waste_and_Recycling_Directory)

**Caution:** If you see a syringe, don't touch it. Tell the nearest adult and report it to the Council on 1300 322 322. It needs to be disposed of safely.



Date:	No. at water's edge	No. along beach top
Category		
Plastic bottles		
Glass bottles		
Plastic straws		
Large plastic fragments		
Small plastic (microplastics)		
Broken glass		
Cigarette Buts		
Nurdles		

**Suggestion:**

- Consider joining one of the 2 Beach Patrol Groups who regularly help clean our beaches.  
[3199@beachpatrol.com.au](mailto:3199@beachpatrol.com.au) – Frankston or  
[3198@beachpatrol.com.au](mailto:3198@beachpatrol.com.au) - Seaford
- Get involved in the Great Global Nurdle Hunt to help remove nurdles from our beaches. Every little bit helps! <https://www.nurdlehunt.org.uk/take-part/the-great-global-nurdle-hunt.html>

## FLOWER WATCH

Australia has many types of insects, birds, and even mammals that pollinate flowers. There are 2,000 native bee species in Australia, and Each Spring the bush and our gardens come alive with flowers bursting open ready to attract them with



<https://wildpollinatorcount.com/>

**Instructions:** Choose a sunny, warm and calm day

- Find a flowering plant or tree in a park or your yard
- Select either a large flower or a bunch of small flowers that are easy to watch
- Watch the flower(s) continuously for 10 minutes
- Record below any insect that visits your flower
- Try watching different flowers at different locations and times of the day
- 



Flower type & colour	Time of Day	Insect visitors	Insect visitors
e.g. Banksia (orange)	8.30am	3 Butterflies	6 Hover Flies

**Tips:** Visit the Wild Pollinator Count website to help you identify insects. (Print the Quick Guide to take with you)

<https://wildpollinatorcount.com/resources/bee-fly-or-wasp-2/>

## A LIVING PLANET

Nearly 300 years ago, James Hutton came up with the idea that our Earth and it's atmosphere is a living "super-organism" that can regulate its own environment.

He said the Earth is able to maintain conditions favorable for the survival of life, and it is the living things on Earth that make that happen.



At the time no one took much notice, but 200 years later James Lovelock called the idea the "Gaia theory" (pronounced GAY-ah), after the Greek Goddess of Earth who pulled the living world together out of chaos and disorder.

Lovelock wrote that the Earth operates like the human body as a system of interacting components:

- Rain forests exchange O<sub>2</sub> and CO<sub>2</sub> like our lungs
- Earth's atmosphere is like our respiratory system
- Streams and rivers are like our circulatory system
- Wetlands are like our kidney's filtering the blood
- The Earth can "breathe", contracting and expanding with the Moon's gravitational pull
- Seasonal changes reflect our own bodily cycles.
- The diversity of life reflects billions of cells in our bodies working together as a single being
- Soil microbes are like our gut bacteria
- Earth's inner core is like our heart

Lovelock says the Earth has four main systems that work together:



- Atmosphere (air)
- Biosphere (all life forms)
- Geosphere (soils and rocks)
- Hydrosphere (water)

For Gaia (Mother Earth) to be healthy, all four systems must be in good working order and able to work together in harmony.

## FURTHER READING:

Frankston City website (downloadable booklets)

[https://www.frankston.vic.gov.au/Environment\\_and\\_Waste/Environment/Biodiversity](https://www.frankston.vic.gov.au/Environment_and_Waste/Environment/Biodiversity)

- *Natural Reserves within Frankston City*
- *Indigenous Fauna Guide*
- *Indigenous Plant Guide*



## FOREST ECOSYSTEM COLOUR IN PAGE



## MARINE ECOSYSTEM COLOUR IN PAGE



More colour-in sheets from Museum Victoria [https://museums victoria.com.au/media/14741/rivers\\_play\\_activity\\_final.pdf](https://museums victoria.com.au/media/14741/rivers_play_activity_final.pdf)