SEASHORE CHARADES
A SLIDE SCRIPT

SLIDE #1
The Rocky Seashore

The rocky seashore is where the sea meets the shore. It is THE home and neighborhood or "habitat" for many interesting plants and animals. A habitat is a special place with shelter, food, and water for the plants and animals that live there.

SLIDE #2
Waves Crashing

If you live at the rocky seashore you must be able to survive the crash of as many as 8,000 waves every day. These waves bring water full of oxygen and food to the animals that live there, but are also very dangerous. Animals need to be able to hold tight to the rocks, hide in cracks and crevices, fly or run away to keep from getting swept out to sea by the crashing waves.

SLIDE #3
High Tide/Low Tide Chart

All the time that waves are crashing on the edge of the rocky seashore, the water of the ocean is rising slowly up towards the cliffs or ebbing back down towards the shore. This slow movement of water goes on all day and all night and is called the tidal cycle. When the water is high up on the shore covering most of the plants and animals it is high tide. When the water goes back to the ocean and the plants and animals are uncovered, it is low tide.

SLIDE #4
High Tide

When it is high tide most animals and plants are covered with water. Some animals such as sea stars and fish use the high tide as an opportunity to move up into the rocky seashore from deeper water or leave the tidepools where they have been hiding. Animals like turban snails and shore crabs cannot live under water for long periods of time. These animals live higher up on the shore where they are not underwater for very long.

SLIDE #5
Low Tide

About six hours later it will be low tide. Animals that need to be covered by water all the time live in tidepools where water stays even during very low tides. Other animals such as barnacles and mussels, which live on the exposed rocks, close up tightly to avoid losing any water during the low tide. The main problems affecting animals at low tide are the drying heat from the sun and birds that might discover and eat them

SLIDE #6
Camouflaged Fish
(coralline sculpin:
2 to 3 inches long)

Rocky Seashore animals need to have special adaptations to help them live there. An adaptation is something that helps a plant or animal to survive and be successful in its habitat. An adaptation could be the way an animal is shaped or the way it behaves. Each animal needs to be able to hang on tightly or hide when the waves crash, close up tightly to stay moist when the tide is low, find food, and keep from being eaten. What adaptations do you think this sculpin has that help it live at the rocky seashore? It is camouflaged to match the coralline algae it lives in, it sits on the bottom of the tidepool on long pectoral fins so the waves don't wash it out to sea, its small size allows it to hide in crevices and it sits motionless so predators don't see it. If you were a sculpin could you find a place to hide in the room where you would be camouflaged?

ACTION for Students
Select several students to be sculpins. Ask them to look at the colors of their own clothes and to swim to a part of the room where they will be camouflaged and it will be hard for others to see them. They can use their pectoral fins (hands) to hold onto the rock (wall, floor or desk) and they must remain motionless.

SLIDE #7
Acorn Barnacles
in the
High Tide Zone
(.5 to 3.5 inches tall)

Let's pretend we are taking a walk in the tidepools from the highest zone up by the cliffs down to the lowest zone that is almost always under water. The first animal we see is a barnacle. Barnacles live within the high tide zone-the area uncovered by water for the longest period of time each month. Barnacles start

out their lives as plankton. Plankton are animals and plants that are weak swimmers and float through the water pushed about by waves and currents. Most plankton are so small you need a microscope to get a good look at them. The tiny barnacles drift through the water riding on the waves and currents looking for a good place to live. When they've found the right spot on a rock or the shell of another animal or the skin of a whale, they cement themselves headfirst onto their new home. They build volcano-shaped shells around their bodies to protect themselves from predators and the drying effects of the sun. At low tide when most people see barnacles, this is what they look like. Closed up like this many people think they are not alive, but look what happens when the tide comes in.

SLIDE #8
Barnacles Feeding

When the tide is high a barnacle opens up its shell and pumps its long, beautiful, feathery legs to strain plankton out of the water. It kicks the tiny trapped bits of food down into its mouth at the bottom of its shell.

ACTION for Students
Ask a small student to act like a baby planktonic barnacle. Hold the "barnacle" up in the air and swing her/him (they're all hermaphrodites!) as if being tossed about by the waves. As the barnacle grows, it sinks and settles onto a rock. Help the barnacle lay on its back and "cement" its head to the rock (the top of a table or the floor). The barnacle can pretend to build its hard volcano shell. You can make a circle around the barnacles legs with your arms and this can be the shell.

High Tide
Have the student barnacle kick its legs in the air to imitate filter-feeding. Have another student or two (the tide) toss a jacket or sweater (plankton) to the feeding legs and see if the barnacle can catch them and drop the "food" down to its mouth.

Low Tide
Have the student barnacle take a mouthful of water with oxygen in it and close up tight by pulling in its feeding legs to its chest.

SLIDE #9

Purple Shore Crab
(2 to 3 inches across)

Let's go a little lower down into the tidepools. These shore crabs are related to hermit crabs, lobsters, shrimp, and barnacles, as well as insects like spiders, fleas, and ticks. They have a hard outer shell called an exoskeleton, which covers their entire body. In order to grow larger they need to shed their exoskeleton and grow a new one. Crabs have eight walking legs and two pincers, which they use to catch food and to protect themselves. These animals live in the mid-tide zone. They can remain out of water for quite a while, but must keep their gills wet so that they can breathe.

ACTION for Students
Have several students do the "crab walk," crawling on all fours with their bellies facing the ceiling. They must walk sideways, holding their stomachs flat. Crabs have flat bodies that allow them to hide under rocks and wedge themselves in crevices.

High Tide
Students scurry about sideways scavenging for bits of food with their pincers.

Low Tide
The teacher becomes a powerful wave or a gull predator. The crabs run fast to escape before they are smashed against a rock or eaten. They hide under rocks (desks) and hold on with their legs.

SLIDE #10
Hermit Crab
(0.5-1 inch long)

Unlike true crabs, these hermit crabs are only partially protected by a hard exoskeleton. Their walking legs, claws and head have a protective exoskeleton, but their rear end (abdomen) is soft and vulnerable so they need to borrow a shell for protection. They live in empty shells that were originally made and inhabited by sea snails. When the snails die, the hermit crabs take over their shells.

ACTION for Students
Have two students make a snail shell. They face each other holding hands to make a hoop, the opening of the shell. Have another student act as a crab,

backing its soft bottom into the shell. Its head and pincers (hands) stick out through the opening of the shell.

High Tide
The hermit crab drags its shell around scavenging food and growing bigger. Like other crabs, hermit crabs are scavengers and at high tide will eat just about anything that they can find.

Low Tide
Hermit crabs scurry quickly to hide in crevices or tidepools until the tide returns. They use one of their large front pincers to close the opening of their shell.

Second High Tide
Add a second hermit crab in a larger shell (three more students). The first hermit crab has grown, but its shell hasn't, so it needs a new home. It can check out the shell of the other crab. Crabs can box or joust with one another. The second crab sees it is losing, leaves its shell and goes to hide from predators under a rock. The first hermit crab leaves its shell, backs happily into the vacant one and carries it off. The second crab can now come out from hiding, squeeze into the smaller shell, and carry it off looking for yet another hermit crab to fight and swap shells.

SLIDE #11
Giant Green Sea Anemone
(3 to 6 inches across)

These giant green sea anemones are animals that look very much like flowering plants. They live attached to a rock in the mid-zone, and have tentacles that sting their prey and pull it into their mouth when the prey comes too close. Each tentacle has a little dart gun in its tip that fires a tiny poison stinger into whatever touches it. (In the United States, as in most places, there are no tidepool anemones that are harmful to people.) The tentacles surround the mouth which opens directly into their stomachs.

ACTION for Students

High Tide
Have half the class become anemones. They are stuck to a rock and wave their stinging tentacles (outstretched arms with thumbs and forefingers cocked like a dart gun) in the water when the tide is high. Other students can act like fish or tidepool shrimp swimming by, or crabs doing the crab walk. When one of the prey gets within reach, have the anemones capture them with their stinging

tentacles. The anemone pulls the prey into its mouth, closes up tightly, digests the animals and spits out the shells, opening up again for its next victim.

Low Tide
Have the sea anemones take a mouthful of imaginary water, close up their tentacles by folding their arms over their head and crouching down. At low tide they need to close up tightly to trap water in their bodies to keep from drying out in the hot sun. Some anemones are able to stick light colored rocks and shells on the outside of their body to reflect the hot sunlight. Have students reach out and pretend to place shells and rocks around their bodies.

SLIDE #12
Lined Chiton
(1 inch long)

Chitons are related to snails, clams, and even squid and octopus. Most chitons eat algae and detritus (small pieces of dead plant and animal material) that they scrape off rocks with their tongue-like radula. Chitons have a shell made up of eight overlapping butterfly-shaped plates.

ACTION for Students
Have eight students line up, one behind the other close together with the tallest in the middle and the shortest in the back and the front. Have them bend at their waist over the back of the person in front of them, sticking their elbows out, and placing hands on their own hips.

High Tide
The first person in line determines where the chiton goes. Have the chiton slowly walk forward without pulling the plates apart. Their eight plates allow them to be flexible and to fit tightly against the irregularly shaped rocks they are grazing on. Have students attempt to move over a rock (chair) while staying in formation.

Low Tide
Chitons have a very strong muscular foot to help them clamp down on their rock with tremendous force when the tide is low. This helps them to retain moisture, keep from getting ripped off the rock by waves, and offers protection from being eaten. Have the student chiton clamp down on a rock by crouching low to the ground and dropping to their knees while staying in their formation.

SLIDE #13
California Mussels

(2 to 4 inches long)

Mussels have two shells like clams, oysters, and scallops. Animals with two shells are called bivalves. Mussels don't have a foot adapted for hanging on like a chiton or for digging in sand or mud like a clam. Instead, these animals use their foot to attach threads from their body to a rock with one of the strongest glues in the world. These threads allow the mussels to stay attached to the rocks even in the strongest waves. Mussels can often be found in large groups called mussel beds. They eat by opening their shells and filtering microscopic plankton out of the water with their gills.

ACTION for Students
Turn two students into a mussel. One is the shell. The shell stands with arms out; each arm is one of the bivalve shells. Use strips of masking tape as byssal threads to anchor the shell's feet to the floor. The second student is the soft body of the mussel inside the shell (between the arms of the first student).

High Tide
The mussel opens its shell, while the soft body uses its fingers like gills to grab tiny plankton and oxygen out of the water.

Low Tide
The mussel shuts its shells tightly around the soft body to keep from drying out in the sun or from being eaten by a predator like the one in the next two slides! (Keep the student mussel on stage.)

SLIDE #14
Bat Star
(3 to 5 inches across)

This colorful bat star, a type of sea star, is holding on tight to keep from being washed away by the waves. It is related to sea urchins, sand dollars, and sea cucumbers.

SLIDE #15
Ochre Sea Star
(5 to 7 inches across)

Most sea stars, like this ochre star, have five arms or rays, and suction-cup-like tube feet for holding on tight, moving around and capturing food. The mouth of the sea star is in the middle of the underside of the star. To eat, sea stars push their stomach out through their mouth and digest their food outside of their bodies. They then pull their stomach back into their body. Though they live in the low zone, their primary source of food is mussels from the mid-zone. At high tide, sea stars travel up to the mussel beds to feed and then follow the tide down to the low zone. Sea stars also have amazing powers of regeneration and can grow back new arms if one is lost.

ACTION for Students
Have two students stand close together front to back with their arms outstretched at different angles. Each of their four arms is an arm, or ray, of the star, and the head of the student in front is the fifth arm. Have the student in front put a sweater under her/his shirt-this is its stomach. Now have the star use its hundreds of tube feet to hold on tight to a rock (desk or wall).

High Tide
It's lunch time for the sea star! The sea star moves slowly on its tube feet toward the mussel, which is fixed onto its rock. The mussel is open and filter feeding. The star wraps two of its arms around the mussel. As soon as the mussel feels the star, it snaps shut tight. Two of the sea star arms try to pry the shells open slightly. When the arms tire, two fresh arms take over. Finally, the mussel opens just a crack, and the sweater "stomach" is taken out of the "mouth" and put between the shells and over the soft mussel within. The inner soft body of the mussel is then digested (in the comfort of its own home). The soft body student leaves and the shell opens up. The star pulls its now full stomach back in through its mouth (under its shirt).

SLIDE #16
Western Gull
(21 inches long,
55 inch wingspan)

Low Tide
As the tide ebbs out the sea star retreats to the low zone, since it cannot tolerate the drying of the sun, and finds a rock to grab onto. All that is left of the mussel is an empty, open shell, still attached to the rock (with no one home, since the sea star came to visit for lunch!). Have the student sea star stay on stage.

Gulls are everywhere. They visit all marine habitats and many inland habitats. Do you ever see gulls at your school? These western gulls often come to the rocky seashore to scavenge or hunt for a meal. They eat practically everything, including sea stars and bologna sandwiches.

ACTION for Students
Have a student become a gull. It can fly to the rocky seashore with its arms as wings, and "CAAAAAW, CAAAAAW" very loudly.

Low Tide
The gull lands in the tidepools and awkwardly waddles over to the sea star. If the sea star was unlucky enough to be caught out of water at low tide, the gull can peck at it with its very strong beak. It may even swallow small sea stars whole. The gull picks up mussels, clams and sea urchins in its beak, flies up over the seashore and drops them on the rocks. The shell of these animals breaks open and the gull swoops down and eats the soft insides.

High Tide
As the tide come in higher and higher, the gull walks up on the beach for a short nap, and then flies off circling the seashore several times before leaving to look for another meal over the open ocean.

SLIDE #17
Sea Palm
(8 to 10 inches tall)

The sea palm grows only in the low zone where the waves are the strongest. This is only one of the many kinds of seaweed at the rocky seashore. Large brown seaweeds like this are called kelp. Sea palms are related to the fastest growing plant in the world, the giant kelp that lives in kelp forests.

ACTION for Students
Have one student stand with their arms extended out to their sides. Their torso represents the rubbery, flexible stalk called the "stipe," which is much like the stem of a land plant. It survives the wave shock by bending without breaking. Their arms are the leaf-like blades of the plant. Have another student hold the feet of the first student to represent the "holdfast" that attaches this seaweed to the rocks. The teacher can act as a wave that washes

over the sea palm, bending them from left to right while their "holdfast" keeps them from being washed off the rocks.

SLIDE #18
Octopus
(3 to 4 inches long)

The tiny red octopus is sometimes found within the lowest zones of the rocky seashore. Lacking the hard shell of most of its relatives (mussels, clams, etc.), these intelligent animals use camouflage as their means of protection from predators. They use a poison bite and their eight handy tentacles or arms to eat hermit crabs, other small crabs, and small fishes. An octopus usually occupies a lair or hole within the rocks with a pile of bones and shells outside as evidence of the prey that it has eaten.

ACTION for Students
Have one student stand to represent the head and body of the octopus. The eyes of the octopus are at the student's feet. Have four other students sit in a circle with their backs against the octopus and their legs extended to represent the eight arms of the octopus.

High Tide
With the head and body directing, have the octopus move slowly around. Using the suction cups on their tentacles they can pick up an object and take it to its "lair" under a nearby desk. Perhaps one of your student crabs can come back up to be caught and eaten by the octopus.

Low Tide
The octopus needs the protection of a watery home and must hide within a crevice or hole when the tide is low.

SLIDE #19
Bucket Brigade

Remember, when you go to the rocky seashore put all plants and animals back where you found them. Each one is adapted to specific homes and zones within their rocky seashore habitat. When you turn a rock over, do it gently, being careful not to crush any animal living under or beside it. Be sure to turn the rocks back over because most of the animals and plants living under the rocks will not be able to survive exposed to the sun and waves. State Fish and Game laws protect most of these animals all year round. Without a special

permit it is illegal to take any of them out of their rocky seashore home.

SLIDE #20
Children Visiting
Tidepools

If you visit the rocky seashore please remember to be kind and gentle with the plants and animals that live there. They are adapted to survive the changing tide and the crashing waves, but they aren't adapted to survive rough treatment by people. When you go, always go with a buddy, since the crashing waves and slippery rocks can make the rocky shore a dangerous place. Now that you have met some of the interesting plants and animals that live at the rocky seashore, you can teach other people about this special place.