Exploring the Depths: Teaching Skills Across the Curriculum With Ocean Creatures

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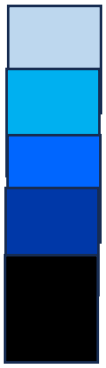
The Layers of the Ocean- A General Overview

- Sunlight Zone: From sea level to about 650 feet. This layer has the most sunlight penetration, and a wide variety of sea life, such as algae, plankton, krill, tuna, lionfish, dolphins, sharks, rays, sea turtles, pufferfish, corals, oysters, and most ocean fish.
- Twilight Zone: From 650 ft to about 3,200 feet. Lower levels of sunlight are here, so we begin to see bioluminescent creatures. Sea life includes hatchet fish, cuttlefish, swordfish, octopus, squid, lantern fish, deep sea sharks, eels, jellyfish, and some whales.
- Midnight Zone: From 3,200 feet to about 13,000 feet. Absolute darkness here, and food is scarce. Most creatures have no scales. They lie in wait to ambush prey instead of pursuing it. Or, they eat "marine snow" (bits of uneaten food sinking down from upper layers). Sea life includes sperm whales, angler fish, blob fish, dragon fish, mussels, vampire squid, deep sea jellyfish, bristlemouths, and dumbo octopus. Many of the creatures here are mostly water, are red or black because of no light, have big eyes to see better in the darkness, have bioluminescence to attract prey, and have bodies that withstand high pressure.
- Abyss Zone: From 13,000 feet to about 20,000 feet. No light at all, and extreme pressure. Sea life includes sea spiders, tripod fish, gulper eel, deep sea angler fish, viperfish, giant tube worms, tiny squid, sea stars, and basket stars.
- Trenches Zone: From about 20,000 feet to 37,797 feet (the depth of the Mariana Trench in Japan- the deepest part of the world's oceans). Consists of underwater valleys and geothermal vents. Sea creatures here include starfish, giant tube worms, snailfish, sea cucumber, giant squid, Mariana Trench shrimp, grenadiers, pearlfish, cusk-eels, and cutthroat eels. There are probably still unknown species yet to be discovered.

Activity: DIY Ocean Layers

What You Need:



- Clear or pale blue plastic wrap (or butcher paper to represent the Sunlight Zone)
- Turquoise blue plastic wrap (or butcher paper, for the Twilight Zone)
- Royal blue plastic wrap (or butcher paper, for the Midnight Zone)
- Dark blue plastic wrap (or butcher paper, for the Abyss Zone)
- Black plastic wrap (or butcher paper, for the Trenches Zone)

What to Do:

- Do this as a group project. If using butcher paper, ask 2-4 children to work together to make an ocean layer, with its corresponding color. You'll have 5 groups of children, with each group working on one layer. Provide each group with a sheet of butcher paper in their color, and invite them to work together to crunch up their sheet, and then stretch it back out, still keeping the texture. When all groups are finished, invite each group in turn, starting with the Trenches layer, to lay their sheet one on top of the next, until you have all five layers represented. Ask each table group member to draw and color a sea creature that lives in their layer (or you can provide cutouts and labels beforehand), and add it to the layer they made. When everyone has added sea life to the ocean layers, invite children to observe their completed ocean model and share about it.
- If using plastic wrap (colored plastic wrap, in both rolls as well as sheets, can be found at www.amazon.com), children may wish to work in pairs or individually to lightly crunch up their ocean layers. As before, add their ocean creatures to each layer. Observing from the top (Sunlight layer) down to The Trenches, what can they see?
- Try This! On a bulletin board or wall space, attach your butcher paper sheets, overlapping a bit, to form the ocean layers. Draw, color, and label creatures for each level.

Resources: DIY Ocean Layers, to explore how to use various liquids to make layers of the ocean in a jar.

https://www.learningresources.com/blog/diy-ocean-layers/

https://littlebinsforlittlehands.com/layers-of-the-ocean/

The Fascinating Ocean Book for Kids: 500 Incredible Facts! (Bethanie Hestermann)
The Deep End: Real Facts About the Ocean (Drew Sheneman)
The Beginner's Bible: Timeless Children's Stories (Creation Story, Genesis 1, Karyn Henley)
68 Bible Verses About Deep Into the Ocean

https://www.openbible.info/topics/deep_into_the_ocean

Little Lives: Explain to Kids: The Ocean

https://blog.littlelives.com/explain-to-kids-the-ocean-97adcf2ba224

Sciencerific: (The Five Layers of the Ocean)

https://www.youtube.com/watch?v=1ArwPfNgSKE

Layers of the Ocean: Learn About the Ocean (EZA Homeschool Academy):

https://www.youtube.com/watch?v=iDOh3SIjNuI

Sunlight Zone

Loggerhead Sea Turtles

- Attributes: They are reptiles, weighing about 250 lbs., and are 36 inches long. They are the most common species of sea turtles.
- Behaviors: They are carnivores. Their front flippers propel them through the water and their back legs help to steer them.
- Life Cycle: They return to the exact spot where they were born to lay eggs. They do this by using the Earth's invisible magnetic field to guide them at sea as they return to the beaches where they were born. Each stretch of coastline has its own magnetic signature, which turtles remember and use as guides.

Activity: A Non-Techy Coding Game: Help the Loggerhead Return to its Birthplace

What You Need:

- A volunteer to be the loggerhead turtle. You could give the child a turtle hat or mask to identify them as the turtle, if you'd like.
- A sheet of brown butcher paper to act as the "beach", with an "X" marked on it.
- A sheet of chart paper and a marker, to write the instructions children give for the turtle.

What to Do:

- Lay the butcher paper, marked with a big "X", at one end of your room.
- Place another "X" for the starting spot, where your turtle will begin their journey.
- Ask children to suggest instructions, one step at a time, for the turtle to reach the "X" on the beach. Use numbers to 5 when giving instructions. These might include: Take two steps forward, three steps to the side, 1 step back, etc., from the starting point, until the turtle reaches the "X" of its birthplace. Write each step on the chart paper.
- Choose another child to be the turtle, or ask the first turtle to repeat the activity. Call out the instructions once again, following the chart, as the turtle navigates to the beach. Did it work a second time? Why or why not? Did you need to start over and change steps, or "debug" the program?
- Check out this resource, for more on this sea turtle activity and other fun coding activities: https://teachyourkidscode.com/coding-for-preschoolers/

Resources: https://www.nationalgeographic.com/animals/article/150115-loggerheads-sea-turtles-navigation-magnetic-field-science

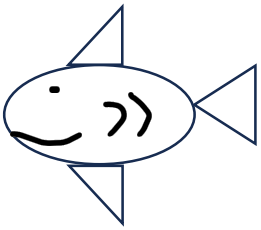
Ocean Fish

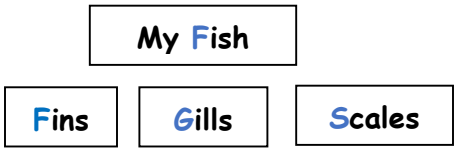
- Attributes: Ocean fish are vertebrates (have backbones) and can be found in both ocean waters as well as fresh water, all over the world. All fish are cold-blooded, live in water, breathe through gills, have swim bladders to keep them buoyant, and have fins for movement. There are about 18,000 different species of ocean fish!
- Behaviors: Ocean fish eat a diverse diet, depending on the species. Some are carnivores (they eat other fish, squid, crustaceans, etc.) and some are herbivores (they eat algae, seagrass, plankton, etc.).
- Life Cycle: Depending on the species, fish can live up to 100 years!

Activity: Create a Fish! (Parts of a Fish)

What You Need:

- A real (dead) fish, from your local grocery store
- Sanitary hand wipes, and/or 2 tubs of water: one of warm soapy water for washing, and one of warm water for rinsing. Provide also paper towels for drying hands.
- A sheet of blue construction paper, one per child
- An assortment of paper shapes to glue onto your paper, as parts of your unique fish you'll create. Try a large oval for the body, triangle shapes for the fins (dorsal and tail fin), and small circles for eyes. Or, children can draw those shapes, starting with a large oval for the body and triangle tail fin.
- Glue sticks
- Labels for the body parts (optional)
- Sticky dots, for scales





What to Do:

- Observe a real fish. Allow children to use their senses to see, touch, and smell the fish. Talk about the parts of a fish, and what children are noticing. What kind of fish is it? Trout? Tilapia? Where does this fish live, what does it eat? Which layer of the ocean would we find this fish? After observing/touching the fish, children must wash hands. Afterwards, utilize resources such as books, online videos, etc. to gain more information. Also, point out the wide diversity of fish in the ocean. Fish come in all colors, patterns, shapes, and sizes!
- Using our knowledge of the parts of a fish, and the diversity and uniqueness of fish, invite children to create their own fish. They could name their fish, use colors of their choice, create a story about their fish, talk about where it lives and what it eats, etc.
- Provide a sheet of construction paper, a variety of paper shapes, glue sticks and markers. Provide also sticky dots cut in half (or not) to overlap on their fish to represent scales.

As children work, make sure they include all parts of their fish, in the appropriate places. For kindergarten, provide labels they read and attach by parts of their fish.
- When children are finished, invite them to share their creation with the group, and talk about it.

Resources: 5 Characteristics That All Fish Have in Common: https://sciencing.com/fish-homeostasis-different-water-temperatures-7433473.html

Sea Horses

- Attributes: Sea Horses are small fish, living in the ocean near the shore. They have big eyes that can each look in a different direction. They have gills, a long snout, and hard plates over their body. They have one fin behind their back, and two fins behind their head.
- Behaviors: Sea Horses spend most of their lives in one place. They aren't great swimmers, and secure themselves to plants and coral by wrapping their tail around it (so they don't get washed away by the current). They can camouflage themselves for protection.
- Life Cycle: Sea Horses can live for 1-5 years. The mother lays the eggs, and gives them to the father to protect in his pouch until they hatch. The mother lays up to 2,000 eggs at a time, and the father stores them for 10-25 days until they hatch.

Activity: How Many Sea Horse "Eggs" Can We Fit in the Seahorse Pouch?

What You Need:

- A supply of pom poms (or a variety of loose parts you have on hand)
- A "sea horse pouch": This could be a Ziploc baggie (your choice of size), or another type of bag or pouch.

What to Do:

- Ask children to estimate how many pom poms we could fit in our "sea horse pouch". Could we actually fit 2,000 pom pom "sea horse eggs"?
- Count together as we fit pom poms in our "pouch". How many fit inside? Try various sizes of baggies or pouches. Try different objects. Is the number going to be different? Is our number less than 2,000? What are we noticing? Is it possible to try a pouch that stretches (unlike a Ziploc baggie), and would that help us to fit more inside?

Resources: *Oceans Alive: Sea Horses* (Ann Herriges)

More Sunlight Zone Ideas: Some dolphins have been observed using a sponge to dig up prey (see resource below). Activity Idea: Could we use a sponge to move things around, dig for

"prey"? See link below. Also, dolphins jump high out of the water. Possibly, it's a way of shaking off any parasites. What if we pretend we are dolphins, and attach a few loose parts (with tape) to our "dolphin bodies"? We'll pretend those are the "parasites". If we jump really high, will some of them fall off? (We hope so!) Dolphins also jump because it's fun! Let's have fun like dolphins, and see how high and how many times we can jump!

https://ocean.si.edu/ocean-life/marine-mammals/sponge-wielding-bottlenose-dolphin#:~:text=A%20female%20bottlenose%20dolphin%20(Tursiops,daughters%2C%20but%20not%20their%20sons

Twilight Zone

Octopus

- Attributes: Octopi have eight arms, one beak, two eyes, and three hearts. They have no bones so they can squeeze in tight places. There are more than 300 different kinds of octopi, including the dumbo octopus with earlike fins.
- Behaviors: Octopi have strong suction cup arms that they can use to catch dinner, build a den of rocks, or make a rock door to keep other animals out, and to stay safe. They can modify their appearance, by changing their skin color or patterns. The mimic octopus can make itself look like another animal (such as a sea snake, lionfish, or flatfish) to fool predators. Octopi are carnivores that eat clams, fish, shrimp, etc. Octopi have been observed using tools, remembering locations, opening jar lids, and solving puzzles. Octopi have been known to hunt with other fish, and "direct them". If they stop moving, the octopus "punches" them to keep them involved in the hunt!
- Life Cycle: Octopi can live from 6 months to 5 years. The mother lays the eggs, then protects them until they hatch (months, or even years, for the deep sea variety).

Activity: Suction Cup "Octopus Arms"

What You Need:

- A large suction cup, two per child
- A variety of suction cup toys, for free exploration (see www.amazon.com for ideas)
- A variety of small toys, and flat objects such as pattern blocks, Magnatiles, pieces of paper, etc.

What to Do:

- Talk about how our arms work, and how they are different from those of an octopus (e.g., we don't have suction cups underneath each arm, but octopi do). We use our fingers and

hands to move objects and pick them up, but octopi use their arms to do that, AND utilize their suction cups as well.

- Invite children to be "octopi" with "octopus arms". Give each child two suction cups (try ones that are at least 2 inches in diameter, without hooks). Holding each suction cup in one hand, ask children to try to pick up various objects with their suction cups. What's working? What's not? What observations and conclusions can we draw?
- Next, attach a few smaller suction cups to a small dowel or small, long piece of wood. Try picking up objects, holding your "octopus arm". Does having several smaller suction cups work better to pick up objects? Why or why not?
- For kindergarten, try making a chart of your findings. What did our "octopus arms" pick up? What did they not pick up? Does the weight of the objects make a difference?

More Ideas:

- If the octopus can move rocks to create a habitat, and create a rock door to keep predators out, could we use our strong "octopus arms" (or fingers) to pretend we are octopi and use manipulatives (or small rocks) to create a habitat like that? Try out your habitat with a small toy figure to represent your octopus. Does your habitat keep your octopus safe? Did you create a door for your structure that keeps other creatures out?
- The glowing sucker octopus has beads of light under each arm, to light their way. Could we create our own model of an octopus, attaching a transparent colored bead at the end of each arm? Then, what happens if we put it inside a dark box (or turn off the lights) and shine a flashlight on our octopus? What will we observe?

Resources: *Behold the Octopus!* (Suzanne Slade)

Swordfish

- Attributes: Swordfish are up to 15 feet long, and have no scales. There is only one species of swordfish, also called broadbill, since their bill is flat. Swordfish have no teeth, so they use their bill to catch and slash prey, swallowing it whole. Swordfish have dark skin on their backs with pale skin on their bellies, to protect themselves from predators. They are cold blooded, and have heat organs near their eyes to warm their eyes and brain. This helps them see as they hunt in cold waters.
- Behaviors: Swordfish are carnivores. They feed on squid, octopi, and fish. They like to jump above the water's surface, likely to remove any parasites (as the dolphin does). They can swim 60 MPH.
- Life Cycle: There are at least 6 different life cycle stages. Swordfish can lay between 1-30 million eggs at once!

Activity: Fishing With Swordfish Bills

What You Need:

- A paper towel tube, one per child
- A variety of small objects, toys, or other loose parts

What to Do:

- Talk about how the swordfish has a very long bill that it uses to spear its prey and swallow it whole. Brainstorm what we could use (something skinny and long), if we are pretending to be swordfish, to be our bill that we can use to spear and capture our prey. We could use a stick, small dowel, or even a paper towel tube (which we'll use for this activity since it's not sharp and has the added ability to capture and hold what we're picking up).
- Give each child a paper towel tube. They could wrap it in foil, or otherwise decorate it if they wish, leaving the top open. Ask children to gather a small amount of loose parts or toys that they think they could pick up with their paper towel tube. Invite them to capture their prey with the open end, drop it into their other hand (the swordfish's mouth), and pretend their hand has now eaten it. If they can't transport the object to their hand with the tube, invite them to try again or choose another object to pick up. Would they need to make any modifications to their tube? Or try something else to be an efficient swordfish bill? At the end, count how many things the swordfish ate!

Resources: *Swordfish* (Deborah Coldiron)

Eels

- Attributes: Eels have fins, gills, sharp teeth, and a backbone. They are nocturnal. They can't see or hear well, but they do have a strong sense of smell that they use to find food. There are over 800 species of the eel!
- Behaviors: They are carnivores, and eat fish, octopus, crabs, mollusks, and squid.
- Life Cycle: They can travel 4,000 miles to breed. They lay eggs in the open ocean. It takes 3 years for larvae to become adults.

Activity: Can You Smell as Well as an Eel?

What You Need:

- A variety of objects that have an easily identifiable smell to us (such as vanilla, perfume, etc.)
- A blindfold

What to Do:

- Invite a child to use a blindfold for this activity (or they can close/cover their eyes). Ask the child to sit at a table, wearing their blindfold, as you place a smellable object on the table. Using their sense of smell, can they locate or point to where the object is located on the table? Or place two objects, apart from each other, and ask them to use their sense of smell to identify and find where the objects are.

Resources: *Eels* (Darla Duhaime)

More Twilight Zone Ideas: Here are some interesting facts about cuttlefish! Cuttlefish can imitate the shape and texture of objects around them. The Pharoah Cuttlefish can shape-shift itself to resemble a hermit crab, to scare off predators and get more food for itself. Cuttlefish are very intelligent. In one study, they could seemingly tell that a box with five shrimp contained more than a box with four shrimp, and appeared to be considering the quantities. Can children compare quantities of two sets of objects and choose the set with more, like the cuttlefish might?

Resources: https://www.treehugger.com/amazing-facts-about-strange-beautiful-cuttlefish-4864493

Midnight Zone

Anglerfish

Attributes: Over 200 different species; many live in the bottom of the ocean. They have a "fishing lure"-type rod above their mouth; their wide jaw and sharp teeth can expand to swallow prey twice their size. Females are much larger than the males.

Behaviors: Males attach to the females like a parasite. Anglerfish use their lure and bioluminescence to attract and eat invertebrates and fish.

Life Cycle: They live for up to 25 years.

Activity: Feed the Anglerfish!

What You Need:

- A small flashlight or glowsticks for each child
- A small dowel, one per child
- A variety of loose parts and materials: streamers, tape, small objects, string, yarn, etc.

What to Do: (Version One)

- Ask children to hold a small flashlight in their hand. The flashlight provides the light, and your arm holding it is your "fishing rod". You could also invite children to hold a glowstick, and use that as their light for their lure. Dim the classroom lights. Like the anglerfish, stand in one spot and experiment with moving your light around. You can make patterns, zig zags, wiggly lines, etc. What type of light movement would work best to attract a fish?
- Play a game in a small group. Half of the group will be the anglerfish, and stand in one spot in the room. The other half will be the fish (prey) that can "swim" around. The anglerfish should wave their lights in a way that they think will attract the most fish. The "fish" may choose which anglerfish to go to, and which light patterns they like best. What worked best to attract the most fish?

What to Do: (Version Two)

- Provide each "anglerfish" with a dowel, tape, and misc. materials (see above list). Tape a string or yarn segment to the tip of the dowel, and attach your choice of materials to the end of the string or yarn. Wave your "lure". Does it hold together? If not, what could you do to solve the problem? What do you notice as you move your lure around?
- Play the same game as in the first version, but this time keep the lights on, and invite the anglerfish to wave their lures. The fish prey may "swim" to the one that is most interesting to them. Which lure worked best to attract the most fish? Why?

Blobfish

- Attributes: Blobfish have a very soft, squishy, gelatinous body (like Jell-o) that helps them float near the bottom of the ocean, in the deep water. Blobfish have no muscles or teeth. They look like a normal fish in the deep, but when they are brought to the water's surface, their body expands due to the lack of pressure, to look like a pink blob. They grow to up to 27 inches, and weigh up to 20 lbs.
- Behaviors: A blobfish may bury itself in the sand and wait for prey to come, or float along the ground and wait for prey to swim into its mouth. Since they have almost no muscles, they don't move much. They eat crustaceans, sea urchins, and sea feathers, which they swallow whole.
- Life Cycle: Little is known about their life expectancy or mating habits. They do lay eggs.

Activity: What does air pressure/water pressure do to our blobfish?

What You Need:

- A box of Jell-O
- A small bowl
- A tub of water
- A hairdryer, air pump (such as what you'd blow up balloons with), or fan

What to Do:

- Make Jell-O ahead of time, using less water than the recipe calls for, so the Jell-O is firmer. Use a silicone bowl as a Jell-O mold, or any small bowl that you've sprayed with cooking spray for easy release.
- Unmold your Jell-O "blobfish". Encourage children to use their senses to talk about their Jell-O blobfish. What are they noticing?
- Invite children to make predictions. What will happen if we submerge our Jell-O blobfish in a tub of water? Will it sink? Change shape? Dissolve, since it's Jell-O? How does the water pressure change the appearance of our blobfish?
- What if we unmold our Jell-O blobfish onto a plate, and blow air on it (from a fan, hairdryer, or balloon pump)? Does air pressure change the shape of our blobfish?
- Another Idea: Try using non-edible slime instead of the Jell-O. How does water or air pressure change the appearance? You might also try other materials, to test the affect of water pressure and air pressure.

Resources: Animal Fun Facts (Blobfish) https://www.animalfunfacts.net/perciformes/7-blobfish.html

Giant Squid

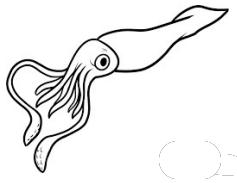
- Attributes: They grow to 40 feet (some are as large as busses), and have 10 inch eyes, as big as soccer balls or the human head. The eyes are unblinking (largest eyes of any known animal). These squid have back fins to help them steer, and have 8 arms (over 9 feet long), and 2 tentacles (33-40 feet) that lock together like a zipper to hold prey.
- Behaviors: A giant squid can squirt ink, to protect it from predators. They eat smaller squid, and hunt fish.
- Life Cycle: They lay eggs that are tiny, perhaps only 2 inches. Their life span is less than 5 years.

Activity: Giant Fun With the Giant Squid!

What You Need:

- A sheet of butcher paper (40 feet long), or sidewalk chalk to mark out and draw a 40 foot oval shape outside.
- 40 1-foot strands of yarn or string
- Two soccer balls

What to Do:



- Provide children with the 40 1-foot pieces of yarn or string. Ask them to start at one end of the blacktop or outside sidewalk area and lay their yarn pieces end to end until you've marked out a 40-foot length. Draw a large oval shape around that. You now have the beginnings of a 40-foot giant squid! Remove the yarn, and provide sidewalk chalk. Invite children to draw 2 tentacles, 8 arms, and the rest of the body, staying within the 40-foot space. They can color it if they like. Trace around the two soccer balls to form the giant eyes.
- After drawing your giant squid, see how many children could fit within the space. What other things could fit within the squid? Brainstorm other things that are smaller or larger than the squid. Compare and contrast that size with the size of a school bus. Inside the classroom, make a chart of things that are smaller than or bigger than the squid. How many things could you think of?
- Another Idea: Fill a tub halfway with water, and submerge a few small items in the tub. What do you see? Add dark blue food coloring to the water, as if your squid squirted ink to protect itself from the "predators". How does that affect what you're seeing now?
- One More Idea: Giant Squid have huge, unblinking eyes. How long can you go without blinking, like the Giant Squid? Estimate how long, and time yourself!

Resources: *Giant Squid* (Candace Fleming, Eric Rohmann)

More Midnight Zone Ideas: Mussels use one powerful foot to move around. Invite children to move around, using only one foot, like a mussel does! Can they sit on the ground, and use one foot to move themselves forward? Standing up, how do you propel yourself with one foot? How far can you travel with one foot?

Abyss Zone

Tripod Fish

- Attributes: Tripodfish can be up to 17 inches long. Their fins can be up to 3 feet long, due to bony rays that stick out below its tail fin and both pelvic fins.
- Behaviors: The fish perch on the muddy ocean floor, facing the current, and wait for the shrimp, tiny fish, and small crustaceans to swim by so they can eat them.
- Life Cycle: They lay eggs, and live a few years to as long as 20 years.

Activity: Balance on three fins!

What You Need:

- Playdough
- 3 toothpicks per child

What to Do:

- Use your playdough to create a long oval, to represent the long and skinny tripod fish shape. For younger children, forming an oval shape for the fish works. For older children, encourage them to follow a picture as a guide, and use that information to create their tripod fish. Using 3 toothpicks, can you then insert them into your "fish" to make it stand up and balance?
- Another Idea: Talk about what a tripod is, and how you can balance something on 3 legs (like a camera, for instance). Can you balance your body with only your 2 hands and 1 foot? Or 2 feet and 1 hand? How long can you balance yourself?

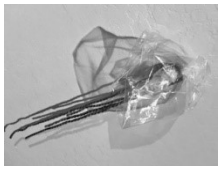
Resources: https://kids.kiddle.co/Tripodfish

Deep Sea Jellyfish

- Attributes: Jellyfish are invertebrates, and can be clear or a variety of colors; their bodies are shaped like a bell, and their mouth is inside the bell.
- Behaviors: They sting with their tentacles, to paralyze their prey before eating it. Most jellyfish eat fish, shrimp, crabs, and tiny plants. Jellyfish move by squirting water from their mouths, which propels them forward, or they let the ocean current move them along. They spend all their time looking for food, escaping predators, or finding a mate.
- Life Cycle: They live a few hours to a few years.

Activity: Baggie Jellyfish

What You Need:



- A gallon sized baggie (use the type that are open on one end and don't have a Ziploc end; or, cut that part off); or colored plastic sheets that can be tied to create a jellyfish.
- 3 or more strands of yarn or string
- Small colored plastic sheets, to place over a flashlight.

What to Do:

- Using one strand of yarn or string, tie the closed end of the baggie about 3 inches down from the top. You should have yarn dangling down from where it's tied closed. Add more strings or yarn, as desired, until you have several strings hanging down.
- Turn your baggie inside out. You should now have a jellyfish shape, with a "stomach/mouth" inside where you tied the baggie, and the yarn "tentacles" hanging down from the inside of the baggie. Practice moving your jellyfish up and down, or in any direction.
- Since deep sea jellyfish usually display bioluminescence to attract prey, and can be many colors, place a piece of colored plastic over the end of a flashlight, and shine your light inside your jellyfish. Try this with different colors of plastic. OR, you could use a sheet of colored plastic to make your jellyfish instead of a plastic baggie (gather the ends and tie them together with the yarn strings, to make what looks like a Portuguese Man O War). Shine your flashlight through your jellyfish. What are you noticing?

Sea Spiders

- Attributes: They aren't actually spiders, but a type of marine arthropod. There are over 1300 species of sea spiders. They are very slow moving, with legs larger than their bodies. They can have up to 8 pairs of legs. Sea spiders can often regenerate a lost limb but it's often smaller and less efficient than the other limbs. They vary in size, up to 27 inches.
- Behaviors: They are slow moving and not strong swimmers. They are scavengers and eat a variety of small marine animals.
- Life Cycle: They can live up to 20 years.

Activity: Sea Spiders and Lost Limbs

What You Need:

- A Styrofoam ball
- Pipe cleaners

- A variety of loose parts

What to Do:

- Create your sea spider, using the Styrofoam ball as the body and attaching any number of pipe cleaners (up to 16, since it can have up to 8 pairs of legs). Can you make your sea spider stand up on its legs?
- Pretend that your sea spider lost one of its legs and needs to regenerate it. Since the new leg may be smaller or less efficient than the lost leg, ask children what they might use instead, to attach to their sea spider's body to make a sturdier leg. Can your revised sea spider stand with its new leg?

More Ideas: Compare/contrast sea spiders with arachnids (regular spiders). How are they similar? How are they different?

Resources: https://mentalbomb.com/sea-spiders-fun-facts/

The Trenches Zone

Giant Tube Worms

- Attributes: They can be up to 8 feet long, but weigh less than 2 oz. They have no eyes, stomach, or mouth. These worms have a soft body inside a protective white tube. They have a bright red plume that is like a fish's gills. It absorbs needed chemicals from the water for the tube worm. These giant tube worms are one of the largest tube species in the world.
- Behaviors: Giant tube worms live in hydrothermal vents in the deep ocean, and feed on bacteria. They release gases, and chemicals like carbon dioxide and sulfur, which keep predators away from them.
- Life Cycle: They can live up to 300 years.

Activity: Become a colony of tubeworms with retractable gills

What You Need:

- A straw, one per child
- A red pipe cleaner, one per child
- Bubble solution and a bubble blower

What to Do:

- Ask children to make their own "tube worm" by inserting the red pipe cleaner through their straw. Invite them to come outside with you as you blow bubbles with the bubble solution. We'll pretend those bubbles are the "bacteria" that the tube worms feed on. Can children extend their red "plume" through their straw and catch or pop the bubbles?
- Another Idea: Invite children to stand together, as a colony of "tube worms", and move one arm in different patterns. Can they move their "tube worm arm" fast, slow, up, down, etc.? Play instrumental music as children move to it. You could also call out the names of different sea creatures and invite children to separate and pantomime those movements. Try moving as a school of fish around the room, as eels coming out of the rocks, as jellyfish propelling themselves forward, etc.

Resources: https://kidadl.com/facts/animals-nature/tube-worm-facts

Sea Cucumber

- Attributes: There are over 1,700 different species of sea cucumbers. They come in various shapes, sizes, and colors.
- Behaviors: They can expel their inner organs to confuse a predator, and give them time to get away from their predator. They can then regenerate new organs.
- Life Cycle: They can live for over 5 years.

Activity: Sock Puppet Sea Cucumbers

What You Need:

- A sock, one per child
- A variety of loose parts

What to Do:

- Invite children to create their own "sea cucumber" by filling a sock with a variety of loose parts. Try items that are softer (e.g., pom poms, cotton balls, crunched up paper, etc.) and items that are harder (e.g., small balls, blocks, small toys, manipulatives, etc.). Estimate and count how many items it takes to fill your sea cucumber body.
- Predator Drill: Have your sea cucumbers practice what to do in case of an emergency! If a predator swims by, your sea cucumber must quickly expel all the contents inside its body, to confuse the predator and give it time to escape. How long does it take to empty your sea cucumber of its "guts"? Is it faster when you use softer items, or ones that are more firm?

- Decide on what works best. Perhaps using all soft items would take longer when you're trying to empty the sock, but would be a more authentic texture for a sea cucumber since their bodies are soft.
- The Real Deal: If you'd like, set a time limit, such as 30 seconds, for the sea cucumbers to empty themselves and swim off. Some children could be the sea cucumbers, emptying their sock puppet, before the predators arrive, and some could be predators arriving at their prey within the allotted time. Can the cucumbers escape in time? If not, what adjustments would need to be made?

Resources: https://facts.net/nature/animals/17-facts-about-sea-cucumber/

The Mariana Snailfish

- Attributes: They are the world's deepest dwelling fish, living about 26,000 feet down in the Mariana Trench. Recently discovered, they are about 4 in long. They look like tadpoles, and are called snailfish because they are similar in some ways to snails.
- Behaviors: They cluster in groups, and live in the trenches. They can withstand tremendous pressure- like an elephant standing on your thumb.
- Life Cycle: They lay eggs. Most snailfish live for about a year, but some have lived up to 10 years.

Activity: Snail or Fish? You Decide!

What You Need:

- A picture of snailfish
- A picture of a snail, or a few live snails
- Magnifying glasses
- Paper and pencils for drawing

What to Do:

- Compare/contrast a snail with a snailfish. Talk about similarities and differences. Why do you think snailfish were named after snails?
- "Look and Draw" Activity: Choose what you'd like to draw (a snail or snailfish), and observe the creature (or a picture of it). What shapes, lines, colors, etc., do you see? Draw your creature. Dictate something about it, or write about it yourself.

Resources: https://www.sci.news/biology/mariana-snailfish-pseudoliparis-swirei-05481.html