Name_____

DATA Nugget

Corals in a strange place

Featured scientists: Karina Scavo Lord and John Finnerty from Boston University

Research Background:

When you imagine a coral, you likely picture it living on a coral reef, bathed in sunlight, surrounded by crystal clear waters teeming with colorful fishes. But corals can actually live in a range of habitats, even habitats that are sometimes murky and much darker!

Marine Biologist, Karina, snorkeling in the mangroves. Photo by John Finnerty.

As marine biologists, Karina and John often snorkel around the mangroves in Belize, where they do their research. **Mangroves** are trees that have roots able to grow in saltwater. By capturing mud and sediment, these underwater roots build habitat for marine life. While Karina and John were documenting the different marine life that can grow on underwater roots, they noticed something shocking. The same corals that live on coral reefs were growing in the mangrove forests too! This surprised Karina and John because coral reefs and mangrove forests are very different habitats. Coral reefs have clear water and bright light, while mangrove forests are darker with murky water that has a lot of nutrients. How can corals live in such different places?

Karina and John started to wonder if the corals that live in the mangroves look different than the corals on the reefs. Sometimes animals can look different based on where they live. These differences may be adaptations that help them live in different environments. Karina and John measured differences between two different coral species that were found in both habitat types. The two species they used are the **mounding mustard hill coral** and the **branching thin finger coral**.

Scientific Question: Are there differences in the appearance of mustard hill coral and thin finger coral that live in coral reef and mangrove forest habitats?

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Draw Your Predictions: Knowledge of how corals grow helped Karina and John form their predictions. They study two coral species, mustard hill coral and thin finger coral. Coral grow in a way that maximizes two things: (1) the amount of light they can capture, and (2) the amount of polyps on their surface.

The two species of coral: (left) branching thin finger coral and (right) mounding mustard hill coral.

(1) Light is a requirement for coral growth, because the algae that live inside and help coral grow need light to photosynthesize. The more surface area they have, the more light they can capture. In habitats with a lot of light, corals with branches grow more of them, and corals that are flat grow more rounded in shape. This allows them to absorb the greatest amount of light.

(2) Polyps are the small individual coral animal. Many polyps together form a coral colony. Each individual polyp has tentacles that are used for feeding, so if a coral colony has more polyps, it can acquire more food or nutrition. In habitats with high nutrients or food, corals may have more polyps per unit area.

Draw what you think the two corals would look like in the mangroves and on the reef.

a. Start by thinking about what makes the two habitats different. What is the environment like on the reef versus the mangrove?
b. Then think about how a coral may respond to those differences. What will be the differences between how a mounding or branching coral species responds?
c. Draw your predictions in the boxes below.

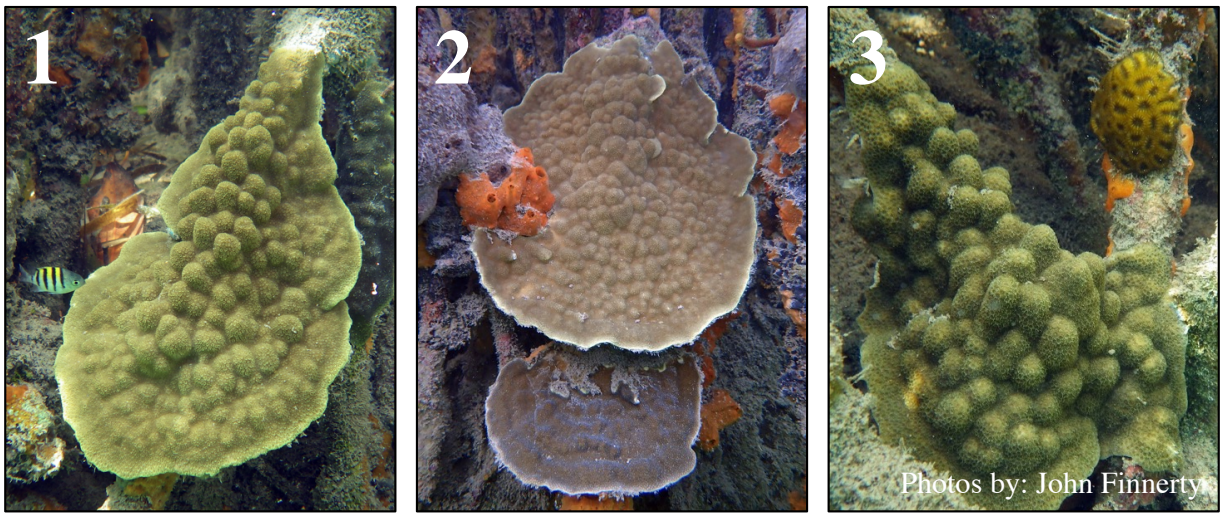
Mustard Hill Coral	**Thin Finger Coral**
Reef:	**Reef:**
Mangrove:	**Mangrove:**

Name_____

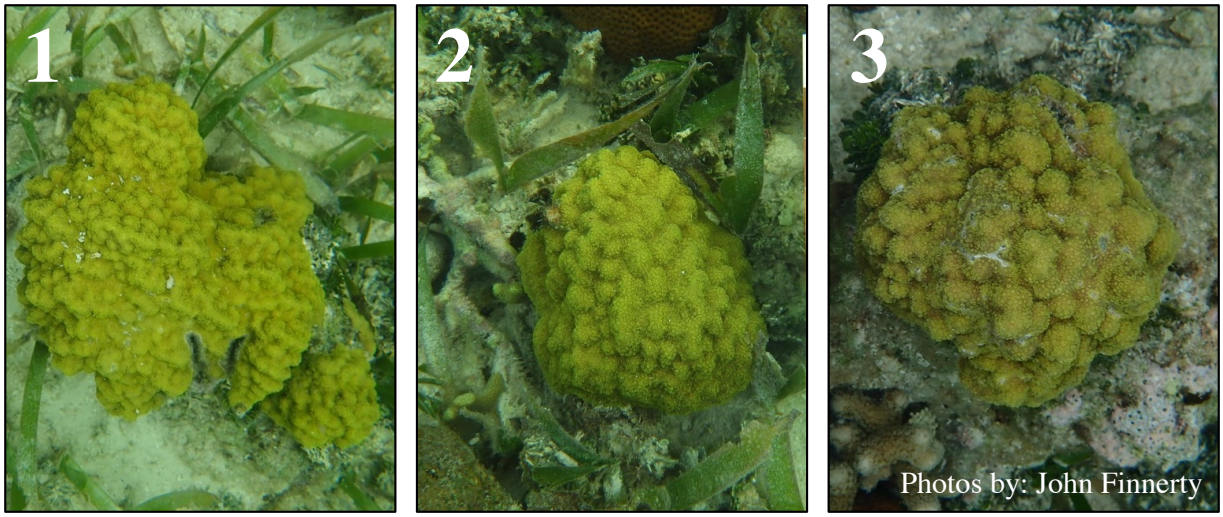
Data Collection: Let's look at two of the methods Karina used to observe corals and collect her data. She used both methods on both coral species.

Method 1: Used to observe differences in form, which is a measure of light capture. Here we have photos of 3 mustard hill coral from the mangrove and 3 from the reef. Write whether the corals are mounding (circular and/or bumpy), plating (flat), or both.

Mustard hill coral growing in **mangroves**



Mustard hill coral growing in **reefs**



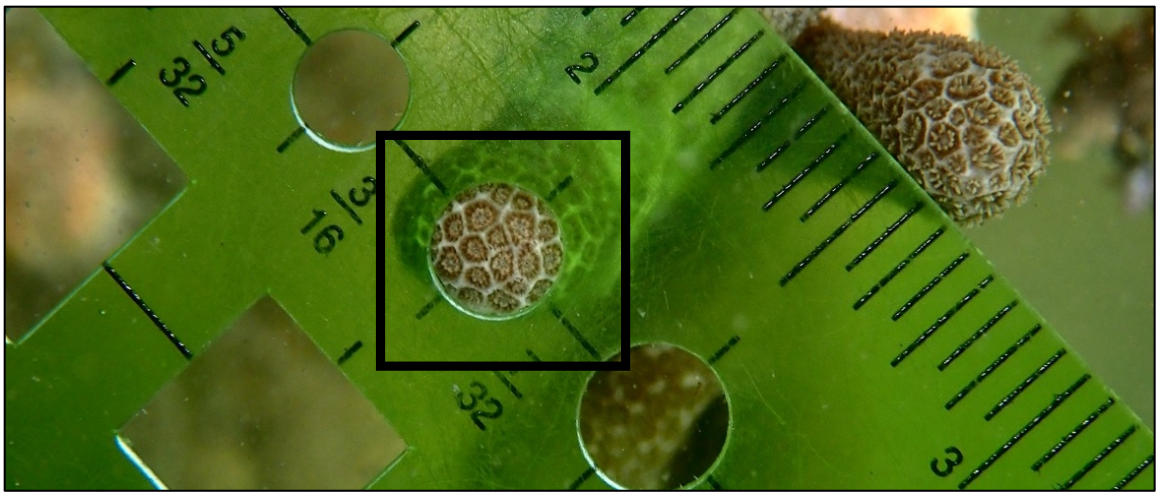
Count the total number of each form in both habitats:

Mangroves:	Mounding	_____	**Reefs:**	Mounding	_____
	Plating	_____		Plating	_____
	Both	_____		Both	_____

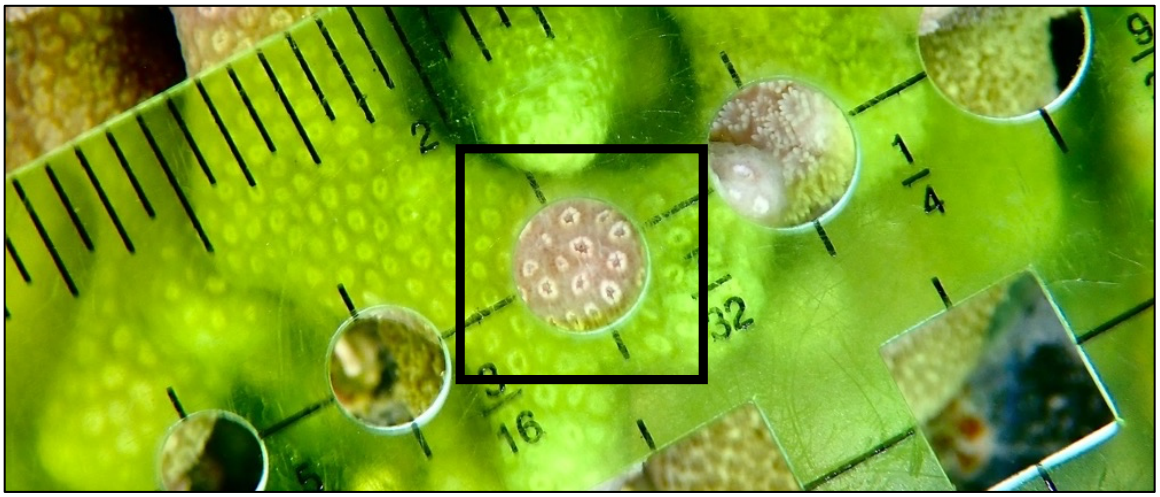
Name_____

Method 2: Used to observe differences in number of polyps, a measure of food and nutrient capture. Here we have photos of 2 thin finger coral, one from the mangroves and one from the reef habitat. Look for differences in the number of polyps in each photo by counting the total number in the green circle in the photographs. By using this same green circle across different colonies, we can compare the number of polyps within the same defined area. Write the total number of polyps in the space below.

Thin finger coral growing in **mangroves**



Thin finger coral growing in **reefs**



Count the total number of polyps in both habitats:

Mangroves: _____ **Reefs:** _____

Name_____

Scientific Data: Karina collected data by doing underwater observations of over 50 additional Mustard Hill and 50 additional Thin Finger corals, along with other observations. A summary of these observations is below.

Use the data to answer the scientific question:

Table 1: Mustard Hill Coral

Habitat	% of each form	Average # of Polyps (#/cm^3)
Reef	100% Mounding	63.9
Mangrove	27% Mounding 59% Plating 14% Both	79.8

Table 2: Thin Finger Coral

Habitat	Average # of Branches	Average # of Polyps (#/cm^3)
Reef	44.8	68.1
Mangrove	22.2	87.7

Name_____

Draw your graph(s) below: Identify any changes, trends, or differences you see in your graph(s). Draw arrows pointing out what you see, and write one sentence describing what you see next to each arrow.

Name_____

Interpret the data:

Make a claim that answers the scientific question.

What evidence was used to write your claim? Reference specific parts of the tables or graph(s).

Explain your reasoning and why the evidence supports your claim. Connect the data back to what you learned about coral appearance in different habitat conditions.

Your next steps as a scientist: Science is an ongoing process. What new question(s) should be investigated to build on Karina and John's research? How do your questions build on the research that has already been done?