FROST SCIENCE
Field Trip Guide

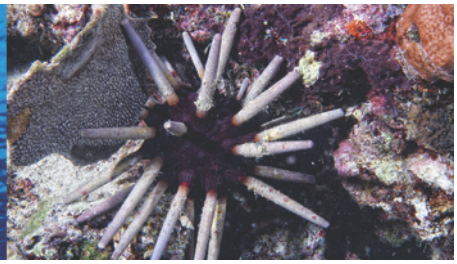
Aquarium
Grades K-2

Contents

Questions? Ready to book your field trip? | Please visit: www.frostscience.org/fieldtrips

Elkhorn coral create a home for many underwater species

Hammerhead sharks have an unusual head shape that helps them catch prey



Blunt spikes give the pencil urchin its name

Overview

Students will discover the crucial ecosystems of South Florida through face-to-face encounters with working scientists and dynamic live animals. Students will learn about local coastal habitats, the plants and animals that reside in them, and the ecological connections to Miami's urban landscape. Though interactions with stories from working scientists, students will learn about the process by which researchers ask and answer questions.

Educational Standards

Kindergarten

Big Idea 14 – Organization and Development of Living Organisms

- SC.K.L.14.3 Observe plants and animals, describe how they are alike and how they are different in the way they look and in the things they do.

1st Grade

Big Idea 17 - Interdependence

- SC.1.L.17.1 Through observation, recognize that all plants and animals, including humans, need the basic necessities of air, water, food and space.

2nd Grade

Big Idea 1 – The Practice of Science

- SC.2.N.1.6 Explain how scientists alone or in groups are always investigating new ways to solve problems.

Big Idea 17 – Interdependence

- SC.2.L.17.2 Recognize and explain that living things are found all over Earth, but each is only able to live in habitats that meet its basic needs.

Background Information

We're all connected.
People, plants, animals and habitats are all part of a dynamic natural community.

From Gulf Stream sharks to the tiny organisms within coral, the *Aquarium* offers a trip through the beautiful watery worlds of South Florida. The exhibition is comprised of three levels:

- On the Vista, students discover the surface of South Florida ecosystems, including the Gulf Stream, coral reefs, mangroves, beaches and the Everglades.
- In the Dive, students take lessons from the Vista and apply them to global habitats, as they descend into underwater worlds and the science behind them, through scientist interactions and immersive exhibits.
- In the Deep, students explore the mysterious depths of the Gulf Stream, examining the connectivity of the ocean currents, as well as the animals that depend upon them.

Aquarium Key Questions

- Why are coastal habitats important?
    - What sorts of animals use those habitats?
- What can you do to support and protect coastal habitats?
- What are some research questions scientists might try to answer?
- What is one question you have about ocean science?

Pre-Activity

See pages 5 - 13 for pre-activity instructions and presentation.

Field Trip Experience

All Museum field trips are a three-hour experience, offered Monday through Friday, beginning at 9:30 a.m. or 10:00 a.m. Each field trip includes three experiences of the teacher's choice and time for lunch. Upon arrival, the teacher will be provided with a specific schedule for his/her visit based on the three chosen experiences. Additional information regarding field trip logistics is provided in the field trip package that each teacher will receive upon booking a field trip.

During the field trip, students will encounter a variety of experiences. To enhance these learning opportunities, facilitator cards are provided at arrival for all teachers and chaperones who would like to use them (please see pages 20 - 23 for a sample). The facilitator cards include prompting questions, additional content, and exhibition location maps which show where in the exhibit one can find content related to that card. Additionally, a student guide that corresponds to the exhibition prompting questions are available in this document on pages 18 - 19. Please print a student guide for each student in advance of your arrival to the museum, and bring pencils; student guides and pencils will not be provided by Frost Science.

Post-Activity

See pages 14 - 17 for post-activity instructions and presentation.

Select Recommended Extensions

Kindergarten: Investigating Local Ecosystems
http://www.cpalms.org/Public/PreviewResourceUrl/Preview/20387
Grade 1: Microhabitats
http://www.cpalms.org/Public/PreviewResourceUpload/Preview/13387
Grade 2: Jellies and Junk
http://www.cpalms.org/Public/PreviewResourceLesson/Preview/46607

Pre-Field Trip Activity: Zoom In
(A Visual Thinking Routine)

Overview
Students will participate in an activity to prime their curiosity and imagination around a South Florida habitat. In Zoom In, students examine an image, piece by piece, until the complete image is revealed. Students will make observations and create different hypotheses along the way to modify their thinking as they gain new information about the habitat the image is showcasing.

Objective
Students will make observations to build an explanation and interpretation of why mangroves are important to humans and animals alike.

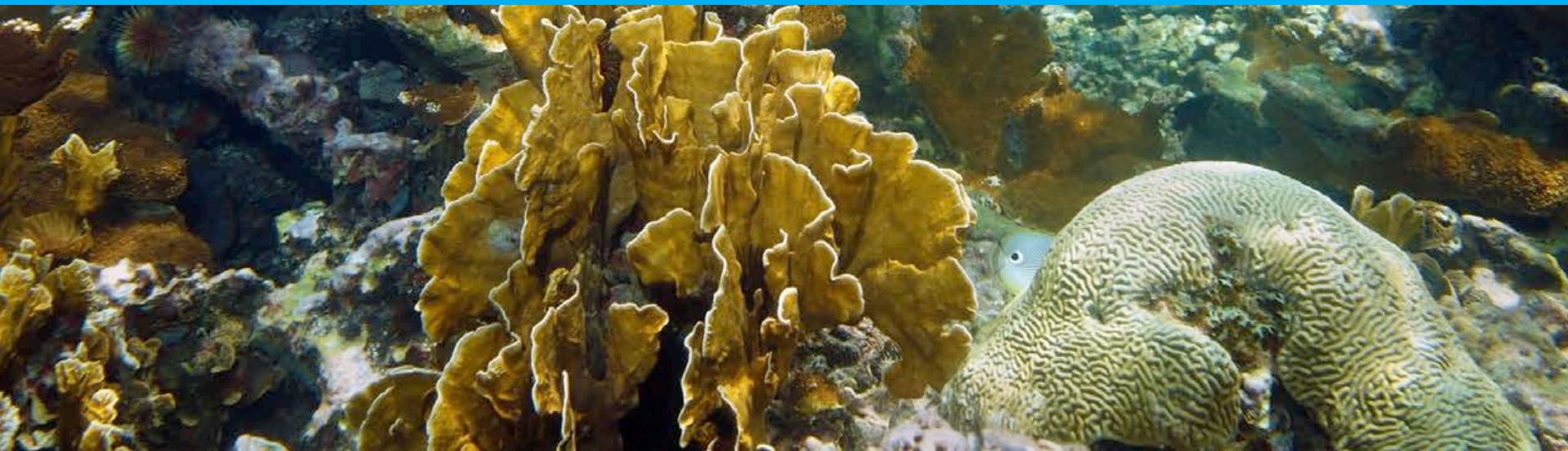
Materials
- Computer, white board and projector
- *Aquarium* Grades K-2 Pre-Field Trip Presentation (pages 6 - 13)

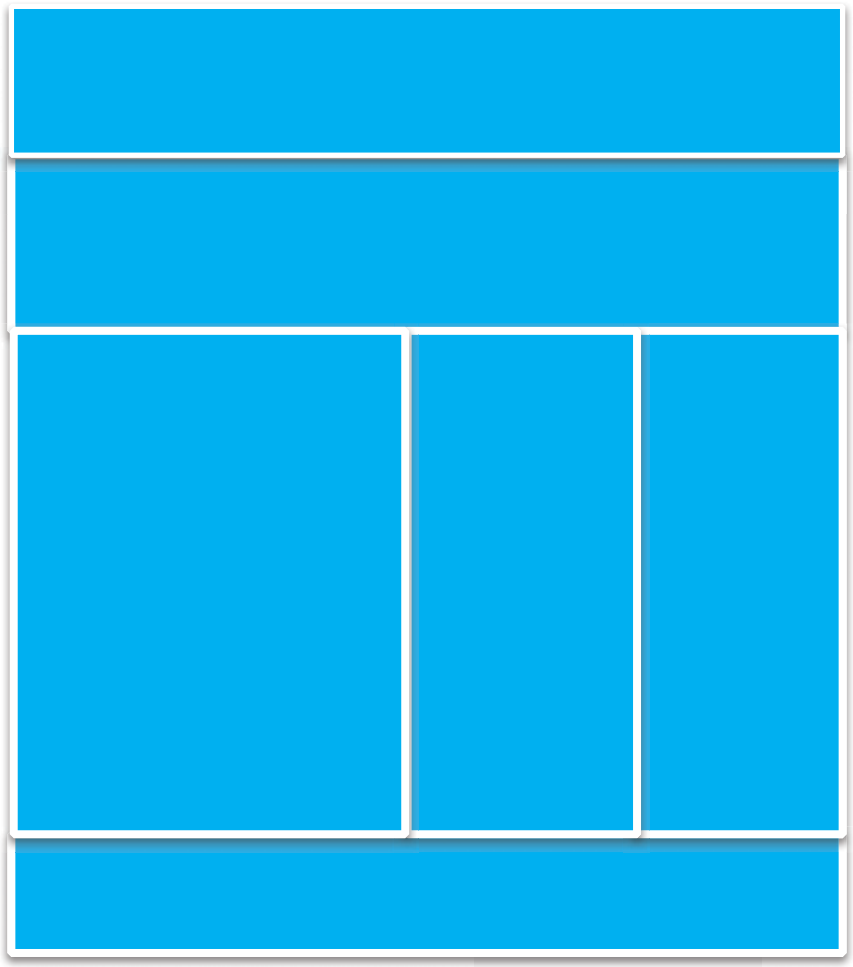
Activity Steps
1. Test the presentation on your computer: open the document, go to "View" on the menu bar, then click the full screen option ("Enter Full Screen" or "Full Screen Mode").
2. Use the presentation to guide the activity.
3. Use the Visual Thinking Routine "What Makes You Say That" to encourage a thoughtful class discussion.
4. During the field trip, link student observations back to this activity to encourage a closer look and a more meaningful experience.

Helpful Information
- Red mangroves (like the one shown in the image on page 13) provide many ecosystem services. They:
    - stabilize coasts and provide a storm buffer by reducing wave and wind action
    - provide underwater nursery habitat for many juvenile fish, including commercially important fish species
    - provide terrestrial habitat for crustaceans, birds, and reptiles
    - cycle nutrients through their detritus-based food web (detritus is the decomposing material that serves as the ground surface in mangrove habitats)
- In the image on page 13, there is a school of mangrove snapper (the fish with black bars diagonally through their eyes) and a nurse shark swimming in a habitat provided by the red mangrove's finger-like prop roots. At the bottom of the image, seagrass provides habitat for benthic (bottom-dwelling) organisms. At the top of the image, look for sessile (non-moving) crustaceans, such as barnacles, on the roots toward the water line.
- **What Makes You Say That** is a Visual Thinking Routine that asks students to support their interpretation with evidence.

Frost Science | Aquarium Pre-Field Trip Activity | K - 2ND Grade

ZOOM IN





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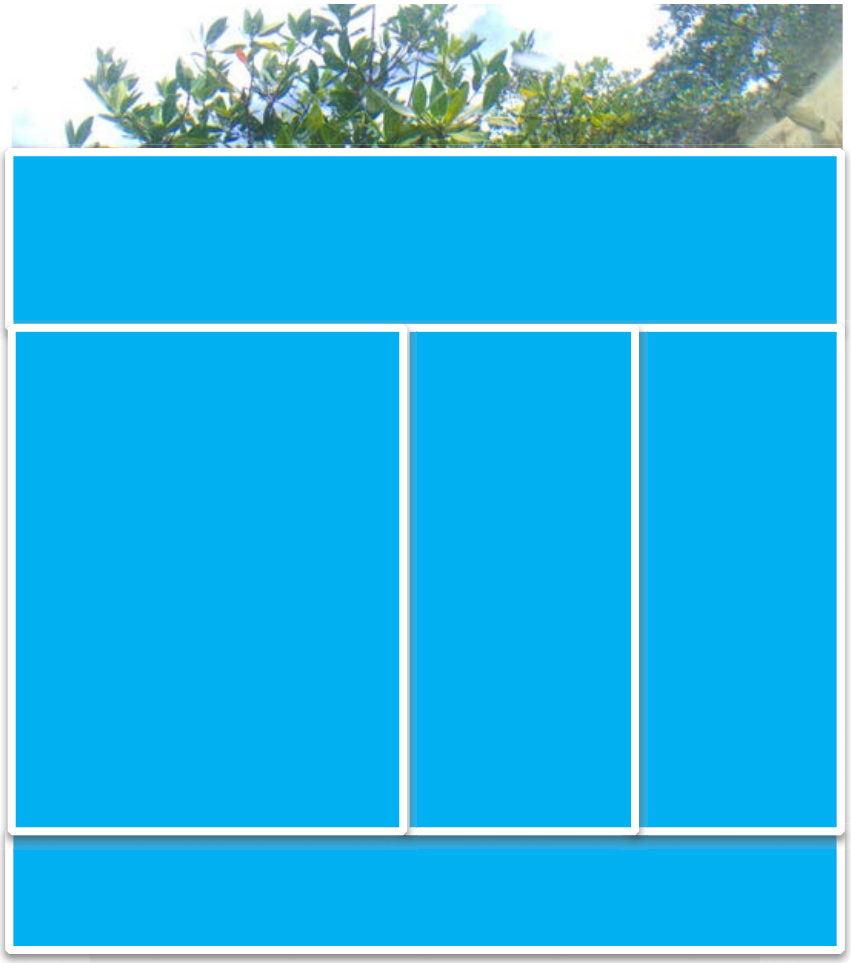
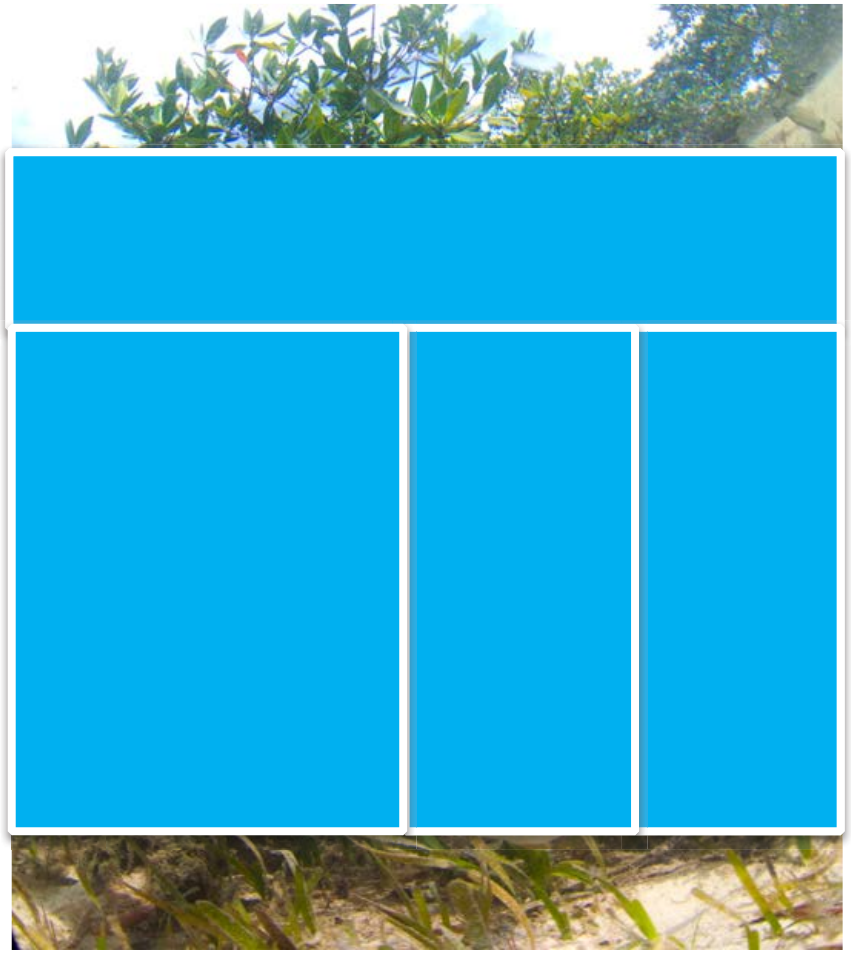
What do you see or notice?
What does this make you think about?



FROST SCIENCE

Now, what do you see or notice?
How do you think this is related to the first piece you saw?



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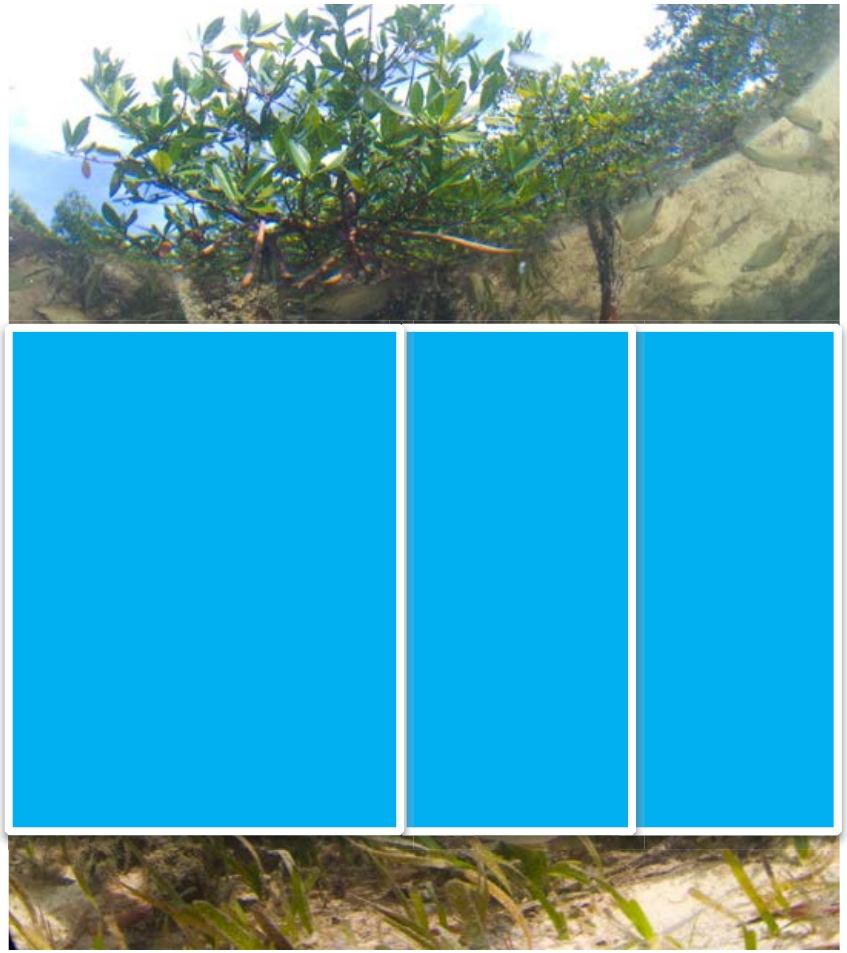
What do you see that is new?
How is the new piece related to the other two?
What do you think you'll see next?



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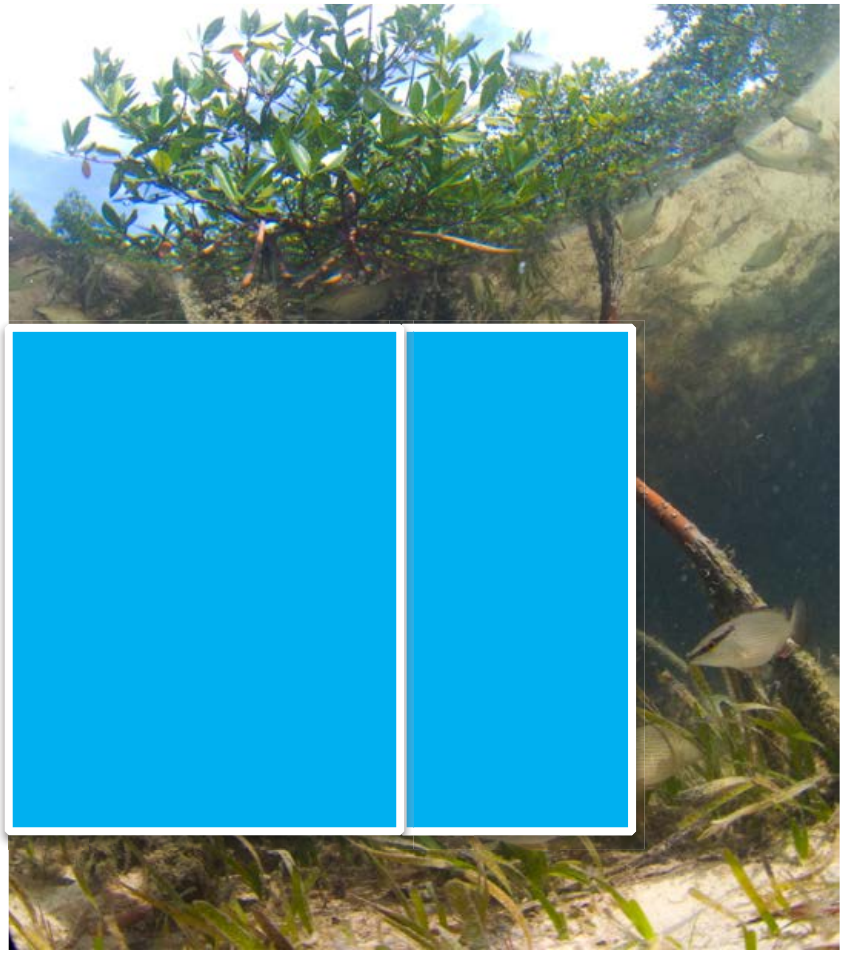
Now, what do you see or notice?
How does this change your idea about what it is?
What do you think might be in the rest of the image?



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What is different about the image now?
What do you think the last piece will show?

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How can you describe the whole image?
What questions do you still have about the image?

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Post-Field Trip Activity: Step Inside
(A Visual Thinking Routine)

Overview:
After the field trip, students will reflect on what they have explored and what they have learned at the *Aquarium*. Students will complete the Step Inside Visual Thinking Routine. This activity will help students explore different perspectives and viewpoints as they try to step inside the shoes of a marine scientist. This exploration will lead students to more deeply understand the roles of scientists.

Objective:
Students will reflect on their experience at Frost Science and take on the role of a marine scientist by assuming that point of view and creating a drawing.

Materials:
- Computer, white board and projector
- *Aquarium* Grades K-2 Post-Field Trip Presentation (pages 15 - 17)
- Paper, markers, color pencils, crayons, etc.

Activity Steps
1. Test the presentation on your computer: open the document, go to "View" on the menu bar, then click the full screen option ("Enter Full Screen" or "Full Screen Mode").
2. Use the presentation to guide the activity.
3. Give students paper, markers, color pencils, or crayons to complete the activity.
4. Conclude with a class discussion about the completed activity.
5. *Optional extension: Have students compare/contrast the drawings they did in the student guide while visiting the Aquarium to the drawings they do now.*

Helpful Information
- Remember to reinforce the idea that all scientists don't look or think in a certain way. They don't all wear lab coats and goggles. Some scientists dive in the ocean or trek through mangroves. Scientists in a lab and scientists in the field are all collecting data and doing research.

Frost Science | Aquarium Pre-Field Trip Activity | K - 2ND Grade

STEP INSIDE

Step Inside!

Now that you have visited the Frost Science *Aquarium*, your challenge is to become a scientist!

Step Inside the shoes of a scientist, like the ones you learned about during your visit, and answer the following questions:

If you were a scientist studying animals in the ocean…

- What would you see?
- What would you think?
- What would you care about?
- What questions would you ask?

Now, draw yourself as a scientist. Be sure to draw what you would study underwater!

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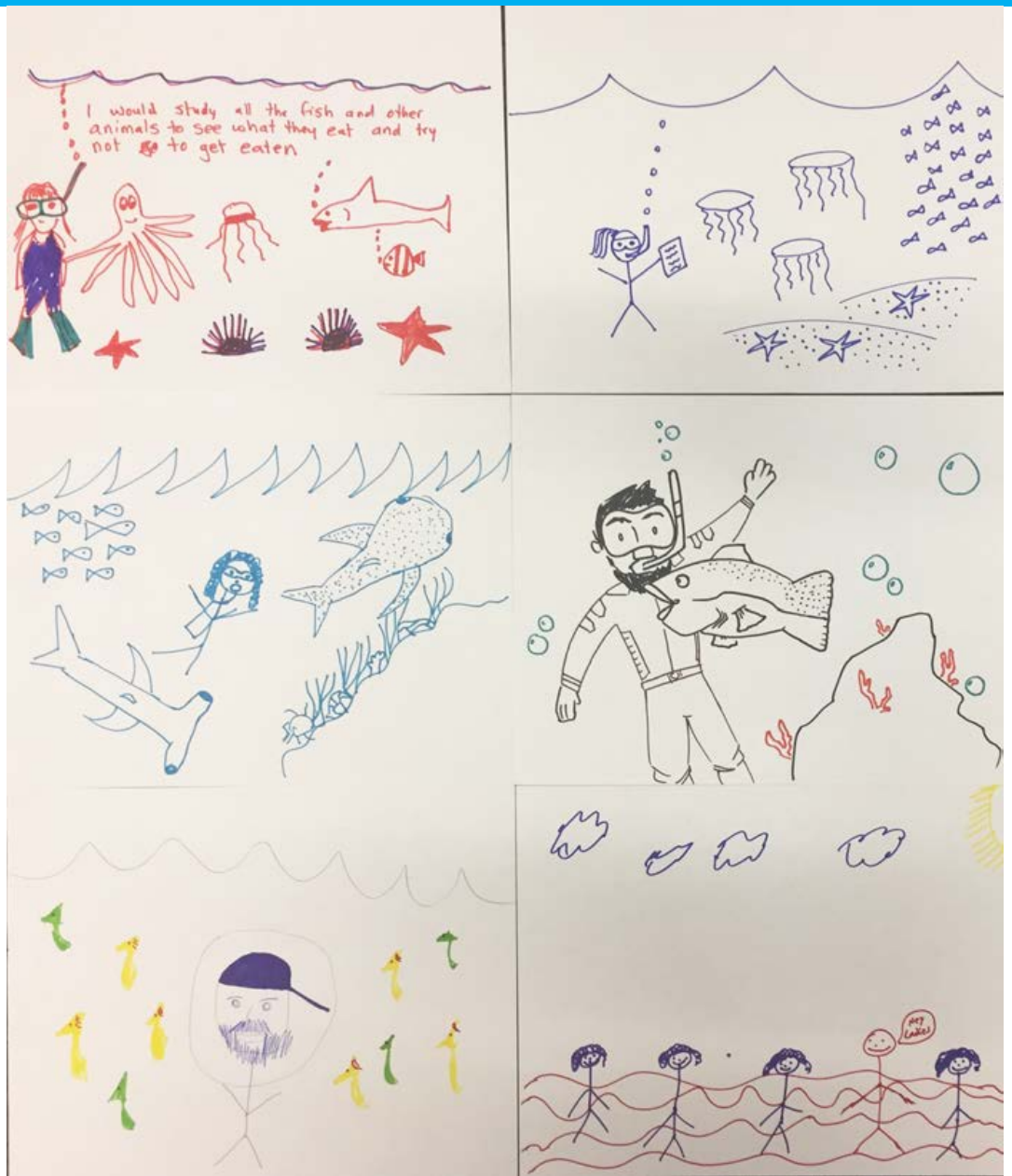
Sample Post-Field Trip Activity



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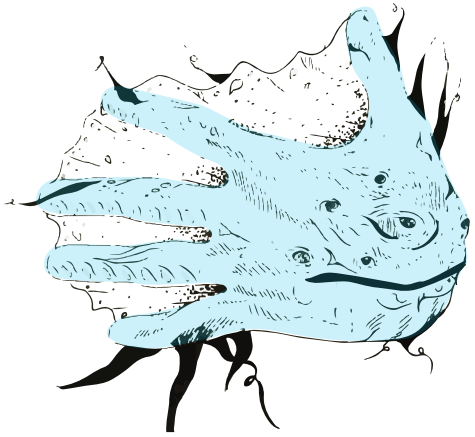
AQUARIUM



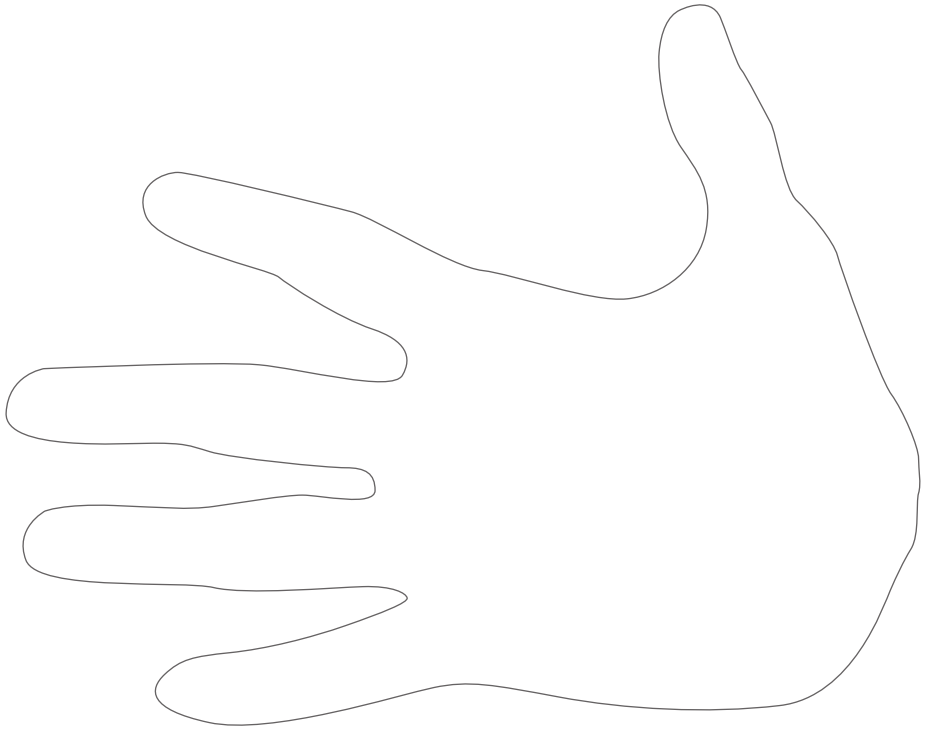
K - 2ND Grade
Student Guide

Handprint Fish

Date: _____
School: _____
Name: _____

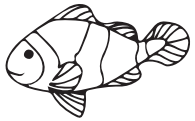
Handprint Fish!

Trace your hand to create a fish body. Add eyes, a mouth, and fins, then draw the fish's home (habitat).



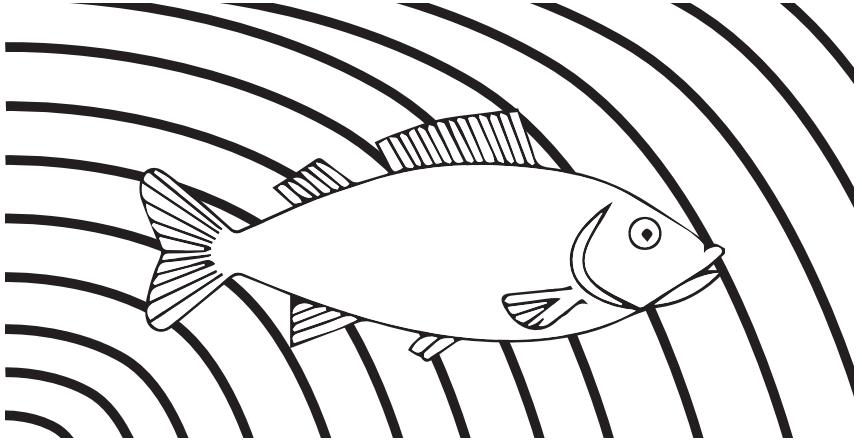
A

Draw a line to match each animal to its habitat.



B

Help this fish camouflage into its habitat!



C

Fill in the blanks to complete the things that every animal must have for life.

S - H - E - ___ - T - E - R

S - P - ___ - C - E

F - ___ - ___ - D

W - ___ - T - E - R

D

Draw a scientist!

CHECK IN

Fish Body Shape

Say:

"Fish come in many different colors, shapes and sizes, depending on their habitat. Let's explore why."

Explore and use the Student Guide

Examine fish body shapes in reef and Gulf Stream habitats.

Discuss:

What characteristics make fish better suited to life in the open ocean?

Some possible answers include…

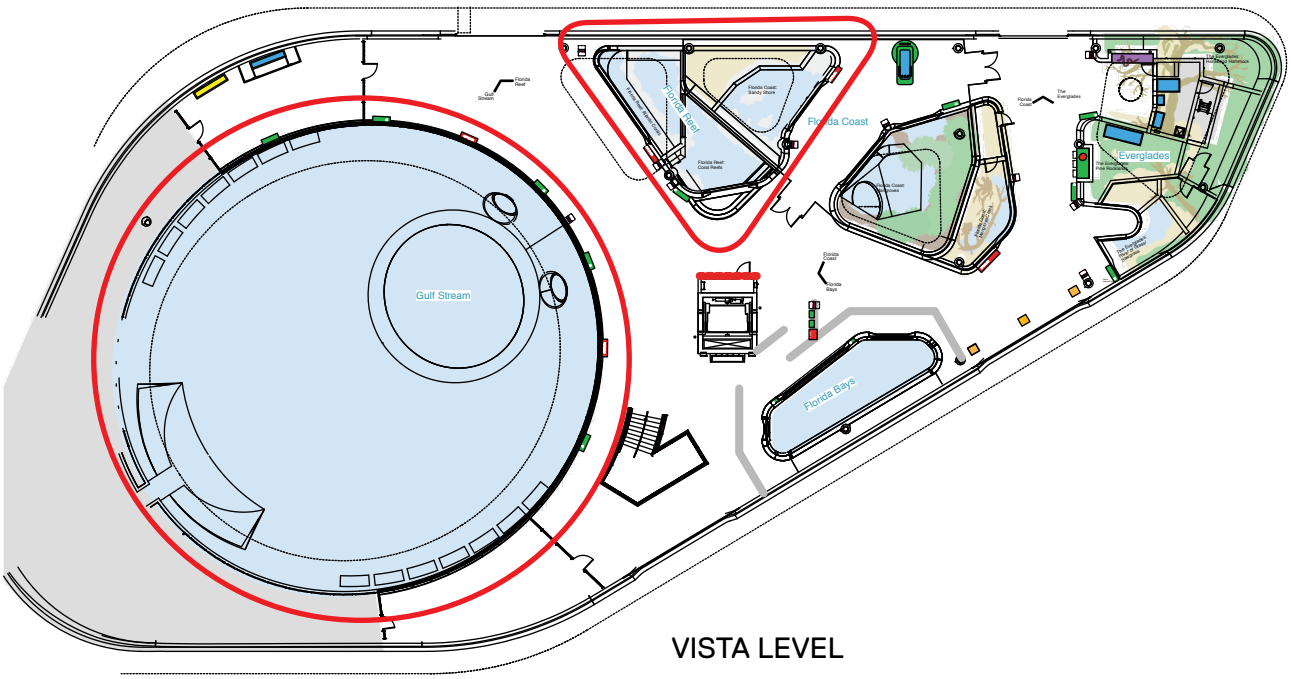
- *Torpedo-shaped body*
- *Forked tail*
- *Shiny body color*

What characteristics make fish better suited to life on the reef?

Some possible answers include…

- *Flexible pectoral fins*
- *Colorful body colors*
- *Tubular mouth*

FROST SCIENCE | Aquarium

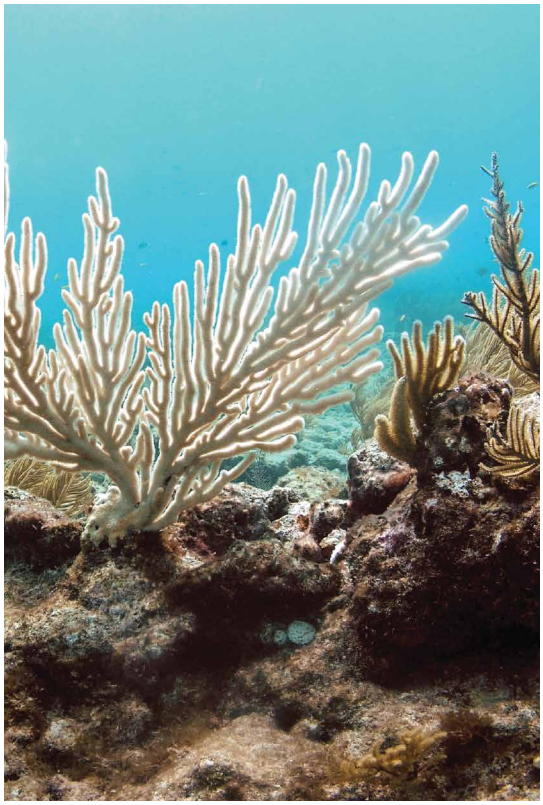


VISTA LEVEL

FLOOR PLAN

CHECK IN

Habitats



Say:

"Although coastal habitats are very different, they all share some basic components."

Explore and use the Student Guide

Discover the features of various coastal habitats, looking for the essential components common to all of them.

Discuss:

What makes a habitat good for an animal?

Some possible answers include…

- *There is plenty of **food** and **water** for the animal.*
- *Animals may use **camouflage** in the habitat.*
- *There is **shelter** with many **hiding places** for the animal.*
- *There is sufficient **space** for the animals to coexist.*

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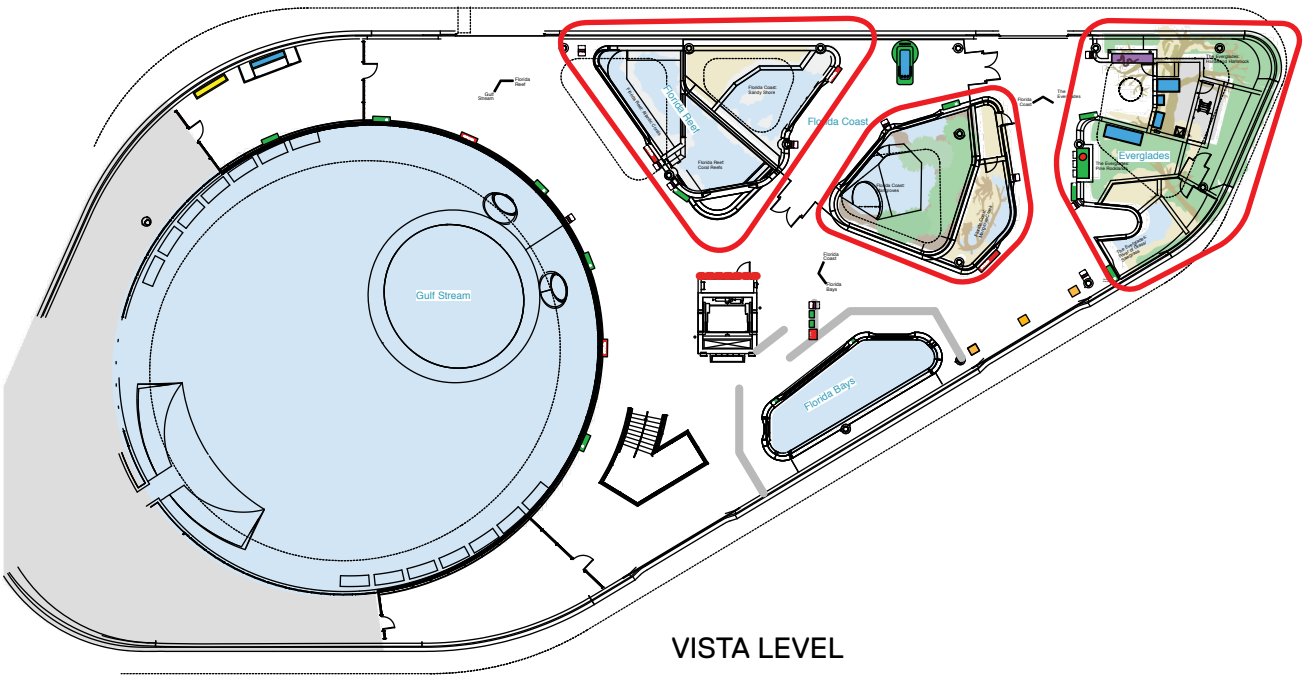


VISTA LEVEL

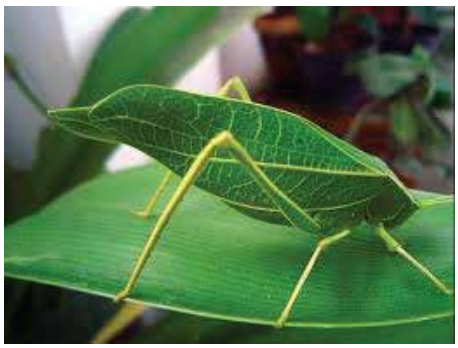
FLOOR PLAN

CHECK IN

Camouflage

Say:

"Many animals use camouflage to help them blend into their surroundings. There are many different types of camouflage, including blending into the background, using patterns, decoration, or distracting other animals. This helps them catch food (predator) and avoid becoming food (prey)."



Explore and use the Student Guide

Explore the Dive level of the Aquarium *to discover animals that camouflage into their marine environments.*

Discuss:

How do different animals blend in with their surroundings?

Some possible answers include…

- *Color*
- *Pattern*
- *Shape*
- *Illumination*
- *Decoration*

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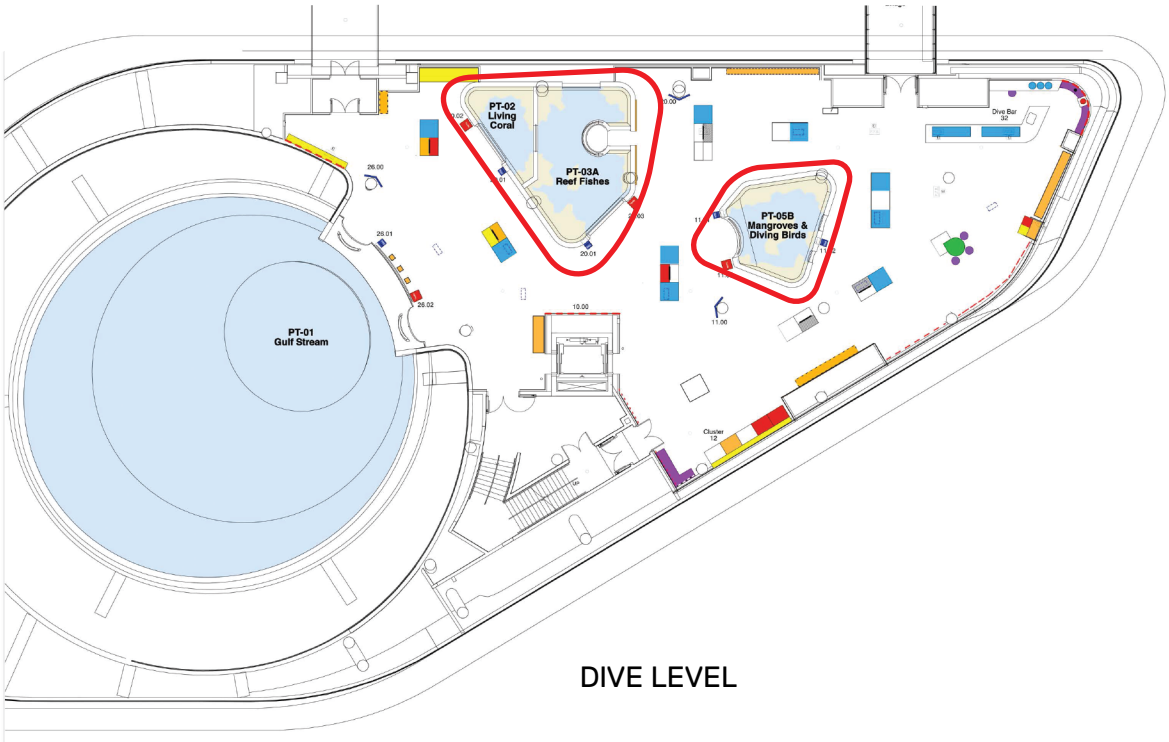

DIVE LEVEL

FLOOR PLAN

CHECK IN

Scientific Process

Say:

"Scientists use the scientific method to help them answer research questions in an organized way."

Explore and use the Student Guide

Explore the Dive level of the Aquarium *to learn more about how the highlighted scientists use the scientific method to answer questions.*

Discuss:

How is the scientific method an open-ended process?

Some possible answers include…

- *It is possible to modify details of the question at any stage of the process.*
- *Answers lead to new questions.*
- *It doesn't have to be used "in order."*
- ***(Great for K-2)** What story was interesting to you and why?*

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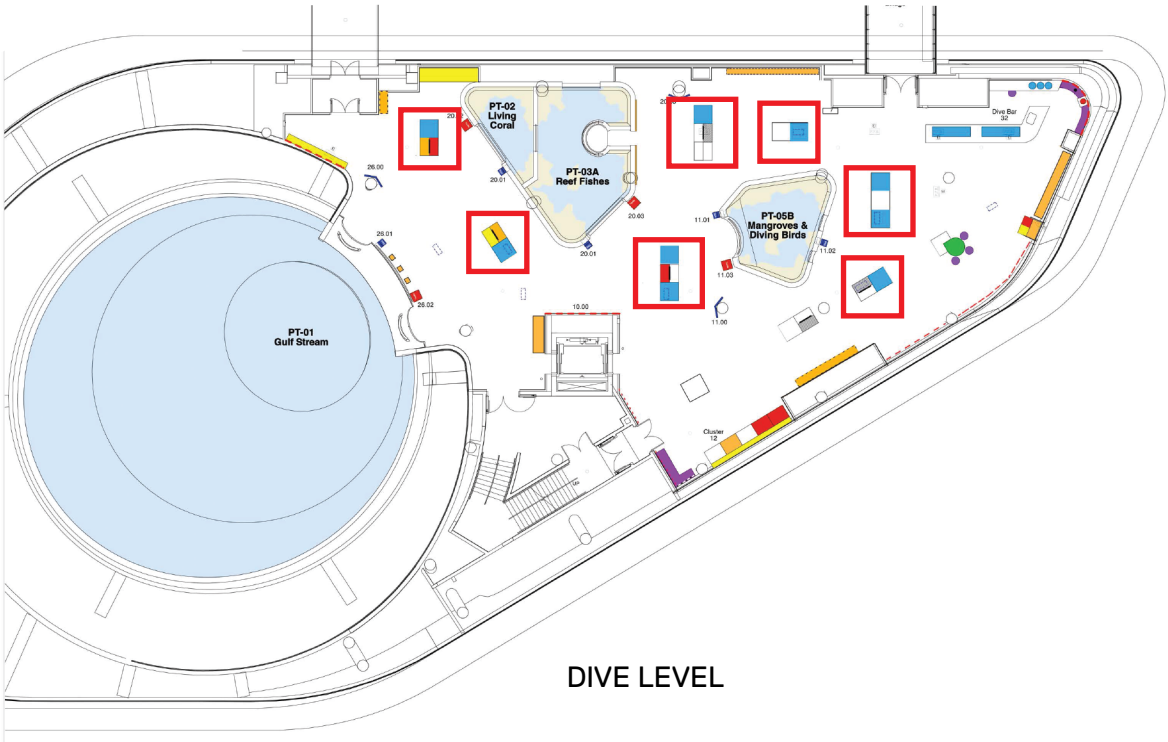

DIVE LEVEL

FLOOR PLAN