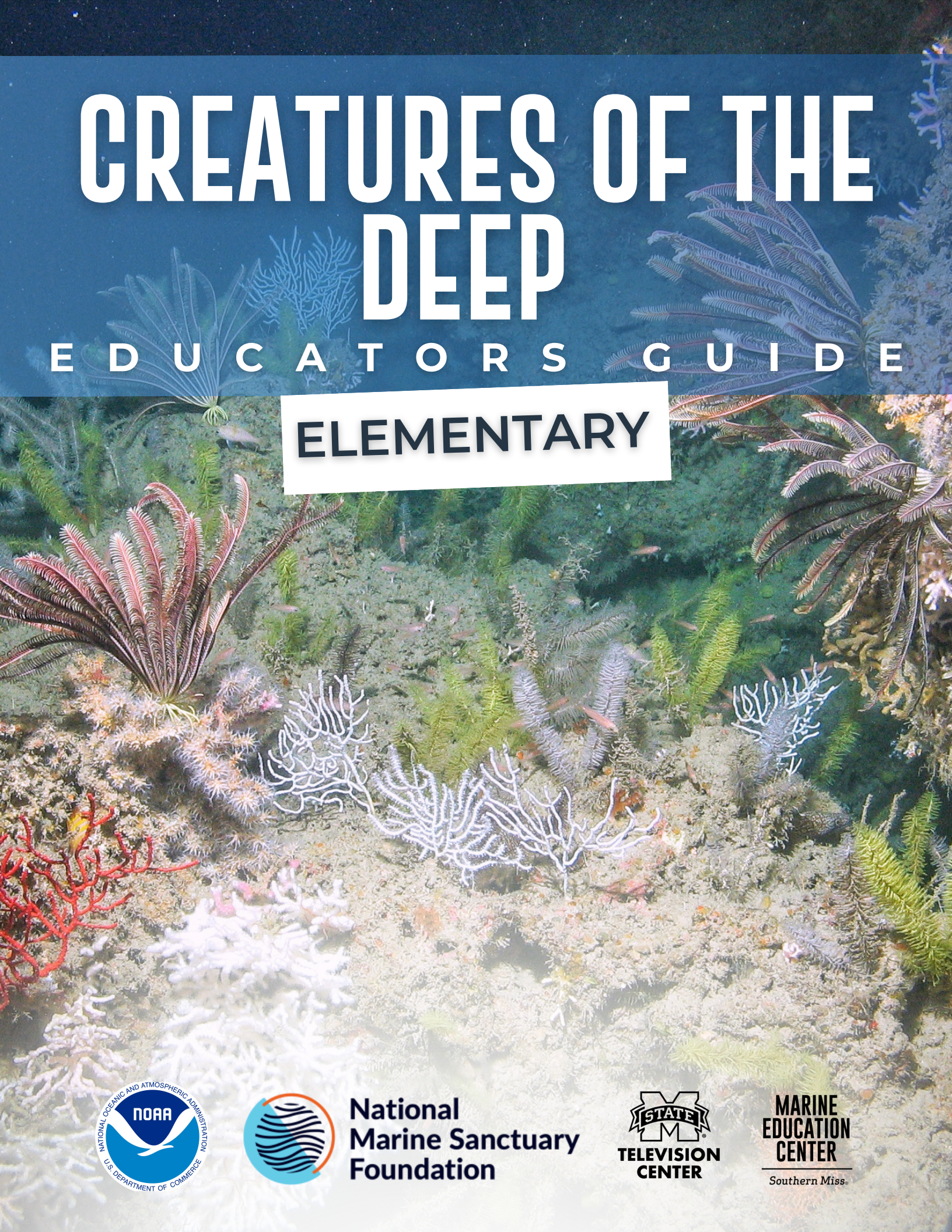
CREATURES OF THE DEEP

EDUCATORS GUIDE

ELEMENTARY

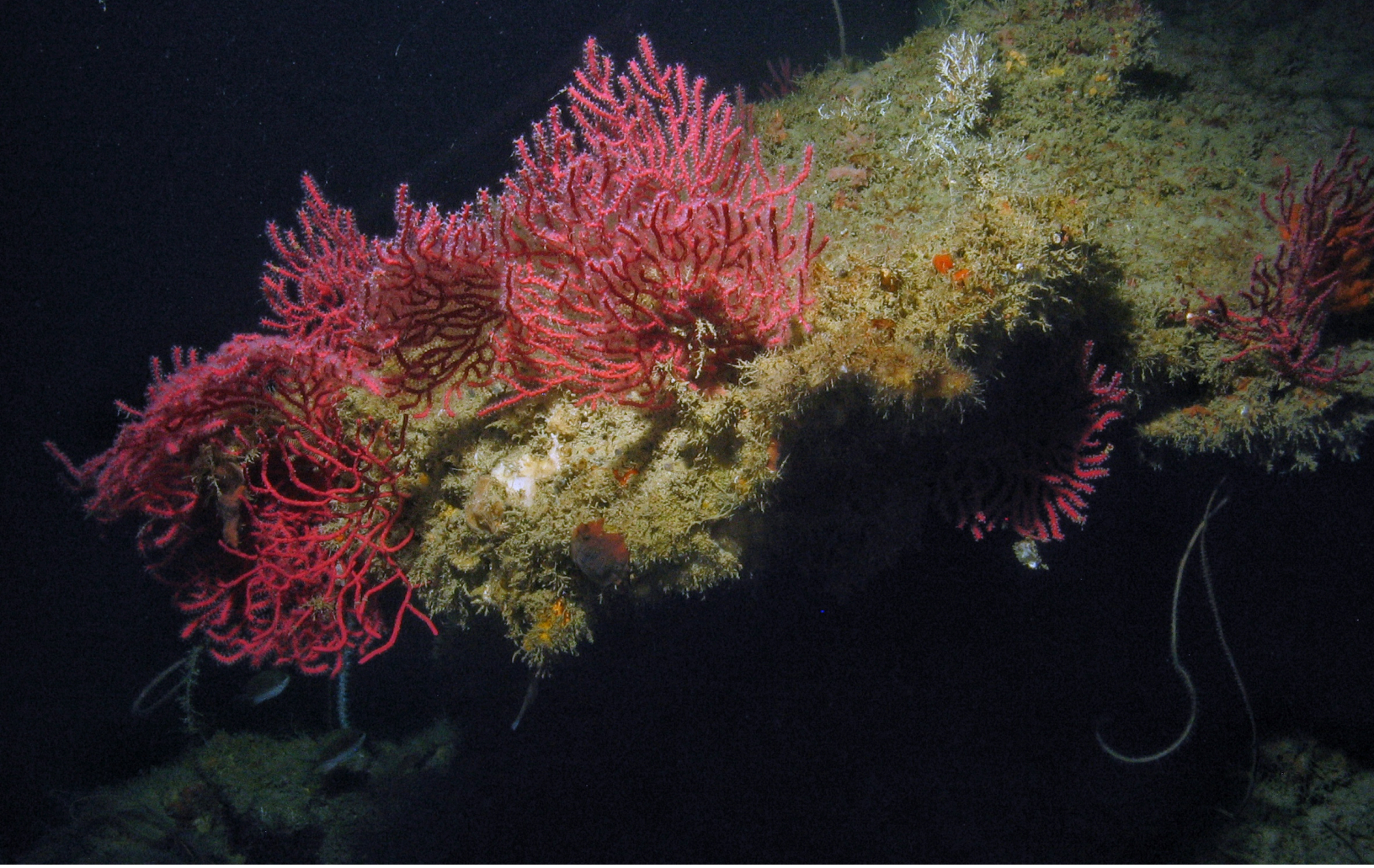


NOAA National Oceanic and Atmospheric Administration U.S. Department of Commerce

National Marine Sanctuary Foundation

STATE Television Center

Marine Education Center Southern Miss.



This activity was created in 2025 through a grant from the National Marine Sanctuary Foundation with funding to restore natural resources injured by the 2010 *Deepwater Horizon* (DWH) oil spill from the DWH Open Ocean Trustees.

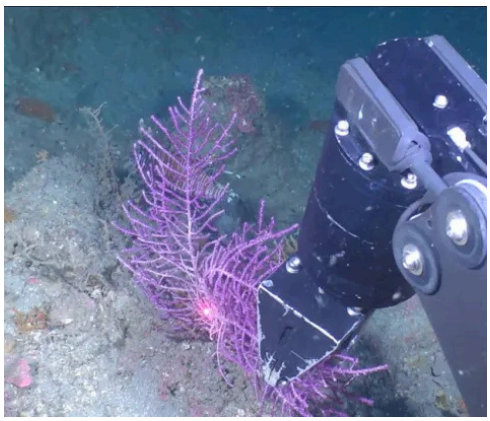
National Marine Sanctuary Foundation

For additional information and activities, visit:
https://marinesanctuary.org/mdbc/

UNIT 1

RESTORING THE DEPTHS

INTRODUCTION



The "Restoring the Depths" unit introduces students to Mesophotic and Deep Benthic Communities (MDBC) found deep in the ocean. Due to their challenging environments, these ecosystems require specialized technology, like remotely operated vehicles (ROVs), for exploration and restoration. Students will participate in hands-on activities to learn ROV piloting, data collection, and scientific communication, gaining insights into deep-sea restoration and the significance of these communities.

OBJECTIVES

- Describe the role and challenges of scientists studying and restoring Mesophotic and Deep Benthic Communities.
- Demonstrate ROV piloting skills for sample collection and underwater observations.
- Explain the significance of technology in deep-sea exploration and restoration.
- Collaborate and communicate effectively during a simulated science mission.
- Reflect on the learning experience and summarize the mission in a report.

LESSON SUMMARY

In this lesson, students simulate tasks that science teams perform through an underwater exploration mission. They start with a video introducing ROVs and their role in deep-sea exploration and restoration, then practice piloting an ROV to collect samples at simulated depths. The lesson concludes with a class discussion to share findings, watching a documentary for reinforcement, and compiling a Mission Report to showcase their work and understanding.

UNIT PLAN

Day 1: Engage and Explore Task 1
Day 2: Explore Task 2
Day 3: Explain and Extend
Day 4: Evaluate
*Plan based on 50 min class periods.

STANDARDS ADDRESSED

3rd Grade

Science

- E.3.9

4th Grade

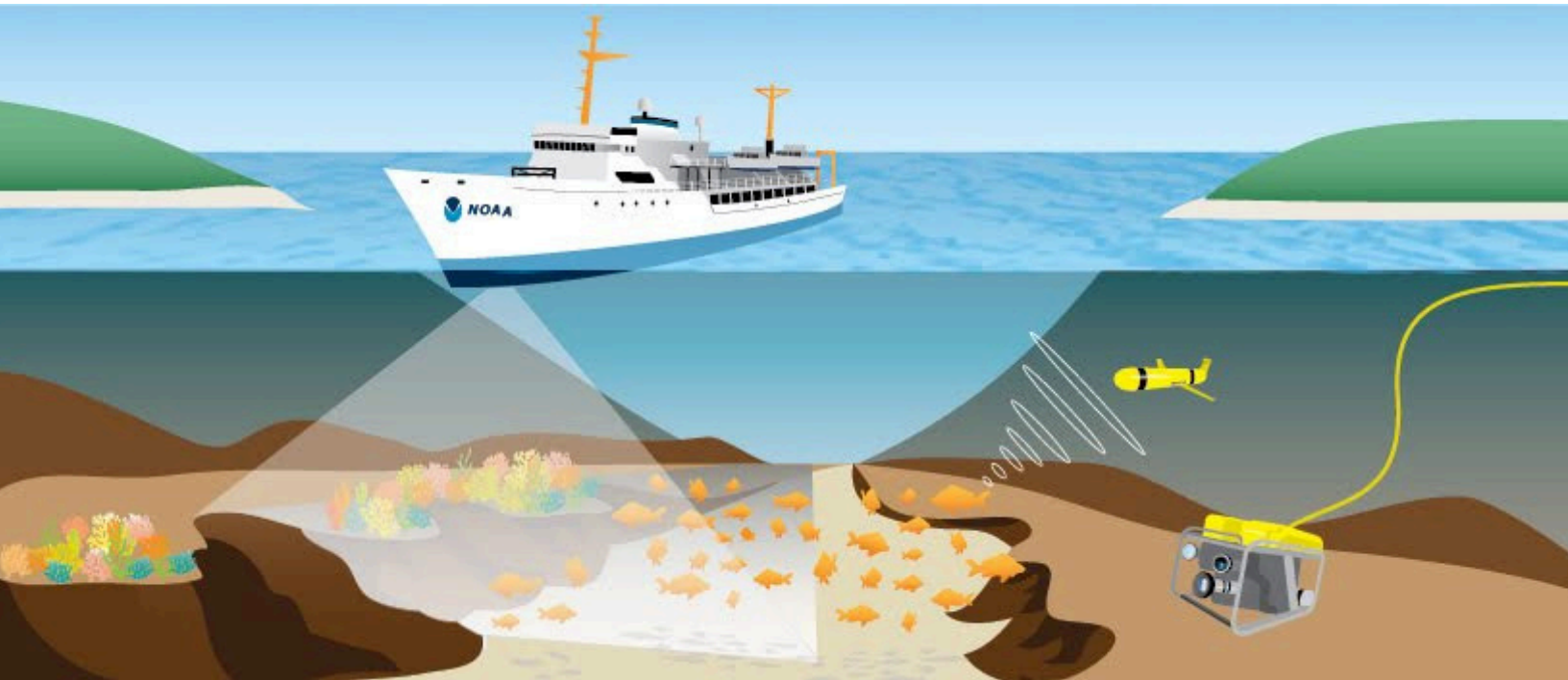
Science

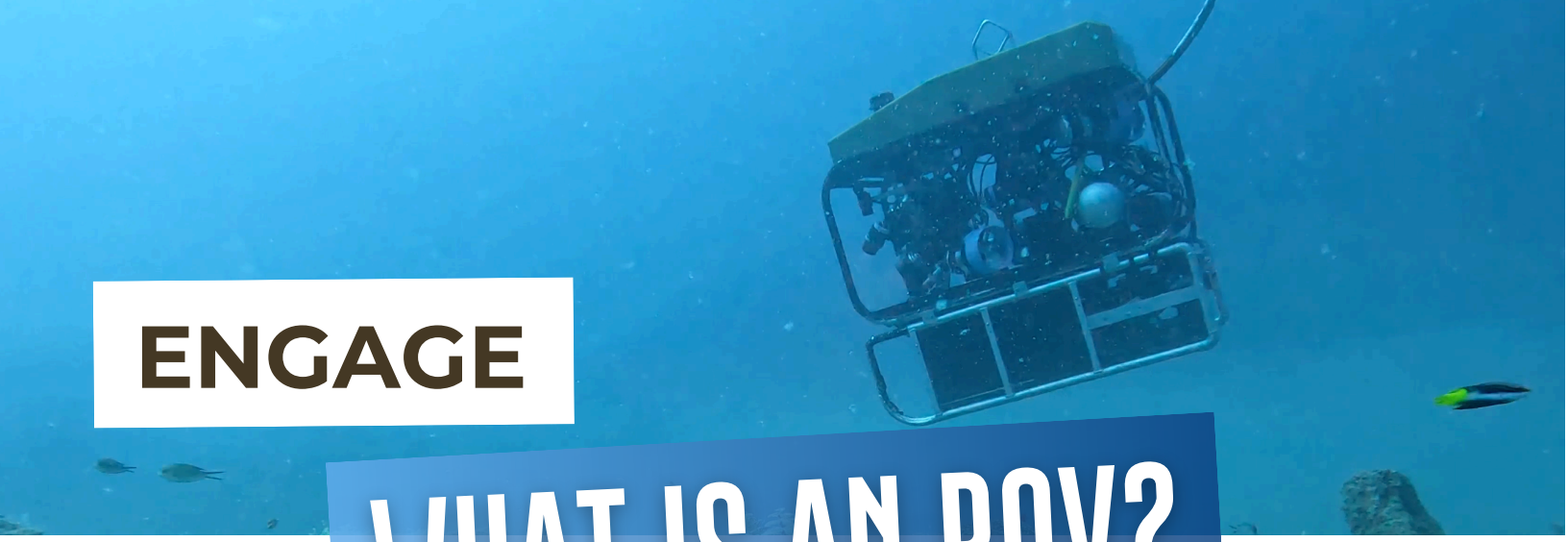
- E.4.9

5th Grade

Science

- P.5.6





ENGAGE

WHAT IS AN ROV?

ESTIMATED TIME

5 minutes

FOCUS QUESTION

What is an ROV (Remotely Operated Vehicle)?

MATERIALS

- Video link to “What is an ROV?” vignette
- See, Think, Wonder Graphic organizer

PREPARATION

- Print a graphic organizer for each student or load the fillable slide into your online classroom
- Pull up the “What is an ROV Vignette?” and make sure the video is working.

*You can post the video in your virtual classroom for students to complete as independent or morning work.

FACILITATION

STEP 1. Have the students view the video and complete the See, Think, Wonder Graphic organizer.

Step 2. After the students have completed the Graphic organizer, ask a few to share what they notice and identify a common theme between student understanding.

Step 3. Reinforce the key ideas: Deep-sea coral communities are important and worth exploring and protecting. Scientists that study and restore these communities face challenges.

SEE THINK WONDER

Name:

Date:

SEE

What do you see?

THINK

What do you think?

WONDER

What do you wonder?

EXPLORE

ROVS & RESTORATION

ESTIMATED TIME

Two 45 minute class periods

FOCUS QUESTIONS

How are remotely operated vehicles (ROVs) used to restore and explore the ocean, and what challenges do scientists and other deep-sea experts face when using them?

How can we work together as a team to solve problems during our ocean exploration mission?

MATERIALS

- Remote control vehicles with Screens (one for every 4 students)
- Markers for ocean waypoints (cones).
- Stopwatches
- Tape Measure
- Pencils and paper
- Masking tape
- Student Worksheets
- Calculators

PREPARATION

- Set-up calibration area in a large open space.
- Set up Blind Mission Course
- Print student worksheets
- Print turn guides
- Make Team Supply kits for each group
- Charge remote control vehicles

FACILITATION

Task 1: Calibrate the ROV

Step 1. Tell the students that they will be divided into teams to complete a mission to a deep-sea coral community to collect coral samples to bring to the surface so scientists can help grow more in labs and learn about them to help restore seafloor habitats injured by a large oil spill.

Step 2. Divide the students into teams of 3 to 4.

Step 3. Explain Calibration
Calibration is essential for restoration experts because it helps ensure the ROV (remotely operated vehicle) is working accurately before it operates in deep underwater environments. Imagine trying to steer a car in a straight line but finding out the steering wheel pulls to one side; without fixing it, you might not reach your destination! Similarly, when scientists calibrate an ROV, they're making sure its sensors and controls are set correctly, so it can navigate accurately and gather reliable data. Calibration helps the ROV avoid mistakes and makes the information more dependable, which is crucial when exploring areas that are difficult to reach and observe directly.

Step 4. Have the students calibrate the ROV and record their data on the calibration sheet.

Step 5. Have the team set up the Calibration course that is included in the trunk.

Step 6. Each team will complete the Mission Plan for the calibration course. They will fill in the missing information by measuring the distance between way points and calculating the amount of time they think it will take them to complete the course.

Step 7. Have each driver complete the calibration course 2 times. The first trial they will be watching the robot. The second trial will be a blind trial.

Step 8.After each team has completed the calibration course, have the students fill out the Calibration Course data sheet for their team.

ROVS & RESTORATION

TEAM NAME: _____

CALIBRATION MISSION DATA SHEET

Using a stopwatch and measuring tool, consistently record the time or distance of the ROV during tests. Ensure measurements are taken from the same starting point, marked with masking tape, for accuracy.

CALIBRATION TEST	DISTANCE OR TIME
How far did the ROV travel in 5 seconds?	Distance trial # 1= meters
How far did the ROV travel in 5 seconds?	Distance trial # 2= meters
How far did the ROV travel in 5 seconds?	Distance trial # 3= meters
Add the three distances together and divide by 3 (the number of distance trials) to get the average distance the ROV traveled in 5 seconds =	meters
Divide the average distance (answer in box above) by 5 seconds to get the distance per second =	meters/seconds
Time needed to turn 45˚ = Time needed to turn 90˚ =	seconds seconds
Time needed to turn 135˚ = Time needed to turn 180˚ =	seconds seconds
Time needed to turn 225˚ = Time needed to turn 270˚ =	seconds seconds
Time needed to turn 315˚ = Time needed to turn 360˚ =	seconds seconds
Time needed to come to a full stop =	seconds

ROVS & RESTORATION

TEAM NAME: _____

CALIBRATION MISSION PLANNING SHEET

You're going to help plan your ROV's trip to each target (waypoint)!

1. Write down how far the ROV needs to go to each waypoint (in meters).
2. Use your ROV speed (meters per second) to figure out how many seconds to drive that far.
   - Formula: Time = Distance ÷ Speed
3. If the ROV needs to turn, use your calibration test to figure out how many degrees to turn and how many seconds that takes.
4. For each move, write:

ROV MISSION PLAN

1. Distance to waypoint #1 = _____ meters

   ROV time to waypoint #1 =_____ seconds

2. Turn _____ degrees for next waypoint

   ROV time to turn degrees = _____ seconds

3. Distance to waypoint #2 = _____ meters

   ROV time to waypoint #2 = _____ seconds

4. Turn _____ degrees for next waypoint

   ROV time to tum degrees = _____seconds

5. Distance to waypoint #3 = _____ meters

   ROV time to waypoint #3 = _____seconds

ROVS & RESTORATION

TEAM NAME: _____

CALIBRATION MISSION DATA

Fill in the chart using the data your team collected!

1. Write the measurements your team took before driving the ROV. These are the distances between each waypoint on the course.
2. Write what really happened when the ROV drove the course. How far did it actually go?
3. Check for any differences.
    - Was the ROV's path longer or shorter than you planned?
    - Write the difference in the “Difference in Results” box.

CALIBRATION MISSION DATA TABLE

Actual Measurements to Way Points	Actual Distance Traveled by ROV	Difference in Results
Waypoint #1 measurement		
Waypoint #2 measurement		
Waypoint #3 measurement		

FACILITATION

Task 2: Mission Course

Step 1. The teacher will set up the Mission course using the guide. This will simulate a coral community on the seafloor beyond the reach of sunlight (a "deep benthic" community). Make sure that the mission course cannot be seen by the students.

Step 2. The students will select or be given a role on the Mission Crew.

Step 3. Using the calibration summary from the calibration course data sheet, have the students complete the ROV Mission Plan.

Step 4. The teacher will place the ROV at the designated start line and have the students use the mission plan to collect the coral samples at each way point. This is a blind trial so the team should not be able to see the course. Each team member will perform a different role to make sure the mission is a success.

Step 5. The students will collect the Deep Benthic Mission Data that is assigned to their role and use it to write their final mission brief.

Step 6. Have the students reflect as a team on the following topics: How they could make the ROV more accurate in reaching the waypoints. Encourage them to think about challenges in the ocean (currents, obstacles).

ROV Pilot

Pilots the ROV during the mission and follows the instructions that are read to them by the Comms Lead.

Data Manager

Use the stopwatch to time the ROV during its transits between the waypoints and records the data on the data sheet.

Comms Lead

Reads the mission plan instructions aloud to the ROV Pilot.

Chief Scientist

Can see the mission course and give feed back to the team between trials during the mission.

TEAM NAME: _____

EXPLORING THE DEPTHS 101

DEEP BENTHIC MISSION PLANNING SHEET

You're going to help plan your ROV's trip to each target (waypoint)!

1. Write down how far the ROV needs to go to each waypoint (in meters).
2. Use your ROV's speed (meters per second) to figure out how many seconds to drive that far.
   - Formula: Time = Distance ÷ Speed
3. If the ROV needs to turn, use your calibration test to figure out how many degrees to turn and how many seconds that takes.
4. For each move, fill in the blanks below.

ROV MISSION PLAN

1. Distance to waypoint #1 = _____ meters

   ROV time to waypoint #1 =_____ seconds

2. Turn _____ degrees for next waypoint

   ROV time to turn degrees = _____ seconds

3. Distance to waypoint #2 = _____ meters

   ROV time to waypoint #2 = _____ seconds

4. Turn _____ degrees for next waypoint

   ROV time to tum degrees = _____seconds

5. Distance to waypoint #3 = _____ meters

   ROV time to waypoint #3 = _____seconds

TEAM NAME: _____

EXPLORING THE DEPTHS 101

DEEP BENTHIC MISSION DATA

Fill in the chart using the data your team collected!

1. Write the measurements your team took before driving the ROV. These are the distances between each waypoint on the course.
2. Write what really happened when the ROV drove the course. How far did it actually go?
3. Check for any differences.
    - Was the ROV's path longer or shorter than you planned?
    - Write the difference in the “Difference in Results” box.

DEEP BENTHIC MISSION DATA TABLE

Actual Measurements to Way Points	Actual Distance Traveled by ROV	Difference in Results
Waypoint #1 measurement		
Waypoint #2 measurement		
Waypoint #3 measurement		

EXPLAIN

MISSION DEBRIEF

ESTIMATED TIME

15 minutes

FOCUS QUESTION

How was this activity like real-world deep-sea restoration?

What lessons did you learn?

How do scientists share what they learn on restoration missions?

MATERIALS

- Mission Summary Guide

PREPARATION

Print a copy of the Mission Summary guide for each group

FACILITATION

STEP 1. Have each team complete the Mission Summary guide and share their experience with the class.

TEAM NAME: _____

ROVS & RESTORATION

DEEP BENTHIC MISSION SUMMARY GUIDE

Directions: Use your test results to answer the questions below. Try your best and explain what you noticed!

What Did You Learn?

What is calibration, and why is it important for the ROV?

About the ROV Test

What did you notice when you measured the ROV's movements during the test? (Think about how far it traveled, how long it took to turn, etc.)

Mission Experience

What was different between the first time you drove the ROV (when you could see it) and the blind trial (when you couldn't see it)?

What was the most challenging part of the ROV mission?

ROVS & RESTORATION

DEEP BENTHIC MISSION SUMMARY GUIDE CONTINUED

Working as a Team
What role did you play in the team during the mission?

How did your team work together to complete the mission?

Looking Ahead
What would you change next time to make the ROV mission even better?

What do you think would be the hardest part of using an ROV in the deep ocean?

Final Thoughts
What's one thing you learned from this activity that you didn't know before?

EXTEND

CREATURES OF THE DEEP FILM

Coming Soon!

ESTIMATED TIME

45 minutes

FOCUS QUESTION

How do scientists work in, explore , and restore the deep sea?

30 minutes

MATERIALS

- Video link to the “Creatures of the Deep” documentary

PREPARATION

- Pull up the documentary and make sure the video is working.

FACILITATION

STEP 1. Show the documentary and make connections to the ROV activity and discuss how ROVs help restore the deep coral habitats injured by the *Deepwater Horizon* oil spill.

Step 2. Give students their See, Think, Wonder graphic organizer and see if any of their wonder questions were answered.

DEEP WATER EXPLORATION LIVE STREAM OPTION

- Pull up the ROV Livestream on YouTube. *Be sure you have access from your district.
- YouTube Channel: Inner Space Center
- Video Title: Gulf Restoration Live! Tools of Deep-Sea Coral Restoration

EVALUATE MISSION REPORT

ESTIMATED TIME

45 minutes

FOCUS QUESTIONS

What is an ROV?

How was this activity like real-world deep-sea restoration?

How do scientists share what they learn on restoration missions?

How are remotely operated vehicles (ROVs) used to explore the ocean, and what challenges do scientists face when using them?

How can we work together as a team to solve problems during our restoration missions?

MATERIALS

- All student worksheets, data and graphic organizers from the previous activities
- Mission Report Rubric
- Online survey link for students to provide lesson feedback.

FACILITATION

STEP 1. Have teams create a presentation that summarizes their learning about ROVs and how scientists work on deep sea restoration.

Step 2. Allow each team to share their Mission Report

Step 3. Have students complete the online survey.

NAME:_____
ROLE:_____

ROVS & RESTORATION

MISSION REPORT RUBRIC

Each team member will complete the section of the report that corresponds to their assigned role. Students can create a slide, write a sentence or write a paragraph depending on the grade level and the learning objectives

Category	4 - Excellent	3 - Good	2 - Fair	1 - Needs Improvement
Introduction (Chief Scientist)	Clearly explains the mission with details about what they were trying to do and why it's important.	Gives a clear idea of the mission but lacks some details.	Mentions the mission but leaves out many details.	Does not clearly explain the mission or why it was done.
Activity Summary (ROV Pilot)	Describes each step they took in the activity with clear details.	Describes most of the activity steps with some detail.	Describes only a few activity steps or lacks detail.	Does not describe the activity steps clearly.
Results (Data Manager)	Clearly records all measurements and results with correct information.	Records most measurements and results correctly.	Records some measurements, but there are some errors.	Does not record measurements clearly or is missing data.
Lessons Learned (Comms Lead)	Explains what they learned with details and gives examples.	Explains what they learned but lacks some detail.	Mentions something learned but gives very little detail.	Does not clearly explain what they learned.

UNIT 2

MESOPHOTIC MYSTERIES

INTRODUCTION

The "Mesophotic Mysteries" lesson introduces students to the unique coral ecosystems of mesophotic and deep benthic communities through engaging activities, videos, and hands-on learning. Students explore the challenges scientists face in studying and restoring these habitats, while gaining insight into the role of technology, such as remotely operated vehicles (ROVs), in deep-sea exploration and restoration.

OBJECTIVES

- Understand the unique qualities of coral communities in the mesophotic and deep benthic zones.
- To explore the challenges scientists face when conducting restoration of these communities.
- Gain insight into the role of technology in deep-sea restoration.

LESSON SUMMARY

The lesson includes a board game that simulates a mission to restore coral, a documentary on deep-sea restoration, and articles to deepen students' understanding of coral restoration. By the end of the unit, students will have strengthened their science inquiry skills, learned about the importance of these ecosystems, and gained an appreciation for the complexities of deep-sea restoration and conservation.

UNIT PLAN

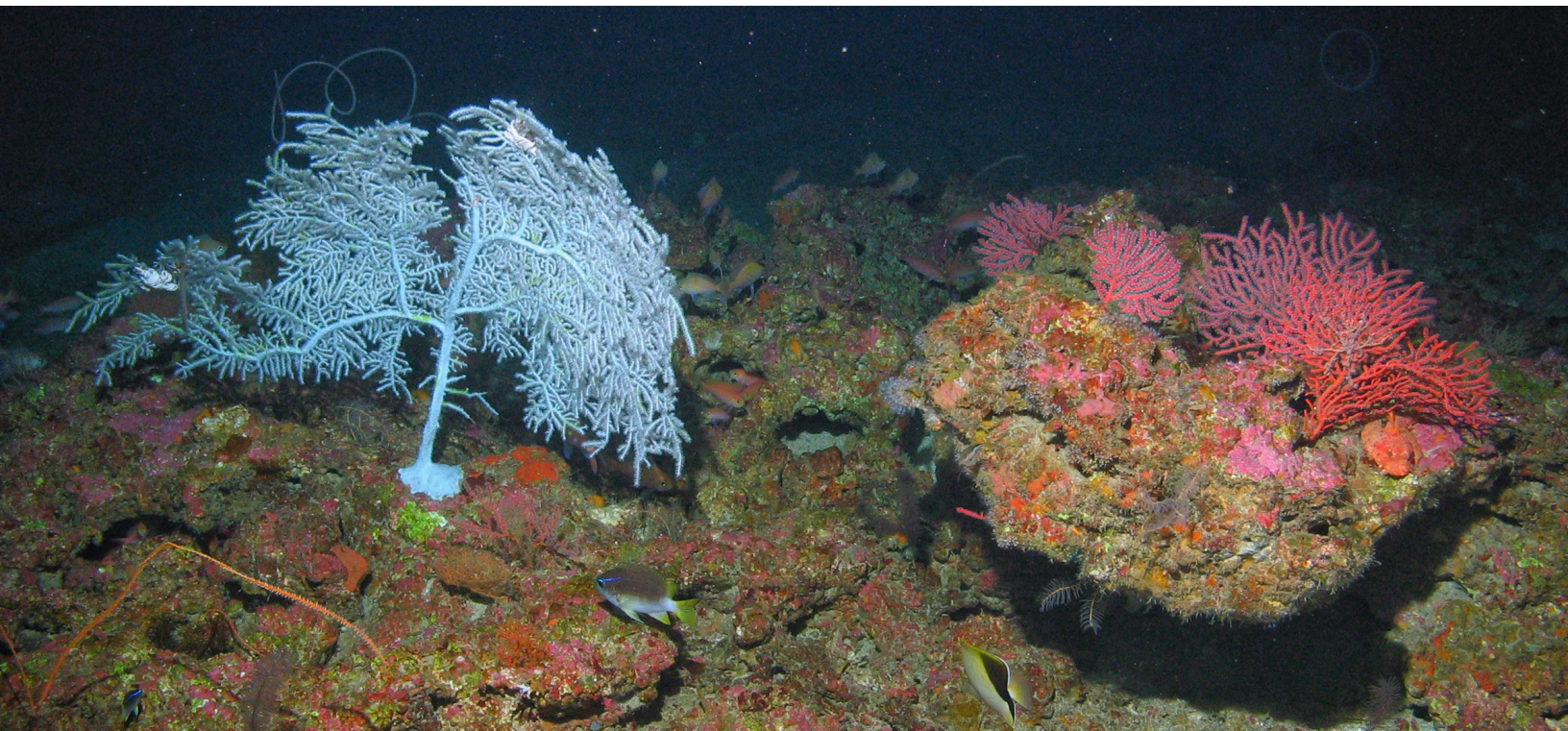
Day 1: Engage and Explore
Day 2: Explain and Extend
Day 3: Extend and Evaluate
*Plan based on 50 min class periods.

STANDARDS ADDRESSED

3rd Grade
Science
- E.3.9

4th Grade
Science
- E.4.9

5th Grade
Science
- P.5.6



ENGAGE

DEEP-SEA CORALS

ESTIMATED TIME

5 minutes

FOCUS QUESTION

Why might scientists find it challenging to study deep-sea environments?

What tools or technology do you think they might need?

MATERIALS

- Video links to “Deep-Sea Coral Care” and “MDBC” vignettes
- See, Think, Wonder Graphic Organizer

PREPARATION

- Print a graphic organizer for each student or load the fillable slide into your online classroom
- Pull up the 2 videos and test playback of each.

*You can post the video in your virtual classroom for students to complete as independent or morning work.

FACILITATION

STEP 1. Have the students view the videos and complete the See, Think, Wonder Graphic Organizer.

Step 2. After the students have completed the Graphic Organizer, ask a few to share what they notice and identify a common theme between student understanding.

Step 3. Reinforce the key ideas: These habitats are important and worth studying and protecting. Scientists that studies these communities face challenges.

SEE THINK WONDER

Name:

Date:

SEE

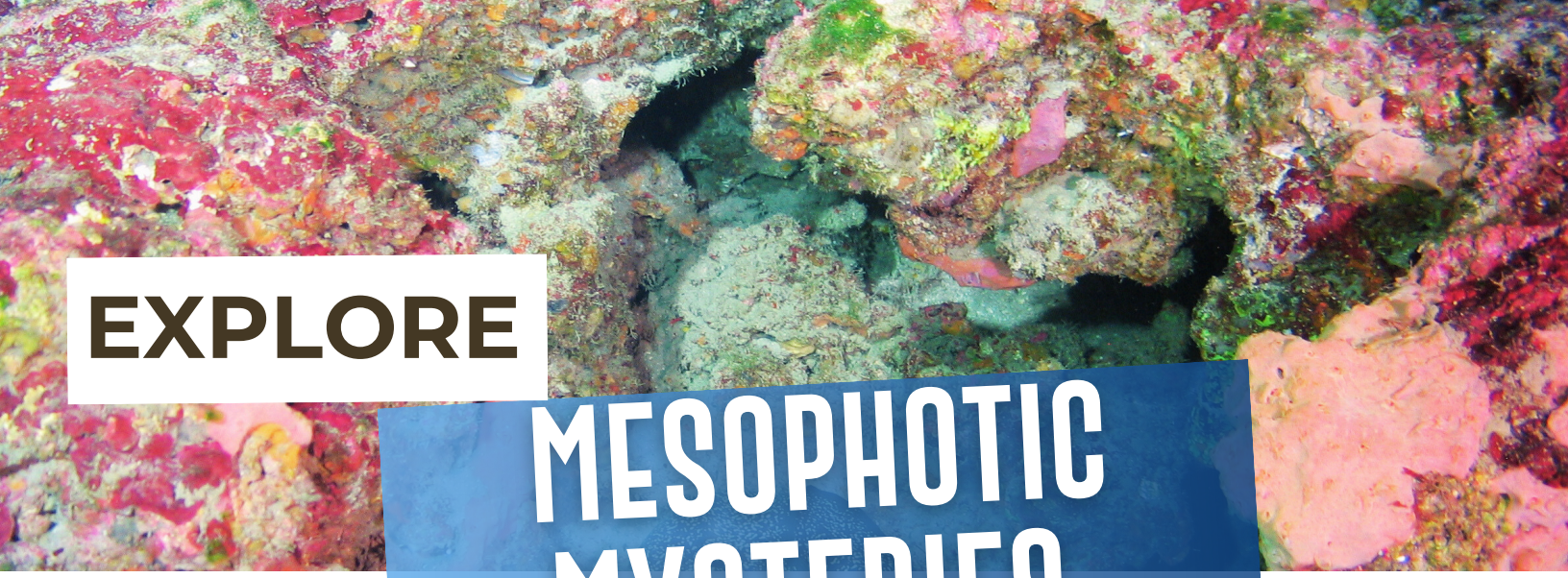
What do you see?

THINK

What do you think?

WONDER

What do you wonder?



EXPLORE MESOPHOTIC MYSTERIES

ESTIMATED TIME
30 minutes

FOCUS QUESTIONS
What technology is used when learning about mesophotic and deep benthic communities?

What challenges do scientists encounter when doing deep-sea coral restoration?

What is needed to restore deep-sea coral?

MATERIALS

- Mesophotic Mysteries Board Game
- Game Pieces
- Game Cards

PREPARATION

- Set up board game

FACILITATION

Step 1. Tell the students that they will be divided into groups to complete a board game that simulates a mission to a deep-sea coral community to collect coral samples to bring to the surface for propagation and experiments.

Step 2. Divide the students into groups of up to 6 players.

Step 3. Explain game rules and instructions.

Step 4. Have the group play the board game.

Step 5. After all the groups finish the game, ask the students to describe the challenges and the milestones that they learned about. Make connections to related ideas and concepts.

MESOPHOTIC MYSTERIES BOARD GAME INSTRUCTIONS

OBJECTIVE

Players act as scientists collecting coral from the seafloor to return to their vessel. The first to successfully bring back a coral sample wins!

SETTING UP

- Place the game board on a flat surface.
- Each player selects a game piece.
- Shuffle the game cards and place them face-down beside the board.

WHO GOES FIRST

- Each player rolls a die.
- The player with the highest number goes first.
- If it's a tie, roll or draw again.
- Play will continue clockwise from the first player.

QUICK REMINDERS

- Take turns in clockwise order.
- Always follow the instructions on the card you draw.
- Have fun and learn about the challenges and successes of coral restoration projects!

HOW TO PLAY

1. **Start Your Turn**: On each turn, draw a card from the deck and read it aloud
2. **Follow the Card's Instructions**:
   * Some cards will ask you to move forward toward the coral, while others may send you back or delay your mission.
   * Move your game piece according to the card's instructions.
3. **Take Turns**: After following the instructions on your card, place it in the discard pile. The player to your left then takes their turn.

SPECIAL RULES

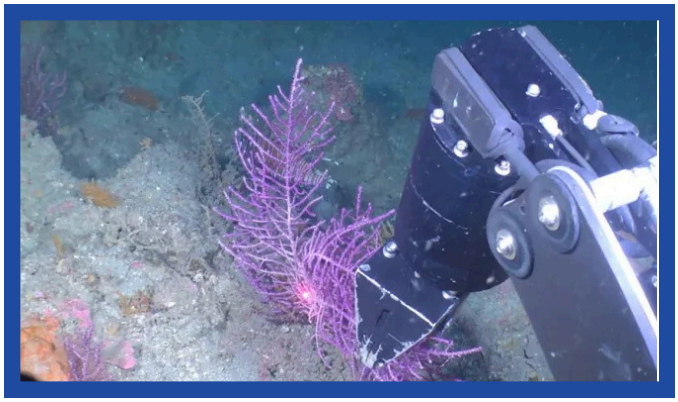
- **Collecting the Coral**: When you reach the "Coral Site" space on the board, you've collected your coral sample! Now, you must head back to the vessel to complete your mission.
- **Returning to the Vessel**: Continue drawing cards and moving according to their instructions until you make it back to the " Vessel" space.

WINNING THE GAME

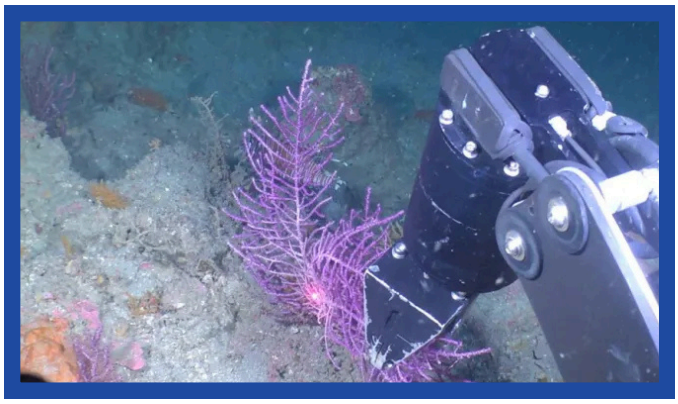
The first player to return to the "Vessel" space with their coral sample wins the game!

IMPORTANT NOTES

- **Multiple Players on One Space**: More than one player can be on the same space at any time.
- **Shuffle the Cards**: If you run out of cards in the deck, shuffle the discard pile and continue playing.



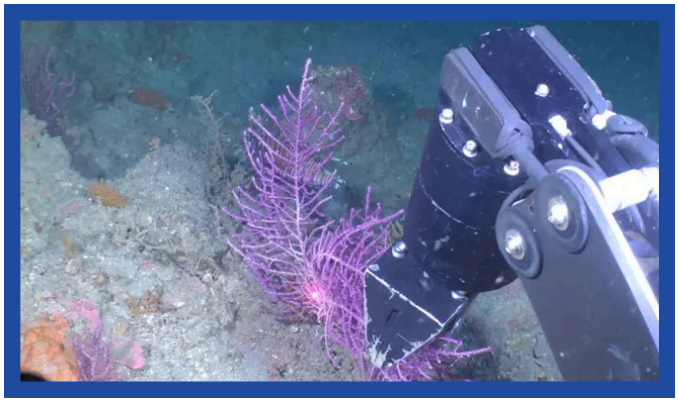
MESOPHOTIC MYSTERIES 2-5 Grade Mission Cards



ROV Works Perfectly!

Your underwater robot, called a remotely operated vehicle (ROV), dives smoothly with no problems.

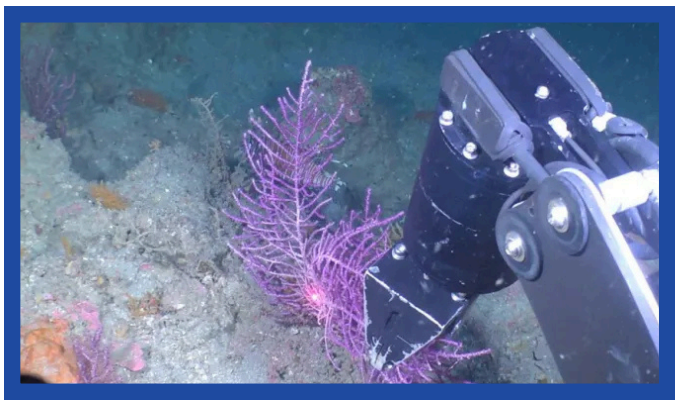
Move forward 2 spaces.



Important Water Data Collected

Your team collects water samples, helping scientists understand the deep-sea environment.

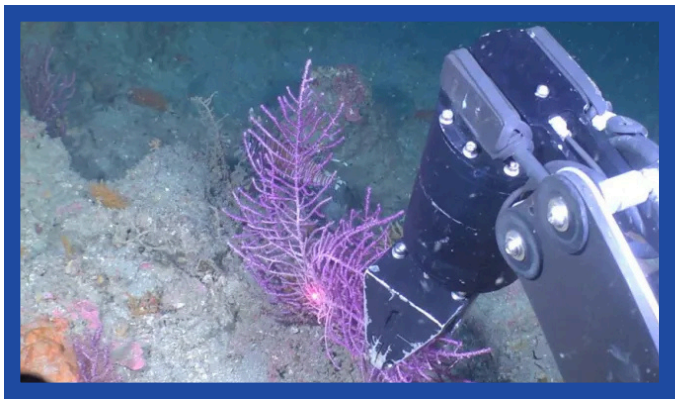
Your paragraph text



Successful Feeding Experiment

A new way of feeding corals in the lab helps them capture more food from the water column.

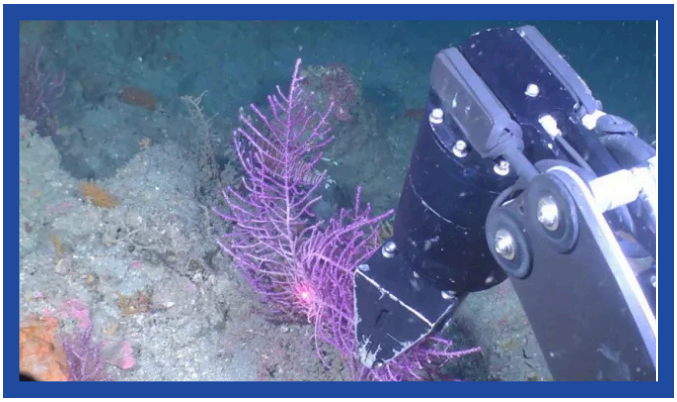
Move forward 4 spaces.



New Coral Growth

A coral piece in the lab grows a new polyp, adding to the colony.

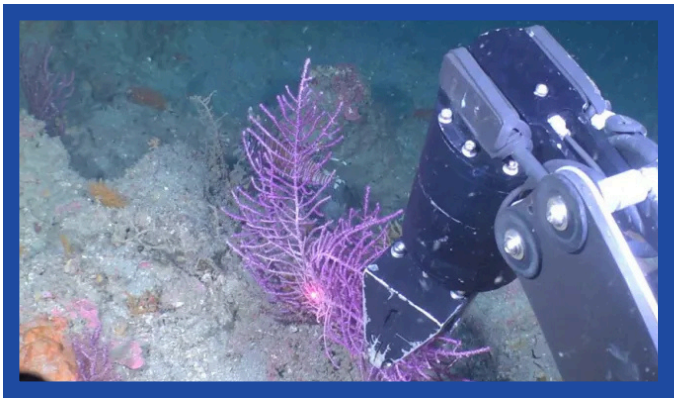
Move forward 5 spaces.



Coral Babies Settle Down

Coral larvae (tiny coral babies) settle onto tiles in the lab, helping scientists learn about coral growth.

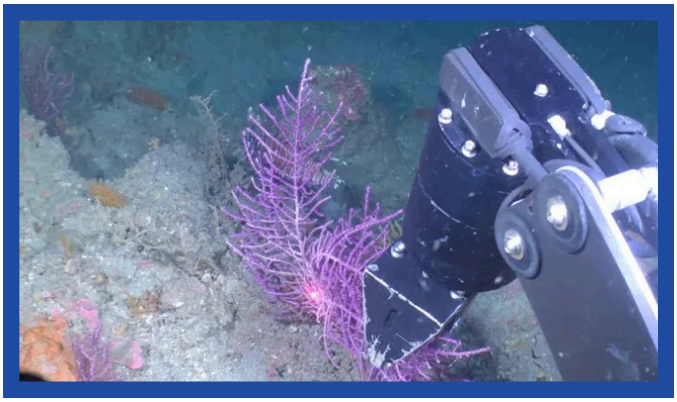
Move forward 3 spaces.



Mapping the Seafloor

Your team uses special tools to map a large area of the seafloor, finding more places where corals live.

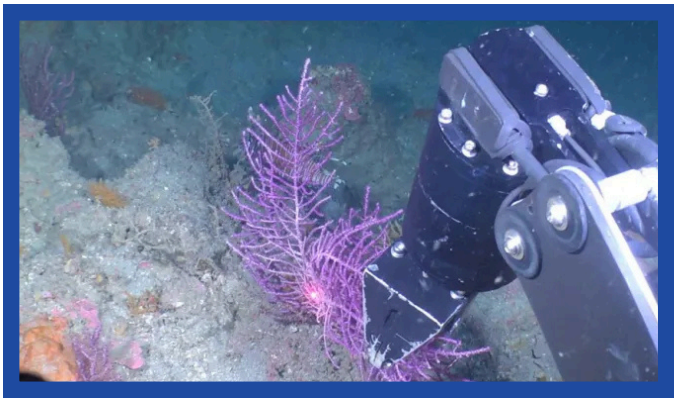
Move forward 3 spaces.



Corals Reproduce in the Lab

Corals in the lab "spawn", releasing tiny eggs and sperm into the water that combine to create baby corals.

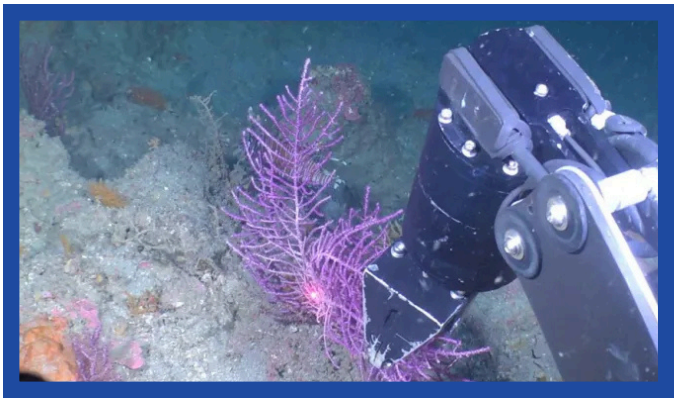
Move forward 4 spaces.



Coral Health Check Complete

Your team checks several coral colonies and gathers important information about their health.

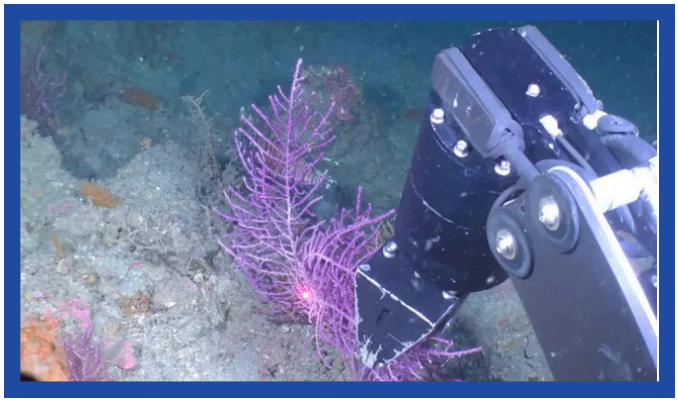
Move forward 2 spaces.



New Way to Grow Coral

A new type of material is tested that more coral babies are settling on to grow.

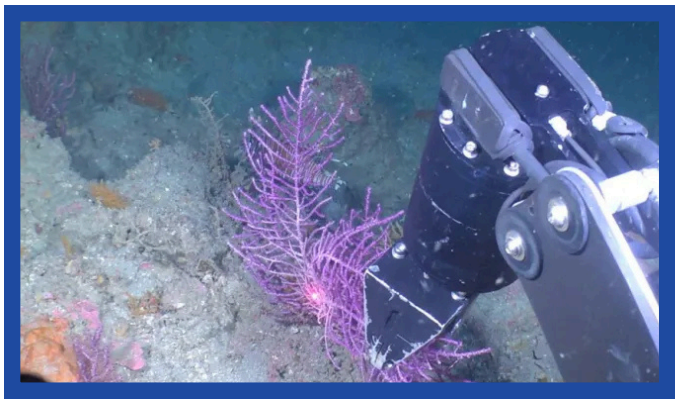
Move forward 5 spaces.



Perfect Weather for Diving

The weather is clear and the sea is calm, so your team can complete all planned ROV dives.

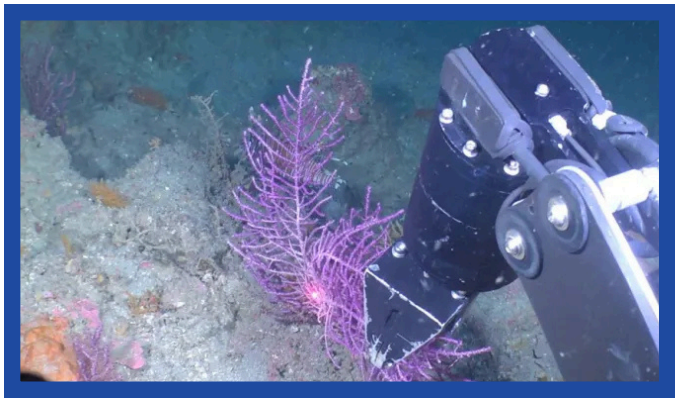
Move forward 2 spaces.



Coral Transplants Doing Well

Coral pieces moved to a new place are healthy and growing, showing promise for future restoration.

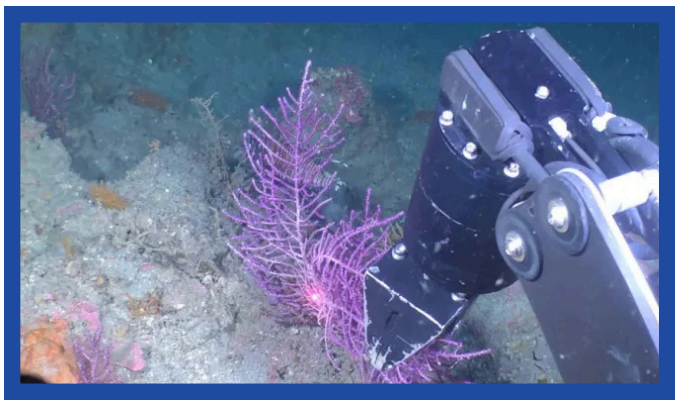
Move forward 3 spaces.



ROV Malfunction

During a dive, the ROV's arm breaks, stopping coral collection. The team has to go back for repairs.

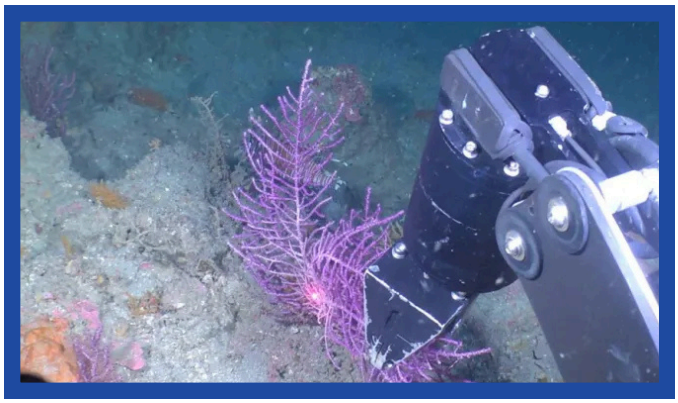
Move back 3 spaces.



Strong Ocean Currents

Strong, fast-moving water makes it too hard for the ROV to reach the coral site. The dive is postponed.

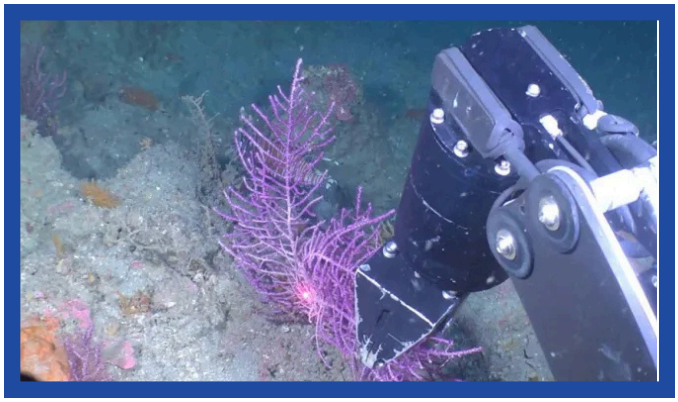
Move back 3 spaces.



New Coral Colony Found!

During a dive, your team finds a healthy coral colony and collects a piece to bring back to the lab.

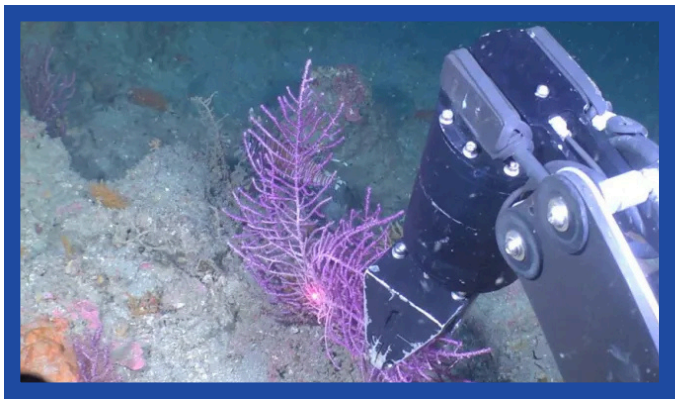
Move forward 3 spaces.



Water Cloudy in the Lab

Keeping the lab water clean is tough, and some corals show signs of stress. The team stops to fix the problem.

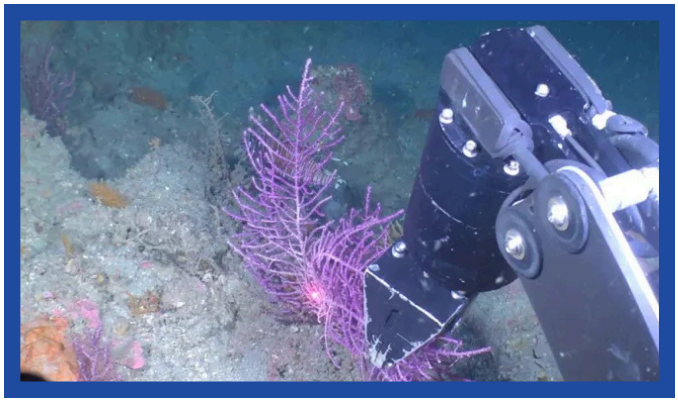
Move back 4 spaces.



Sand Clouds the Water

When reaching the coral site, sand is stirred up, making it too hard to see and collect samples quickly.

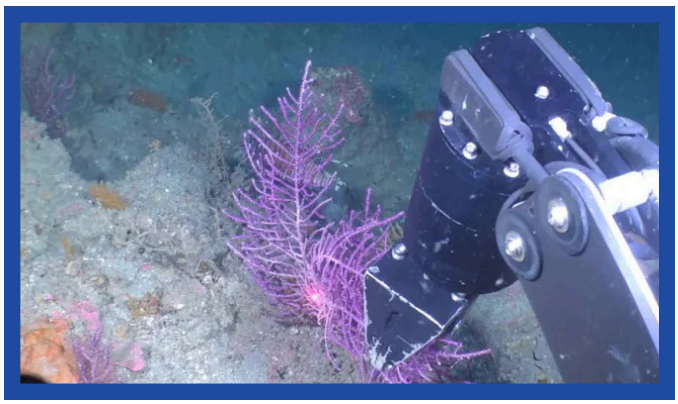
Move back 2 spaces



COVID-19 Case on Ship

A crew member tests positive for COVID-19, so the team has to go back to port, delaying more dives.

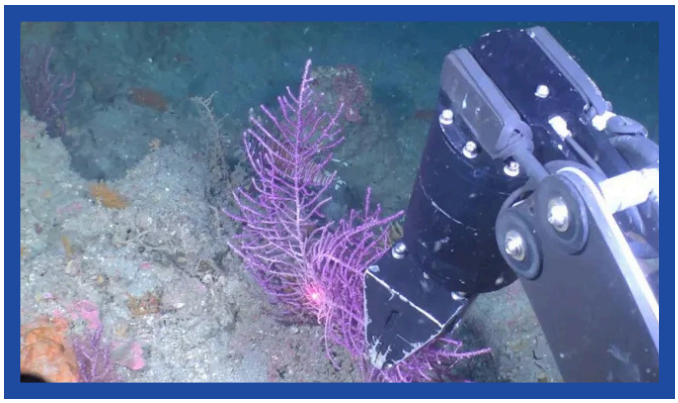
Move back 3 spaces.



Coral Samples Don't Make It

Some corals don't survive the trip back to the lab. The team has to wait until the next mission for more samples.

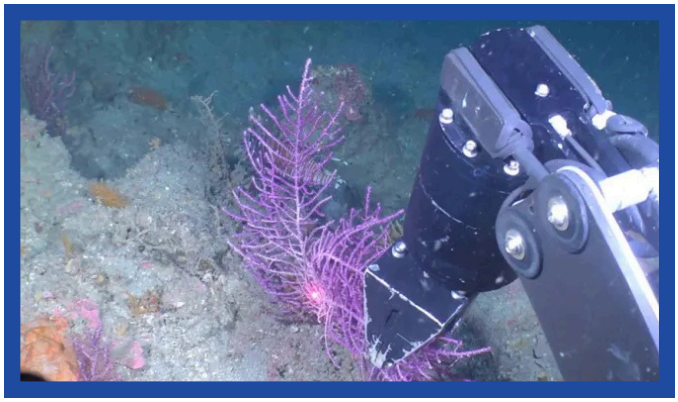
Move back 4 spaces.



No Coral Colonies Found at Dive Site

No coral colonies were found at the site of this ROV dive, so the team has to wait until the next dive to collect.

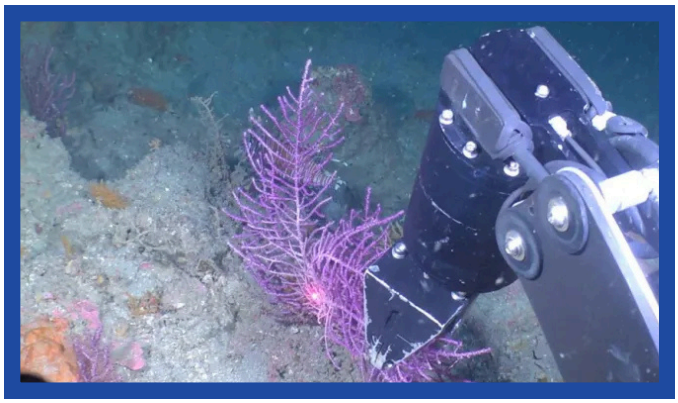
Move back 2 spaces.



Equipment Breaks Underwater

One of the cameras stops working, so your team can't take important photos of the corals on this dive.

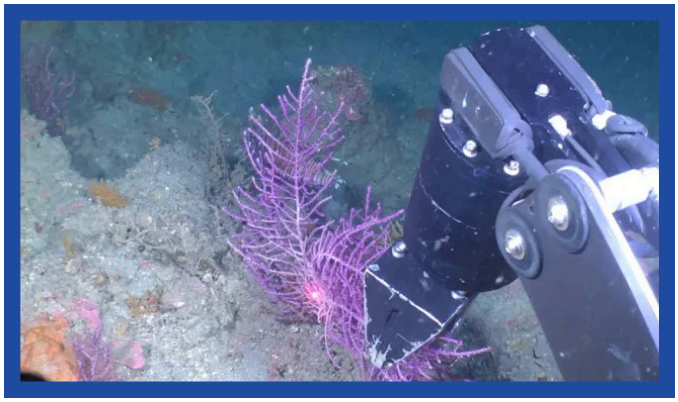
Move back 3 spaces.



Water Quality Issue

The salinity of the water in one of the coral lab tanks is too high (too salty). The team pauses to fix the issue.

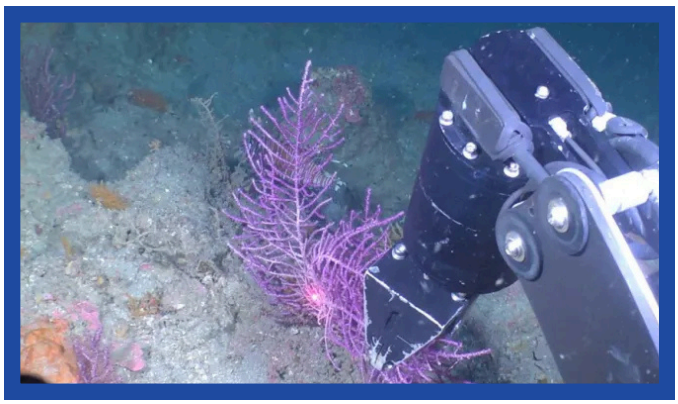
Move back 4 spaces.



Injured Coral Found

The team finds a coral colony with damage from the oil spill.

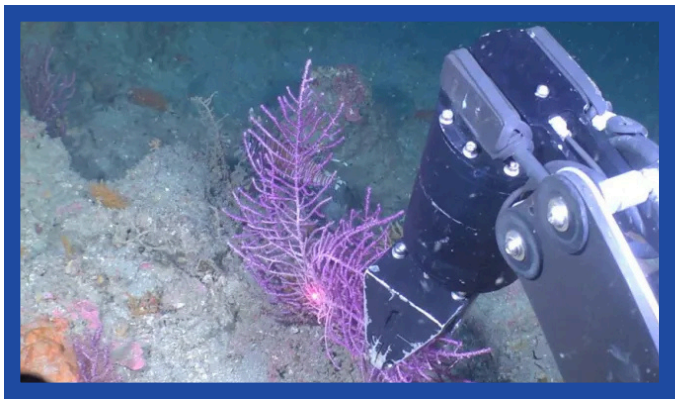
Move back 2 spaces.



Lab Equipment Issue

Water quality testing equipment in the lab isn't working properly, and the team has to start tests over.

Move back 3 spaces.



High Currents Stop Sampling

Strong currents at the dive site make it impossible to collect coral correctly. The ROV has to return to the ship.

Move back 2 spaces.

EXPLAIN

CREATURES OF THE DEEP FILM

Coming Soon!

ESTIMATED TIME

30 minutes

FOCUS QUESTION

How do scientists work in, explore, and restore the deep sea?

MATERIALS

- Video link to “Creatures of the Deep” film

PREPARATION

- Pull up the documentary and make sure the video is working.

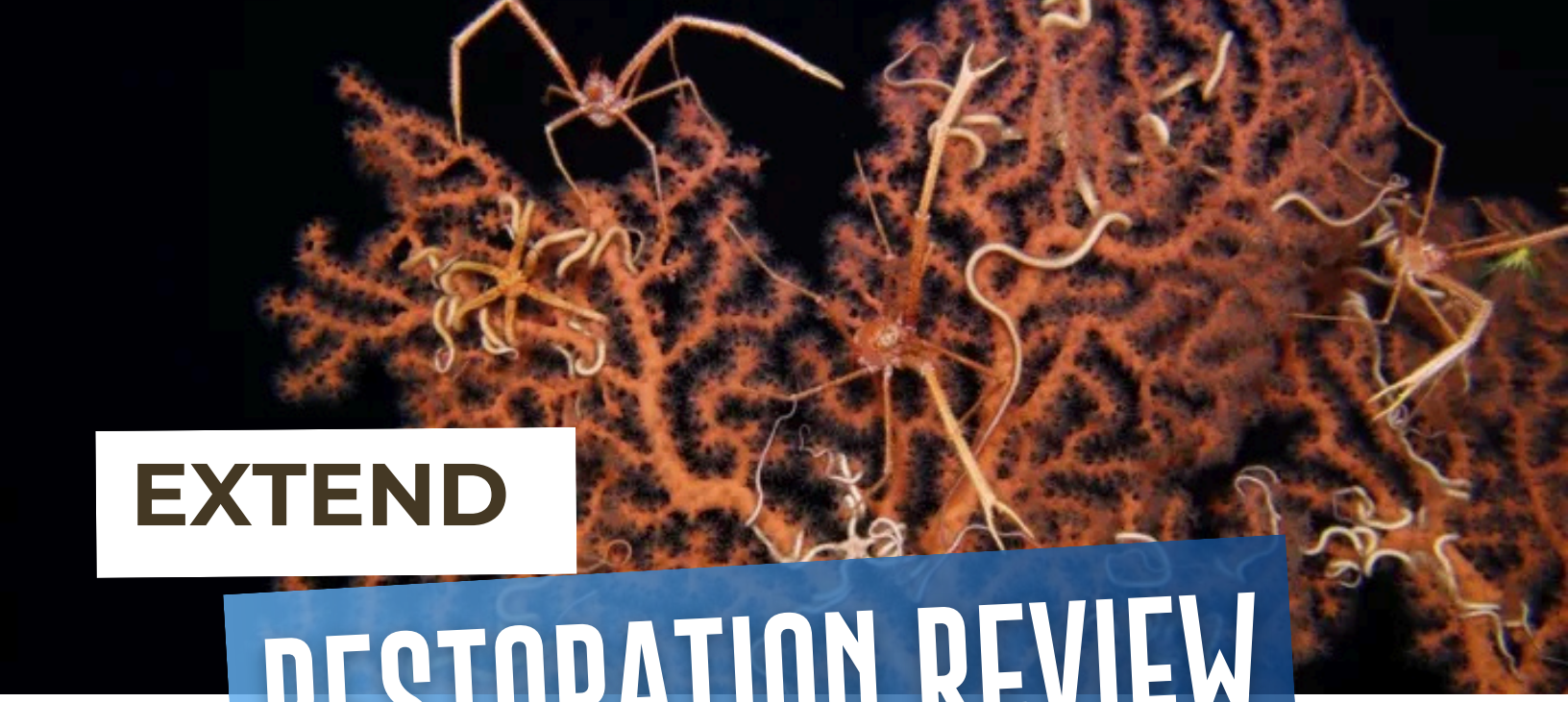
FACILITATION

STEP 1. Show the documentary and make connections to the ROV activity and discuss how ROVs help restore the deep coral habitats injured by the Deepwater Horizon oil spill.

Step 2. Give students their See, Think Wonder graphic organizer and see if any of their wonder questions were answered.

DEEP WATER EXPLORATION LIVE STREAM OPTION

- Pull up the ROV Livestream on YouTube. *Be sure you have access from your district.
- YouTube Channel: Inner Space Center
- Video Title: Gulf Restoration Live! Tools of Deep-Sea Coral Restoration



EXTEND

RESTORATION REVIEW

ESTIMATED TIME

40 minutes

FOCUS QUESTION

How do scientists share what they learn on restoration missions?

MATERIALS

Articles & Infographics from NOAA & National Marine Sanctuary Foundation.
Non-Fiction Article Graphic Organizer

PREPARATION

Print a copy of the Non-Fiction Article Graphic organizer for each student

FACILITATION

STEP 1. Have the students read their assigned articles independently.

Step 2. Either independently or in pairs have them complete the graphic organizer.

Step 3. Have them share what they learned from their article.

NAME: _____

NON-FICTION ARTICLE GRAPHIC ORGANIZER

ARTICLE TITLE: _____

AUTHOR(S): _____

The main idea:

A quote that shows this is the main idea:

Key Vocabulary Words

1.

2.

3.

Two important facts or stastitics:

1.

2.

Text Structure:
(Circle all that apply)

Compare & Contrast
Describe
Order/ Sequence
Problem & Solution
Cause & Effect

Tone:
I know because...

Author's Purpose:
(Circle all that apply)

Inform
Persuade
Entertain

I rate this article ☆☆☆☆☆ because...

Intended Audience

I'm still wondering?

Illustration to show the main idea:

EVALUATE

EXPLAIN-IT POSTER

ESTIMATED TIME

30 minutes

FOCUS QUESTION

What was the most surprising or interesting thing you learned about deep-sea corals?

How did each activity help you understand the role of scientists in exploring deep-sea communities?

MATERIALS

- Poster paper
- Markers
- Online survey link for students to provide lesson feedback.

FACILITATION

STEP 1. Have each student use what they learned to create a paper or digital Explain-It Poster.

Step 2. Display each poster and have the students do a gallery walk.

Step 3. After the gallery walk, allow students to ask each other questions.

Step 4. Have students complete the online survey.

MESOPHOTIC MYSTERIES

TEAM NAME: _____

EXPLAIN-IT POSTER INSTRUCTIONS

Directions: You will create a poster (paper or digital) that shows what you learned during the Mesophotic Mysteries unit. Use what you saw, played, and read to make your poster informative and creative.

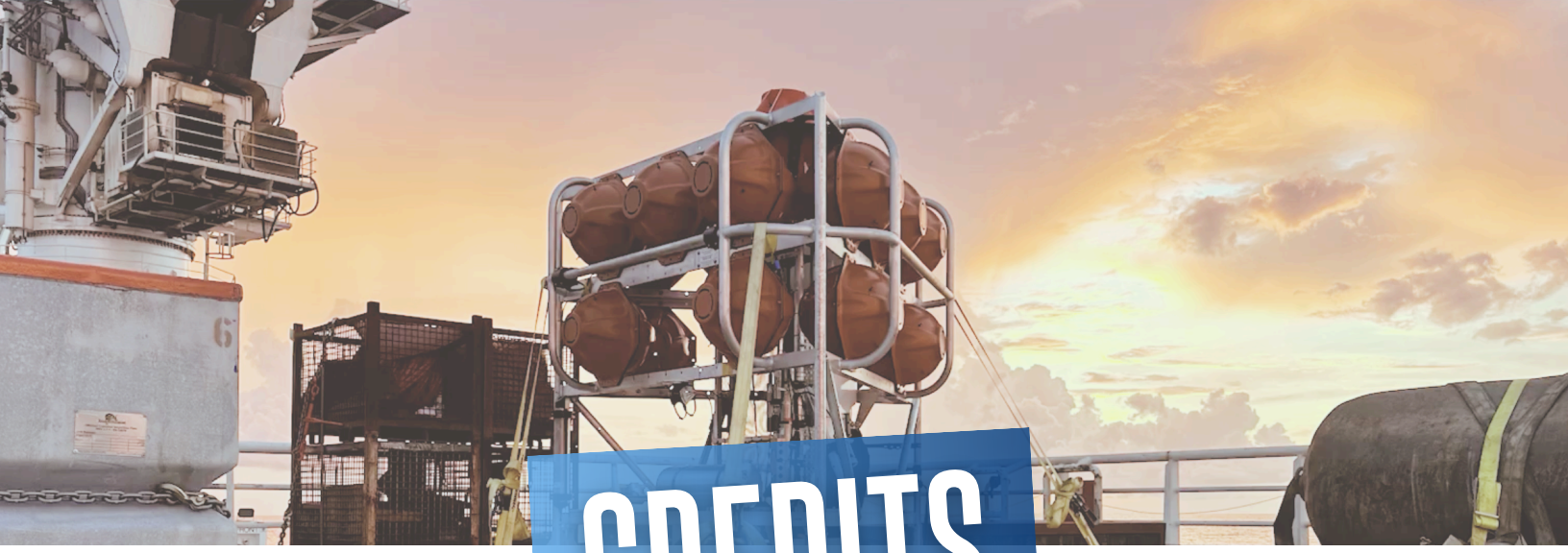
Poster Check List

Poster Must Include:

- A Title
- One thing you learned that surprised you
- Tools or technology scientists use
- Challenges scientists face in the deep sea
- A picture (you can draw or use digital tools)
- A sentence that explains why these coral communities are important

Poster Gallery Walk Reflection

I really like _____ about my classmates' posters.	I have questions about..	I wanted my classmates' to notice _____ about my poster.	One thing I would do differently next time is...
1.	1.		
2.	2.		
3.	3.		



CREDITS

These activities were created in June 2025 by the staff at the University of Southern Mississippi Marine Education Center to be used as supporting documents for the film “Creatures of the Deep” and short vignette videos created by the Mississippi State Televison Center.

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NOAA, National Marine Sanctuary Foundation, Marine Applied Research & Exploration, UNCW Undersea Vehicles Program, Oceaneering International, Inc., Pelagic Research Services, URI Inner Space Center