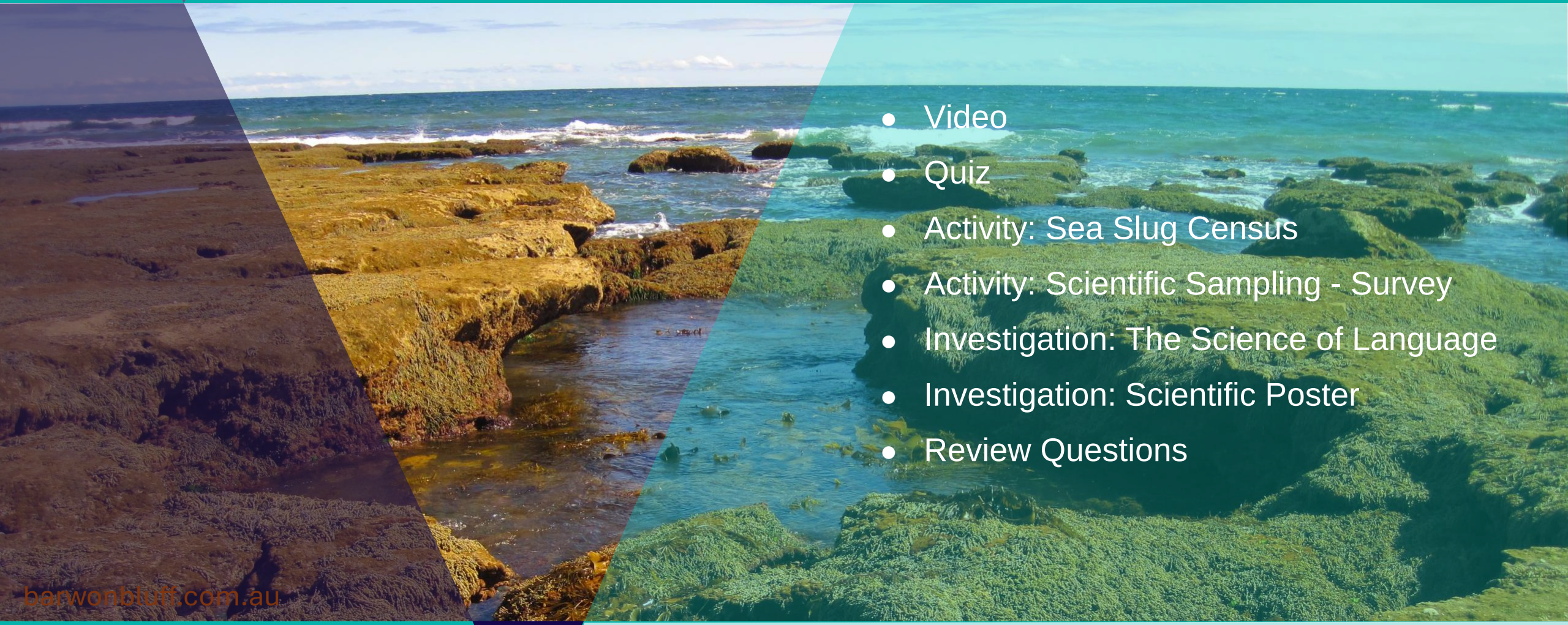
Coastal Custodians, Citizens and Scientists

Parks Victoria

Coastcare Victoria

VICTORIA State Government

Lesson outline



- Video
- Quiz
- Activity: Sea Slug Census
- Activity: Scientific Sampling - Survey
- Investigation: The Science of Language
- Investigation: Scientific Poster
- Review Questions

barwonbluff.com.au

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Video: Barwon Bluff

Video link: https://www.marineandcoasts.vic.gov.au/coastal-programs/coastcare-victoria/coastcare-victoria-school-kit

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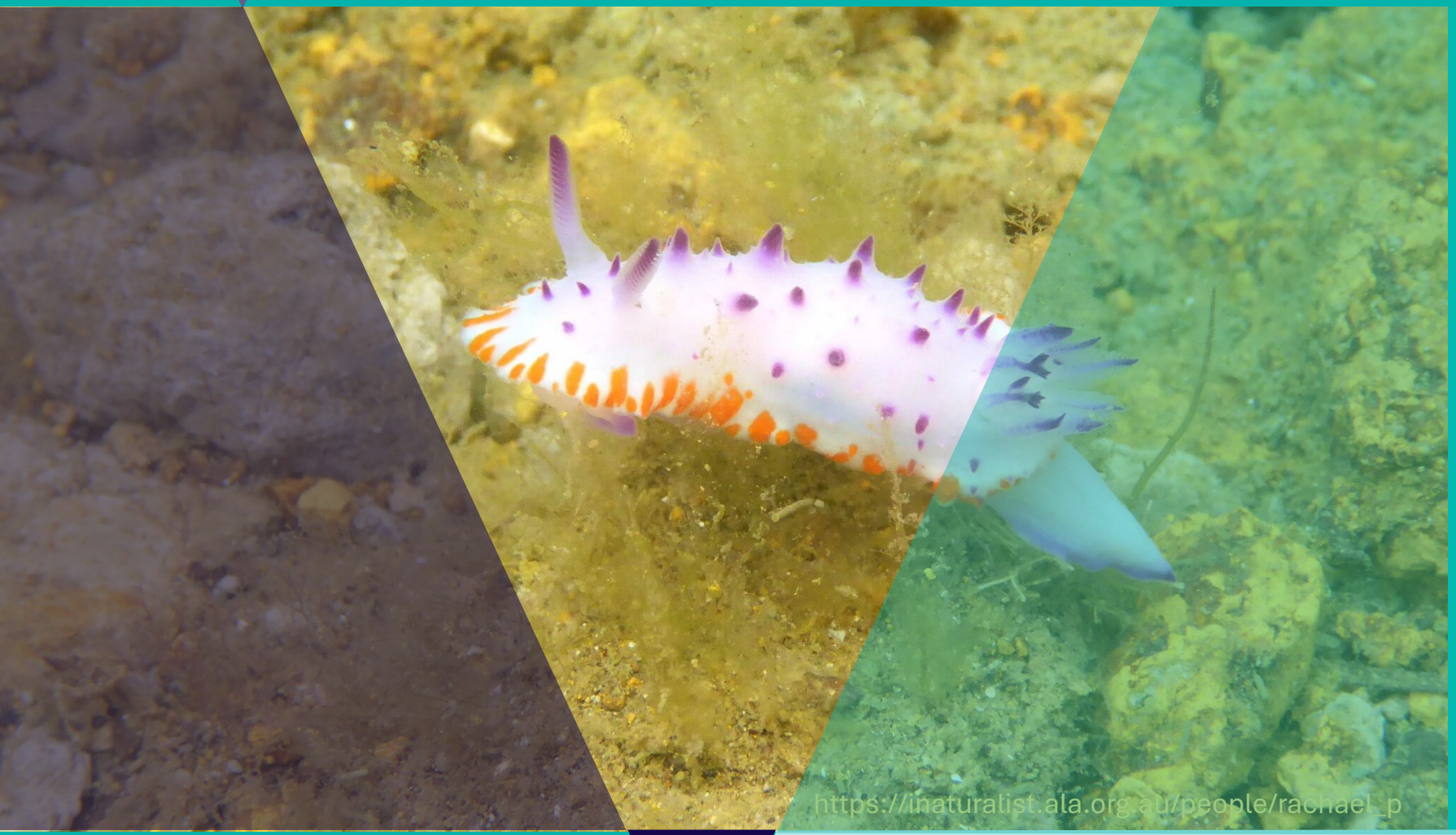
Quiz

- It’s time for a quick quiz to see what you can remember from the video!
- There are a total of 10 multiple choice questions on your worksheet.

Sea Slugs Census



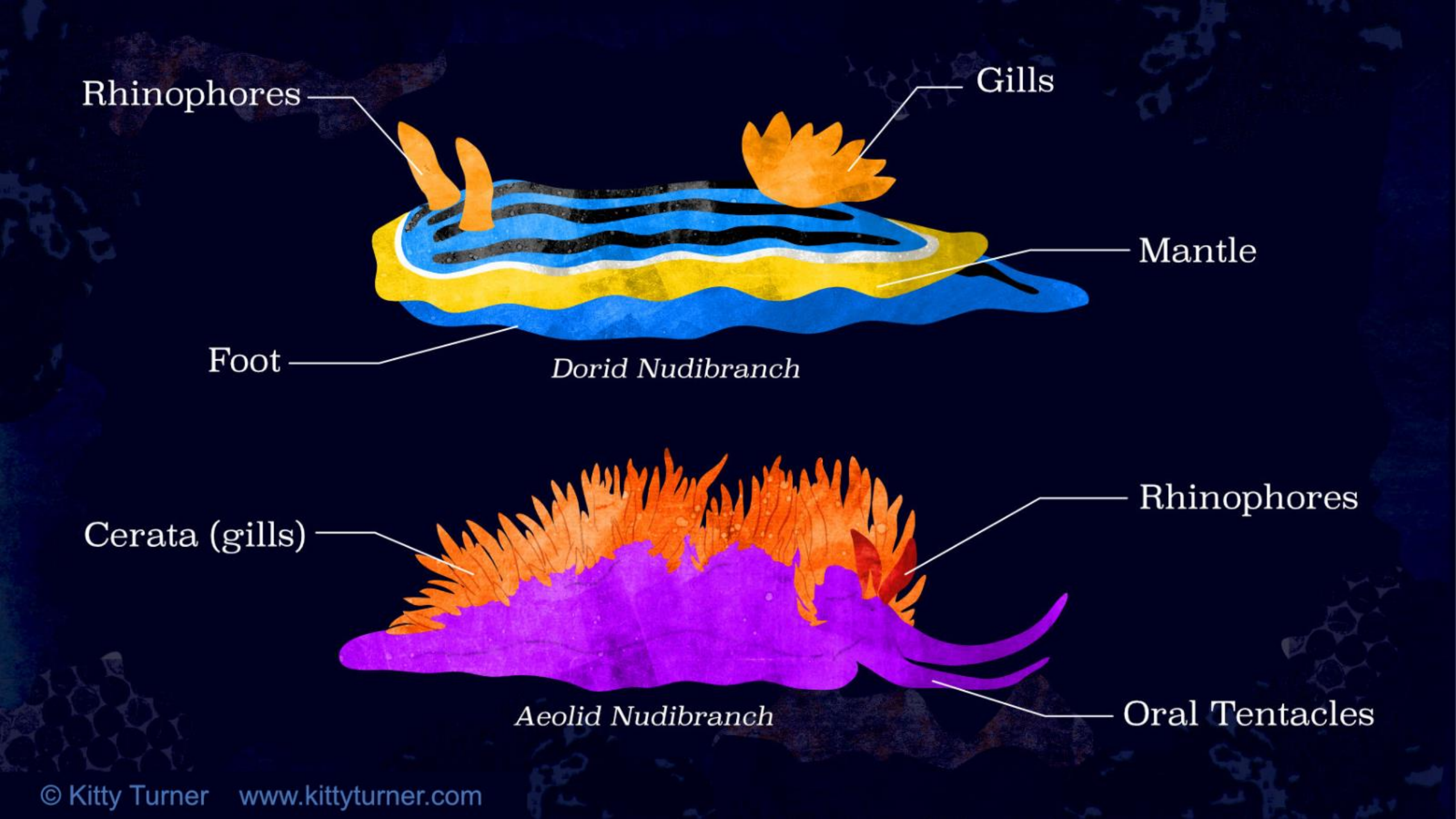
- A census is an official count of a population.
- The Sea Slug Census focuses on sea slugs, also known as nudibranchs.
- Nudibranch means naked-gill, because these sea slugs have no shell and exposed gills.
- You can identify different groups of nudibranchs using their gills.
- iNaturalist uses AI image recognition and specialists to identify photos taken by citizen scientists.

https://inaturalist.ala.org.au/projects/melbourne-sea-slug-census-march-2024

What is a Nudibranch?

A Nudibranch (new-dih-brank) is a type of sea slug. They are shell-less molluscs and come in many weird and wonderful varieties. They often have amazing bright colours, unusual patterns and strange superpowers!

There are two main categories of Nudibranch- Dorid and Aeolid. Take a look at the differences in their anatomy.



Bright Colours

Nudibranchs can come in many amazing bright colours and patterns which can look really pretty to us. However, this acts as a warning signal to show predators that they are poisonous and dangerous.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Mimicry

Some nudibranchs have colours, patterns or cerata that look similar to plants and corals around them as a way to camouflage. The food they eat can also affect their colouring which will help them blend into their surroundings. This helps keep them safe and out of sight from predators.


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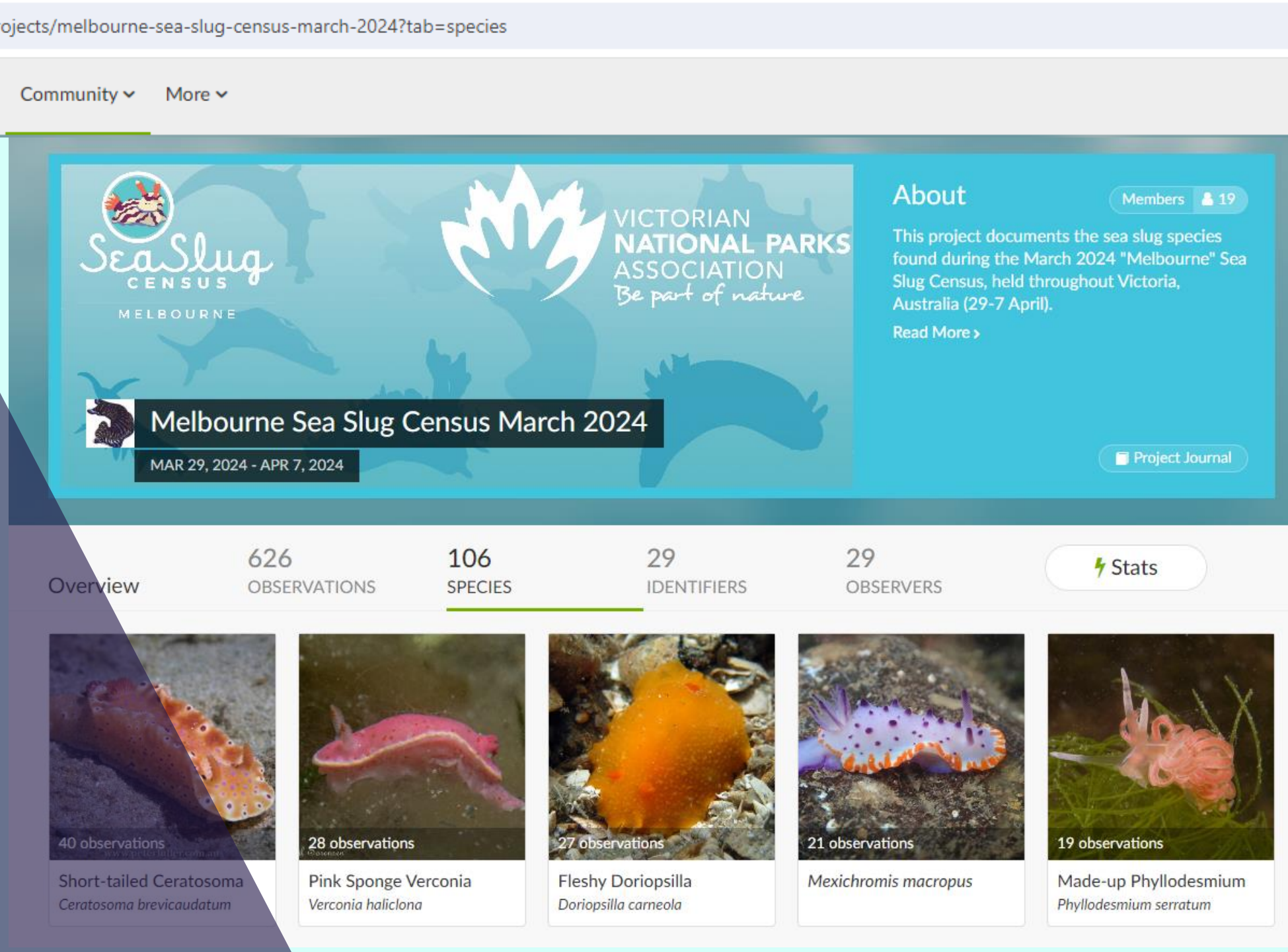
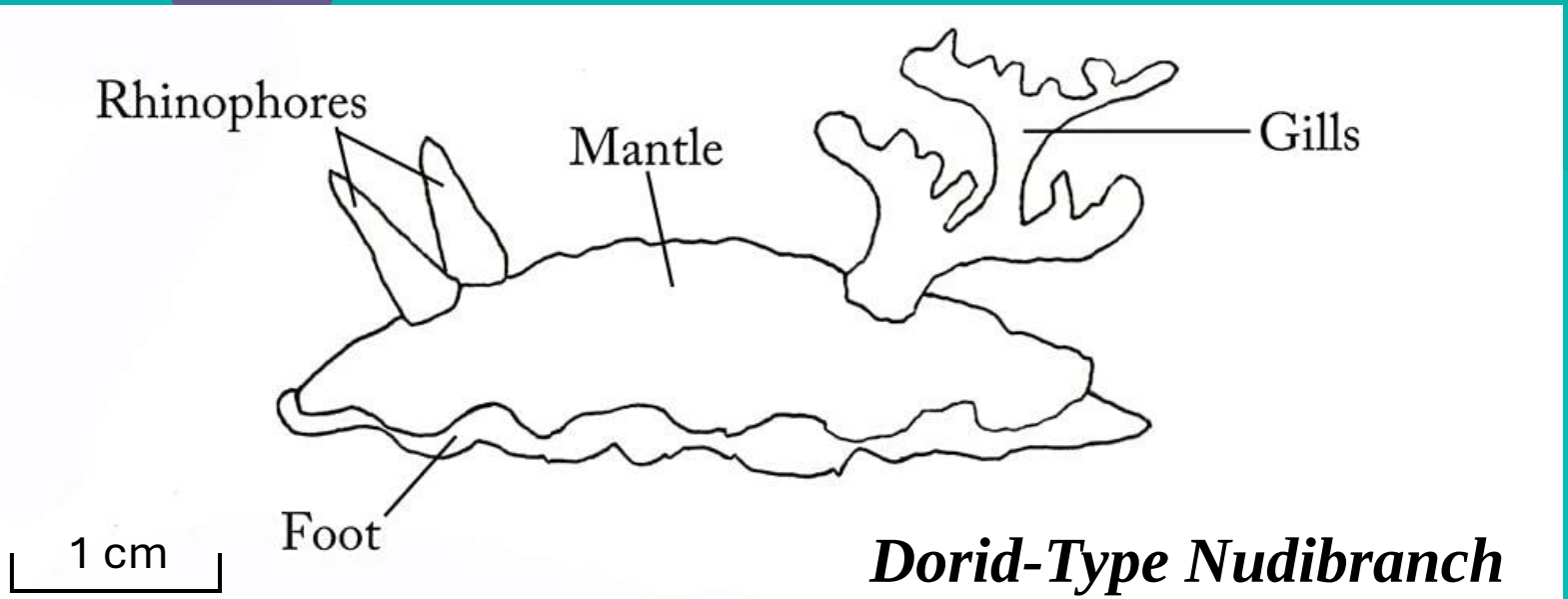
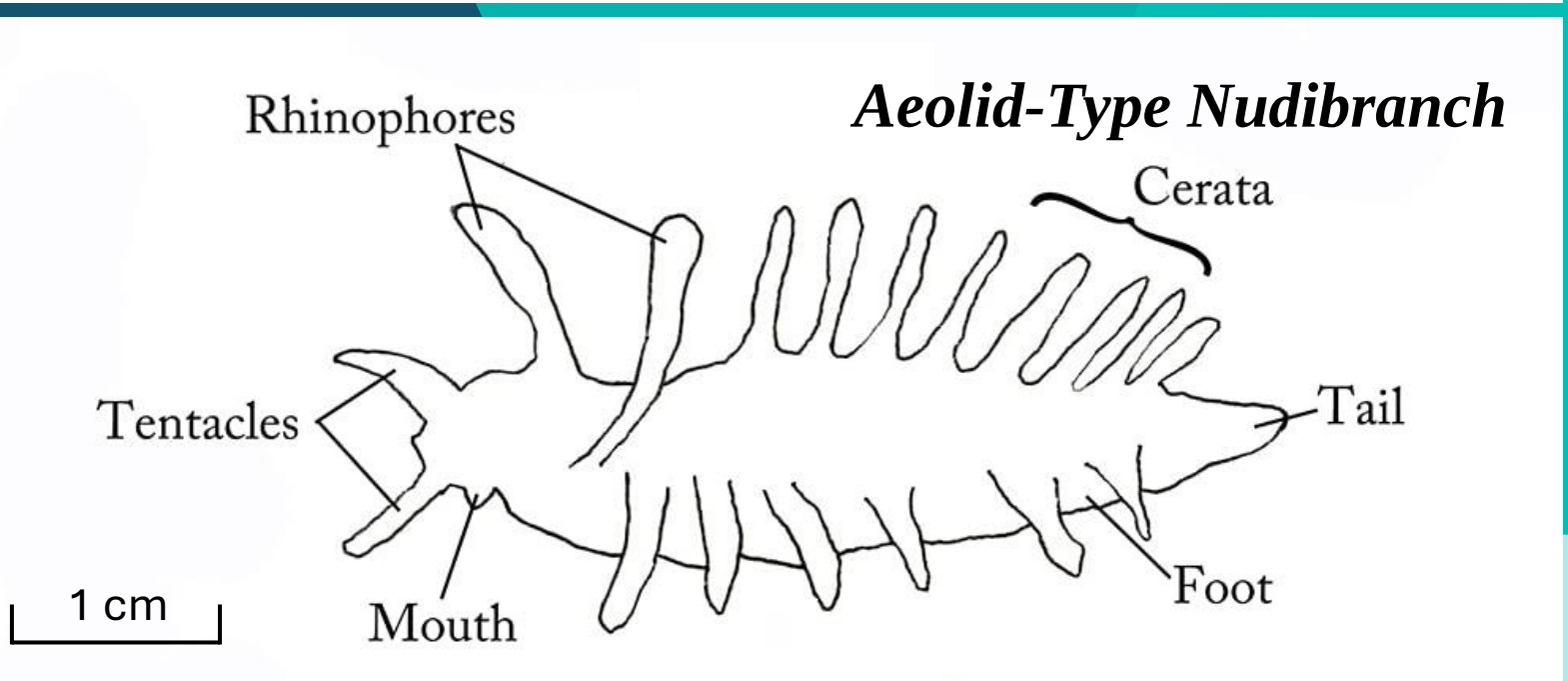
- Go to iNaturalist
- Search for the project page of Melbourne Sea Slug Census
- Answer the questions in Activity 2



Scientific Diagram

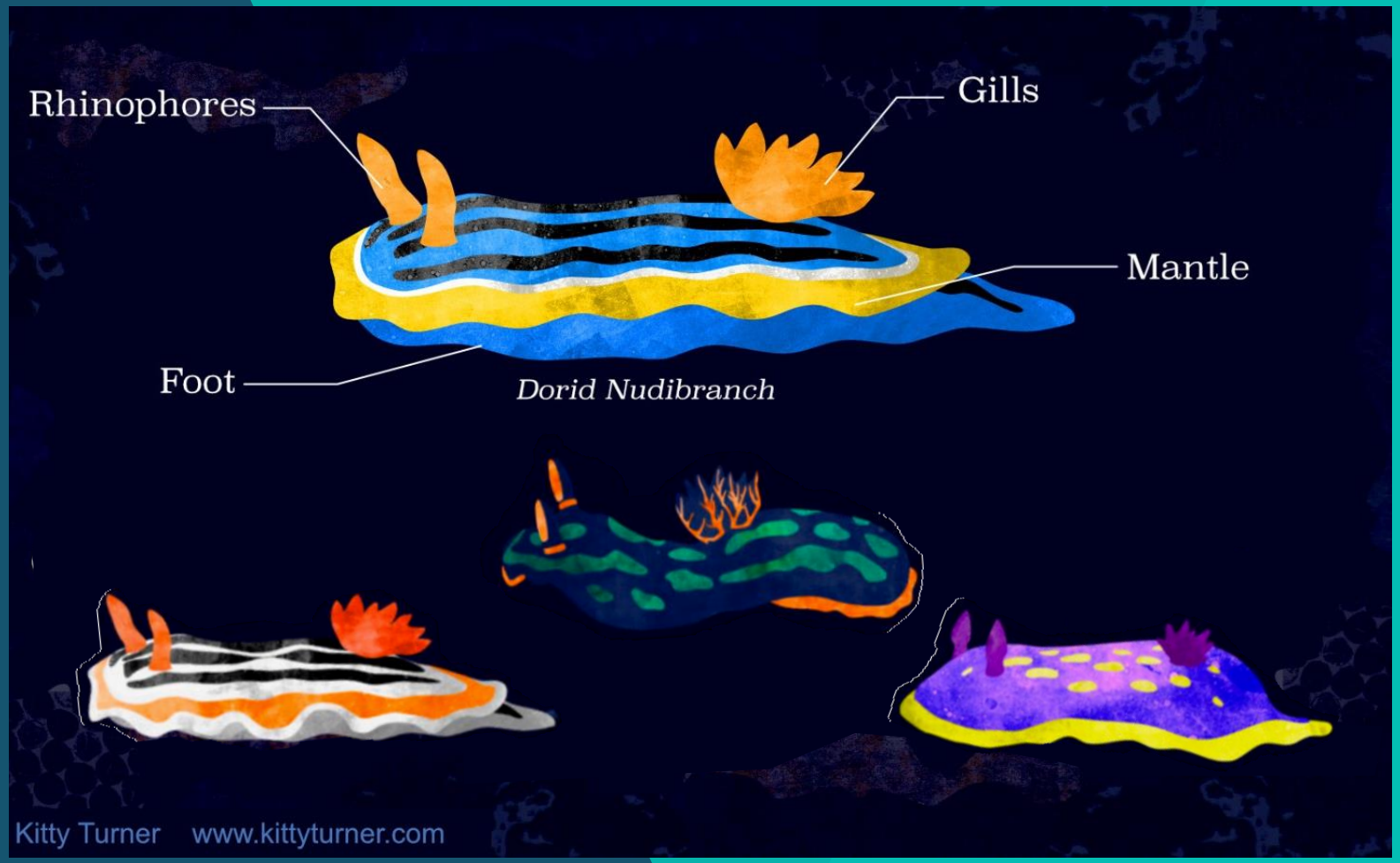




- Scientific diagrams are simple line drawings which focus on anatomy (body parts).
- They include:
  - Labels for body parts
  - A scale bar showing the size of the animal in real life.
- They do not include colour or shading.

Choose a nudibranch from the Melbourne Sea Slug Census and draw a scientific diagram of its anatomy.

Scientific Illustration

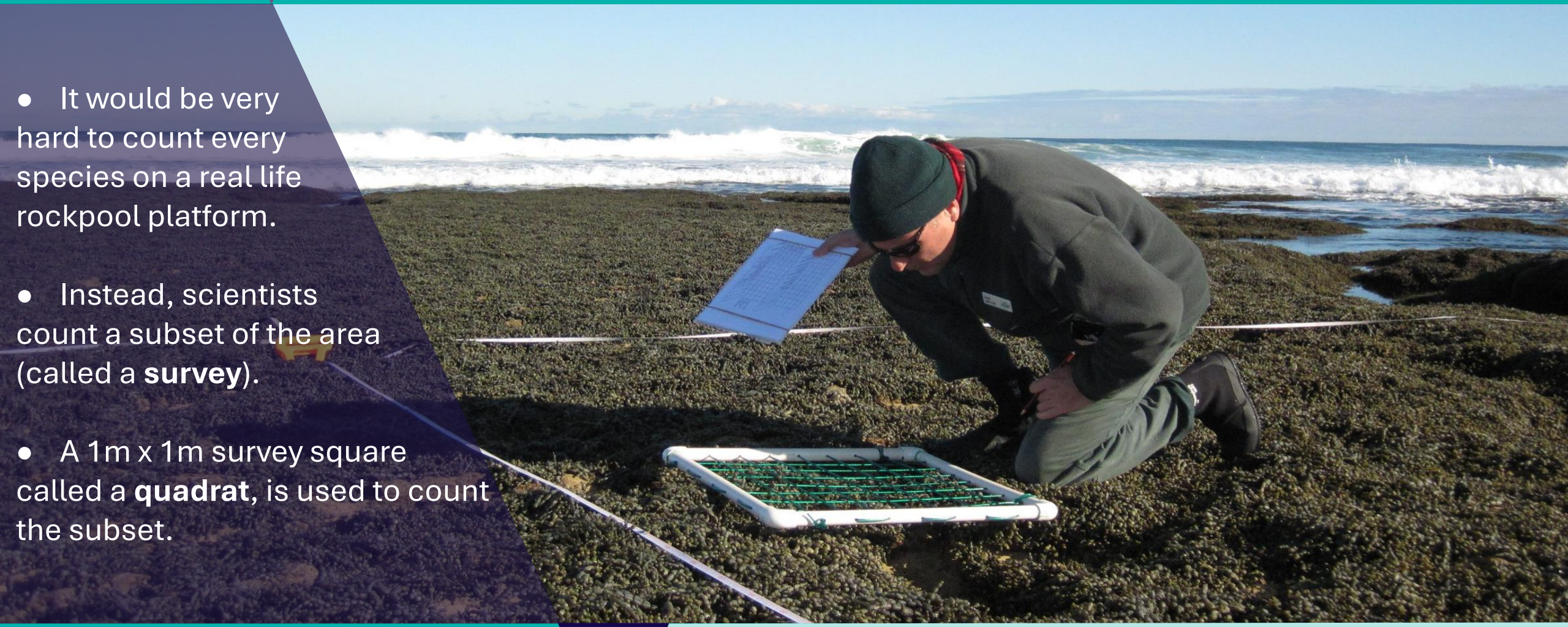


- Many nudibranchs share the same basic body shape – covered in wild and wonderful markings.
- Their species cannot be identified from a black and white diagram.
- A scientific illustration is a precise and accurate technical drawing which includes realistic colour.

Add colour to your nudibranch diagram to match the species you drew.

Scientific Sampling - Survey

- It would be very hard to count every species on a real life rockpool platform.
- Instead, scientists count a subset of the area (called a **survey**).
- A 1m x 1m survey square called a **quadrat**, is used to count the subset.



Scientists count species to understand how many there are and what species are present. This balance can tell scientists a lot about the health of the ecosystem.

Survey Species Profile

Neptune's Necklace seaweed

Hyper-abundant:

Can store water within each bead-like segment which protects it from drying out during low tide. Therefore, it is often the most abundant seaweed in the intertidal zone covering 80 – 100% of intertidal rocks in some areas of the Barwon Bluff. Providing food and shelter for many intertidal animals. A traditional food for Indigenous People.

Elephant Snail

Uncommon:

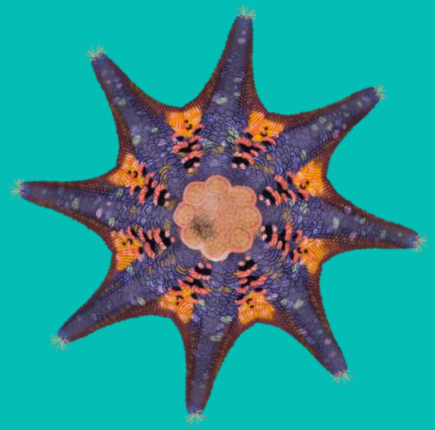
These large snails (8-10 cm) are easily recognized by their black body which is not totally covered by their white shell. They are easily dehydrated and come out at night to graze on seaweed. A traditional food for Indigenous People.

Nudibranchs

Some species are common, some are rare:

Easily overlooked.

Most are small 5 mm - 3 cm and very difficult to see.



Eight-armed Sea Star & Notched Shore Crab

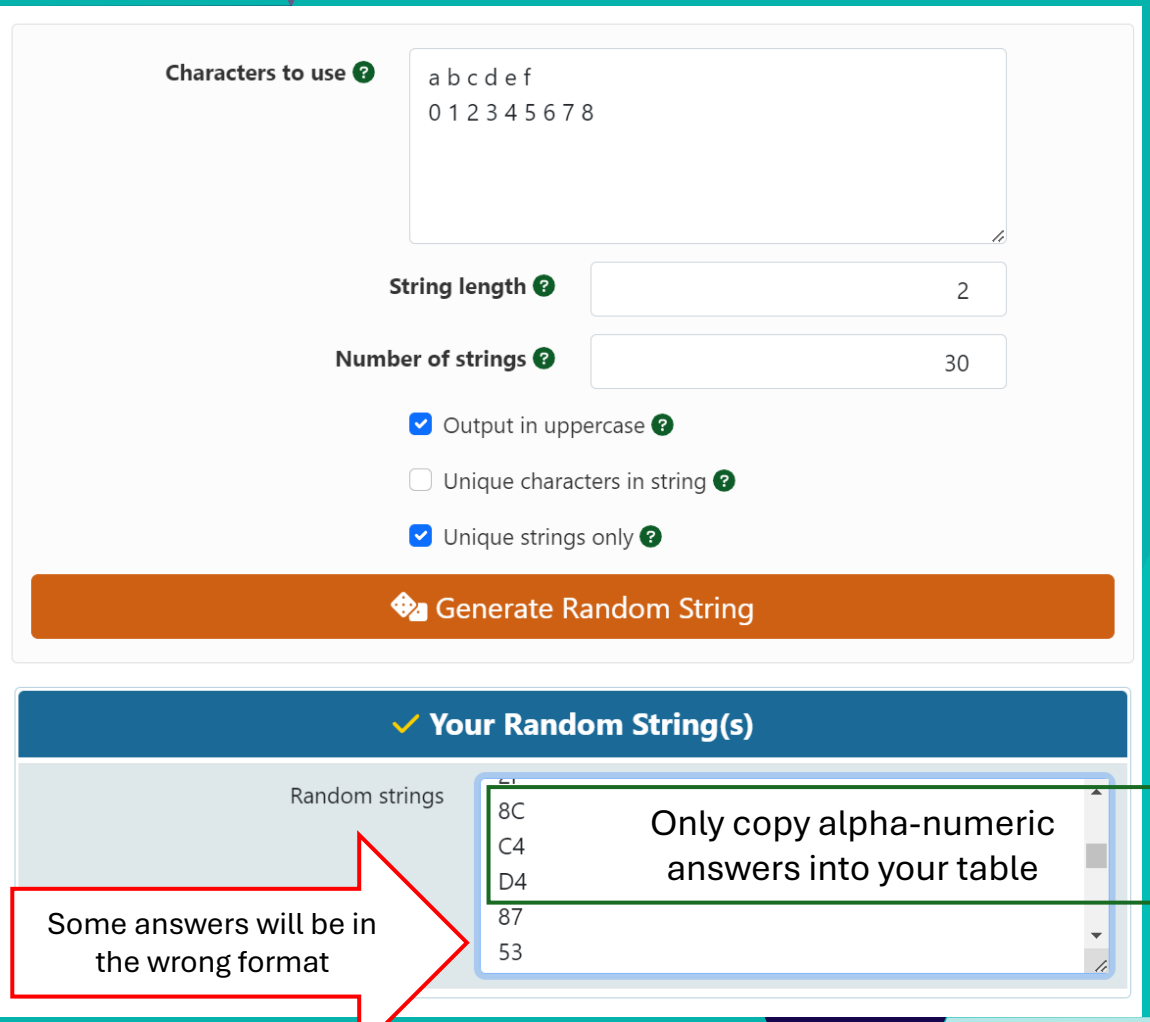
Common:

These abundant scavengers find plenty to eat in rockpools; like seaweed and dead fish.

They both reproduce in large numbers.

They can be found sheltering in big groups under rocks while the tide is low.

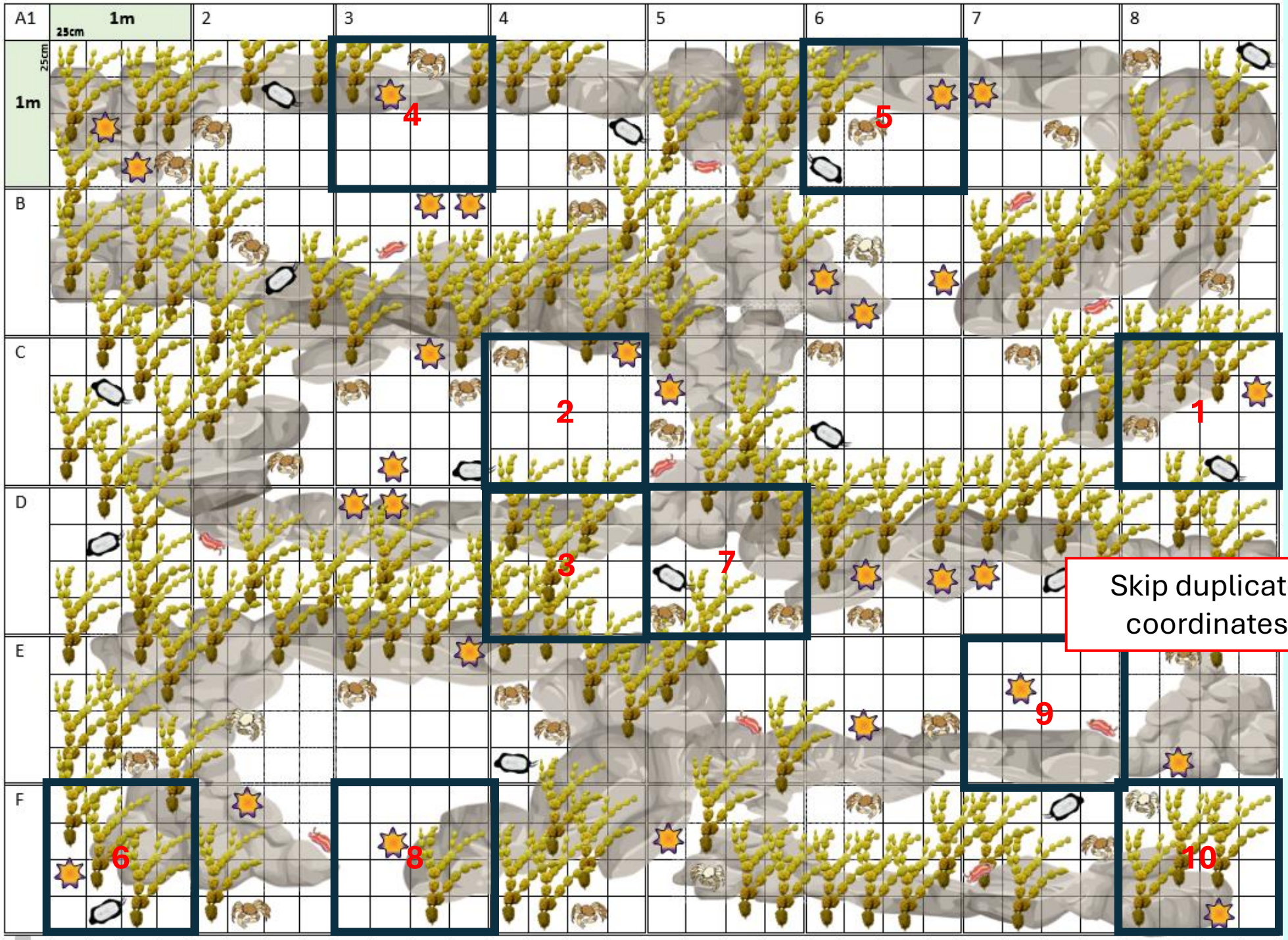
Scientific Sampling: Survey



- Use a random number generator to create unbiased coordinates for placing your quadrat on the rockpools
  - Between 1-8 across
  - Between A-F down
- Record 10 alpha-numeric coordinates in your worksheet
  - Make sure each one is unique

Quadrat coordinates 1-8 x A-F									
1:	8C	**2:**	4C	**3:**	4D	**4:**		**5:**	
6:		**7:**		**8:**		**9:**		**10:**	

Random String Generator:
https://www.gigacalculator.com

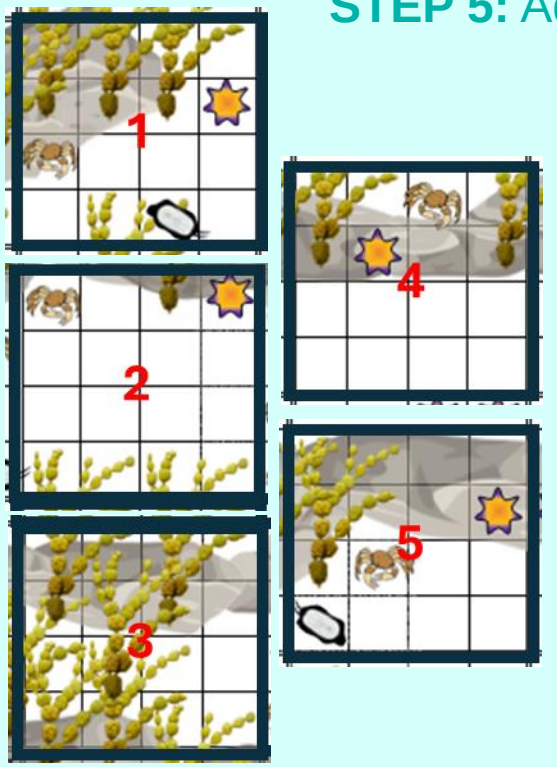


Outline & number each of your ten 1m x 1m quadrats

Skip duplicate coordinates

Coordinates		
#	1-8	A-F
1	8	C
2	4	C
3	4	D
4	3	A
5	6	A
6	1	F
X	6	A
7	5	D
8	3	F
9	7	E
10	8	F

STEP 5: Add together each organism you counted in 1, 5 and 10 quadrats



Species	Shore Crab	Eight-armed Sea Star	Nudibranchs	Elephant Snail	Neptune's Necklace Seaweed
TOTAL COUNT	35	30	10	15	420 grid squares
Quadrat 1	1	1	-	1	7
Quadrat 2	1	1	-	-	5
Quadrat 3	-	-	-	-	14
Quadrat 4	1	1	-	-	5
Quadrat 5	1	1	-	1	5

STEP 6: Calculate your multipliers

How much of the total rockpool area is 1 quadrat?

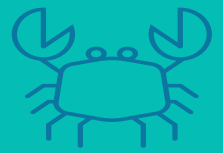
48 ÷ 1 = [_48_] A

Multiply the number of species from quadrat 1 by answer **A 48**

Species	Shore Crab	Eight-armed Sea Star	Nudibranchs	Elephant Snail	Neptune's Necklace Seaweed
TOTAL COUNT	35	30	10	15	420 grid squares
Number in Q1	1	1	-	1	7
Multiply x A 48	48	48	0	48	336
Number in Q1+2+3+4+5	4	4	0	2	36

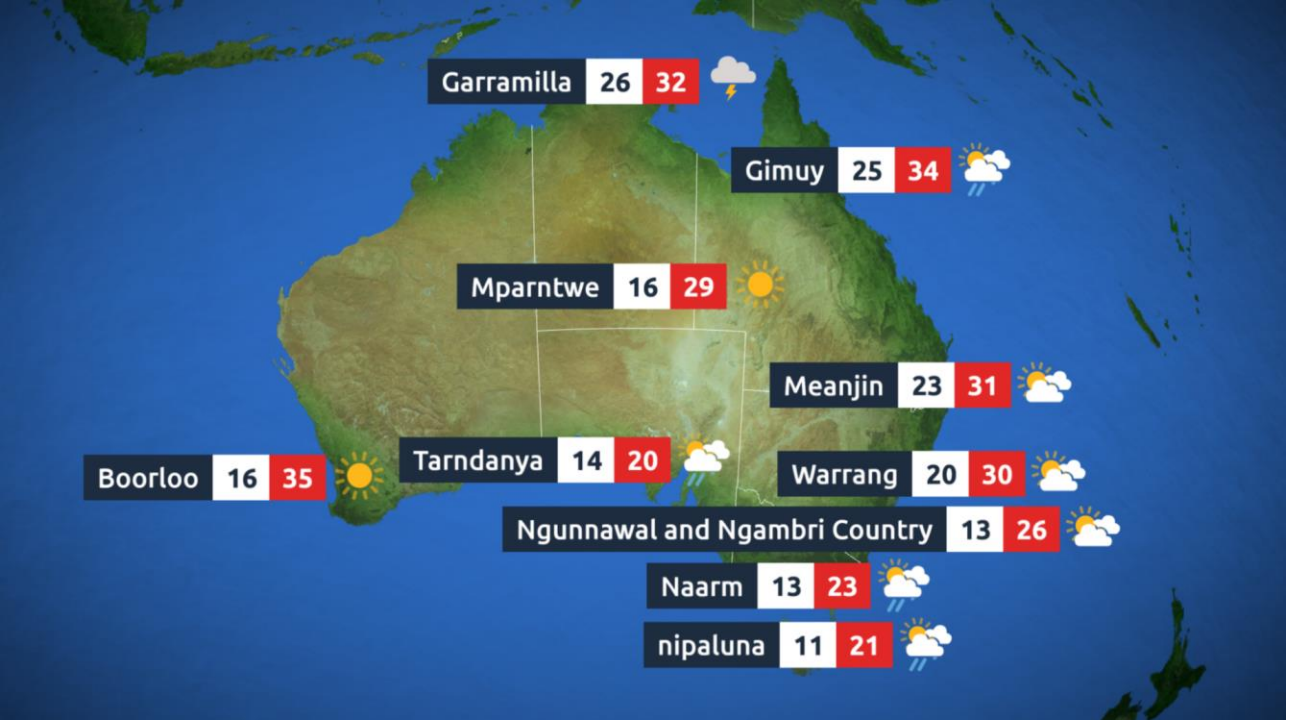
The Language of Science: Infographics

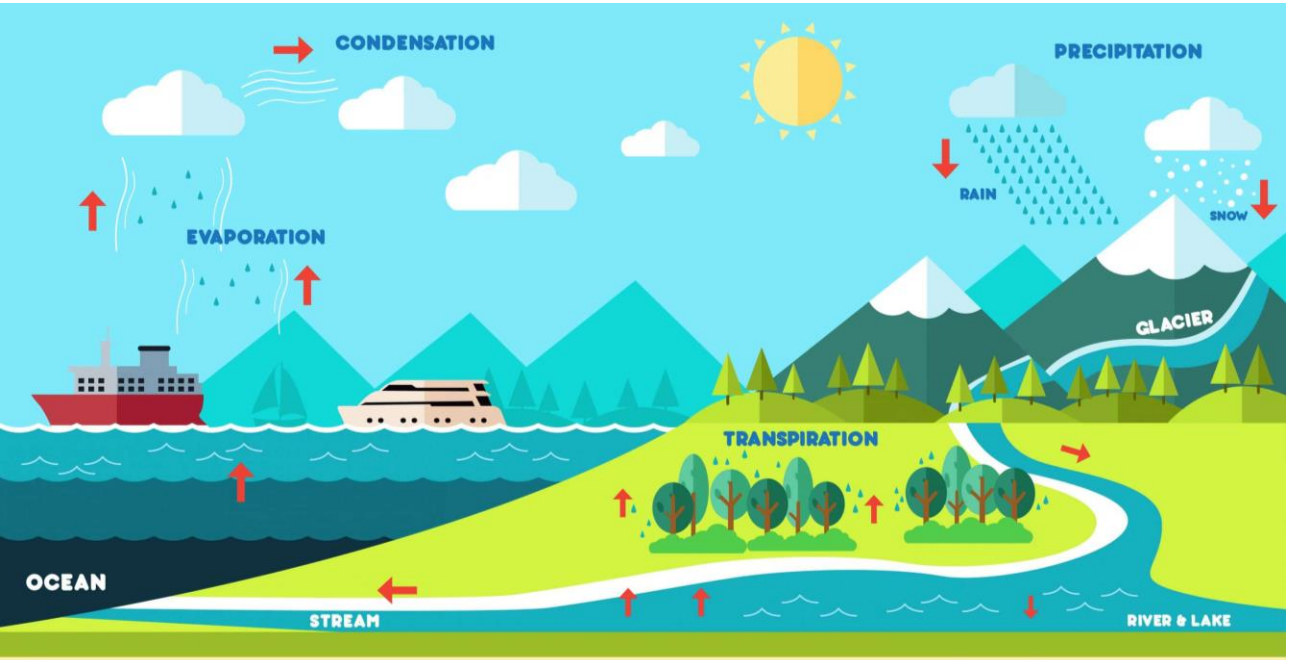
- Science has a lot of information to share.
- Even everyday words can share scientific meaning.

CRAB 

- Our brains understand pictures 60,000 times faster that text!
- INFOGRAPHICS make reading simple by replacing text with photos, maps, arrows and numbers.

Can you think of an infographic you have seen recently?





DEFAULT CONTROLS

Target Lock/ Camera Adjust/ PSI Float*

Primary PSI Power (player assigned)

Interact

Move Raz

Return Item to Backpack/ Cancel/ Exit

Open Thought Bubble

Jump/ Double Jump

Open Journal

Press A button then X button for Palm Bomb

Control Camera

PSI Punch

Player Assigned PSI Powers

➡: PSI Power Menu

⬅: Inventory Menu

⬅/➡: Change Pages or Inventories in Journal and Backpack

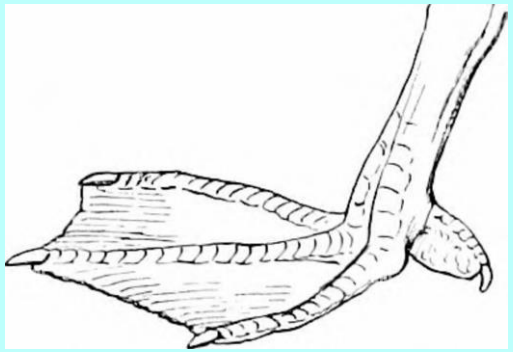
Sea

eagle

‘Eagle’ describes large birds of prey with hooked beaks

Sea

gull



‘Gull’ describes some seabirds, with webbed feet and a noisy call: “Caaaaaaaaw!”

Pacific

gull

‘Sea’ and ‘Pacific’ both mean ‘Ocean’.

Pacific Gulls only live in Australia not the whole Pacific

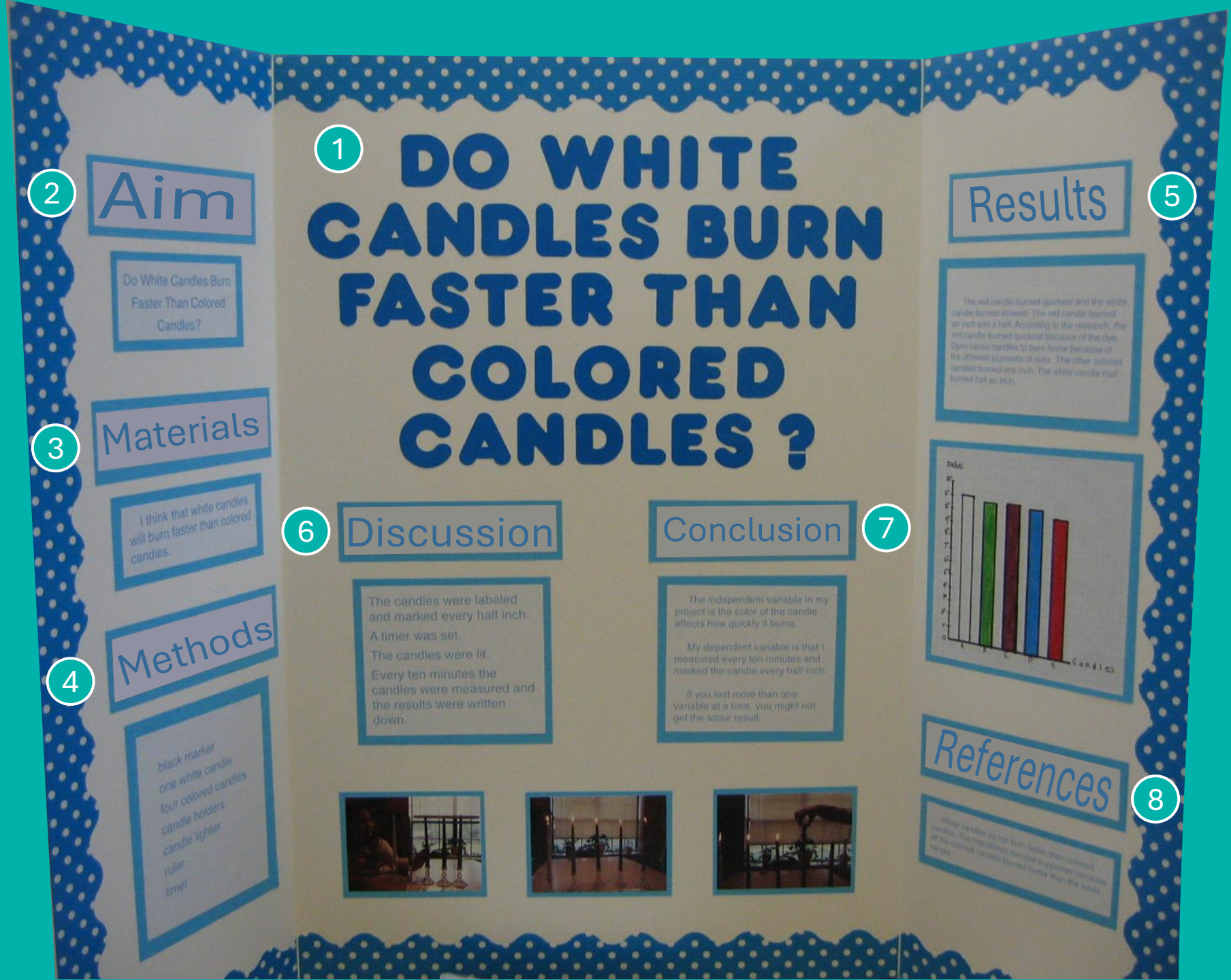
Scientific Poster

A poster is an engaging way to present the results of an experiment or research. It is a science communication tool.

It follows the logical order of the ‘scientific method’

1. Title
2. Aim
3. Materials
4. Methods
5. Results
6. Discussion
7. Conclusion
8. References

A poster includes graphic design to enhance the communication of the words.



By Sarah Smith
Mx. Mumford's Grade 6 Class
October 1, 2024

Title of My Scientific Poster: A Coastcare Investigation

Coastcare Victoria

Aim

What is the question that your experiment or investigation will answer?

Materials

Experiments have materials like:

- 100 ml glass beaker
- 50 ml water
- 10 g salt

Methods

1. Describe step one
2. And step two
3. Describe what you did in the experiment
4. And could repeat your methods if they wanted to get the same results

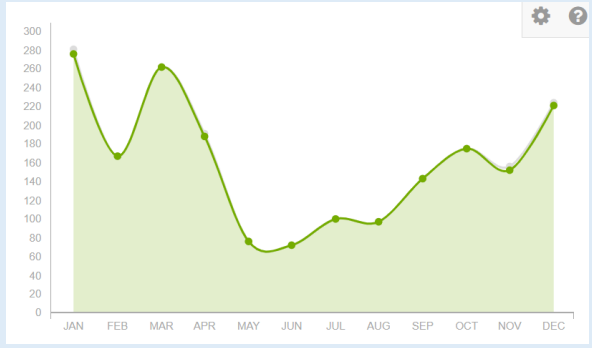
Results

Here you report the outcome of your experiment/research.

Results include graphs and tables of numbers, usually measurements recorded during an experiment.

Pictures of your experimental results or effects.

Also, short statements of your key findings.



Discussion

What does it all mean?

Offer more information and make links between facts for your reader.

Conclusion

What is the key take away from your research?

References

Where did you get this information from?

1. Websites
2. Books
3. National Geographic
4. Coastcare videos

By Sarah Smith
Mx. Mumford's Grade 6 Class
October 1, 2024

Friends of the Barwon Bluff: A Coastcare Investigation

Coastcare Victoria

Aim

To protect, maintain and enhance amazing habitats on the Barwon Bluff.

Materials

- Citizen science volunteers
- Survey Quadrats
- Identification keys
- iNaturalist app on phone

Methods

Sea Search

1. Collect data over time
2. Monitor for change

Sea Slug Census

1. Record all sea slugs on shore
2. Record all sea slugs subtidaly

BioBlitz

1. Identify as many species as possible in a set time
2. Upload photos to iNaturalist

Results

Friends of the Bluff Coastcare group formed in 1992. Results include:

- Weed collection
- Litter collection
- Community education programs
- Citizen science programs: Sea Search, BioBlitz, Sea Slug Census
- Community enjoyment and connection to the Bluff.

Discussion

The Barwon Bluff intertidal zone has diverse habitats of volcanic boulders and limestone sheet reefs.

The biodiversity which lives here is protected by the Barwon Bluff Marine Sanctuary. Also, by the efforts of community members like the Friends of the Barwon Bluff and citizen scientists.

Conclusion

The Barwon Bluff is an important place to the Wadawurrung traditional owners, and all Australians.

People help to protect the biodiversity through laws and through actions.

References

1. Coastcare School Kit Video.
2. Friends of the Bluff Barwon Heads Facebook.
3. Living on the Edge: Barwon Heads website.
4. Parks Victoria.

Review Questions

- It’s time to check your understanding.
- Fill out the review questions worksheet.

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