

Community Building Day

In-School Experience

Goal: Student are able to identify the ecosystem of a tide pool and establish belief that they are a unique individual contributing to a community of science.

Supplies:

- 11th Grade Community Building Day PowerPoint from teacher portal
- Rocky Intertidal [Video](#)
- Rocky Intertidal Search and Find (laminated) (1/student)
- Dry Erase Markers (1/ pair of students)
- Colored squares (5 of every color for each lab table)
- Mosaic Grids (1/student)
- 5/31 Tide chart – La Jolla (1/pair of students)
 - <https://tidesandcurrents.noaa.gov/noaatidepredictions.html?id=9410230>
- Ocean / Tidepool Poster (1/ class)
- Gluestick (1/pair of students)
- Concept map sheets (1 /student)

Timing:

Time	Activity	Learning Cycle
0:00 – 0:15	Introductions & Would you Rather Intro	Engagement
0:15 – 0:20	Rocky Intertidal Intro	Exploration
0:20 – 0:30	Tide Charts	Guided Analysis
0:30 – 0:45	TidePool & Search and Find – Rocky Intertidal	Guided Analysis
0:45 – 1:00	Concept Mapping	
1:00 – 1:10	Finish Would You Rather	Reflection
1:10 – 1:20	Self-Reflection	Reflection
1:20 – 1:30	Field Trip Reminders	

Team Lead Notes:

- € Introduce yourself and staff to teacher
- € **Collect waivers from teacher**
- € Ask teacher if they would prefer you to write on board or chart paper.
- € Invite teacher to participate throughout and explain when you and staff will need their help during the lesson.
- € Discuss floor management plan with other staff.
- € Use attention getters whenever necessary. (i.e. transitioning from activity to activity, when giving a set of directions, when bringing the class together to share out, etc.).

Set Up:

- € Cue up Community Building Day PowerPoint from teacher portal -OR- bring all visuals to front of classroom:
 - Rocky Seashore Video (need connection to the internet):
 - <https://www.nps.gov/subjects/oceans/rocky-shores.htm>
 - Skip ads and pause video
- € Check that external video sources are enabled to play the video of the Rocky Seashore (both PowerPoint or directly from YouTube).
- € Set up mosaic poster, colored papers and glue sticks
- € Set up chart paper and sharpies at front of room where whole class can see (if using chart paper).
 - Write the word "Rocky Seashore" on the board/chart paper.

Assistant Team Lead Teaching Notes:

- € During Introduction:
 - Prep supplies quickly then join the class
- € During the activities, you have a Mentoring opportunity. Potential questions include:
 - Why did you choose that answer?
 - Would you ever consider doing the other one (the choice they didn't choose)?
 - Tell me why you enjoy that more?

Introductions

Introductions:

- All staff take 30 seconds to introduce themselves and share their story.
- Introduce Ocean Discovery Institute.
 - Give a very brief overview of the program (2 days, 1 class visit, 1 exploration day)
 - Some students have had Ocean Discovery since Kindergarten and for some students it's their first year.

Community Agreements:

- At Ocean Discovery we believe everyone should Be Their Best Self.
 - (Show Community Agreements slide.)
- **To Be Your Best Self**, you should:
 - **Be curious!**
 - Ask questions, make observations, and share your thoughts and ideas.
 - **Be respectful!**
 - Respect people, living things, and the environment around you.
 - **Be safe!**
 - Take care of yourself and others.
- Ask students to give a thumbs up or a verbal “yes” if they can agree to be their best self when working with Ocean Discovery.

Would You Rather Intro

- Throughout class today, we want to learn a bit more about you. We are going to play a “Would you Rather” game.
 - For example, the question is: “Would you rather climb the tallest mountain on Earth /or/ dive to the bottom of the ocean?” If you would rather climb the tallest mountain, you will hold up the beige paper and if you would rather dive to the bottom of the ocean, you will hold up the dark blue paper.
 - Once you show your answer, glue the square onto the grid. You can talk to the person next to you and tell them which color you chose and why you chose it, and you can ask them about which color they chose and why.
- Ask 2-3 more questions:
 - As a science leader, would you rather learn about the deepest parts of the ocean / or / space?
 - As a science leader would you rather study plants and animals on land /or/ plants and animals in the water?
 - Would you rather study the minerals and water in the ocean /or/ the rocks, dirt and soil on land?
- We will return to this game later.
- Now we will learn about the habitat we will be exploring together this year and the many unique organisms that live there.

- (Have students put supplies at the center of their tables.)

Rocky Intertidal Intro:

Introduce Rocky Intertidal:

- Today we will be exploring a special ecosystem here in San Diego called the rocky intertidal.
- Uncover prior knowledge:
 - Has anyone ever visited the rocky intertidal before?
 - What is it like there?
 - Where do we find rocky intertidals?
- Okay Science Leaders! It is time to **Explore and Wonder!**
 - In a moment we will watch a video of the rocky intertidal. While you watch, make observations about what you see and think about questions you have about the rocky intertidal.
- Let's see what it's like at the rocky intertidal!
 - (Play Rocky Intertidal video)
 - Have students look at the rocky intertidal slide/poster and ask:
 - What do you hear?
 - What questions do you have?
 - What did you observe?
 - What do you think it would be like live at the rocky intertidal?
- Define Rocky Intertidal:
 - Definition of a rocky intertidal:
 - rocky – a place with rocks
 - intertidal – a place where land and ocean meet
 - rocky intertidal = a rocky place where the land and ocean meet.

Introduce High and Low Tide:

- At the rocky intertidal there is a time of day when more of the rocks are covered with water and a time where less of the rocks are covered with water.
 - (Show High Tide/Low Tide slide/poster.)
- High tide and low tide.
 - High tide- when the water is at its highest height
 - Low tide- when the water is at its lowest height
 - Show high tide/low tide visual.
- There is always a high tide and low tide each day. Why?
 - What else comes up and down every day? ... wait for students to answer the moon.
 - Tides are caused by the gravitational forces of the moon on the Earth.
 - Making Predictions (show slide)

- When the moon is closer to the Earth? Would the tides be high or low?
- When the moon is farther away from the Earth? Would the tides be high or low?
- The side of the Earth closest to the Moon experiences the Moon's pull the strongest, and this causes the seas to rise, creating high tides. On the side facing away from the Moon, the rotational force of the Earth is stronger than the Moon's gravitational pull. The rotational force causes water to pile up as the water tries to resist that force, so high tides form on this side, too. Elsewhere on the Earth, the ocean recedes, producing low tides. The gravitational attraction of the Sun also plays a small role in the formation of tides. Tides move around the Earth as bulges in the ocean.

Reading Tide Charts:

- We are going to visit the tides on May 31st, 2024.
- In partners, I want you to read this tide chart and make predictions to what time will be high tide and what time will be low time.
 - Take a poll using multiple choice on the board.

Introduce Tidepools:

- We want to be there to see the tidepools.
 - (Point out tidepools in Low Tide picture.)
- Definition of "tidepool"
 - Definition - *a body of saltwater that is left behind when the tide goes out or during low tide.*
- Tidepools are a place where many animals like to live!

Search & Find – Rocky Intertidal

Assistant Team Lead Teaching Notes:

- € Help pass out Rocky Seashore Search and Find Drawings and a dry erase marker to each student.
- € During the activity help students who are struggling to find the things they are looking for.
- € When activity is done collect and clean Search and Find Drawings using cleaner and rags.

Introduce Search and Find Drawing

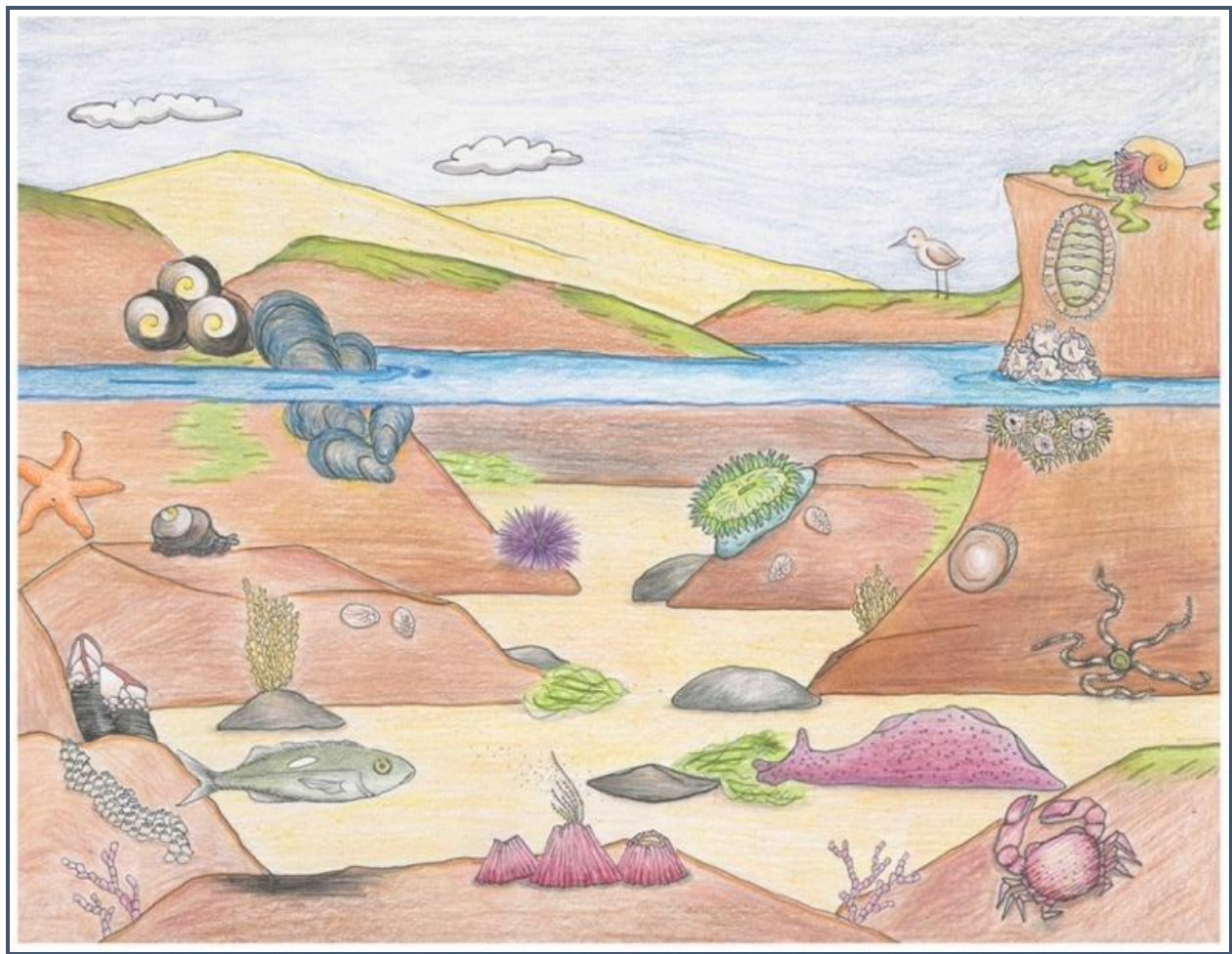
- Okay, Science leaders, it's time to investigate the rocky intertidal!
- We are going to look at a drawing of a rocky intertidal today and in a few days, you will visit a real rocky intertidal with Ocean Discovery.
 - (Pass out Rocky Intertidal Search and Find drawings).
- Orient students to the rocky intertidal drawing.
 - (Show Rocky Intertidal Search and Find Drawing slide.)
 - Point out the waterline and what is above and below the water.

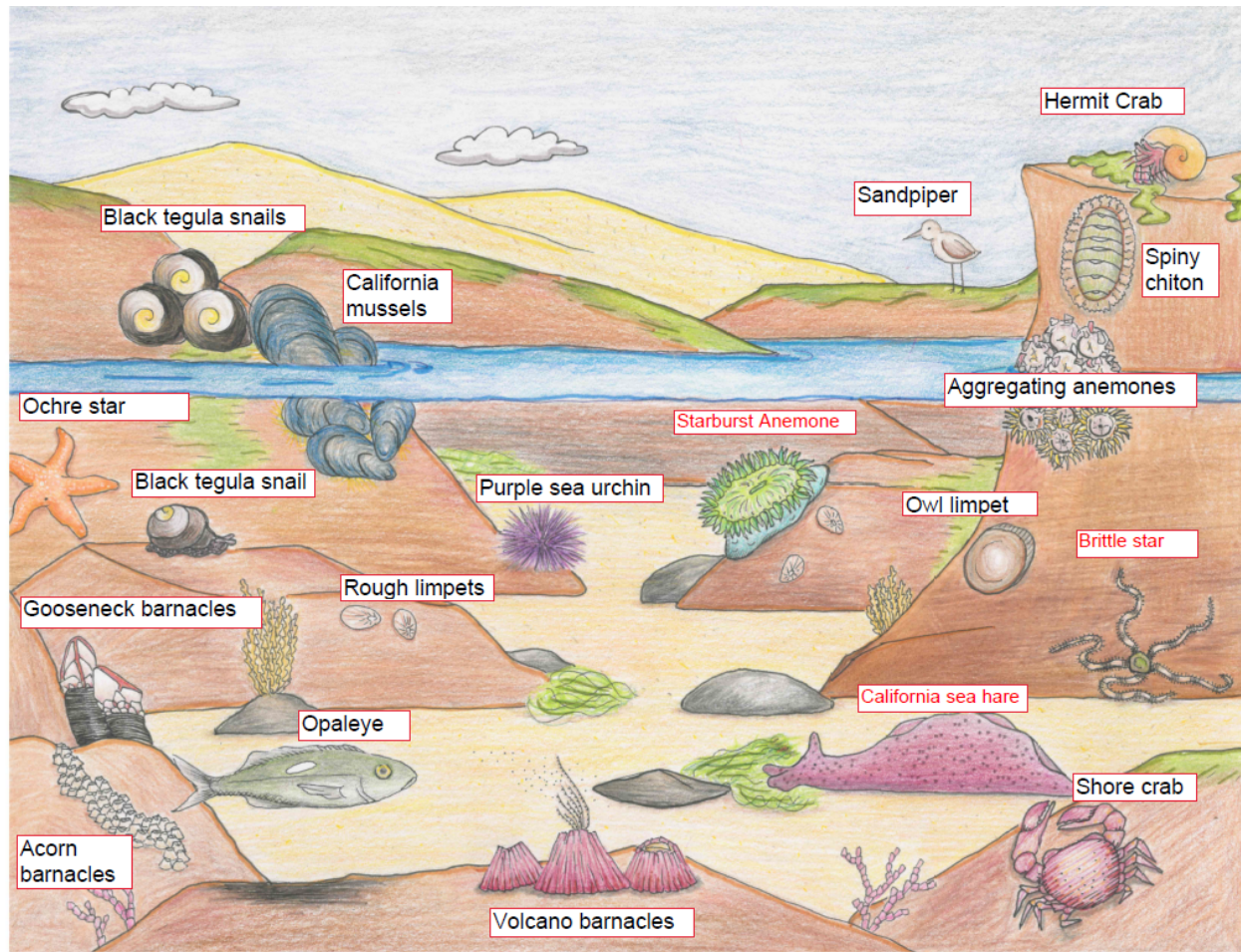
Introduce Bingo

- (Project Rocky Intertidal Bingo Card 1 slide.)
 - Review some words students may be unfamiliar with (invertebrate, carnivore, herbivore, etc.)
- Goal is to create a blackout bingo (the entire card.) using things they see on their search and find drawing.
 - They can use the dry erase markers to mark or circle things on their Search and Find pictures.
 - Demonstrate 1-2 examples.
 - Ex. I see an animal with a shell – point to hermit crab on Rocky Intertidal Search and Find Drawing. I will put an “x” over that square on my Bingo card and circle the hermit crab on the drawing.
- Set a timer.
 - When time is up, ask students to raise their hand if they found a bingo.
 - Ask 2-3 students to share the items from their search and find drawing they used to create a bingo.
 - If time allows repeat the process using a different bingo card.
- (Collect Rocky Intertidal Search and Find drawings.)

Debrief Search and Find

- Ask students to name some of the animals they saw in their rocky intertidal drawing.
 - Lots of unique animals live at the rocky intertidal.
 - Science leaders refer to this as a diverse ecosystem.
 - Define diversity: variety, lots of different things.
 - Diverse ecosystems are healthy ecosystems. Science leaders like to see healthy ecosystems.





Concept Mapping

Timing

- 0:00 – 0:05 Intro to Concept Maps
- 0:05 – 0:15 Fill in Concept Map

Intro to Concept Maps

- Concept maps are a way of taking new knowledge and organizing it in a way that helps you understand it, remember it, and link it to other already existing knowledge you have.
- Review how concept maps work. (SLIDE)
 - Concept maps help us identify relationships between ideas and link them together.
 - Review example Reptile concept map.
 - Science tells us that understanding these relationships and making a visual representation of those connections can help you understand things at a much deep level and make it easier for you to remember and recall the knowledge later. (SLIDE)
 - Concept maps should make sense to you! (SLIDE)
 - There isn't a right or wrong way to create concept map.

- Everyone's will look a little different.
- Lines between bubbles means ideas are connected.

Fill In Concept Map

- Demonstrate how to build a concept map using mental modeling. (SLIDE)
 - o Today, I will show you an example of how to create a concept map.
 - o We can consider how this concept map can change after your field trip.
 - o Right now I am going to explain how my thinking when I create a concept map.
 - o We are going to do this all together, but it is OK if yours does not look exactly like mine.
 - o You can even add more connections and thoughts to yours
 - o (Build a concept map on whiteboard while modeling your thinking – SEE BELOW EXAMPLE.)
 - (Students need to understand what goes on inside your mind as you build a concept map.)
 - o Have students put their names on them and collect! We will use these during Explore!

Finish Would you Rather

Mental Modeling

Assistant Team Lead Teaching Notes:

€ Talk to students about their answer choices to "Would You Rather" questions. Potential questions include:

- Why did you choose that answer?
- What do you like more about....?
- What do you think that would be like?

€ Help students finish Discovery bracelets and put them on.

- (Walk over to white board and draw a large box and write the word "Invertebrates" inside).
- I will make this box the largest because it is the main idea of this concept map.
 - Any other boxes I draw will be smaller because they are ideas related to the main concept.

● Okay, so now I want to ask myself "What are some important things I have learned about the rocky seashore?"

- Ask students "What are some things I learned about the rocky seashore today?"
 - We talked about tides and how tide pools are formed during low tide.
 - I will add those in separate smaller boxes below.

● Okay now what are some other things you learned about?

- We learned about some of the animals that live there. Can you name any?
- That will probably help me remember things later, so I am going to another box to my concept map and call it "Examples". I will also add a line between this one and the "Invertebrates" box to show that these would be examples of invertebrates.
- Ask students if they remember any examples of invertebrates.
 - As they mention one – add another smaller box under the "Examples", write the name of the invertebrate they mention and draw a line connecting them
- Continue to add any other connections or definitions, etc.

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graph TD
    RS[Rocky Seashore] --- I[Invertebrates]
    RS --- HT[High Tide]
    RS --- LT[Low Tide]
    HT --- I
  
```

- Have students pick up their grids
- Ask as many questions as time allows:
 - o As a science leader, would you rather investigate the rocky intertidal animals that stay in one place /or/ animal that move around the tide pools?
 - o As a science leader, the invertebrates at the rocky intertidal /or/ vertebrates at the rocky intertidal?
 - o As a science leader, would you rather design a submarine to explore tidepools/or/ miniature drone that can fly over the tide pools ?
 - o As a science leader with Ocean Discovery, are you more excited to talk to real science leaders /or/ to learn how to protect the rocky intertidal?
 - o As a science leader, would you rather draw your ideas with pen and paper /or/ build your ideas with tools?
 - o As a science leader, would you rather work with microscopes and DNA to understand how the human body works /or/ use telescopes to explore outer space?
 - o As a science leader, would you rather make a difference by working to help protect endangered animals or helping to create a healthy environment?
- We are all science leaders working with Ocean Discovery so let's all put one blue square as the last one.
 - o (Have every student put a final dark blue square on the grid)

Would You Rather Debrief = Building Our Ocean

- Let's combine each of our grids to create a mosaic of an ocean.
- (Tape all mosaics up)
 - o At Ocean Discovery Institute we believe that all students are unique individuals who belong to a community of science leaders.
 - o Belonging:
 - Each of have different responses but all belong to a community of science leaders.
 - o Uniqueness:
 - But each of you is unique.
 - Define unique: being the only one of its kind.
 - (Add "unique" to the world wall.)
 - Each of you is, one of a kind, so the grids will be different, because everyone has different interests and picked different answers to the questions.
 - o One of the greatest assets to the science leader community is having lots of unique people with many different interests and ideas.

Reflection:

- Congratulations Science Leaders, each and every one of you today accomplished pieces of the Science Discovery Process.

- o (Show Science Discovery Process slide.)
- o This is the process science leaders use to do science!
 - The Science Discovery Process is a cycle.
 - Make a Difference is at the center because science leaders want to make the world a better place.
- Go through each part of the Science Discovery Process and provide a brief explanation.
 - o Explore and Wonder:
 - Science leaders take time to explore a wonder about the world, they do this by asking questions and making observations using their senses of seeing, hearing, touching, tasting, and smelling.
 - o Investigate:
 - Those questions and observations lead to ideas that science leaders want to test, so they design investigations and gather evidence.
 - o Analyze:
 - Once science leaders have gathered lots of evidence, they look for patterns and try to explain what they see – this is called analyzing.
 - o Communicate:
 - Science leaders know it is essential to share what they learn with other people, so they spend time sharing what they learn in many ways – this is communicating.
 - o Make a Difference:
 - Through the Science Discovery Process, science leaders often learn new things about the world that can be used to make a difference.
 - Once science leaders have learned something new, it often leads them to other questions and ideas, so the cycle begins again! Science leaders are always working on some part of the Science Discovery Process!

Self-Reflection

Reflection:

- Introduce why we do reflection:
 - o Reflection is a part of every Ocean Discovery Institute experience.
 - o Reflection gives you time to think about what you experienced and learned today and how it fits into the things you already know.
 - o Reflection can highlight ways your thoughts, ideas, and feelings change over time as you learn and experience new things.
- Think-Pair-Share Reflection:
 - o (See Think-Pair-Share protocol below if unfamiliar.)
 - o What do you think a science leader is?
 - o Review Science Leader definition.
 - o Think-Pair-Share questions:

- (Show Reflection Questions slide.)
- How does it feel to be a member of a community of science leaders?
- Why do you think it's important for the community of science leaders to be diverse?

Closing:

- Field Trip Reminders
 - Wear comfortable shoes with good grip (tide pools are slippery!)
 - Wear sun protection
 - Bring water bottle
 - Try not to bring backpacks
- At Ocean Discovery Institute we:
 - (Show Believe! Achieve! Lead! slide.)
 - BELIEVE that science is something each of you can do and a science leader is someone you can be, that you can
 - ACHIEVE in science and think critically about our world, and you can
 - LEAD in science and make a difference in the world.
- Because we believe this about all of you, we do a "Believe! Achieve! Lead! Go Awesome!" cheer at the end of every program so that you will continue to do awesome things after we leave.
 - On the count of three we will yell "Believe! Achieve! Lead! Go Awesome!"

Think-Pair-Share Protocol:

- *Read a question out loud.*
- *Give 20-30 seconds of silent think time.*
- *Choose one student to share their response first - give that student 30 seconds to share.*
 - *Remind students that when you are sharing with a partner it is important to both share and listen carefully.*
 - *Remind students that when it is their turn to listen they should use body language that tells the other person they are listening. Not talking over them, making eye contact, nodding, asking questions, etc.*
- *Bring attention back to team lead.*
- *Allow second student in pair 20-30 seconds to share their responses.*
- *If time allows choose 1-3 students to share their response or their partner's response with the group.*
- *Repeat with different questions as often as time allows.*

ROCKY INTERTIDAL BINGO CARDS

An animal that is out of the water	An animal with a shell	An animal that stays in the same place
An animal with spines	An algae	An animal that can stick to rocks
A fish	An animal that grows with its shell	An animal with claws

An animal in the water	An invertebrate (animal without a backbone)	An animal you do not recognize
An animal that can swim	An animal with 5 arms	An animal with a soft body
An animal that can leave its shell	An animal you know the name of	An animal with 2 h

An animal that can molt	An animal with tentacles	An animal with 1 shell
An animal with a round body	An animal that must stay in the water	An animal with tube feet
An animal that cannot swim	A vertebrate (animal with a backbone)	An animal that moves very slowly

Exploration Day

Coastal Field Experience

- Exploration tools:
 - When exploring it can be good to have tools. Review tools:
 - Binoculars
 - Hand lens
 - Small aquaria (instructor pack)
 - Rocky Intertidal Animal ID Card
 -

Goal: Students build belief that they can recognize and do science while investigating how animals and humans interact with the water, rocks, and other animals at the rocky intertidal.

Location: La Jolla Cove area (see map)

Supplies:

- Ocean Discovery Institute Field Trip Volunteer Card print out (1/adult volunteer)
- Cover sheet (1/class)
- Water bottles (3 per group)
- Explorer Backpacks (1/student)
 - Binoculars
 - Hand lens
 - Rocky Intertidal Animal ID Card
 - Papi//Curriculum/SI New/Upper Elementary (3-5)/3rd Grade/Explore Day Visuals
 - Pencil
 - Observation Page (1)
 - Refractometer (1)
 - Pipette (1)
 - Clipboard
- Concept Maps (collected from Community)
- Believe Surveys (1/student)
- Team Lead backpacks (1/team lead)
 - First Aid kit
 - Science Discovery Process Mini Poster (18 x 11")
 - Clipboard with large laminated "STOP" sign taped to back
 - Example Observation Page
 - To be used for demonstrations
 - Mini white boards
 - Dry erase markers (2)
 - Dry erase eraser (1)
 - Small aquaria w/ lid (2)
 - Black trash bags (1)

- o Bottle of hand sanitizer (1)
- o ½ sheet of blank paper (1/student + 1/adult)
- o Stopwatch (1)
- o Large towel (1)

11th Grade Explore Timing

Low Tide is Early

On Time:

Time	Group 1	Group 2	Group 3
9:45 – 9:55 AM	Arrival & Walk to Introduction Station		
10:00 – 10:20 AM	Introduction		
10:20 – 11:20 AM	Animals & the Rocky Intertidal		
11:20 – 11:50 AM	Lunch		
11:50 – 12:20 PM	Humans & the Rocky Intertidal		
12:20 – 12:35 PM	Measuring Salinity		
12:35 – 12:50 PM	Self-Reflection		
12:50 – 1:00 PM	Clean up		
1:00 – 1:15 PM	Walk to Buses + Goodbye		

Late Start School/A Little Late: *5 minutes less time at this station

Time	Group 1	Group 2	Group 3
9:55 – 10:05 AM	Arrival & Walk to Introduction Station		
10:05 – 10:20 AM*	Introduction		
10:20 – 11:20 AM	Animals & the Rocky Intertidal		
11:20 – 11:50 AM	Lunch		
11:50 – 12:20 PM	Humans & the Rocky Intertidal		
12:20 – 12:35 PM	Measuring Salinity		
12:35 – 12:50 PM	Self-Reflection		
12:50 – 1:00 PM	Clean up		
1:00 – 1:15 PM	Walk to Buses + Goodbye		

A Lot Late: *5 minutes less time at this station

Time	Group 1	Group 2	Group 3
10:05 – 10:15 AM	Arrival & Walk to Introduction Station		
10:15 – 10:25 AM*	Introduction		
10:25 – 11:25 AM	Animals & the Rocky Intertidal		
11:25 – 11:55 AM	Lunch		
11:55 – 12:20 PM	Humans & the Rocky Intertidal		
12:20 – 12:35 PM	Measuring Salinity		
12:35 – 12:50 PM	Self-Reflection		
12:50 – 1:00 PM	Clean up		
1:00 – 1:15 PM	Walk to Buses + Goodbye		

Low Tide is Late

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10:45 – 11:00 AM	Measuring Salinity		
11:00 – 11:30 AM	Lunch		
11:30 – 12:30 PM	Animals & the Rocky Intertidal		
12:30 – 12:45 PM	Self-Reflection		
12:45 – 12:55 PM	Clean up		
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11:35 – 12:35 PM	Animals & the Rocky Intertidal		
12:35 – 12:45 PM*	Self-Reflection		
12:45 – 12:55 PM	Clean up		
12:55 – 1:15 PM	Walk to Buses + Goodbye		

Rocky Intertidal Observations

1. Draw the animal in the box
2. Record the animals name in the space below the box
3. Record any observations of the animals or adaptations

Name:	Name:	Name:
Observations / adaptations:	Observations / adaptations:	Observations / adaptations:

Name:	Name:	Name:
Observations / adaptations:	Observations / adaptations:	Observations / adaptations:

Salinity of the Rocky Intertidal

1. Record your location (ocean, storm drain, tide pool)
2. Open the clean flap of the refractometer and using a pipette, drop 1-2 drops of water on the slanted base
3. Close flap and look through the eyepiece with the refractometer directed toward the sun, adjust lens as needed.
4. The line that is created by the blue and white sections will be your salinity reading. Record the reading. (Optimal salinity of seawater is 35 parts per thousand (ppt))

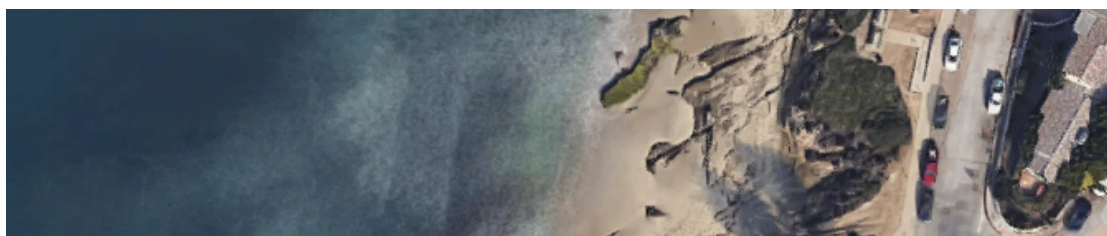
Location: _____	Location: _____	Location: _____
Salinity: _____ ppt	Salinity: _____ ppt	Salinity: _____ ppt

Reflection

1. What ways are humans impacting the rocky intertidal?
2. What are ways that we can protect the rocky intertidal?
3. At what parts of the day do you feel like you were doing science?



Close-Up Humans & Rocky Intertidal



Storm Drain #1



Storm Drain #2



Arrival

Program Set Up:

- € At the lab:
 - Fill student water bottles (~5 per group more students bring personal bottles now)
 - Fill water jugs
- € Introduction area:
 - Have each Team Lead choose a location in the grass to do their introduction. Be sure groups are spread out enough to not interfere with one another. At each of these locations:
 - Set up explorer backpacks (1/student)
 - Try to pull a consecutive grouping of backpack numbers (e.g., #'s 1-15) for each group. This will make it easier at the end of the trip to separate backpacks that need to be restocked vs. those that don't.
 - Set out bandanas (1/student+ 1/adult)
 - Set out a few water bottles at each intro spot
- € Place water jugs in the intro area to be used for refills throughout the day
- € Have all team leads choose an area of the rocky seashore and a storm drain area where they will take their group today.
 - The goal is for groups to spread out so that team leads can monitor safety and easily count their students at all times.
 - Be aware of areas that are particularly slippery and avoid these (green slick, etc.).
- € Determine who will take on which of the below Arrival responsibilities.
- € ~~Determine what your groups name will be: color + animal.~~
 - Ex. Blue Egrets, Green Sharks, Purple Hermit Crabs, etc.

- **BUS DROP OFF LOCATION:** Corner of Jenner and Coast.
- (Trip Lead: Meet buses at La Jolla Cove bus stop, introduce yourself to teachers and bus driver.)
 - Welcome students to La Jolla Cove.
 - Confirm with teachers that all chaperones know which group they are working with.
- (Begin Arrival Tasks.)
 - (Note: The below should take place simultaneously.)
 - Trip Lead (1)
 - Dismiss all chaperones on the bus to meet with the team lead doing the **Chaperone Introduction**.
 - Take teachers off buses and have them note any students absent on the roster and sign a cover sheet stating they've collected all waivers to the best of their ability.
 - Confirm with Assistant Team Lead #1 that lunches are ready to be passed out to students as they unload.
 - Explain to students that they will each be handed a lunch as they exit the bus which they will carry to their introduction area and then place in a backpack provided by Ocean Discovery Institute.
 - Unload students by class.
 - Each class = 1 group

o Assistant Team Leads (1-2)

- Help the bus driver unload the lunches.
- Place lunches in front of each bus so that one lunch can be handed to each student as they disembark.
- Stand outside each bus to pass out lunches to students as they disembark.

o Team Lead (1)

- Conduct **Chaperone Introduction** to discuss expectations for the day.
- Provide each chaperone with an “Ocean Discovery Institute Field Trip Volunteer Card” and explain how they can be most helpful today:
 - No cell phones unless snapping a quick picture.
 - Interact with the students. Ask them questions. Don’t be worried if you don’t know the answers to things, that is okay!
 - o On your card there is a short list of some questions you can ask students.
 - Participate with the group. Sit in the circle with the students. Do dances, answer questions, be a partner with a student during pair-shares.
 - Please no side conversations while the team lead is talking.
 - Have fun!
- Dismiss all chaperones to join their groups.

o Team Leads & Assistant Team Leads

- Meet students in their group as they get off the bus.
- As soon as your group is ready, walk students to bathroom for a quick bathroom break and then walk to your Introduction area and begin.
 - Stand at street crossings, use STOP sign on back of your clipboard to direct students when to cross.
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Introduction

Assistant Team Lead Teaching Notes:

- € Help distribute Explorer backpacks & bandanas (1 color/group)
 - Help students place their lunch in their Explorer backpack.
 - Wear a bandana! Students love to do what you do!
- € Sit with students during introduction.
- € One of the goals of the day is for students to feel that they are **doing science**. Potential questions to ask throughout the day include:
 - How are you using science to look at this?
 - What are you wondering about?
 - What tool(s) are you using to help you explore?
 - What have you written in your scientific notebook?

Staff and Volunteer Intros:

- Staff and volunteer introductions:
 - All staff + volunteers take 30 seconds to introduce themselves and share their story.

Welcome to La Jolla Cove:

- Welcome to La Jolla Cove Science Leaders!
 - We are in La Jolla to the north and west of City Heights.
 - La Jolla is only a 25-minute car ride or hour-long bus ride from City Heights.
 - Everywhere we will visit today is open to the public which means you can return on your own with friends and family at any time.

Review Community Agreements:

- As science leaders we all need to Be Our Best Self.
 - (Show Community Agreements)
- To Be Your Best Self, you should:
 - **Be curious!**
 - Ask questions, make observations, and share your thoughts and ideas.
 - **Be respectful!**
 - Of each other, of adults, of the environment.
 - **Be safe!**
 - Take care of yourself and others. Walk everywhere and stay within the boundaries.
- Ask students to give a silent thumbs up if they can agree to be their best self when working with Ocean Discovery.

Review Science Discovery Process:

- As Science Leaders we will be using the Science Discovery Process.
 - Ask students what they recall about the Science Discovery Process.
- Review Science Discovery Process.
 - (Show Science Discovery Process Mini Poster.)
 - Be sure to cover:
 - This is the process science leaders use to do science!
 - The Science Discovery Process is a cycle.

- Make a Difference is at the center.
- Explore and Wonder:
 - Science leaders use their sense to ask questions and make observations.
- Investigate:
 - Science leaders design investigations and gather evidence.
- Analyze:
 - Science leaders look for patterns in their evidence and try to explain what they see.
- Communicate:
 - Science leaders share what they learn with other people.
- Make a Difference:
 - Science leaders often learn new things about the world that can be used to make a difference.

Preview the Day's Theme:

- Today we will be focused on the “Explore and Wonder” and “Investigate” parts of the rocky intertidal.
 - (Point to these bubbles on the Science Discovery Process Mini Poster.)
- Our focus will be on investigating how animals and humans interact with the water, rocks, and other animals here at the rocky intertidal.

Review Rocky Intertidal:

- Define rocky intertidal = a rocky place where the land and ocean meet.
 - Ask students to name some of the animals that live at the rocky intertidal.
 - You can remind them of their classroom rocky intertidal if they struggle.
- Remind students that the tide changes daily at the rocky intertidal and that there is a high tide and a low tide.
 - Have students do kinesthetic movements for high tide and low tide.
 - (*See Community Building Day – Rocky Intertidal Intro for movements.*)
 - Ask students if they think it is high tide or low tide right now? Why?
- Review tidepools.
 - Define tidepool: a body of saltwater that is left behind when the tide goes out.
 - Ask students when you get more tidepools during high or low tide? – Low tide.

Introduce Science Notebooks & Explorer Backpacks:

- To Explore and Investigate, science leaders need tools and a place to write their observations and ideas.
- Each backpack has a science notebook.
 - Science leaders use notebooks for recording things they see, and questions and thoughts they have.
 - Can be used anywhere- in the lab, in the field, at home.
 - You can write, draw, or sketch in your science notebook at any time today.
 - At the end of this program your science notebook will be yours to take home.
- Each backpack has tools for investigation.
 - You may use any tool at any point today to make observations about the rocky intertidal.
 - Treat all tools respectful and be sure you return them to your backpack when you are finished using them.
 - Take time to review the use of the hand lens.

- Remind students that we use all tools respectfully.
- Anyone using their hand lens to burn or “scrape” at the rocks or animals will lose the privilege of using the hand lens.
 - o You are responsible for your backpack all day.
- (Give students time to look through backpack.)

Lunches & Personal Backpacks:

- If students brought their own backpacks, they need to place their backpack inside their Explorer Backpack.
- Have all students place their lunch in their Explorer backpack.
- Distribute a water bottle to any student who needs one.

Introduce Bandanas:

- Science leaders work as a team. Even though we are unique individuals with our own thoughts, ideas, and questions, we must be able to work as a team.
- Look around you- these are your fellow science leaders.
- We all have the same color bandana to signify our unity as a team.
- Adults have bandanas as well because they are also part of the scientific team. Feel free to ask any adult questions throughout the day!
- (Pass out bandanas to students and adults.)

Introduce Team Name:

- Tell students their team name.
- Explain that the team name is an attention getting signal.
- Example:
 - o When you here “Blue!”
 - o You all shout “Egrets!”
- (Practice call and response a few times.)

Animals & the Rocky Intertidal

Assistant Team Lead Teaching Notes:

- € Take half the group to Explore the tidepools.
 - See “Rocky Seashore Exploration Management” in curriculum below.
- € When looking in tidepool ask students questions. Potential questions include:
 - What do you notice about the animals?
 - How do the animals interact with the water? Rocks? Other animals?
 - What questions do you have?
 - What observations have you made?
- € Remind/help students to use the tools in their backpack.
- € Make sure students remain within the boundaries and are begin safe at all times.

Location: Animals & the Rocky Intertidal (see map)

Timing for this station:

- Intro (10 min)
- Walk to/from tidepools (10 min)
- Exploration (25 min)
- Process Reflection (20 min)

Intro:

- At this station you will investigate - **How do animals interact with water, rocks, and other animals at the rocky intertidal?**
 - Your job is to find animals, make observations, and ask questions.
- Review the Rocky Intertidal Animal ID Card.
 - (Have all students take the card out of their Explorer backpacks and look at it.)
 - These are some of the animals you might find in and around the tidepools.
- Review the Five Rules of Rocky Intertidal Exploration.
 - Introduce the five rules of exploring the rocky intertidal.
 - No running
 - No jumping
 - No pushing
 - Stay in boundaries
 - Be gentle with animals
 - Have students repeat each rule back to our out loud.
 - Explain to students that anyone who breaks one of the five rules will receive a 5-minute time out from exploring.
- Clarify the final rule: Be gentle with animals:
 - Use only two fingers to touch.
 - Wet your hand before touching any animal.
 - Touch gently without poking.
 - If you want to pick up an animal pull GENTLY. If the animal doesn't come loose, leave it where it is and observe it from there.
 - When you are finished looking at an animal return it to the location you found it.
- Review Community Agreements
 - Be your best self!

- **Be curious!**
 - When you find an animal -take a few moments to observe it before touching it. Things you might want to notice:
 - What is the animal doing?
 - Is the animal in or out of the water?
 - Is the animal using the rocks in anyway?
 - How is the animal reacting to other animals?
 - Don't forget to utilize any tools you would like from your explorer backpack.
- **Be respectful!**
 - Share your findings with other science leaders around you.
 - Listen to any adults that give you directions.
 - We must leave everything we find here at the rocky intertidal – including empty shells and rocks. These are the things that animals make their homes from, and as science leaders we want to observe but leave these items behind.
- **Be safe!**
 - Abide by the Five Rules of Rocky Intertidal Exploration at all times.
 - We will move around together as a group – so stick close by but feel free to look around at different tidepools when we stop.
 - We will be moving slowly and stopping and crouching down often. If you really want to find things that live in the tidepools it's helpful if you move slowly and look closely.
 - Stay away from the waves. Waves come in many different sizes so don't be surprised by a wave – always be watching!
 - When I need to get your attention, I will use our team name.
 - (Practice call and response with students- make sure they get LOUD!)
 - (Ex. Team Lead: "Blue!" Students "Egrets!")

Walk to Tidepools

- Have students take Explorer Backpacks and put them on.
- Use the staircase to access the tidepools.
- Place cones out to show boundaries for students.
- Review Five Rules of Rocky Intertidal Exploration.
 - No running
 - No jumping
 - No pushing
 - Stay in boundaries
 - Be gentle with animals

Rocky Seashore Exploration Management

Exploration

- Enforce Five Rules of Rocky Seashore Exploration.
 - When necessary, give a 5-minute timeout to anyone not abiding by the five rules.
- Exploring the rocky seashore works best when it's an instructor-guided group exploration. Ideally you want the students close together & huddled with you.
- Point out animals and encourage students to observe & touch.
 - Ramp up the excitement – "LOOK AT THIS HERMIT CRAB!! WHO WANTS TO TOUCH THE ANEMONE?!"
 - Be sure to replace any rocks that you turn over.

Exploration Weather: Calm

- Split the group in half.
 - Team Lead will take half the students.
 - Assistant Team Lead + Classroom teacher will take the other half of the students.

Exploration Weather: Rough

- Team Lead will walk students around to explore tidepools together.
- Assistant Team Lead will focus on "herding" – making sure all students respect boundaries and are being safe.

- Consider ending the exploration early if conditions are so bad that it feels unsafe.

Exploration:

- Explore as a group with students.
- Ask students questions as they make observations. Potential questions:
 - What animal have you found?
 - Encourage students to use Rocky Intertidal Animal ID Card to identify animals.
 - What do you notice about this animal?
 - How does this animal interact with the water? Rocks? Other animals?
 - What questions do you have about this animal?
- After students make observations and ask questions, share fun/interesting facts about animals that you are looking at (see instructor supplement for info).

Process Reflection:

- Investigate an animal intro:
 - It is now time to investigate a single animal at the rocky intertidal.
 - Everyone will spread out and find a single animal they want to observe closely.
 - It can be an animal you looked at before or a new animal.
 - You will have approximately five minutes to:
 - (Show students the page they will be working on in their science notebook w/ an already done example.)
 - Observe your animal.
 - Draw your animal.

- Write down: one way your animal is interacting with the water, the rocks or other animals or observed adaptations
- o Have all students put their observation sheet on clipboard.
 - Review boundaries for sitting.
 - Remind students to Be Their Best Self.
 - Be respectful. If another science leader has chosen an animal to observe, go and find another animal.
 - Be safe: Stay within the boundaries.
 - Be curious: Make lots of observations about your animal.
- Investigate an Animal:
 - o Give students time to spread out.
 - o (Give students five minutes to work.)
 - o (Give students a two and one-minute warning.)
 - o (Walk up to grassy area to do Investigate an Animal Debrief.)
- Investigate an Animal Debrief:
 - o *Instructor note: Focus this conversation on the NGGS Cross Cutting Concept: Systems and System Models. Animals at the rocky intertidal interact with the physical environment (i.e. rocks, waves, etc. and other animals).*
 - o Ask students to share what animal they drew and what ways that animal was interacting with the water, rocks, or other animals?
 - Ask students follow up questions to their response in order to get to the idea of how/why animals interact with the physical and biological environments.
 - Teacher – What animal did you observe?
 - Student – Anemone.
 - Teacher – Can you tell me an observation you made about the anemone?
 - Student – The anemone was using a rock.
 - Teacher – How was the anemone using a rock.
 - Student – It was sticking to the rock.
 - Teacher – Why do you think anemone’s stick to rocks?
 - Student – So they don’t get washed away by the ocean.
 - Teacher – Why would the anemone want to stay here and not float around in the ocean.
 - Student – Because it’s protected here and it’s calm and safe compared to the ocean where the anemone could be eaten by a fish or a shark.

Humans & the Rocky Intertidal

Assistant Team Lead Teaching Notes:

- € Help walk students safely to the storm drain area.
- € Interact with students when they are looking at the storm drain. Potential questions include:
 - What do you think this is?
 - Where do you think the other end of this pipe starts?
 - What do you think moves through this pipe?
 - Why do you think humans built this pipe?
- € Help students make observations about how humans are interacting with the rocky seashore. Potential questions include:
 - What do you notice people doing at the rocky seashore?
 - How are humans interacting with the water? Rocks? Animals?
- € Remind/help students to use the tools in their backpack to make observations

Location: Walk to/from a Storm Drain/Storm Drain

Timing for this station:

- Intro (5 min)
- Walk to storm drain (10 min)
- Storm Drain (5 min)
- Debrief (15 min)
- Walk back to grassy area (5 min)

Intro:

- At this station you will investigate - **How humans interact with water, rocks, and other animals at the rocky intertidal?**
 - Your job is to observe humans, make observations, and ask questions.
 - You will make observations as we walk.
 - You can use any tools in your backpack as we go.
- Expectations for exploration.
 - Be your best self!
 - **Be curious!**
 - We will stop as we walk, from time to time, to make observations but you should make observations the whole time.
 - **Be respectful!**
 - Stay with the group.
 - We must keep the group together so if you are walking slower than the other science leaders, you will be making them wait.
 - Share your findings with other science leaders around you.
 - Listen to any adults that give you directions.
 - **Be safe!**
 - Keep up with the group and stay between adults.
 - Define who will lead the group (Team Lead) and who will be at the back of the group (Assistant Team Lead).

Walk to Storm Drain:

- Walk students to storm drain.
- Stop 2-3 times on the walk to give students time to look for ways humans are interacting with the rocky intertidal.
 - Remind students to use binoculars.
 - Potential Questions:
 - What do you notice people doing at the rocky intertidal?
 - How are humans interacting with the water? Rocks? Animals?

Storm Drain:

Instructor note: Try to point out any trash – even tiny pieces in the sand at the storm drain outlet. The goal is for students to realize that storm drains connect neighborhoods to the rocky intertidal/ocean.

- Stop at pre-determined storm drain location.
- Allow students to gather around and look around the storm drain opening.

- Potential questions to ask as students are looking in/around storm drain:
 - What do you think this is?
 - Where do you think the other end of this pipe starts?
 - What do you think moves through this pipe?
 - Why do you think humans built this pipe?
 - Could anything else besides water flow through this drain?
 - Would that be good or bad for the animals that live around the rocky intertidal?
- Be sure to cover:
 - This is a storm drain.
 - It connects the neighborhood streets above to the ocean.
 - When it rains in the neighborhood above, water goes into the drains and eventually comes out here at the ocean.
 - Other things like trash, oil, liquids spilled on the street, etc. might also come through the storm drain and end up here on the beach.
 - Trash and pollution that end up on the beach could be harmful to the animals that live at the beach and rocky intertidal.

Measure Salinity:

Students will use refractometer to measure salinity in different areas.

- The ocean is salty and marine species are adapted to live in that environment.
- The measurement of salt concentration in the water is called salinity, and we can measure that using a refractometer.
- We will measure the salinity at different areas around the tide pools, to see if each area is at optimal salinity levels for a healthy environment.
 - Example locations: Near storm drain, storm drain and ocean meeting point, tide pool further away from ocean vs tide pool closer to wave action
- To use the refractometer:
 - Open the clean flap and using a pipette, drop 1-2 drops of water on the slanted base
 - Close flap and look through the eyepiece with the refractometer directed toward the sun, adjust lens as needed.
 - The line that is created by the blue and white sections will be your salinity reading.
 - Optimal salinity of seawater is 35 parts per thousand (ppt)
- Debrief:
 - Was there a difference in salinity? Where? Why?
 - What can impact salinity?
 - Evaporation in tide pools can lead to higher salt concentration
 - Fresh water input from storm drains can dilute salt concentration
 - Rain itself can dilute salt concentrations
 - Climate change
 - Melting ice caps & glaciers can decrease salinity
 - Warmer temperatures lead to more evaporation and higher salinity
 - Changing weather patterns and increased rainfall

Process Reflection:

- (Gather all students together in a tight group where they can sit and work in their science notebooks.)

- Humans & the Rocky Intertidal Intro:

- It is now time to write down the observations we made along our walk and at the storm drain about how humans interact with water, rocks, and other animals at the rocky intertidal.
- You will have approximately five minutes to answer questions 1-3 in the Reflection section.
- Have students go to the “Reflection” section of their observation page.
 - Review boundaries for sitting.
 - Remind students to Be Their Best Self.
 - Be respectful. If another science leader has chosen an area to sit, go and find another place to sit and work.
 - Be safe: Stay within the boundaries.

- Humans & the Rocky Intertidal:

- Give students time to spread out.
- (Give students five minutes to work.)
- (Give students a two and one-minute warning.)
- (Gather students together to do Humans & the Rocky Intertidal Debrief.)

- Humans & the Rocky Intertidal Debrief:

- *Instructor note: Focus this conversation on the NGGS Cross Cutting Concept: Systems and System Models. Humans at the rocky intertidal interact with the physical environment (i.e. rocks, waves, etc. and other animals).*
- Ask students to share what they wrote to any of the questions.

Walk back to Grassy Area.

- Walk students back to grassy area for self-reflection and believe surveys.

Lunch

- Give students an opportunity either before or after lunch to use the restrooms.
- Eat lunch with students in the grassy area.
- Be sure students throw away all trash.
- Remind students that Ocean Discovery leaves a place better than we found it- encourage them to pick up any additional trash they see.
- Give students hand sanitizer when finished with lunch.

Self-Reflection

Assistant Team Lead Teaching Notes:

- € Sit with students and model good listening behavior during intro.
- € Participate in Circle Toss Activity

Introduction to Reflection:

- (Have students sit down in a circle and hand each student a half sheet of paper.)

- You have done a lot of science with Ocean Discovery today and now it is time to reflect on our experiences.
- Explain why we reflect to students.
 - Reflecting is the process of exploring your feelings, experiences, and learning to build connections.
 - Reflecting is important because it is an opportunity to share your thoughts, ideas, and feelings. Everyone's voice is important and should be heard.
 - Sharing your reflections can allow others to learn new ideas and perspectives, and can create greater compassion and empathy in our world.

Circle Toss Intro:

- Ask students to write down three words about how they feel about doing science today.
 - Give students some examples: proud, fun, tiring, etc.
- Give students 2-3 minutes to write their words down on their paper.
 - Tell students to write their words as neatly as possible.
 - If they have extra time they can draw or sketch on their paper.

Circle Toss Activity:

- Once everyone has written their words have the students crumple it up into a ball.
- (Have students stand up and form a circle.)
- Circle Toss:
 - Have all students throw their papers into the center.
 - Have each student pick up a paper that is not theirs.
 - Repeat this process several times.
 - Finally have each student pick up a paper ball and hold onto it.
- Remind students the question was how do you feel about doing science today?

Reflection:

- Explain that we will go around the circle and have each person read the three words off the paper in their hand until everyone has done so.
- Remind students to **Be Their Best Self**.
 - Be respectful:
 - All voices are important and should be heard.
 - Use your best voice when reading someone's thoughts.
 - Be curious:
 - Use your best listening skills when hearing others thoughts. Are you surprised by what you hear? Did someone think differently than you?
- Thank students for sharing their thoughts about doing science.
- If time allows have students do a THINK-PAIR-SHARE and answer the question:
 - What are you most excited to tell your family about today?
- (Have all students throw paper balls into trash bag.)

Clean up + Walk to Buses + Goodbye

(If using the "A Little Late" or "A Lot Late" schedule skip the "Clean out Explorer Packs" but collect science notebooks and do "Go Awesome!" cheer.)

Collect Science Notebooks & Water bottles:

- Have student hold notebooks up and make sure every notebook has a first, last and teacher's name on it.
- Collect notebooks and let students know they will get them back when they come to the Living Lab.
- Collect all notebooks and place in a Ziploc bag with school and teacher's name on it.
- Collect borrowed water bottles.

Clean out explorer packs:

- Have students empty out their backpacks onto the grass.
- Have students make sure they have each of the following:
 - o Binoculars
 - Hand lens
 - Rocky Intertidal Animal ID Card
 - Pencil
- If anyone has extras of anything collect them. If anyone is missing something replace it.
- Have students throw any garbage from their explorer packs into the trash bags.
- Have students' clean binoculars and hand lenses:
 - Give each pair of students a piece of lens paper to clean off eye pieces of binoculars and hand lens. Demonstrate.
 - Throw all used lens paper into garbage bin.
 - Make sure these go in the correct bags.
- Have students replace everything into their bags.

Believe! Achieve! Lead! Go Awesome!

- Remind students that you will see them one final time when they come to the Living Lab where they will continue to do science and explore more about the rocky intertidal.
- Thank you for being your best self today science leaders!
 - At Ocean Discovery Institute we **BELIEVE** that science is something you can do and a science leader is someone you can be, that you can **ACHIEVE** in science and think critically about our world, and you can **LEAD** in science and conservation and make a difference in the world. Because we believe this, we do a "Believe! Achieve! Lead! Go Awesome!" cheer at the end of every program so that you will continue to do awesome things after we leave.
 - o On the count of three we will yell "Believe! Achieve! Lead! Go Awesome!"
- (Walk students back to bus area with a stop at the restrooms if time allows.)

Surveys

Assistant Team Lead Teaching Notes:

€ Monitor students taking BELIEVE Survey.

Believe Survey (Students)

- On a whiteboard, write today's date, the teacher's name, and the school as reference for students.

- Explain to students that they will be taking a brief survey. Use the following talking points:
 - Thank you for being great learners and science leaders today. As we end, we'd like to learn a little bit more about how you think and feel about science. To do so, we'd like you to complete a simple survey.
 - This survey allows us to learn what you think and helps us build the best science experiences possible for you in the future. There are no right or wrong answers, we just want to know what you think. Your answers on this survey stay private, in fact your teacher never sees it, and this won't be graded.
 - It is 10 multiple choice statements. I'll read each one out loud and you'll color in the circle of the statement that best describes how you feel about it. Please stay with me, don't work ahead, and only answer the question I am currently reading out loud.
- Pass out surveys and pencils and have students fill in their information at the top.
- When students are ready, read each question and the answers out loud.
- After reading each question, give students approx. 30 seconds to choose their answer before moving on to the next question.
- When finished, collect all surveys.
- Paper clip together by class.
- Give completed surveys to Nalleli