
ACTIVITY

2

WATER, WATER EVERYWHERE *CLASSIFYING DIFFERENT KINDS OF AQUATIC HABITATS.*

SCIENTIFIC SKILLS:

- classifying

CONCEPTS:

- Characteristics observed about a thing allow you to find its name and to place it in a system that groups similar things.
- An introduction to aquatic habitats.

MATH AND MECHANICAL SKILLS PRACTICED:

- following a flow chart
- using a key

SAMPLE OBJECTIVES:

- students will be able to classify different kinds of aquatic habitats.
- students will use a flow chart and/or a scientific key.

INTRODUCTION:

This activity introduces students to classification of habitats by using physical characteristics. This allows students to discover for themselves the different kinds of places that marine organisms live rather than sitting and listening to an aquatic lecture. Students use a FLOW CHART to visualize the process of classification. At each step they must choose between two characters in order to proceed to the next step. They may also use a scientific KEY to identify aquatic habitats. Students will learn about these habitats as they do the exercise.

MATERIALS:

- blow-up of habitat flow chart on blackboard or bulletin board
- duplicates of habitat cards (1 per student) (may use line drawings or may add photographs of appropriate aquatic habitats from magazines)
- copies of flow charts and keys for students

Optional:

- salt water made with 35 gm (3 tbs.) table salt per liter (quart) water
- tap water for fresh water
- mix of tap water and salt water for brackish water
- small disposable paper cups for each child

INFORMATION:

When humans group and name things, they are CLASSIFYING them. Things that are classified are first named and then placed in larger groups of things that share similar characteristics. For example, many kinds of tables are lumped under the term "table", as are many kinds of chairs under "chairs". Both tables and chairs belong to a larger category, furniture. The inclusion in ever-larger groups results in a hierarchical organization of groups.

Why bother with classifying things? Classification requires that we look for relationships among things which enhance our understanding of their functions and characters. Also, knowing that something belongs to a certain group means that you know something about it if you are familiar with the characteristics of the group.

LESSON PLAN

BEFORE CLASS:

Read the exercise and plan which parts you will do. Make habitat cards. You may just duplicate the cards at the end of this section. For nicer cards, glue them to one side of stiff paper and add pictures of the same habitat to the reverse side. Ask parents to donate magazines like *National Geographic*. Aides or students may cut out pictures. Laminate the cards to last for years. You might not find pictures of all of the habitats - it's OK to leave some out. Make duplicates of the most common ones. Duplicate the flow chart and key.

DURING CLASS:

METHODS:

Begin by asking if the students know what the word HABITAT means. It is the place where a plant or animal normally lives and is usually characterized by a dominant plant or a set of physical characters. Can they name any AQUATIC places (water habitats) where plants and animals live? Write their suggestions on the board. Can they tell you what kind of water each has?

Make sure that they know the terms SALT WATER, FRESH WATER and BRACKISH WATER. Salt water has the salinity of the oceans, fresh water has little or no salt (you cannot taste any) and brackish water is a mix of salty ocean water and fresh water so it tastes less salty than the ocean. If you would like, you can have your students taste samples of each. A sip of salty water made with table salt will not hurt though it does taste bad. To make your point about brackish water, mix the fresh water with the salt water while they watch.

Now each student is going to become a mystery aquatic habitat. Each will discover what he/she is by following a CLASSIFICATION system that divides habitats up by their CHARACTERISTICS. Students will know what their characteristics or traits are from cards that tell them what they are like.

Explain that when identifying things using a system of classification, one starts with the biggest category and begins to work down small groups. Here the first category is aquatic habitats, and the characteristic they have in common is that they all are in water. Use the flow chart on the board and have a student read one card aloud to demonstrate that at each stage, they must make a choice between two things until they come to a group in which all the things have the same characters and cannot be divided further. This is their aquatic habitat.

Pass out the cards and give all time to read them. Would they like to make a guess about what kind of habitat they are? Have them write their guess. Distribute flow charts and let them work until they have identified themselves. Trade cards for more practice until they have seen each one.

The key is harder to use. With younger children you may delete it. With older children you

may repeat the same process of one demonstration followed by independent work that you used for the flow chart.

RESULTS:

Check results of following the flow chart or keying habitats out by comparing answers with the teacher's answers provided.

CONCLUSIONS:

Have the class make a list of the important characteristics used in this exercise to classify aquatic environments. These are some of them:

- salt or fresh water
 - flowing or still water
 - tides or currents or waves
 - shallow or deep
 - sandy, rocky or muddy bottom
 - plants submerged or sticking out of the water
 - near shore or away from land.
-

USING YOUR CLASSROOM AQUARIUM:

Discuss with your students the following questions:

- Which aquatic habitat most resembles your classroom aquarium?
- Does it have fresh or salt water?
- What kind of bottom does it have?
- Does the water flow or stand still?

Try keying it out. The gravel on the bottom might be a problem.

EXTENSIONS:

1. One way for students to test their own knowledge of aquatic habitats following this activity is to have the pictures of water habitats mounted on cards with a string long enough to hang behind the students' backs. The name of the habitat should be written on each card. Students must find out what kind of water habitat they are by asking other students yes/no questions about themselves.
2. Have each student write several paragraphs about how it would feel to be an animal that lived in his/her aquatic habitat. Include a discussion of some of the problems each would face in making a living. Make sure the student has a picture of the habitat to help with writing.
3. On a map of your state, help your students locate the aquatic habitats they may have seen locally. While landlocked states are limited to freshwater habitats or salt lakes, states like Florida have almost everything but kelp forests. A U.S. map with markings for depth in the ocean would help you locate the saltwater habitats.
4. Research naming in other societies. Different cultures use different degrees of refinement when they create categories of names. This degree of detail in naming is frequently based on the importance of the items in their culture. For example: the South American cowboys, gauchos, have some two hundred different words or names for horse colors, but divide all plants into only four categories depending on their use in ranching.

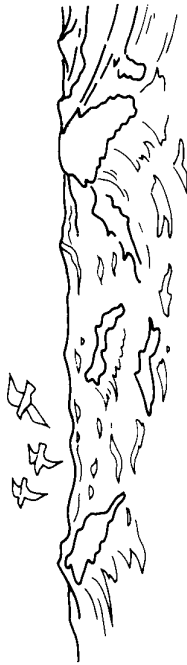
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5. Compare common names and their local origins with scientific names. Scientists use a formal classification system in giving names to plants and animals which gives each kind of plant or animal a name consisting of two words which is unique to that species. An animal's scientific name is the same anywhere in the world. Since the scientific name is based on Latin and Greek words, most people give plants and animals a common name in their own language. Because these are arrived at informally, they vary from place to place and can be very confusing because the same animal may have several different common names.
6. To test student understanding of the principles governing classification and the construction of keys, have students classify groups of other things and make their own key. Creative choices of things might include keys to different groups of adventure toys, model collections or rock groups. Let them trade keys to test the quality of their work. There should be at least ten items in each key.
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CARD ANSWERS

1. OCEAN OR SEA
2. SANDY BEACH
3. ROCKY INTERTIDAL
4. CONTINENTAL SHELF
5. KELP FOREST
6. CORAL REEF
7. ESTUARY
8. SEA GRASS BED
9. SALT MARSH
10. MANGROVE SWAMP
11. RIVER
12. STREAM OR CREEK
13. LAKE
14. POND
15. FRESHWATER MARSH
16. SWAMP
17. BOG
18. SALT LAKE

AQUATIC HABITAT CARDS:

You have salt water and are a big body of water. When the wind blows, waves roll over your surface. During storms the waves get huge. Things on you are far from land.
YOU ARE an ocean



Your rocky shore is covered with seaweeds that live attached to the rocks. When the salt water is at low tide, the sun or snow or rain falls on your seaweeds and animals. Waves crash into you, so animals and plants have ways of clinging tightly to your rocks.

YOU ARE a rocky intertidal



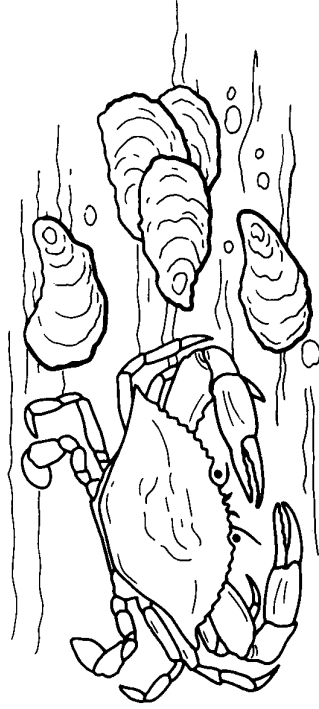
You have cold, salt water. You are found near rocky shores. Your plants and animals are always covered by your cold water. You have forests of seaweeds called kelp which hide hundreds of kinds of animals.

YOU ARE a kelp forest



Salt water mixes with fresh water from a river in your wide shallow waters. You have lots of food for fish and crabs in your open waters above your muddy bottom. You are a nursery for many ocean animals.

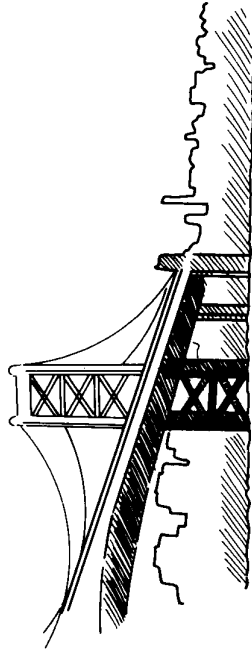
YOU ARE an estuary



AQUATIC HABITAT CARDS:

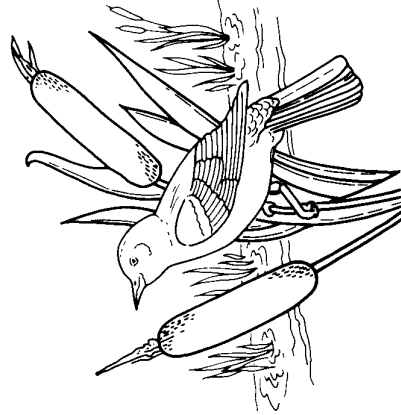
Your fresh water flows over a wide, muddy bottom. Big catfish lurk in your murky waters. Cities were located on you because in the old days you were the easiest place to travel. Barges are towed up and down you in many states even today.

YOU ARE a river



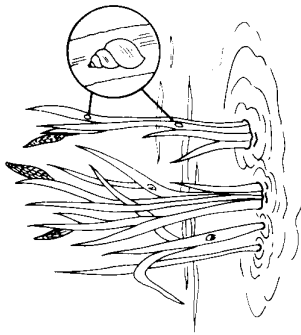
Grasses grow out of your still, fresh waters. Red-winged blackbirds build nests in the grasses. The air is filled with the calls of the male blackbirds.

YOU ARE freshwater marsh



Your brackish water is full of nutrients for the tall grasses that emerge along your shore. In the winter these grasses die, but each spring they come back from their strong roots. The decaying grass particles are food for crabs and oysters. The grasses protect the shore from storms.

YOU ARE a salt marsh



Your quiet, fresh waters are home to many fish which hide deep beneath your surface. Storms may make waves on your wide surface. Where winters are very cold, you may be covered with ice.

YOU ARE a lake



AQUATIC HABITAT CARDS:

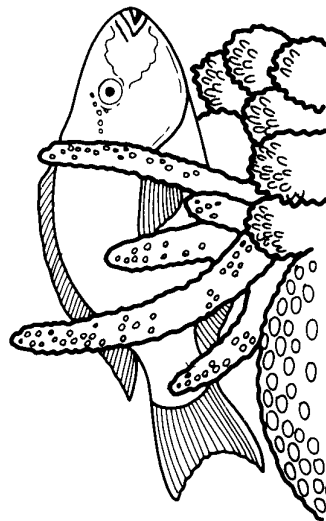
You have salt water that rises and falls with the tides. Sometimes the waves roll way up on your sand while at other times much of your sand is not covered with water. Children play on you. When a storm comes, your sand is moved all around.

YOU ARE a sandy beach



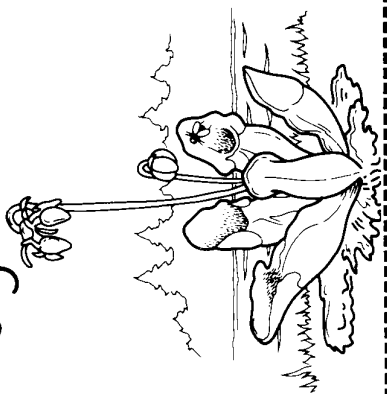
Your warm, salt water and rocky bottom provide the perfect place for animals called corals to grow. Their skeletons make a great place for fish to live. Because you are in a place that is warm all year-round, you are a tropical habitat. Tourists swim out from the beach to visit you.

YOU ARE a coral reef



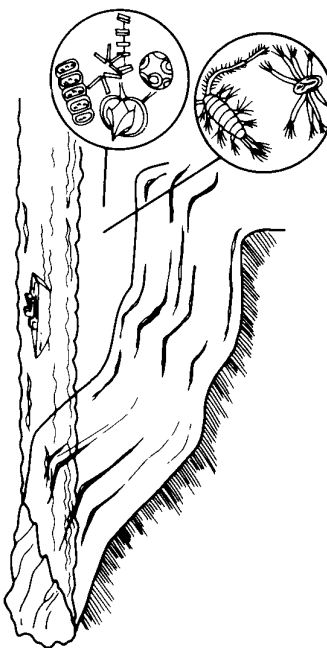
Bushes and mosses grow in your shallow, still water. Patches of very wet ground are home to pitcher plants which get their nutrients from the insects they catch in their leaves. Your water is fresh, but very acid.

YOU ARE a bog



Your sandy or muddy bottom is under salt water. In some places the water is deep, but you are along the shore. Animals burrow in your sand or mud. Your water is rich in tiny plants which provide food for many animals. Fishermen harvest your animals.

YOU ARE the continental shelf



AQUATIC HABITAT CARDS:

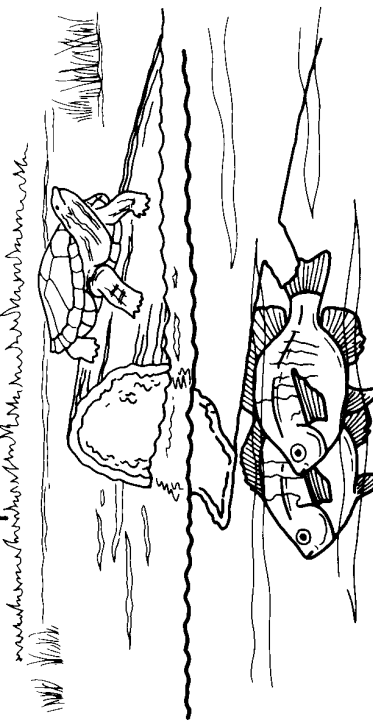
Short trees line the shores of your brackish or salt water. Their big roots hold the trees in the mud, even when hurricanes disturb your constant warm days. Many animals and plants find a home on your tree roots or in your waters. Because it is warm all year-round, you are said to be a tropical habitat.

YOU ARE a mangrove swamp



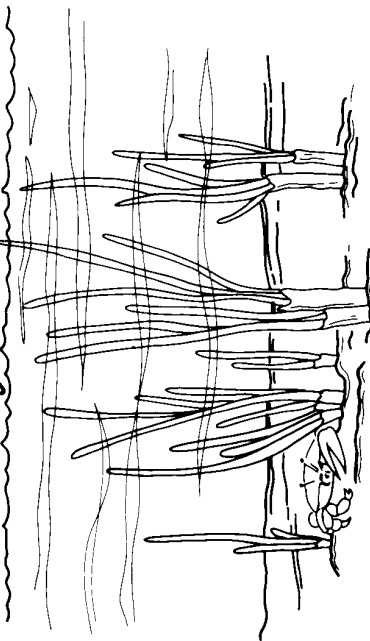
Sun shines through your shallow, open, fresh water, allowing underwater plants to grow on the bottom. Still and small, you may freeze solid where winters are cold. In the summer turtles bask on your shore and deer drink from you.

YOU ARE a pond



Underwater fields of plants grow in your shallow, brackish water or salt water. Many animals find food and shelter among the plants. The plants protect the nearby shore from erosion because they break the force of the waves.

YOU ARE a sea grass bed



Your fresh water tumbles down over rocks and through small pools where fish and crayfish hide. Your water comes from rain that runs off the land and from springs that bring underground water to the surface.

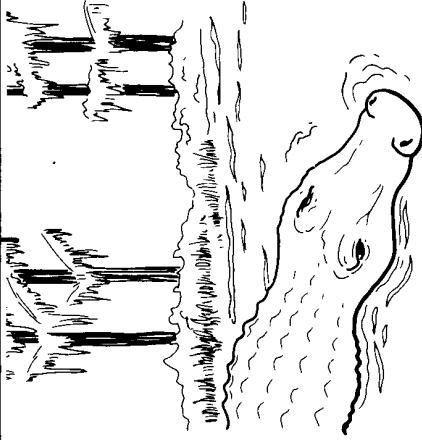
YOU ARE a stream or creek



AQUATIC HABITAT CARDS:

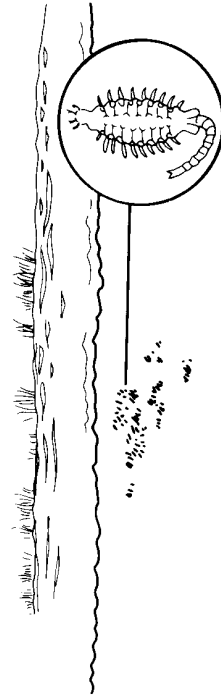
Tall trees stand in your quiet water. Freshwater turtles bask in a patch of sun while mosquitos buzz. It is very dark in the shade of the trees.

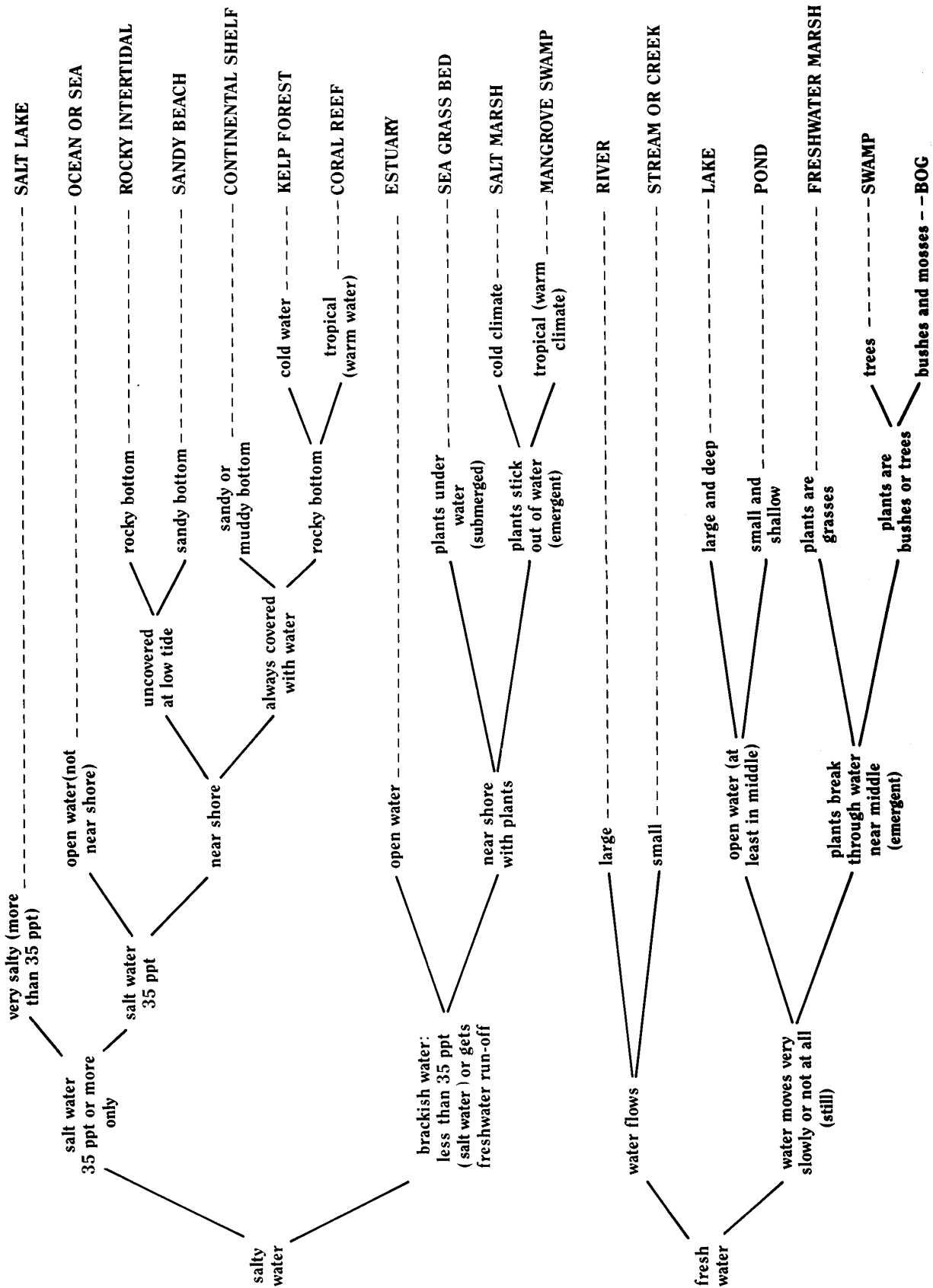
YOU ARE a swamp



Your water is very salty, saltier than the sea. Water flows into you, but there is no way for it to leave except by evaporation in the hot sun. You form in low areas in deserts.

YOU ARE a salt lake





WATER HABITATS

1. Water is salty	2
1. Water is fresh	12
2. Water is salt water (sea water) or saltier than sea water	3
2. Water is brackish, less salty than the sea	9
3. Water is saltier than sea water	SALT LAKE
3. Water is salt water, 35 ppt*	4
4. Open water, not near shore	OCEAN OR SEA
4. Near shore	5
5. Part uncovered at low tide	6
5. Always covered with water	
6. Sandy	SANDY BEACH
6. Rocky	ROCKY INTERTIDAL
7. Bottom of sand or mud	CONTINENTAL SHELF
7. Bottom hard and rocky	8
8. Cold water and cold winters (temperate)	KELP FOREST
8. Warm waters and warm climate yearround (tropical)	CORAL REEF
9. Open water	ESTUARY
9. Near or at shore with green, rooted plants	10
10. Plants are entirely under the water	SEA GRASS BED
10. Plants grow out of the water	11
11. Climate is cold during winter (temperate)	SALT MARSH
11. Climate stays warm all year (tropical)	MANGROVE SWAMP
12. Water flows in a definite bed.	13
12. Water appears not to move at all unless windy	14
13. Large, flowing over muddy bottom	RIVER
13. Small, flowing over sandy or rocky bottom	STREAM OR CREEK
14. Has open water although shores with plants are around it	15
14. Plants grow out of the water all over	16
15. Large and deep; plants grow under water only near shore	LAKE
15. Small and shallow; plants grow under water everywhere	POND
16. Plants are grasses	FRESHWATER MARSH
16. Plants have woody branches; they are trees or bushes	17
17. Plants are trees with definite trunk	SWAMP
17. Plants are bushes; moss grows on ground	BOG

*35 ppt is a way of expressing how salty the water is in the ocean or other saltwater habitats; if you had one kilogram of sea water, 35 grams of the weight would be salt.

