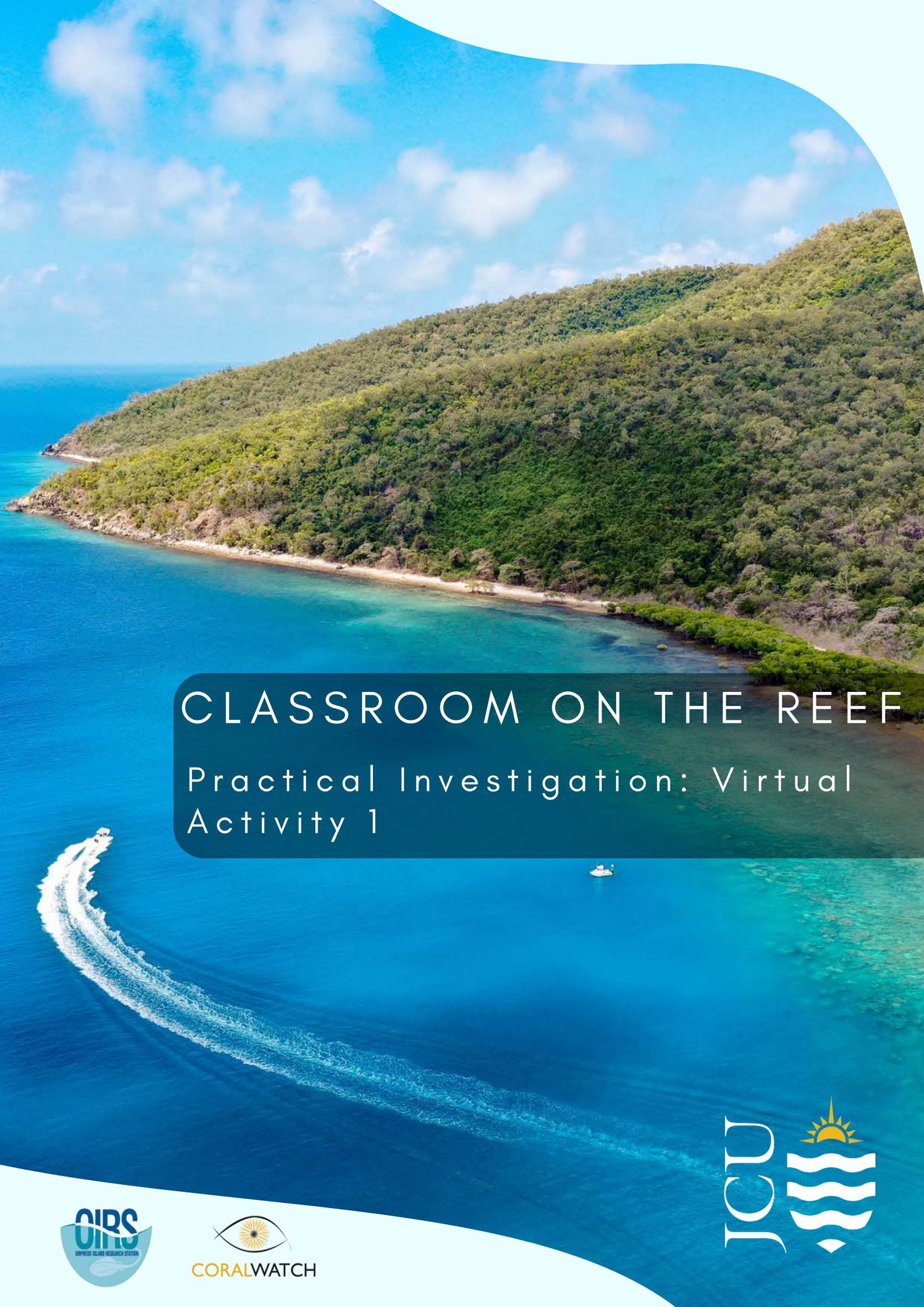


CLASSROOM ON THE REEF

Practical Investigation: Virtual Activity 1

OIRS
ORPHEUS ISLAND RESEARCH STATION

CORALWATCH

JCU

PRACTICAL INVESTIGATION: ONLINE ACTIVITY 1

CORAL GROWTH FORM ABUNDANCE & DIVERSITY

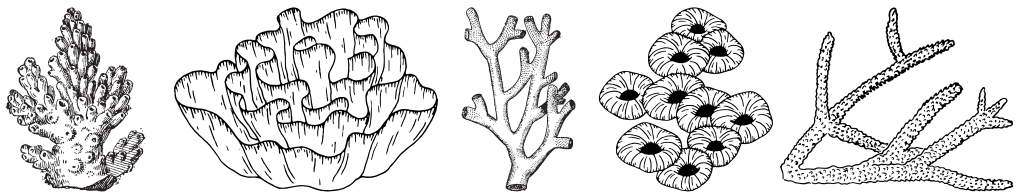
Objective

Learn about the most common growth forms that corals exhibit, and the types of coral reef habitats they are best suited to. Collect biological data from underwater videos of the coral reef to assess coral diversity and abundance and manipulate and interpret patterns in the data for presentation in a scientific poster to be shared with your class.

Background

At first, trying to differentiate between coral species can seem overwhelming – there is incredible diversity in the ways a coral polyp can lay down their calcium carbonate (limestone) skeleton, which gives rise to so many different shapes underwater. In fact, the structure a coral polyp and colony builds is unique to each species, much like a fingerprint is unique to each human. Being able to identify coral is not only helpful to your appreciation of corals while underwater, but a critical skill required for measuring coral diversity (e.g. the number of different species), coral abundance (number of individuals of each species), and also to measuring coral health – because you can't report whether a coral is sick if you first can't identify it when it's healthy!

Corals occupy a variety of common shapes – called growth forms. Some common growth forms include 'branching' versus 'boulder (called 'massive') corals. Each growth form presents both pros and cons in terms of resilience on a coral reef. For example – branching corals lay down a thin skeleton which allows them to grow quickly, creating mini delicate forests underwater. Because of this, they can rapidly occupy new space on the reef following a disturbance (e.g. a cyclone) and grow quickly into it. Mounding corals on the other hand lay down a dense skeleton that forces them to grow very slowly creating a sturdy structure. However, they are more likely to survive a disturbance, like a storm, and persist in the long term.



Background continued...

In this activity, we're going to begin our training in coral identification by learning the most common types of coral growth forms. Then we will learn about how to collect data underwater. Next we will view underwater videos of coral reef substrata (the benthos, or sea floor bottom) and collect data on the number of individual colonies of common coral growth forms. As a group, we will collate (combine) our data, and begin to explore it together by graphing it, analysing it, and presenting it (individually) in a Scientific Poster format much the way marine scientists share their data at large scientific conferences. **Let's dive in!**

Notable words

growth form, resilience, substrata, foliose, encrusting, branching, massive, columnar, free-living, soft coral, collate

Your Task

1. **As a class, watch: Introduction to coral growth forms** (02:47 duration) (https://youtu.be/ef8mdCobuGg)

Next, as a class, watch each of the following short videos on different coral growth forms to learn about the diversity of shapes corals grow into:

Massive or Mound Shape Corals (03:06 duration)
(https://youtu.be/PVYRuYs6wJ0)

Branching, Columnar and other 'Weird' Corals (04:10 duration)
(https://youtu.be/Vu07mxf-i1Y)

Encrusting and Foliose Corals (03:39 duration)
(https://youtu.be/-vBPDEAH9K4)

Free Living Corals (02:37 duration)
(https://youtu.be/pSS7eqoZm3w)

Soft Corals and Seafans (02:14 duration)
(https://youtu.be/Fvry1zFMEqQ)

2. Now that we know a bit about coral growth form diversity, how can we use these skills to collect meaningful data underwater…?

As a class, watch: How to determine the relative abundance of coral growth forms on a reef https://youtu.be/LKXzcdQIkUY (duration 08:25) **which will give us inspiration for the ways we can collect data in the field and underwater.**

3. As a group, let's have a discussion about how we can collect data from underwater videos and turn it into a data set we can present in a scientific report/poster

Considerations Before We Start:

To complete this activity, you will need to view videos of underwater footage. You will need a reliable internet connection and the ability to access YouTube from your school's server. Viewing the videos will take approximately 1-2 hours. Print the data sheet or record data on your computer screen while viewing the videos.

Materials Needed:

- Datasheet printed (or on computer screen)
- Access to Internet, YouTube
- Scrap paper and pencil/pen for notes / observations
- Computers with MS Excel/Google Sheet for data entry and manipulation

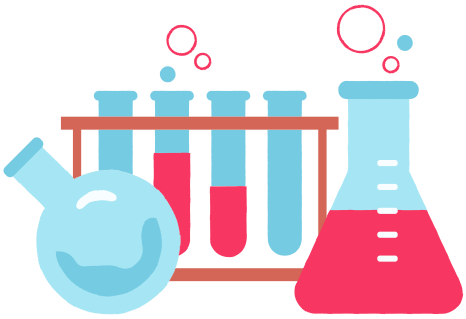
Develop your research question and create predictions:

Before you begin, it is important to have a clear understanding of your research question which will help with the development of your specific research objective(s) that you will achieve by collecting data. Also, it is essential to make some predictions about the data and what the answer to your research question may be. Your predictions should include anticipated problems you may encounter, and any back-up plans in case things don't work out as expected.

4. As a class, let's have a discussion to formulate our:

Research Question – overarching question(s) encompassing ALL objectives
Research Objective(s) – specific and individual research aims
Predictions/hypotheses – Patterns we anticipate based on research / prior knowledge

Complete the sections on the following page based on your discussion



RESEARCH PLAN

Practical Activity 1

Student Name

Date

RESEARCH QUESTION(S):

RESEARCH OBJECTIVE(S):

PREDICTIONS/HYPOTHESES:

ANTICIPATED PROBLEMS:

CORAL GROWTH FORM ABUNDANCE & DIVERSITY

5. Individually (or in pairs) watch each of the 5 underwater video transects of coral reef habitat in the links below. While you watch the video be sure to record your observations (data) from each of the 10 quadrats within each video. Please pause the video when a quadrat appears so you can properly assess the area and record your data (use tally marks to count the number of each growth form as you go and total these at the completion of each video or quadrat). Use the datasheet on the following page to help you record your data.

Video Transect Links:

Transect 1 – SW Pelorus Island (02:41 duration)
(https://youtu.be/mxsl-1i3HUw)

Transect 2 – SW Pelorus Island (02:42 duration)
(https://youtu.be/E-u1hRT4S30)

Transect 3 – SW Pelorus Island (02:44 duration)
(https://youtu.be/J1ZRR-eZUC8)

Transect 4 – SW Pelorus Island (02:45 duration)
(https://youtu.be/lEuRqFAnj6Y)

Transect 5 – SW Pelorus Island (02:48 duration)
(https://youtu.be/j1JEsaLGpk4)

Once you have finished watching all the videos and recording your data, **please enter your data into our online database at the link below.** We will hold a Data Analysis session as a class in MS Excel to begin to play with and manipulate that data (convert the raw data into averages, tables and graphs).

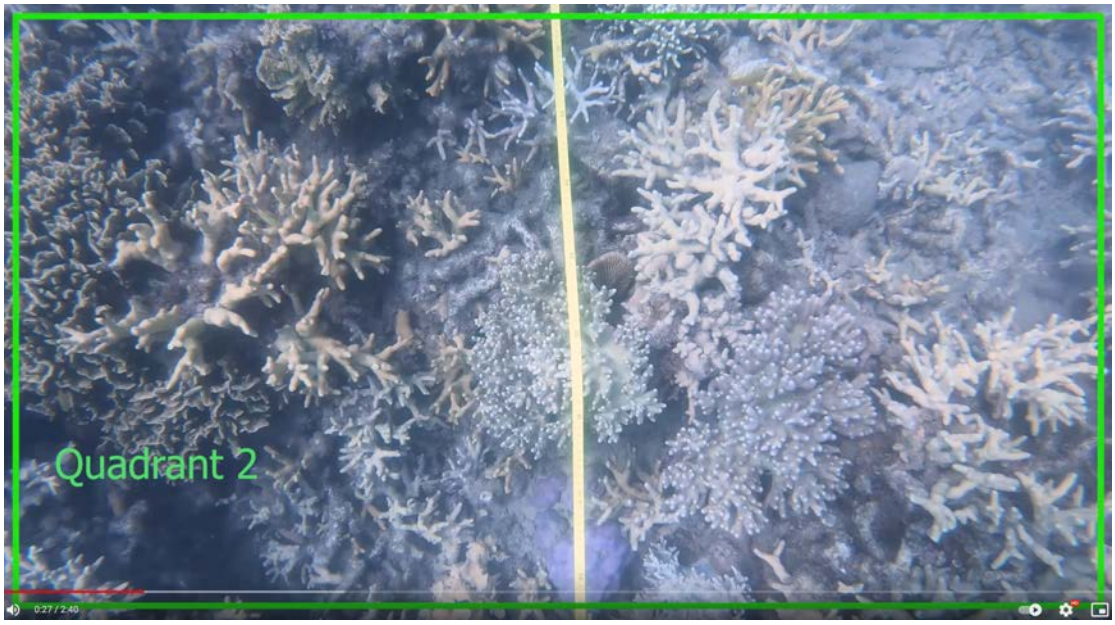
Google Sheet – Database: please enter your individual data here:

(https://docs.google.com/spreadsheets/d/1V3Zi3jGtwy8m1kik_VPzjJX1awQSpscwTHPNwkC-sBA/edit?usp=sharing)

Coral ID Practice

Before you collect data - it's a good idea to have some trial runs (e.g. practice!) identifying coral growth forms. Practicing before you start a scientific investigation is critical to ensure you : 1) don't waste time, 2) don't misidentify target species and bias your data, 3) determine if there are any problems and make plans to mitigate them in your future data collection.

The images below are taken from your data set and show you what the quadrats you'll be viewing will look like. **Have a 'go' at identifying common coral growth forms within these images.** Compare your data with a classmate or work in pairs and come to agreement on what you are identifying - this is critical in a study with multiple observers (data collectors) to minimise bias in your data. Your teacher will have an 'answer key' version that you can compare with your own assessment.



CORAL GROWTH FORM ABUNDANCE & DIVERSITY

Reef Profile Data Sheet	
Observer(s):	
Location:	
Date:	

Transect	Quadrat	Branching	Columnar	Massive	Encrusting	Foliose	Free-Living/ Solitary	Soft Corals
1	1							
1	2							
1	3							
1	4							
1	5							
2	1							
2	2							
2	3							
2	4							
2	5							
3	1							
3	2							
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4	1							
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4	3							
4	4							
4	5							
5	1							
5	2							
5	3							
5	4							
5	5							

CORAL GROWTH FORM ABUNDANCE & DIVERSITY

Reef Profile Data Sheet	
Observer(s):	
Location:	
Date:	

Transect	Quadrat	Branching	Columnar	Massive	Encrusting	Foliose	Free-Living/ Solitary	Soft Corals
6	1							
6	2							
6	3							
6	4							
6	5							
7	1							
7	2							
7	3							
7	4							
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10	3							
10	4							
10	5							

CORAL GROWTH FORM ABUNDANCE & DIVERSITY

6. Assessment: Using the Poster Template, design a Scientific Poster of your research investigation including all the relevant information required (you can elect to omit certain areas with permission from your instructor). Some tips as you complete your Poster:

·Make sure your information is clear and concise so any person, without knowledge of your project, could read and interpret your findings.
·Make sure any graphs you include are clear and the font large enough to read when pasted into the Poster Template.
·Make conclusions about your data and state these as 2-3 dot points or a quick summary paragraph (3-5 sentences).
·Be sure to give your Poster a Unique Title which could summarise your main finding and include your name in the poster and in the file name when you save your Poster.
·The most EXCITING part of your poster are the results and your conclusions...so spend the most time on these and make them stand out to your reader.