Living Lab Trip

Guiding Statement: Students will explore and build a love for the kelp forest and the animals that live there.

Make a Difference Actions:

- (Today) I love kelp forest and the organisms that live there.
- (Tomorrow) I love the kelp forest and I want to learn how to protect the ocean and kelp forests with Ocean Discovery Institute in the future.

STEM Discovery Focus: Explore and Wonder

Ocean Discovery Unit

Cross Cutting Concept: Observing Patterns - *Observed patterns of forms and events guide organization and classification, and they prompt questions about relationships and the factors that influence them.*

SE Practice: Asking Questions and Defining Problems - *A practice of science is to ask and refine questions that lead to descriptions and explanations of how the natural and designed world works and which can be empirically tested.*

Performance Standard: Life Science: 1-LS1-1 *From Molecules to Organisms: Structures and Processes* – Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow and meet their needs.

Disciplinary Core Ideas:

- *LS1.A Structure and Function* - All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow.
- *LS1.D Information Processing* - Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs.

Performance Standard: Life Science: 1-LS3-1 *Heredity: Inheritance and Variation of Traits* - Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.

Disciplinary Core Ideas:

- *LS3.A: Inheritance of Traits* - Young animals are very much, but not exactly like, their parents. Plants also are very much, but not exactly, like their parents.
- *LS3.B: Variation of Traits* - Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways.

Unit NGSS Alignment

Main instructor

- Classroom management & timing of lesson
- Lead discussions & ask guiding questions to get students thinking about science
- Use Belief and STEM exploration language during lesson
- Provide rules for activities
- Call on students to include as much of the class as possible

Additional staff/volunteers

- Prep materials
- **Do the dance moves! Make a visor! Kids love it when you are a little silly and fun!** ☺
- Whenever not prepping supplies:
    - Talk to/interact with students. They LOVE talking to adults. Walk around and ask questions, help, etc.
    - When students are listening to the instructor, spread out throughout the space and stand near/sit with any students struggling to pay attention.

Supplies:

- Laminated time table (1/instructor/volunteer)
- Community Agreements poster (2)
- Water bottle (1/student)
- Clipboard with paper
- Pen (1/student)
- Kelp poster (1)
- Folding tables (3)
- Visors (1/student)
- Plastic bins with markers (9)
- Hand sanitizer
- Blankets to sit on for lunch (8)
- Trash bag
- Recycling Bag
- Water cooler (2)
- Folding Tables (1) – for water coolers
- Curiosity cubes (3)

Timing

Time	Group 1	Group 2	Group 3
9:30	Arrival-Watershed Plaza		
9:30-9:40	**Welcome + Community Agreements**		
	SciTech Lab	EcoLab	Plaza Del Sol
9:40-10:00	**Visors + Cheer**		
	SciTech Lab	EcoLab	Plaza Del Sol
	Activities		
10:00-10:30	Plaza Del Sol	Ocean Alcove	EcoLab
10:30-11:00	EcoLab	Plaza Del Sol	Ocean Alcove
11:00-11:30	Ocean Alcove	EcoLab	Plaza Del Sol
11:30-11:55	Science & Conservation Leader Show & Tell SciTech Lab	Lunch Fisler Family Adventure Tree	½ students to SciTech Lab ½ students have lunch
11:55-12:00	Groups switch/bathroom break		
12:00-12:25	Lunch Fisler Family Adventure Tree	Science & Conservation Leader Show & Tell SciTech Lab	½ students to SciTech Lab ½ students have lunch
12:25-12:50	**Reflection**		
	SciTech Lab	EcoLab	Plaza Del Sol
12:50-1:00	Clean Up & Depart		

Activity Locations:

- Ocean Alcove – Crabby Adaptations
- EcoLab – Holdfast Dissection
- SciTech Lab/Plaza Del Sol – Great Kelp Race

Arrival & Walk to Site

- Play Welcome Song
- Meet buses or walking students
- Introduce Living Lab
    - Ask students if they have visited before.
    - Our Living Lab is a place where elementary, middle, and high school students, like you, from City Heights can come to visit after school to explore and learn all about science.
- Divide students into three groups (1 group/class)
- Intro ODI the fish mascot and have students high five him on the way past.
- Take Group 1 to the SciTech Lab
- Take Group 2 to the Eco Lab
- Take Group 3 to Plaza Del Sol

Welcome & Community Agreement & Ocean Leader Video (10 min)

Set Up

- Set up three folding tables in Plaza Del Sol
- Kelp forest poster at Plaza Del Sol station
- Have the Kelp Forest Poster photo on screens in SciTech and EcoLabs

This will need to be set up at each station (SciTech, Eco Lab and Plaza Del Sol)

- Fill water bottles (35/lab)
- Community Agreement poster (1/lab)
- Visors (1/student)
- Set a plastic art bin with magic markers on each table (1/table)

Teaching Notes

- Help to hand out water bottles
- Move lunches to Achievement Alcove
- Take students to bathroom
- Do the Kelp Forest Dance

Goal of Station: Students will agree to behavioral expectations for the day, students will feel like scientists and will continue to explore the kelp forest and the organisms that live within it.

- Introduce yourself
- Let all staff members introduce themselves and say one sentence about themselves.
    - Ex. My name is David I have been volunteering with Ocean Discovery for two years now and I am a student at San Diego State.
- Review of community agreements -expectations about **how scientists work together**.
- Ask students to abide community agreements with a verbal "yes" or thumbs up, etc.
- Explain that you will again be **working as a team of scientists** to continue your **exploration** of kelp forests.
- Remind students that scientist ask a lot of **questions, make observations**, and **look for patterns**.
- Give each student a water bottle.
- Introduce that students will continue working as scientists today and exploring the kelp forest.
- THINK-PAIR-SHARE: Do you think you could be a scientist when you graduate college? Why or why not?
    - THINK: Give students 30-60 seconds to think silently.
    - PAIR: Share your thoughts with a partner
    - SHARE: Call on a couple of students to share their thoughts or their neighbors' thoughts.

Visors +Cheer (20 min)

Objective of Station: Students feel like a **scientist** and are **part of a community of scientists** who will work together.

- Have students do the Kelp dance they learned in the classroom:
    - Students say each part out loud and do the motion with the instructor
        1. Holdfast –crouch down and spread your fingers out like a holdfast
        2. Stipe – stand up straight and tall and keep arms close to side
        3. Air Bladders – make balls with your fists and hold them out at your sides
        4. Blades – make your hands flat and wave your arms gently like kelp waving in the ocean
        5. Canopy – hold hands above head with fingers spread out and wave them around
- Introduce field hats and explain that students will have a chance to decorate them. Some ideas:
    - Write your name
    - Draw your favorite kelp forest animal
    - A scientific tool that could help scientists learn about the kelp forest
    - … anything that you think should be on there as a scientist
- Give students 10 minutes to decorate visors.
- Instructors should make their own if they do not already have one.
- Introduce concept of team name (5 minutes max).
    - Options for doing this:
        1. Ask students what they want to explore today as field biologists? Take student answers and narrow down to a few specific words. Ask students to vote on 2-3 words that are coming up the most often in the group discussion.
        2. Ask students what their favorite kelp forest animal is. Write each one down and have a student pick a name from a hat.
        3. Ask students which part of kelp is their favorite. Have students vote. Take the winning part and make a rhyme with it. For example: We are the Stupendous Stipes!
- Introduce concept of team cheer.
    - Great! We are Team ___! Now, throughout the day, when we need to gather our attention back together as a team, I'm going to say, "Hey Team ___!" And I want you all to say back to me, "Go Team __!" After that, our voices turn off and our eyes look at the speaker. Are you ready? Let's practice!
- *Note: Use your group cheer throughout the day as an attention getter or just to get students excited!*
- Remind all students in group that they are here to explore and they should share any questions or observations they make with the group so everyone can learn together.

Holdfast Dissection – **EcoLab (30 min)**

Objective of Station: Students learn that young animals are very similar to but not exactly like their parents while some young animals are extremely different from their adult form.

Set Up

- Break holdfast into 3-4 pieces (enough for each group of students to have one piece)
- Hand lenses (3-4/table)
- Dissection trays or other trays to pieces of holdfast (5-6)
- Petri dishes (30)
- Plastic eye droppers (10)
- Beakers w/ seawater (2/table)
- Make sure adult forms of holdfast organisms in rack tanks are alive and healthy
- Dry cloth towels (5)
- Paper (1/student)
- Pencils (1/student)
- Laminated word bank of body parts (2/table)

Teaching Notes

- Help students stay focused during intro – sit down next to any student struggling to pay attention
- Pass out/collect holdfasts in dissection/plastic trays
- Help students look for organisms
- Help students use hand lenses
- Help students place organisms in petri dishes w/ seawater
- Help students match young and adult forms using questions from curriculum.
- Help students return organisms to holdfasts
- Clean up tables when dissection is finished. Dry tables with cloths.

Introduction (5 min)

- Ask students some questions to access their pre-existing knowledge about heredity. Questions could include:
  - Do you look exactly like your parents? What is similar about you? What is different?
  - Do you look exactly like your siblings? What are some things about you that are the same? What are some things about you that are different?
- Share with students that young animals look similar to but not exactly the same as their parents just like you. Let students know that there are some young animals that look completely different from their adult forms as well.
- Let students know you will be looking for both kinds of examples today.
- Show students the holdfast. Review through questions:
  - Name of this part of kelp
  - Function of holdfast
  - Kelp forest dance - holdfast

- Let students know that many young and small organisms make their home in the holdfast.
- Ask students why they think small and young animals would live in the holdfast.
    - Protection from prey
- Let students know they are going to dissect the holdfast. Review what a dissection is through questions:
    - Does anyone know what it means to dissect something?
    - Has anyone every had an older brother or sister who dissected an animal in school?
    - Dissection: To look closely at what's inside and learn more about it.

Holdfast Dissection (10 min)

- Dissection rules:
    - Groups of 3 people to a piece of holdfast.
    - The holdfast has already been cut up for you. Do not break the holdfast into pieces.
    - Be gentle with your piece of holdfast – we will return the organisms to it at the end.
    - You will be looking for organisms – you will need to look closely because they are often very small. There are hand lenses to help you.
    - If you find an organism, ask an adult to help you remove it from the holdfast.
    - It is important to be VERY gentle with the organism you find! Don't pull hard or some of them may break apart.
    - Remember scientists are very respectful of organisms.
    - If you find something place it in the tiny plastic dishes with some seawater.
    - Continue searching- you may find many organisms.
    - Set a timer for 7 minutes.
- Distribute the pieces of holdfast to the groups of students. Set a visual timer on the whiteboard.
- When timer goes off have students place holdfast pieces back into the bin but keep their organisms in the petri dishes.

Find Adults (8 min)

- Tell students that Ocean Discovery has larger versions of some of the things they have found.
- Let students know there will NOT be adult match for everything they have found but that there are also cards on the tables that have pictures of adults that Ocean Discovery does not have.
- Have students try to match up juveniles with adults in rack tanks and cards on tables. Ask questions like:
    - Which of these do you think are the same? Why do you think that?
    - What is the same about them? What is different?
    - Which is the adult and which is the baby? How do you know?

- *Note: It is possible that some organisms will not have matches in rack OR on cards – please make note of these so they can be added to cards in the future.*

Young versus Adult (7 min)

Option 1: (when there is more time)

- Divide students into as many groups as there are ODI staff available.
- Give each group of students a "match" (juvenile and adult)
    - Try to focus on the ones that are very similar
- Ask questions:
    - Which is adult/baby? How do you know?
    - What is the same?
    - What is different? Why do you think they have "that" part when they are young but not as adults? Or vise versa?
- Have each student sketch a picture of their adult animal.
- Have students label parts that are similar to the baby form.
    - Example label: eyes, claws, fins, etc.
    - Direct students to laminated glossary of body parts for help spelling and ideas.
- If time allows have students discuss how any of these body parts could help their animal to survive in the kelp forest.

Option 2 (when time is shorter)

- Gather students around one or two tables (depending on the number of instructors) and place a matched set of organisms in the center. Ask questions:
    - Which is adult/baby? How do you know?
    - What is the same?
    - What is different? Why do you think they have "that" part when they are young but not as adults? Or vise versa?
- Repeat the process for as many matched organisms as you have time for.

Clean Up

- Have students place organism back into holdfasts
- Collect holdfasts

<u>The Great Kelp Race</u> – Plaza Del Sol (30 min)

<u>Objective of Station:</u> Students create a diagram of an underwater kelp forest and learn that kelp reacts to its environment and there are optimum environmental conditions for kelp growth.

<u>Set Up</u> – SciTech Lab

- VR glasses (1/student)
- Ipod (1/student)
  - with kelp forest video loaded onto ipod
- Have a piece of juvenile kelp available
- Paper to write down each group's temperature guess

<u>Set Up</u> – Plaza Del Sol

- Staff to pre-draw all three types of kelp to create a "forest", a seafloor and ocean (see diagram at end of curriculum) 2 – 3 of each temperature pre drawn
- Jumbo chalk (5-6 pieces)
- 8" sticks (5)
- 14" sticks (5)
- 24" sticks (5)
- ½ piece of red construction paper that says xx degrees (20)
- ½ piece of yellow construction paper that says xx degrees (20)
- ½ piece of green construction paper that says xx degrees (20)

<u>Rain Day Set Up</u> – SciTech Lab

- 12 foot long pieces of butcher paper (6-7)
- Tape
- Sharpies (10)
- 8" sticks (5)
- 14" sticks (5)
- 24" sticks (5)
- ½ piece of red construction paper that says xx degrees (20)
- ½ piece of yellow construction paper that says xx degrees (20)
- ½ piece of green construction paper that says xx degrees (20)

Teaching Notes

- Distribute VR glasses to students
- Help students put on VR glasses and watch videos
- Collect VR glasses
- Sit with students who are having trouble focusing during intro
- Help groups of students come up with a hypothesis.
- Help groups of students chose a temperature to "grow" their kelp based on their hypothesis.
- Help students transition to Plaza del Sol and back without disrupting other groups.
- Help students measure and draw their kelp in the Plaza del Sol.
- Pass out and collect measuring sticks and chalk

Intro (5 min)

- Tell students they are going to go for a virtual "swim" in a San Diego kelp forest so they can see what kelp looks like when it is grown.
- Distribute VR glasses with ipods and have students experience the kelp forest.
- Have students put on VR glasses with ipods and play video to experience what life is like in a kelp forest.
    - https://sanctuaries.noaa.gov/vr/olympic-coast/seastar-kaleidoscope.html
- Collect VR glasses

Kelp Race (20 min)

- Explain to students that baby kelp just like baby animals can be similar to but not exactly the same as adults kelp.
- Show students juvenile kelp (or a poster of juvenile kelp if living sample is not available) and explain this is the baby form of the Giant Kelp that they have been studying and that they just saw in the video.
- Now that students have seen adult kelp have them compare and contrast the two. (Write on board)
    - What is similar
        - Color, air bladder, holdfasts, blades
    - What is different
        - Size, no canopy
- Cover the following:
    - Kelp is algae and needs sunlight and nutrients to grow- just like plants
    - Because sunlight does not go very deep and a lot of it is blocked by the canopy of adult kelp, young kelp must grow quickly to survive.
    - How quickly kelp grows depends on many things such as amount of sunlight, temperature, amount of nutrients, wave conditions, etc.
- Explain the Amazing Kelp Race
    - Students in groups of three.
    - Today we will do an experiment to see how temperature affects how fast kelp can grow.
    - Have students discuss (1 min) in their group and make a hypothesis:
        - Hypothesis: Do you think kelp grows best in colder or warmer water?
    - Ask each group to share their hypothesis.
    - Tell students they will test their hypothesis. Each group will get a chance to "grow" kelp.
    - They may choose to grow their kelp in water that is 50 degrees 60 degrees or 75 degrees.
    - Give students 1 minute to decide in their group.
        - Write down each group's chosen temperature.
        - Try to encourage at least one group to try each of the temperatures.

        - If one temperature is not covered make sure the staff draw one or two pieces of kelp of that temperature.
- Take students outside to Plaza del Sol.
- Explain that each team of scientists will "grow" their kelp for 10 days. Each team will be given a stick that represents 1 day of growth.
    - 75 degrees = 8 inch stick
    - 60 degrees = 14 inch stick
    - 50 degrees = 24 inch stick
- They will need to start their kelp from the seafloor (point this out on the Plaza) and then measure their stick 10 times, making a chalk mark for each day.
- All kelp must grow towards the ocean surface where the sunlight is (point this out).
    - Show students how to measure out two days using an example stick.
    - Encourage students to decorate their kelp (add blades and air bladders) if they are done measuring before other groups.
- Hand out appropriate stick (for the temperature the group chose) and chalk to each group.
- Tell students to begin. While students are working, place temperature construction paper cards out.
- When all groups are done gather students towards the tops of the kelp.
- Ask each group to take the temperature card they chose and place it next to the kelp they drew. Instructors should quickly place corresponding temperature signs next to the ones that were pre-drawn.
- Collect sticks and chalk.
- Ask students to make observations about what they notice.
- Kelp grow fastest in colder water
- Return to SciTEch Lab

<u>Debrief</u> (5 min)

- Look at adult kelp in kelp tank.
- Cover the following:
    - Kelp is one of the fastest growing organisms on earth.
    - Kelp can grow over 150 feet.
- Ask students which water temperature helps kelp grow faster – colder water.
- Explain to students that the reason kelp grows faster in cold water is:
    - Cold water causes nutrients to come up from the bottom. Kelp needs nutrients to grow just like plants. The more nutrient the faster kelp grows.
- Write on board colder water → more nutrients → faster growing kelp
- Ask students questions:
    - What season would you expect kelp to grow fastest? Why?
    - What season would you expect kelp to grow the slowest? Why?

<u>Rain Plan for Great Kelp Race:</u>

- Same activity will just take place indoors.

- In SciTech Lab before students arrive tape down 6-7 twelve-foot-long pieces of butcher paper.
- Pre draw kelp just like you would outside with chalk so some kelp is in place before hand.
- Have students draw their pieces of kelp on the butcher paper instead of outside on group with chalk.
- When it comes time to label each piece of kelp with a temperature do so with a piece of construction paper. This way students will be able to analyze the data and when one group is finished you can collect the pieces of paper and the next group can add to the kelp forest too.

Crabby Adaptations - Ocean Alcove (30 min)

Objective of Station: Students learn different types of physical adaptations that crabs have as juveniles and adults and how crabs react to stimuli from the environment

Set Up

- Set up a projection microscope in Ocean Alcove with crab zoea slide.
- Set up black out curtains.
- Place 3-4 adult crabs in small organism plastic bins to be observed by students.
- Clipboard w/ zoea drawing (1/student)
- Pencils (1/student)
- Make sure ocean alcove screen can play two crab behavior videos

Teaching Notes

- Sit with students who are having trouble focusing during intro
- Help students figure out what adaptations adult crabs have. Ask them questions about how the adaptation helps the animal to survive.
- Help students figure out how a zoea might be adapted to survive.
- Help students figure out what behaviors might be helping crabs survive.

Intro/Adult Crab (10 min)

- Be sure to cover:
    - What an adaptation is – something that helps you to survive.
    - Project a picture of a lion.
        - What adaptations does it have to survive?
- Explain to students that we will be looking at crabs that live in the kelp forest today.
- Let students know that crabs look very different at different times in their life cycle.
- Tell students they will first look at an adult crab.
- Explain to students that they will get to look at an adult crab up close but that they are not to touch it.
- Tell students that their job is to come up with at least 2 adaptations a crab has to survive in the kelp forest.
- Divide students into 3 or 4 groups and give each student an adult crab to look at.
- Give students 4 minutes to discuss in their group.
- Call on students to share adaptations that crabs have. Try to have students come up with at least 4 adaptations.
    - Claws for defense, claws to eat, eyes on stalks, hard exoskeleton, coloration (camouflage)

Zoea (10 min)

- Explain to students that baby crabs look very different from adults.
- Explain to students that baby crabs are very small so scientists like yourselves need to use special equipment to see them. Introduce the projection microscope and explain to students

that we will all be able to look at a microscope image at the same time instead of one at a time when we use smaller microscopes.
- Students look at projection of crabs as zoea with projection microscope.
- Students get a drawing of zoea on a clipboard. Have students take a moment to think about what on the zoea might be an adaptation.
- Hand out pencils and tell students to circle on their picture a possible adaptation.
- Have students turn and talk with a partner about what they circled and how it might help the zoea survive to adulthood.
- If time allows have a few students share their ideas while pointing to the parts on the projected image.
- Collect clipboards and pencils.

Behavioral Adaptations (10 min)
- Explain to students that animals can also do things to help themselves survive. These are called behavioral adaptations.
    - How many of you have ever gone to the beach or the park and had a picnic? Raise your hand.
    - While you were there how many of you have had seagulls or other birds land around you? What were those birds trying to do?
        - Eat your food.
    - Correct! But that is something that the birds learned to do. Birds are not adapted to eat human food but over time they have learned that people are an easy source of food and that food is always easily available. That means it is often easier for a bird to eat your food then to go find food on their own. That is a behavioral adaptation, something an animal learns to help it survive.
    - Do you think it is healthy for birds to eat our food?
        - No. We should do everything possible to make sure birds don't eat our food. When you eat outside always be sure to throw away in a COVERED trash can any food or packaging and NEVER feed birds. Tell all your friends and family that it is important to not feed birds because it is bad for them.
- Tell students they are going to watch a couple of videos and see if they can see something the crabs are doing to help themselves survive.
- Show this blue crab video:
    - https://www.youtube.com/watch?v=NexIShpu6zM
- Ask students what kind of behavior the crab is doing to help it survive.
    - Make sure student say why what the crab is doing will help it. For example: The crab is putting stuff on itself so that it looks like the rock. Teacher: Why would that help it?
- Show decorator crab video
    - https://www.youtube.com/watch?v=k5bsyHpTZAA
- Ask students what kind of behavior the crab is doing to help it survive.
    - Make sure student say why what the crab is doing will help it. For example: The crab is putting stuff on itself so that it looks like the rock. Teacher: Why would that help it?
- Include adaptation dances for each one of the above. ☺

Science and Conseravtion Leader (25 min)

Objective of Station: Students will meet, talk to and ask questions of a real local science and/or conservation leader whom they can see themselves becoming in the future.

Set Up

- Load any picture or other audio/visual the visiting scientist has brought

Teaching Notes

- Walk around and monitor students.
- Sit with any students who are struggling to help keep them focused during show and tell and the Q & A portion.

Show and Tell (10 min)

- SCL talks about what they do for a living in student friendly language.
- Focus on background (if from the community or a similar community)
- Focus on how they make a difference in the world

Q & A (10 min)

- Let students ask questions if they have them.
- If students are shy or struggling to come up with questions use curiosity cubes.

Lunch & Bathroom Break (25 min)

Set Up

- Hand sanitizer
- Blankets to sit on
- Trash bag
- Recycling Bag
- Water cooler (2)

Teaching Notes

- Walk around and monitor students while they eat lunch – ask them questions about their experience
- Hand out hand sanitizer
- Monitor water cooler and help students refill water bottles
- Walk around with trash bag when you see students starting to finish up
- Supervise and encourage clean- up of surrounding area when clean up begins

- Before lunch have students take a bathroom break.
- Refill water bottles.
- Give hand sanitizer to each student before lunch.
- Give students a five-minute warning before clean up.
- Remind student that we are connected to the ocean through the canyon watershed and that any trash that ends up on the ground here can end up in the ocean so we need to be careful.
- Have students take 2 minutes to walk around and clean up their area.
- Refill water bottles.

Self Reflection (25 minutes)

Objective of Station: Students reflect on their experience at Ocean Discovery Institute and consider who they would like to bring back for a future visit and what they would want to show them.

Set Up

- Put up kelp forest video on silent in the background
- Have "Do the Hustle" music queued and ready to go – check audio volume.
- Blank pieces of paper (70)
- Pencils (1/student)

Teaching Notes

- Walk around and help students with reflection activities
- Help pair up students who don't have partners when the music turns off.
- High five students and have a conversation with them about the question being asked.
- Don't let students get bogged down in the perfect picture.
- If students are struggling to draw, sit with them and quietly ask them the answer to one of the guiding questions. When they give you an answer -encourage them to draw that.
- Collect pictures and give them to teacher.

High Five Hustle (10 min)

- Tell students you are going to turn on some music (Do the Hustle or other) and they will walk around the classroom.
- When the music turns off they must high-five the nearest person and stand face to face with them.
    - Walk around and help pair up any students who don't have a partner.
    - Adults can be partners with students- this is encouraged.
- The instructor will read a question out loud and give everyone 20-30 seconds to think about their answer. Then the instructor will say who will go first. For example:
    - The person with the longest hair will go first.
    - The shorter person will talk first.
    - The person with the most brothers and sisters will talk first.
    - Etc.
- After giving the first student 20-30 seconds to respond the instructor will prompt the second student to speak.
- The instructor can then choose 2-3 students to share their thoughts or their partners thoughts.
- Turn on the "Do the Hustle" music again and tell students they must walk around.
- When music stops they must high five someone NEW and face them.
- Repeat until you run out of time.
- Questions:
    - What was your favorite memory about today?
    - What do you want to learn more about?
    - What do you think is the coolest part of kelp and why do you think that?

- Which organism did you like best that you found during the holdfast dissection?
- What is one new thing you learned today?
- What is one question you still have about the kelp forest or any of the animals that live in it?

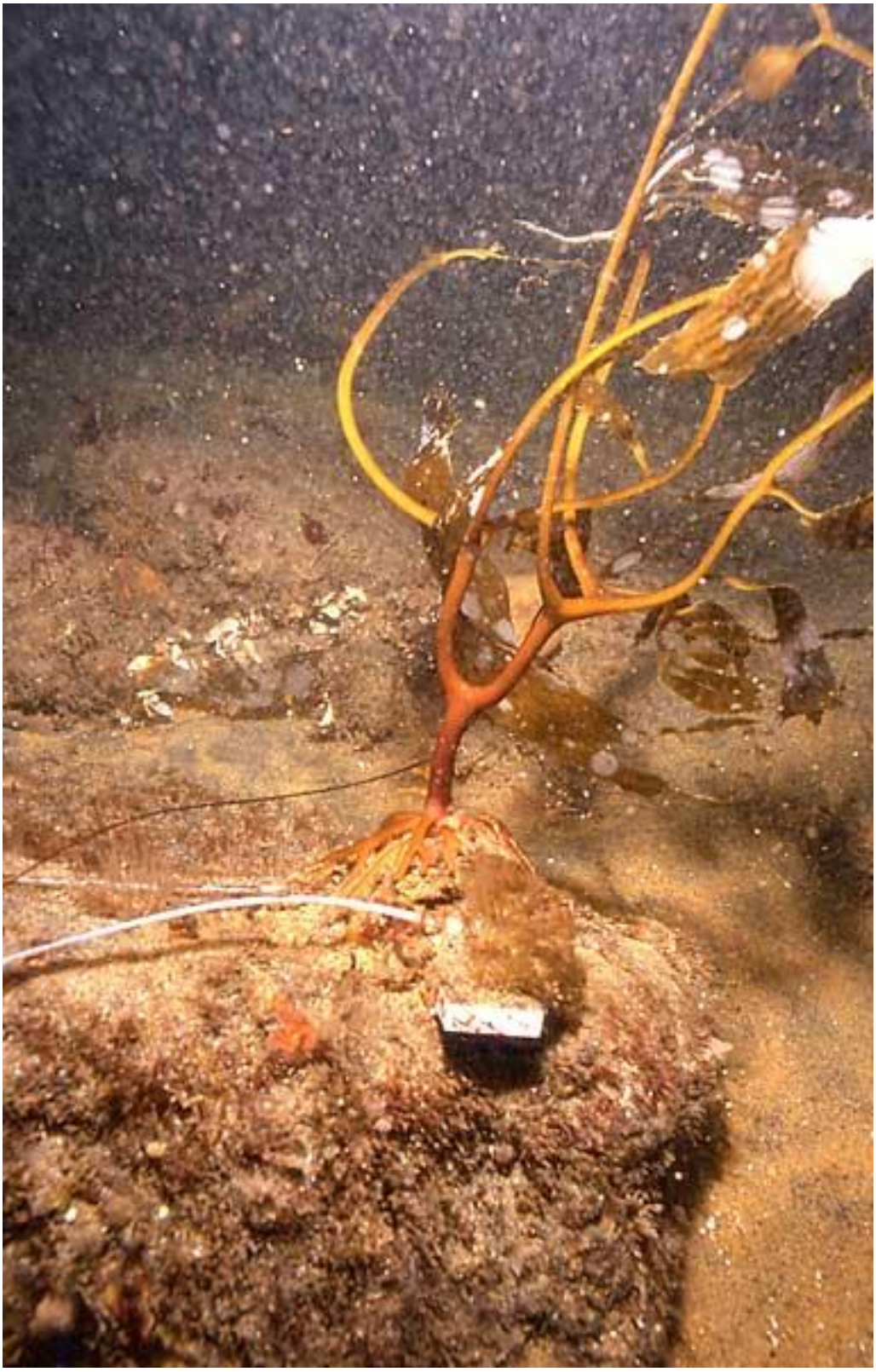
Future Ocean Discovery Visits Drawing (15 min)

- Remind students that they can visit Ocean Discovery Institute anytime.
- Give each student a piece of paper and pencil to draw a picture of themselves and an adult they would like to bring back to Ocean Discovery Institute visiting in the future.
- As students are working walk around and ask the following questions:
  - Ask students who is in the picture with them?
  - Why do you want to bring that person here?
  - What would you want to show/or do with that person here?
- If time remains ask a couple of students to share what they drew.
- Have students write first and last name on back of pictures.
- Collect pictures and give them to teacher.

Clean-Up & Depart (10 min)

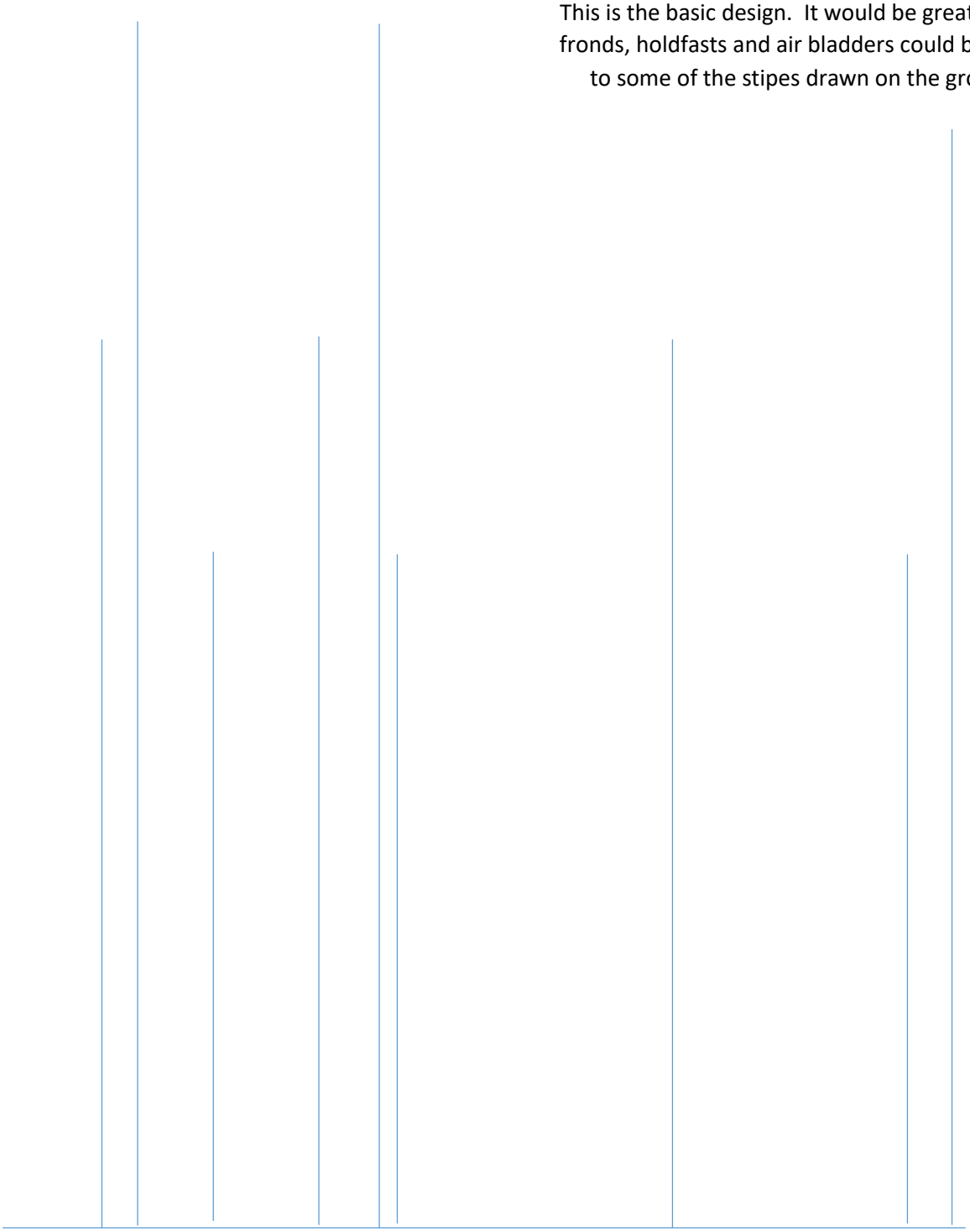
- Invite students back to Living Lab for Family Saturday
- Have students turn in water bottles
- Look around you on table and floor – pick up any trash you see.
- Note: While clean up is happening also do a quick bathroom break before student begin walk or get on buses.
- Push in chairs at tables.
- Walk students to watershed plaza.
- Today, we tried new things, and made new discoveries. Whenever we do that, we have an Ocean Discovery cheer to send us off. We say “Go Awesome!” Say it with me on the count of 3. 1, 2, 3… Go Awesome!!
- Let’s give ODI and all your Ocean Discovery teachers a high-five on the way out scientists!
- Have staff line up next to ODI and high five students on their way out.

Juvenile Kelp



Pre-Drawn Kelp Forest

This is the basic design. It would be great if some fronds, holdfasts and air bladders could be added to some of the stipes drawn on the ground.



OCEAN FLOOR