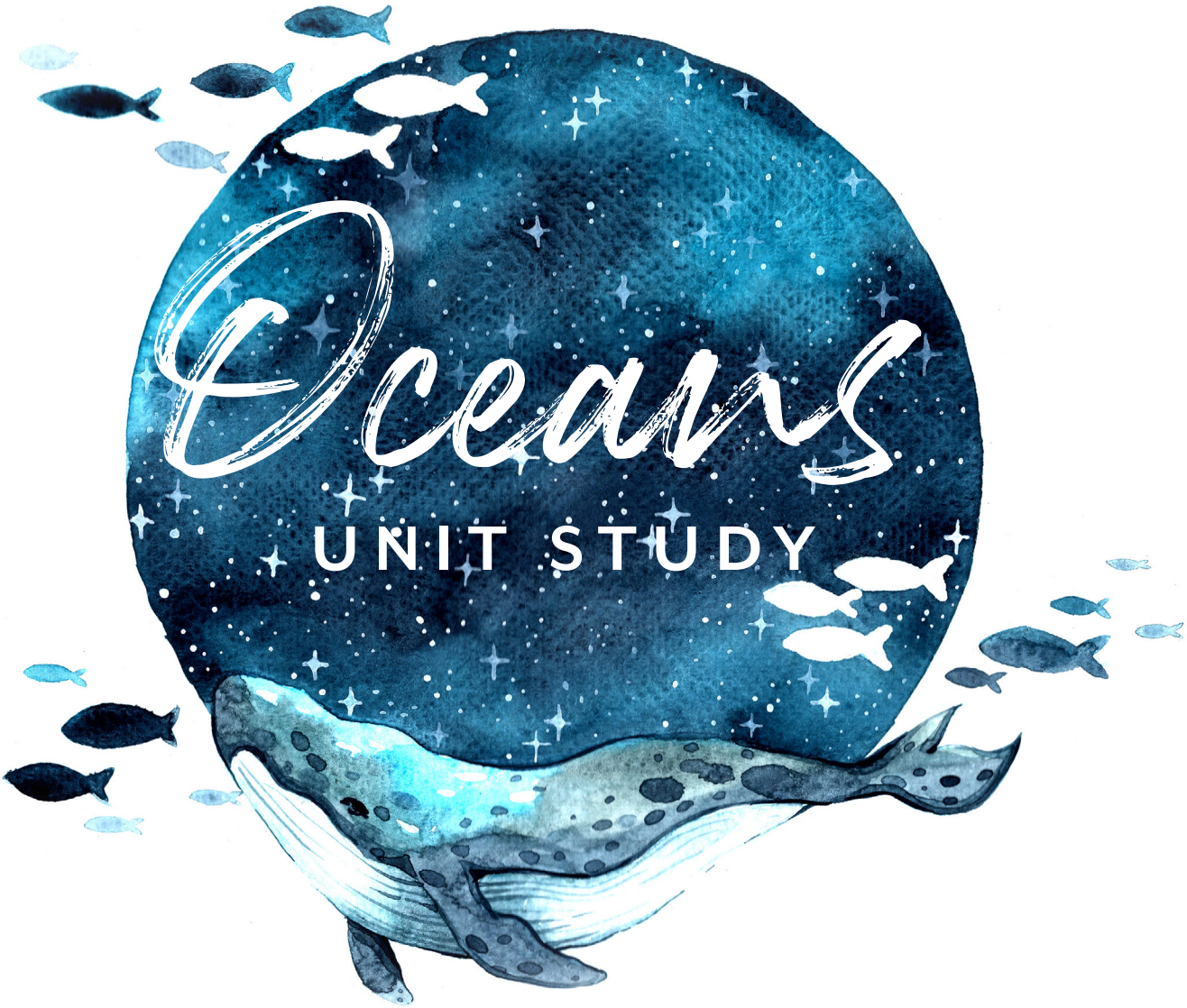
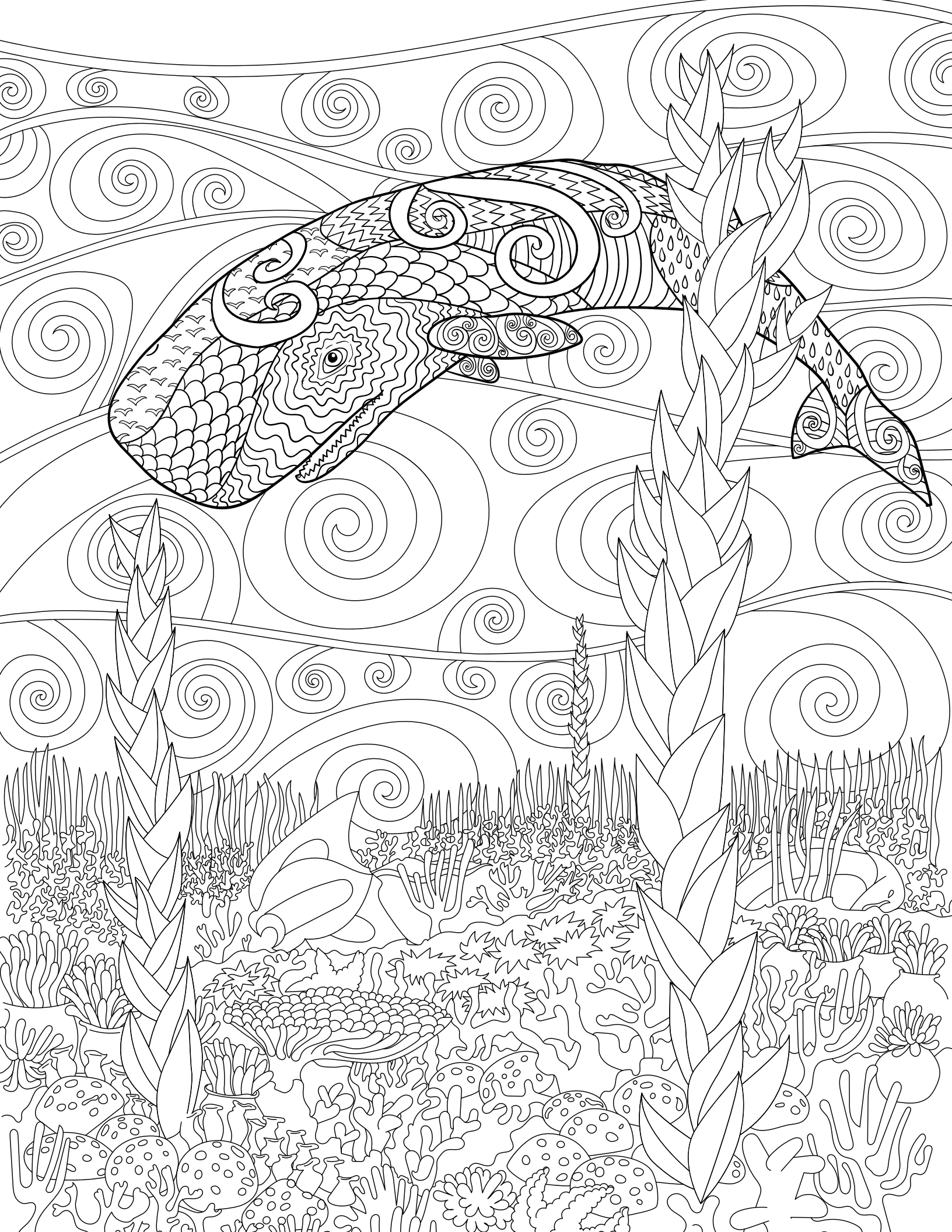


TEACHER'S GUIDE

Gather 'Round
HOMESCHOOL



PLUS DOWNLOAD OUR APP!

WITH CONTRIBUTIONS BY JENNA LABBE

Scripture references used or referred to are ESV unless otherwise noted.

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To the teacher:

Welcome to an undersea adventure! As I was planning out the vision for this month's unit, I wanted it to be all about the fascinating and interesting creatures under the sea to pull our kids into the lessons. But, like all our Gather 'Round units, the lesson titles barely begin to scratch the surface of all the connections that the lessons will make. Your kids will be learning about endangered species, pollution, weather, layers of the ocean, scientific discoveries, Bible stories and passages, sketching and painting, the fishing industry, oil spills, how islands are made, the scientific method, geography, and so much more!

Though you will see a supply list for the unit, those are only for the optional extension activities. The only real "tools" that are necessary for this program is a pencil, a map or atlas (or the internet), and a Bible. Gather 'Round is open and go. The books on the next few pages are 100% optional and given in case you want to add a literature component on top of the lessons that you will be reading with your kids. The books are designed to be assigned to your child with the exception of the resources, videos, and pre-reader picture books. Simply go to your library or click on the links (these are my Amazon affiliate links so you can see inside the books to know what is a good fit) and create a reading list for each child.

We recommend your children read for 10 minutes a day for new readers, up to an hour a day for high schoolers. You know your child! You can choose books from the middle school/high school, resource, or picture book section to read aloud if you want, or you can just assign books to your children based on their reading level. Pre-reader are picture books for children who aren't ready for reading, early reader are 3-4 letter words, early elementary is simple sentences, upper elementary is easy chapter books with pictures, and then middle/high are novels.

Don't miss the add on cursive writing notebook that goes along with this unit and has the Bible verses and spelling words in cursive as well as coloring pages! A great way to make copywork go the extra mile!

I can't wait to hear what you think of this unit and if you have any questions, don't hesitate to email us at rebecca@homeschoolon.com.

Love,
Rebecca

-Rebecca

PRE-READER:
(OR READ ALOUD)

The Boy and the Ocean *by Max Lucado* (AMAZING!)

Over in the Ocean: In a Coral Reef *by Marianne Berkes*

Deep in the Ocean *by Lucie Brunellière*

The Big Book of the Blue *by Yuval Zommer*

Save the Ocean *by Bethany Stahl*

Inky the Octopus: Bound for Glory *by Eric Guendelsberger*

Somewhere in the Ocean *by Jennifer Ward*

If I Were a Whale *by Shelley Gill*

Baby Beluga *by Raffi*

I'll Follow the Moon *by Stephanie Lisa Tara*

Swimmy *by Leo Lionni*

The Snail and the Whale *by Julia Donaldson*

A Swim Through the Sea *by Kristin Joy Pratt-Serafini*

Manfish: A Story of Jacques Cousteau *by Jennifer Berne*

Flying Deep: Climb Inside Deep-Sea Submersible Alvin *by Michelle Cusolito*

Down, Down, Down: A Journey to the Bottom of the Sea *by Steve Jenkins*

Andre the Famous Harbor Seal *by Fran Hodgkins*

EARLY READER:
(YOU CAN READ)

National Geographic Kids Readers: Swim Fish! *by Susan Neuman*

National Geographic Kids Readers: Dolphins *by Melissa Stewart*

National Geographic Kids Readers: Sea Turtles *by Laura Marsh*

National Geographic Kids Readers: Weird Sea Creatures *by Laura Marsh*

National Geographic Kids Readers: In the Ocean *by Jennifer Szymanski*

A Whale of a Tale!: All About Porpoises, Dolphins & Whales *by Bonnie Worth*

Clara and Clem Under the Sea *by Ethan Long*

National Geographic Kids Readers: Tide Pools *by Laura Marsh*

Wish for a Fish: All About Sea Creatures *by Bonnie Worth*

Hark! A Shark!: All About Sharks *by Bonnie Worth*

Pete the Cat: Scuba-Cat *by James Dean*

Big Shark, Little Shark *by Anna Membrino*

Little Critter: Just an Adventure at Sea *by Mercer Meyer*

A Fish Out of Water *by Helen Palmer*

Harry by the Sea *by Gene Zion*

I'm the Biggest Thing in the Ocean! *by Kevin Sherry*

EARLY ELEMENTARY:

W is for Wave: An Ocean Alphabet *by Marie Smith*

What a Waste: Trash, Recycling and Protecting our Planet *by Jess French*

Solving the Puzzle Under the Sea: Marie Tharp Maps the Ocean Floor *by Robert Burleigh*

Shark Lady: The True Story of How Eugiene Clark Became the Ocean's Most Fearless Scientist *by Jess Keating*

Giant Squid *by Candace Fleming*

Hammerhead vs Bull Shark: Who Would Win? *by Jerry Pallotta*

Coral Reefs: A Journey Through an Aquatic World of Wonder *by Jason Chin*

Eight Dolphins of Katrina: A True Tale of Survival *by Janet Wyman Coleman*

The Blue Whale *by Jenni Desmond*

Dolphin Adventure: A True Story *by Wayne Grover*

Dolphin Treasure *by Wayne Grover*

Dolphins at Daybreak *by Mary Pope Osborne*

Pirates Past Noon *by Mary Pope Osborne*

The Titanic: Lost and Found *by Judy Donnelly*

National Geographic Kids Readers: Ink! *by Stephanie Warren Drimmer*

Ocean Monsters *by Nick Confalone*

UPPER ELEMENTARY:

The Voyage of the Dawn Treader *by C.S. Lewis*

A Whale in Paris *by Daniel Presley*

A Dog's Porpoise *by MC Ross*

A Seal Called Andre *by Harry Goodridge*

Plastic, Ahoy! Investigating the Great Pacific Garbage Patch *by Patricia Newman*

The Octopus Scientists *by Sy Montgomery*

The Great White Shark Scientist *by Sy Montgomery*

Sea Turtle Scientist *by Stephen R. Swinburne*

I Survived Hurricane Katrina, 2005 *by Lauren Tarshis*

National Geographic Kids Mission: Sea Turtle Rescue: All About Sea Turtles and How to Save Them *by Karen Romano Young*

Into the Deep: The Life Naturalist and Explorer William Beebe *by David Sheldon*

MIDDLE /HIGH SCHOOL:

(OR READ ALOUDS)

Moby Dick *by Herman Melville*

20,000 Leagues Under the Sea *by Jules Verne*

Island of the Blue Dolphins *by Scott O'Dell*

Treasure Island *by Robert Louis Stevenson*

The Swiss Family Robinson *by Johann David Wyss*

Stranded *by Ben Mikaelsen*

A Ring of Endless Light *by Madeleine L'Engle*

The Silent World *by Jacques Cousteau*

Tracking Trash: Flotsam, Jetsam, and the Science of Ocean Motion *by Loree Griffin Burns*

Note:

* Books from the Magic Tree House series that do include magic in the text.

SUPPLEMENTAL ACTIVITIES/ ADDITIONAL READING:

The Magic School Bus On The Ocean Floor *by Joanna Cole*

The Magic School Bus Inside a Hurricane *by Joanna Cole*

In the Sea *by David Elliott*

National Geographic Kids: Ultimate Oceanpedia: The Most Complete Ocean Reference Ever by Christina Wilsdon

DK: Eyewitness Books: Ocean *by Miranda Macquitty*

Seashells, Crabs and Sea Stars *by Christiane Kump Tibbitts*

Ocean: A Visual Encyclopedia *by DK*

Simon & Schuster Children's Guide to Sea Creatures *by Jinny Johnson*

Marine Science for Kids: Exploring and Protecting Our Watery World *by Josh & Bethanie Hestermann*

Ocean Bingo *by Mike Unwin*

1000 piece family Oceans puzzle

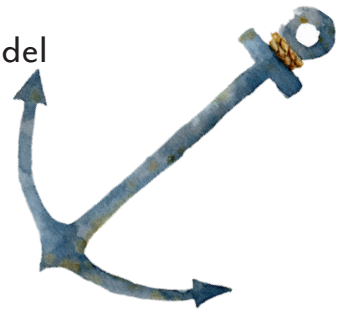
100 piece easier oceans puzzle

BBC Oceans: Our Blue Planet

Watercolor with Me: In the Ocean *by Dana Fox*

How to Draw Incredible Sharks and other Ocean Giants *by Fiona Gowen*

Shark anatomy model



OCEAN THEMED SHOWS AND MOVIES:

Finding Nemo (the movie)

Wild Kratts: Season 1, Episode 2 "Whale of a Squid"

Wild Kratts: Season 1, Episode 13 "Mystery of the Weird Looking Walrus"

Wild Kratts: Season 1, Episode 15 "Octopus Wildkrattiticus"

Wild Kratts: Season 1, Episode 29 "Seasquatch"

Wild Kratts: Season 1, Episode 37 "Stuck on Sharks"

Wild Kratts: Season 2, Episode 12 "Seahorse Rodeo"

Wild Kratts: Season 2, Episode 13 "Speaking Dolphinese"

Wild Kratts: Season 2, Episode 16 "Blowfish Blowout"

Wild Kratts: Season 2, Episode 18 "Rocket Jaw: Rescuer of the Reef" (parrotfish)

Wild Kratts: Season 3, Episode 2 "When Fish Fly" (flying fish)

Wild Kratts: Season 4, Episode 8 "Star of the Tides" (sea star, zooplankton, and lobster)

Wild Kratts: Season 4, Episode 9 "The Last Largest Lobster"

Wild Kratts: Season 4, Episode 13 "Mystery of the Two Tusked Narwhal"

Wild Kratts: Season 4, Episode 21 "This Orca Likes Sharks"

Wild Kratts: Season 4, Episodes 25 & 26 "Creatures of the Deep Sea" Part 1 & 2

Wild Kratts: Season 5, Episode 14 "Choose Your Swordfish"

Octonauts full episodes (free): https://www.youtube.com/channel/UCM9WCm9kvYce9rN9kSIpUOw

LESSON 1

- [ ] Bible
- [ ] Soda or juice bottle
- [ ] Ruler or tape measure
- [ ] Permanent marker
  2-3 inch nail or other
- [ ] sharp pointed object to pierce a bottle
- [ ] Duct or masking tape
  Art supplies

LESSON 2

- [ ] Bible
- [ ] Art Supplies

LESSON 3

- [ ] Bible
- [ ] Art Supplies

LESSON 4

- [ ] Bible
- [ ] Art Supplies

LESSON 5

*Only for Early Reader - Upper Elementary

- [ ] *Continer for water
- [ ] *Ice
- [ ] *Crisco
- [ ] *2 Ziplock bags
- [ ] Bible
- [ ] Art Supplies

LESSON 6

- [ ] Bible
- [ ] Writing project from Lesson 2
- [ ] Art supplies

LESSON 7

- [ ] Bible
- [ ] Art supplies

LESSON 8

- [ ] Bible
- [ ] Art supplies

LESSON 9

*Early reader to early elementary only

- [ ] Bible
- [ ] Small plastic toy without holes *
- [ ] Cooking oil *
- [ ] Water*
- [ ] Dish soap*
- [ ] Art supplies

LESSON 10

- [ ] Container of water for sink or float experiment
- [ ] Random objects from around the house for sink or float experiment
- [ ] Research supplies
- [ ] Bible
- [ ] Supplies for model (if building one)

LESSON 11

- [ ] Art Supplies
- [ ] Bible

LESSON 12

- [ ] Bible
- [ ] Art supplies

LESSON 13

* Early Reader to Middle School only

** Early reader and Early Elementary only

- [ ] Bible
- [ ] Art supplies
- [ ] 3 clear glasses*
- [ ] 3 eggs*
- [ ] Salt*
- [ ] Sugar*
- [ ] Flashlight**

LESSON 14

- [ ] Writing project from Lesson 10
- [ ] Art supplies
- [ ] Bible

LESSON 15

- [ ] Bible
- [ ] Art supplies

LESSON 16

- [ ] Bible
- [ ] Art supplies

LESSON 17

- [ ] Bible
- [ ] Art supplies

LESSON 18

- [ ] Writing project from Lesson 14
- [ ] Art supplies
- [ ] Bible

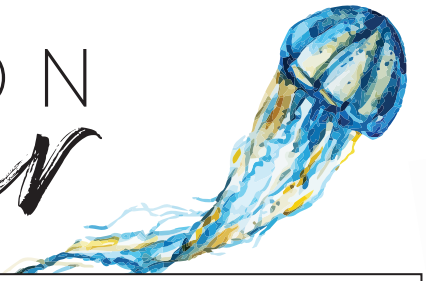
LESSON 19

- [ ] Bible
- [ ] Art supplies

LESSON 20

- [ ] Art supplies
- [ ] Bible

LESSON Planner



LESSON 1	LESSON 2
LESSON 3	LESSON 4
LESSON 5	LESSON 6
LESSON 7	LESSON 8
LESSON 9	LESSON 10

LESSON 11

LESSON 12

LESSON 13

LESSON 14

LESSON 15

LESSON 16

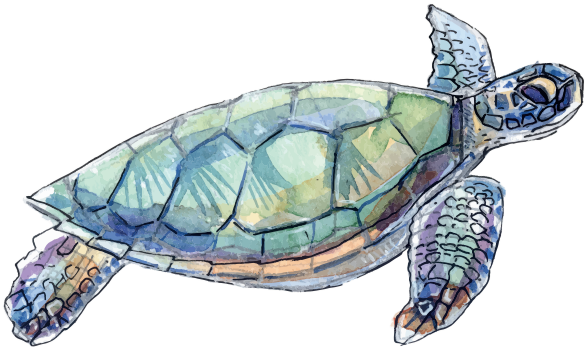
LESSON 17

LESSON 18

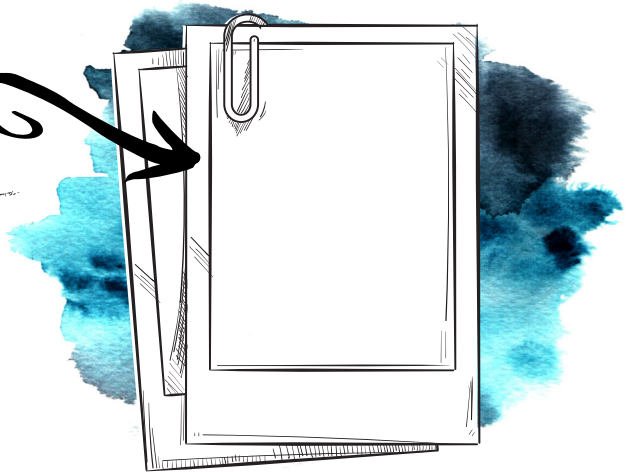
LESSON 19

LESSON 20

LIST:



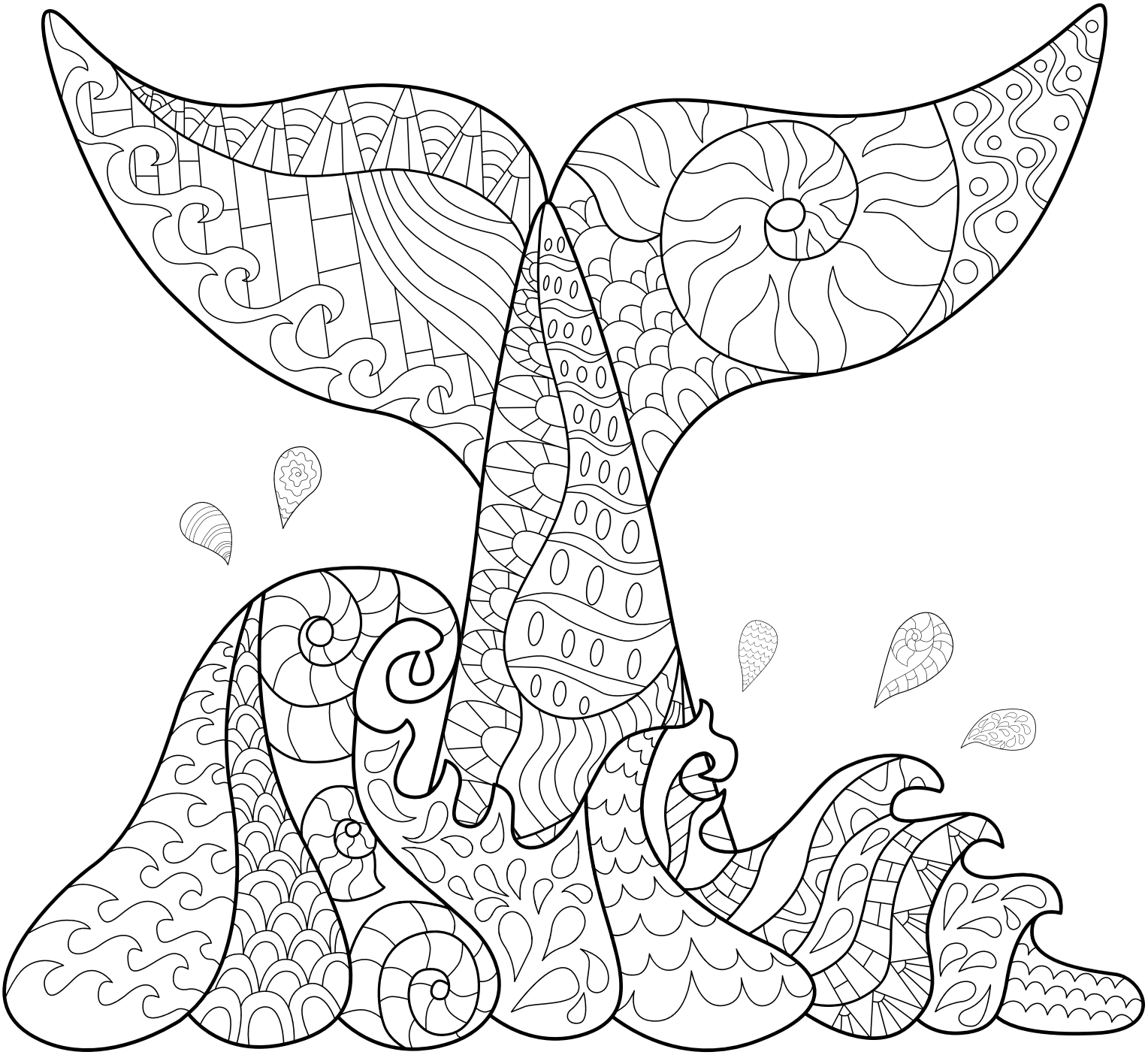
DON'T FORGET!



Notes

Adventures

Shopping LIST



Oceans

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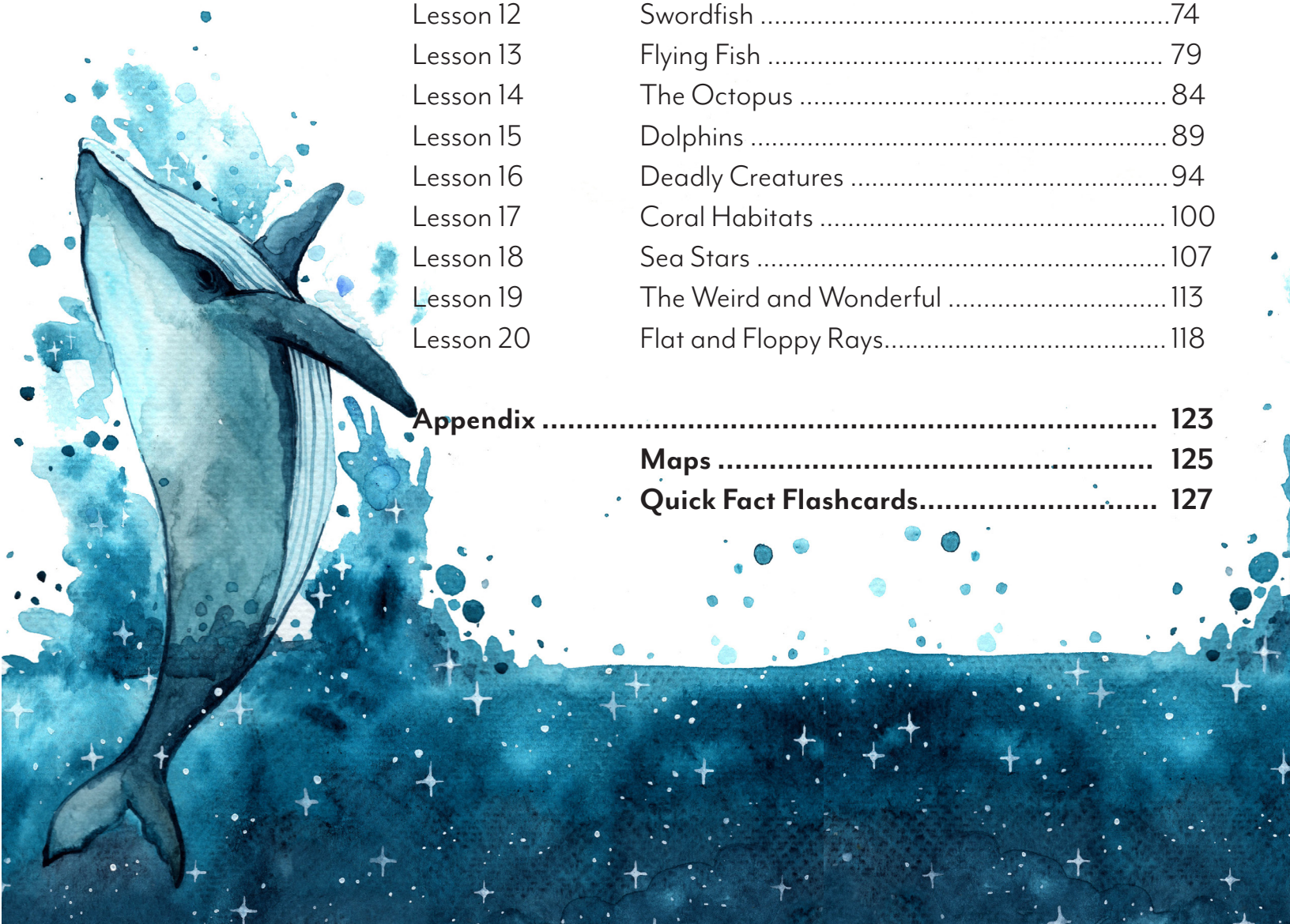
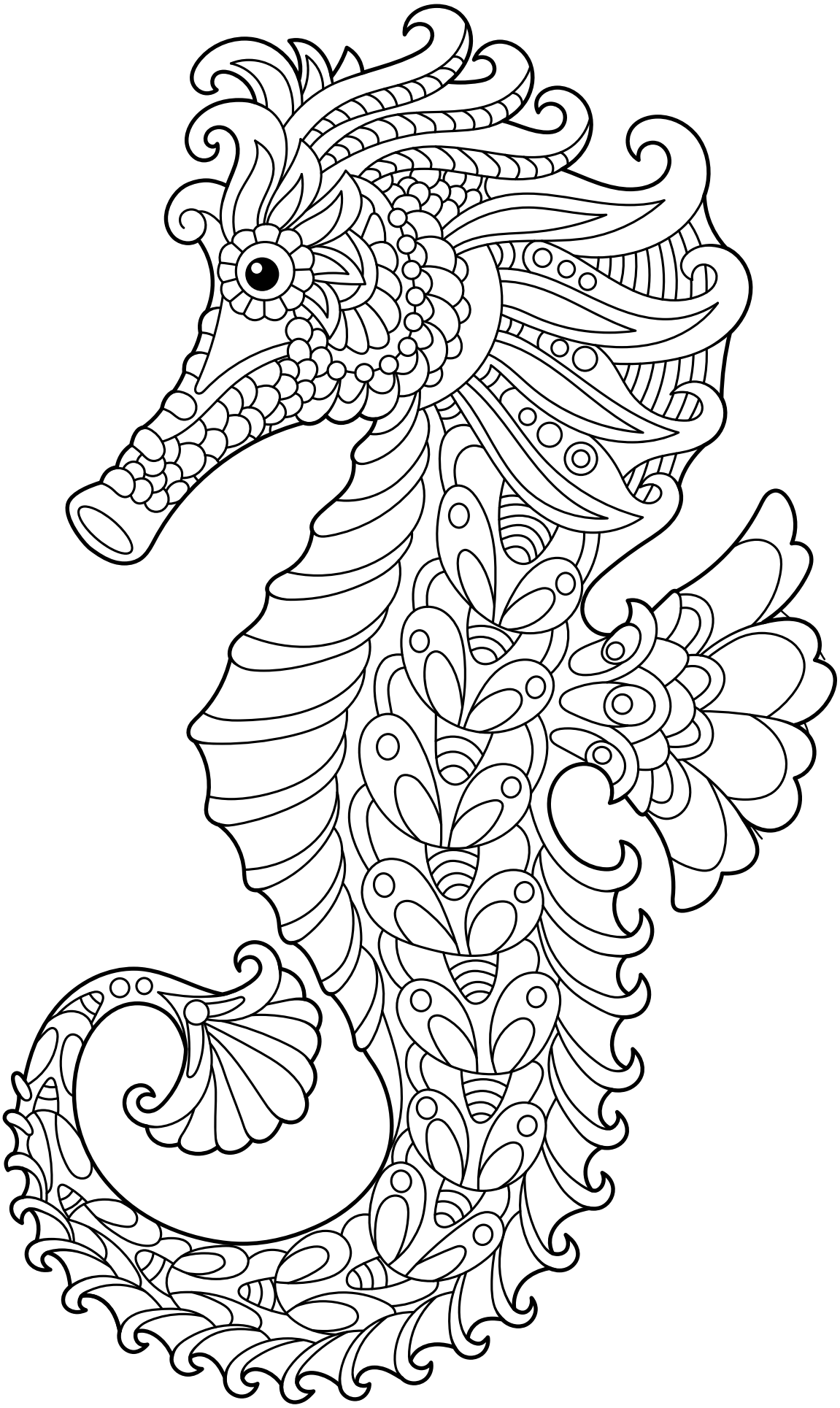




INTRODUCTION TO OCEANS

Over the next few weeks, we are going to be exploring the ocean! The ocean is an amazing part of God's creation, one that scientists are still exploring and discovering new things about every year. Ocean waters cover over 70% of the earth's surface and most of the water on earth is found in the ocean. Just like mountains, rivers and cities have names, the oceans have names too! The shallowest ocean on earth is the Arctic Ocean. It is also the smallest and coldest ocean, and it is like a crown at the top of the globe. The saltiest ocean is the Atlantic Ocean. The warmest ocean on earth is the Indian Ocean, because most of this ocean is near tropical areas below the continent of Asia. The newest ocean was named in 2000 and is called the Southern Ocean. The Southern Ocean is at the bottom of the globe surrounding Antarctica. Finally, the largest ocean is the Pacific Ocean, which spreads nearly halfway around the world. The Pacific Ocean is also the deepest ocean, and today we will be looking more closely at creatures that live in the deepest parts of the ocean.

Today we are going to be learning about some of the features and creatures of the deepest parts of the ocean. Because there is so much pressure deep down underwater, these creatures can look very different than some of the fish we are more familiar with. Sometimes they are *translucent* (or see-through), their eyes look very different so that they can see in the dark, and they often have lights so that they can attract their prey. We don't know very much about these deep sea creatures, because it is hard for scientists to go to the deepest parts of the ocean. Some of the fish we have learned about because we have brought them to the surface, but as the pressure changes, so do the fish! Their appearance becomes different than when they are in their natural habitat! Let's learn about the deep sea!

WHAT ARE HYDROTHERMAL VENTS?

Just like we have volcanoes on land, there are also volcanoes that happen on the ocean floor. The earth is made up of something called *tectonic plates,* which are like puzzle pieces that cover the earth. Unlike the jigsaw puzzles we can make with pieces that fit perfectly together, the tectonic plates on earth have gaps between them or will barely fit together and push up to make a ridge. When these plates move apart, it creates a space for magma, or melted rock, beneath the earth's surface to come up through a vent and create a volcano. On the ocean's floor, these spaces along ridges create hot springs called *hydrothermal vents.* The extremely cold water on the ocean floor is heated by these vents and creates a community of different organisms and creatures that survive around these vents. Here are a few of the unique and interesting creatures found at the deepest parts of our oceans.

FANGTOOTH FISH

Our first creature of the deep is the fangtooth fish. A picture, like the one below, can make this fish look pretty scary but if you see this fish in the ocean, it is only about 6 inches long (15 cm). These fish live in the temperate and tropical waters of the Pacific, Atlantic, and Indian Oceans, including the waters around Australia. Scientists have seen them as far down as 16,404 feet (5000 m) below the surface of the ocean, making this the deepest living fish known at this time.

APPEARANCE:
Fangtooth fish have small bodies and big heads with a mouth full of needle-like teeth and fangs.

DIET:
Fangtooths are carnivorous and are known to eat fish, crustaceans, and squid.

DID YOU KNOW?
Though they spend most of their time in the deep, fangtooths are known to migrate toward the surface, at night, to hunt their preferred prey of crustaceans and other fish.

BLOBFISH

Meet the blobfish, a fish with a bulbous looking nose that is pink and fat and kind of strange looking... or is it? This fish actually looks pretty normal down in the deep parts of the ocean where it lives, but when it is pulled to the surface, the change in pressure damages it because of its lack of structural support.

APPEARANCE:
The blobfish has been called the world's ugliest fish, but it is just another one of God's amazing creatures. The adult blobfish is only about 12 inches long (30 cm).

DIET:
Scientists don't actually know very much about blobfish because they live so deep in the ocean. It is believed that they eat crabs, sea urchins, and shellfish—whatever floats into their mouths.

HABITAT:
The blobfish live in the deep waters just around Australia and Tasmania.

YOUR TURN!
Look up a picture of this unique fish. See if you can find one on the surface and one in the depths of the ocean.

ATLANTIC WOLFFISH

The Atlantic wolffish has a long, elongated body much like an eel and is sometimes called the wolf eel. Their large teeth stick out of their mouths even when closed and give this fish a ferocious look like a wolf. They can grow to be about 5 feet long (1.5 m). This fish is considered a keystone species in the North Atlantic food chain. The wolffish serves a vital role in limiting the population of prey species like sea urchins and green crabs.

DIET:
The Atlantic wolffish eat sea urchins, crabs, and large marine snails.

HABITAT:
Just like its name suggests, the Atlantic wolffish lives in the cold waters of the North Atlantic Ocean, in rocky reefs and the hard bottom of the ocean floor.

DID YOU KNOW?
Because the Atlantic wolffish lives in such cold waters in the ocean, their blood has natural antifreeze within it that prevent this fish from freezing. It has also been called many different names, including the Atlantic catfish, seawolf, devil fish, and seacat.

GIANT ISOPOD

Giant isopods are invertebrates, meaning they have a hard outer shell instead of a skeleton. They're kind of like a pillbug (Rollie Pollie) on land, because if they are scared, they will roll up into a ball. Their hard shell protects them from predators. Giant isopods can swim by gliding through the water, but they also use their 7 pairs of legs to crawl on the ocean floor.

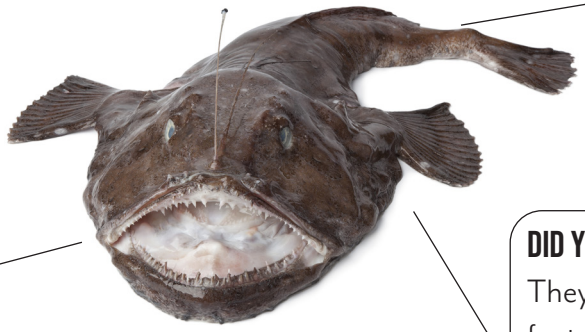
DIET:
Giant isopods are carnivorous and are considered the scavengers of the ocean floor, eating dead whales, fish, and squid.

HABITAT:
The giant isopods are found in the cold, deep waters of the Atlantic, Pacific, and Indian Oceans. They prefer mud or clay ocean bottom surfaces where they can burrow for shelter.

APPEARANCE:
Giant isopods are typically about 7.5-14.2 in (19-36 cm) and weigh about 3.7 pounds (1.7 kg). They have two large antennae and five pairs of pleopods, which are appendages on their abdomens that help them breathe underwater.

MONKFISH

Monkfish are a type of angler fish. The largest documented monkfish was 54 inches long (138 cm). You can tell the age of a monkfish by counting the marks in their vertebrae. The most common predators of the monkfish are swordfish, sharks, and thorny skates. The monkfish can be found in the North Atlantic Ocean and the Mediterranean Sea. When they catch prey, the monkfish will swallow it in one bite. Since it has such a large mouth, it can swallow a fish the same size that it is! The monkfish can also use its pectoral fins to walk on the ocean floor.



DIET:
Monkfish eat fish (including other monkfish), eels, seabirds, crustaceans, and mollusks.

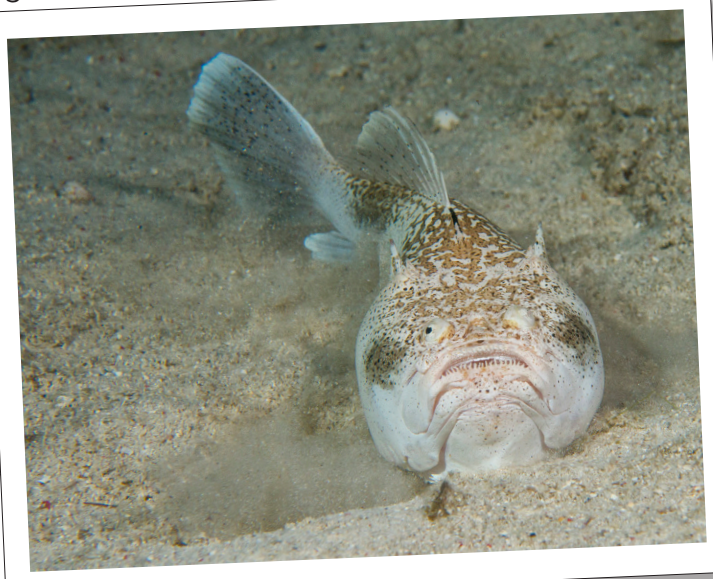
APPEARANCE:
Monkfish don't have scales like other fish and instead have smooth olive-green skin with a white belly. They have been compared to tadpoles since they have such a large head and a very skinny tail.

DID YOU KNOW?
They strike their prey with lightning-fast speed! They shoot up at a 90 degree angle, and strike in just 1/10 of a second!

STARGAZER FISH

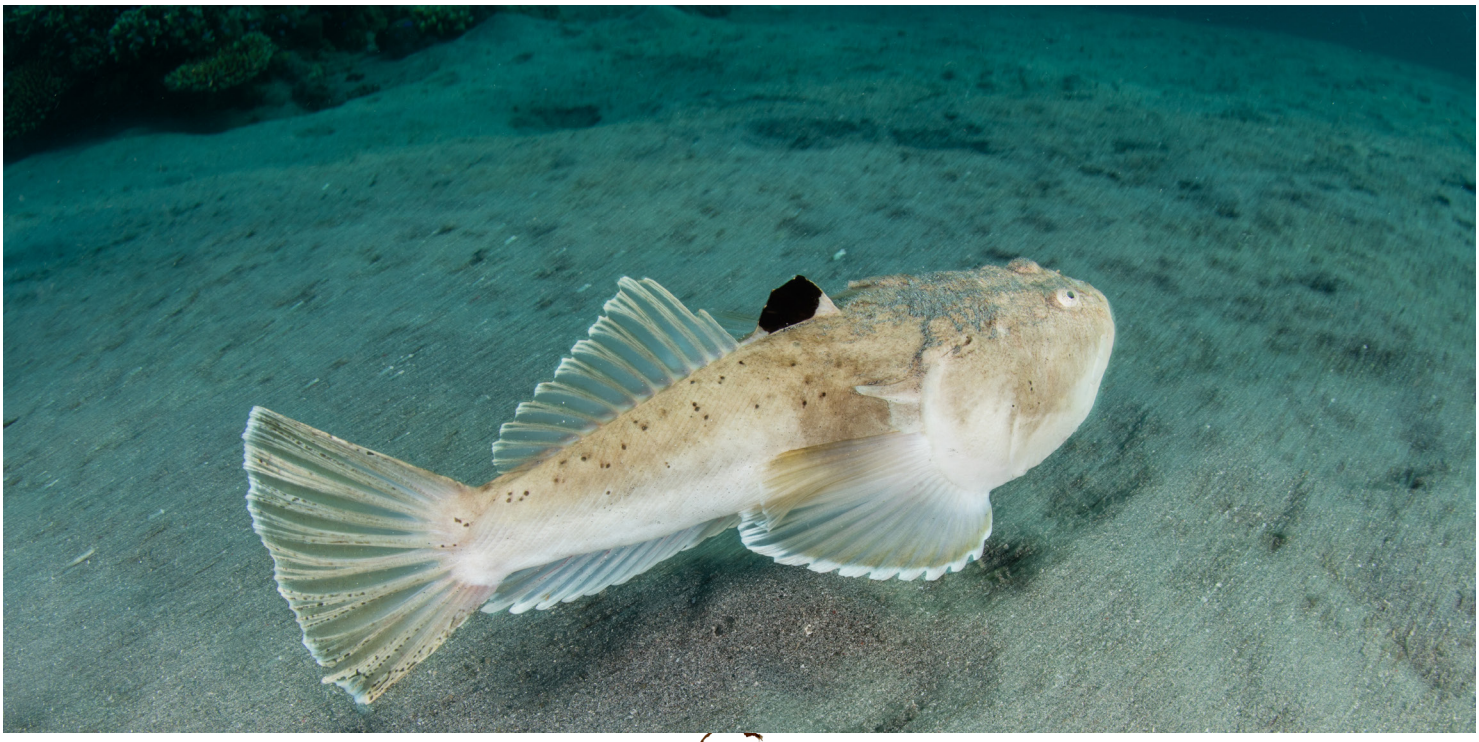
The stargazer fish is found in the Atlantic Ocean and Mediterranean Sea. It lives most of its life on the bottom of the ocean, gazing up at the fish that are swimming by, while looking for its next meal. It camouflages with the sandy ocean floor, burrowing its body into the sand and waits patiently for food to arrive. It is about 8-18 inches long (20-45cm).

DIET:
Stargazers eat small fish, crabs, and other crustaceans by sucking their prey into its mouth.



DID YOU KNOW?
The stargazer is able to produce electricity from its eyes, which it uses to protect itself from predators. It also uses the pectoral fins on the side of its body like shovels to quickly dig itself into the sand. They also have 2 large spines on their back that can inject venom into attackers (or your foot).

APPEARANCE:
The stargazer's eyes, nostrils, and mouth are located on the top of its head, which allows it to breathe when it is buried in the sand, look for prey, and eat unsuspecting fish. Unlike many fish that take in water through their mouths to breathe, the stargazer uses its nostrils.



NOTEBOOK TIME!

Students, it's time to work in your notebooks! Open up your notebook to today's lesson and complete the assignments.

SOURCES:

https://www.oceanicinstitute.org/aboutoceans/aquafacts.html
https://oceanservice.noaa.gov/facts/vents.html
https://www.montereybayaquarium.org/animals-and-exhibits/animal-guide/fishes/fangtooth
https://study.com/academy/lesson/fangtooth-fish-facts-lesson-for-kids.html
http://www.aquariumofpacific.org/onlinelearningcenter/species/giant_isopod
https://www.fisheries.noaa.gov/species/monkfish
https://oceana.org/marine-life/ocean-fishes/atlantic-wolffish
https://www.floridamuseum.ufl.edu/discover-fish/species-profiles/astroscopus-guttatus/
https://www.noaa.gov/education/resource-collections/ocean-coasts-education-resources/ocean-pollution
https://www.education.com/science-fair/article/earth-science_squirter1/
https://oceana.org/marine-life/ocean-fishes/common-fangtooth
https://pubmed.ncbi.nlm.nih.gov/2851724/
https://animals.net/monkfish/#:~:text=In%20the%20Blink%20of%20an,them%20to%20catch%20their%20prey.

LESSON 1 · DAY AT A GLANCE · CREATURES OF THE DEEP

SCIENCE NOTEBOOKING

Notebooking pages are opportunities to take notes and record what you remember from the lesson. Throughout this unit, students will be taking notes on the different sea creatures that they are learning about, today they will choose one of the creatures of the deep! Students can work while they listen or complete their pages after you are done.

EARLY READER + EARLY ELEMENTARY

HEADERS: *Habitat, Diet, Interesting Facts*

UPPER ELEMENTARY

HEADERS: *Appearance, Diet, Habitat, Interesting Facts*

MIDDLE SCHOOL

HEADERS: *Appearance, Diet, Habitat, Interesting Facts*

HIGH SCHOOL

HEADERS: *Interesting Facts, Characteristics, Habitat, Threats*

SCIENCE OCEAN WATER PRESSURE

Today students will be learning about ocean water pressure through a science experiment. They have the option of observing the scientific process through the example of an experiment on the page, or they can try the experiment themselves! If they want to try the experiment, you'll need a soda or juice bottle, ruler or tape measure, permanent marker, a 2-3 inch nail or other sharp pointed object (to pierce the bottle), and duct or masking tape.

EARLY READER - UPPER ELEMENTARY

ASSIGNMENT: *Write your hypothesis (guess) for the experiment in the box before reading the explanation about how it works at the bottom of the page.*

MIDDLE SCHOOL

ASSIGNMENT: *Write your hypothesis (guess) for the experiment in the box before reading the explanation about how it works at the bottom of the page.*
DIG DEEPER: *What if you added more water? What if you poke a hole between the top and bottom ones? Try a different version of the experiment yourself and write a new hypothesis and results based on the changes you made.*

HIGH SCHOOL

ASSIGNMENT: *Research scuba diving and pressure changes to determine how pressure changes with ocean depth.*

SOCIAL STUDIES OCEAN POLLUTION

If you are working with multiple students, get everyone to turn to this page because this is one that you can all work on together, from Early Reader through High School.

EARLY READER - HIGH SCHOOL

ASSIGNMENT: *Sit down with your family and come up with some ideas on what you can do to help decrease pollution. Be creative and have fun with this. If you want, write or draw your ideas in the box.*

LANGUAGE ARTS + BIBLE

COPYWORK + SPELLING

This week you will be working on your spelling through Isaiah 43:2 (or 1-2 for older students who are encouraged to look it up in their own version). You can choose to have your children just copy and focus on spelling, or work on these verses as a family and try to memorize them. At the end of the week they can try to write them from memory or you can dictate the verses to them. You could also practice the Charlotte Mason art of recitation and recite this each morning before you start to help your kids memorize it. All verses are in ESV though you can choose any version for your children.

Students can do their copywork (or dictation if it's that day) in cursive if you have the optional cursive writing notebook add on!

EARLY READER + EARLY ELEMENTARY

VERSE: *"When you pass through the waters, I will be with you..." Isaiah 43:2a*
SPELLING: *"-er" sounds*

UPPER ELEMENTARY

VERSE: *"When you pass through the waters, I will be with you; and through the rivers, they shall not overwhelm you; when you walk through fire you shall not be burned, and the flame shall not consume you." Isaiah 43:2*
SPELLING: *through*

MIDDLE + HIGH SCHOOL

VERSE: *""But now thus says the Lord, he who created you, O Jacob, he who formed you, O Israel: "Fear not, for I have redeemed you; I have called you by name, you are mine. When you pass through the waters, I will be with you; and through the rivers, they shall not overwhelm you; when you walk through the fire you shall not be burned, and the flame shall not consume you." Isaiah 43:1-2*
SPELLING: *through (Only Middle School)*

ART DRAW A SEA CREATURE

Your students will get to use their creativity with this one! Younger students will discuss ideas with their parent and then draw their creature, while older students will write down some features about their creature as well as drawing a picture of it. Be creative and have fun!

EARLY READER

ASSIGNMENT: *Discuss what your sea creature would need to survive in the dark and extremely cold water. Draw your creature and give it a name.*

EARLY ELEMENTARY - HIGH SCHOOL

ASSIGNMENT: *Draw your sea creature and write down some of its features. Don't forget to give it a name!*

GIANT SQUID

INTRODUCTION

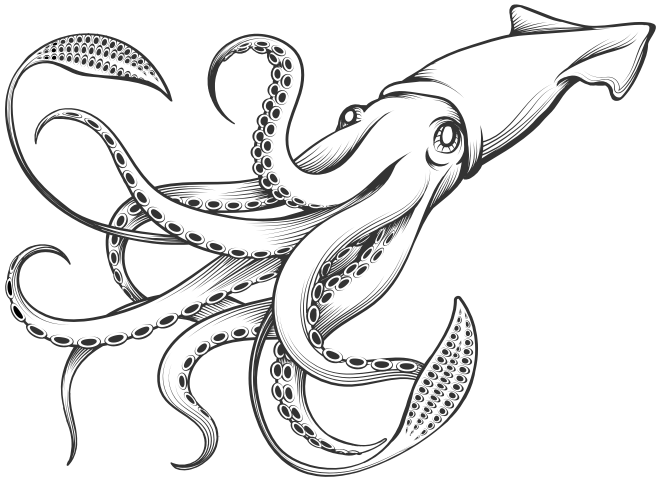
To start our lesson today, let's close our eyes and listen as we read part of a story. Try and imagine what is being described by the author:

"I stared in my turn and couldn't keep back a movement of revulsion. Before my eyes there quivered a horrible monster worthy of a place among the most farfetched teratological legends. It was a squid of colossal dimensions, fully eight meters long. It was traveling backward with tremendous speed in the same direction as the Nautilus. It gazed with enormous, staring eyes that were tinted sea green. Its eight arms (or more accurately, feet) were rooted in its head, which has earned these animals the name cephalopod; its arms stretched a distance twice the length of its body and were writhing like the serpentine hair of the Furies. You could plainly see its 250 suckers, arranged over the inner sides of its tentacles and shaped like semispheric capsules. Sometimes these suckers fastened onto the lounge window by creating vacuums against it. The monster's mouth – a beak made of horn and shaped like that of a parrot – opened and closed vertically. Its tongue, also of horn substance and armed with several rows of sharp teeth, would flicker out from between these genuine shears."

Chapter 18: The Devilfish of 20,000 Leagues Under the Sea by Jules Verne

What we just heard is from a story called *20,000 Leagues Under the Sea*, by Jules Verne. It is about the adventures of Captain Nemo and his crew as they explore the ocean in their submarine called the Nautilus. Captain Nemo was just describing the scene where they came face to face with a giant squid for the first time. The way he describes the giant squid makes it seems rather scary, like a monster (if you came face to face with a creature that was 8 meters long, or over 26 ft long, you might be a little nervous as well!). But just like all of God's creation, the giant squid is an amazing creature. Scientists have confirmed that the giant squid is in fact not a monster at all!

The giant squid lives up to its name of giant, and the largest squid that has been discovered was over 43 feet long (13 m). The average yellow school bus we see driving down the road is only 36 feet long (almost 11 m), so the largest giant squid was 7 feet (or 2 m) longer than that! Just like the creatures we learned about yesterday, the giant squid also lives in the very deep waters of the ocean and is rarely seen.



ACTIVITY BREAK

Look up some pictures or videos of the giant squid. Spend some time investigating the giant squid because it's likely an animal you will never see in the wild!

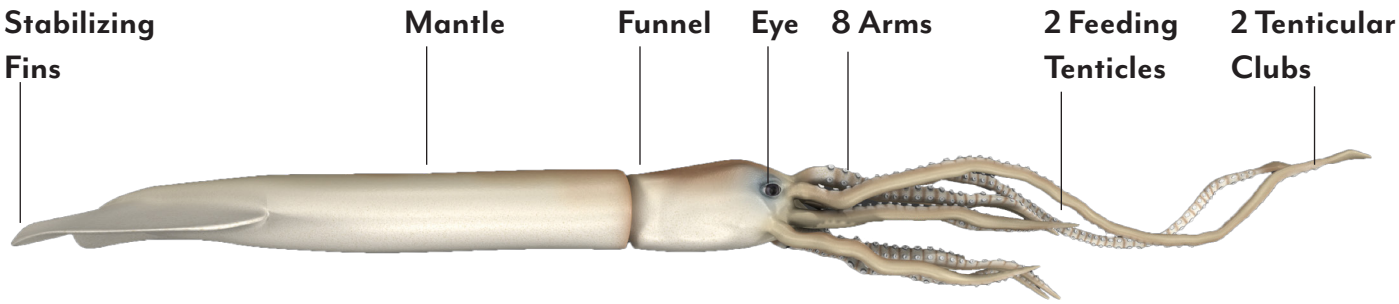
LIFE CYCLE:

Giant squid live for about five years and will only reproduce once in that time. The female giant squid will release millions of eggs into the water in a jellied clump called an *egg mass*. Most of these eggs are eaten by other ocean creatures, but a few will live to become the giant ocean predators we know. Once the squid is about three years old, it is fully matured. That means they grow really fast!

IMPRESS THE REST: If you really want to impress your friends, or surprise someone in your family, tell them the scientific name for the giant squid: *Architeuthis dux* (look up how to pronounce it first so you really know what you're talking about).

APPEARANCE:

Like the octopus, giant squid have eight arms. They also have two feeding tentacles with clubs at the ends that it uses to snatch food, two eyes, a beak, and a *mantle* which is its head. Its feeding tentacles can catch prey from a long distance (33 feet to be exact!) by shooting out like an arrow. It uses one or both clubs, which are covered in hundreds of sharp-toothed suckers, to catch its prey. The giant squid then uses its eight arms to guide its prey up to its mouth or sharp beak. Giant squid have two eyes the size of dinner plates on its mantle or head which allows it to see its prey deeper in the ocean where there is very little light. It would be hard to miss anything with eyes that big!



DIET

Because these amazing animals live so deep in the water, scientists don't have a lot of information about them. They have never seen them eating to know exactly how they behave, but when they have found dead giant squid, they have been able to see what they recently ate by cutting open their stomachs. They have found deep water fish and other squid (including other giant squids). The anatomy of the giant squid is very different than people, once they capture their prey, they use their beak to break up the food, and the *radula* (a tongue-like organ covered in teeth) grinds it up further. Then they swallow it down the esophagus, and the food travels through the squid's brain to get to the stomach!

HABITAT

Giant squid are rarely seen in their natural habitat deep below the surface of the water. Based on where giant squid have been found washed up on beaches, scientists believe they live in most of the oceans around the world, except in the polar or tropical areas of the ocean. They have often washed up on beaches around New Zealand and the Pacific islands, in the Pacific Ocean. They are also seen along Eastern Canada and United States as well as Western Europe in the Atlantic Ocean. They are most often found in water that is 1,000 to 2,000 feet (300 to 600 m) below the surface. They have also been found as low as 3,800 feet (1,158 m) below the surface of the water.

NOTEBOOK TIME!

Students, it's time to work in your notebooks! Open up your notebook to today's lesson and complete the assignments.

SOURCES:

https://ocean.si.edu/ocean-life/invertebrates/giant-squid
https://marinebio.org/species/giant-squid/architeuthis-dux/
http://www.deepseachallenge.com/the-expedition/mariana-trench/

LESSON 2 · DAY AT A GLANCE · GIANT SQUID

SCIENCE NOTEBOOKING

Today, students will be working on a notebooking page about the giant squid! Students can take notes while they listen to the lesson, or they can wait until you are finished reading so they can do extra research.

MIDDLE SCHOOL
HEADERS: *Appearance, Threats, Habitat, Interesting Facts*

HIGH SCHOOL
HEADERS: *Appearance, Threats, Habitat, Interesting Facts*

EARLY READER + EARLY ELEMENTARY
HEADERS: *Habitat, Appearance, Interesting Facts*

UPPER ELEMENTARY
HEADERS: *Appearance, Diet, Habitat, Interesting Facts*

LANGUAGE ARTS WRITING PROJECT

Today students will begin working on their writing project for this unit! Younger students will be working on writing a paragraph about a marine animal of their choice and older students will be working on a blog post or newspaper article.

EARLY READER - HIGH SCHOOL

ASSIGNMENT: *Choose your topic and begin brainstorming your thoughts or ideas for your writing project.*

SOCIAL STUDIES MARIANA TRENCH

If you are working with multiple students, get everyone to turn to this page so that you can read it all together. You can read it aloud to all of your students, or an older one can read it out loud to the younger ones.

EARLY READER

ASSIGNMENT: *Circle the correct answer.*
ANSWERS: *1. b 2. b*

EARLY ELEMENTARY

ASSIGNMENT: *Circle the correct answer.*
ANSWERS: *1. b 2. a 3. b*

UPPER ELEMENTARY

ASSIGNMENT: *Fill in the blanks with the correct answers.*
ANSWERS: *1. Mariana Trench 2. Mariana Trench was formed when two tectonic plates collided with each other. 3. Answers vary*

MIDDLE SCHOOL

ASSIGNMENT: *Research the questions and fill in the answers, don't forget to write your sources!*
ANSWERS: *1. Mariana Trench 2. Mariana Trench was formed when two tectonic plates collided with each other. Where they impact, one plate is forced uner the other, forming a trench. 3. The Mariana Trench was explored in 1875 by the British ship H.M.S. Challenger. 4. Answers will vary.*

HIGH SCHOOL

ASSIGNMENT: *Research what it means for a place like the Mariana Trench to be considered a protected zone. How do places get classified as a protected zone? Is there anything specific they need to have in order to qualify? Write a paragraph about what you discover.*

LANGUAGE ARTS GRASPING GRAMMAR

Students will work on different grammar assignments, each level is a little bit different today but most of your older kids should be able to handle this one independently since we've given them a solid explanation followed by some examples.

EARLY READER

ASSIGNMENT: *Read the sentences and then circle the correct transitional word to complete the instructions for getting ready for bed.*
ANSWERS: ***First** you floss. **Next** you brush your teeth. **Then** you get into your pajamas. **Finally** you go to bed.*

EARLY ELEMENTARY

ASSIGNMENT: *Underline the verb in each sentence, then add a helping verb from the word bank to complete the sentence.*
ANSWERS: *1. Tad **is** watching television tonight. 2. Johnny **will/can/may** help move your couch tonight. 3. Small fish **are** eaten by bigger fish. 4. Natalie **will/can/may** go to the park tomorrow. 5. She **can/will/may** run to the store after lunch.*

UPPER ELEMENTARY

ASSIGNMENT: ***Add commas to two sentences, then write one sentence of your own using quotation and the proper comma placement.***
ANSWERS: *1. Maggie said, "Our cat chased after our chickens today, and it was really fun to watch." 2. Oscar said, "I went biking down by the creek, and I almost fell when I hit a rock." 3. Answers will vary.*

MIDDLE SCHOOL

ASSIGNMENT: ***Re-write the sentences and underline the title correctly.***
ANSWERS: *1. Who wrote the children's book Goodnight Moon?*
2. My little sister loves to watch the movie Beauty and the Beast.
3. Charlotte's Web was my favorite book in elementary school.
4. Have you seen the movie Homeward Bound?

HIGH SCHOOL

ASSIGNMENT: ***Write a book or movie title to complete the sentences, then write your own sentence that includes a title.***
ANSWERS: *Answers will vary.*

ART DRAW A SEA CREATURE

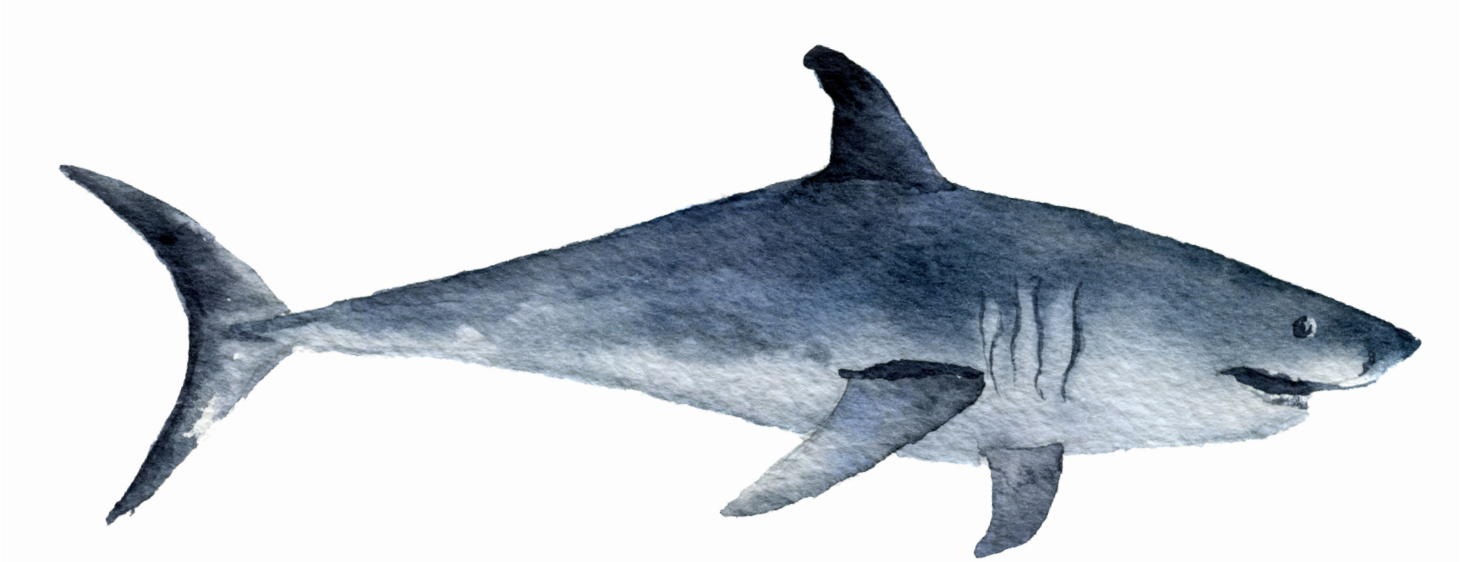
Today students will look at the image of a giant squid and then try to sketch one of their own. If they want, they can add color with colored pencils or watercolor paint! You can do it in this book or they can do it in a science or art journal! Older students can look up more detailed drawings or paintings and try some new techniques if they want!

SHARKS

INTRODUCTION

Sharks have a bad reputation as being scary creatures when in fact they are a very fascinating animal. There are over 470 different species of sharks and only a few of those species have been known to attack humans. That might be scary to many people, but the reality is that you are more likely to get stung by a bee than get attacked by a shark.

Most sharks never sleep; part of the reason is that God designed them to breathe through their gills. When they swim, they open their mouths so that the water passes over their gills where tiny blood vessels take out the oxygen from the water. Some sharks (like the nurse shark) have muscles to pump water over their gills so that they can rest on the ocean floor and still breathe without swimming. On the other hand, there are about 24 species of sharks that have to stay moving constantly so that they can breathe.



Some sharks have live babies (like the hammerhead or mako shark) while others lay eggs (like the bullhead shark). Others sharks lay eggs that hatch inside the mother and grow for a long time (even eating each other) before being born and being independent (like the great white).

Let's learn more about some of these amazing creatures that God made!

IMPRESS THE REST:

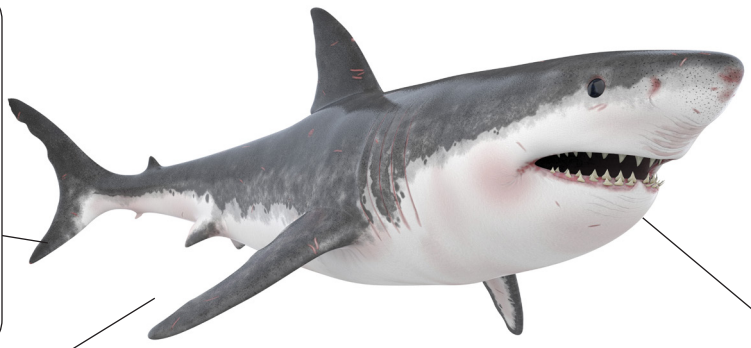
Impress the rest: Did you know that there is in fact oxygen in water? When we write water scientifically, it's written as H2O. The H stands for hydrogen and the O stands for oxygen. Impress your dad when he gets home with that piece of knowledge!

GREAT WHITE SHARK

The great white shark is the largest predatory fish in the ocean and many people have a healthy fear of this large fish. Each year, more than 100 shark attacks happen and of those ⅓ to ½ of them are by great white sharks. Scientists believe, however, that the shark is just "sample biting" and that humans are not actually on the great white shark's menu. These sharks are found in cool, coastal waters of the Atlantic and Pacific Oceans, including the Mediterranean Sea.

DIET:

Great white sharks mostly eat sea lions, seals, small toothed whales, and even sea turtles.



APPEARANCE:

They grow to be between 15 to 20 feet long (4.5 to 6 m). They have gray upper bodies with white stomachs, and this is where they get their name: great white shark.

DID YOU KNOW?

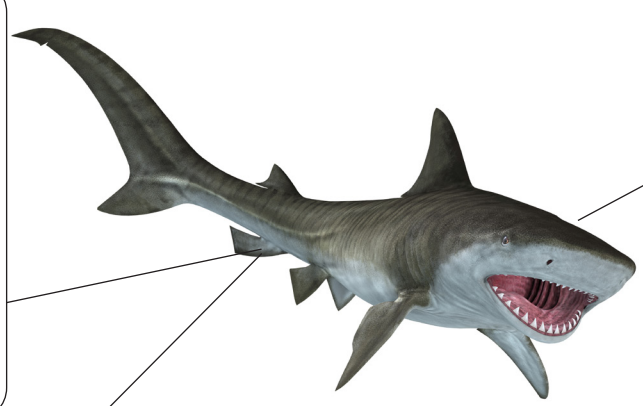
Sharks can feel vibrations in the water from far away and this is what alerts them that there may be food close by. Sharks also have an amazing sense of smell that allows them to smell even the tiniest drop of blood in the water, even from a long distance from where they are. They can also jump out of the water completely when chasing after prey!

TIGER SHARK

This shark is another shark species that people tend to fear. Tiger sharks have the reputation of being man-eaters and it is duly earned. Because they will eat almost anything, they are not likely to swim away like the great white sharks do after sampling a human. These sharks are found in temperate or tropical waters of the Atlantic and Pacific Oceans.

DIET:

Tiger sharks have been known to eat almost anything, including tires and license plates! Their diet mostly consists of seals, stingrays, sea snakes, birds, squid, fish, and sea turtles.



APPEARANCE:

The tiger shark has a blunt-nose and as its name would suggest, stripes on the side of its body. These stripes do fade as they get older. The tiger shark can grow to 10 to 14 feet long (3 to 4.2 m).

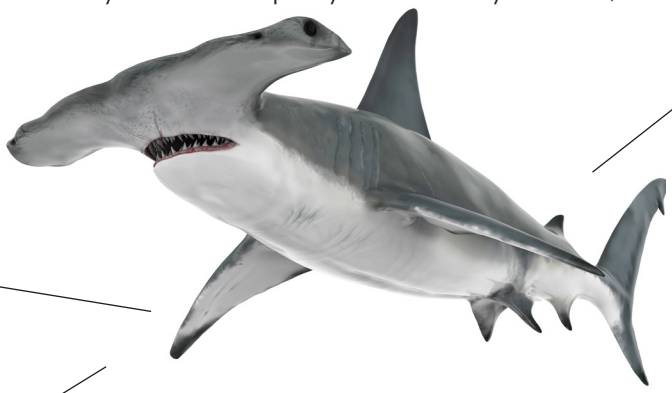
DID YOU KNOW?

Like most shark species, tiger sharks have many rows of teeth in their mouths. Sharks lose their teeth all of the time and when a shark does lose one of its teeth, the tooth from the row behind moves forward to replace that lost tooth. Sharks lose their front row of teeth every few weeks which means a shark can have 30,000 teeth throughout its life.

HAMMERHEAD SHARK

The hammerhead shark has a distinct head shape that makes it one of the easiest shark species to identify. At 13 to 20 feet long (4 to 6 m), it's a massive shark that's hard to miss! Like all sharks, the hammerhead shark has no bones in their body and instead has something called *cartilage* that allows them to be more flexible as well as be able to float better in the water. If you feel the tip of your nose or your ears, that's cartilage and that is what makes up a shark.

HABITAT:
Hammerhead sharks are found in temperate and tropical waters worldwide, both offshore and near shorelines of the Atlantic, Pacific and Indian Oceans.



DIET:
Hammerhead sharks eat smaller fish, rays, octopus, squid and crustaceans. Their odd shaped head and wide set eyes allow the hammerhead shark to find its prey more easily.

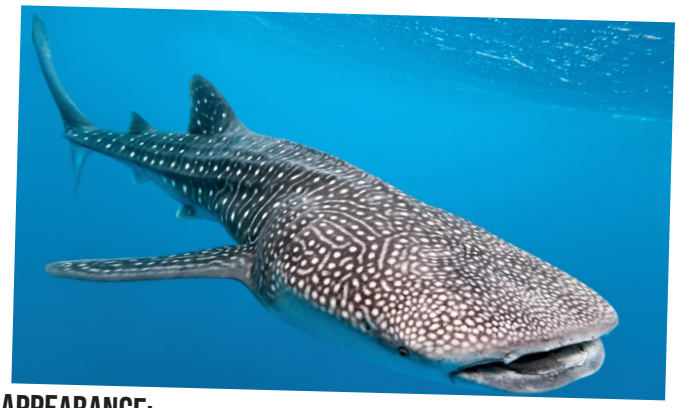
DID YOU KNOW:
Hammerhead sharks have excellent vision. Because their eyes are so far apart and they use both of them to see together, they are able to see 360° around them (this means all around them). Most of the time hammerheads live alone but some of them hunt in groups (schools).

WHALE SHARK

The whale shark is the largest shark species in the entire ocean, and it can get to be 33 feet long (10 meters). The telephone poles outside of many of our houses are usually about 36 feet long. Despite its large size, it's a gentle shark that many scuba divers can get very close to and sometimes can even hitch a ride with them!

DIET:
The whale shark's diet consists mainly of plankton and fish. They are filter feeders and keep their mouths open to take in water and filter out the plankton and fish.

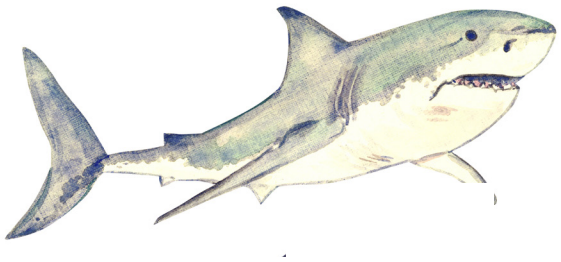
HABITAT:
The whale shark is found in tropical waters of the Atlantic, Pacific and Indian Oceans. They are known to migrate every spring to the west coast of Australia.

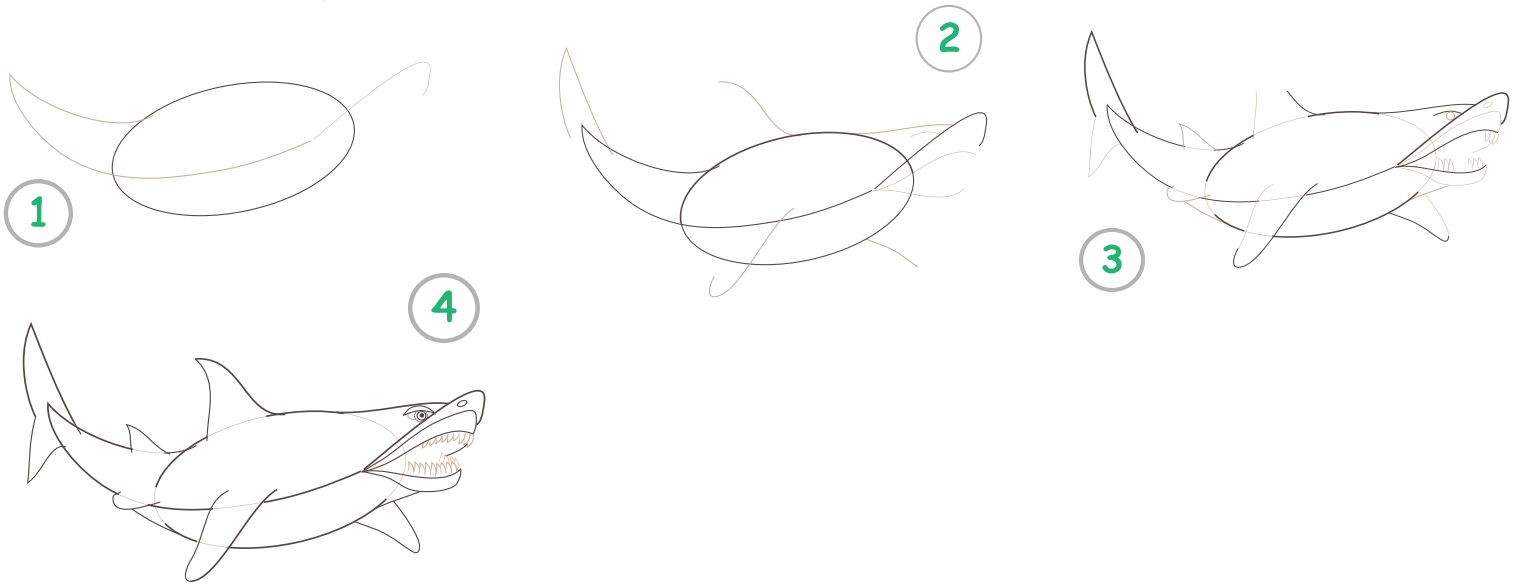


APPEARANCE:
Whale sharks have a flattened head with a blunt snout containing barbels, which are whisker-like, with a likeness to a catfish. Like a fingerprint on humans, each whale shark has a different and unique pattern of spots on their body. Their mouths are about 5 feet wide (1.5 m) and house about 300 teeth, although they don't use their teeth to eat.

YOU TRY!

Need help drawing a shark for your art page? Try following these easy steps!





NOTEBOOK TIME!

Students, it's time to work in your notebooks! Open up your notebook to today's lesson and complete the assignments.

SOURCES:

https://www.surfertoday.com/surfing/the-most-shark-infested-waters-in-the-world
https://www.nationalgeographic.com/animals/fish/group/hammerhead-sharks/
https://www.nationalgeographic.com/animals/fish/g/great-white-shark/
https://www.nationalgeographic.com/animals/fish/w/whale-shark/
https://www.nationalgeographic.com/animals/fish/t/tiger-shark/
https://www.worldatlas.com/articles/the-5-layers-of-the-ocean.html

LESSON 3 · DAY AT A GLANCE · SHARKS

SCIENCE NOTEBOOKING

WHAT'S HAPPENING?

Notebooking pages are opportunities to take notes and record what you remember from the lesson. Today students will use the graphic organizer to take notes about a shark of their choice. They can work while they listen or complete their pages after you are done.

EARLY READER + EARLY ELEMENTARY

HEADERS: *Habitat, Appearance, Interesting Facts*

UPPER ELEMENTARY

HEADERS: *Habitat, Diet, Appearance, Interesting Facts*

MIDDLE SCHOOL

HEADERS: *Characteristics, Interesting Facts, Habitat, Threats*

HIGH SCHOOL

HEADERS: *Choose a topic about one shark species and write it on the line, then research the topic and write about what you have learned.*

SCIENCE OCEAN ZONES

WHAT'S HAPPENING?

If you are working with more than one student in the Early Reader to Upper Elementary levels, Turn to this page together. You can read the passage aloud to all of your students at once, or students can take turns reading aloud to the group.

EARLY READER + EARLY ELEMENTARY

ASSIGNMENT: *Draw a line to label the correct ocean zones.*
ANSWERS: *(In order from top to bottom: Sunlight Zone, Twilight Zone, Midnight Zone, Abyssal Zone, The Trenches.)*

UPPER ELEMENTARY

ASSIGNMENT: *Fill in the names for each ocean zone.*
ANSWERS: *(In order from top to bottom: Sunlight Zone, Twilight Zone, Midnight Zone, Abyssal Zone, The Trenches.)*

MIDDLE SCHOOL

ASSIGNMENT: *Research the names of the five ocean zones. At what depth does each zone start and end? Which zones do the great white shark, tiger shark, hammerhead shark and whale shark live?*
ANSWERS: *Sunlight zone: from surface to 656 feet (199 m), Twilight zone: 656 feet (199 m) to 3,281 feet (1000 m), Midnight Zone: 3,281 feet (1000 m) to 12,124 feet (3,695 m), Abyssal Zone: 12,124 feet (3,695 m) to 19,686 feet (6,000 m), The Trenches Zone: 19.686 feet (6000 m) to 36,100 feet (11,000 m). Sharks swim in sunlight and twilight zones.*

HIGH SCHOOL

ASSIGNMENT: *Research the names (including the scientific names) of each of the five ocean zones. Then do some research about which zones various sharks live in, or what depths the zones start and end at. Compile your research into a paragraph or write an essay about what you find.*
ANSWERS: *Sunlight zone: from surface to 656 feet (199 m), Twilight zone: 656 feet (199 m) to 3,281 feet (1000 m), Midnight Zone: 3,281 feet (1000 m) to 12,124 feet (3,695 m), Abyssal Zone: 12,124 feet (3,695 m) to 19,686 feet (6,000 m), The Trenches Zone: 19.686 feet (6000 m) to 36,100 feet (11,000 m). Sharks swim in sunlight and twilight zones.*

ART DRAW A GREAT WHITE SHARK

WHAT'S HAPPENING?

Today students will look at the image of a great white shark and then try to sketch one of their own. If they want, they can add color with colored pencils or watercolor paint! If they need additional help, there is a "How to Draw a Shark" guide just before the day at a glance started for this lesson! You can do it in this book or they can do it in a science or art journal! Older students can look up more detailed drawings or paintings and try some new techniques if they want!

LANGUAGE ARTS COPYWORK + SPELLING

WHAT'S HAPPENING?

Students will continue to work on their Bible passage for this week. This is an excellent time to repeat the passages as a family to work on memorization!

EARLY READER + EARLY ELEMENTARY

VERSE: *"When you pass through the waters, I will be with you..." Isaiah 43:2a*
SPELLING: *"-er" sounds (Early Reader), water (Early Elementary)*

UPPER ELEMENTARY

VERSE: *"When you pass through the waters, I will be with you; and through the rivers, they shall not overwhelm you; when you walk through fire you shall not be burned, and the flame shall not consume you." Isaiah 43:2*
SPELLING: *through*

MIDDLE + HIGH SCHOOL

VERSE: *"But now thus says the Lord, he who created you, O Jacob, he who formed you, O Israel: "Fear not, for I have redeemed you; I have called you by name, you are mine. When you pass through the waters, I will be with you; and through the rivers, they shall not overwhelm you; when you walk through fire you shall not be burned, and the flame shall not consume you." Isaiah 43:1-2*
ASSIGNMENT: *Look up synonyms for redeemed, overwhelmed, consume, and created.*

SOCIAL STUDIES OCEAN FREIGHT

WHAT'S HAPPENING?

If you are working with multiple students, read the beginning of this assignment to all of your younger students together.

EARLY READER

ASSIGNMENT: *Draw a line from the cargo ship to what it most commonly ships.*
ANSWERS: *tomato, banana, avocado, pomegranate.*

EARLY ELEMENTARY

ASSIGNMENT: *Write the names of the most common items that a cargo ship might haul from one country to another.*
ANSWERS: *banana, mango, cucumber, avocado, tomato, car, truck.*

UPPER ELEMENTARY

ASSIGNMENT: *Write a list of commonly shipped items. Use what you learned to research common imports and exports!*

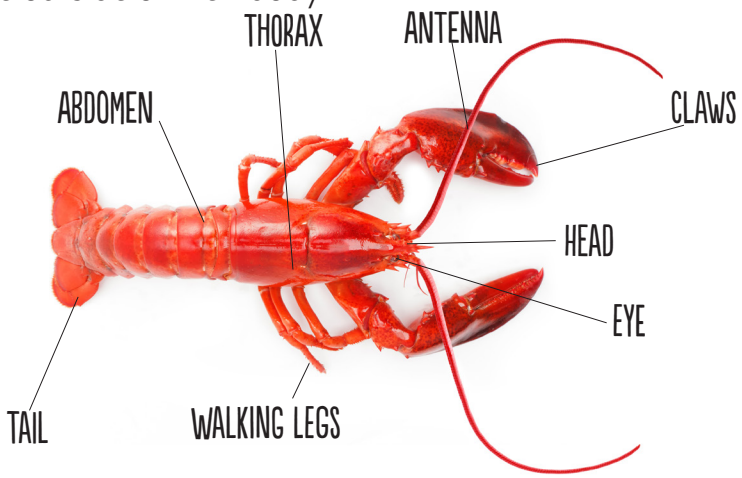
MIDDLE + HIGH SCHOOL

ASSIGNMENT: *Research the largest ocean shipping carrier in the world, what kind of goods they transport, and where they go. High school students will write an essay on their findings.*

CRUSTACEANS

INTRODUCTION

Just take a walk through the grocery store and you are sure to find a few of the creatures we are talking about today. There are over 44,000 known species of crustaceans and most of these live in the ocean. The crustacean gets their name from the Latin word *crustaeus*, meaning having a crust or shell. Have you ever held a lobster? How about a crab? Their shells are very hard, and that hard shell is actually their skeleton. We have bones inside of us that allow us to stand and move, but crustaceans are a part of a larger group of creatures called *arthropods* that have an exoskeleton, meaning their skeleton is on the outside of their body.



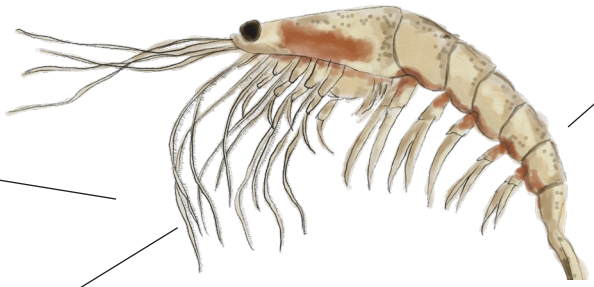
Most crustacean bodies are broken up into three parts: the head, thorax, and abdomen. In some of the larger crustaceans, their head and thorax are fused together into one piece which has the scientific name *Cephalothorax*. On their heads, we can find two pairs of antennae and two eyes on the side of their head. Crustaceans also have appendages, or legs, on their thorax and abdomen. For many species, their front appendages are their claws or pincers. Then the legs on their thorax are used mainly for walking on the bottom of the ocean floor. Finally, the legs that are on the abdomen are usually used for swimming and called *swimmerets*. At the end of the abdomen is a fan-shaped tail which is also used for swimming. Now let's look at some different species of crustaceans.

HOW DO CRUSTACEANS TALK TO ONE ANOTHER?
Any guesses? Most crustaceans talk to one another by flapping their pincers or drumming their claws.

KRILL

This animal may be one of the smallest creatures found in the ocean, but they have a very critical role. Krill are an important food source for many of the marine animals in this unit, including whales, squid, and seals. *Krill* is a Norwegian word that means "small fry of a fish" and that's exactly what they are.

DIET:
Krill are filter feeders. They filter plankton and algae from the water around them.



APPEARANCE:
Krill are mostly transparent in color with some having a slight reddish or pinkish color to them. What is most noticeable are their dark black eyes. They are on average about 2 inches long (5 cm) and are often found swimming in groups.

HABITAT:
Krill are found worldwide in all five of our oceans, including the polar regions of the Southern Ocean and the Arctic Ocean.

JAPANESE SPIDER CRAB

This is the largest species of crab on earth, and gets its name from looking a lot like a spider with its long legs. Japanese spider crabs are found along the sandy and rocky bottoms of the Pacific Ocean around southern Japan. These crabs are unable to swim and are found walking along the ocean floor stalking their prey. They are considered a delicacy, but they are hard to find because they live on the ocean floor.

DIET:
Japanese spider crabs are scavengers and eat dead fish and other shellfish. They also can eat algae, plants, and small fish.

DID YOU KNOW?
Scientists believe this crab can live to be as old as 100 years old! Sadly, they do not live very long before they get leg injuries. Their long and lanky legs are very weak, and often the older crabs are found to be missing legs.

APPEARANCE:
The Japanese spider crab has an orange body with white spots along its legs. It also has a leg span of 12 feet long (3.7 m), a body size of 15 inches across (38 cm), and can weigh as much as 44 pounds (20 kg)!

AMERICAN LOBSTER

The American lobster is the second largest crustacean in the ocean, and is found crawling along the rocky bottom of the Atlantic Ocean around North America. They are often referred to as bottom feeders, and as such they help maintain the health of our oceans by eating the decaying or rotting matter on the bottom of the ocean. They also eat crab, mussels, clams, sea stars, sea urchins, and shrimp.

APPEARANCE:

Most American lobsters are a rusty brown color, but they can also have a variety of different colors and patterns. Some lobsters have been found that are bright blue, green, and even some divided perfectly down the middle with different colors on each side (e.g. half blue, half black).

DID YOU KNOW?

Many crustaceans, like the American lobster, have a hard exoskeleton that does not grow with them. Eventually, when the lobster has outgrown its shell, that exoskeleton will need to be molted and a new one grown in its place. The lobster also has two front claws that each do a different task. They have a larger one that is used for crushing its food while the slightly smaller one is used for cutting things open.

THAT'S INTERESTING!

When you go to buy lobsters in the store, you are often given two choices: soft shell or hard shell. A soft-shell lobster is a lobster that has recently molted its old exoskeleton and has regrown a new, softer shell. A hard-shell lobster means that the lobster has had its shell for awhile. This lobster is probably getting a little crowded in its shell and is getting ready to molt.

EXTENSION ACTIVITY

Look up pictures of American lobsters and see how many different color variations you can find!

NOTEBOOK TIME!

Students, it's time to work in your notebooks! Open up your notebook to today's lesson and complete the assignments.

SOURCES:

https://eol.org/docs/discover/crustaceans
https://www.infoplease.com/encyclopedia/ecology/animals/invertebrates/crustacean/classification
https://www.livescience.com/55392-do-lobsters-live-forever.html
https://dwazoo.com/animal/japanese-spider-crab/
https://www.nationalgeographic.com/animals/invertebrates/group/krill/

LESSON 4 · DAY AT A GLANCE · CRUSTACEANS

SCIENCE NOTEBOOKING

WHAT'S HAPPENING?

Today, students will be working on a notebooking page about a crustacean of their choosing. Students can take notes while they listen to the lesson, or they can wait until you are finished reading so they can do extra research.

EARLY READER + EARLY ELEMENTARY
HEADERS: *Habitat, Diet, Interesting Facts*

UPPER ELEMENTARY
HEADERS: *Appearance, Diet, Habitat, Interesting Facts*

MIDDLE SCHOOL
HEADERS: *Characteristics, Interesting Facts, Habitat, Threats*

HIGH SCHOOL
HEADERS: *Characteristics, Interesting Facts, Habitat, Threats*

LANGUAGE ARTS FREEWRITE

Students will be doing a free write today. Grab a timer, and set it for 5 minutes. Each of your students will have the option of choosing their own topic, or from a list of prompts, and will spend 5 minutes writing whatever they like about that topic.

EARLY READER + EARLY ELEMENTARY

ASSIGNMENT: *Choose a topic you'd like to write about. Write or dictate to your parent or older sibling for 5-10 minutes about your topic.*

UPPER ELEMENTARY - HIGH SCHOOL

ASSIGNMENT: *Set a timer and write for 10-15 minuters about the topic of your choice!*

LA + BIBLE DICTATION

This week you have been working on a Bible passage together as a family. If your child memorized their Bible passage, they can write it from memory. Also, you can dictate the passage and have students write it out. Passages in the book are from ESV but feel free to use your own translation if you prefer.

EARLY READER + EARLY ELEMENTARY

DICTATE: *"When you pass through the waters, I will be with you..." Isaiah 43:2a (Early Reader students will copy the verse instead of writing it from memory today).*

UPPER ELEMENTARY

DICTATE: *"When you pass through the waters, I will be with you; and through the rivers, they shall not overwhelm you; when you walk through fire you shall not be burned, and the flame shall not consume you." Isaiah 43:2*

MIDDLE + HIGH SCHOOL

DICTATE: *"But now thus says the Lord, he who created you, O Jacob, he who formed you, O Israel: "Fear not, for I have redeemed you; I have called you by name, you are mine. When you pass through the waters, I will be with you; and through the rivers, they shall not overwhelm you; when you walk through fire you shall not be burned, and the flame shall not consume you." Isaiah 43:1-2*

SOCIAL STUDIES INDUSTRY

All of your students from Early Reader through Upper Elementary will read the same passage today about the life of a lobsterman from Maine! You can read the passage aloud to all of your students, or ask them to take turns reading aloud to one another.

EARLY READER

ASSIGNMENT: *Discuss the following questions with your family.*
1) What would be your favorite part of working as a lobsterman?
2) If you could ask "Mike" anything about his job, what would it be?

EARLY ELEMENTARY

ASSIGNMENT: *Answer the multiple choice questions.*
ANSWERS: *1. Sunrise 2. Small 3. Summer*

UPPER ELEMENTARY

ASSIGNMENT: *Imagine what it would be like to work as a lobsterman, and then answer the questions.*

MIDDLE SCHOOL

ASSIGNMENT: *Research lobstering or crabbing, and fill in the boxes with the information you find.*

HIGH SCHOOL

ASSIGNMENT: *Research lobstering or crabbing, and record the information you find in the boxes. Fill in a venn diagram to compare commercial lobstering or crabbing to another industry around where you live.*

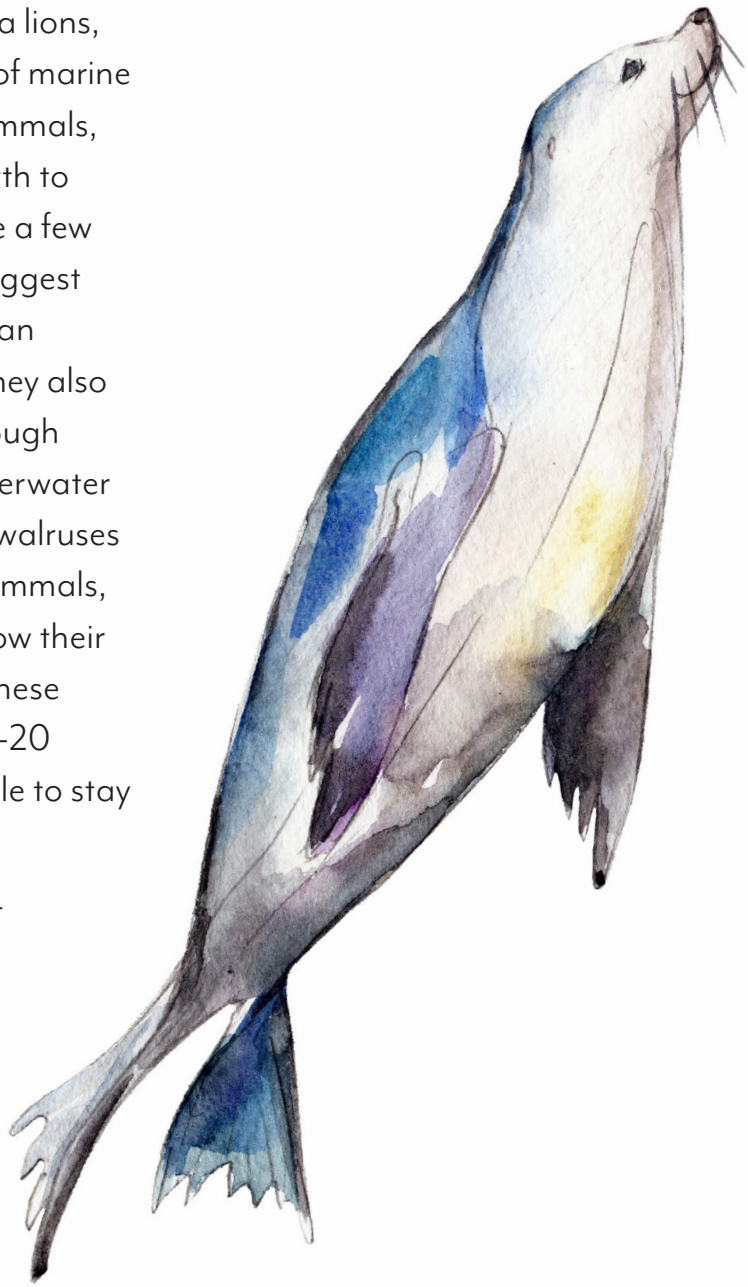
ART DRAW A SEA CREATURE

Today students will look at an image of a lobster and then try to sketch one of their own. If they want, they can add color with colored pencils or watercolor paint! You can do it in this book or they can do it in a science or art journal! Older students can look up more detailed drawings or paintings and try some new techniques if they want!

SEALS, SEA LIONS, AND WALRUSES

INTRODUCTION

Today we are going to learn about a group of marine mammals that so many people love! Seals, sea lions, and walruses make up one of the five groups of marine mammals, called *pinnipeds*. Just like other mammals, marine mammals have hair or fur and give birth to live young. Seals, sea lions, and walruses have a few different features from other mammals, the biggest one being the ability to survive in the cold ocean waters of the Arctic and Southern Oceans. They also cannot breathe underwater like fish can. Through special God given features, they can stay underwater for long periods of time. Seals, sea lions, and walruses have more blood in their bodies than land mammals, compared to their body size. They can also slow their heart beats, using less oxygen when diving. These features allow them to stay underwater for 10-20 minutes at a time. Can you imagine being able to stay underwater for 10 minutes at a time?



Seals, sea lions, and walruses have a torpedo-like shape, although the walrus is a lot bigger than seals and sea lions. They have full upper bodies and narrower lower bodies where their tails are. They look extremely awkward on land as they drag their bodies around, but once they're in the ocean, they are like bullets flying through the water. Now, let's learn a little about each of these marine mammals!

HARBOR SEAL

Our first seal is the harbor seal, and it is the most common seal. This seal spends half of its life in the water and the other half on land along the rocky shores and sandy beaches of the Northern Atlantic and Pacific Oceans. They prefer to stay close to shore, even when they are in the ocean. Harbor seals give birth once a year and will nurse their pup for 4-5 weeks after they are born. Even though pups can swim immediately after they are born, they will stay on their mother's back while she dives for food and remain close to her until they are grown.

DIET:
Harbor seals eat whatever is available to them, including fish, shellfish, and crustaceans. They have also been known to eat octopus and squid.

APPEARANCE:
Harbor seals have spotted coats in many colors, such as white, gray, black, or dark brown. They can grow to be between 5-6 feet long (1.5-2.1 m) and weigh 300 pounds (136 kg). Harbor seals have short flippers and are sometimes called the "crawling seals," compared to their upright cousin, the sea lion.

HABITAT:
Harbor seals can sleep underwater and come up for air every 30 minutes. When harbor seal pups are born, they can swim right at birth! They can also dive for up to 2 minutes, and as they grow older, that time increases.

EXTENSION ACTIVITY:
Look up and read the story about Harry Goodridge and Andre the harbor seal.

HAWAIIAN MONK SEAL

While most seal species live in the colder Arctic waters, the Hawaiian monk seal prefers the warm waters around the northwest Hawaiian Islands in the Pacific Ocean. They spend most of their life at sea, but they come to shore to rest on beaches or find protection from storms. This seal's ancient Hawaiian name means "dog that runs in rough water." Where other seals live in groups, the Hawaiian monk seal lives alone. This seal is one of the most endangered marine mammals on earth. Tiger sharks particularly like monk seal pups and this has made it hard for the monk seals to recover. Male monk seals are also very aggressive and have been known to kill the females in their species.

DIET:
Their diet consists of fish, spiny lobsters, eels, and octopus that live along the coral reefs near the Hawaiian Islands.

APPEARANCE:
Hawaiian monk seals have silvery-gray colored backs with creamy colored stomachs. The Hawaiian monk seal can grow up to 7.5 feet long (2.3 m) and weigh as much as 450 pounds (205 kg).

CALIFORNIA SEA LION

When you think of a circus seal with a ball balanced on its nose, that's exactly what the California sea lion looks like. Even though seals and sea lions look very similar, the biggest difference between them are their ears! Sea lions have downward turned flaps by their ears so water cannot get in them. Seals just have a tiny hole for an ear opening. Sea lions give birth to their babies in June or July. They nurse for 5-6 months or sometimes over a year. Mom sea lions are able to recognize their own pups in a crowd by the sound of their voices and how they smell.

HABITAT:
They are found along the rocky coastlines of the Pacific Ocean along western North America. Huge groups of sea lions are found together along the coast, often with one male and many females and pups in a grouping.

APPEARANCE:
Unlike other species of sea lions, the California sea lion does not have the lion's mane that gives it its name. Their front flippers are broad and help them walk on land. Sea lions also bark like dogs to communicate with one another.

DIET:
Sea lions primarily eat fish, squid, and shellfish.

WALRUS

With its mustached mouth and long tusks, the walrus is a well-known marine animal. They are also a very large mammal, with large blubbery bodies that can be 7.5 to 11.5 feet long (2.2 to 3.5 m) and weigh up to 3,000 pounds (1,360 kg). Due to their large size, getting out of the water on the ice can be difficult. So walruses use their tusks to pull themselves out of the water. Despite their large size, they are agile in the water. They are visual predators with excellent hearing, especially underwater, even though they lack ears on the outside of their body like other mammals.

HABITAT:
Walruses are found near the Arctic Circle in the Arctic Ocean, as well as the northern parts of the Atlantic and Pacific Oceans.

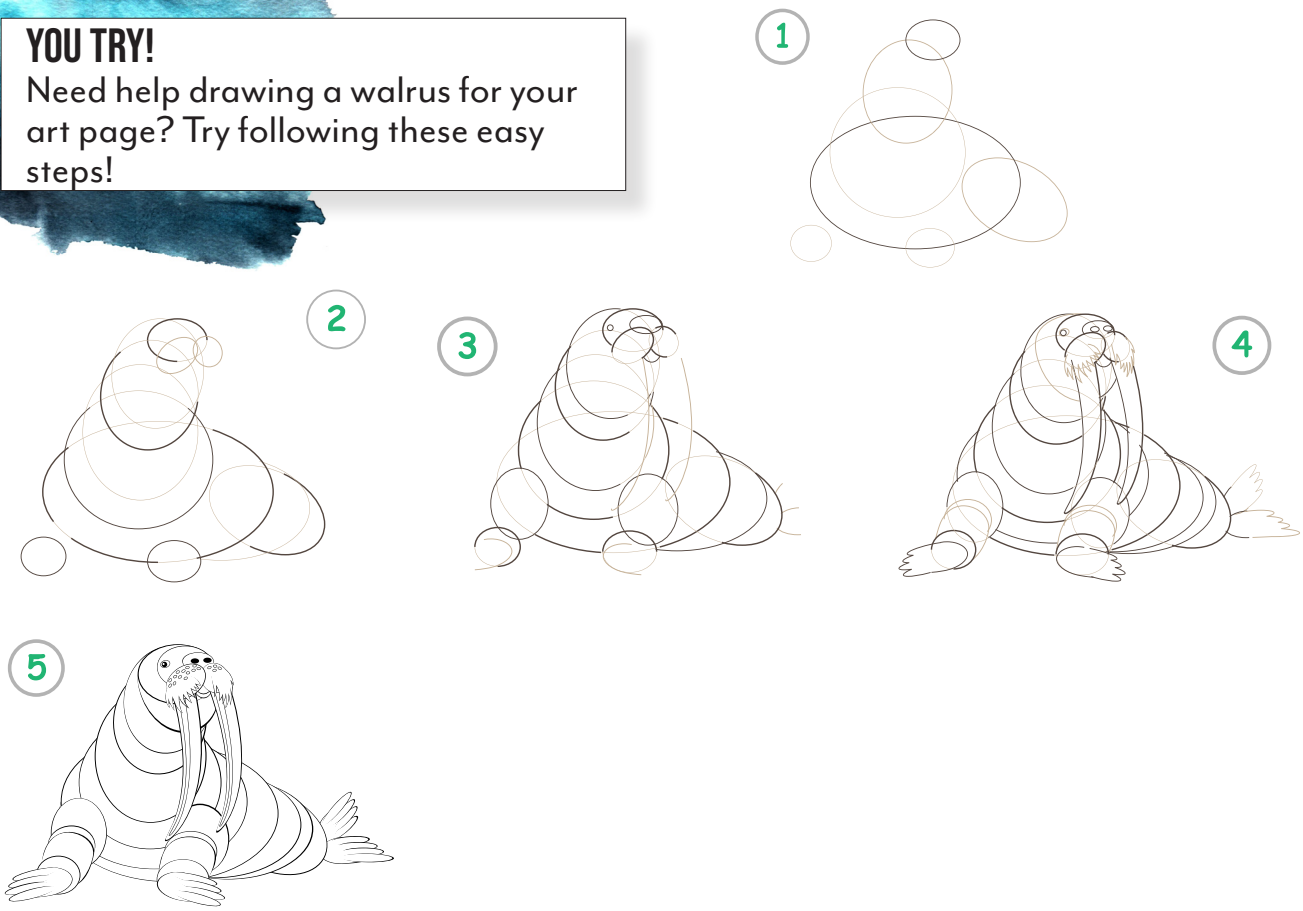
DID YOU KNOW?
Walruses are quite social. They are often found snorting and loudly bellowing to one another. They are known to live in large groups, usually separated by females and males.

YOUR TURN!
Look up videos of walruses "talking" with one another, as well as other videos of this unique creature.

DIET: Their primary source of food are clams, but they have been known to eat sea cucumbers, coral, shrimp, crabs, seals, sea birds, and whales. The walrus dives underwater to find food along the ocean floor and can stay underwater for 30 minutes. The walrus's whiskers are used to find shellfish that live on the dark ocean floor.

YOU TRY!

Need help drawing a walrus for your art page? Try following these easy steps!



NOTEBOOK TIME!

Students, it's time to work in your notebooks! Open up your notebook to today's lesson and complete the assignments.

SOURCES:

https://www.britannica.com/animal/pinniped
https://www.nationalgeographic.com/animals/mammals/w/walrus/
https://www.fisheries.noaa.gov/species/harbor-seal
https://www.nationalgeographic.com/animals/mammals/c/california-sea-lion/
https://www.nwf.org/Educational-Resources/Wildlife-Guide/Mammals/Hawaiian-Monk-Seal
https://www.nationalgeographic.org/encyclopedia/blubber/
http://www.seagrant.umn.edu/coastal_communities/hypothermia#what

LESSON 5 • DAY AT A GLANCE • SEALS, SEA LIONS + WALRUSES

SCIENCE NOTEBOOKING

WHAT'S HAPPENING?

Today students will use the graphic organizer to take notes about a seal, sea lion, or walrus of their choice. Students can work on this page and take notes while they listen or complete their pages after you have finished reading from the Teacher's Guide.

MIDDLE SCHOOL

HEADERS: *Venn Diagram of Seals vs. Sea Lions.*

HIGH SCHOOL

HEADERS: *Venn Diagram of Seals vs. Sea Lions.*

EARLY READER + EARLY ELEMENTARY

HEADERS: *Habitat, Diet, Interesting Facts*

UPPER ELEMENTARY

HEADERS: *Habitat, Diet, Appearance, Interesting Facts*

SCIENCE BLUBBER

WHAT'S HAPPENING?

Students will be learning about blubber: the thick layer of fat that marine animals (like seals) use to stay warm. Want to see for yourselves how blubber keeps marine animals warm? You'll need a container for water, some ice, a block of Crisco, and 2 sandwich bags!

EARLY READER

ASSIGNMENT: *Cut out the items from the appendix that you would use to stay warm on a cold winter day.*
ANSWERS: *scarf, sweater, mittens, warm hat, gloves*

EARLY ELEMENTARY

ASSIGNMENT: *Circle the items that you would use to stay warm on a cold winter day.*
ANSWERS: *jacket, hat, boots, scarf, mittens*

UPPER ELEMENTARY

ASSIGNMENT: *Answer the questions to see how we make up for not having blubber.*
ANSWERS: *Answers will vary but could include winter clothing and life jackets.*

MIDDLE SCHOOL

ASSIGNMENT: *Research and answer the questions.*
ANSWERS: *1. A person can survive in 41ºF(5ºC) water for up to 20 minutes before hypothermia sets in. 2. Shivering, slurred speech, shallow breathing, weak pulse, drowsiness,confusion, loss of consciousness. 3. Be gentle with the victim, move them out of the cold, remove wet clothes, cover with warm blankets, monitor breathing, provide warm drinks.*

HIGH SCHOOL

ASSIGNMENT: *Research the answers to the questions.*
ANSWERS: *1. Hypothermia is the condition of having an abnormally low body temperature, typically one that is dangerously low. 2. The symptoms of hypothermia are shivering, slurred speech, shallow breathing, weak pulse, drowsiness, confusion, loss of consciousness. 3. The mammalian diving reflex is the body's physiological response to submersion in cold water and includes slectively shutting down parts of the body in order to conserve energy for survival. 4. The torso reflex, also known as the gasp reflex, inhalation response, or cold water shock is caused by sudden immersion into water colder than 70 degrees (21 degrees C).*

ART DRAW A WALRUS

WHAT'S HAPPENING?

Today students will look at the image of a walrus and then try to sketch one of their own. If they want, they can add color with colored pencils or watercolor paint! If they need additional help, there is a "How to Draw a Walrus" guide just before the day at a glance started for this lesson! You can do it in this book or they can do it in a science or art journal! Older students can look up more detailed drawings or paintings and try some new techniques if they want!

LANGUAGE ARTS COPYWORK + SPELLING

WHAT'S HAPPENING?

Students will work on their Bible passage for this week. This is an excellent time to repeat the passages as a family to work on memorization!

EARLY READER + EARLY ELEMENTARY

VERSE: *"You rule the raging of the sea; when its waves rise, you still them." Psalm 89:9*
SPELLING: *waves (Early Reader), raging (Early Elementary)*

UPPER ELEMENTARY

VERSE: *"O LORD God of hosts, who is mighty as you are, O LORD, with your faithfulness all around you? You rule the raging of the sea; when its waves rise, you still them." Psalm 89:8-9*
SPELLING: *faithfulness*

MIDDLE + HIGH SCHOOL

VERSE: *"For who in the skies can be compared to the Lord? Who among the heavenly beings is like the Lord, a God greatly to be feared in the council of the holy ones, and awesome above all who are around him? O Lord God of hosts, who is mighty as you are, O Lord, with your faithfulness all around you? You rule the raging of the sea; when its waves rise, you still them." Psalm 89:6-9*
SPELLING: *faithfulness (Middle School)*

SOCIAL STUDIES

WHAT'S HAPPENING?

ENDANGERED MARINE ANIMALS

Your students from Early Reader through Middle School will all be watching a movie on engangered manatees today at:
https://oceantoday.noaa.gov/fullmoon-manatees/welcome.html

EARLY READER

ASSIGNMENT: *Watch the video, then discuss the questions with a parent or older sibling. 1. What is one reason manatees were endangered? 2. What is being done to help save the manatees?*

EARLY ELEMENTARY

ASSIGNMENT: *Circle your answer to the questions.*
ANSWERS: *1. B 2. A*

UPPER ELEMENTARY

ASSIGNMENT: *Write your answers to the questions.*
ANSWERS: *1. Loss of habitat/nesting grounds and collision with boats or ships. 2. Informing the public, educating on signs of manatees in the water, slow speed zones in manatee habitats.*

MIDDLE SCHOOL

ASSIGNMENT: *After watching the video, do some research on Manatees and record your findings in the boxes.*

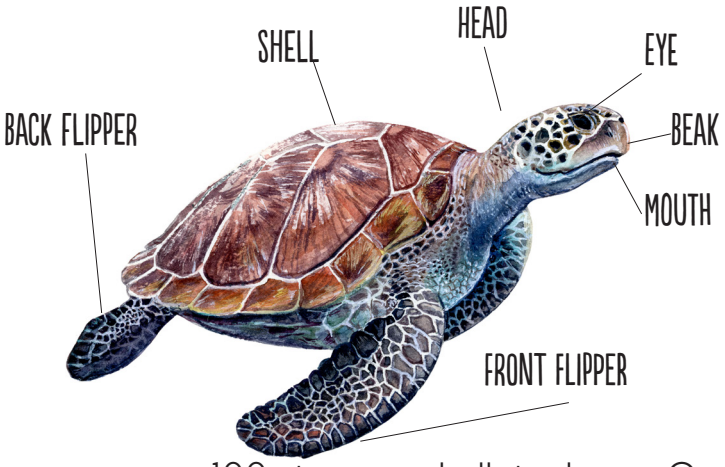
HIGH SCHOOL

ASSIGNMENT: *Research an endangered ocean animal and write your thoughts in a paragraph response.*

SEA TURTLES

INTRODUCTION

For many years, sea turtles have graced our oceans, and today, 7 different species are found worldwide. All seven species have the same basic structure with only small differences between them. They all have front and back flippers that they use to gracefully swim through the oceans. Their back flippers also help them steer while swimming. Female sea turtles also use their back flippers to dig a hole in the sand where she will lay her eggs. All turtles have a shell that helps protect their body. Sea turtles do not come out of their shells, despite what the cartoons show us! Their heads have a hard skull bone within to protect their brain, much like its shell protects its body. Above their mouth is a beak that they use for scraping, crushing, tearing, or biting their food.



Sea turtles are amazing creatures that make incredibly long migrations from where they find their food to where they lay their eggs each year. The leatherback turtle will go 3,700 miles (5,954 km) one way to to lay their eggs on the beach. Sea turtles will return to the same beach every summer to make their nest. Mothers dig a hole in the sand where they lay their eggs, often as many as 100 ping-pong ball sized eggs. Once all the eggs are in the nest, the mother sea turtle will bury the eggs with sand and off she goes, back to the sea. The eggs remain buried, incubating in the warm sand for about 60 days.

When they are ready to hatch, the baby turtles dig their way to the surface. This is known as a "turtle boil," because so many of them come up at the same time and it makes the sand look like it's boiling! The baby sea turtles then make the dangerous journey from their nest to the ocean, using the light from the sun or moon to guide them down the beach. Many are eaten by sea gulls and crabs, but many others will make it to the ocean. Once they have reached the ocean, they enter what scientists call the "lost years." Since they are so small, scientists have very little information on what happens to them and how many survive to maturity. But as they grow, they return to coastal waters to forage for food.

Sea turtles often ride the currents of our oceans to find food and get from place to place. What exactly are ocean currents? A *current* is like a large river within our oceans. As the ocean water moves, it affects our climates, the plants that grow around the ocean, and the seafood we get to eat. These ocean currents are made by the wind, by how dense or how salty the ocean waters are, and by the ocean's tides. The earth's rotation also impacts the currents and changes the direction that currents flow. This is called the *Coriolis effect.*

DID YOU KNOW?

The temperature of the sand will determine the gender of the sea turtle babies. Warmer sand means there will be more female sea turtles, and cooler sand means there will be more male sea turtle babies.

EXTENSION ACTIVITY:

Look up videos of baby sea turtles hatching from their nest and making their way to the ocean. It's an amazing experience to watch!

YOUR TURN!

Watch this video about the Coriolis effect and how it works:
https://www.nationalgeographic.org/encyclopedia/coriolis-effect/

GREEN SEA TURTLE

The first species we are going to learn about today is the green sea turtle. This turtle gets its name not from its shell, which is brown, but from the greenish color of its skin. Green sea turtles are one of the largest sea turtles in the world. Their shell can be up to 5 feet long (1.5 m), and they can weigh up to 700 pounds (317 kg). Green sea turtles live in the tropical and sub-tropical waters of the Atlantic, Pacific, and Indian Oceans.

DIET:
When green sea turtles are younger, they eat sea grass and algae. When they are older, they will eat crabs and jellyfish.

DID YOU KNOW:
Green sea turtles make long migrations in order to lay their eggs, often to the same sandy beaches that they were born. The female green sea turtle will dig a hole on the beach and lay 100-200 eggs.

LEATHERBACK SEA TURTLE

The leatherback sea turtle is the largest sea turtle in the world! Their shell can get to 7 feet long (2.1 m), and they can weigh as much as 2,000 pounds (907 kg). Leatherback turtles have a unique shell that has seven long ridges that run down it. While other sea turtles have a hard shell, a leatherback sea turtle's shell has an almost rubbery feel.

DIET:
Leatherbacks are unique in that their main food source is jellyfish. They also eat fish, sea urchins, and squid.

HABITAT: Leatherbacks have the largest range of any reptile or cold-blooded animal. They are found in the temperate and tropic waters of the Atlantic, Pacific, and Indian Ocean, as well as the Mediterranean Sea. They go as far north as Canada and Norway and as far south as New Zealand and South America.

DID YOU KNOW:
They can dive down as far as 4,200 feet (1,280 km), which is deeper than any other sea turtle can dive.

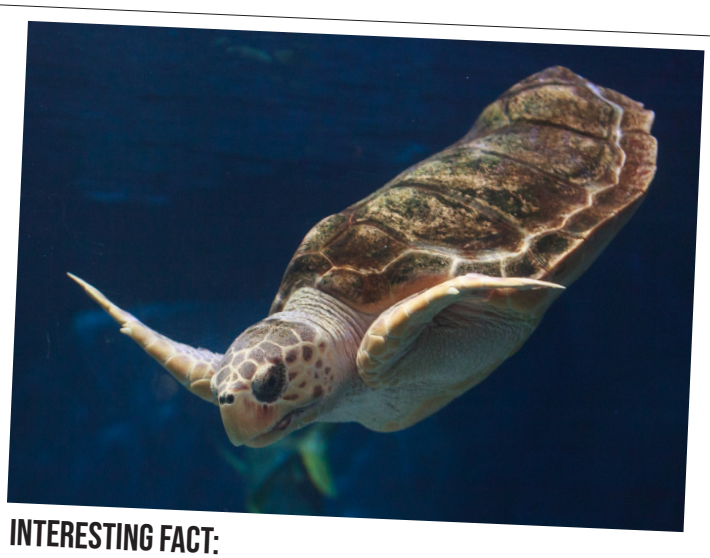
LOGGERHEAD SEA TURTLE

Loggerhead sea turtles get their name from having a large head that other sea turtles don't have. They also have powerful jaws that help them eat *conchs*, which are large shelled snails. They are smaller sea turtles, only growing to about 3 feet long (0.9 m) and weighing about 250 pounds (113 kg). This is the sea turtle that is most familiar and referenced in a popular movie about a small orange fish!

DIET:
They are carnivores, eating jellyfish, conchs, crabs, and fish. They also eat seaweed.

HABITAT:
Loggerhead sea turtles are found in the tropical and sub-tropical waters of the Atlantic, Pacific, and Indian Oceans.

EXTENSION ACTIVITY:
Choose another species of sea turtle to research. What makes them unique from the ones we've looked at today?



INTERESTING FACT:
Loggerhead sea turtles can rest or sleep underwater for several hours, but when diving and searching for food, they cannot stay under as long.

NOTEBOOK TIME!

Students, it's time to work in your notebooks! Open up your notebook to today's lesson and complete the assignments.

SOURCES:

https://www.nationalgeographic.com/animals/reptiles/g/green-sea-turtle/
https://www.nationalgeographic.com/animals/reptiles/l/leatherback-sea-turtle/
https://marinebio.org/species/loggerhead-sea-turtles/caretta-caretta/

LESSON 6 • DAY AT A GLANCE • SEA TURTLES

SCIENCE NOTEBOOKING

WHAT'S HAPPENING?

Today, students will be working on a notebooking page about a sea turtle of their choice. Students can take notes while they listen to the lesson, or they can wait until you are finished reading so they can do extra research.

MIDDLE SCHOOL
HEADERS: *Appearance, Threats, Habitat, Interesting Facts*

HIGH SCHOOL
HEADERS: *Appearance, Threats, Habitat, Interesting Facts*

EARLY READER + EARLY ELEMENTARY
HEADERS: *Habitat, Diet, Interesting Facts*

UPPER ELEMENTARY
HEADERS: *Appearance, Diet, Habitat, Interesting Facts*

LANGUAGE ARTS WRITING PROJECT

WHAT'S HAPPENING?

Students will continue on their writing project today. Younger students will work on the middle section of their paragraph, upper elementary students will work on some research, and older students will work on choosing the titles and headers for their blog post or newspaper article.

EARLY READER - UPPER ELEMENTARY

ASSIGNMENT: *Write or dictate some details based on your ideas from Lesson 2 to work on a rough draft of the middle portion, the body, of your paragraph.*

MIDDLE + HIGH SCHOOL

ASSIGNMENT: *Read the graphic organizer on the second page to plan your headings for your article.*

SCIENCE OCEAN CURRENTS

WHAT'S HAPPENING?

If you are working with multiple students, get all of the younger students to turn to this page together while you read it aloud, or have them take turns reading it aloud to one another.

EARLY READER

ASSIGNMENT: *Circle yes or no to each question.*
ANSWERS: *Yes, no, yes.*

EARLY ELEMENTARY

ASSIGNMENT: *Circle true or false.*
ANSWERS: *True, false, true, true.*

UPPER ELEMENTARY

ASSIGNMENT: *Answer the questions.*
ANSWERS: *1. Ocean curents are caused by the wind, by how dense or how salty the ocean waters are, and by ocean tides. 2. Currents bring warm water from the equator to areas that would otherwise be cooler. 3. The gulf stream current. 4. Currents help the ocean stay at a stable water temperature by mixing the warmed top layer of the ocean with the cooler deep layers.*

MIDDLE + HIGH SCHOOL

ASSIGNMENT: *Research ocean currents and answer the questions.*
ANSWERS: *1. Ocean curents are caused by the wind, by how dense or how salty the ocean waters are, and by ocean tides. 2. By moving heat from the equator toward the poles, ocean currents play an important role in controlling the climate. 3. Ocean currents act much like a conveyor belt, transporting warm water and precipitation from the equator toward the poles and cold water from the poles back to the tropics. 4. Two of the most commonly identified currents are surface currents and deep ocean currents. 5. Answers will vary.*

LANGUAGE ARTS GRASPING GRAMMAR

WHAT'S HAPPENING?

Each level will be working on something a little bit different in this lesson since it's so important to ensure a solid foundation in grammar for younger students while providing more challenging concepts for older students.

EARLY READER

ASSIGNMENT: *Circle the word that needs to be capitalized.*
ANSWERS: *Saturday - capital, weekend - not capital, Tuesday - capital, weekday - not capital, Friday - capital.*

EARLY ELEMENTARY

ASSIGNMENT: *Write the compound subjects into the new sentences.*
ANSWERS: *2. Sharks and jellyfish live in the ocean. 3. Geese and ducks fly south for the winter.*

UPPER ELEMENTARY

ASSIGNMENT: *Re-write the sentences, and add the quotation marks and comma.*
ANSWERS: *1. Sarah said, "Let's go ride our bikes at the marina today." 2. Jasper remarked, "Those clouds look like rain clouds." 3. Walter said "My sister loved that movie." 4. Maria said to her friends, "Meet me at the swings in the park." 5. Chris said, "I'm not going to karate today."*

MIDDLE SCHOOL

ASSIGNMENT: *Take a website you've used as a source and cite it in both the APA and MLA formatting.*

HIGH SCHOOL

ASSIGNMENT: *Using the lines, take a book you're reading, or have read, and cite it in both the APA and MLA formatting.*

ART DRAW A SEA TURTLE

WHAT'S HAPPENING?

Today students will look at the image of a sea turtle and then try to sketch one of their own. If they want, they can add color with colored pencils or watercolor paint! You can do it in this book or they can do it in a science or art journal! Older students can look up more detailed drawings or paintings and try some new techniques if they want!

LUMINESCENT FISH

INTRODUCTION:

Let's take a little journey to a magical place along the beaches of Puerto Rico. It's night and everything around is dark, except what appears to be thousands of fireflies in the water. These blueish-green lights are what draw thousands of people each year to see the "fireflies of the sea." But these "fireflies" are not the bugs; they are plankton that are *bioluminescent* (glow in the dark).

There are many different animals and creatures in the ocean that have this special "glow in the dark" feature; but what causes them to glow? When you mix warm water and yeast together, it creates a chemical reaction and starts to bubble or release energy. A chemical reaction is exactly what happens to create this glowing energy that some fish produce. The light is made when oxygen and a special substance, either "luciferin" or "luciferase," mix together. The light can be different colors, but the most common color is blue or blue-green because this color is seen best underwater.

So why do fish and other ocean creatures glow? Some glow in order to attract prey closer so they will be able to catch them. Others use it for defense, to scare away predators. Some ocean creatures use it as a camouflage; by glowing, they blend in with the light from the surface coming down to the deeper ocean. Some species use their glowing colors to talk with other creatures. Whatever the reason, seeing these creatures glow is just another amazing way to see God's creativity in action!

Let's look at a few ocean creatures that use bioluminescence!

ANGLERFISH

Our first species is the anglerfish, and it's definitely a unique fish. Anglerfish are dark gray or dark brown in color. They have huge heads with crescent-shaped mouths filled with sharp, translucent teeth. Their mouths are so big that they can actually swallow a fish twice its size. Most anglerfish are small, but some can reach 3 feet long (0.9 meters). Their most well know feature is the piece of their spine that hangs above their mouths like a fishing pole. Its end is luminescent and draws in prey for them to capture.

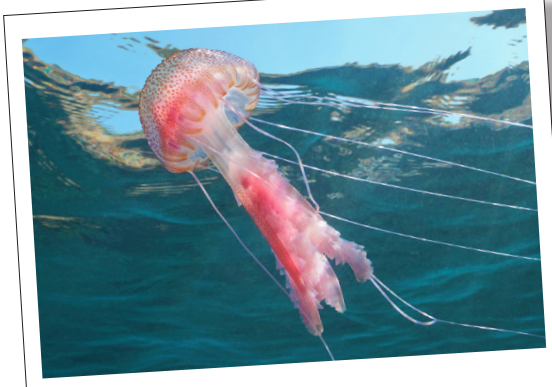
DIET:
The anglerfish is not picky since food in the deep ocean can be scarce at times. They often eat fish, crustaceans, shrimp, and snails.

HABITAT:
The anglerfish lives along the murky ocean floor of the Atlantic and Southern Oceans.

DID YOU KNOW?
The anglerfish's body is round like a basketball. Because of this, they cannot swim very fast and instead kind of wobble through the water.

MAUVE STINGER JELLYFISH

Jellyfish almost have a magical appearance as they float through the ocean, but don't let that make you want to touch them. Most jellyfish have a very dangerous sting that can cause pain lasting for a couple of weeks. The mauve stinger jellyfish's scientific name means "night light" in German and refers to the purpleish color that it glows. Its bell, or top, can be between 2.3-3.5 in (60-90mm), and it has 8 tentacles and 4 long arms coming down from the bell. Their color can change from purple to yellow.



DID YOU KNOW?
When startled, this jellyfish will leave a glowing mucous behind it.

DIET:
This jellyfish is known to eat plankton, fish eggs, and larvae.

HABITAT:
It is found in the temperate and tropical waters of the Atlantic, Pacific, and Indian Oceans.

PLANKTON: DINOFLAGELLATE

There are many different kinds of plankton in the ocean, and they are all a very important part of the ocean food chain. One type that has bioluminescent features is called dinoflagellate, and it is a form of algae. Algae is a group of plants that survive in water. You may have seen some types of algae floating on pond water. When dinoflagellate plankton is threatened, it will glow brighter to scare away predators. This species of plankton is so small, it can only be seen under microscope!

DIET:
They eat other small plankton, including other dinoflagellate.

HABITAT:
Dinoflagellate can be found in both oceans and freshwater. They have also been found in snow and ice!

BIGFIN REEF SQUID

This squid is a much smaller version of the giant squid we learned about last week. They have the same body shape with 8 arms and 2 tentacles. This squid grows up to 13 inches long (33cm) and can grow very fast. They have been known to eat 1/3 of their body weight each day! The bigfin reef squid uses its bioluminescence as both camouflage and communication. The male reef squid have the ability to change color as well.

DIET:
The bigfin reef squid eat crustaceans and fish, using their two tentacles to guide food to their mouth or beak.

HABITAT:
The bigfin reef squid can be found in the Indian and western Pacific Ocean.

DID YOU KNOW?
Like the octopus, this squid has the ability to squirt a dark, inky cloud when scared!

YOUR TURN

Look up pictures and videos of the firefly squid, or any bioluminescent creature that interested you!

NOTEBOOK TIME!

Students, it's time to work in your notebooks! Open up your notebook to today's lesson and complete the assignments.

SOURCES:

https://www.history.com/topics/inventions/telegraph
https://ucmp.berkeley.edu/protista/dinoflagellata.html
https://www.nationalgeographic.com/animals/fish/group/anglerfish/
https://scripps.ucsd.edu/zooplanktonguide/species/pelagia-noctiluca
https://www.dw.com/en/bioluminescence-why-plankton-glows/a-40118563
https://www.montereybayaquarium.org/animal-guide/octopuses-and-kin/bigfin-reef-squid

LESSON 7 · DAY AT A GLANCE · LUMINESCENT FISH

SCIENCE NOTEBOOKING

Today students will use the graphic organizer to take notes about a luminescent fish of their choice. Students can work on this page and take notes while they listen or complete their pages after you have finished reading from the Teacher's Guide.

EARLY READER + EARLY ELEMENTARY

HEADERS: *Habitat, Diet, Interesting Facts*

UPPER ELEMENTARY

HEADERS: *Habitat, Diet, Appearance, Interesting Facts*

MIDDLE SCHOOL

HEADERS: *Habitat, Diet, Appearance, Interesting Facts*

HIGH SCHOOL

HEADERS: *Characteristics, Interesting Facts, Habitat, Threats*

HISTORY JACQUES COUSTEAU

WHAT'S HAPPENING?

Students will be learning about Jacques Cousteau. If you are working with more than one student, read this page together with your younget students, or have an older student read aloud to the younger ones.

EARLY READER
ASSIGNMENT: *Draw a line to match the question to the correct answer.*
ANSWERS: *France, Aqua lung*

EARLY ELEMENTARY
ASSIGNMENT: *Circle the correct answer.*
ANSWERS: *France, Aqua lung*

UPPER ELEMENTARY
ASSIGNMENT: *Answer the questions.*
ANSWERS: *France, Aqua lung, Scuba diving*

MIDDLE + HIGH SCHOOL
ASSIGNMENT: *Research and answer the questions. Bonus: Collect your research into a paragraph about Jacques Cousteau. (Middle School)*
ANSWERS: *1.France 2. Aviator; a car accident left him needing extensive rehabilitation so he took to swimming to help. 3. Aqua lung. 4. He used it to help the French resistance. 5. The Silent World. 6. Someone who studies the ocean.*

SOCIAL STUDIES COMMUNICATION

WHAT'S HAPPENING?

You need a flashlight for this lesson, and your younger kids will all have the same text to read at the beginning. We learned about how some ocean animals use bioluminescence for communication. In this lesson, students will learn about the origins of Morse Code and practice using it to deliver a message.

EARLY READER
ASSIGNMENT: *Try using the Morse Code alphabet to send a secret message with your flashlight.*

EARLY + UPPER ELEMENTARY
ASSIGNMENT: *Try using the Morse Code alphabet to send a secret message. Practice with the word "YES" which is mapped on the page.*

MIDDLE + HIGH SCHOOL
ASSIGNMENT: *Research the Morse Code and its inventor. Try writing your own Morse Code message in the box, then practice sending it.*

LANGUAGE ARTS COPYWORK + SPELLING

WHAT'S HAPPENING?

Students will continue to work on their Bible passage for this week. This is an excellent time to repeat the passages as a family to work on memorization!

EARLY READER + EARLY ELEMENTARY
VERSE: *"You rule the raging of the sea; when its waves rise, you still them." Psalm 89:9*
SPELLING: *waves (Early Reader), raging (Early Elementary)*

UPPER ELEMENTARY
VERSE: *"O LORD God of hosts, who is mighty as you are, O LORD, with your faithfulness all around you? You rule the raging of the sea; when its waves rise, you still them." Psalm 89:8-9*
SPELLING: *faithfulness*

MIDDLE + HIGH SCHOOL
VERSE: *"For who in the skies can be compared to the Lord? Who among the heavenly beings is like the Lord, a God greatly to be feared in the council of the holy ones, and awesome above all who are around him? O Lord God of hosts, who is mighty as you are, O Lord, with your faithfulness all around you? You rule the raging of the sea; when its waves rise, you still them." Psalm 89:6-9*
SPELLING: *faithfulness (Middle School)*

ART DRAW A JELLYFISH

WHAT'S HAPPENING?

Today students will look at the image of a jellyfish and then try to sketch one of their own. If they want, they can add color with colored pencils or watercolor paint! You can do it in this book or they can do it in a science or art journal! Older students can look up more detailed drawings or paintings and try some new techniques if they want!

GIANTS OF THE SEA

INTRODUCTION

Whales are the biggest animals in the ocean. Although they look like fish, whales are actually mammals. Seals, sea lions, and walruses are also mammals, but there are a few differences between them. The biggest difference is that whales do not have fur or hair like other mammals do. Whales are very social creatures and often live in pods with many other whales. Like other mammals, they feed their babies their own milk and spend a lot of time taking care of their young and teaching them life skills. Whales also cannot breathe underwater, so will come to the surface for air and breathe through the blowhole on the top, or the back of their head. When people go whale watching they look out for *spouting*, which is when a whale breathes out at the surface, causing a spray of water. People also watch for breaching, which is when a whale throws themselves right out of the water. Often, they appear to be playing together when a bunch of whales are breaching all at once!

HUMPBACK WHALE MOUTH

There are two different types of whales: toothed whales and baleen whales. The first type we'll look at is the baleen whale. Baleen is something that is made up of keratin, like what makes up your fingernails. Baleen whales have about 600 baleen plates that make up their top jaw. These plates strain water to allow the whale to eat fish and krill. Let's learn about three different baleen whales!

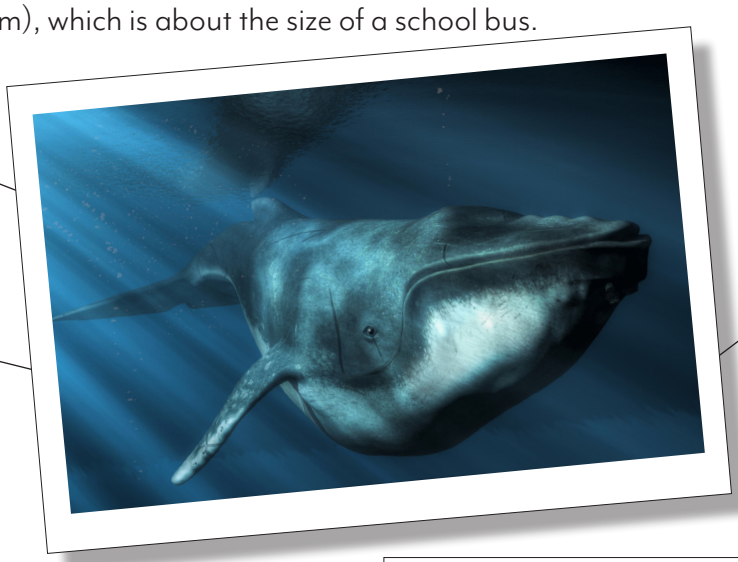
YOUR TURN!
Look up videos of humpack whales and orcas (sometimes called killer whales) breaching. It's going to be quite a show, so enjoy!

HUMPBACK WHALE

As their name suggests, humpback whales have a small hump right before the dorsal fin on their backs. They have dark gray backs and light-colored stomachs with speckled fins. Humpback whales can grow up to 48 to 62.5 feet long (14.6 to 19 m), which is about the size of a school bus.

HABITAT:
Humpback whales are found in every ocean in the world.

DIET:
Humpback whales eat krill, small fish, and plankton.



DID YOU KNOW?
Humpback whales are known for singing beautiful songs with moans, howls, cries, and other noises. The use of these songs seems to be for communicating with other whales, sometimes for hours at a time. Humpback calves will actually whisper to their mothers.

BLUE WHALE

The blue whale is the largest animal on earth, growing to be between 82 to 105 feet long (25 to 32 m). Their tongue can weigh as much as an elephant! Being the biggest makes them one of the loudest animals on earth as well! They communicate through pulses, groans, and moans that can be heard a thousand miles from where the whale is.

APPEARANCE:
As this whale's name suggests, its coloring looks blue underwater. But their skin is actually more of a gray-blue.

HABITAT:
Blue whales are found in the Atlantic, Pacific, Indian, and Southern Oceans. They are often alone or swim in small groups.

DIET:
Blue whales eat krill. Isn't it interesting that the largest animal on earth eats one of the smallest? They first take in a large mouthful of water, then use their tongue to push the water back out through their baleen plates, leaving behind only krill.

RIGHT WHALE

Right whales are the rarest of all the whale species. They were hunted to the brink of extinction in the 1900s and are still struggling to recover to this day, with only 400 left in the wild in the Atlantic Ocean. Right whales live in temperate waters, just off the coast of the Atlantic and Pacific Oceans.

DID YOU KNOW?

When whalers were searching the ocean for whales and they spotted a right whale, they would yell out "right whale" to let their crew know this was the whale to get.

APPEARANCE:

Right whales have a large head that can be 1/3 of their body weight. Their mouth begins around their eyes and they have 8-inch-long baleen plates along the entirety of their top jaw. Right whales have raised patches of rough skin that is white in appearance, due to something called whale lice. They grow to be about 45 to 55 feet long (13.7 to 16.7 m).

DIET:

They eat zooplankton, which are small, shrimp-like creatures.

EXTENSION ACTIVITY:

Look up videos on the endangered right whale and see what's being done to help keep this species alive!

The second type of whales are toothed whales, and as their name suggests, they have teeth that they use to actively catch their prey. Toothed whales are much smaller than baleen whales and include dolphins as part of their family. Let's learn about three different toothed whales!

BELUGA WHALE

Beluga whales are also called "white whales," and because of this very different skin color, they are very easy to recognize. Like all whales, belugas are very social animals and live in groups. They talk with each other through clicks, whistles, and clangs. Sailors used to call them "sea canaries." Belugas can also mimic many other sounds as well.

APPEARANCE:

Beluga whales have a rounded forehead and no dorsal fin. They range in size from 13 to 20 feet long (4 to 6 m). When beluga whales are first born, they are gray or brown, but this color will fade to white as they get older. Usually, by 5 years old they are fully white.

HABITAT:

They are found in the coastal waters of the Arctic Ocean.

DIET:

Beluga whales eat fish, crustaceans, and worms.

NARWHAL WHALE

This whale is the unicorn of the sea, with a large horn coming from its head that can sometimes be up to 9 feet long (2.7 m)! Males are usually the ones that have these long horns and sometimes even have two of them. Females can grow small horns, but nothing as magnificent as the males. They have a thick layer of blubber that allows them to live in the Arctic Ocean near Canada, Greenland, Norway, and Russia.

DID YOU KNOW?

A narwhal's long tusk is actually its tooth! The tusk always grows in a counterclockwise spiral (as the whale sees it) and continuously grows to replace the damage that happens.

DIET:

Narwhal eat fish, squid, shrimp, and crabs. They dive deep in the ocean to find their food and have 4 inches of blubber that allow it to swim through such cold water.

ORCA WHALE

Orcas are probably the most recognized whale with their characteristic black and white markings. They are the largest of the dolphin family and are highly intelligent, as seen with the many tricks they've been known to do. Orcas are very social and live in a close-knit pod of up to 40 other whales. They have the nickname of "killer whale" because they are fierce predators, especially when they are hunting as a pod.

DIET:

Orcas eat fish, penguins, and marine mammals such as seals, sea lions, and even other whales. They've been known to grab a seal from right on top of the ice.

HABITAT:

Orcas can live in all oceans of the world but are frequently found near Antarctica, Iceland, Norway, and Pacific North America.

NOTEBOOK TIME!

Students, it's time to work in your notebooks! Open up your notebook to today's lesson and complete the assignments.

OPTIONAL EXTENSION ACTIVITY: As a family, watch the movie *Free Willy* when you're done with today's lesson! *Viewer discretion is advised.*

SOURCES:

https://www.nationalgeographic.org/news/big-fish-history-whaling/
https://www.nationalgeographic.com/animals/mammals/b/blue-whale/
https://www.nationalgeographic.com/animals/mammals/group/right-whales/
https://www.nationalgeographic.com/animals/mammals/h/humpback-whale/
https://www.nationalgeographic.com/animals/mammals/b/beluga-whale/
https://www.acsonline.org/narwhal

LESSON 8 · DAY AT A GLANCE · GIANTS OF THE SEA

SCIENCE NOTEBOOKING

WHAT'S HAPPENING?

Today students will use the graphic organizer to take notes about the whale of their choice. Students can work on this page and take notes while they listen or complete their pages after you have finished reading from the Teacher's Guide.

EARLY READER + EARLY ELEMENTARY
HEADERS: *Habitat, Diet, Interesting Facts*

UPPER ELEMENTARY
HEADERS: *Habitat, Diet, Appearance, Interesting Facts*

MIDDLE SCHOOL
HEADERS: *Habitat, Characteristics, Threats, Interesting Facts*

HIGH SCHOOL
HEADERS: *Characteristics, Interesting Facts, Habitat, Threats*

BIBLE JONAH

WHAT'S HAPPENING?

If you are working with more than one student, pull out your Bible and read the story of Jonah as a family before breacking off to allow your students to answer the questions in their workbooks.

EARLY READER

ASSIGNMENT: *Answer the multiple choice questions.*
ANSWERS: *1. no 2. a 3. b 4. c*

EARLY ELEMENTARY

ASSIGNMENT: *Fill in the blanks with the words from the word bank to complete the sentences.*
ANSWERS: *1. didn't 2. Tarshish 3. Throw him into the sea. 4. 3*

UPPER ELEMENTARY

ASSIGNMENT: *Answer the questions after reading the story of Jonah.*
ANSWERS: *1. No, Jonah did not listen to God and go to Ninevah. 2. Jonah tried to go to Tarshish. 3. Jonah told the mariners to throw him into the sea to calm the storm. 4. Jonah was in the belly of the fish for 3 days and 3 nights. 5. Answers will vary*

MIDDLE + HIGH SCHOOL

ASSIGNMENT: *Read the story of Jonah and and answer the questions.*
ANSWERS: *.Answers will vary.*

ART DRAW A KILLER WHALE

WHAT'S HAPPENING?

Today students will look at the image of a Killer Whale and then try to sketch one of their own. If they want, they can add color with colored pencils or watercolor paint! You can do it in this book or they can do it in a science or art journal! Older students can look up more detailed drawings or paintings and try some new techniques if they want!

LA + BIBLE DICTATION

WHAT'S HAPPENING?

Today your students will have the opportunity to write their Bible passage from memory! If you have the cursive notebook, your students can write their passage in there instead.

EARLY READER + EARLY ELEMENTARY

VERSE: *"You rule the raging of the sea; when its waves rise, you still them." Psalm 89:9*

UPPER ELEMENTARY

VERSE: *"O LORD God of hosts, who is mighty as you are, O LORD, with your faithfulness all around you? You rule the raging of the sea; when its waves rise, you still them." Psalm 89:8-9*

MIDDLE + HIGH SCHOOL

VERSE: *"For who in the skies can be compared to the Lord? Who among the heavenly beings is like the Lord, a God greatly to be feared in the council of the holy ones, and awesome above all who are around him? O Lord God of hosts, who is mighty as you are, O Lord, with your faithfulness all around you? You rule the raging of the sea; when its waves rise, you still them." Psalm 89:6-9*

SOCIAL STUDIES WHALING

WHAT'S HAPPENING?

If you're working with more than one student, read this page out loud to all of your younger students, or have your older students read it out loud to the younger ones.

EARLY READER + EARLY ELEMENTARY

ASSIGNMENT: *Discuss the questions with your parents or older siblings. 1. Do you think it was okay for the Inuit people to hunt whales for food? 2. Do you think whale hunting should be illegal? Why or why not?*

UPPER ELEMENTARY

ASSIGNMENT: *Discuss the questions with your family.*
OPTIONAL BONUS QUESTION: *Research the laws about whaling in your country and other countries around the world. Write what you find below!*

MIDDLE SCHOOL

ASSIGNMENT: *Pick a culture that used whaling to survive, and record your findings in the boxes.*

HIGH SCHOOL

ASSIGNMENT: *Pick a culture that used whaling to survive, and record your findings in the boxes.*
OPTIONAL EXTENSION ACTIVITY: *On a separatre sheet of paper, write a persuasive essay defining your opinion on whaling, past and present.*

EELS

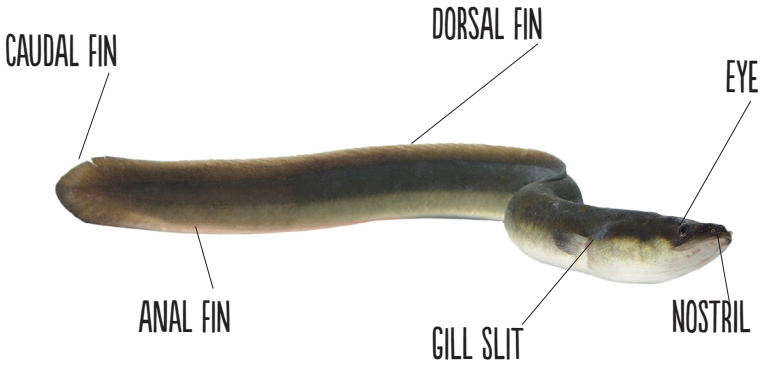
INTRODUCTION

Do you know what an eel is? Today we are going to learn a little about this interesting species. An eel has a snake-like appearance but is a fish, not a reptile. Eels swim by making body waves that travel down their entire body. They can also swim backwards by changing the direction of their wave. They most often live in shallow ocean waters in areas where they have good places to hide. The term "eel" has been used to describe other animals that have an eel-like appearance, but they are not actually true eels. The electric eel of South America is one of these animalss, and it is not a true eel but a knifefish instead. It also does not live in the ocean, but in the Amazon River.

Most eels live in coral reefs around the world since there are many areas for them to hide from predators. They have God-given characteristics that make them able to survive well in reefs. Eels lack pectoral fins on the sides of their bodies, as well as pelvic fins on their stomachs, which could easily get damaged as they swim throughout the coral. They also have smaller gill openings that protect their gills. Despite having three fins on its body, the eels appear to have just one fin. An eel's dorsal fin begins right after its head and continues down its body until it reaches the caudal fin around its tail. The caudal fin continues until it seamlessly becomes the anal fin underneath the eel. They also have a backbone that is made up of 100 vertebrae.

YOUR TURN: Look up videos of eels and how they swim!

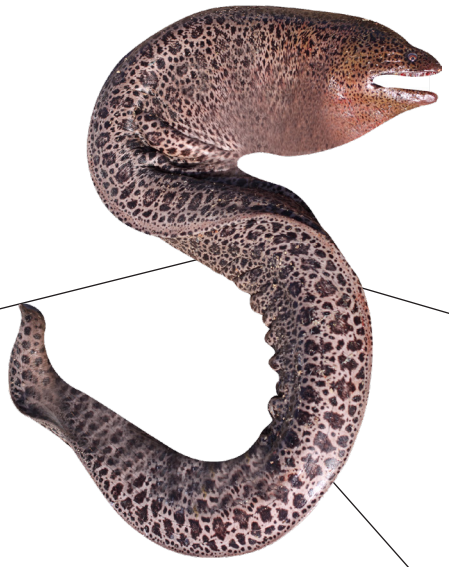
ANATOMY OF AN EEL



Most eels migrate short or long distances to a spawning area where they will lay their eggs. All eels start out as flat, transparent larvae that float along the ocean currents, eating marine snow or small particles floating in the water. After about 18 months, they become glass eels, which are bigger but still transparent in color. They continue to grow until they reach their "juvenile" stage where they are then called elvers. Elvers become eels around 10 years old, when they have become mature. These creatures may seem like a fish you need to stay away from, but most eels are not aggressive or dangerous at all. Now let's dive down into the ocean and learn about some different eels!

MORAY EEL

Moray eels are a family of eels that have a size range of 4 to 157 inches (11 to 400 cm). There are around 200 different species, and they can be a variety of different colors including grey, black, brown, white, yellow, green, blue, and orange. Moray eels are broken up into two categories: eels that have sharp, long teeth and eels with blunt teeth like molars. Despite them having huge differences in color and size, all moray eels have a very similar appearance. They all have scales and a snake-like shape that flattens towards the end of its tail. They also have many teeth and large eyes.



HABITAT:
Moray eels are found in the tropical waters of the Atlantic, Pacific, and Indian Oceans. Most species live in coral reefs where the food is plenty and there are many places to hide.

DIET:
What a moray eel eats depends on what type of teeth they have. Those eels that have sharp teeth will eat fish, octopus, and sometimes crustaceans. The eels that have blunt, molar-like teeth, like the snowflake and zebra moray, will eat crustaceans, especially crabs.

DID YOU KNOW?
Moray eels spend most of their time hiding in rock crevices, caves, and cracks in coral reefs. They do this to ambush their prey and hide from predators.

EUROPEAN CONGER EEL

This eel is the largest eel species in the ocean and have an average size of 5 feet long (1.5 m) but can grow to 9 feet long (2.75 m). They do not have any scales on their body and are usually blue-gray in color. They have large gills on the side of their heads, and like most eels, they have very strong teeth. The European conger eel is highly sought after as a food delicacy.

DIET:
European congers eat fish, squid, and crustaceans, though they will also scavenge dead fish.

HABITAT:
They are found along the rocky and sandy bottoms of the northeast Atlantic Ocean, including the Mediterranean Sea. They hide in holes or crevices during the day but become more active at night when they hunt for food.

GARDEN EELS

These are one of the tiniest of the conger eel species. Even though they have the body of a snake, they are, in fact, fish. They live in groups of hundreds of garden eels and use their tails to dig holes into the sand to hide. If one of them sees a threat, it will make a quick movement to alert the others and they will all quickly hide. They are only about 16 inches long (40 cm).

DIET:
They eat by bringing almost their whole body out of the sand and balancing in the water to catch the tiny zooplankton from the current.

HABITAT:
Garden eels live in the sandy bottoms of the coral reefs of the Atlantic, Pacific, and Indian Oceans.

YOUR TURN:
Look up videos of the garden eels and see how unique they are!

GULPER EEL

The gulper eel is a deep-sea dwelling fish that can be found down at 9,000 feet below sea level (2,700 m). What sets the gulper eel apart is its enormous mouth, which can be bigger than its body. Gulper eels also have expandable stomachs that allow them to eat prey larger than itself. This eel also has a very long, ribbon like tail that has a bioluminescent end that glows in the dark. It is likely that this eel uses its tail like a fishing pole to lure food in close to its mouth so that it can swallow them whole.

HABITAT:
The gulper eel is found in the tropical and temperate waters of the Atlantic, Pacific, and Indian Oceans.

DIET:
Despite its large mouth, gulper eels mostly eat small crustaceans, although it can eat larger fish and squid. This eel can use its mouth like a net and swim with its mouth wide open, capturing its food. After, the gulper eel pushes the extra water out through its gills, back into the ocean.

EXTENSION ACTIVITY:
Did you know that Gulper eels actually inflate their mouths? If you want, watch a video showing them in action!
https://www.nationalgeographic.com/animals/2018/09/gulper-eel-video-deep-sea-fish-nautilus-news/

NOTEBOOK TIME!

Students, it's time to work in your notebooks! Open up your notebook to today's lesson and complete the assignments.

SOURCES:

https://www.britannica.com/animal/eel
https://apps.dtic.mil/dtic/tr/fulltext/u2/a330550.pdf#page=122
https://dwazoo.com/animal/spotted-garden-eel/
https://animals.net/moray-eel/
https://www.fishbase.de/summary/Conger-conger.html
https://www.marlin.ac.uk/species/detail/2126
https://www.nationalgeographic.org/encyclopedia/island/
https://sciencing.com/oil-spill-information-kids-5444185.html

LESSON 9 · DAY AT A GLANCE · EELS

SCIENCE NOTEBOOKING

WHAT'S HAPPENING?

Today, students will be working on a notebooking page about an eel of their choice. Students can take notes while they listen to the lesson, or they can wait until you are finished reading so they can do extra research.

EARLY READER + EARLY ELEMENTARY
HEADERS: *Habitat, Diet, Interesting Facts*

UPPER ELEMENTARY
HEADERS: *Appearance, Diet, Habitat, Interesting Facts*

MIDDLE SCHOOL
HEADERS: *Habitat, Characteristics, Threats, Interesting Facts*

HIGH SCHOOL
HEADERS: *Habitat, Characteristics, Threats, Interesting Facts*

SCIENCE OCEAN ISLANDS

If you are working with multiple students, turn to this page together and read it aloud to all of your students, or have older students read it aloud to the younger ones.

EARLY READER
ASSIGNMENT: *Circle the answer to each question.*
ANSWERS: *1. b 2. a*

EARLY ELEMENTARY
ASSIGNMENT: *Use the word bank to fill in the missing words.*
ANSWERS: *1. volcanoes 2. Mauna Loa, Hawaii*

UPPER ELEMENTARY
ASSIGNMENT: *Answer the questions.*
ANSWERS: *1. Some ocean islands are formed by erupting volcanoes. 2. The most active volcano in the world is Mauna Loa in Hawaii. 3. Yes, because the lava will continue to build up over time.*

MIDDLE SCHOOL
ASSIGNMENT: *Research how ocean islands are formed, then write a news article about a new island that has just formed.*
ANSWERS: *Answers will vary.*

HIGH SCHOOL
ASSIGNMENT: *Research how ocean islands are formed, then write an essay or paragraph response.*
ANSWERS: *Answers will vary.*

SOCIAL STUDIES OIL SPILLS

If you are working with multiple students, get all of the younger students to turn to this page together while you read it aloud, or have them take turns reading it aloud to one another. The extension activity will have you cover some plastic toys in cooking oil and then have your students attempt to clean the toy with water. Let them observe whether that works, and then add in dish soap, and see if the toy gets cleaner that way.

EARLY READER
ASSIGNMENT: *Discuss ideas for cleaning animals that have been caught in an oil spill with your parent or older sibling.*

EARLY + UPPER ELEMENTARY
ASSIGNMENT: *Do you think it would be a lot of work to clean animals after an oil spill? Why or why not? Write, draw, or dictate your answer.*

MIDDLE + HIGH SCHOOL
ASSIGNMENT: *Students will be researching the effects of an oil spill on marine life, and the 2010 Deep Water Horizon spill in the Gulf of Mexico. They will then answer some questions in paragraph form (Middle School) or write an essay explaining your research. (High School)*

LANGUAGE + BIBLE

COPYWORK + SPELLING

This week your students will be working on their spelling by copying 1: John 4:19 (or 18-21 for older students). This is a great opportunity to work on recitation as a family. If you purchased the optional cursive writing notebook, your students can copy their passage in the cursive notebook instead!

EARLY READER + EARLY ELEMENTARY
VERSE: *"We love because he first loved us." 1 John 4:19*
SPELLING: *first*

UPPER ELEMENTARY
VERSE: *"There is no fear in love, but perfect love casts out fear. For fear has to do with punishment, and whoever fears has not been perfected in love. We love because he first loved us." 1 John 4:18-19*
SPELLING: *punishment, perfected*

MIDDLE + HIGH SCHOOL
VERSE: *"There is no fear in love, but perfect love casts out fear. For fear has to do with punishment, and whoever fears has not been perfected in love. We love because he first loved us. If anyone says, "I love God," and hates his brother, he is a liar; for he who does not love his brother whom he has seen cannot love God whom he has not seen. And this commandment we have from him: whoever loves God must also love his brother." 1 John 4:18-21*
SPELLING: *punishment, perfected (Middle School)*
REFLECTION: *What do you think it means that "perfect love casts out fear"? What do you think it means that anyone who says they love God but hates their brother is a liar? Journal your response to the verses on a separate sheet of paper, and if you want, discuss it with a parent or trusted adult.*

ART DRAW A MORAY EEL

Today students will look at the image of a moray eel and then try to sketch one of their own. If they want, they can add color with colored pencils or watercolor paint! You can do it in this book or they can do it in a science or art journal! Older students can look up more detailed drawings or paintings and try some new techniques if they want! You could even grab some clay and try forming a sculpture of an eel!

ITTY BITTY CREATURES

INTRODUCTION

Our oceans are home to many creatures, some of them so tiny we don't even notice them. No matter how small any of these animals are, they are just as important to the ocean as the bigger animals we easily recognize, like whales and squid. The tiniest of all the ocean species are actually marine viruses and bacteria. Just like the viruses and bacteria that we have on land that make us sick, they are so tiny that we can't see them with our eyes. Over the past few weeks, we've learned about krill, which are a very tiny and very important food source for many of the animals in the ocean. Today, let's learn about a few other unique itty-bitty creatures of the ocean!

ACTIVITY BREAK: Today we will be learning about some of the smallest creatures in the ocean but there are so many more! If you want, look up some pictures of the Nudibranch or a video of the Pygmy seahorse or see what other small creatures you can learn about!

FROGFISH

The frogfish is a small, warty looking fish that grows to be about 6 inches long (15 cm). They are related to the anglerfish we learned about and have the same "fishing pole" coming off their back. But instead of a glowing orb, like the anglerfish of the deep ocean, they have an end that looks like a little fish. The frogfish uses this to attract its prey closer and can even move it to match the fish's swimming.

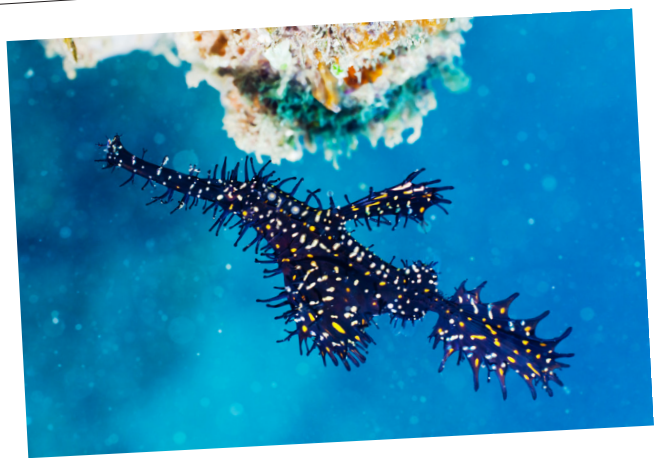
DIET:
The frogfish eat small fish in the coral reef. Their mouths can open to be as wide as their bodies to be able to eat their prey.

HABITAT:
The frogfish live in the coral reefs, often among sponges, of the Atlantic, Pacific, and Indian Oceans. They crawl along the reef, using their pectoral fins like arms!

GHOST PIPEFISH

What a different looking fish! The ghost pipefish is a rare fish that is only about 3 to 7 inches long (7.5 to 17 cm). They are related to seahorses but do have some differences, their skeleton is made up of large bony plates. They have a small but long mouth that they use like a vacuum cleaner to suck up plankton.

DIET:
Ghost pipefish feed on plankton and other tiny crustaceans.



HABITAT:
Ghost pipefish live in the tropical waters of the Indian and Pacific Oceans. They are found along the edges of coral reefs, often in pairs of one male and one female.

DID YOU KNOW?
Often, ghost pipefish swim upside down!

SQUAT SHRIMP

The squat shrimp is a very small species of crustacean, usually less than 0.5 inches long (1.3 cm). These shrimp are found most often in sea anemones and have a symbiotic relationship. What is a *symbiotic relationship*? It's a relationship where there are two different animals and one or both benefit from each other being there. Sea anemones protect the shrimp from predators and provide food on their tentacles.

HABITAT:
Squat shrimp live in the tropical waters of the Atlantic, Pacific, and Indian Oceans. They are usually found in groups.

DIET:
They eat plankton, algae, and parasites.

ZOOPLANKTON

The plankton in the ocean comes in two different types: plant (phytoplankton) and animal plankton (zooplankton). Zooplankton are very important because they are a huge food source for many of the animals in the ocean. Zooplankton are small, floating and weak-swimming animals, often very tiny crustaceans and snails. They are so tiny, they can only be seen with a microscope.

DIET:
Zooplankton eat the plant-form of plankton and will eat other zooplankton creatures as well.

HABITAT:
Zooplankton are found throughout the oceans of the world. They can also live in freshwater areas like rivers and ponds.

CORAL BEAUTY ANGELFISH

Commonly found in coral reefs, the coral beauty angelfish is a small fish that only gets to be about 4 inches long (10 cm). They are typically red or orange, having dark bluish stripes and a purple head and fins. Their coloring can also change depending on where they live in the ocean. These fish have been found all blue, orange, pale yellow, or even white. This fish is often found in aquariums and is a popular fish to keep as a pet since they are very hardy.

DIET:
They are known to eat plankton and other small crustaceans, like shrimp. They also are known to eat coral.

HABITAT:
This fish lives in the coral reefs of the Pacific and Indian Oceans.

NEON BLUE GOBY

The neon blue goby is another fish found in coral reefs. This fish can be found alone, in pairs, or often in large groups of other goby fish. They are a black fish with two iridescent stripes down their sides, and they grow to be about 2 inches long (6 cm). They eat parasites and are known as a cleaner fish, meaning they help keep coral, other reef structures, and even other fish free from parasites. This is possibly why larger fish often leave the neon blue goby alone and instead eat other smaller fish of the reef.

HABITAT:
The neon blue goby is found in coral reefs of the Caribbean in the Atlantic Ocean.

DID YOU KNOW?
Other species of goby fish use their pectoral fins like legs and "walk" along the ocean floor. The neon blue goby fish does not do this and instead swims or rests on coral and sponges.

NOTEBOOK TIME!

Students, it's time to work in your notebooks! Open up your notebook to today's lesson and complete the assignments.

SOURCES:

https://www.britannica.com/animal/ghost-pipefish
http://www.thecephalopodpage.org/MarineInvertebrateZoology/Thoramboinensis.html
https://www.britannica.com/animal/frogfish
https://www.britannica.com/science/plankton
http://animal-world.com/encyclo/marine/goby_ble/NeonGoby.php

LESSON 10 • DAY AT A GLANCE • ITTY BITTY CREATURES

SCIENCE NOTEBOOKING

WHAT'S HAPPENING?

Today students will use the graphic organizer to take notes about an itty bitty creature of their choice. Students can work on this page and take notes while they listen or complete their pages after you have finished reading from the Teacher's Guide.

MIDDLE SCHOOL
HEADERS: *Habitat, Characteristics, Threats, Interesting Facts*

HIGH SCHOOL
HEADERS: *Characteristics, Interesting Facts, Habitat, Threats*

EARLY READER + EARLY ELEMENTARY
HEADERS: *Habitat, Diet, Interesting Facts*

UPPER ELEMENTARY
HEADERS: *Habitat, Diet, Appearance, Interesting Facts*

LANGUAGE ARTS WRITING PROJECT

WHAT'S HAPPENING?

Today your younger students will learn about the structure of a paragraph and then write a rough draft of their paragraph.Upper Elementary students will work on a rough draft of their report. Middle school and high school students will work on the rough draft of their blog post or newspaper article.

EARLY READER + EARLY ELEMENTARY

ASSIGNMENT: *Read about the hamburger paragraph and then use what you learned to put together your own!*

UPPER ELEMENTARY

ASSIGNMENT: *On a separate sheet of paper, write a rough draft of your report using your research.*

MIDDLE + HIGH SCHOOL

ASSIGNMENT: *Write a rough draft of your blog post or newspaper article.*

SCIENCE HURRICANES

WHAT'S HAPPENING?

If you're working with multiple students, have them all turn to this page together and have them take turns reading the passage about hurricanes aloud, or read it aloud yourself if your students are younger or struggle with longer passages of text.

EARLY READER

ASSIGNMENT: *Draw, write or dictate to a parent what you have learned about hurricanes.*

EARLY ELEMENTARY

ASSIGNMENT: *Can you draw a hurricane? What would it look like?*

UPPER ELEMENTARY

ASSIGNMENT: *Answer the questions about what you learned.*
ANSWERS: *1. A hurricane is a very big storm that starts over the ocean. 2. Counterclockwise 3. Very strong winds, heavy rain, big ocean waves that crash onto land.*

MIDDLE SCHOOL

ASSIGNMENT: *Research hurricanes and fill in the boxes. Practice writing your sources in MLA or APA format.*

LANGUAGE ARTS GRASPING GRAMMAR

WHAT'S HAPPENING?

Students will continue to work on the grammar concepts that were introduced to the various levels earlier in this unit.

EARLY READER

ASSIGNMENT: *Each word is shown capitalized and non-capitalized. Circle the correct way of writing each word.*
ANSWERS: *September, fall, July, May, spring, October*

EARLY ELEMENTARY

ASSIGNMENT: *Underline the verbs, and circle the adverbs.*
ANSWERS: *1. verb: swam adverb: quickly 2. verb: goes adverb: everywhere 3. verb: watched adverb: closely 4. verb: go adverb: often 5. verb: walked adverb: quickly 6. verb: blew adverb: softly*

UPPER ELEMENTARY

ASSIGNMENT: *Rewrite the sentences following the given steps.*
ANSWERS: *1. "I should not have eaten all that candy," thought Jasmine. 2. "You can go faster!" screamed the coach. 3. "Where are you going?" asked mom. 4. Joe said, "I think I'm going to be sick."*

MIDDLE + HIGH SCHOOL

ASSIGNMENT: *Take a website you've used as a source and cite it in both the APA and MLA formatting on the lines below.*

ART DRAW AN ANGELFISH

WHAT'S HAPPENING?

Today students will look at the image of an angelfish and then try to sketch one of their own. If they want, they can add color with colored pencils or watercolor paint! You can do it in this book, or they can do it in a science or art journal! Older students can look up more detailed drawings or paintings and try some new techniques if they want!

SEAHORSES

INTRODUCTION

Curled tails, a face like a horse, and squat little bodies, the seahorse is a wonderful example of the creativity of our Creator! There are 47 different seahorse species, each with different coloring. Seahorses can also change their color to blend in with their surroundings. They have excellent eyes and can move their eyes independent of each other. That means that the seahorse can be looking forward at the same time that it is looking backward! Seahorses find a mate for life, and in the morning when seahorses greet each other, they do a unique dance that sometimes includes changing color! The seahorse pair will pirouette (spin) together for a few minutes before separating for the day. This little dance lets the seahorses know that they are still alive and reinforces their bond.

One of the biggest things that make seahorses so different from other ocean animals is that the male seahorse is the one that carries the babies! The female seahorse is the one that has the eggs and when it is time, she will lay her eggs in a kangaroo-like pouch that the male seahorse has on his stomach. After about two weeks, the baby seahorses emerge, ready to explore the ocean. While most seahorse species live in tropical waters, there are some seahorses that live in the colder waters around eastern Canada and the United Kingdom. Let's look at a few different seahorses now!

DID YOU KNOW?

Baby seahorses are called fries!

COMMON SEAHORSE

When we think of a seahorse, this is the species that we think of. This animal gets its name from its horse-like face, with a long snout (nose) and bent neck. The common seahorse lives in the coral reef of the Pacific Ocean, often hiding among seagrasses. They use their tails to lock onto a piece of coral so that they can stay in one place. The seahorse is not a very good swimmer, so they need to rest their bodies often. They are also hitchhikers and will attach themselves to floating seaweed to travel long distances without having to actually do the work. This species grows to be about 6.5 inches long (16.5 cm).

DIET:
Seahorses will live in areas where there is plenty of food since they are not great swimmers. They often eat small guppy fish or brine shrimp. The seahorse does not have a digestive tract to hold the food like we do, so they need to eat often. If they aren't eating, they are resting!

DID YOU KNOW?
Seahorses make noises that can be heard underwater. When they are feeding, they make a sound similar to lips smacking!

BIG BELLY SEAHORSE

This seahorse is also called the pot-bellied seahorse because of its very large belly even when not carrying eggs. Other than its large belly, this seahorse looks very similar in appearance to the common seahorse, with coloring that can be anywhere from brown to white to yellowish. Males are the ones that have the biggest bellies, with the females having smaller or non-existent potbellies. This seahorse is more active at dusk or at night than it is during the day and are often found in groups feeding together. The big belly seahorse is one of the largest seahorses in the world, growing to be about 12 inches long (30 cm).

HABITAT:
This seahorse lives only around Australia and New Zealand in the Pacific Ocean. They are often found attached to sponges and coral in the shallow waters of the coral reef.

DIET:
The big belly seahorse mainly eats crustaceans that are found around seaweed.

LEAFY SEA DRAGONS

Here is a unique looking seahorse! The leafy sea dragon looks just like seaweed, or other leafy plants floating in the water and that is how it remains hidden from predators. They have leaf-like appendages all over their bodies that are a brownish to yellowish color, making it easy to miss this seahorse when diving in the ocean. They remain still for a very long time when the water is calm since they get tired very easily. If the water moves too fast, they can actually die from exhaustion! They grow to be about 8 inches long (20 cm), which makes it one of the bigger seahorse species.

DIET:
The leafy sea dragon eats crustaceans, plankton, and shrimp. They don't have any teeth so they can't chew their food. This means that what they eat needs to be small enough to swallow in one bite.

HABITAT:
They live in the Pacific Ocean around western and southern Australia.

PYGMY SEAHORSE

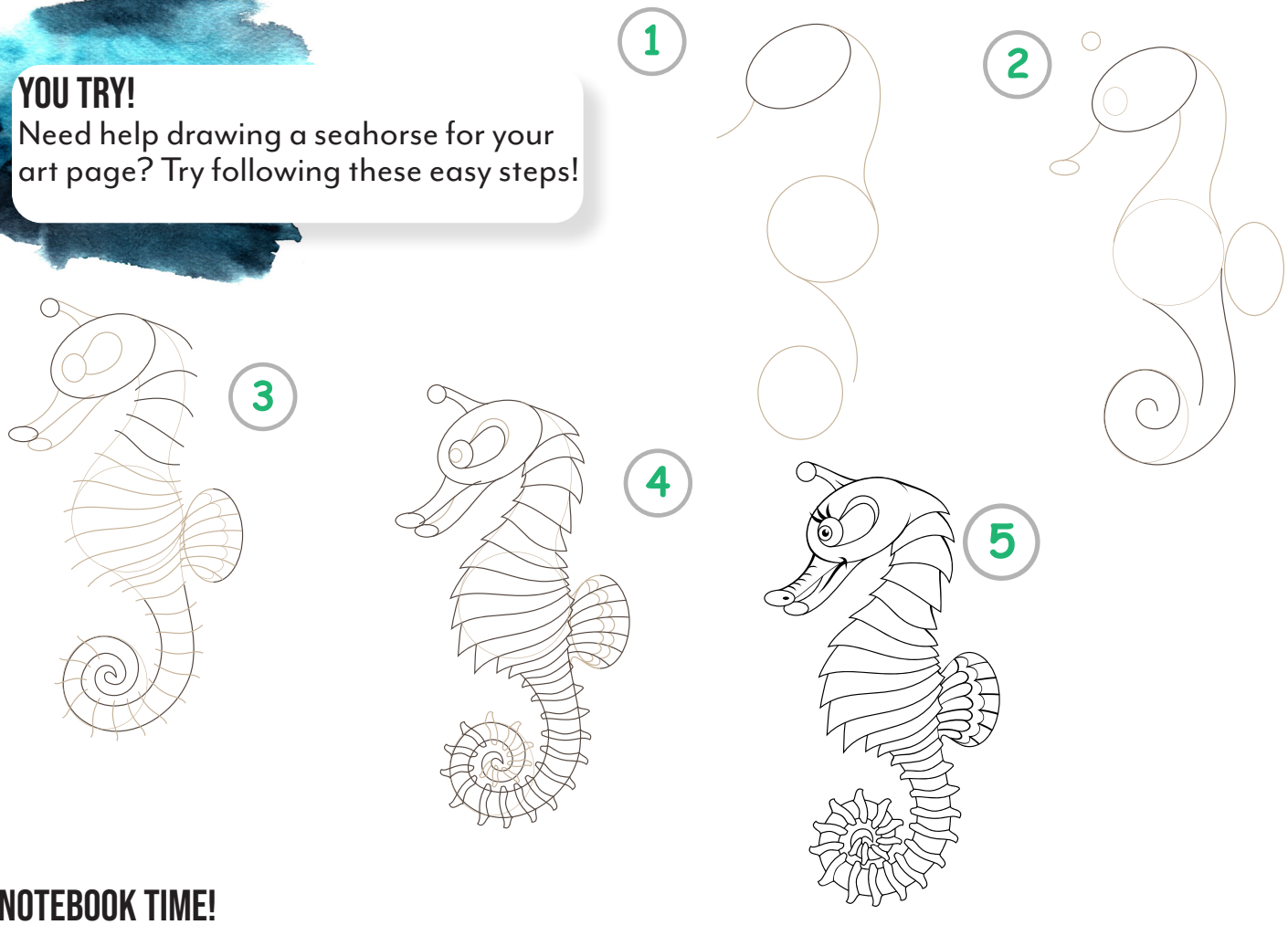
Pygmy seahorses are the tiniest species of the seahorse family. They only grow to be about 0.5 to 1 inch long (1.4 to 2.7 cm). They are often a purple color with pink tubercles (bumps on their skin) or yellow with orange tubercles, depending on which coral they are living in. Just like all seahorses, the male seahorses give birth to young from an egg pouch on their body. This seahorse is so well camouflaged that they were only discovered when scientists had taken a piece of coral to study and discovered this tiny seahorse in it! Because of this, there are likely other species of this seahorse in the ocean, just too hidden for scientists to find.

HABITAT:
The pygmy seahorse lives in pairs in the coral reefs of the Indian and Pacific Oceans.

DIET:
They eat very tiny crustaceans.

YOU TRY!

Need help drawing a seahorse for your art page? Try following these easy steps!



NOTEBOOK TIME!

Students, it's time to work in your notebooks! Open up your notebook to today's lesson and complete the assignments.

SOURCES:

https://oceana.org/marine-life/ocean-fishes/pygmy-seahorse
https://www.seahorseworlds.com/types-of-seahorses/
https://www.seahorseworlds.com/big-belly-seahorse/

LESSON 11 · DAY AT A GLANCE · SEAHORSES

SCIENCE NOTEBOOKING

WHAT'S HAPPENING?

Today, students will be working on a notebooking page about a seahorse of their choice. Students can take notes while they listen to the lesson, or they can wait until you are finished reading so they can do extra research.

EARLY READER + EARLY ELEMENTARY

HEADERS: *Habitat, Diet, Interesting Facts*

UPPER ELEMENTARY

HEADERS: *Habitat, Diet, Interesting Facts*

MIDDLE SCHOOL

HEADERS: *Habitat, Characteristics, Threats, Interesting Facts*

HIGH SCHOOL

HEADERS: *Habitat, Characteristics, Threats, Interesting Facts*

SCIENCE THE SCIENTIFIC METHOD

If you are working with more than one student, turn to this page together to read through the beginning passage and the steps of the scientific method. There is an optional extension activity to make an experiment of your own, and that will be a great opportunity to work together as a family!

EARLY READER + EARLY ELEMENTARY

ASSIGNMENT: *Try it! Answer the questions to follow the steps in the scientific method.*

UPPER ELEMENTARY

ASSIGNMENT: *Answer the questions to follow the scientific method.*
ANSWERS: *1. Answers will vary. 2. Answers may vary but should suggest one of the bikes will be faster because... 3. Answers may vary but could include, "Have both bikes go along the same loop and time them to see which is faster." 4. My friend. 5. Answers may vary but could include "We can learn that just because you have a bigger bike doesn't mean you'll be the fastest."*

MIDDLE SCHOOL

ASSIGNMENT: *Look up each part of the scientific method and write their purpose. Then try going through the scientific method by making up an experiment of your own. Fill in the graphic with your observations.*

HIGH SCHOOL

ASSIGNMENT: *Look up each part of the scientific method and write them down, and explain their purpose. Then try going through the scientific method by making up an experiment of your own. Fill in the scientific method graphic with your observations.*

ART DRAW A SEAHORSE

Today students will look at the image of a seahorse and then try to sketch one of their own. If they want, they can add color with colored pencils or watercolor paint! You can do it in this book or they can do it in a science or art journal! Older students can look up more detailed drawings or paintings and try some new techniques if they want!

LA + BIBLE COPYWORK + SPELLING

Students will continue to work on their Bible passage for this week. This is a great opportunity to work on recitation together as a family! Have students tape their Bible passage on their bedroom door and remind them to read it every time they go in their bedroom. They can also stick them to the fridge to practice every time they have a snack! If you purchased the optional cursive book for this unit, your students can practice their copywork in cursive instead.

EARLY READER + EARLY ELEMENTARY

VERSE: *"We love because he first loved us." 1 John 4:19*
SPELLING: *first*

UPPER ELEMENTARY

VERSE: *"There is no fear in love, but perfect love casts out fear. For fear has to do with punishment, and whoever fears has not been perfected in love. We love because he first loved us." 1 John 4:18-19*
SPELLING: *punishment, perfected*

MIDDLE + HIGH SCHOOL

VERSE: *"There is no fear in love, but perfect love casts out fear. For fear has to do with punishment, and whoever fears has not been perfected in love. We love because he first loved us. If anyone says, "I love God," and hates his brother, he is a liar; for he who does not love his brother whom he has seen cannot love God whom he has not seen. And this commandment we have from him: whoever loves God must also love his brother." 1 John 4:18-21*
SPELLING: *punishment, perfected (Middle School)*
REFLECTION: *What does it mean that, "We love because He first loved us?" How can you apply this in your own life?*

SOCIAL STUDIES OCEAN RESOURCES

If you are working with multiple students, get everyone to turn to this page and read the paragraph at the top to all of your students at once. You can also have your older students read it aloud to the younger ones.

EARLY READER

ASSIGNMENT: *Draw some resources the ocean provides for us in the box.*

EARLY ELEMENTARY

ASSIGNMENT: *Draw or write some resources the ocean provides for us in the box.*

UPPER ELEMENTARY

ASSIGNMENT: *Using the graphic, write down some ocean resources and their various uses.*

MIDDLE + HIGH SCHOOL

ASSIGNMENT: *Research some ocean resources and collect information in the graphic. Then write your observations in a couple of paragraphs. Write your sources in MLA or APA form.*

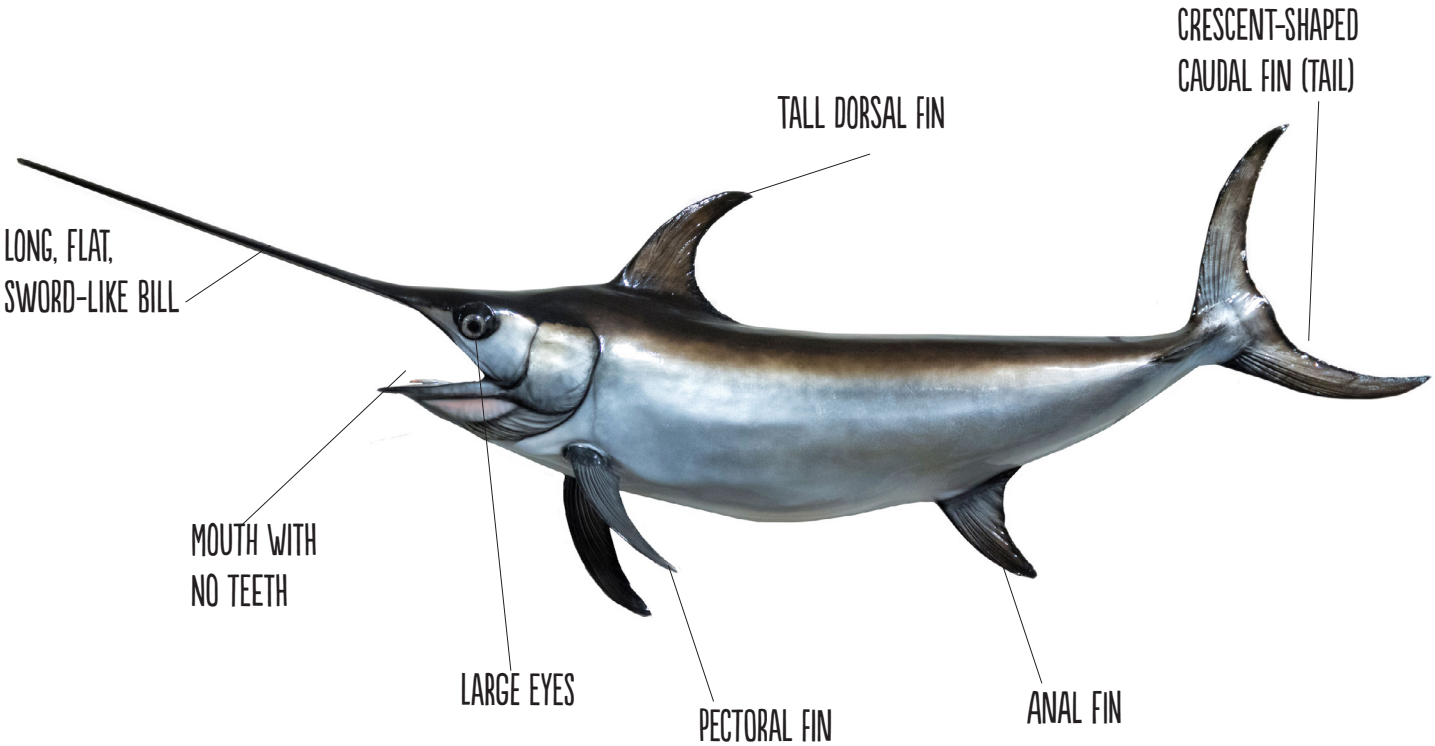
SWORDFISH

INTRODUCTION

Today we are going to learn about the swordfish, one of the fastest and strongest predators in the open ocean. They can reach speeds of about 60mph (97km/h). Cheetahs are known to run about 65-75 mph, so the swordfish can almost swim as fast as a cheetah runs! Swordfish will actually jump, or breach, out of the water and are often seen at the surface of the water basking their large dorsal fin in the sun. They have very few predators when they are adults, only toothed whales and some sharks. This fish is also a prized game fish, meaning catching a fish like this gives anglers or fishermen bragging rights!

APPEARANCE

The swordfish has a very unique top jaw that sets it apart from all other fish. It's top jaw or bill, is long and flat like sword and that's where it gets its name. They have two dorsal fins: one large one followed by a smaller one. They also have an anal fin and two pectoral fins on the side of their bodies. Swordfish have a bony skeleton (just like you and I do) and not a hard, outer exoskeleton like some of the other creatures we've talked about. The swordfish can grow to be nearly 15 feet long (4.5 m) and weigh at least 1,400 pounds (about 650 kg).



IMPRESS THE REST:

If you really want to impress your friends, or family, tell them the scientific name of a swordfish: *Xiaphias gladius* (but look up how to pronounce it first so you know what you're talking about).

LIFE CYCLE:

Swordfish go through an amazing transformation in size. When they first hatch from their eggs, they are *microscopic*, meaning they can only be seen under a microscope. Eventually they grow into one of the biggest predatory fish. Swordfish become adults when they are 5 or 6 years old and can live to 9 years old.

DIET:

What the swordfish eats depends on its size. When they are just hatched from eggs, swordfish eat zooplankton. As they grow, so does the size of their food. When they are adults, they eat larger bony fish like small tuna, barracudas, flying fish, and squid. Swordfish use their long sword-like bill to stun their prey by slashing their head side to side. This knocks their prey unconscious, making them easier to catch.

HABITAT:

Swordfish are found swimming in the warm, temperate waters of the Atlantic, Pacific, and Indian Oceans. They live alone and don't swim with other swordfish. Swordfish will migrate in the winter to warmer waters and then in the summer to cooler waters. They are usually found swimming in shallow water but can swim down to deeper ocean waters to find food. These amazing fish can do this because of a special tissue under their skin around their eyes that keeps their eyes and brain warm. This special adaptation allows them to think more quickly and see more clearly when hunting in the colder ocean water.

ACTIVITY BREAK!

See if you can find a video of a swordfish jumping out of the water!

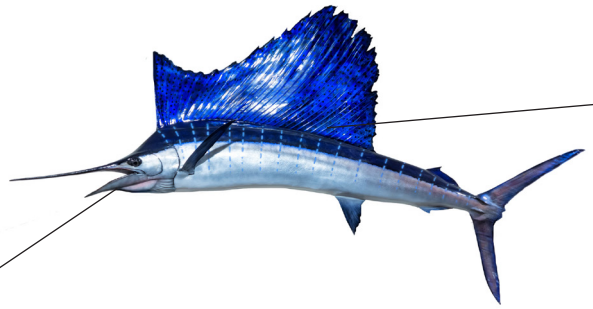
Billfish is the name of the family that swordfish are a part of. They are all characterized by their long, spear-like top jaw. They are all predatory fish, and many are the top predator fish of the open ocean. Let's learn about the two other members of the billfish family: the sailfish and the marlin.

SAILFISH

Sailfish are the fastest fish in the ocean, reaching speeds of 68 mph (109 km/h). They can grow between 5.7 feet and 11 feet long (1.7 to 3.3 m) and weigh as much as 120 to 220 pounds (54 to 100 kg). They get their name from their very large dorsal fin that stretches almost the entire length of their body and is much wider than their body. Like the swordfish, their top jaw is elongated like a sword and is flat and blunt. When they hatch from eggs, they are the size of larva but grow very quickly and reach 4-5 feet in their first year of life. They are found in the temperate and tropical waters of the Atlantic and Pacific Ocean, often in open waters far from land.

DIET:

Sailfish eat smaller fish like sardines and anchovies, as well as squid and octopus. They are found near the surface of the water in the open ocean, feeding on schools of fish. They will also use their sail like a shepherd's staff to herd the fish, making them easier prey.



DID YOU KNOW?

Sailfish are a prized game fish even though their meat is tough and not very good to eat. When they get hooked by a fisherman, they will fight vigorously against the line. They leap and dive repeatedly, sometimes taking hours for anglers to reel them in.

BLUE MARLIN

The blue marlin is the most common of the marlin species. It also has a long bill, like the swordfish and sailfish, but its bill is different because it is round and pointed rather than flat and blunt. The marlin is the most sought-after game fish in the world. Even though they are often catch and release fish, research is showing many of them die after being released. Blue marlin are found in the tropical waters of the Atlantic, Pacific, and Indian Oceans. They migrate long distances and often follow ocean currents for hundreds or thousands of miles.

DIET:

The Atlantic blue marlin eats large bony fish like mackerel and tuna, as well as squid. They use their bill to slash through a school of their prey and stun them.

DID YOU KNOW?

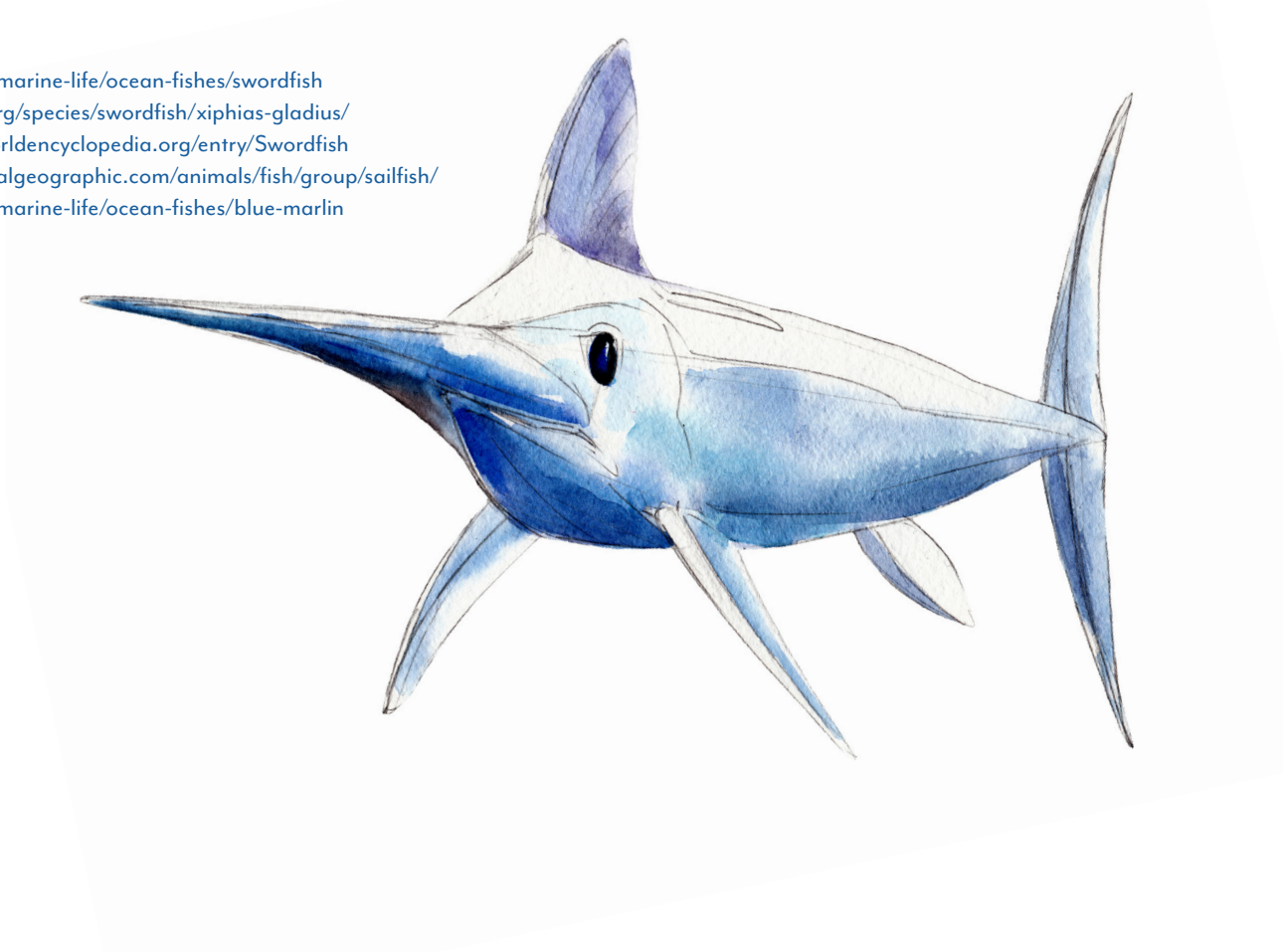
There are 10 different species of marlins. The black marlin is the largest of the marlins, getting to be 16.4 feet long (5 m) and up to 1,480 pounds (670 kg). The white marlin is very rare and endangered due to overfishing.

NOTEBOOK TIME!

Students, it's time to work in your notebooks! Open up your notebook to today's lesson and complete the assignments.

SOURCES:

https://oceana.org/marine-life/ocean-fishes/swordfish
https://marinebio.org/species/swordfish/xiphias-gladius/
https://www.newworldencyclopedia.org/entry/Swordfish
https://www.nationalgeographic.com/animals/fish/group/sailfish/
https://oceana.org/marine-life/ocean-fishes/blue-marlin



LESSON 12 · DAY AT A GLANCE · SWORDFISH

SCIENCE NOTEBOOKING

WHAT'S HAPPENING?

Today students will use the graphic organizer to take notes about a swordfish of their choice. Students can work on this page and take notes while they listen or complete their pages after you have finished reading from the Teacher's Guide.

EARLY READER + EARLY ELEMENTARY
HEADERS: *Habitat, Appearance, Interesting Facts*

UPPER ELEMENTARY
HEADERS: *Habitat, Appearance, Interesting Facts*

MIDDLE SCHOOL
HEADERS: *Habitat, Characteristics, Threats, Interesting Facts*

HIGH SCHOOL
HEADERS: *Characteristics, Interesting Facts, Habitat, Threats*

BIBLE ARMOR OF GOD

WHAT'S HAPPENING?

If you are working with more than one student, pull out your Bible and read Ephesians 6:10-18 together as a family before your students work on their individual activities.

EARLY READER

ASSIGNMENT: *Match the names to each piece of armor.*
ANSWERS: *Sword: Word of God, Helmet: Salvation, Boots: Gospel of Peace, Belt: Truth, Shield: Faith, Breastplate: Righteousness*

EARLY ELEMENTARY

ASSIGNMENT: *Fill in the name for each piece of armor.*
ANSWERS: *Sword: Word of God, Helmet: Salvation, Boots: Gospel of Peace, Belt: Truth, Shield: Faith, Breastplate: Righteousness*

UPPER ELEMENTARY

ASSIGNMENT: *Write the name for each piece of armor.*
ANSWERS: *Sword: Word of God, Helmet: Salvation, Boots: Gospel of Peace, Belt: Truth, Shield: Faith, Breastplate: Righteousness*

MIDDLE SCHOOL

ASSIGNMENT: *Answer the questions.*
ANSWERS: *Answers will vary.*

HIGH SCHOOL

ASSIGNMENT: *Use your concordance or a computer to find other verses in your Bible that talk about each of these attributes. Then pray, asking God to equip you with each piece of the armor, preparing you for the day ahead.*
ANSWERS: *Answers will vary.*

ART DRAW A SWORDFISH

WHAT'S HAPPENING?

Today students will look at the image of a swordfish and then try to sketch one of their own. If they want, they can add color with colored pencils or watercolor paint! You can do it in this book or they can do it in a science or art journal! Older students can look up more detailed drawings or paintings and try some new techniques if they want!

LA + BIBLE DICTATION

WHAT'S HAPPENING?

Today your students will have the opportunity to write their Bible passage from memory! If you have the cursive notebook, your students can write their passage in there instead.

EARLY READER + EARLY ELEMENTARY

VERSE: *"We love because he first loved us." 1 John 4:19*

UPPER ELEMENTARY

VERSE: *"There is no fear in love, but perfect love casts out fear. For fear has to do with punishment, and whoever fears has not been perfected in love. We love because he first loved us." 1 John 4:18-19*

MIDDLE + HIGH SCHOOL

VERSE: *"There is no fear in love, but perfect love casts out fear. For fear has to do with punishment, and whoever fears has not been perfected in love. We love because he first loved us. If anyone says, "I love God," and hates his brother, he is a liar; for he who does not love his brother whom he has seen cannot love God whom he has not seen. And this commandment we have from him: whoever loves God must also love his brother." 1 John 4:18-21*

HISTORY OCEANOGRAPHY

WHAT'S HAPPENING?

If you're working with more than one student, read this page out loud to all of your younger students, or have your older students read it out loud to the younger ones.

EARLY READER

ASSIGNMENT: *Discuss some ideas about what you would like to explore in the ocean with your parent or sibling or draw a picture in the box.*

EARLY ELEMENTARY

ASSIGNMENT: *Dictate, draw, or write about something you would like to explore in the ocean.*

UPPER ELEMENTARY

ASSIGNMENT: *Write about something you would like to explore in the ocean.*

MIDDLE SCHOOL

ASSIGNMENT: *Research the HMS Challenger Expedition in 1872 and gather your research into the boxes. Then, on a separate piece of paper write 1-2 paragraphs about this expedition. Include your sources in MLA or APA format.*

HIGH SCHOOL

ASSIGNMENT: *Research the HMS Challenger Expedition in 1872 and gather your research into the boxes. Then, on a separate piece of paper write 3-5 paragraphs about this expedition. Include your sources in MLA or APA format.*

FLYING FISH

INTRODUCTION

Have you ever seen a fish fly? This fish may not be able to fly like birds do, using their wings to power their flight, but watching them maneuver above the water is definitely a sight to behold. God was definitely being creative with these fish!

APPEARANCE

The flying fish have a torpedo-like shape that allows them to swim at very fast speeds underwater. They have large, rigid, wing-like pectoral fins that help them get airborne when they come out of the water. Flying fish also have a forked tail fin. There are about 40 species of flying fish, with small differences between them. Some of them have only two wing-like fins, while others have four wing-like fins. They are a smaller fish and typically grow to be between 7 to 12 inches long (17 to 30 cm) but can grow up to 18 inches long (45 cm).

HOW DO THEY FLY?

While they don't fly like birds do, they are able to glide across the surface of the water making it appear like they are flying. Underneath the water, the flying fish first must swim at very fast speeds, about 37 mph (60 km/h). Once it reaches this speed, they angle their bodies upward and break the surface of the water. After, they spread their wing-like fins and glide above the water. Some go up to 4 feet high (1.2 m) when they first come out of the water and then glide in the air for distances up to 655 feet (200 m). Sometimes these fish jump out so high that they are found on the decks of ships along the coast! As their glide starts to slow down and they get closer to the water, they will flap their tail along the surface of the water. This makes it look like they are skating on top of the water, and they can continue this along the surface for even further distances.

WHY DO THEY FLY?

The biggest reason this fish uses their flying ability is to escape predators. They have many natural predators in the wild, including mackerel, tuna, swordfish, marlin, and other larger fish species. But flying away doesn't protect them from everything. Once they are in the air, many sea birds will try to get them as well. Their flying does not protect them from humans either. Since they are attracted to light, flying fish are an easily caught game fish. There are other theories as to why this fish flies, like migration to an area with more food, but there is very little evidence or proof.

IMPRESS THE REST:

If you really want to impress your friends or family, tell them the scientific name for the flying fish: *Exocoetidae* (but look up how to pronounce it first so you know what you're talking about)."

DIET:

The flying fish eat a variety of different foods but most often are found eating plankton. They are also known to eat small crustaceans.

LIFE CYCLE:

The flying fish lives for an average of 5 years. When the female is ready to lay her eggs, she attaches them with a sticky substance to seaweed and other pieces of floating debris. When the eggs hatch, the newly hatched fish have whisker-like filaments near their mouths. This camouflages them from predators and keeps them safe in order to grow to adulthood.

HABITAT:

Flying fish are most often found in the open ocean, but they can sometimes be found along the edges of coral reefs. They survive in tropical waters and are found in the Atlantic, Pacific, and Indian Oceans. They are often found in large schools of flying fish.

CULTURAL IMPORTANCE:

A small island in the Caribbean, called Barbados, is called "the land of the flying fish." Due to a very large plankton population off their coast, flying fish live there in large schools. Some fishermen have reported seeing schools of at least 1,000 flying fish in them. Also, in Taiwan, there is the Flying Fish Festival which is a coming of age ceremony for young men who earn their society ranking according to how many fish they can catch!

The flying fish is a very unique fish, but are there any other fish that have similar skills? The flying fish is the only fish that can glide across the water for such long distances, but there are other fish that leap out of the water. Let's look at a couple of these fish that also have very unique abilities!

HOUND NEEDLEFISH

This fish may not be able to glide like the flying fish, but it is able to leap out of the water. Their leaping can be to escape a predator, and because they are a predator themselves chase after prey! As their name suggests, needlefish are long and slender with a mouth filled with sharp teeth. They can grow up to almost 5 feet in length (1.5 m), and their shape allows them to swim very fast, reaching speeds of 37 mph (60 km/h). They have been known to jump over small boats instead of swimming underneath them and this makes them feared by fishermen. So far there are only 2 deaths by needlefish, but their sharp snouts can cause puncture wounds when they leap out of the water.

HABITAT:
The hound needlefish is found in the Indian and Pacific Oceans. They live alone or sometimes in small schools of needlefish, often patrolling lagoons and seaweed reefs.

DIET:
They often eat small fish, squid, and crustaceans. Although when they are young, they eat plankton. They are quick hunters, often using an upward swipe of their head to bite a prey with their very sharp teeth.

GIANT TREVALLY FISH

The giant trevally fish is a carnivorous fish that will leap out of the water as well. This fish has been seen jumping out of the water to catch a bird in flight! The giant trevally has earned the "giant" in its name and can get to 5.7 feet long (1.7 m) and weigh well over 100 pounds (45 kg). They can reach speeds of 37 mph (60 km/h), just like the needlefish and flying fish, in order to jump out of the water. They are a popular game fish, and due to their large size, they are quite a prize.

HABITAT:
This fish lives in the Indian and Pacific Oceans, often close to bays or estuaries. They live alone in reefs, but the younger giant trevally will school together.

DIET:
The giant trevally eats crustaceans such as spiny lobsters and crabs, as well as other fish. They often hunt at night and will shadow other predators like the monk seal to pick off escaping prey. They have also been known to use sharks to ambush prey.

NOTEBOOK TIME!

Students, it's time to work in your notebooks! Open up your notebook to today's lesson and complete the assignments.

SOURCES:

https://www.fishbase.in/summary/Caranx-ignobilis.html
https://www.nationalgeographic.com/animals/fish/group/flying-fish/
https://www.britannica.com/animal/flying-fish
http://www.beaufortonline.com/nautical-flag-guide/
https://www.aboutanimals.com/fish/needlefish/
https://www.wou.edu/~taylors/gs106/Lab3_Key_Oceanography.pdf
https://www.totallybarbados.com/articles/about-barbados/facts-about-barbados/flying-fish/#.Xcl1n-hKhPY

LESSON 13 · DAY AT A GLANCE · FLYING FISH

SCIENCE NOTEBOOKING

Today students will use the graphic organizer to take notes about a flying fish of their choice. Students can work on this page and take notes while they listen or complete their pages after you have finished reading from the Teacher's Guide.

EARLY READER + EARLY ELEMENTARY

HEADERS: *Habitat, Appearance, Interesting Facts*

UPPER ELEMENTARY

HEADERS: *Appearance, Habitat, Interesting Facts, More about the _____.*

MIDDLE SCHOOL

HEADERS: *Habitat, Appearance, Interesting Facts, Threats, More about the _____.*

HIGH SCHOOL

HEADERS: *Habitat, Appearance, Interesting Facts, Threats, More about the _____.*

SCIENCE SALINITY

WHAT'S HAPPENING?

If you are working with more than one student, flip to this page together. Younger students will be using the scientific method to investigate ocean water salinity through an example of an experiment, and older students will be graphing the surface salinities of the Atlantic and Pacific Oceans at different latitudes. Want to try the experiment yourselves? All you'll need is 3 glasses, 3 eggs, sugar, some table or sea salt and water. Don't forget to make sure the salt is completely dissolved in the water, you may have to heat the water in the microwave.

EARLY READER + EARLY ELEMENTARY

ASSIGNMENT: *Dictate or write your hypothesis in the box.*

UPPER ELEMENTARY

ASSIGNMENT: *Write your hypothesis and the conclusion in the boxes.*

MIDDLE SCHOOL

ASSIGNMENT: *Make a line graph of the surface salinities of the Atlantic and Pacific Oceans using two different colors (one for each ocean).*
ANSWERS: *1. 20ºN 2. Pacific*

HIGH SCHOOL

ASSIGNMENT: *Make a line graph of the surface salinities of the Atlantic and Pacific Oceans using two different colors (one for each ocean).*
ANSWERS: *1. 20ºN and S 2. Pacific 3. Large amounts of space at the equator where there is a lot of rainfall in the Pacific. 4. Addition of water: rainfall, run off. Removal of water: Evaporation, formation of sea ice.*

SOCIAL STUDIES NAUTICAL FLAGS

WHAT'S HAPPENING?

If you are working with more than one student, flip to this page together so that you can read aloud the paragraph at the beginning before they each work on their individual activities.

EARLY READER

ASSIGNMENT: *Create your own nautical flag. Tell a parent or sibling what your nautical flag means.*

EARLY ELEMENTARY

ASSIGNMENT: *Create your own nautical flag. Have a parent or sibling write what your nautical flag means on the lines.*

UPPER ELEMENTARY

ASSIGNMENT: *Using the nautical alphabet as a key, try and decode the message.*
ANSWERS: *Be strong in the Lord.*

MIDDLE SCHOOL

ASSIGNMENT: *Use the nautical alphabet as a key, try and decode the message. Write the meanings of 4 nautical flags on the lines.*
ANSWERS: *Be strong in the Lord.*

HIGH SCHOOL

ASSIGNMENT: *Research nautical flags and record your research in the boxes.*

LANGUAGE ARTS COPYWORK + SPELLING

WHAT'S HAPPENING?

Students will continue to work on their Bible passage for this week. This is an excellent time to repeat the passages as a family to work on memorization!

EARLY READER + EARLY ELEMENTARY

VERSE: *"Finally, be strong in the Lord and in the strength of his might." Ephesians 6:10*
SPELLING: *strong (Early Reader), might (Early Elementary)*

UPPER ELEMENTARY

VERSE: *"Finally, be strong in the Lord and in the strength of his might. Put on the whole armor of God, that you may be able to stand against the schemes of the devil." Ephesians 6:10-11*
SPELLING: *scheme*

MIDDLE SCHOOL

VERSE: *"Finally, be strong in the Lord and in the strength of his might. Put on the whole armor of God, that you may be able to stand against the schemes of the devil. For we do not wrestle against flesh and blood, but against the rulers, against the authorities, against the cosmic powers over this present darkness, against the spiritual forces of evil in the heavenly places." Ephesians 6:10-12*
SPELLING: *authorities*

HIGH SCHOOL

VERSE: *"Finally, be strong in the Lord and in the strength of his might. Put on the whole armor of God, that you may be able to stand against the schemes of the devil. For we do not wrestle against flesh and blood, but against the rulers, against the authorities, against the cosmic powers over this present darkness, against the spiritual forces of evil in the heavenly places. Therefore take up the whole armor of God, that you may be able to withstand in the evil day, and having done all, to stand firm" Ephesians 6:10-13*
REFLECTION: *What do you think it means to wrestle against "cosmic powers over this present darkness"?*

ART DRAW A FLYING FISH

WHAT'S HAPPENING?

Today students will look at the image of a flying fish and then try to sketch one of their own. If they want, they can add color with colored pencils or watercolor paint! You can do it in this book or they can do it in a science or art journal! Older students can look up more detailed drawings or paintings and try some new techniques if they want!

THE OCTOPUS

INTRODUCTION

Do you know an ocean animal that has eight arms and one very large, bulbous head? Must be an octopus! The octopus is an easy animal to identify and is seen throughout the ocean. These mysterious creatures have inspired many creepy villains in movies, books, and throughout history. The Kraken was a legendary sea monster from Scandinavian folk tales that would attack ships in the ocean and destroy them. Like the Kraken, the Lusca was in the Caribbean, supposedly a giant octopus. These are just tales and we know octopuses are actually another one of God's amazing creations. The octopus is probably most famous for the inky cloud they release as a way to escape when they are scared or in danger. There are over 300 different species of octopus with more being discovered every year. Let's learn more about this fascinating creature.

APPEARANCE

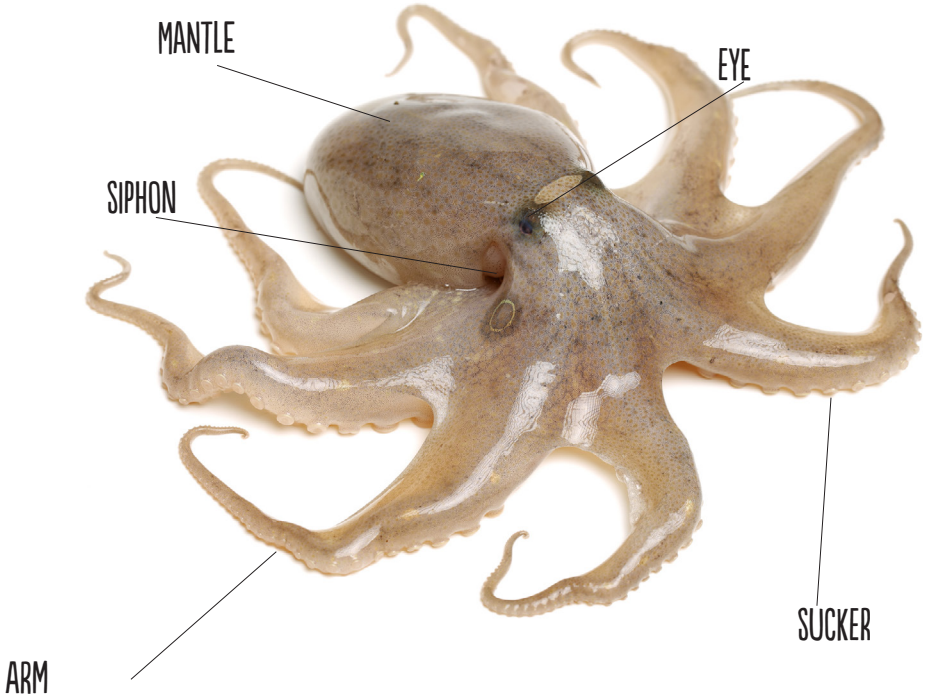
An average octopus can grow anywhere from 12 inches to about 36 inches long (30 to 91 cm), depending on the species. The largest known octopus is the giant Pacific octopus and can grow to be 16 feet long (4.9 m). The smallest known octopus is the star-sucker pygmy octopus, which is smaller than an inch (less than 2.54 cm). All octopuses have a sac-shaped head, called a mantle, with eight arms underneath. The mantle is made up of muscle and surrounds all the octopus's organs, such as the gills, hearts (more about this later), and digestive system. The strong muscles in the mantle help protect their organs and help with breathing as well. Each arm has two rows of suckers that are like suction cups and used for gripping prey and feeling surfaces. They can also taste through their suckers as they feel along the ocean floor.

ACTIVITY BREAK!
Go look up videos of an octopus escaping by swimming quickly in the opposite direction using its siphon.

Octopus use both their arms and suckers to crawl along the bottom of the ocean. An interesting fact is that 2/3 of an octopuses' nerves go from their brain to their arms! This means that an octopus can explore a cave for food with one arm while another arm cracks open shellfish to eat. What happens if an octopus gets caught and loses an arm? If that happened to you or me, things would become more complicated! But to an octopus it's no big deal. If an octopus loses an arm, they will simply grow another one.

WHAT IS THE SIPHON?

An octopus takes in water through its mantle, or head, and then pushes it out of a short funnel on the side of its head, called the siphon, when the octopus breathes out. When the octopus is alarmed by something, they will take water into their mantle and close it off to seal the water in. Then it releases the water quickly through its siphon, which pushes the octopus in the opposite direction at speeds of 25 mph (40 km/h). This is essentially like filling up a balloon with air and then letting it go. Depending on which direction the octopus wants to go, they will point their siphon to change direction.



THREE HEARTS AND BLUE BLOOD?

This creature is one of a kind because they have three hearts! One heart pumps blood through all its organs and arms and the other two hearts pump blood through its gills, allowing it to breathe underwater. When an octopus is swimming, the heart pumping blood to the organs and arms stops beating. This might be why they prefer to crawl along the ocean floor, since not having blood to their organs would cause the octopus to tire very easily while swimming. They also have blood that is blue! Instead of hemoglobin, which makes our blood red, an octopus has hemocyanin which is a copper-based protein that makes the octopus have a blue tint to their blood.

DIET

Octopuses eat crab, lobsters, plankton, clams, snails, and many small marine fishes. They will also eat other octopuses. They drop down on their prey from above, and using their powerful suckers, will pull the animal into their mouth. Their mouth is located at the very base of their head between all their arms. Octopus have a parrot-like beak for a mouth that helps them eat hard shelled animals like crabs. Octopuses tend to eat smaller animals, but they have been known to attack sharks as well.

HABITAT

Octopuses live in all the oceans of the world but are more common in warm, tropical waters. Most live near the water's surface in reefs and crevices, but some octopus species live on the deep ocean floor in caves. They usually live alone in their dens and sometimes an octopus will make a rock "door" for their den that they pull closed when they are inside to keep them safe. Octopuses have no bones in their body, allowing them to squeeze into these very tight spaces. They are also masters of disguise! Octopuses can alter their skin to take on many different colors and textures so that they can blend into their surroundings.

HOW DO OCTOPUSES CHANGE COLOR?

Just like we have pores on our skin, octopuses have something called *chromatophores*. These cells have three sacs of color each, and thousands of them cover the surface of the octopus. Since each of these chromatophores are controlled by different nerves, the octopus can change color in seconds.

YOUR TURN!
Look up pictures of an octopus camouflaging itself in different environments. Can you find the octopus?

LIFE CYCLE

When it's time, the female octopus will lay her eggs under rocks or in holes. She can lay anywhere from 200,000 to 400,000 eggs at a time! The eggs remain incubating for four to eight weeks, and during that time, the mother octopus stays to guard her eggs. She will even stop eating in order to keep her eggs safe. She cleans the eggs with her suckers and agitates the water around them to keep them clean. Finally, the eggs hatch and baby octopuses, that look just like tiny versions of their parents, will drift in a plankton cloud for a few weeks before they take refuge on the bottom of the ocean for protection.

After the eggs hatch, the mother octopus will die since octopuses have a very short life span. The father octopus doesn't stay around to guard the eggs, but he will also die within a few months after the eggs hatch. An octopus has a life span of 6 months to about 5 years, but the average is about 1 to 2 years. Usually the larger the octopus, the longer their life.

OCTOPUS INTELLIGENCE

Not only are octopuses masters of disguise, they are also masters of escape. There have been countless stories of octopuses escaping their tanks in aquariums and other enclosures. Octopuses have complex brains that allow them to process information and make decisions about which tricks to use to escape a predator. They also seem to use this same skill to escape aquariums! Octopuses have been known to unscrew tightly capped jars, pry open food bins, and even been taught to choose a red ball instead of a white ball. There is a book by Henry Lee about one smart octopus at the Brighton Aquarium in England. In May 1873, the aquarium staff were noticing that lumpfish were mysteriously disappearing from their tank. Finally, the staff discovered the culprit when they found an octopus in the lumpfish tank. Their sneaky octopus had been climbing over the tank wall, getting into the lumpfish tank for a snack, and then climbing back into his tank before anyone could notice! Octopus intelligence is something scientists continue to research, but one thing is for sure, the octopus is an amazing creature to learn about!

NOTEBOOK TIME!

Students, it's time to work in your notebooks! Open up your notebook to today's lesson and complete the assignments.

SOURCES:

https://www.britannica.com/animal/octopus-mollusk
https://kids.nationalgeographic.com/animals/invertebrates/octopus/
https://www.smithsonianmag.com/science-nature/ten-curious-facts-about-octopuses-7625828/
https://www.scientificamerican.com/article/are-octopuses-smart/
https://www.britannica.com/animal/crow-bird#ref1242613
https://www.britannica.com/animal/African-gray-parrot/Intelligence-tests#ref1185650
https://www.britannica.com/animal/chimpanzee/Intelligence#ref751131
https://play.google.com/store/books/details?id=ID8DAAAAQAAJ

LESSON 14 • DAY AT A GLANCE • THE OCTOPUS

SCIENCE NOTEBOOKING

WHAT'S HAPPENING?

Today students will use the graphic organizer to take notes about the octopus. Students can work on this page and take notes while they listen or complete their pages after you have finished reading from the Teacher's Guide.

EARLY READER + EARLY ELEMENTARY

HEADERS: *Habitat, Appearance, Interesting Facts*

UPPER ELEMENTARY

HEADERS: *Habitat, Appearance, Interesting Facts, More about Octopus Hearts*

MIDDLE SCHOOL

HEADERS: *Habitat, Appearance, Interesting Facts, More About the Siphon, Octopus Intelligence, Scientific Name.*

HIGH SCHOOL

HEADERS: *Habitat, Appearance, Diet, Interesting Facts*

LANGUAGE ARTS WRITING PROJECT

WHAT'S HAPPENING?

Students will continue to work on their writing project. They'll need to pull out their writing project from lesson 10 so that they can correct any mistakes and edit their text.

EARLY READER + EARLY ELEMENTARY

ASSIGNMENT: *Edit any mistakes in your rough draft and re-write a good draft as neatly as possible.*

UPPER ELEMENTARY

ASSIGNMENT: *Re-read your rough draft from lesson 10 and correct any mistakes. Try to add more descriptive words, and make sure your writing makes sense.*

MIDDLE + HIGH SCHOOL

ASSIGNMENT: *Proofread your article and make sure your sources are correctly cited at the bottom.*

SOCIAL STUDIES ANIMAL INTELLIGENCE

WHAT'S HAPPENING?

If you are working with more than one student, turn to this page so that you can all work on this together. Stuents can take turns, switching off at the different animals, or older students can read the entire page aloud to younger students.

EARLY READER + EARLY ELEMENTARY

ASSIGNMENT: *Draw, write, or dictate to a parent to show what you learned about the smartest animals in the world.*

UPPER ELEMENTARY

ASSIGNMENT: *Choose one of the animals you learned about today and write a few sentences about it and why it interests you.*

MIDDLE SCHOOL

ASSIGNMENT: *Research other animal species that have been found to be very intelligent. Use the lines below to collect your information. Then, on a separate sheet of paper (or the computer), write a few organized paragraphs showing what you learned. Cite your sources in MLA or APA formatting.*

HIGH SCHOOL

ASSIGNMENT: *Research other animal species that have been found to be very intelligent. Use the boxes to collect your information, then write a short persuasive essay about one of the animals you find, explaining how smart the animal is and why. Use 2-3 points for your argument, with examples to prove your points. Cite your sources at the bottom in either MLA or APA formatting.*

LANGUAGE ARTS GRASPING GRAMMAR

WHAT'S HAPPENING?

Students will continue to work on the grammar concepts from earlier in this unit.

EARLY READER

ASSIGNMENT: *Circle the dates that are written correctly.*
ANSWERS: *Saturday, March 12, 2016; Monday, July 20, 2020; Wednesday, December 11, 2019; January 23, 2010; October 7, 2016.*

EARLY ELEMENTARY

ASSIGNMENT: *Add commas to the sentences to separate the items in each sentence.*
ANSWERS: *Jake wants to run, swing, and slide at the playground.*
Callie got a doll, books, colors, and a dress for her birthday.
Donny saw a cat, dog, hamster, and parrot at the pet store.
Lydia loves to visit her aunt, uncle, and cousins at Christmas.

UPPER ELEMENTARY

ASSIGNMENT: *Write out a conversation between two people. Practice making a new line when a new speaker starts talking and remember all your quotation rules!*

MIDDLE + HIGH SCHOOL

VERSE: *Practice adding a footer using the word processor on your computer.*

ART DRAW AN OCTOPUS

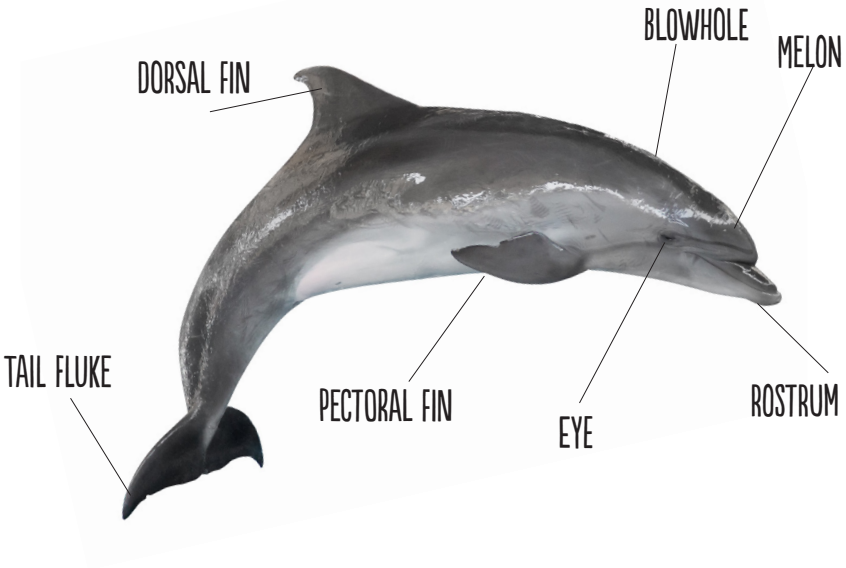
WHAT'S HAPPENING?

Today students will look at the image of an octopus and then try to sketch one of their own. If they want, they can add color with colored pencils or watercolor paint! You can do it in this book or they can do it in a science or art journal! Older students can look up more detailed drawings or paintings and try some new techniques if they want! You could even grab some clay and try forming a sculpture of an octopus!

DOLPHINS

INTRODUCTION

Dolphins seem to be the happiest and most playful creature in the ocean. They are one of the most beloved creatures of the sea. The United States even has a National Dolphin Day on April 14. There are 40 different species of dolphins, including the orca and pilot whale. The smallest of the dolphin family is the Maui dolphin, which gets to be 5.6 feet long (1.7 m) and weighs about 110 pounds (50 kg). The largest in the dolphin family is the orca at 31 feet long (9.5 m) and 20,000 pounds (9,072 kg). While most dolphins live in the ocean, there are four dolphins that actually live in rivers around the world. The Amazon River dolphin can have a pink color to them and is the most famous of the river dolphins.



All dolphins share the same general shape and appearance, with slight differences in colors, fin shapes, and sizes. Their head has two eyes that are able to move independently of each other. This means they can be looking at two different things. They have a blowhole on the top of their head that they breathe through and make sounds from. On their forehead is their melon, which is an organ used for echolocation. It is made up of fat and is what gives their head a rounded shape. Their mouth, or rostrum, has 80 to 100 teeth, depending on the species. A dolphin's jaw is elongated and helps them sense things in the environment around them. Their dorsal fin gives them stability while they are swimming. However, there are a few dolphin species that do not have a dorsal fin. The dolphin's tail fin and flukes are what they use to propel themselves in the water, and their pectoral flippers are used to help steer themselves while swimming.

DID YOU KNOW?

Although dolphins sleep, it doesn't look that way! When dolphins sleep, they rest only one side of their brain at a time. The opposite side of their brain remains alert for dangers and helps them get to the surface to breathe regularly.

Dolphins are highly social animals and their pod is an important part of their life. Dolphins can live in pods of up to 1,000 dolphins, but most pods include about 12 to 16 dolphins. In each pod, they rely on each other for finding and catching food, companionship, and fun! When dolphins are seen in the wild by humans, they are often playing in the ocean by jumping and leaping out of the water. They will also follow behind a ship, playing in the waves made by the ship's wake. Dolphins are compassionate creatures as well, and when one of the dolphins in their pod is sick or injured, they rally around to help. One dolphin pod was seen doing this by helping a member of their pod with an injured fin. The injured dolphin was struggling to get to the surface to breathe, so the other dolphins all grouped around the injured dolphin, helping it stay at the surface.

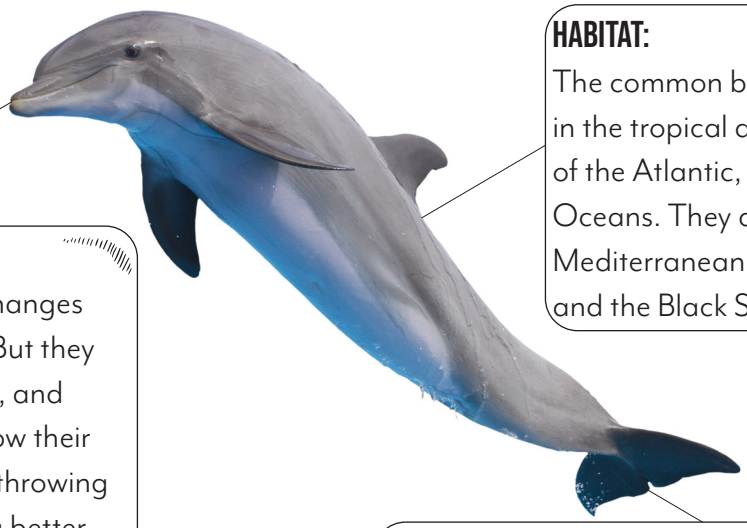
INTERACTION WITH HUMANS

ACTIVITY BREAK:
Go watch videos of dolphins playing in the ocean. You can also find videos of the spinner dolphin, which we will learn about later today.

Dolphins are highly intelligent and have brains that work very similar to ours. Dolphins have been able to learn 90 different words in sign language and can even understand these words in a sentence. Although they don't have hands to be able to communicate back, researchers are hopeful that with advances in technology, someday they can carry on a meaningful conversation with a dolphin. Dolphins have also been known to help save humans from shark attacks. There are many stories of divers and swimmers being attacked by a shark, only to have a pod of dolphins circle around and protect them. Dolphins are remarkable animals and these stories give more reasons why they are such a well loved ocean creature!

BOTTLENOSE DOLPHIN

If you imagine a dolphin in your mind, it's most likely this species of the dolphin family. The bottlenose dolphin has been made popular through many popular movies and their amusing acrobatic shows at aquariums around the world. This species is highly intelligent and can learn many tricks. The bottlenose dolphin has dark gray skin and a lighter coloring on their sides and stomachs. They grow to be between 6.6 to 13 feet long (2 to 4 m).



HABITAT:
The common bottlenose dolphin lives in the tropical and temperate waters of the Atlantic, Pacific, and Indian Oceans. They are also found in the Mediterranean Sea, the North Sea, and the Black Sea.

DIET:
A bottlenose dolphin's diet changes depending on where it lives. But they most often will eat fish, squid, and crustaceans. Dolphin's swallow their food whole and can be seen throwing their food into the air to get a better angle to swallow the fish.

DID YOU KNOW?
Each bottlenose dolphin has their own name! Each dolphin has a unique pattern of whistles used by the other dolphins to get their attention.

SPINNER DOLPHIN

Spinner dolphins are known for their epic acrobatic spins in the air and have been recorded doing seven spins in the air at one time. Why do they spin? Scientists are not exactly sure, but they have a few possible reasons. Since spinning usually happens after they have rested, it could be a type of workout to get them ready to hunt. It also could be for social reasons and a way to play; once one dolphin starts to spin, others will join in. This dolphin has three colors: dark gray at the top down to their sides, then a sharp change in color to lighter gray, and white stomachs. This dolphin grows to be about 4.2 to 7.5 feet long (1.3 to 2.4 m).

DIET:
Spinner dolphins eat most fish, squid, and shrimp. Their prey are often moving at night so the spinner dolphin often hunts at this time.

HABITAT:
The spinner dolphins live in the tropical oceans of the Atlantic, Pacific, and Indian Oceans. There are four different subspecies of spinner dolphins, some found in various oceans and others located in just one ocean. The dwarf spinner is found only in the Pacific Ocean near Southeast Asia and Australia, while the Gray's spinner dolphin is found in all three oceans listed above.

INDO-PACIFIC HUMPBACK DOLPHIN

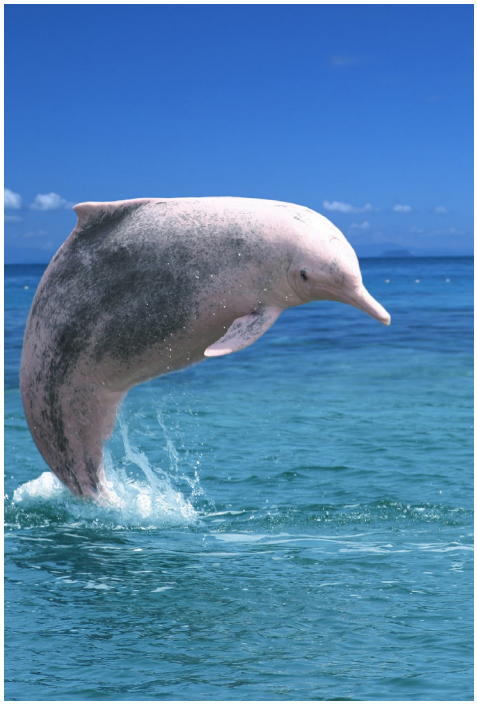
This dolphin is a type of humpback dolphin that lives in the tropical waters of the Pacific Ocean from Australia to East China, as well as to the coast of India in the Indian Ocean. This dolphin can be easily recognized due to their pinkish colored skin, although in different parts of the world they can appear different colors. Around China, they are often white in color while near Hong Kong they have a more pinkish color. They also have a hump on their dorsal fin that makes them look similar to a humpback whale.

DIET:

The Chinese white dolphin prefers to eat coastal fish living in reefs or off estuaries, but they will also eat octopus, squid, and crustaceans.

DID YOU KNOW?

Why is the the Indo-Pacific humpback dolphin pink? It is not because their skin is actually a pink color, but instead, it is from the blood vessels underneath. Young Indo-Pacific humpback dolphins are actually gray in color, not pink.



OPTIONAL EXTENSION ACTIVITY:

Research some popular movies about dolphins and choose one to watch together as a family!

NOTEBOOK TIME!

Students, it's time to work in your notebooks!

Open up your notebook to today's lesson and complete the assignments.

SOURCES:

https://us.whales.org/whales-dolphins/species-guide/common-bottlenose-dolphin/
https://www.dolphins-world.com/bottlenose-dolphin/
https://www.dolphins-world.com/spinner-dolphin/
https://www.dolphins-world.com/chinese-white-dolphin/
https://www.newscientist.com/article/dn23108-dolphins-form-life-raft-to-help-dying-friend/
https://www.dolphins-world.com/dolphins-rescuing-humans/
https://www.britannica.com/science/echolocation

LESSON 15 · DAY AT A GLANCE · DOLPHINS

SCIENCE NOTEBOOKING

WHAT'S HAPPENING?

Today students will use the graphic organizer to take notes about a dolphin of their choice. Students can work on this page and take notes while they listen or complete their pages after you have finished reading from the Teacher's Guide.

EARLY READER + EARLY ELEMENTARY

HEADERS: *Habitat, Diet, Interesting Facts*

UPPER ELEMENTARY

HEADERS: *Diet + Habitat, Appearance, Interesting Facts*

MIDDLE SCHOOL

HEADERS: *Habitat, Appearance, Characteristics, Interesting Facts*

HIGH SCHOOL

HEADERS: *Habitat, Dolphins + Humans, Characteristics, Interesting Facts*

SCIENCE ECHOLOCATION + SONAR

WHAT'S HAPPENING?

If you are working with more than one student, turn to this page about Echolocation and Sonar all together so that you can follow the rabbit trails together as a family.

EARLY READER - UPPER ELEMENTARY

RABBIT TRAIL WITH ME: *Do you think a person who is blind could use something like echolocation to walk through a room? How? What would be some other uses for echolocation?*

FURTHER DOWN THE RABBIT TRAIL: *How are sound waves used in medicine? Research ultrasound machines. How do they work? What do the iamges look like? Compare the diferences between an ultrasound machine vs an x-ray and fill in the chart below.*

MIDDLE SCHOOL

ASSIGNMENT: *Research how sonar works in more detail. How do submarines find targets underwater? Then research the ultrasound machine. How does it work to collect images? Write or illustrate your findings below.*

HIGH SCHOOL

ASSIGNMENT: *Research how sonar works in more detail. Write your notes on the page, then compile a paragraph on a separate sheet of paper.*

SOCIAL STUDIES + GEOGRAPHY

WHAT'S HAPPENING?

OCEAN VS. SEA

If you are working with multiple kids, you can read this page to all of them together and then have them work on their assigned sections.

EARLY READER + EARLY ELEMENTARY

ASSIGNMENT: *Color the Mediterranean Sea green. Fill in the names of the continents using the word bank.*

UPPER ELEMENTARY

ASSIGNMENT: *Find and label the Mediterranean Sea. Then label the three continents surrounding the Mediterranean Sea.*

MIDDLE SCHOOL

ASSIGNMENT: *Research the differences between the ocean and the sea and write the differences in the graphic organizer. Then label the Mediterranean Sea and the countries that surround it on the map.*

HIGH SCHOOL

ASSIGNMENT: *Research the differences between the ocean and the sea. Then research the Mediterraneana sea. Collect your findings in the graphic organizer.*

LANGUAGE ARTS COPYWORK + SPELLING

WHAT'S HAPPENING?

Students will continue to work on their Bible passage for this week. This is an excellent time to repeat the passages as a family to work on memorization! If you purchased the optional cursive workbook, students can use that for their copywork passage instead!

EARLY READER + EARLY ELEMENTARY

VERSE: *"Finally, be strong in the Lord and in the strength of his might." Ephesians 6:10*

SPELLING: *strong (Early Reader), might (Early Elementary)*

UPPER ELEMENTARY

VERSE: *"Finally, be strong in the Lord and in the strength of his might. Put on the whole armor of God, that you may be able to stand against the schemes of the devil." Ephesians 6:10-11*

SPELLING: *scheme*

MIDDLE SCHOOL

VERSE: *"Finally, be strong in the Lord and in the strength of his might. Put on the whole armor of God, that you may be able to stand against the schemes of the devil. For we do not wrestle against flesh and blood, but against the rulers, against the authorities, against the cosmic powers over this present darkness, against the spiritual forces of evil in the heavenly places." Ephesians 6:10-12*

SPELLING: *authorities*

HIGH SCHOOL

VERSE: *"Finally, be strong in the Lord and in the strength of his might. Put on the whole armor of God, that you may be able to stand against the schemes of the devil. For we do not wrestle against flesh and blood, but against the rulers, against the authorities, against the cosmic powers over this present darkness, against the spiritual forces of evil in the heavenly places. Therefore take up the whole armor of God, that you may be able to withstand in the evil day, and having done all, to stand firm" Ephesians 6:10-13*

REFLECTION: *What does it mean to be "strong in the Lord?" How can you do this in your own daily life?*

ART DRAW A DOLPHIN

WHAT'S HAPPENING?

Today students will look at the image of a dolphin and then try to sketch one of their own. If they want, they can add color with colored pencils or watercolor paint! You can do it in this book or they can do it in a science or art journal! Older students can look up more detailed drawings or paintings and try some new techniques if they want!

DEADLY CREATURES

INTRODUCTION

The ocean holds many mysterious and interesting creatures, in fact, more than a million different species! While there are many that have been discovered, scientists estimate that there are 9 million more species out there that have yet to be discovered. Some people find the "unknown" of the ocean is too scary to venture into, but not all of the ocean creatures are dangerous! We've already talked about some of the amazing, and not in any way scary, creatures of the oceans. Today, we are going to focus on some of the more dangerous creatures. True, the ocean can be a pretty dangerous place because some of the deadliest creatures on earth live there. From poisonous to just outright vicious, the ocean holds many of these animals.

When people think of deadly sea creatures, often the first one named is sharks. We already learned about two species of sharks that need extra caution. The great white shark and the tiger shark both make people fear the water, and the bull shark is another shark species that is known to attack humans. Sharks can definitely be deadly, but for the most part, many shark species are completely harmless. We also learned about the mauve stinger jellyfish that can sting and cause painful sores that last a couple of weeks. But what other deadly creatures live in the ocean? Today we will learn about some of these creatures.

RED LIONFISH

The lionfish is quite a fish to behold, with its red, black, and white zebra stripes and fancy looking pectoral fins. Don't let that fool you into touching it though, because this fish is quite deadly. Today we learned that the red lionfish is an invasive species. There are 18 needle-like dorsal fins on the lionfish that house their venom. This is just for defense and they are not known to actively attack anything. Although a sting from a lionfish is extremely painful, it rarely kills people. It can often cause nausea or breathing difficulties in some people. The largest lionfish was 15 inches long (38 cm), but most are about 12 inches in length (30 cm).

DIET:
The lionfish eats fish and shrimp found within the reef. They rely on their camouflage and quick reflexes to capture their prey.

HABITAT:
Lionfish live in coral reefs of the Indian and Pacific Oceans. They are now considered an invasive species of the Atlantic Ocean.

PORTUGUESE MAN-OF-WAR

Although they look like a jellyfish, the Portuguese man-of-war is not a jellyfish but instead a group of organisms working together. This type of fish is called a *siphonophore* (si-fono-for). They have a purplish-blue bladder that sits above the surface of the water, like a ship at full sail. The tentacles of the man-of-war are long, and some have been found to reach 165 feet in length (50 m), but their normal length is about 30 feet long (9 m). Their tentacles are covered in venom-filled cysts that paralyze fish and other small creatures. For humans, a man-of-war sting is extremely painful but rarely deadly. Even washed up along the shore, Portuguese man-of-war can deliver a painful sting!

HABITAT:
The Portuguese man-of-war lives in the tropical waters of the Atlantic, Pacific, and Indian Oceans.

DIET:
They eat small fish, crustaceans, and plankton by trapping them in their long tentacles.

ACTIVITY BREAK:
Look up videos of the Portuguese man-of-war to see their long tentacles floating in the ocean.

BEAKED SEA SNAKE

For some people, snakes living in the ocean is literally their worst nightmare! The beaked sea snake is one snake that you don't want to mess with either. Just 1.5 milligrams of its venom could kill eight humans. In comparison, its venom is eight times more toxic than a cobra and makes it the most venomous sea snake. But don't worry, because they are not known to attack humans unless they are provoked. The beaked sea snake has a gray top, whitish stomach, and darker gray stripes along their body. This snake is able to go on both land and in the water. The beaked sea snake can also move both backward and forward in the water at the same speed.

DIET:
They mainly eat catfish and pufferfish but have been known to eat other fish, crustaceans, and squid. They often hunt at night when their prey is unsuspecting.

HABITAT:
This sea snake is found in clear, shallow reef waters of the Indian and Pacific Oceans.

BLUE-RINGED OCTOPUS

The blue-ringed octopus is a small octopus that only grows to be about 6 inches long (15 cm). This tiny octopus may look harmless, but be warned, they have extremely toxic venom inside those little bodies. In fact, this octopus has two different types of venom! The first venom is used on their prey and is mixed with their saliva or spit, which it uses to poison its prey. Once their prey is dead, then they eat it with their beak-like mouth. The second venom is used for self-defense and is extremely toxic. The octopus will bite and poison whatever predator is trying to get them. The poison can cause nausea, vision loss, losing the ability to move, and cause you to stop breathing.

DIET:
Blue-ringed octopuses eat small crabs, hermit crabs, and shrimp that they hunt for during the day.

HABITAT:
They are only found around the temperate waters of Australia in the Pacific Ocean.

GREAT BARRACUDA

This large predatory fish is known for its mouth full of teeth and vicious behavior. Their teeth are shaped like that of a piranha, very sharp and triangular. Their body is long and slender in shape, with two dorsal fins and black blotches on their sides. The largest barracuda caught was 5.5 feet long (1.7 m) although they average about 4.5 feet (1.4 m). They rarely attack humans, and if they do, it's just a strike bite which can be serious due to their sharp teeth. This fish can also leap out of the water to catch its prey.

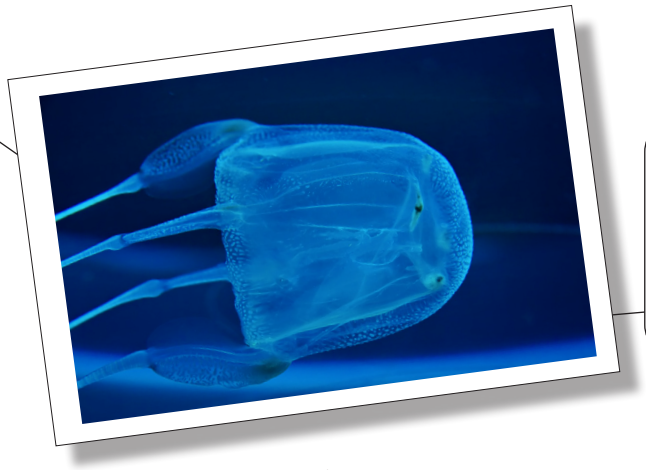
HABITAT:
The great barracuda live in warm, tropical waters of the Atlantic Ocean, near Florida and the Caribbean. They are found mostly along the surface and often alone.

DID YOU KNOW?
The great barracuda are attracted to shiny, reflective objects that look like the silvery fish they often eat. Wearing large rings, earrings, or other jewelry should be avoided in their habitat, to prevent them from thinking you're dinner!

BOX JELLYFISH

The box jellyfish, also called the sea wasp, is not like the gentle jellyfish we see floating in the ocean. The box jellyfish is the deadliest jellyfish in the ocean and accounts for more human deaths in Australia than sharks do. One sting from the box jellyfish is extremely uncomfortable and, in some cases, causes death. They have a cube-shaped bell with tentacles that can grow up to 10 feet long (3 m). While most jellyfish cannot control their movements and drift with the currents, the box jellyfish is able to move which gives them an advantage in capturing prey.

DIET:
The box jellyfish eat small fish, shrimp, crustaceans, worms, and other jellyfish. This jellyfish lures their prey in with their tentacles and then gives them a deadly sting when they get close enough.



HABITAT:
The box jellyfish lives in the tropical waters around Australia, in the Indian and Pacific Oceans.

Interested in learning more about deadly ocean animals? Look up the saltwater crocodile, the flower urchin, the pufferfish, or the stonefish.

NOTEBOOK TIME!

Students, it's time to work in your notebooks! Open up your notebook to today's lesson and complete the assignments.

SOURCES:

https://www.nationalgeographic.com/animals/fish/r/red-lionfish/
https://marinebio.org/species/great-barracudas/sphyraena-barracuda/
https://marinebio.org/species/blue-ringed-octopuses/hapalochlaena-maculosa/
https://www.nationalgeographic.com/animals/invertebrates/p/portuguese-man-of-war/
https://www.nationalgeographic.com/animals/invertebrates/group/box-jellyfish/
https://www.sealifebase.ca/summary/Enhydrina-schistosa.html
https://www.nationalgeographic.org/encyclopedia/invasive-species/

LESSON 16 · DAY AT A GLANCE · DEADLY CREATURES

SCIENCE NOTEBOOKING

WHAT'S HAPPENING?

Today students will use the graphic organizer to take notes about a deadly ocean creature of their choice. Students can work on this page and take notes while they listen or complete their pages after you have finished reading from the Teacher's Guide.

EARLY READER + EARLY ELEMENTARY

HEADERS: *What makes me Dangerous, Appearance, Interesting Facts.*

UPPER ELEMENTARY

HEADERS: *What makes me Dangerous, Appearance, Habitat, Interesting Facts*

MIDDLE SCHOOL

HEADERS: *What makes me Dangerous, Diet, Appearance, Habitat, Interesting Facts*

HIGH SCHOOL

HEADERS: *What makes me Dangerous, Diet, Appearance, Habitat, Interesting Facts*

BIBLE JESUS CALMS THE STORM

WHAT'S HAPPENING?

If you are working with more than one student, pull out your Bible and read Matthew 8:23-27 together as a family before your students work on their individual activities.

EARLY READER
ASSIGNMENT: *Draw a picture of what you think the story of Jesus calming the storm looked like.*

EARLY ELEMENTARY
ASSIGNMENT: *Draw a picture of the story, then answer the questions.*

UPPER ELEMENTARY
ASSIGNMENT: *Write a first person account of the story, pretending that you were one of the disciples on the boat.*

MIDDLE SCHOOL
ASSIGNMENT: *Look up the story of Jesus calming the storm in both Matthew 8:23-27 and Mark 4:35-41, and compare the two accounts in the venn diagram.*

HIGH SCHOOL
ASSIGNMENT: *Look up each of the gospel accounts of Jesus calming the storm, and write any differences you notice betwen the stories.*

SCIENCE INVASIVE SPECIES

WHAT'S HAPPENING?

If you're working with more than one student, read this page about invasive species out loud to all of your younger students, or have your older students read it out loud to the younger ones.

EARLY READER
ASSIGNMENT: *Draw, write, or dictate to your parent what you learned in the box.*

EARLY ELEMENTARY
ASSIGNMENT: *Write, draw, or dictate to your parent what you learned in the boxes. Do you have any ideas for how you can help stop the spread of invasive species?*

UPPER ELEMENTARY
ASSIGNMENT: *Fill in the boxes with what you learned. Can you think of other ways to help prevent the spread of invasive animals or plants?*

MIDDLE + HIGH SCHOOL
ASSIGNMENT: *Research what it means to be an invasive species. Then find three other invasive species and write down what impact they are having on the environment. Are any of them in your area?*

LA + BIBLE DICTATION

WHAT'S HAPPENING?

Today your students will have the opportunity to write their Bible passage from memory! If you have the cursive notebook, your students can write their passage in there instead.

EARLY READER + EARLY ELEMENTARY
VERSE: *"Finally, be strong in the Lord and in the strength of his might." Ephesians 6:10*

UPPER ELEMENTARY
VERSE: *"Finally, be strong in the Lord and in the strength of his might. Put on the whole armor of God, that you may be able to stand against the schemes of the devil." Ephesians 6:10-11*

MIDDLE SCHOOL
VERSE: *"Finally, be strong in the Lord and in the strength of his might. Put on the whole armor of God, that you may be able to stand against the schemes of the devil. For we do not wrestle against flesh and blood, but against the rulers, against the authorities, against the cosmic powers over this present darkness, against the spiritual forces of evil in the heavenly places." Ephesians 6:10-12*

HIGH SCHOOL
VERSE: *"Finally, be strong in the Lord and in the strength of his might. Put on the whole armor of God, that you may be able to stand against the schemes of the devil. For we do not wrestle against flesh and blood, but against the rulers, against the authorities, against the cosmic powers over this present darkness, against the spiritual forces of evil in the heavenly places. Therefore take up the whole armor of God, that you may be able to withstand in the evil day, and having done all, to stand firm" Ephesians 6:10-13*

ART DRAW A LIONFISH

WHAT'S HAPPENING?

Today students will look at the image of a lionfish and then try to sketch one of their own. If they want, they can add color with colored pencils or watercolor paint! You can do it in this book or they can do it in a science or art journal! Older students can look up more detailed drawings or paintings and try some new techniques if they want!

CORAL HABITATS

INTRODUCTION

Coral reefs are found throughout our oceans and hold a wide variety of different sea creatures. Coral reefs cover only 1% of the ocean floor, but this small area provides a home for a quarter or 25% of all marine animals. Coral reefs are so diverse that they are believed to be the most diverse ecosystem in the world, even more so than tropical rainforests which have many animal species in them. Coral reefs provide millions of people with food, medicines, and protection from storms. They also help with a country's economy by providing resources and tourism. Let's learn more about this important and beautiful part of our oceans.

Do you see the white slit in the middle? That's the polyp's mouth!

Did you know that coral is actually alive? Coral is made up of a tiny organism called a *coral polyp* and they are related to sea anemones and jellyfish. A *coral polyp* has a sac-like body and a mouth in the middle where a sac would synch together. All around the mouth are stinging tentacles. The coral polyp that makes up hard coral takes calcium and carbonate from seawater to build itself into a hard, cup shaped skeleton made of limestone. Limestone's scientific name is calcium carbonate because it is made up of these two elements. The limestone skeleton protects the soft body of the coral polyp inside. During the day, coral polyps stay inside their skeletons, but at night they will stick out their tentacles in order to find food. Mostly, coral polyps get their nutrients from algae, but they will eat zooplankton and small fish as well.

A coral reef begins when one of these tiny coral polyps attaches to a rock on the sea floor. The coral polyp then buds or divides into thousands of clones. A *clone* is an exact replica of itself. The coral continues to grow, creating a group that acts like a single organism. As they grow over many years, they join up with other coral groups and create a coral reef. Each species of coral grows at a different rate and depends on how warm the water is, how much salt is present in the water, and how much food is available. The largest corals are the slowest to grow, only adding 0.19 to 0.78 inches (5 to 25 mm) per year. Branching corals tend to grow much faster, adding 8 inches (20 cm) to their branches each year.

Most coral polyps have clear bodies and their skeletons are white, like our bones. But when we see a coral reef, there are so many different colors. How do they go from white to purple, blue, yellow, red, and green? Coral is home to tiny algae that live inside the coral, and these special algae (called *zooxanthellae*) give coral their many different colors. There are many millions of zooxanthellae that live in just a tiny square of coral, and their colors are what show through the clear bodies of the coral polyps.

Most people know about hard corals, but there are also soft corals that are not made up from limestone. Soft coral is bendable and often looks like plants or trees. They do not have a hard skeleton like hard coral does, but instead they have wood-like cores that help support them with a fleshy outside. This type of coral does not build coral reefs and they do not always have the zooxanthellae algae that gives coral its amazing colors.

ACTIVITY BREAK:
Turn to the end of this lesson to see different hard and soft corals. Which one is your favorite?

Scientists label coral reefs into four different types of reefs. Fringing reefs grow near coastlines of islands and continents. These are the most common types of reefs that we see. *Atolls* are rings of coral that create a protected lagoon and usually grow in the middle of the sea. A *lagoon* is saltwater that is separated from the ocean by sandbars or coral reefs. *Patch reefs* are very small and isolated reefs that are separated from each other by sand. They look like patches on the ocean floor because they do not connect to one another. Finally, barrier reefs also follow the coastline but are separated from the shore by deeper and wider lagoons. The largest and probably the most famous reef in our ocean is the Great Barrier Reef. This reef is one of the seven natural wonders of the world and is larger than the Great Wall of China. Located on the northeast coast of Australia, it is home to more than 600 types of coral and thousands of marine animal species. Let's explore and learn about four of those amazing and colorful fish that live in the coral reef.

BUTTERFLY FISH

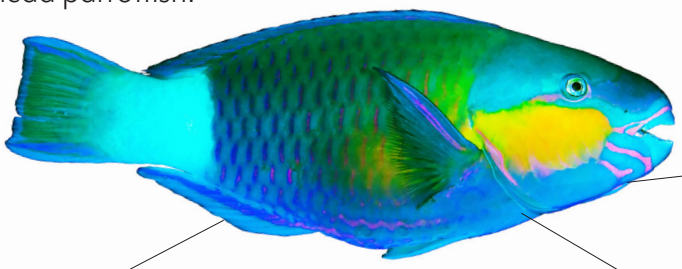
The butterfly fish is a small, saltwater fish found primarily in coral reefs. There are 100 different types of butterfly fish found around the world in tropical and subtropical waters. The one pictured here is the Latticed Butterfly Fish. They generally grow to be 4 to 5 inches long (10 to 13 cm), but some have been known to grow up to a foot long (30 cm). Butterfly fish mate for life and are often seen swimming around the coral reef in pairs. The smaller butterfly fish species will often school (a large group of fish) together, but the larger species tend to stay with just their mate.

DIET:
Most butterfly fish eat plankton, coral, sea anemones, and small crustaceans. They eat during the day and rest at night.

HABITAT:
Butterfly fish are found in the Atlantic, Pacific, and Indian Oceans.

BULLETHEAD PARROTFISH

Like its name suggests, the parrotfish shares characteristics with a parrot, including its bright colors and beak-like mouth. There are believed to be 60 different species of parrotfish in the ocean, although this is hard to determine because each parrotfish will change color depending on their age and gender, even within the same species. Their colors range from red, green, blue, yellow, gray, brown, and black. The health of the coral reef is greatly impacted by this fish, who eats the algae that would overtake the coral reef if not kept under control. The parrotfish pictured here is a bullethead parrotfish.



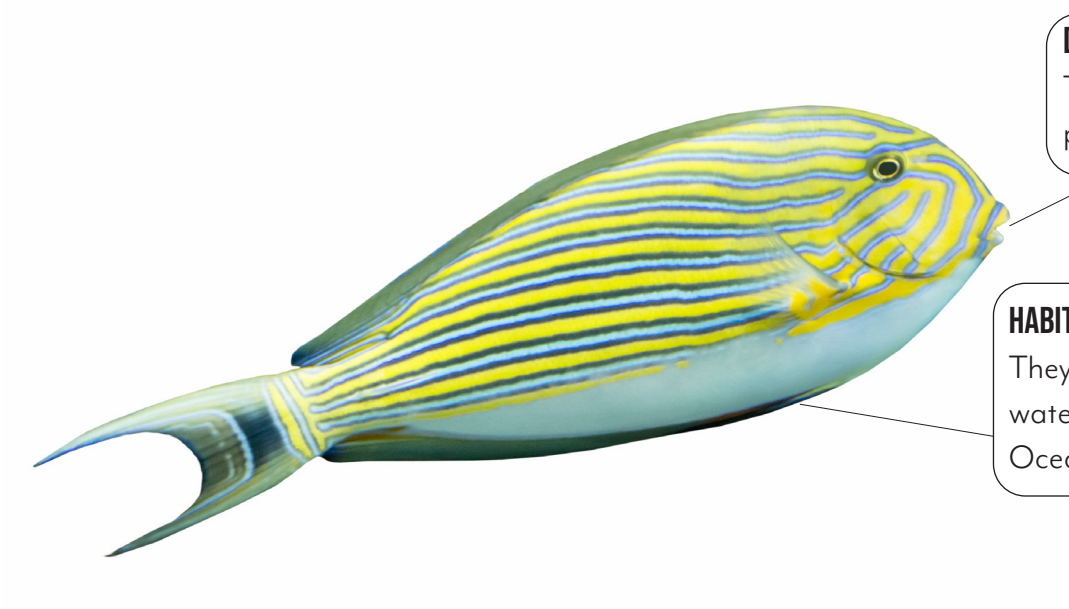
DIET:
The parrotfish eats the algae that it takes out of the coral in the reef. In fact, much of the sand around where a parrotfish lives is just undigested coral pieces that the parrotfish excreted.

DID YOU KNOW?
Parrotfish create a mucous bubble around themselves at night. Scientists think this cocoon is to protect them from predators by making it harder for predators to smell them.

HABITAT:
Parrotfish are found in tropical waters of the Atlantic, Pacific, and Indian Oceans.

STRIPED SURGEONFISH

The striped surgeonfish is one fish that can be easily identified by its bright blue and yellow striped side and pale blue stomach. They are also called the clown surgeonfish or the blue-lined surgeonfish. This surgeonfish has a blade-like spine on their tail that points outward and is used for defense. The spine is as sharp as a surgeon's scalpel (knife) and this is how they get their name. There are about 75 different surgeonfish in the ocean with varying colors and sizes, but this species can grow to be 15 inches long (8 cm).



DIET:
The striped surgeonfish eat plankton and algae.

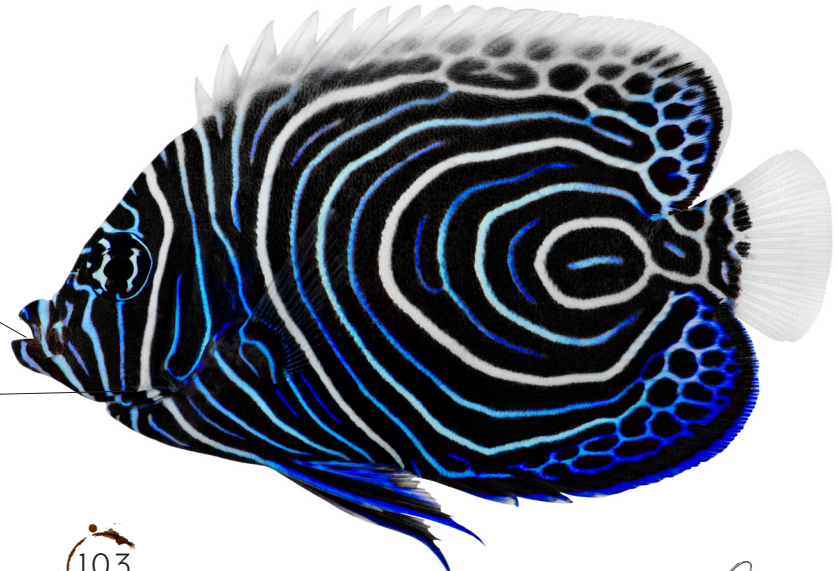
HABITAT:
They are found in tropical waters of the Indian and Pacific Oceans.

EMPEROR ANGELFISH

The angelfish species is the most abundant fish in the coral reef, with over 80 different angelfish in their family. They are found at all levels of the coral reef, from the surface to the base of the coral formations. They have many different colors and patterns, making each fish unique. The emperor angelfish, also known as the imperial angelfish, has two different color variations depending on its age. The angelfish pictured here is the young angelfish. Adult angelfish have thin yellow and blue alternating stripes on their sides. The change from young to adult angelfish occurs between 3.1 to 4.7 inches (8 to 12 cm), with the adult fish growing to 15 inches long (38 cm).

DIET:
They primarily eat sponges and algae found in the coral reef.

HABITAT:
The emperor angelfish is found in the tropical waters of the Indian and Pacific Oceans.



HARD CORALS

ELKHORN CORAL

STAGHORN CORAL

BRAIN CORAL

TUBE CORAL

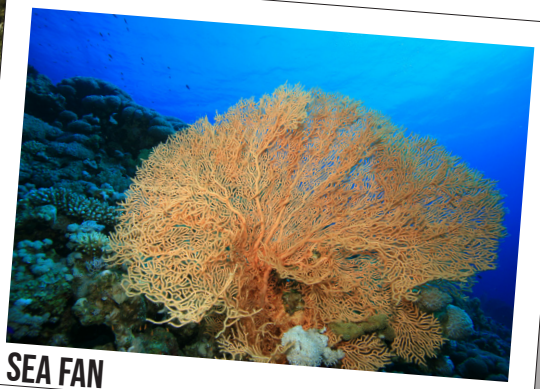
TABLE CORAL

SOFT CORALS

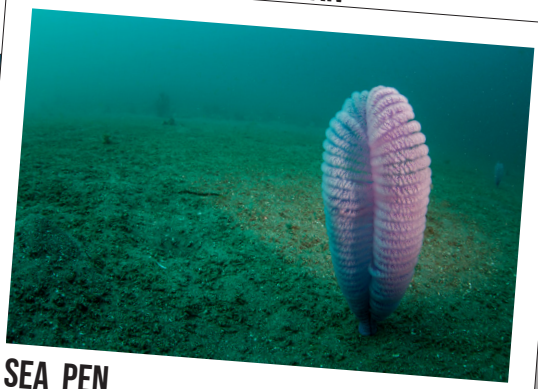
CARNATION CORAL

SEA WHIPS

TOADSTOOL CORAL



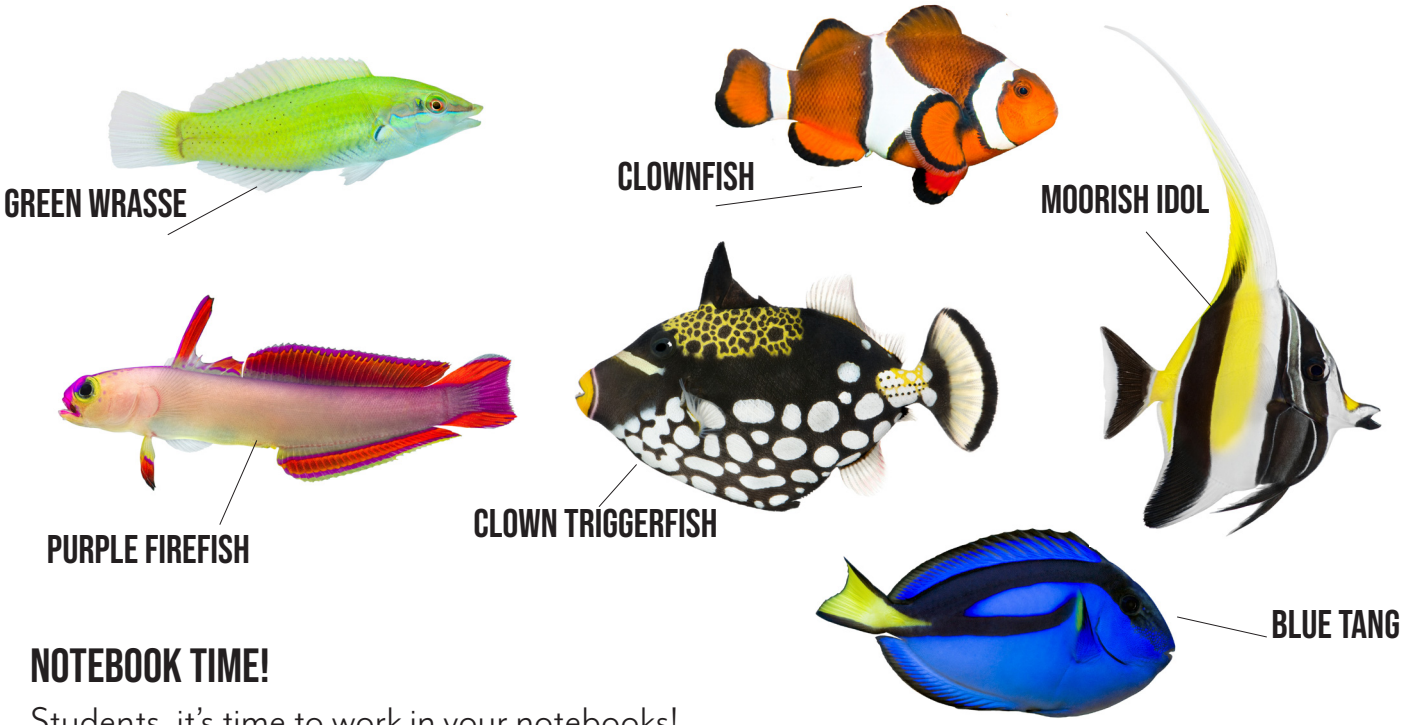
SEA FAN



SEA PEN

ACTIVITY BREAK:

Interested in learning more about the fish that live in the coral reef? Here are a few other species that you can research! Or find a video of someone scuba diving in a coral reef and see if you can find the coral and fish we learned about today.



NOTEBOOK TIME!

Students, it's time to work in your notebooks!

Open up your notebook to today's lesson and complete the assignments.

SOURCES:

https://www.nationalgeographic.com/animals/invertebrates/group/corals/
http://www.greatbarrierreef.org/
https://www.nationalgeographic.com/animals/fish/group/butterflyfish/
https://www.nationalgeographic.com/animals/fish/group/parrotfish/
https://www.britannica.com/animal/surgeonfish
https://www.whatsthatfish.com/fish/striped-surgeonfish/394
https://nas.er.usgs.gov/queries/FactSheet.aspx?speciesID=2294
http://www.secore.org/site/corals/detail/coral-reefs-are-dying.23.html
http://www.icriforum.org/sites/default/files/Status%20Coral%20%20Reefs%20of%20World%202008%20%20Executive%20Summary_0.pdf
https://coral.org/coral-reefs-101/coral-reef-ecology/

LESSON 17 • DAY AT A GLANCE • CORAL REEFS

SCIENCE NOTEBOOKING

WHAT'S HAPPENING?

Today students will use the graphic organizer to take notes about coral reefs! Students can work on this page and take notes while they listen or complete their pages after you have finished reading from the Teacher's Guide.

EARLY READER + EARLY ELEMENTARY

HEADERS: *Color where the Great Barrier Reef is located, Appearance, Interesting Facts*

UPPER ELEMENTARY + MIDDLE SCHOOL

HEADERS: *Color where the Great Barrier Reef is located, Where Coral Reefs are found, Appearance, Interesting Facts*

MIDDLE + HIGH SCHOOL

HEADERS: *Mark where the Great Barrier Reef is found on the map of Australia. Habitat, Appearance, Interesting Facts, Find Four Coral Reefs*

SCIENCE

WHAT'S HAPPENING?

SNORKELING VS. SCUBA DIVING

Students from Early Reader through Upper Elementary will have similar passages about Snorkeling vs. Scuba Diving to read, so if you are working with more than one student, you can read the paragraph aloud to all of your students at once or have one of your students read it aloud instead!

EARLY READER

ASSIGNMENT: *Draw yourself scuba diving or snorkeling in the box.*

EARLY ELEMENTARY

ASSIGNMENT: *Draw yourself scuba diving or snorkeling in the box and then write or dictate your ocean adventure on the lines below.*

UPPER ELEMENTARY

ASSIGNMENT: *Imagine that you are going snorkeling or scuba diving, and then write about your imaginary adventure!*

MIDDLE + HIGH SCHOOL

ASSIGNMENT: *Research the difference and similarities between snorkeling and scuba diving, and write your findings and sources.*

SOCIAL STUDIES DISAPPEARING CORAL

WHAT'S HAPPENING?

If you are working with multiple students, get everyone to turn to this page together so that you can read the paragraph about disappearing coral aloud to all of your students together before spending some time researching and discussing this issue as a family.

EARLY READER + EARLY ELEMENTARY

ASSIGNMENT: *Do some research to discover what other issues are impacting the coral reefs. Discuss some ideas for what you can do to help protect coral reefs. In the box, write, dictate to your parent, or draw your ideas.*

UPPER ELEMENTARY

ASSIGNMENT: *Research other issues that are impacting the coral reefs and write or draw your findings.*

MIDDLE + HIGH SCHOOL

ASSIGNMENT: *Research disappearing coral reefs and write a breaking news article about the topic.*

LANGUAGE ARTS + BIBLE

WHAT'S HAPPENING?

COPYWORK + SPELLING

This week you will be working on your spelling through Jeremiah 29:11 (or 11-13 for older students who are encouraged to look it up in their own version). You can choose to have your children just copy and focus on spelling, or work on these verses as a family and try to memorize them. At the end of the week they can try to write them from memory or you can dictate the verses to them. You could also practice the Charlotte Mason art of recitation and recite this each morning before you start to help your kids memorize it. All verses are in ESV though you can choose any version for your children.

Students can do their copywork (or dictation if it's that day) in cursive if you have the optional cursive writing notebook add on!

EARLY READER

VERSE: *"For I know the plans I have for you, declares the LORD," Jeremiah 29:11a*
SPELLING: *know*

EARLY ELEMENTARY

VERSE: *"For I know the plans I have for you, declares the LORD, plans for welfare and not for evil, to give you a future and a hope." Jeremiah 29:11*
SPELLING: *future (Early Elementary)*

UPPER ELEMENTARY

VERSE: *"For I know the plans I have for you, declares the LORD, plans for welfare and not for evil, to give you a future and a hope. Then you will call upon me and come and pray to me, and I will hear you." Jeremiah 29:11-12*
SPELLING: *welfare, fair*

MIDDLE + HIGH SCHOOL

VERSE: *"For I know the plans I have for you, declares the LORD, plans for welfare and not for evil, to give you a future and a hope. Then you will call upon me and come and pray to me, and I will hear you. You will seek me and find me, when you seek me with all your heart." Jeremiah 29:11-13*
SPELLING: *welfare (Middle School)*
REFLECTION: *1. What do you think it means that God has plans for your welfare? 2. What do you think this means: "You will seek me and find, me, when you seek me with all your heart"? Do you think we can find God if our heart is not really wanting to seek God?*

ART DRAW A BUTTERFLY FISH

WHAT'S HAPPENING?

Today students will look at the image of a butterfly fish and then try to sketch one of their own. If they want, they can add color with colored pencils or watercolor paint! You can do it in this book or they can do it in a science or art journal! Older students can look up more detailed drawings or paintings and try some new techniques if they want!

SEA STARS

INTRODUCTION

What was once known as a starfish has now had its named changed to sea star because it's not actually a fish. Sea stars are *invertebrates*, meaning they don't have a backbone. Today there are an estimated 1,600 different species throughout the oceans of the world. Most species range in size from 8 to 12 inches long (20 to 30 cm), but there are some that are only 0.4 inches (1 cm) and others that are as big as 25 inches across (65 cm). Not only do they differ in size but also in the amount of their arms. The most common is five arms, hence the name of sea star, but some species can have as many as 50 arms!

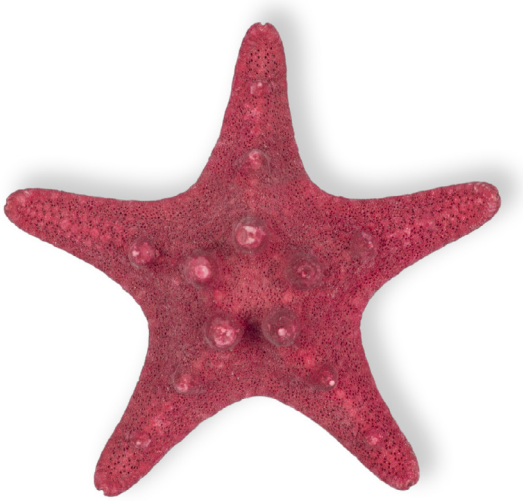
APPEARANCE

Sea stars have hard, calcified skin. If you remember from yesterday, coral is made from calcium and carbonate that makes the hard coral. Sea stars also have a similar type of skin, and this protects them from predators. They also have bright colors that camouflage them or scare off predators. A sea star's arms are hollow and covered in short spines. There are grooves underneath the sea star that house rows of tube feet. These little tube feet give the sea star the ability to move in any direction as well as cling to the sides of steep surfaces.

A unique feature of the sea star is their ability to regrow or regenerate an arm. Some species can actually regrow their entire body! God gave them the ability to do this by having most or all of their vital organs in their arms. Some require that their central body, which is in the middle of the sea star, be intact to regrow their arms. This type of sea star cannot regrow itself from just one arm. But there are a few species that can grow an entirely new sea star from just a portion of their severed arm! Sea stars do not have brains but do have eyes in the tip of each of their arms. These eyespots can't see much as far as details of an object, but they can detect light and darkness. Also, if something swims by very fast, the sea star won't be able to see it well since their sight is very slow.

DIET

A sea star's primary food sources are clams, oysters, sand dollars, and mussels. These are usually attached to rocks, so they are easy for a sea star to get. Sea stars will also eat snails and injured fish when they can find them. When you look at a sea star, you might wonder how exactly do they eat? Once a sea star has caught a clam, it wraps itself around the shell tightly. It then pries the shell open with its powerful arms to expose the meat inside of the clam. When looking at a sea star, it doesn't appear to have a mouth, but it does have one in the very center of its body. Once the clam shell is open, the sea star actually pushes its stomach out of its mouth and eats the clam whole. Once it's done, the sea star will swallow its stomach again and begin to digest its meal. How would you like to push your stomach out of your mouth to eat your food?



HABITAT

Sea stars are found in all the oceans of the world. But they can't survive in freshwater, so they are never found in rivers, ponds, or lakes. The largest population of sea stars live in the Indian and Pacific Oceans and are usually found in shallow waters or on rocky beaches where they can find food.

LIFE CYCLE

It's hard to tell a male and female sea star apart because they look identical to each other. Sea stars reproduce two ways. We already learned that a sea star can grow an entire new body from an arm that was severed. Not many species can do this, but it is a way for more sea stars to come into the world. Also sea stars produce eggs that settle on the ocean floor, eventually hatching and growing into adults. A sea star can live in the wild up to 35 years!

SUNFLOWER SEA STAR

The sunflower sea star is one of the largest sea star species. It can get to be 3.3 feet long (1 m) and weigh as much as 11 pounds (5 kg). This giant sea star can have anywhere from 15 to 25 arms and thousands of tube feet to move itself. Most sunflower sea stars are bright orange, yellow, or red, but some have been found to be blue and purple. They are very fast for a sea star and can move at a speed of 3.3 feet per minute (1 meter per minute) using their 15,000 tube feet to accomplish this.

DIET:
The sunflower sea star eats mussels, sea urchins, fish, crustaceans, sea cucumbers, clams, algae, sponges, and squid.

HABITAT:
Sunflower sea stars are found in the Northeast Pacific Ocean up to Alaska, usually in tidal areas rich in seaweed and kelp.

DID YOU KNOW?
If predators are in the area, the sunflower sea star will drop one of its arms and send out a chemical that alarms the other sunflower sea stars in the area.

RED KNOB SEA STAR

The red knob sea star, also called the African sea star, has five arms with bright red, raised tubercles. They have also been found with 4 or 6 arms as well. The red knob sea star can grow to be almost a foot in length (30 cm). They are often found alone or in groups on shallow sand, gravel areas, and seagrass beds. Just like other sea stars, the red knob sea star can cool itself down when it overheats. When sea stars are in direct sunlight, their body temperature goes up. The sea star pumps saltwater into their bodies to bring their body temperature down.

DIET:
The red knob sea star eats algae, soft corals, sponges, tubeworms, clams, and other starfish. They are active during the daytime.

HABITAT:
They are found in the Indian Ocean around Africa and Indonesia.

CUSHION SEA STAR

This is a unique sea star because instead of being slightly raised or almost flat, the cushion sea star has an inflated appearance. They actually look like a pin cushion! They come in many different colors, from orange, red, brown and green. The cushion sea star moves the same way other sea stars move by using their tube feet, found underneath of them, to move in any direction. When cushion sea stars are young, they are completely different in appearance. In their young days, they have five arms and are flat. As they get older, they fill in and expand until they are fully inflated.

DIET:
The cushion sea star eats coral, clams, oysters, sea urchins, crab larvae, and sponges.

HABITAT:
They are found in the tropical waters of the Indian and Pacific Oceans.

CROWN OF THORNS SEA STAR

This is another one of the largest sea stars, growing to be about 19.7 inches long (0.5 m). They can have up to 23 arms and are covered in venomous spines. Since they are so well protected, they have very few natural predators. As adults, they eat mostly coral in coral reefs. One crown of thorns sea star can eat 32 square feet (10 square m) of coral in one year. Because they damage coral reefs, many fishermen fear them and cut them into pieces trying to rid the reef of them. Of course, this didn't work, and the sea stars just regrew.

HABITAT:
The crown of thorns sea star is found in the Indian and Pacific Oceans.

DID YOU KNOW?
Crown of thorns sea stars can take over a coral reef and seem to cause serious damage. But because they typically eat the faster growing corals, they allow the slower growing corals to catch up. Even though it seems bad, they are actually balancing the coral reef.

NOTEBOOK TIME!

Students, it's time to work in your notebooks! Open your notebooks to today's lesson and complete the assignments.

SOURCES:

https://www.nationalgeographic.com/animals/invertebrates/group/starfish/
https://www.britannica.com/animal/sea-star
http://ourmarinespecies.com/c-starfish/sunflower-starfish/
https://www.whatsthatfish.com/fish/redknobbed-sea-star/2380
https://oceana.org/marine-life/corals-and-other-invertebrates/cushion-star
https://oceanservice.noaa.gov/facts/tides.html

LESSON 18 • DAY AT A GLANCE • SEA STARS

SCIENCE NOTEBOOKING

Today students will use the graphic organizer to take notes about a sea star of their choice! Students can work on this page and take notes while they listen or complete their pages after you have finished reading from the Teacher's Guide.

EARLY READER + EARLY ELEMENTARY

HEADERS: *Habitat, Appearance, Interesting Facts*

UPPER ELEMENTARY

HEADERS: *Habitat, Appearance, Diet, Interesting Facts*

MIDDLE SCHOOL

HEADERS: *Habitat, Appearance, Diet, Interesting Facts, Reproduction*

HIGH SCHOOL

HEADERS: *Habitat, Appearance, Diet, Interesting Facts, Reproduction, Threats*

LANGUAGE ARTS WRITING PROJECT

Your students have worked hard on their writing project for this unit, and today they finally get to publish their final draft! Try to find an opportunity for them to show off their work, or post a photo of it online in our Gather 'Round Facebook Community!

EARLY READER - MIDDLE SCHOOL

ASSIGNMENT: *Look at the list of publishing ideas and choose one together with a a parent. Then find an opportunity to show off your work!*

HIGH SCHOOL

ASSIGNMENT: *Write or type out your blog post or newspaper article to get it ready for your readers. Make sure to type or write out all your sources in either MLA or APA formatting. Present it orally to your family or friends!*

SCIENCE OCEAN TIDES

If you are working with multiple students, get everyone to turn to this page so that you can read it all together. You can read it aloud to all of your students, or an older one can read it out loud to the younger ones.

EARLY READER

ASSIGNMENT: *Circle the correct answer.*
ANSWERS: *1. b 2. b*

EARLY ELEMENTARY

ASSIGNMENT: *Fill in the blanks with the correct word from the word bank.*
ANSWERS: *1. rise, fall. 2. pull, moon.*

UPPER ELEMENTARY

ASSIGNMENT: *Answer the questions.*
ANSWERS: *1. The rise and fall of the sea level. 2. Moon 3. The difference in sea level between low and high tide.*

MIDDLE + HIGH SCHOOL

ASSIGNMENT: *Research ocean tides and fill in the boxes with the correct answers.*
ANSWERS:1. *Tides are the rise and fall of the sea level and are caused by the moon, sun, and earth's rotation. 2. Tidal ranges are the difference between low and high tide 3. Answers will vary but might include differences in the shape or slope of the ocean floor. 4. The largest tidal range is the Bay of Fundy, New Brunswick and the range is 53.5 feet (16.3 m) (High school only) The Bay of Fundy has the highest tidal ranges due to the shape of the bay funneling the water in and resonance (seiche).*

LANGUAGE ARTS GRASPING GRAMMAR

Today is our final grammar lesson for this unit! Your students will review the concepts they have been working on for this unit one final time. Make sure to congratulate them on their hard work!

EARLY READER

ASSIGNMENT: *Circle the words that need to have a capital letter in the front.*
ANSWERS: *June, September, January, Thursday, March, Monday, Tuesday*

EARLY ELEMENTARY

ASSIGNMENT: *Add helping verbs and commas to the sentences.*
ANSWERS: *1. Our cat was being crazy yesterday. 2. Samuel does help mom with the dishes some nights. 3. Matt had played soccer last year but decided to go swimming instead. 4. We have been learning about amazing sea animals like the sea star, coral, octopus, and dolphin.*

UPPER ELEMENTARY

ASSIGNMENT: *Write each quotation the way it should be written.*
ANSWERS: *1. Susan commented, "She looked really sad today. Maybe we should go cheer her up."*
2. Tony remarked, "I can't believe that Julie doesn't want to play soccer anymore." "Yeah, I thought she loved soccer," I replied.
3. "My fingers are really tired from writing today," Sarah said.
4. "Tomorrow makes two years that we've been friends," I told Sam. "Wow, it feels like we've known each other forever," Sam replied.

MIDDLE + HIGH SCHOOL

ASSIGNMENT: *Find a book and a website source that you've used and practice formatting the book source in both MLA and APA format, and then the website in both MLA and APA format.*

ART DRAW A SEA STAR

Today students will look at the image of a sea star and then try to sketch one of their own. If they want, they can add color with colored pencils or watercolor paint! You can do it in this book or they can do it in a science or art journal! Older students can look up more detailed drawings or paintings and try some new techniques if they want!

THE WEIRD AND WONDERFUL

INTRODUCTION

Over the past few weeks, we've explored the ocean and discovered some very interesting ocean creatures. From the giant squid that lives in the deep oceans to fish that glow in the dark to the amazing way sea stars eat, there are so many different and amazing creatures in the ocean. Looking at all these animals, you can't help but see God's creativity with each of them. On the fifth day of creation, when God had already made the heavens and sky, the earth, the stars, day and night, and the waters of the earth, after all this work, He was just getting started. Let's read about it in Genesis:

> "And God said, "Let the waters swarm with swarms of living creatures, and let birds fly above the earth across the expanse of the heavens." So God created the great sea creatures and every living creature that moves, with which the waters swarm, according to their kinds, and every winged bird according to its kind. And God saw that it was good. And God blessed them, saying, "Be fruitful and multiply and fill the waters in the seas, and let birds multiply on the earth." And there was evening and there was morning, the fifth day."
> Genesis 1:20-23 ESV

God saw that all He had made was good, every unique and creative and interesting creature was formed by Him. Just like every unique person was fashioned and planned by Him.

SUNFISH

The sunfish, also called the mola, is a very interesting-looking fish with silvery, rough skin. They have a bullet shape because their back fin never grows and remains rounded. Many people think they look like half a fish that lost its tail! They are often seen floating on their sides, basking in the sun near the surface of the water, and this is how they got their name. Their teeth are fused together into a beak shape and they cannot close their mouths fully because of this. Sunfish are the heaviest of all bony fish, growing to be 10 feet from their mouth to their tail (3 m) and weighing 2,000 pounds (907 kg)! The largest sunfish ever found was 5,000 pounds (2,268 kg)! Sunfish are often mistaken as sharks because of their large dorsal fins.

DIET:
Sunfish eat jellyfish, small fish, zooplankton, and algae.

DID YOU KNOW?
Out of all fish species, they lay the most eggs: 300 million to be exact!

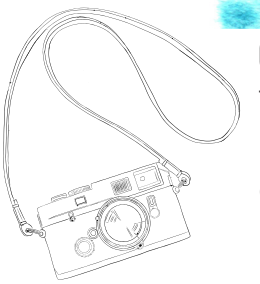
HABITAT:
Sunfish are found in the temperate and tropical waters of the Atlantic, Pacific, and Indian Oceans.

GIANT OARFISH

The giant oarfish, also called a ribbon fish, is the longest bony fish in the ocean. Because of their large and long shape, it is believed that many legendary sightings of sea monsters or sea serpents were actually this fish, floating near the surface. They grow to be 50 feet long (15 m) and can weigh as much as 600 pounds (272 kg). Around their head are thin, red or coral-colored fins that appear like a crest over its head. They have a small mouth with no visible teeth so they are far from the scary predator of the legends. They may seem like a fish that would be caught for eating, but their flesh is actually gooey and gelatinous like Jello and makes them not very good for humans to eat.

HABITAT:
Giant oarfish are found in the Eastern Atlantic Ocean and Mediterranean Sea. They are a deep-sea creature, living at 3,000 feet below the surface of the water but will come to the surface if they are sick or dying.

DIET:
The giant oarfish eat zooplankton, shrimp, and crustaceans.



OPTIONAL ACTIVITY:
Try looking up a picture of a Giant Oarfish!

PUFFERFISH

There are 120 species of pufferfish throughout the world but all share similarities. They have long bodies with blub-like heads and four teeth that are fused together into a beak shape. They are scaleless fish with rough or spiky skin. They range in size from 1 inch (2.54 cm) long pygmy puffer to the 2 foot long (0.6 m) giant puffer. Their colors are very muted so they can blend in with their environment, but some species have markings and bright colors to let other fish know to stay away because they are in fact poisonous! They have a toxin in their organs causing anything that eats the pufferfish to potentially be poisoned. Larger animals are not likely to die from it, but the smaller predators will be feeling pretty sick after eating a pufferfish.

DIET:
The pufferfish eats invertebrates and algae. Larger pufferfish will also eat clams, mussels, and shellfish.

HABITAT:
Pufferfish are found in the tropical waters of the Atlantic, Pacific, and Indian Oceans.

DID YOU KNOW?
Another defense besides their poisonous body is their ability to inflate themselves or puff up to keep predators from eating them.

SEA CUCUMBER

Wait, a cucumber in the ocean? Yes you heard right, but it's not the cucumber that you are thinking of. The sea cucumber is a soft-bodied invertebrate (no back bone) that is shaped like a cucumber. There are 1,250 different species of sea cucumber and they grow between 0.75 inches to 6.5 feet (1.9 cm to 2 m). These creatures are the earthworms of the ocean, taking waste, breaking it down, and then putting it back into the ocean for bacteria to use. A sea cucumber doesn't have gills like fish do, so how do they breathe in at the bottom of the ocean? A sea cucumber actually breathes through its butt! They take in water through their anus, which is where they take out the oxygen from the water so they can breathe.

HABITAT:
They are found in all the oceans of the world but most are in the Indian and Pacific Ocean. Some live in the deep ocean while others live in shallow water. They live on or near the ocean floor and are sometimes buried beneath it to hide from predators.

DIET:
Sea cucumbers eat tiny particles of algae, tiny ocean animals, or waste. They gather these particles with tube feet that look like tentacles and surround their mouth.

SEA URCHIN

The sea urchin is like the porcupine of the ocean, with their long spines that they use to stop predators from trying to eat them. However, you can pick up most sea urchins without getting hurt. The exception is the long-spined sea urchin of South Florida that has poisonous spines that can puncture our skin. They have a hard, outer shell and spines on the outside of it. When the sea urchin dies, all of its spines fall off and leave just the outer shell behind. Sea urchins are in the same family as the sea cucumber and sea stars.

DIET:
Sea urchins eat algae that they scrape off rocks with something called Aristotle's lantern. It is made of 5 hard plates that come together like a beak. Scraping the rocks wears down the plates and so they grow teeth to replace the worn-down ones.

HABITAT:
Sea urchins are found in all the oceans of the world, both warm and cold. They are commonly found in rock pools, coral reefs, kelp forests, and in mud.

NOTEBOOK TIME!

Students, it's time to work in your notebooks! Open up your notebook to today's lesson and complete the assignments.

SOURCES:

https://www.nationalgeographic.com/animals/fish/o/ocean-sunfish/
https://www.nationalgeographic.com/news/2013/10/131022-giant-oarfish-facts-sea-serpents/
https://www.nationalgeographic.com/animals/invertebrates/group/sea-cucumbers/
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https://www.nationalgeographic.com/animals/fish/group/pufferfish/
https://www.worldatlas.com/articles/what-are-the-characteristics-of-an-oceanic-type-of-climate.html
http://www.bible.ca/archeology/bible-archeology-exodus-route-pi-hahiroth.htm

ACTIVITY BREAK:
Look up videos of the pufferfish inflating itself.

LESSON 19 · DAY AT A GLANCE · THE WEIRD + WONDERFUL

SCIENCE NOTEBOOKING

WHAT'S HAPPENING?

Today students will use the graphic organizer to take notes about one of the unique creatures that we read about in this lesson. Students can work on this page and take notes while they listen or complete their pages after you have finished reading from the Teacher's Guide.

EARLY READER + EARLY ELEMENTARY
HEADERS: *Habitat, Diet, Interesting Facts*

UPPER ELEMENTARY
HEADERS: *Habitat, Diet, Appearance, Interesting Facts*

MIDDLE SCHOOL
HEADERS: *Habitat, Characteristics, Threats, Interesting Facts*

HIGH SCHOOL
HEADERS: *Habitat, Characteristics, Threats, Interesting Facts*

BIBLE THE ISRAELITES + THE RED SEA

WHAT'S HAPPENING?

If you are working with more than one student, pull out your Bible and read Exodus 14:1-31 together as a family before your students work on their individual activities.

EARLY READER + EARLY ELEMENTARY

ASSIGNMENT: *Draw what you think it would have looked like to have the Red Sea parted and the Israelites crossing over on dry ground.*

EARLY ELEMENTARY

ASSIGNMENT: *Draw a picture of the story, then answer the questions.*

UPPER ELEMENTARY

ASSIGNMENT: *Write what you think it would have been like to witness the parting of the Red Sea. If you want, draw a picture (or a few) to illustrate your writing and share it with your family.*

MIDDLE SCHOOL

ASSIGNMENT: *Write what you think it would have been like to witness the parting of the Red Sea.*

HIGH SCHOOL

ASSIGNMENT: *Write what you think it would have been like to witnes the parting of the Red Sea. What would it have been like to see the sea crash down on the Egyptians?*

SOCIAL STUDIES OCEAN CLIMATES

WHAT'S HAPPENING?

If you're working with more than one student, read this page about ocean climates out loud to all of your younger students, or have your older students read it out loud to the younger ones.

EARLY READER + EARLY ELEMENTARY

ASSIGNMENT: *Draw or dictate what you learned about ocean climates. What are the summers like? How about the winters?*

UPPER ELEMENTARY

ASSIGNMENT: *Draw or dictate what you learned about ocean climates. What are the summers like? How about the winters? What causes this climate?*

MIDDLE + HIGH SCHOOL

ASSIGNMENT: *Research ocean climates and record your findings in the boxes. Don't forget to record your sources!*

LA + BIBLE DICTATION

WHAT'S HAPPENING?

Today your students will have the opportunity to write their Bible passage from memory! If you have the cursive notebook, your students can write their passage in there instead.

EARLY READER

VERSE: *"For I know the plans I have for you, declares the LORD," Jeremiah 29:11a*
SPELLING: *know*

EARLY ELEMENTARY

VERSE: *"For I know the plans I have for you, declares the LORD, plans for welfare and not for evil, to give you a future and a hope." Jeremiah 29:11*
SPELLING: *future*

UPPER ELEMENTARY

VERSE: *"For I know the plans I have for you, declares the LORD, plans for welfare and not for evil, to give you a future and a hope. Then you will call upon me and come and pray to me, and I will hear you." Jeremiah 29:11-12*
SPELLING: *welfare, fear*

MIDDLE + HIGH SCHOOL

VERSE: *"For I know the plans I have for you, declares the LORD, plans for welfare and not for evil, to give you a future and a hope. Then you will call upon me and come and pray to me, and I will hear you. You will seek me and find me, when you seek me with all your heart." Jeremiah 29:11-13*
SPELLING: *welfare (Middle School)*
REFLECTION: *How do you feel knowing that God has a great plan for your life? Journal your response to these verses and spend some time calling upon and seeking the Lord today.*

ART DRAW A SUNFISH

WHAT'S HAPPENING?

Today students will look at the image of a sunfish and then try to sketch one of their own. If they want, they can add color with colored pencils or watercolor paint! You can do it in this book or they can do it in a science or art journal! Older students can look up more detailed drawings or paintings and try some new techniques if they want!

FLAT + FLOPPY RAYS

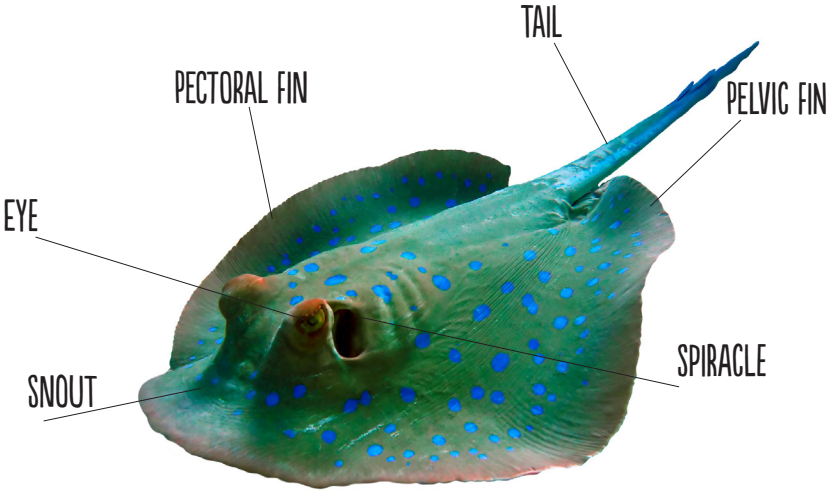
INTRODUCTION

The ray fish are found in every ocean in the world and are a distant relative to the shark family. There are 534 different species of rays and each can be identified by their shape and how they act. Most rays are not aggressive towards people, but you should never touch a ray because you could get shocked, stung, or worse! Let's learn more about the ray family.

APPEARANCE

All rays have a flattened body shape with large pectoral fins that are attached to their bodies and look like wings. Rays use these fins to swim, flapping like a bird's wings to swim quickly through the water. They also move in a more elegant, wave-like movement as they glide through the water. Different species have different shapes to their body, from round to diamond to triangular. A ray's mouth, nostrils, and gill slits are all located on its underbelly, and their eyes are on the top of their head. They are related to sharks and have cartilage that makes up their body and skeleton instead of bones. But a big difference between rays and sharks is how they breathe. Rays have large openings called spiracles on the top of their head in order to take in the oxygen from the water. They use this form of breathing when they are hiding in the sand on the ocean floor. A ray also has a long, slender tail that in many species has sharp spines with poison in them. They use their tails to defend themselves.

DIET



Rays are bottom feeders or filter feeders. If the species is a bottom feeder, they search through the sands for crustaceans and *mollusks* (clams, oysters, and mussels) that are buried. These rays have teeth that are like plates that they use to crush the shells of crustaceans. They tend to eat things that are smaller than themselves. If the species is a filter feeder, they have a sieve-like filter that they use to strain plankton from the water. This group does not have teeth but instead have just a mouth to suck water in so they can strain out the food. The whale shark is another filter feeder that we learned about earlier in this unit.

HABITAT

What type of ray it is will determine where they live. Although most rays live in the ocean, there are some that will venture into freshwater areas. Typically, rays are found on the bottom of the ocean, hiding from predators in the sand or waiting for unsuspecting prey. Because their gills are on their belly side, they rely on the spiracles on their head to breathe while they are buried in the sand. But rays can also be seen swimming gracefully in the open ocean.

LIFE CYCLE

Rays are interesting because, unlike other ocean creatures that have eggs and then lay them somewhere in the ocean (or on land if you're a turtle), the female ray carries her eggs inside her body. After about three months, the eggs will hatch inside the mother before they are released into the ocean. When a ray is first born, its *disc* (the width from one end of the pectoral fin to the other) is only about 3 inches (8 cm) wide. Each litter of rays can have 1 to 6 rays in it, and the mother ray will have just one litter a year. How long rays live in the wild has yet to be determined by scientists, but most think they live about 25 years.

STINGRAY

This ray is probably the most well known ray because of its long, whip-like tail that has spines or barbs on the end. These spines have sharp, serrated edges that produce venom and can remain deadly even after the stingray has died. The stingray's venom can be fatal to humans if it hits the stomach area. The stingray is often colored like the seafloor, camouflaging itself from sharks and larger rays that would eat it. They grow up to 6.5 feet wide (2 m) and can weigh up to 790 pounds (358 kg).

DID YOU KNOW?

A stingray doesn't use its eyes much for hunting. Instead they use special sensors called "ampullae of Lorenzini" that detect electrical charges emitted from their prey.

HABITAT:

They are found in the shallow, temperate or tropical waters of the Atlantic, Pacific, and Indian Oceans. They spend most of their time partially buried in the sand, only moving with the sway of the tide.

EXTENSION ACTIVITY:

Steve Irwin, the crocodile hunter, was killed by stingray venom. Look up this animal enthusiast and his many crazy adventures.

GIANT MANTA RAY

The giant manta ray is the largest ray in the world. They have two triangular shaped pectoral fins and two horn-shaped fins that stick out from their head. These fins have also given them the name "devil fish." The giant manta ray's wingspan is up to 29 feet wide (8.8 m) and can weigh up to 5,300 pounds (2,404 kg). They are often found alone but will group together with other rays to eat, mate, and migrate. While most rays have young once a year, the giant manta ray will only give birth once every couple of years and to one or two young.

HABITAT:

Giant manta rays are found in the tropical and temperate waters of the Atlantic, Pacific, and Indian Oceans. They are found offshore in the open ocean and often make long migrations to visit colder oceans for short periods of time during the year.

DID YOU KNOW?

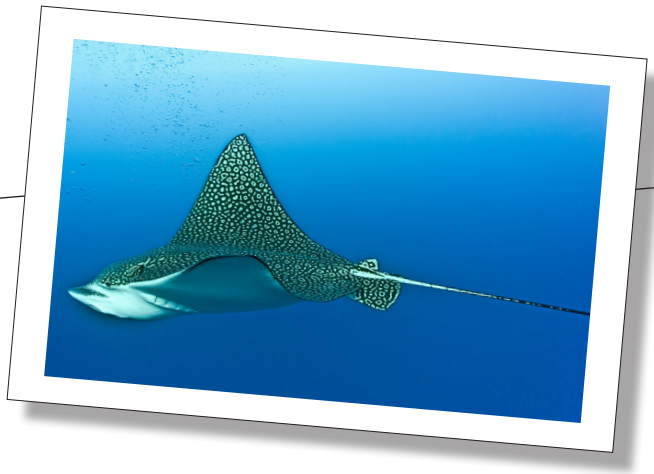
Manta rays go to "cleaning stations" which are spots on the coral reef where sea animals go to be cleaned by smaller creatures. The "cleaner" fish will remove parasites and dead skin from the manta rays.

SPOTTED EAGLE RAY

While many ray species are found along the ocean floor camouflaging in the sand, the spotted eagle ray does not behave that way. They are active swimmers and will not lie motionless on the ocean floor. Instead, they are found foraging in the open ocean. Like its name suggests, they are covered in spots and other markings that make it easy to identify them from other rays. The spotted eagle ray has venom in its tail, like the stingray, that it uses for defense. They grow to have a wingspan of 9.8 feet (3 m) and weigh as much as 507 pounds (230 kg).

DID YOU KNOW?

The spotted eagle ray can leap their entire body out of the water when swimming close to the surface.



HABITAT:

The spotted eagle ray is found in the tropical waters, often in coral reefs or bays, of the Atlantic, Pacific, and Indian Oceans. They often swim close to the surface of the water and are found in schools of rays.

YOUR TURN!

Go look up videos of the spotted eagle ray leaping out the water. Or watch videos of the manta ray swimming gracefully through the open ocean.

SAWFISH

Sawfish are also in the ray family, and unlike their family members, they have a long snout or rostrum that is edged with special teeth. These teeth allow the sawfish to cut or saw their food in half. They also use their snout to dig in the sand to search for food. When a sawfish's teeth wear down or they lose them, they can replace them like other toothed fish. The sawfish is listed as endangered due to overfishing and being tangled and killed in fishing nets. There are five different species of sawfish and they range in size from 10 feet (3 m) to 23 feet (7 m).

HABITAT:
Sawfish are found in the tropical waters of the Atlantic, Pacific, and Indian Oceans. They often live near coastlines.

DIET:
Sawfish eat fish and crustaceans. Their saw-shaped snout is extremely helpful in catching and killing their prey. They can use their snout as a weapon but also have small pores that can detect electrical fields that their prey produce (ampullae of Lorenzini).

NOTEBOOK TIME!

Students, it's time to work in your notebooks! Open up your notebook to today's lesson and complete the assignments.

SOURCES:

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https://www.nationalgeographic.com/animals/fish/group/stingrays/
https://kids.nationalgeographic.com/animals/fish/stingray/
https://www.nationalgeographic.com/animals/fish/group/manta-ray/
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LESSON 20 • DAY AT A GLANCE • FLAT + FLOPPY RAYS

SCIENCE NOTEBOOKING

WHAT'S HAPPENING?

Today students will use the graphic organizer to take notes about a ray of their choice. Students can work on this page and take notes while they listen or complete their pages after you have finished reading from the Teacher's Guide.

EARLY READER + EARLY ELEMENTARY
HEADERS: *Habitat, Diet, Interesting Facts*

UPPER ELEMENTARY
HEADERS: *Habitat, Am I dangerous? Why or why not? Appearance, Interesting Facts*

MIDDLE SCHOOL
HEADERS: *Habitat, Characteristics, Threats, Interesting Facts*

HIGH SCHOOL
HEADERS: *Characteristics, Interesting Facts, Habitat, Threats*

SCIENCE RED TIDES

WHAT'S HAPPENING?

If you are working with multiple children, read the paragraph about red tides together as a family with all of your younger students.

EARLY READER
ASSIGNMENT: *Color the ocean to show a red tide.*

EARLY ELEMENTARY
ASSIGNMENT: *Write, draw, or dictate what you learned about red tides.*

UPPER ELEMENTARY
ASSIGNMENT: *Research a red tide event that happened recently. Record your research and discuss it with a parent or older sibling.*

MIDDLE + HIGH SCHOOL
ASSIGNMENT: *Research the three types of algae that can cause a red tide: Alexandrium catenella, Alexandrium fundyense, and Karenia brevis. Record your research in the boxes.*

HISTORY PIRATES OF THE CARIBBEAN

WHAT'S HAPPENING?

If you're working with more than one student, read this page out loud to all of your younger students, or have your older students read it out loud to the younger ones.

EARLY READER
ASSIGNMENT: *Color the picture of the pirate ship. What do you think life would have been like for a pirate?*

EARLY ELEMENTARY
ASSIGNMENT: *Color the picture of the pirate ship while you think about what life would have been like for pirates!*

UPPER ELEMENTARY
ASSIGNMENT: *Research the life of a famous pirate. What pushed them into piracy? How hard was their life? How did they die?*

MIDDLE SCHOOL
ASSIGNMENT: *Research the life of a famous pirate. Collect your research into 3-5 paragraphs on a separate sheet of paper.*

HIGH SCHOOL
ASSIGNMENT: *Research the life of a famous pirate. Collect your research into 3-5 paragraphs on a separate sheet of paper.*

LA + BIBLE DICTATION

WHAT'S HAPPENING?

Today your students will have the opportunity to write their Bible passage from memory! If you have the cursive notebook, your students can write their passage in there instead.

EARLY READER
VERSE: *"For I know the plans I have for you, declares the LORD," Jeremiah 29:11a*

EARLY ELEMENTARY
VERSE: *"For I know the plans I have for you, declares the LORD, plans for welfare and not for evil, to give you a future and a hope." Jeremiah 29:11*

UPPER ELEMENTARY
VERSE: *"For I know the plans I have for you, declares the LORD, plans for welfare and not for evil, to give you a future and a hope. Then you will call upon me and come and pray to me, and I will hear you." Jeremiah 29:11-12*

MIDDLE + HIGH SCHOOL
VERSE: *"For I know the plans I have for you, declares the LORD, plans for welfare and not for evil, to give you a future and a hope. Then you will call upon me and come and pray to me, and I will hear you. You will seek me and find me, when you seek me with all your heart." Jeremiah 29:11-13*

ART DRAW A MANTA RAY

WHAT'S HAPPENING?

Today students will look at the image of a manta ray and then try to sketch one of their own. If they want, they can add color with colored pencils or watercolor paint! You can do it in this book or they can do it in a science or art journal! Older students can look up more detailed drawings or paintings and try some new techniques if they want!


Oceans
APPENDIX

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WORLD MAP

CONTINENTS, COUNTRIES, BODIES OF WATER

EUROPEAN MAP

HELLO, I'M A
Fangtooth Fish

- I have a small body, large head and needle shaped teeth with two large fangs.
- My fangs are so big, I can't fully close my mouth.
- I'm found in tropical and temperate waters of Atlantic, Pacific, and Indian Oceans.
- I eat other fish, squid and shrimp.
- I can swallow my food in one bite (if a fish is 1/3 my size).

HELLO, I'M AN
Atlantic Wolffish

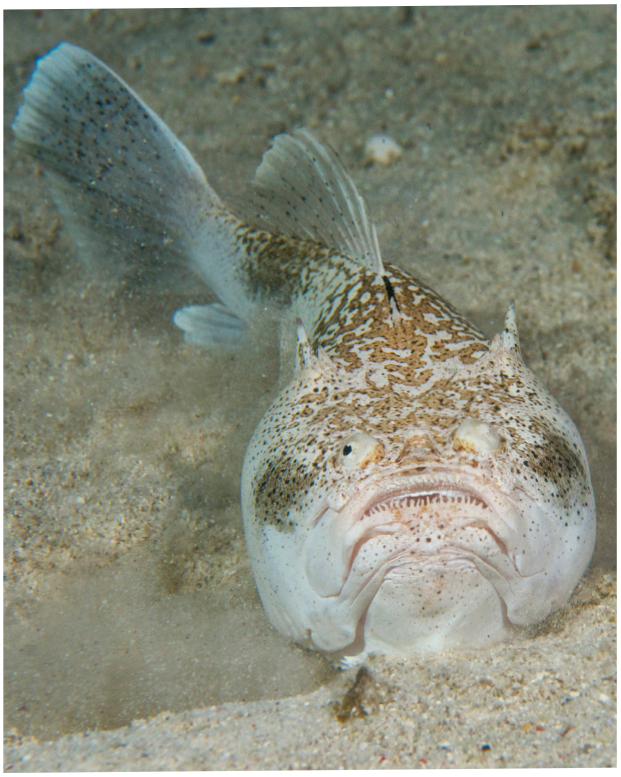
- I have a large head and a powerful jaw filled with canine teeth.
- My large teeth stick out of my mouth even when closed, giving me a wolf-like appearance.
- I'm found in the cold North Atlantic Ocean on rocky reef areas of the ocean floor.
- I eat sea urchins, crabs, and large marine snails.
- I have substances in my blood that prevent me from freezing in the cold ocean water.

HELLO, I'M A
Stargazer Fish

- I'm called the stargazer fish because I live my life looking up at the stars, waiting for prey.
- I have eyes and nostrils on the top of my head which allow me to remain in the sand camouflaged for a long time.
- I eat fish and will eat fish whole.
- I have two pectoral fins that act like shovels, allowing me to dig into the sand very quickly.
- I have the ability to electrocute predators to protect myself.

HELLO, I'M A
Giant Isopod

- I have a hard, outer shell like many insects on land.
- I can grow to over 14 inches long.
- I'm found in the cold, deep waters of the Atlantic, Pacific and Indian Oceans.
- I will burrow in the mud on the ocean floor for protection.
- I eat scavenged food, including dead whales, fish and squid.
- I will curl up into a ball when I'm scared.



HELLO, I'M A
Monkfish

- I look like a large tadpole because of my large head and skinny tail.
- I'm found deep on the ocean floor of the North Atlantic Ocean and Mediterranean Sea.
- I eat fish, other monkfish, seabirds, crustaceans and mollusks.
- I can "walk" on the ocean floor using my fins.
- I can swallow my food whole in a single bite and can eat prey as large as I am.

HELLO, I'M A
Giant Squid

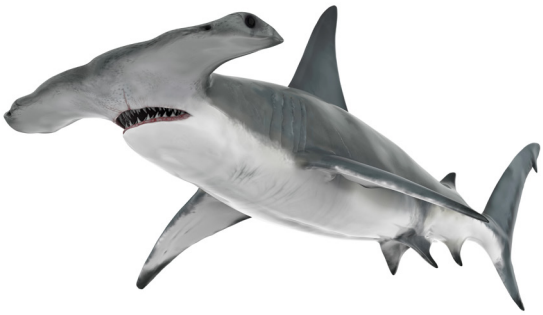
- The largest giant squid was found to be 43 feet (or 13 m) long!
- My eye is the size of a dinner plate in order to see well in the darker waters.
- I eat fish and other squid.
- My tentacles can shoot out like arrows to catch prey.
- I live deep in the oceans around the world, except in polar or tropical areas.

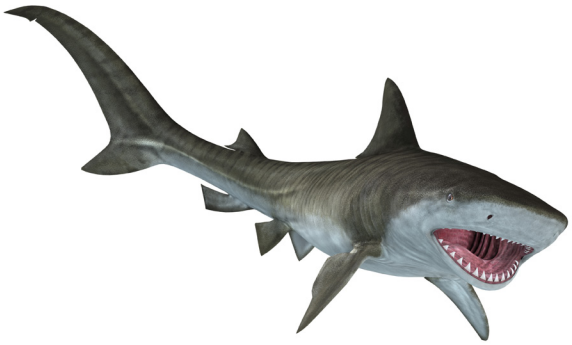
HELLO, I'M A
Tiger Shark

- I can grow to be 10 to 14 feet long (3 to 4.2 m).
- I'm found in temperate and tropical waters of the Atlantic and Pacific Oceans.
- I'm a scavenger and will eat almost anything, including tires and metal.
- Mostly, I eat seals, stingrays, sea snakes, birds, squid, fish and sea turtles.
- I have very sharp teeth that can crush turtle shells.

HELLO, I'M A
Hammerhead Shark

- I can grow to be 13 to 20 feet in length (4 to 6 m).
- I'm found in temperate and tropical waters worldwide, both offshore and near shorelines.
- I have an odd shaped head that helps me find prey easier.
- My eyes being set so far apart gives me better vision.
- I eat smaller fish, rays, octopus, squid and crustaceans.





HELLO, I'M A
Great White Shark

- I can grow to be 15 to over 20 feet in length (4.5 to 6 m).
- I'm found in cool, coastal waters worldwide.
- I'm the largest predatory fish on earth.
- I can jump out of the water completely, like a whale breaches, when I'm chasing after prey.
- I eat sea lions, seals, small toothed whales and sea turtles.

HELLO, I'M A
Whale Shark

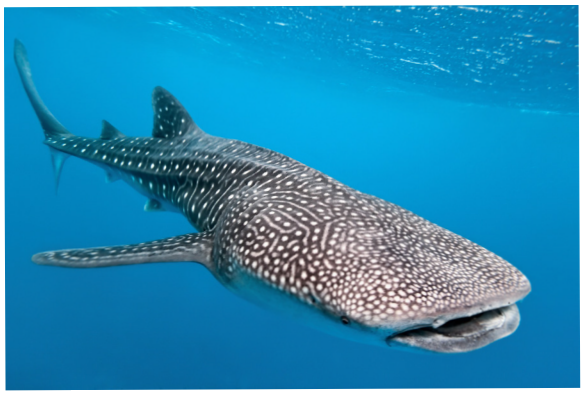
- I can grow to be 18 to almost 33 feet in length (5.5 to 10 m).
- I'm the largest fish on earth.
- I'm found in warm, tropical waters and migrate off the coast of Australia every spring.
- I'm a filter feeder, meaning I filter through the water to find my food.
- I eat plankton and small fish.

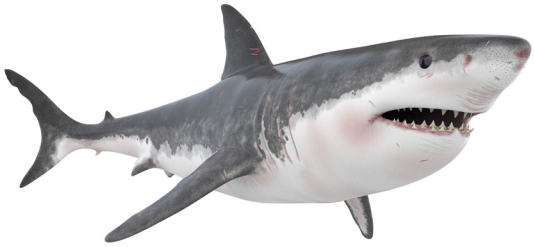
HELLO, I'M A
Krill

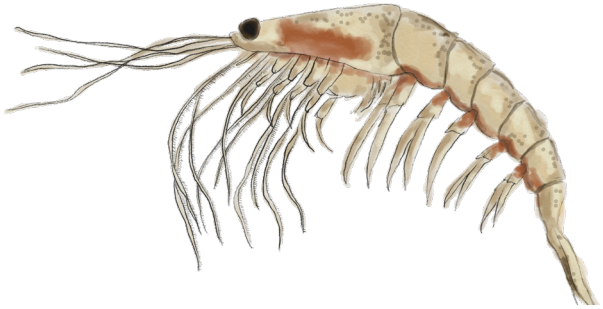
- I'm transparent with slight reddish or pinkish color to me.
- I'm often found swimming in groups.
- I eat plankton and algae.
- I can be found in all five of our oceans, even the cold waters of the Southern and Arctic Oceans.
- I'm a very important food source for many marine animals.

HELLO, I'M AN
American Lobster

- Most lobsters are a rusty brown color, but I can also have a variety of different colors and patterns.
- I'm a bottom feeder and eat crab, mussels, clams, sea stars, sea urchins, and shrimp.
- I molt my shell when I outgrow it.
- I'm found along the rocky bottoms of the Atlantic Ocean around North America.
- I have two different shaped claws, a larger one for crushing and the other for cutting.







HELLO, I'M A
Japanese Spider Crab

- I'm the largest crab species with a leg span of 12 feet long (3.7 m), a body size of 15 inches across (38 cm), and I can weigh as much as 44 pounds (20 kg)!
- I'm a scavenger and eat dead fish, algae, and other shellfish.
- I'm found along the sandy and rocky bottom of the Pacific Ocean around Southern Japan.
- My long legs are very weak and I can get leg injuries or lose a leg.

HELLO, I'M A
Harbor Seal

- I'm called a "crawling seal" because I have short flippers that keep me low to the ground.
- I eat fish, shellfish, crustaceans, octopus, and squid.
- I prefer to stay closer to shore in the Northern Atlantic and Pacific Oceans.
- I spend half my life in the water and half my life on land.
- I can sleep underwater and come up for air every 30 minutes.

HELLO, I'M A
Hawaiian Monk Seal

- Unlike other seals, I prefer the warm waters near the northwest Hawaiian Islands.
- I was named by the ancient Hawaiians and my name means "dog that runs in rough water."
- I can grow up to 7.5 feet long (2.3 m) and weigh up to 450 pounds (205 kg).
- I spend most of my life at sea but will come to shore to rest or find shelter from storms.
- I'm one of the most endangered marine mammals on earth.

HELLO, I'M A
California Sea Lion

- My front flippers are broad so that I can walk on land.
- Unlike my cousins, I don't have a mane like a lion does.
- I eat fish, squid, and shellfish.
- I'm found along the rocky coastlines of the Pacific Ocean along western North America.
- I communicate with other sea lions by barking like a dog.

HELLO, I'M A Walrus

- I have a mustached mouth and long tusks that make me very well known.
- I use my tusks to help pull myself out of the water.
- I can grow to 11.5 feet long (2.2 to 3.5 m) and weigh up to 3,000 pounds (1,360 kg).
- I eat clams, sea cucumbers, coral, shrimp, crabs, seals, sea birds, and whales.
- I'm found near the Arctic Circle in the Arctic Ocean, as well as the northern parts of the Atlantic and Pacific Oceans.

HELLO, I'M A Green Sea Turtle

- I have a brown shell but greenish skin.
- I can be up to 5 feet long (1.5 m) and weigh up to 700 pounds (317 kg).
- I'm found in the tropical and sub-tropical waters of the Atlantic, Pacific, and Indian Oceans.
- I make long migrations in order to lay my eggs, and I will go to the same beach where I was born.

HELLO, I'M A Leatherback Sea Turtle

- I can grow up to 7 feet long (2.1 m) and weigh as much as 2,000 pounds (2268 kg).
- I'm unique because I eat jellyfish even though other turtles usually don't.
- I will also eat fish, sea urchins, and squid.
- I'm found in the temperate and tropic waters of the Atlantic, Pacific, and Indian Ocean, as well as the Mediterranean Sea.
- I can dive down 4,200 feet (1,280 km), which is deeper than any other sea turtle dive.

HELLO, I'M A Loggerhead Sea Turtle

- I have a larger head with a powerful jaw so I can eat snails.
- I can grow up to 3 feet long (0.9 m) and weigh about 250 pounds (113 kg).
- I eat jellyfish, conchs, crabs, and fish, but I will eat seaweed as well.
- I'm found in the tropical and sub-tropical waters of the Atlantic, Pacific, and Indian Oceans.
- I can rest or sleep underwater for several hours.

HELLO, I'M A **Humpback Whale**

- I have a small hump on my back that gives me my name.
- I can grow up to 48 to 62.5 feet long (14.6 to 19 m), about the size of a school bus.
- I eat krill, small fish, and plankton.
- I'm found in every ocean of the world.
- I communicate with moans, howls, cries, and other noises that sound like a song.

HELLO, I'M A **Blue Whale**

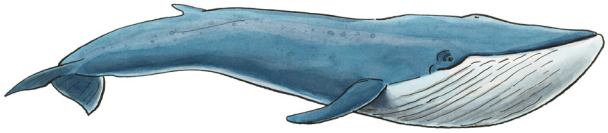
- I'm the largest animal on earth.
- I grow to be 82 to 105 feet long (25 to 32 m).
- I eat only krill, using my baleen to filter them out of the water.
- I'm found in the Atlantic, Pacific, Indian, and Southern Oceans.
- I communicate through pulses, groans, and moans that can be heard 1,000 miles away.

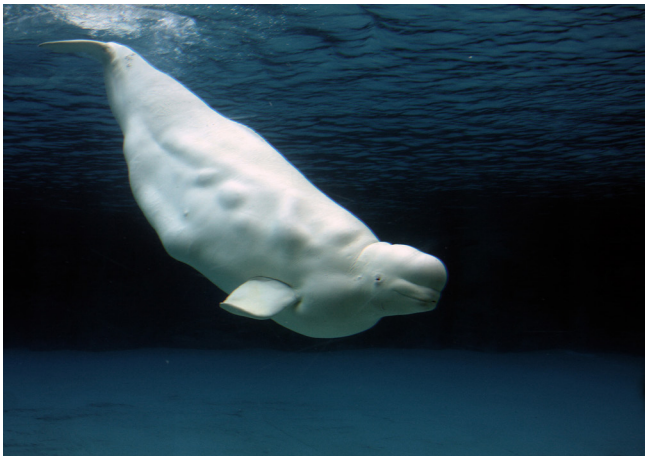
HELLO, I'M A **Right Whale**

- I have a large head with raised, rough patches of skin that are white.
- I can grow to be 45 to 55 feet long (13.7 to 16.7 m).
- I eat zooplankton, which are small, shrimp-like creatures.
- I'm found in the temperate waters of the Atlantic and Pacific Oceans.
- I'm the rarest whale and very endangered, with only 400 of my family left.

HELLO, I'M A **Beluga Whale**

- I'm also called a "white whale" because of my white skin color.
- I have a rounded forehead that sets me apart from other whales.
- I talk with clicks, whistles, and clangs and was called the "canary of the sea" by sailors.
- I eat fish, crustaceans, and worms.
- I'm found in the Arctic Ocean.





HELLO, I'M A
Narwhal

- I'm called the unicorn of the sea because of a large tusk that comes up from my head.
- I have a thick layer of blubber that allows me to live in the Arctic Ocean.
- I eat fish, squid, shrimp, and crabs.
- My tusk is actually a tooth and grows in a counterclockwise spiral.
- If I have a large tusk, I am a male.

HELLO, I'M AN
Orca Whale

- I'm actually the largest of the dolphin family.
- I have black and white markings that make me look like I have a large white spot for an eye.
- I can live in all the oceans of the world, but tend to stay in colder waters.
- I eat fish, penguins, seals, sea lions, and other whales.
- I live in a very close-knit pod of 40 other whales.

HELLO, I'M A
Moray Eel

- I have a snake-like appearance with a flattened tail.
- There are 200 different species of me in the ocean.
- I eat fish, octopus, and sometimes crustaceans.
- I'm found in the tropical waters of the Atlantic, Pacific, and Indian Oceans.
- I spend most of my time hiding in caves and crevices.

HELLO, I'M A
European Conger Eel

- I'm the largest eel in the ocean and range in size from 5 to 9 feet long (1.5 to 2.75 m).
- I don't have scales on my body like other fish.
- I eat fish, squid, and crustaceans; I will scavenge dead fish also.
- I'm found in the northeast Atlantic Ocean.
- I hide during the day and hunt for food at night.

HELLO, I'M A
Garden Eel

- I'm a tiny eel that lives in the sandy bottom of coral reefs of the Atlantic, Pacific, and Indian Oceans.
- I use my tail to dig holes that I hide in.
- I live with hundreds of other garden eels.
- I eat zooplankton by taking almost my whole body out of my hole and catching them in the current.

HELLO, I'M A
Gulper Eel

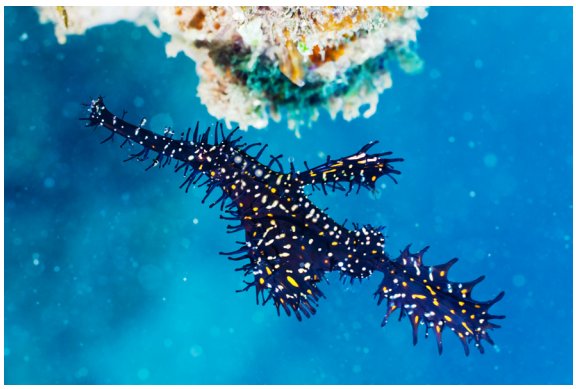
- I'm a deep sea dwelling eel found near the ocean floor.
- I have an enormous mouth and it can be bigger than my body.
- I have a long, ribbon like tail that has a bioluminescent (or glow in the dark) tip to attract prey.
- I can use my large mouth like a net to capture fish and shrimp.
- I'm found in the tropical and temperate waters of the Atlantic, Pacific, and Indian Oceans.

HELLO, I'M A
Ghost Pipefish

- I only grow to be 3 to 7 inches long (7.5 to 17 cm).
- I'm related to a seahorse.
- I have a long mouth that I use to suck up plankton like a vacuum cleaner.
- I live on the edges of coral reefs in the Indian and Pacific Ocean.
- I often swim upside down!

HELLO, I'M A
Squat Shrimp

- I'm less than half an inch long (1.3 cm).
- I have a symbiotic relationship with sea anemones.
- I eat plankton, algae, and parasites.
- I live in the tropical waters of the Atlantic, Pacific, and Indian Oceans.



HELLO, I'M A
Frogfish

- I'm a small, warty looking fish that grows to about 6 inches long (15 cm).
- I have a "fishing pole" like the anglerfish that I use to attract my food.
- I eat small fish and can open my mouth as wide as my body.
- I live in coral reefs of the Atlantic, Pacific, and Indian Oceans.
- I can change color to camouflage myself to match what I'm near.

HELLO, I'M A
Coral Beauty Angelfish

- I'm a small coral reef fish that gets to be about 4 inches long (10 cm).
- I have different coloring depending on where I live.
- I'm typically red or orange with blue stripes and purple head and fins.
- I eat plankton and other small crustaceans like shrimp.
- I live in the coral reefs of the Pacific and Indian Oceans.

HELLO, I'M A
Neon Blue Gobyfish

- I have two iridescent stripes and grow to be about 2 inches long (6 cm).
- I eat parasites off coral, other reef structures, and other fish.
- Because I help larger fish stay healthy, I'm often left alone by fish that would otherwise eat me.
- I'm found in coral reefs in the Caribbean (Atlantic Ocean).

HELLO, I'M A
Common Seahorse

- I am not a good swimmer, so I use my tail to hang onto coral.
- I eat guppy fish or brine shrimp.
- I don't have a digestive tract to hold my food, so I need to eat often.
- If I'm not eating, I'm resting.
- The male seahorses are the ones who hold the eggs and watch over them until they are born.

HELLO, I'M A
Big Belly Seahorse

- I am also called the pot-bellied seahorse because of my large belly.
- I'm one of the largest seahorses in the ocean, growing up to 12 inches long (30 cm).
- I'm often found in groups and am more active at night.
- I live only around Australia and New Zealand in the Pacific Ocean.
- I eat tiny crustaceans that are found among seaweed.

HELLO, I'M A
Leafy Sea Dragon

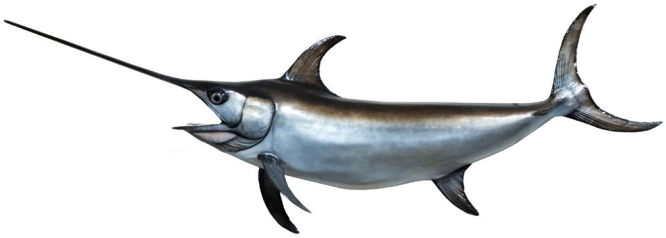
- I look like a plant drifting in the ocean, helping me stay hidden from predators.
- I can remain still for a very long time in calm water.
- I eat crustaceans, plankton, and shrimp.
- I don't have any teeth so I need to swallow my food in one bite.
- I live in the Pacific Ocean around Australia.

HELLO, I'M A
Pygmy Seahorse

- I only get to be about 0.5 to 1 inch long (1.4 to 2.7 cm).
- I have either purple skin with pink tubercles or yellow skin with orange tubercles.
- My coloring allows me to camouflage very well in coral.
- I live in pairs in the coral reefs of the Indian and Pacific Ocean.

HELLO, I'M A
Swordfish

- I grow from a microscopic fish to a fish that can be 15 feet long (4.5 m).
- I have a long and flat bill like a sword that I use to stun my food.
- I eat larger bony fish and squid.
- I have a special adaptation that helps keep my brain and eyes warm swimming in deeper waters.
- I jump out of the water, or breach, and often sun myself at the surface of the water.



HELLO, I'M A
Sailfish

- I'm the fastest fish in the ocean, reaching speeds of 68 mph (109 km/h).
- I also have a long, flat bill that is blunt like the swordfish.
- I get my name from my long dorsal fin that looks like a sail above my body.
- I eat smaller fish like sardines and anchovies as well as squid and octopus.
- I'm found in the tropical waters of the Atlantic and Pacific Ocean.

HELLO, I'M A
Blue Marlin

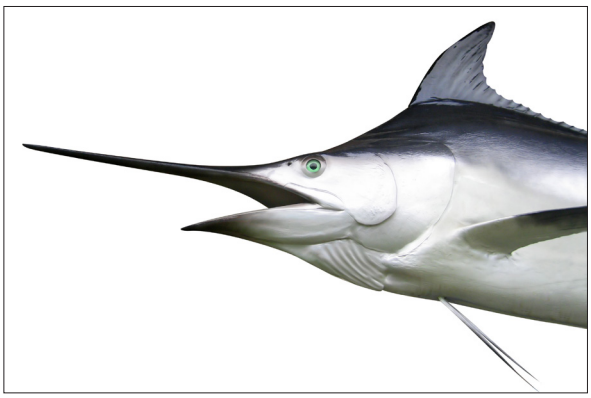
- I'm the most common marlin in my family.
- I have a long bill that is round and pointed, unlike the sailfish and swordfish.
- I eat large bony fish like mackerel and tuna. I also eat squid.
- I migrate long distances and follow ocean currents many miles.
- I'm a highly sought-after game fish.

HELLO, I'M A
Flying Fish

- I'm a torpedo-shaped fish that can swim at speeds of 37 mph (60 km/h).
- I can grow up to 18 inches long (45 cm) but am usually between 7 to 12 inches long (17 to 30 cm).
- I can jump out of the water up to 4 feet high (1.2 m) and then glide in the air for 655 feet (200 m).
- I jump out of the water to escape predators.

HELLO, I'M A
Hound Needlefish

- I'm long and slender, like a needle, and can grow to be almost 5 feet long (1.5 m).
- I'm a very fast swimmer and can swim at speeds of 37 mph (60 km/h).
- I can leap out of the water and have jumped over boats instead of swimming underneath.
- I eat small fish, squid, and crustaceans.
- I can be found in the Indian and Pacific Oceans.



HELLO, I'M A
Common Octopus

- I have a large head, or mantle, and eight arms with two rows of powerful suckers on them.
- I have three hearts and blue blood.
- I'm able to quickly change color and camouflage myself from predators.
- I will squirt a dark ink to escape from predators.
- I'm a master of disguise and escape!

HELLO, I'M A
Giant Trevally Fish

- I can get to be 5.7 feet long (1.7 m) and weigh well over 100 pounds (45 kg).
- I eat crustaceans and other fish.
- I can swim very fast and jump out of the water to catch sea birds.
- I use other predators and shadow them so I can pick off escaping prey.
- I live in the Indian and Pacific Oceans.

HELLO, I'M A
Spinner Dolphin

- I'm known for my acrobatic spins and have been seen spinning 7 times in a row.
- Often when I start spinning, the other dolphins in my pod join in.
- I have three colors: dark gray top, lighter gray sides, and a white stomach.
- I eat fish, squid, and shrimp, and I often hunt at night.
- I live in the tropical waters of the Atlantic, Pacific, and Indian Oceans.

HELLO, I'M A
Common Bottlenose Dolphin

- I'm what most people picture when they talk about dolphins.
- I have dark gray skin that is lighter colored on my sides and stomach.
- I grow to be 6.6 to 13 feet long (2 to 4 m).
- I eat fish, squid, and crustaceans.
- Each dolphin in my pod has a different whistle that they respond to.

HELLO, I'M A
Red Lionfish

- I have 18 needle-like dorsal fins that house my venom.
- I don't attack people and my venom is just a defense mechanism.
- I eat fish and shrimp found in the coral reef.
- I live in coral reefs of the Indian and Pacific Ocean.
- I'm currently an invasive species in the Atlantic Ocean.

HELLO, I'M AN
Indo-Pacific Humpback Dolphin

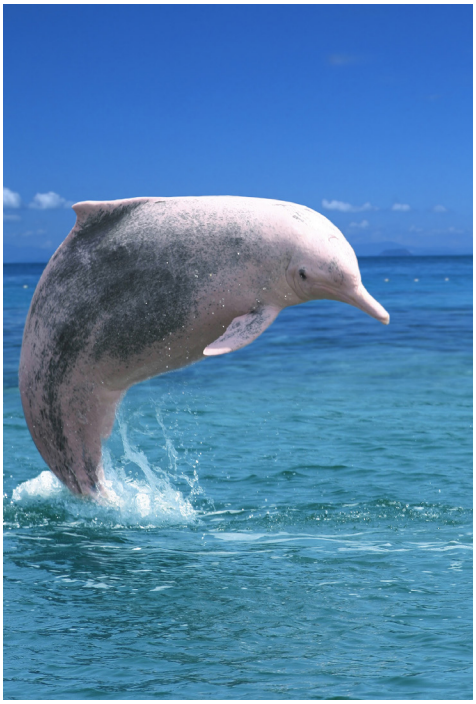
- My skin can be different colors depending on where I live, from white to a pinkish color.
- I have a hump on my dorsal fin that makes me look like a humpback whale.
- I live in the tropical waters of the Indian and Pacific Oceans.
- I eat octopus, squid, and crustaceans.
- My skin can look pink due to blood vessels under my skin, not because my skin is actually pink!

HELLO, I'M A
Portugese Man-of-War

- Although I look like a jellyfish, I'm actually a group of organisms working together.
- My bladder sits above the surface of the water, like the sail of a ship with my tentacles hanging below.
- My tentacles can grow to 165 feet in length (50 m) but more commonly are 30 feet long (9 m).
- I eat small fish, crustaceans, and plankton by trapping them in my tentacles.
- I'm found in the tropical waters of the Atlantic, Pacific, and Indian Oceans.

HELLO, I'M A
Blue Ringed Octopus

- I'm a small octopus that only gets to be about 6 inches long (15 cm).
- I have two different venoms: one for my prey and one for defense.
- My venom for defense is extremely toxic.
- I eat small crabs, hermit crabs, and shrimp.
- I'm only found around the temperate waters of Australia in the Pacific Ocean.



HELLO, I'M A
Box Jellyfish

- I'm also called the sea wasp and am the deadliest jellyfish in the ocean.
- My tentacles can grow up to 10 feet long (3 m).
- Unlike other jellyfish, I don't just float in currents and can control my movements. I eat fish, shrimp, crustaceans, worms, and other jellyfish.
- I live in the tropical waters of the Atlantic, Pacific, and Indian Oceans.

HELLO, I'M A
Beaked Sea Snake

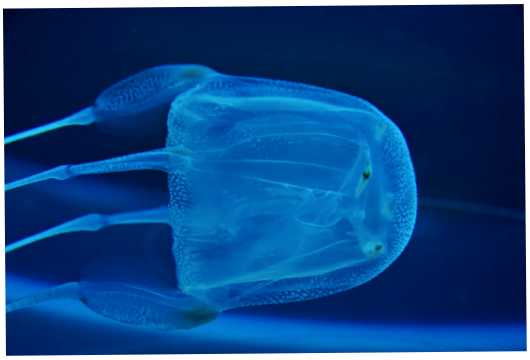
- I'm the deadliest sea snake in the world.
- My venom is 8 times more deadly than that of a cobra.
- I can slither on land and swim in the ocean.
- I eat pufferfish, catfish, other small fish, crustaceans, and squid.
- I'm found in the shallow reef waters of the Indian and Pacific Oceans.

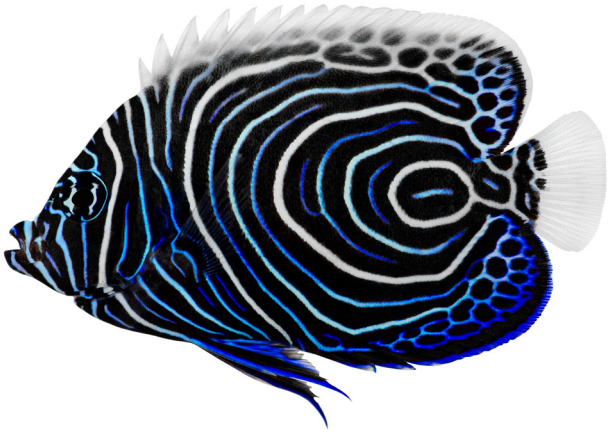
HELLO, I'M AN
Emperor Angelfish

- My family of angelfish are the most abundant fish in the coral reef.
- When I'm a young emperor angelfish, I'm also called an imperial angelfish.
- I have two different colorings, depending on what age and size I am.
- I primarily eat sponges and algae.
- I'm found in the Indian and Pacific Oceans.

HELLO, I'M A
Great Barracuda

- I'm a large predatory fish that often grows to 4.5 feet long (1.4 m).
- I have sharp, triangular shaped teeth that make me look ferocious.
- I can leap out of the water to get prey.
- I live in the tropical waters of the Atlantic Ocean near Florida and the Caribbean.
- I'm attracted to shiny objects like the silvery prey I seek.





HELLO, I'M A
Striped Surgeonfish

- I have a bright blue and yellow striped side and pale blue stomach.
- There are 75 different types of surgeonfish in my family.
- I'm called a surgeonfish because of the sharp, scalpel-like spine on my tail.
- I eat plankton and algae in the coral reef.
- I'm found in the tropical waters of the Indian and Pacific Ocean.

HELLO, I'M A
Bullethead Parrotfish

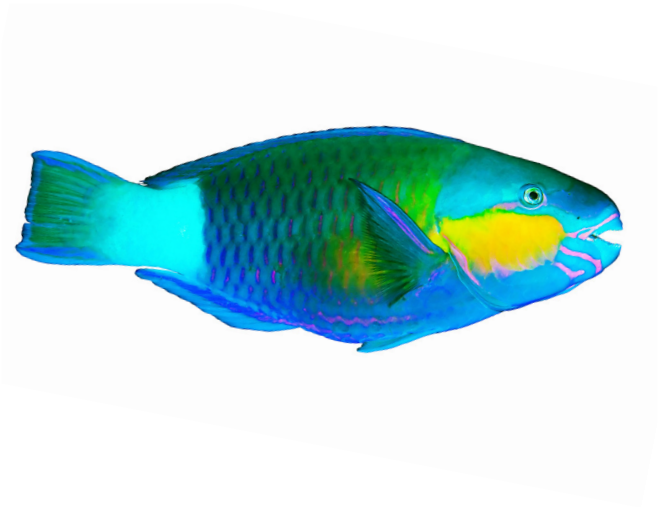
- I have brightly colored scales and a parrot-like, beaked mouth.
- I change color depending on my age and gender.
- I eat algae off coral and keep the coral reef healthy.
- I live in the tropical waters of the Atlantic, Indian, and Pacific Oceans.
- I create a mucous bubble around myself to protect me at night.

HELLO, I'M A
Latticed Butterfly Fish

- There are 100 different types of butterfly fish in my family.
- I grow to be 4 to 5 inches long (10 to 13 cm).
- I mate for life and can be found swimming with my pair through coral reefs.
- I eat plankton, coral, sea anemones, and small crustaceans.
- I'm found in the Atlantic, Pacific, and Indian Oceans.

HELLO, I'M A
Sunflower Sea Star

- I'm one of the largest sea stars and grow to 3.3 feet long (1 m).
- I can have 15 to 25 arms with 15,000 tube feet.
- I alert other sunflower sea stars of danger by dropping one my arms and releasing chemicals.
- I eat mussels, sea urchins, fish, crustaceans, sea cucumbers, clams, algae, sponges, and squid.
- I'm found in the Northeast Pacific Ocean.



HELLO, I'M A **Cushion Sea Star**

- I'm not flat like other sea stars but inflated like a pin cushion.
- I come in many different colors: orange, red, brown, and green.
- When I'm younger, I look like a typical sea star but change as I grow.
- I eat coral, clams, oysters, sea urchins, crab larvae, and sponges.
- I'm found in tropical waters of the Indian and Pacific Ocean.

HELLO, I'M A **Red Knob Sea Star**

- I have five arms with bright red, raised tubercles on them.
- I can cool myself down by pumping saltwater through my body.
- I grow to be almost a foot in length (30 cm).
- I eat algae, soft corals, sponges, tubeworms, clams, and other sea stars.
- I'm found in the Indian Ocean.

HELLO, I'M A **Crown of Thorns Sea Star**

- I'm one of the largest sea stars, growing to 19.7 inches long (0.5 m).
- I can have 23 arms covered with venomous spines.
- I eat mostly coral and can damage huge areas of the coral reef.
- I only eat the fast-growing coral to give the slower growing coral a chance to catch up.
- I'm found in the Indian and Pacific Oceans.

HELLO, I'M A **Sunfish**

- I'm often found sunning myself on my sides on the water surface and that's how I got my name.
- My teeth are fused together into a beak and I cannot close my mouth completely.
- I'm the heaviest of all bony fish, weighing 2,000 pounds (907 kg).
- The largest sunfish ever found was 5,000 pounds (2,268 kg).
- I eat jellyfish, small fish, zooplankton, and algae.
- I'm found in the temperate and tropical waters of the Atlantic, Pacific, and Indian Oceans.

HELLO, I'M A
Sea Urchin

- I'm the porcupine of the ocean, using my spines to keep predators from eating me.
- When I die, my spines fall off, leaving my hard outer shell that is my skeleton.
- I eat algae off rocks by scraping rocks with plates that make up my teeth.
- I'm found in all the oceans of the world, in both warm and cold waters.
- I'm safe to pick up, except the long-spined sea urchin in my family that has poisonous spines.

HELLO, I'M A
Giant Oarfish

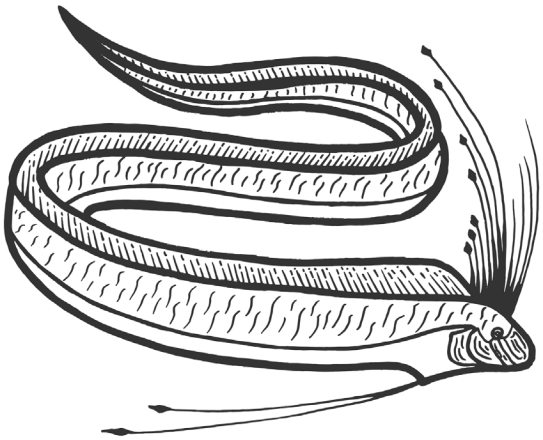
- I'm the longest bony fish in the ocean and can grow to be 50 feet long (15 m).
- I have red or coral-colored fins that appear like a crest over my head.
- I'm believed to be the sea monster or sea serpent from legends.
- I have no teeth so I'm not a scary creature at all.
- I live in the deep ocean waters but will come to the surface when I'm dying or sick.

HELLO, I'M A
Sea Cucumber

- I'm shaped like a cucumber and have a soft body.
- Members of my family can grow between 0.75 inches to 6.5 feet (1.9 cm to 2 m).
- I'm the earthworm of the ocean, taking waste and breaking it down to help the environment.
- I'm found in all the oceans of the world, in shallow or deep waters.
- I breathe through my butt, by taking in water through my anus and removing the oxygen from it.

HELLO, I'M A
Pufferfish

- I'm a long, bulb-like fish that can inflate to be like a ball when threatened.
- I have four teeth that are fused together into a beak.
- I'm poisonous to eat because I have toxins in my organs.
- I eat invertebrates, algaes, clams, mussels, and shellfish.
- I'm found in the tropical waters of the Atlantic, Pacific, and Indian Oceans.



HELLO, I'M A
Giant Manta Ray

- I'm the largest ray in the world with a wingspan of up to 29 feet wide (8.8 m).
- I can weigh up to 5,300 pounds (2,404 kg).
- I migrate with other manta rays to colder waters during the year.
- I only give birth once every couple of years to 1 or 2 young.
- I go to cleaning stations in the coral reef where cleaner fish will remove dead skin and parasites from me.

HELLO, I'M A
Stingray

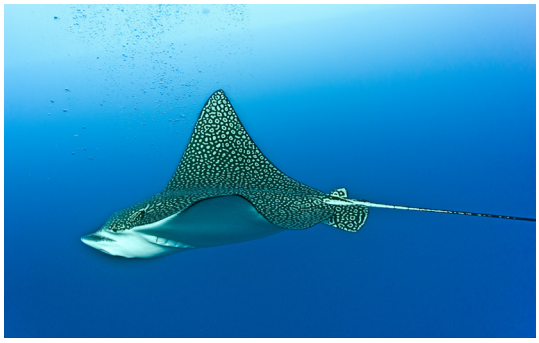
- I have sharp spines with serrated edges on my tail that produce venom.
- I can grow up to 6.5 feet wide (2 m) and can weigh up to 790 pounds (358 kg).
- I'm colored like the seafloor so I can camouflage with it.
- I spend most of my time buried in the sand waiting for prey or staying hidden from predators.
- I use my special sensor called "ampullae of Lorenzini" to detect electrical charges from my prey.

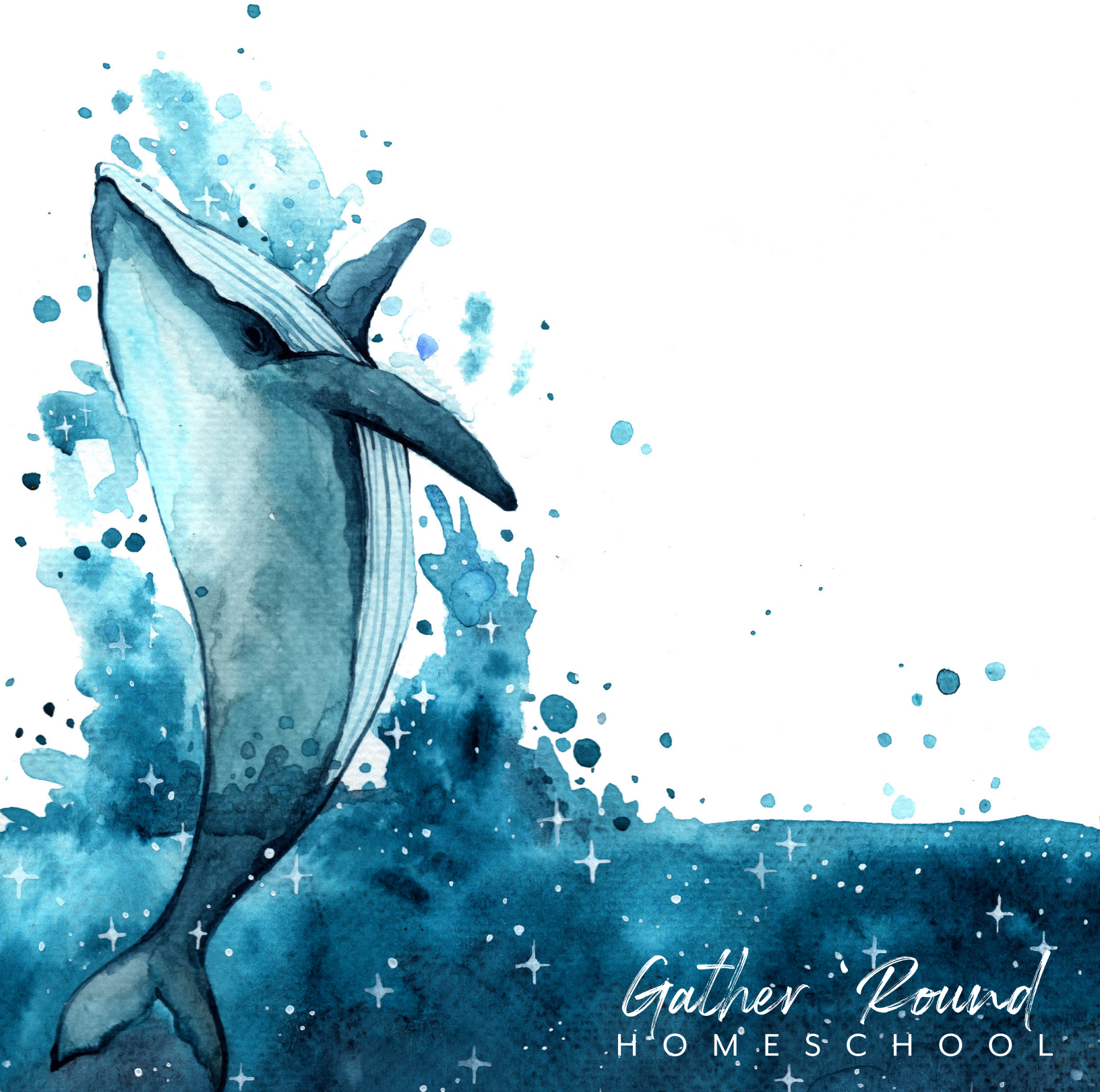
HELLO, I'M A
Sawfish

- I have a long snout or rostrum that is edged with special teeth.
- I use my snout to saw my food in half or to dig in the sand for food.
- I eat fish and crustaceans.
- I'm an endangered fish since I easily get tangled in fishing nets.
- I'm found in the Atlantic, Pacific, and Indian Oceans.

HELLO, I'M A
Spotted Eagle Ray

- I'm covered in spots and other markings that make me easy to identify from other rays.
- I'm not one to lay around on the ocean floor and actively swim in the open ocean most of the time.
- I have venom in spines on my tail like the stingray.
- I can actually leap out of the water when I swim close to the surface.
- I'm often found in coral reefs and bays, swimming close to the surface of the water.




Gather Round
HOMESCHOOL