

LESSON 4 Life at the Beach

“Examining the Crime Scene”

Lesson at a Glance

The fourth and fifth lessons are actual field trip experiences and data collection, and can be done on the same field trip. In this lesson, students learn important safety rules about the beach, and about interacting with organisms on the beach. Then they take a field trip to the beach, and make a series of observations about the water, wind, weather, and animal and human activity, and consider what conditions are necessary for survival. During a transect, students identify life at the beach in different zones of habitation.

Lesson Duration

One 140-minute session broken into several flexible categories, depending on needs and travel time, as follows:

- 30 minutes of rule review and skits. (We suggest that this is done the morning of the field trip in the classroom.)
- 30 minutes of travel time. (varies)
- 20 minutes of simple beach observations upon arrival at the beach. (Additional time at the beach is planned in the next lesson.)
- 60 minutes of beach transect work.

Essential Question(s)

How do we conduct science investigations safely?

Why do organisms need specific environmental conditions to survive?

Related HCPSIII Benchmark(s):

Science: SC 4.1.2
Differentiate between an observation and an inference.

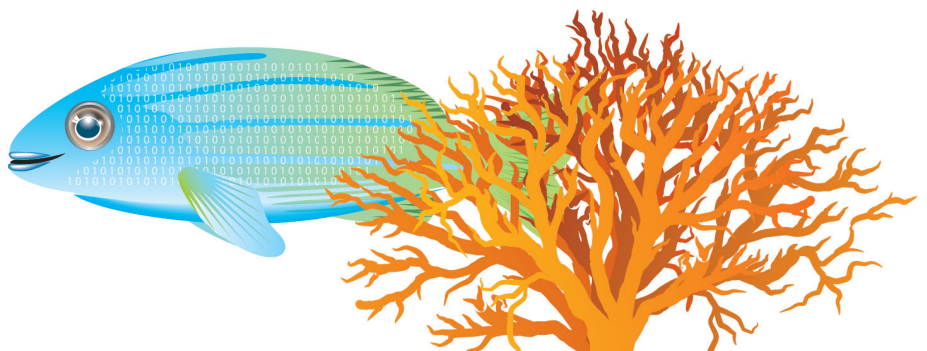
Science: SC 4.5.3
Describe how different organisms need specific environmental conditions to survive.

Key Concepts

- The beach is a constantly changing landscape. By making careful observations of the wind, water, weather, human and animal activity, students can understand the environmental conditions necessary for survival.
- Safe practices including the ethical treatment of organisms should guide any scientific investigation.
- Observations are the base of any scientific investigation.
- Different organisms need specific environmental conditions to survive.

Instructional Objectives

- I can describe what is necessary to ensure a safe and successful fieldtrip to the beach.
- I can describe how different organisms need different environmental conditions in order to survive.
- I can make observations that will serve as the basis for a scientific investigation.



Assessment Tools

Benchmark Rubric:

Topic		Scientific Knowledge	
Benchmark SC.4.1.2		Differentiate between an observation and an inference	
Rubric			
Advanced	Proficient	Partially Proficient	Novice
Explain the difference between an observation and an inference and give examples	Differentiate between an observation and an inference	Provide examples of observations and inferences	Define an observation and an inference
Topic		Unity and Diversity	
Benchmark SC.4.5.3		Describe how different organisms need specific environmental conditions to survive	
Rubric			
Advanced	Proficient	Partially Proficient	Novice
Explain why different organisms need specific environmental conditions to survive	Describe how different organisms need specific environmental conditions to survive	List specific environmental conditions that organisms need to survive	Recall that organisms need specific environmental conditions to survive

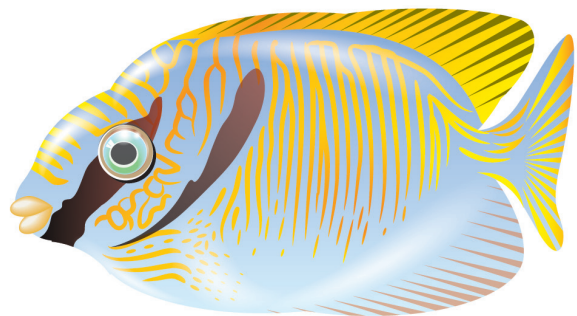
Assessment/Evidence Pieces

Lesson

- Data collection from beach field trip
- Formative discussion of data collected

Materials Needed

Teacher	Class	Group	Student
<ul style="list-style-type: none"> • Teacher Reading: <i>Life at the Beach</i> • Map of your field trip site, including likely sources for beach pollution 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Six stakes • Rope (approximately 20 meters (65 ft.)) • Student Worksheet: <i>Transect Line Map</i> 	<ul style="list-style-type: none"> • Student Worksheet: <i>Tips on Animal Habitat</i> • Student Worksheet: <i>Beach Safety</i> • Student Worksheet: <i>Life at the Beach Observations</i> • Clipboard and pencil (or make one using heavy cardboard with clips)



Instructional Resources

Teacher Reading: *Life at the Beach*

Student Reading: *Beach Safety*

Student Reading: *Tips on Animal Habitat Do's and Don'ts*

Student Worksheet: *Life at the Beach Observations*

Student Worksheet: *Transect Line Map*

Student Vocabulary Words

None

Lesson Plan

Lesson Preparation

- Read the Science Background provided in the Unit's Overview and Teacher Reading *Life at the Beach*.
- Identify an appropriate site by contacting state environmental science specialists.
- Visit the site by yourself first. Talk to any staff members or lifeguards at the site. Gather information about the habitats and potential hazards. Take digital images of the beach to show the class as you prepare for the field trip.
- Decide where to lay out parallel rope transect lines for student groups to walk along that includes upper, middle, and lower beach zones. You will need as many transect lines as groups of students, and the length of the rope will depend on the beach.
- Also decide how often the students should make their observations along the transect line, but plan for at least one thorough observation in each of the three zones: upper beach, middle beach, and lower beach. --If life at the beach is sparse, you might want the students to make observations along the entire transect line, and you might want to increase the width of the sampling area. If life at the beach is abundant, you might want students to make observations at intervals of approximately five 5 steps (paces) along the transect line, and limit the observations to a width of approximately one foot on each side of the rope.
- Review Teacher Reading *Life at the Beach* paying close attention to the "Planning a Field Trip" portion of that page.
- Process necessary school fieldtrip forms, including letters to parents. Arrange for chaperones, and provide them with both safety information and information for assisting during the field trip.
- Enlarge student worksheet, *Transect Line Map*, into a bulletin board display and practice walking the transect line in the classroom prior to the field trip.

IMPORTANT: Refer to State document, HI DOE Standard Practices Document number 2250, Field Trips and Student Travel. Check with your Education Specialist for Environmental Studies in the Office of Curriculum, Instruction and Student Support at (808) 733-9141 x321. Look for the most recently revised guidelines.

I. Student Preparation for the Field Trip

- A. Introduce students to the purpose of the field trip. Explain that they will be working in groups to study the organisms on the beach and how they need specific environmental conditions to survive.
- 1) Tell them which beach they will be studying. Post a map that shows the location of the beach. Show students your digital images to help familiarize them with the beach conditions they will observe, and the kinds of plants and animals they will be looking for.
 - 2) Before the field trip, demonstrate the sampling technique that student groups will use at the beach to study plants and animals that live there.
 - Write the term *transect line* on the board. Sketch how the line will be stretched out at the beach, from top to bottom. Describe how each group will walk along its transect line looking approximately 50 cm (19.69 in.) to the left or right of the line for evidence of plants and animals, living or once living.
 - Familiarize the students with the kinds of observations that they will be making, and how they are to record their data on the Student Worksheet: *Life at the Beach*. This is a good opportunity to ask the students to write a prediction about:
 - the environmental conditions on the upper, middle, and lower portions of the beach.
 - what kinds of plants and animals they expect to find in these zones.
 - the kinds of conditions that various organisms need to survive.
- B. Explain that a very important part of any field study is planning, including planning for the safety of people and care of living organisms.
- Begin by establishing the importance not only of working together in groups, but also of having a buddy. Divide students into the groups of four that they will be using for the field trip, including assigning a buddy.
 - Distribute Student Worksheet: *Beach Safety*, and explain that the first set of safety rules is related to their own safety. Ask each group to read the worksheet, and then create and perform a short skit to act out one of the rules for the entire class. Facilitate safety discussions related to the rules.
 - Now explain that there are also safety rules related to the animals and plants at the beach. Distribute Student Worksheet: *Tips on Animal Habitat*. Ask students to read the sheet, and then ask them questions about it, such as: Should you pick up animals? What should you do if you see a jellyfish?
- C. Also explain to the students what they need to do to prepare for the field trip, including what to wear (e.g., sunglasses, beach hat, footwear, sunscreen, and others), your travel plans, and the proposed schedule at the beach.



II. *Field Trip: Preliminary Beach Observations*

- A. When you arrive on the beach, ask students to gather in their groups and quietly complete their Student Worksheet: *Beach Observations*. Encourage them to use all of their senses.
- B. While students are completing the worksheet, have chaperones help you lay out transect rope lines with stakes and heavy rope. These lines should run from upper to middle to lower zones. You will need one transect line per group, and the lines should be parallel to one another.

III. *Observing Life at the Beach*

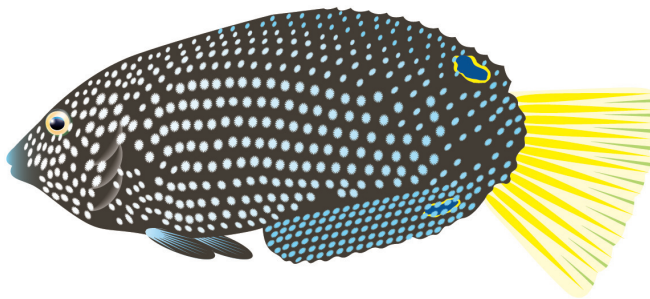
- A. Before starting the transect line survey, briefly review with the class the purpose of their beach study, which is to observe the environmental conditions along the transect line and to find out what kinds of environmental conditions plants and animals need to survive.
- B. Remind students about safety.
- C. Establish where each group is to do its study, and set the amount of time to complete the transect line observations.
- D. Ask chaperones to be available to assist students, if needed, as they make and record their observations.

IV. *Check for Understanding*

- A. Have students look at the data and write a summary of their findings based on the benchmark in their journal. Ask, “Where does Claude live?”
- B. Ask each group to present its work to the class, or post the maps and conduct a gallery walk.
- C. Conclude this lesson by having the class compare and contrast all of the data findings from each group.

Extended Activities

1. Using large chart paper or an entire bulletin board, make a composite map of the class findings. Sketch the general outline of the beach, and indicate where the transect lines were placed. Point out the need faced by all scientists to find a way to share their observations with others. Decide how to depict types of organisms, either in the form of symbols or as drawings or sketches.
2. Ask students to write poems or stories about the plants and animals that they found at the beach.



LESSON 4 Teacher Reading

Life at the Beach

The beach environment is an exciting place for students to explore. Although a beach may look barren and unoccupied at times, it is most likely teeming with life. In this lesson, students bring together a number of elements from the unit, including:

- The beach ecosystem is divided into different zones, or habitats, for living things.
- Organisms have special behaviors that allow them to exist in their habitats.
- Organisms survive under certain environmental conditions in their habitats.
- Pollution affects life at the beach.
- Sand is an important part of life at the beach.
- Both point source pollution and sand can be traced to a source.

Although the content in this lesson should not be entirely new to students, because it has been covered in Lessons 1, 2, and 3, the hands-on experience with life at the beach, sand, and pollution may be new to them.

Planning a Field Trip

IMPORTANT: Refer to State document, HI DOE Standard Practices Document number 2250, Field Trips and Student Travel. Check with your principal or librarian for a copy or check with your Education Specialist for Environmental Studies in the Office of Curriculum, Instruction and Student Support at (808) 733-9141 x321. Look for the most recently revised guidelines.

After identifying a site, and consulting with any specialists as to habitats and hazards, use the following questions as a checklist for further evaluating the site:

- o Is the site safe?
- o Are there restrooms?
- o Where can the students safely conduct their beach study? What boundaries will you set?
- o Do you have a first aid kit to bring? If not, can you borrow one?
- o Do you have field guides? If not, can you borrow some?
- o Have you sent permission slips home? And have they been returned?
- o Have you filled out appropriate water-related forms with your school?
- o Have you talked to your principal about the trip? About student-to-teacher ratios?
- o Have you recruited and trained your chaperones?
- o Have you gathered supplies, including footwear, gloves, sunscreen, sunglasses, and/or hats, bottles of water, and others?
- o Are the participants divided into working groups? Does each student have a buddy? Do you know who is in each group, and who is buddy to whom?

LESSON 4 Student Reading – Beach Safety

1) *Wait for, and follow instructions.*

There are always good reasons behind the instructions given on field trips and for marine activities.

2) *If you have a time limit, complete work within the time limit.*

However, do not rush. Accidents often happen when people start to rush.

3) *If anyone gets an abrasion or cut, let your chaperone know.*

Abrasions and cuts should be cleaned with an anti-bacterial agent, and dressed if necessary.

4) *To avoid a fall, walk carefully on slippery surfaces.*

Rocks, water-washed pathways, ledges, and mud can be very slippery.

5) *Never leave the group and go off alone.*

If, for any reason, you need to leave, notify a chaperone.

6) *Stick with your buddy, and stay with your assigned group.*

Remember to stay within the boundaries that your chaperone has established.

7) *Keep your eyes on the ocean.*

When you are close to water, face the on-coming waves. Waves can be unpredictable and oftentimes crash onto shore.

8) *Wear protective footwear.*

Sneakers, tabis, booties, or old shoes help prevent accidents from objects such as glass, shell fragments, or metal.

9) *Wear gloves.*

Garden gloves help prevent accidental cuts on your hands.

10) *Notify an adult immediately if a dangerous item (syringe, metal drums, chemical containers, medical waste), or stranded animal is found.*

Do not pick up any of these, or anything that you do not recognize.

LESSON 4

Tips on Animal Habitat Do's and Don'ts



Plants and animals are living organisms. Therefore, treat them with care and respect.

Follow these tips:

- When visiting any habitat, avoid walking on, or trampling plants and animals that live there. Stay in assigned areas.
- Do not intentionally hurt any animal.
- **DO NOT HANDLE MARINE ANIMALS!** Remember, it is alive, and needs to stay under water.
- Do not stick hands in holes or under rocks.
- If you turn over a rock, make sure you return it to where it was.
- Do not walk on the coral.
- Do not leave your trash at the site. If you come across trash that is not your own, pick it up and put it in a waste receptacle.

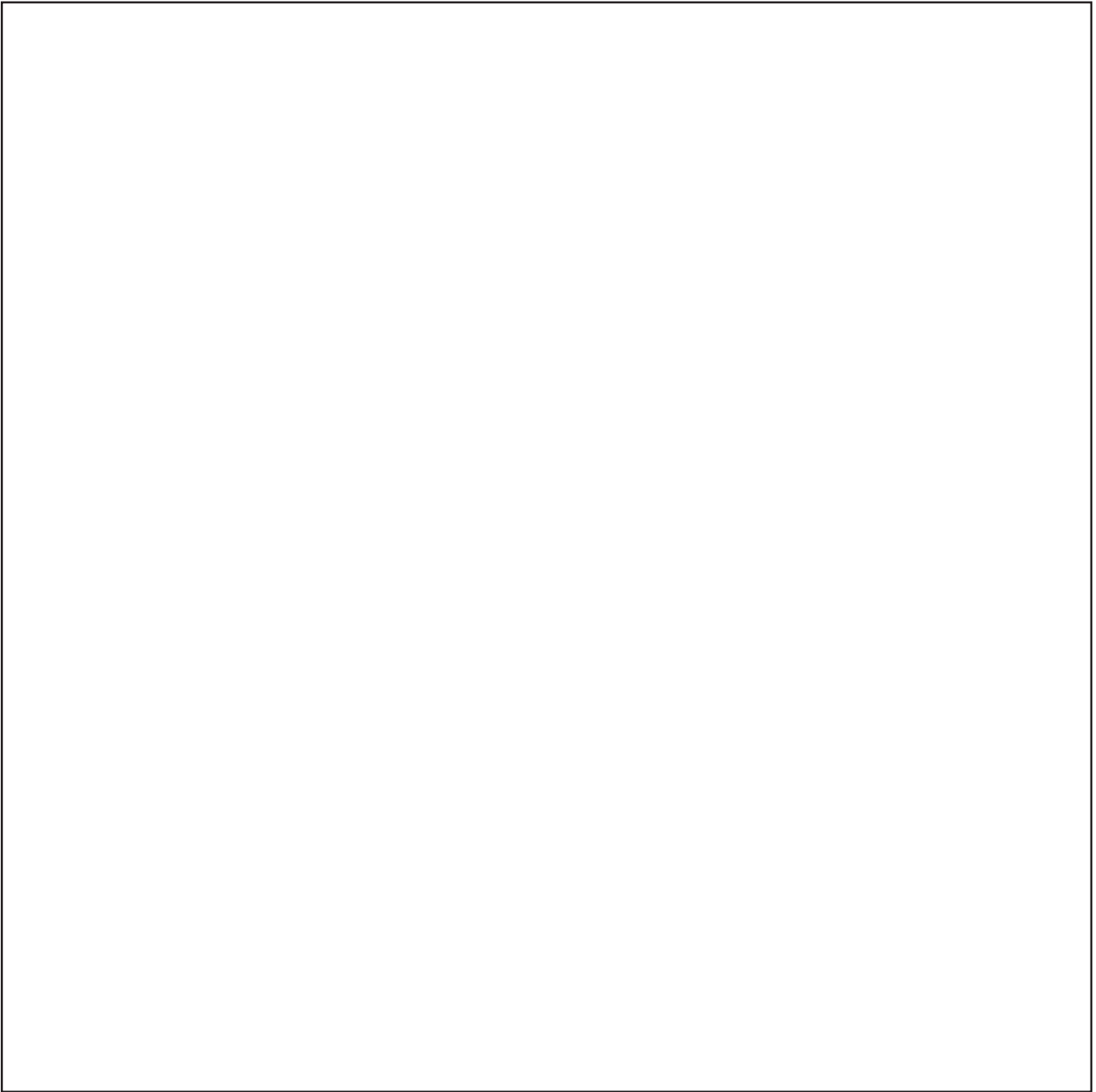


LESSON 4 Life at the Beach Observations

Before walking the beach, sit down and take a close look at what you are seeing in terms of the weather, waves, water condition, animal, and human activity. Put your observations in the left column. You may use sketches as well as words. Then consider how an animal or plant could survive in these conditions. Put those responses in the right column.

	Observations
Date:	
Time of Day:	
Transect location:	
Weather:	
Estimated Wave height:	
Water Conditions (color, clarity, objects and others):	
How could an animal or plant survive with this condition?	
Signs of Human Activity:	
Signs of Plant Life:	
Signs of Animal Life:	
Other observations:	

Draw a profile of the beach below. Is there a steep drop off? Rocks and logs?



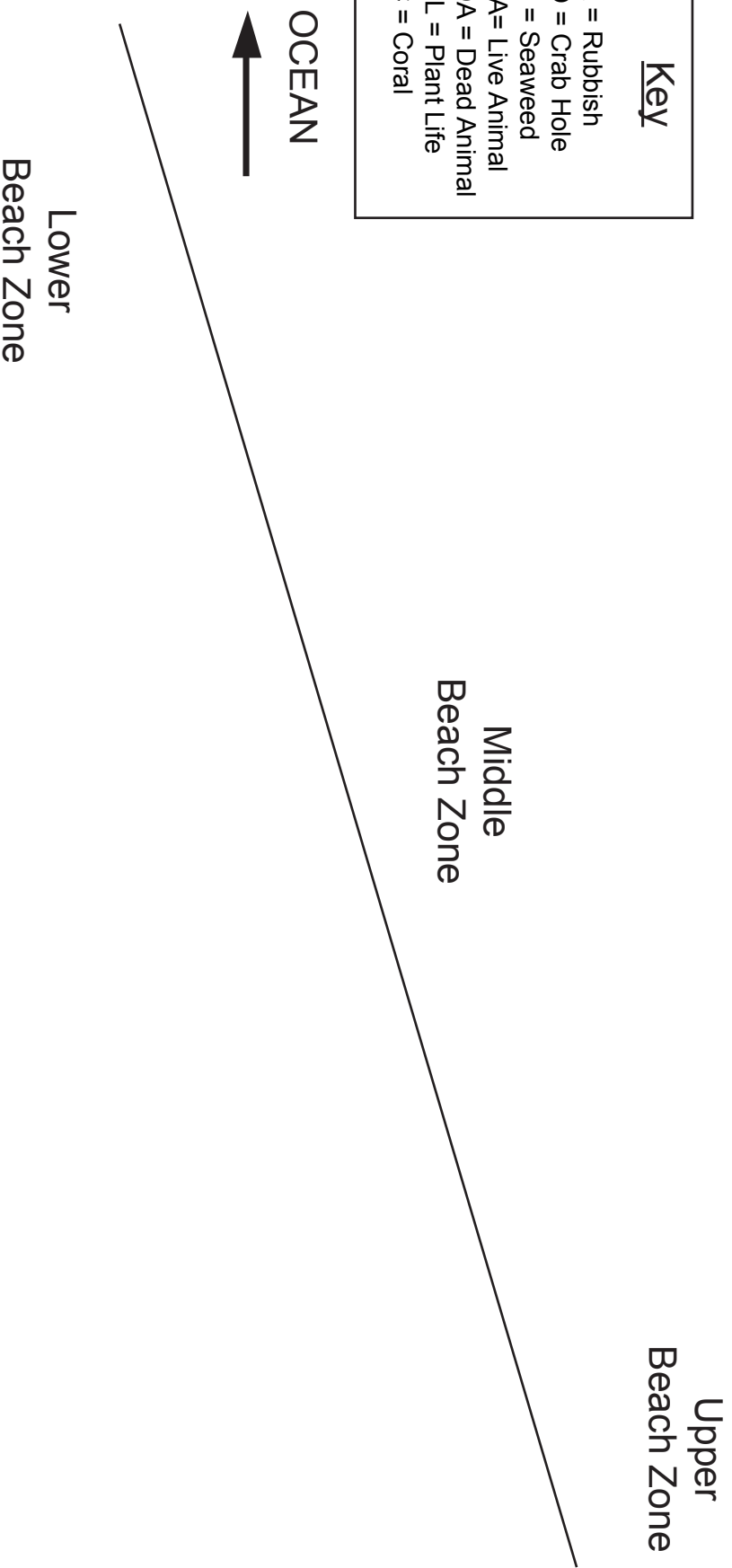
LESSON 4 Transect Line Map

Group Members: _____

- Directions:**
1. Lay a rope along the area to be studied, beginning at the top of the beach, running through the middle and down toward the bottom portion of the beach.
 2. Walk along the transect line.

Start at the top, and look for the plants and animals you find within one foot to the left, or right of the line.
Use the following key to note what you find.

Key	
X	= Rubbish
O	= Crab Hole
S	= Seaweed
LA	= Live Animal
DA	= Dead Animal
PL	= Plant Life
C	= Corral



Page 2 – Transect Line Map

Now that you have recorded what items and where you found them on the beach, spend some time classifying the items.

Directions: In the chart below, write the item type across the top of the chart, and then list the number of each item type that you found in the zones. Then total the number of each item type along the bottom. Use tally marks, i.e. IIII.

Chart

Item Type:	Crab holes	Plants											
Upper													
Middle													
Lower													
Total													

