Dive 1: Welcome to the Reef

Module Summary
This module is a "Welcome Back" dive that explores the world of coral reefs and re-introduces the Reefs Go Live format. Participants become familiar with how to interact through the platform by asking questions, engaging in live polls, and chatting with our team throughout the live lesson. Students are taken on a guided dive with a CCMI underwater educator, where they will explore the vast diversity of organisms on the reef and the important role each plays in a coral reef ecosystem. Students will be given an in-class activity to assist with the discovery of different organisms on the reef, including corals, sponges, fishes, and invertebrates.

Primary level students

Learning objectives:

- List some of the organisms that make up the coral reef ecosystem
- Describe and label the parts of a coral
- Understand the role of sponges on the coral reef
- Summarize why coral reefs are important to humans
- Identify at least three actions students can put into practice that minimize their carbon footprint on Earth

Live broadcast outline (40 mins)

00:00 – 03:00 Welcome to Reefs Go Live!
03:00 – 05:00 CCMI topside host outlines the lesson and introduces the rest of the team
05:00 – 10:00 What is a coral and what is a coral reef?
10:00 – 15:00 Why are sponges so important?
15:00 – 20:00 Fish and their roles on the reef
20:00 – 25:00 Abiotic environmental factors
25:00 – 30:00 How YOU can help!
30:00 – 35:00 Questions
35:00 – 40:00 CCMI topside host recaps the live lesson and concludes the dive

Materials:

- internet connection
- computer/phone
- projector (optional)
- speakers/headphones
- notebook paper
- pencils/pens
- CCMI worksheets

Other useful resources:

- www.reefresearch.org/reefs-go-live
- https://www.natgeokids.com/uk/discover/geography/general-geography/coral-reef-facts/
- https://www.nationalgeographic.com/animals/invertebrates/facts/corals-1
- http://kids.nceas.ucsb.edu/biomes/coralreef.html
- https://ghof.org/education/
- https://savethecorals.club/coral-polyps-diagrams-1

“Welcome to the Reef” Key Terms

The CCMI educators may refer to the following key terms throughout the live lesson. Listen up for your chance to learn some new vocabulary about our coral reef ecosystems!

Calcium carbonate (CO_2) – colourless or white crystalline compound that naturally occurs in some plants and animals

Coral reef – marine structure composed of a layer of living coral atop coral skeletons, minerals, and organic matter

Cleaning station – an area of the coral reef where meso-predators or predators gather to have parasites or organic matter picked off by smaller fishes and creatures in a process known as getting cleaned

Ecosystem – naturally occurring system made up of organisms and their like environment

Habitat – part of the environment occupied by an animal or plant

Herbivore – animal that gets its energy from only eating primary producers such as algae and plants

Nematocysts – specialised stinging cells that look like tiny harpoons; found in animals in the phylum Cnidaria (ex. corals, sea anemones, jellyfish, etc.)

Photosynthesis – process by which green plants convert carbon dioxide and water into organic chemicals using the energy of light, with oxygen released as a by-product

Polyp – tiny soft bodied animal related to jellyfish and sea anemones

Species – taxonomic group containing individuals that resemble one another, can interbreed, and their offspring are also able to reproduce

Symbiotic relationship – an interaction between two organisms where at least one of the organisms benefits; however the other organism may suffer, be unaffected, or benefit as well

Zooxanthellae – symbiotic algae that live in the tissues of coral polyps (and several other marine animals) and provides the coral with 90-95% of its needed energy and nutrients

What are corals?

Fill in the blanks using the keywords:

Thousands	Animals	Polyps	Calcium Carbonate	Space
Symbiotic	Tentacles	Photosynthesis	Zooxanthellae	

1) Corals are tiny soft bodied Animals related to jellyfish and sea anemones.

2) Corals build hard structures that can be seen from the air and even from Space. They build reefs by secreting a Calcium Carbonate skeleton, which the animal uses to hold itself in place.

3) When viewed close up, you can see the individual coral Polyps made up of tentacles and a mouth. Polyps are generally grouped together by the Thousands, forming colonies.

4) Corals often have a Symbiotic relationship with a special type of algae called Zooxanthellae. The algae live inside the cells of the coral.

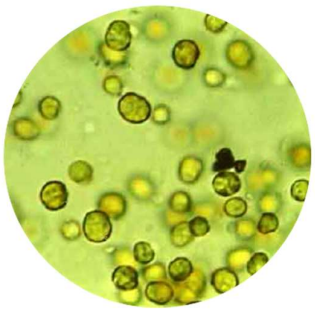
5) When exposed to sunlight, just like other plants, the zooxanthellae (pronounced 'zoo-zan-thel-ay') can produce their own food through Photosynthesis. Ninety-five percent of nutrients that corals need to survive is obtained from the zooxanthellae living inside the coral polyps. The other 5% comes from the coral polyps using their Tentacles to reach out and grab food that floats by in the water column.

Label the parts below using the keywords:

Coral polyp, Zooxanthellae, Colony

Colony

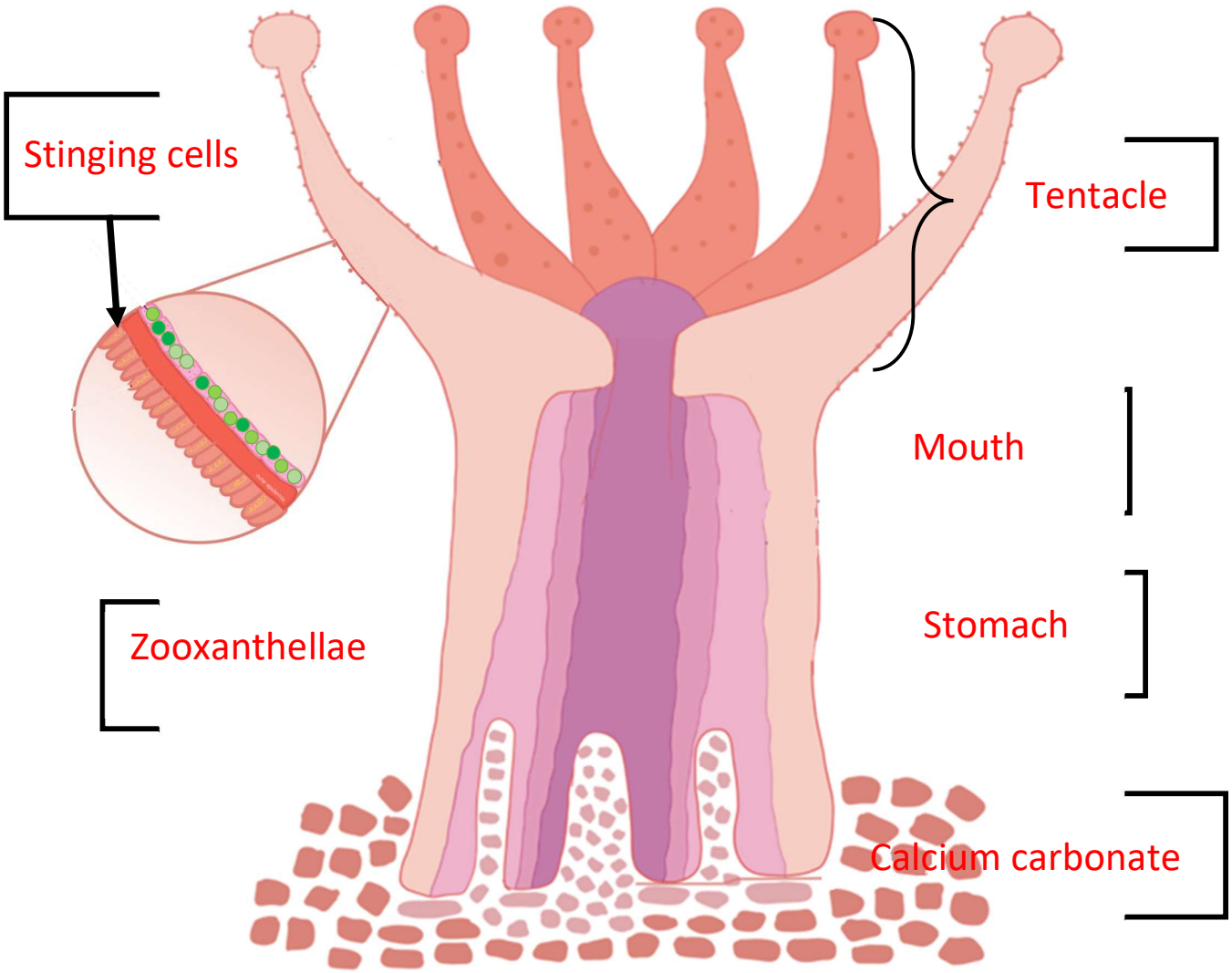
Coral polyp



Zooxanthellae

Stony Coral Polyp Anatomy

Label the diagram below using the keywords to help you. The first one has been done for you.



Key Words

Tentacles	Stinging cells (Nematocysts)	Mouth
Stomach	Calcium carbonate (Stony base)	~~Zooxanthellae~~

Coral Reef Biodiversity

It's your turn to be a scientist! If you see one of the below creatures during the dive, make sure you name the species, then add an interesting fact about it. If you see something during our dive that our underwater educator doesn't see, please raise your hand and let him/her know! Can you identify what it is? Describe or draw it in one of the empty boxes below. If you cannot identify it, describe it to our topside host, who will share with CCMI's underwater educator to help you identify it!

		
Lionfish an invasive species. They can reproduce 30,000 eggs every 4 days and have 18 venomous spines!	Sponge – filter large amounts of water. Some sponges filter up to 20,000 liters per day!	Stoplight parrotfish A crucial herbivore on the reefs.
		
Staghorn coral Critically endangered species, up to 90% of the population died in the Caribbean in the 1980s	Lettuce coral A very common coral in the Caribbean. Looks like lettuce.	Nassau grouper help control the population of other reef organisms helping to maintain the ecological balance.
		
Southern stingray Visit cleaning stations, which is another example of symbiosis		

What are corals?

Fill in the blanks using the keywords:

Thousands - Animals - Polyps - Calcium carbonate - Space Symbiotic - Tentacles - Photosynthesis - Zooxanthellae

1) Corals are tiny soft bodied _____ related to jellyfish and sea anemones.

2) Corals build hard structures that can be seen from the air and even from _____. They build reefs by secreting a _____ _____ skeleton, which the animal uses to hold itself in place.

3) When viewed close up, you can see the individual coral _____ made up of tentacles and a mouth. Polyps are generally grouped together by the _____, forming colonies.

4) Corals often have a _____relationship with a special type of algae called _____. The algae live inside the cells of the coral.

5) When exposed to sunlight, just like other plants, the zooxanthellae (pronounced 'zoo-zan-thel-ay') can produce their own food through _____. Ninety-five percent of nutrients that corals need to survive is obtained from the zooxanthellae living inside the coral polyps. The other 5% of nutrients comes from the coral polyps using their _____ to reach out and grab food that floats by in the water column.

Label the parts below using the keywords:

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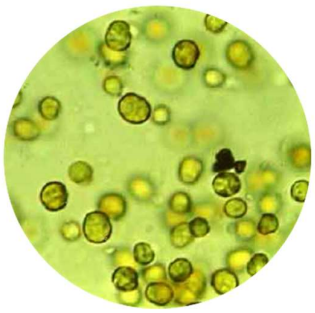

Stony Coral Polyp Anatomy

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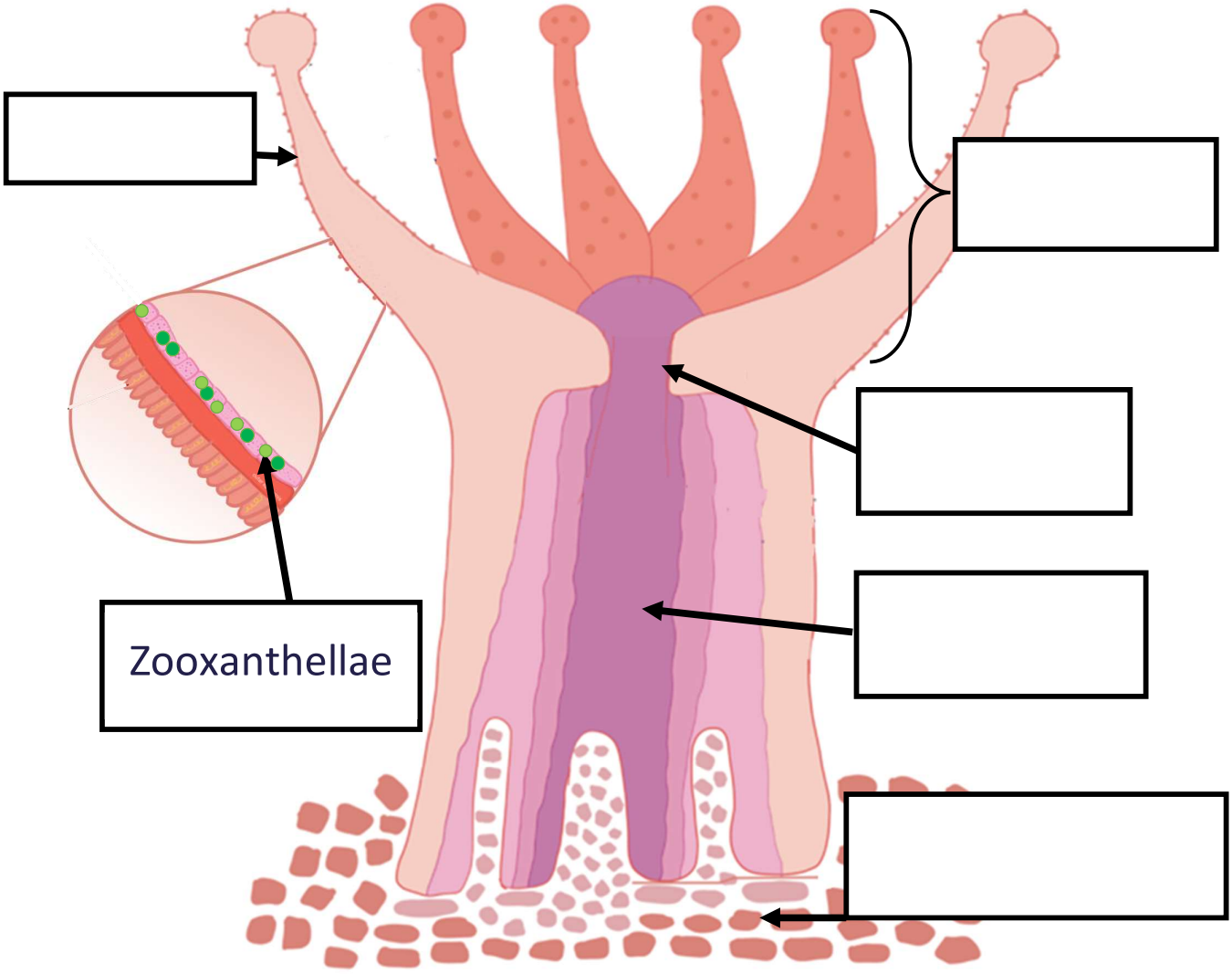
If you need help, ask the CCMI educators!



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