



Let's Investigate Sharks: Shark, Shark, Ray

Grade Level:
Kindergarten

Time:
30 minutes (longer if additional options are chosen)

LEARNING OBJECTIVES

1. Define what a shark is.
2. Understand the importance of sharks.
3. Discover where sharks are located.
4. Learn how many shark species exist.
5. Count how many sharks species exist.
6. Describe various parts of a shark.

SKILLS

analyzing, classifying, comparing and contrasting, defining, describing, evaluating, explaining

BEFORE YOU DIVE IN

Did you know that a shark is classified as a fish and not a mammal? Can you name any special senses that sharks have?

Our educators and scientists have compiled the most important and up to date key facts pertaining to sharks in an easy to follow lesson entitled Let's Investigate Sharks.

The Let's Investigate Sharks PowerPoint is packed with professional photographs combined with cartoon characters to grab the attention of young learners.

The lesson is broken down into 5 sections including: what is a sharks, why are sharks so important, where do we find sharks, how many, and shark parts.

Furthermore, all of the sections include discussion points for each slide. The vocabulary words are highlighted and definitions are included in the packet.

It is not necessary to discuss each and/or every key point. The sections can be used as stand alone curriculum or used as an entire presentation. You have the freedom to personally select the points you wish to discuss or the ones that best coincide with your current curriculum.



ALIGNMENT

Common Core

L.K.1.B; L.K.6; SL.K.2; WK.8; RF.K.2

Next Generation Science Standards

LS1.A; LS1.B; LS1.D; LS2.A; LS2.C; LS3; LS4.C; ESS3.C; CCC1; CCC6

Next Generation Sunshine State Standards

SC.EE.14.1; SC.K.N.1.2; SC.K.N.1.4; SC.K.N.1.5

Ocean Literacy Scope and Sequence

P4A; P5A.3; P5A.4; P5B; P5B.1; P5B.2; P6C.3; P6C.5; P6C.6; P6C.7; P71

VOCABULARY

apex predator, carnivore, cartilage, conservation, consumer, ecosystem, endangered, environment, extinction, fin, fish food chain, food pyramid, gills, investigate, observe, ocean, oxygen, pollution, prey, producer, scientists, shark, temperature

MATERIALS NEEDED

- computer/laptop
- internet access (optional)
- Let's Investigate Sharks PowerPoint
- Let's Investigate Sharks teaching guide
- Let's Investigate Sharks vocabulary list
- large poster board paper (optional)
- overhead projector (encouraged but not required)
- poster print out (optional)

EXTENSIONS

Coloring Sheet (multiple species available). Design Your Own Shark. Maze Easy, Sharky Concentration, Shark Needs



TEACHING GUIDE: LET'S INVESTIGATE SHARKS KINDERGARTEN

This guide is for use with the *Let's Investigate Sharks PowerPoint*. It provides key points to discuss for each slide as well as vocabulary words (highlighted in RED) that can be incorporated. It is not necessary to discuss each and every one of the key points. Select the points you wish to discuss or the ones that best coincide with your current curriculum.

The PowerPoint is broken down in sections (bold, underlined and lettered). The sections can be used as stand alone curriculum or used as an entire presentation. You may find it beneficial to break the presentation of the material up into smaller sections.

SQ: Indicates a question you can ask students to engage them in a discussion (Student Question)

(*) Indicates a recommended activity to be used in that section or with a particular slide.

SLIDES

Intro:

1. SHARKS4KIDS Logo
2. Let's Investigate Sharks

A. WHAT IS A SHARK

3. What is a Shark? (Caribbean reef shark)

SQ: What is a **SHARK**?

-Let students give several guesses

- Sharks are cartilaginous **FISH**

SQ: Have you ever heard any bad things about sharks?

SQ: Do you think they are true?

-Sharks are not monsters and they do not eat people. Yes, accidents happen and people get hurt, but most times it is because the shark has mistaken the person as animal they eat, like a seal, sea lion, or fish.

* Ask the students to come up with words they associate with sharks. Make a list on a large piece of paper, so you can save. Do this again after the presentation and see if the words change.

4. Fish Collage

Sharks are **FISH**

SQ: Do you have a pet fish?

5. ”Whoa! Sharks are Fish Too! “

-Yes, sharks are fish, but they are different than some of the other fish that might come to mind.

SQ: How are sharks different from other fish?

6. Bones vs. Cartilage

-Sharks do not have bones. Get the students to touch their wrist bones.

-A shark’s skeleton is made entirely of **CARTILAGE**. Have students touch their nose or ear and wiggle it a bit.

7. Skin vs. Scales

- Sharks do not have scales like other fish.

- Sharks have placoid scales, which are also known as dermal denticles (more about skin later in the presentation).

-The dermal denticles are razor sharp tooth-like scales that reduce drag and allow the sharks to swim faster.

B. WHY ARE SHARKS SO IMPORTANT

8. Why are Sharks so Important?

SQ: Why do you think sharks are important for the oceans?

SQ: Do they have a specific job in the ocean?

9. Food Pyramid

- The pyramid shows the quantity of organisms on each level (number of animals) of the food chain. There are more **PRODUCERS** (base) than there are **CONSUMERS** (upper levels). This is necessary to keep the whole system in balance.
- Sharks are at the top of the **FOOD CHAIN (FOOD PYRAMID)** in almost every part of the world's **OCEANS**.
- Many are **APEX PREDATORS** meaning they are responsible for maintaining the health of ecosystems. They eat old, sick, dead or dying fish and keep the population of fish beneath them on the food chain from overpopulating. It is important for each level of the food chain to be in balance in order for the whole **ECOSYSTEM** to be healthy.
- Sharks are **CARNIVORES** meaning they eat other animals.
- Sharks eat (**PREY**) fish, turtles, mammals, birds, sea snakes and even other sharks.

10. Human Impact: Sharks are in DEEP Trouble

- Approximately 100 million sharks are killed each year
- Sharks are heavily fished for their livers, meat, cartilage and fins. Their teeth, jaws and fetuses are also sold as souvenirs.
- Shark fins are used to make shark fin soup. A bowl of this soup can cost \$100.00 or more.
- Shark finning is the cruel practice of removing the fins of a live shark.
- POLLUTION** and habitat destruction also have a negative impact on the oceans and sharks.

SQ: Can you design a project to help save sharks?

* There is a printable poster of this slide

C. WHERE DO WE FIND SHARKS

11. Where do we Find Sharks?

SQ: Do you think there are sharks in the ocean near us? (If near an ocean)

SQ: Has anyone ever seen a shark either in the ocean or maybe in an aquarium?

* As a class you can research what shark species can be found in your area.

12. Map of the World

-Sharks are found in every ocean around the world.

13. Habitat & Ecosystems

-Sharks can be found in lots of different ecosystems and **HABITATS** including the open ocean and mangrove forests.

-They can be found in cold water, warm water and even in fresh water rivers.

- Sharks also live in different habitats at different times in their life. As they grow older and bigger, their needs for survival can change, which means they can utilize different habitats. This is like when we go to different schools as we get older.

D. HOW MANY

14. How Many Sharks?

SQ: How many different types of sharks do you think there are?

SQ: Can you name five different sharks? How about ten?

15. Measuring Up

-There are over 500 different types of sharks that we know about. They range in size from 6 inches to 50 feet in length. Each year new species are being discovered.

E. SHARK PARTS

All animals have specific needs in order to survive, which can include food, water and air or oxygen. Animals have body parts and sensory systems to help them survive in their different environments. Almost all sharks live in the ocean (there are some freshwater shark species and bull shark can live in fresh, brackish or saltwater) and have some awesome adaptations to help them survive in different habitats within the ocean.

16. Shark Parts- Just What Have They Got

SQ: Do you think sharks have parts like us?

SQ: Which parts help sharks survive in their ocean habitat?

17. Let's Dive in and Take a Closer Look

18. Say Cheese

-Sharks have lots of teeth and this lemon shark is smiling to show you a few of his.

19. Teeth

-Humans have one row of teeth on the top and one row on the bottom (52 teeth total over our lives, 20 baby teeth that we lose, and 32 adult teeth).

-Sharks have several rows of teeth and they are constantly falling out. Most sharks have about 5 rows of teeth.

-Sharks will have thousands of teeth over their lifetime!

- Sharks usually lose at least 1 tooth per week. Imagine losing a tooth every time you ate an apple.

-Different sharks have different shaped teeth depending on what they eat.

20. Mouth

SQ: Do sharks drink water?

SQ: Do sharks have tongues?

- The mouth of a shark varies in shape and size depending on the species and size of the shark.

- Whale sharks and basking sharks have gigantic mouths used to filter feed, which means they swim along like an underwater vacuum cleaner and suck in the sea water with small organisms in it. A whale shark's mouth can be 3 feet wide (1 meter). (Main image whale shark, top right-basking shark)

- Sharks have a tongue like structure called a basihyal. This is a small, thick piece of cartilage located on the floor of the mouth of sharks and other fishes.

- Instead of drinking water, sharks absorb some seawater (and salt) through their gills. They use a gland in their digestive tract to help get ride of excess salt.

21. Gills

Sharks, like all animals, need to breathe. Sharks do not need to get air from the surface because they are able to get oxygen from the water they swim in.

- Sharks have 5 to 7 gills slits on each side of their body
- Even though they live in the ocean they still need **OXYGEN** to live
- Sharks use their **GILLS** to pull oxygen from the water
- Water enters the shark's mouth and is expelled through the gill slits. This is the part of the gills we can see.
- Most sharks have to swim to stay alive, but others can rest on the bottom and pump water over their gills in order to get oxygen.

22. Fins

- Sharks have 8 or 9 fins (some have a single dorsal fin)
- They use their **FINS** to swim as well as stay upright while moving through the water.

23. Form and Function

- The shape of shark fins varies depending on what habitat they spend most of their time in. Example: A nurse shark has a flat caudal (tail fin) because it spends most of its time on the bottom. (bottom right)
- Some sharks like the Thresher shark can use their caudal (tail) fin to slap and stun their prey before eating them. (upper left)
- The epaulette shark has an increased range of motion in its pelvic and pectoral fins allowing it to walk over the ocean floor or through tide pools. (main image)

24. Eyes

- Shark eyes are similar to our eyes in how they work.
- Shark eyes vary in size and shape depending on the habitat and depth they spend most of their time in.
- Sharks have eyelids, but they do not close all the way
- Some sharks have nictitating membranes, which protect their eyes when they are going after prey.

-Sharks without nictitating membranes can roll their eyes back in order to protect them.

SQ: Do any of these eyes look like other animals' eyes?

25. Nictitating Membrane

-Many shark species have what is called a nictitating membrane. It is a thin membrane similar to our eyelids.

-The membrane protects the eye when a shark is going after prey, they cannot see through this when it is closed, and must use other senses.

* There is a printable poster of this slide

26. Noses

-Sharks have 2 nares (nostrils) on the underside of their snout.

- Each nare has 2 openings: 1 for water to enter and 1 for water to exit.

- Sharks do not use their noses to breathe. It's like when you have a cold and your nose is stuffed up, so you have to breathe through your mouth.

27. Skin

- Shark skin is made up of tiny razor like scales called dermal denticles. (See next slide)

- Shark skin is very smooth in one direction (head to tail), but feels like a cat's tongue or sandpaper when you rub it the other way (tail to head).

28. Dermal Denticles

- These v shaped scales make the sharks hydrodynamic, meaning they can move without resistance through the water allowing them to swim faster, and use less energy.

-Olympic swimsuit designers, and boat builders have modeled material after the skin of sharks

* There is a printable poster of this slide

29. Prickly Situation

- While most dermal denticles are microscopic in size, the dermal denticles on the Prickly Dogfish are large enough to be seen by our own eyes. (Yes, this is a shark)

30. Shark Senses

- Sharks have all five of the same senses we do, but they actually have a very special 6th sense that helps them detect prey.

31. Sight

- Sharks can see in dark or murky water.

32. Hearing

- Sharks have ears, but they are located entirely on the inside of the body. Sound travels faster and farther through water, so often times sharks are able to hear their prey long before they can see it.

33. Smell

- Sharks have an incredible sense of smell.
- Imagine being able to smell a chocolate chip cookie in an area the size of a football field.
- Some sharks can detect a single drop of fish blood within a million drops of seawater or from a quarter of a mile away. A standard track is $\frac{1}{4}$ mile (1320 feet) in length and $\frac{1}{4}$ mile is almost 4 football fields (360 feet) in length.

SQ: Do you think sharks are attracted to human blood?

* If you have a space large enough on school property you can measure out $\frac{1}{4}$ of a mile. Place a marker or half the class at one point and everyone else 1320 feet away. Or you can take the kids onto the track and have them walk/jog a lap around the track, so they can see just how far $\frac{1}{4}$ mile is.

34. Taste

- Sharks have very sensitive taste buds in their mouth and will do a “test bite” to see if something is edible or part of their normal diet. People are NOT part of the normal diet of sharks.

SQ: If you were to bite a crayon or t-shirt (or another item in the classroom the kids would not eat) would it taste good? Would you want to eat it?

- Sharks do not have hands like we do, so they use their mouths to figure out what things are.

- Accidents happen when sharks bite something (people) and then let go because it is not food.

- A candy bar tastes good, but the wrapper it comes in does not. We know the wrapper doesn't taste good because we have learned it is not food. A shark learns by doing a test bite.

- We don't taste good, so they let go, but sharks have a lot of teeth and sometimes the bite can harm a person, but it is not the shark hunting down a human and trying to eat them.

This is a challenging section, but also a great opportunity to reiterate the fact that humans are not on the menu for sharks. Yes, accidents happen, but sharks do not hunt people and consider them food.

E. Touch

- Sharks have two components to their sense of feeling and touch.

- The first is actually touching an object, including a test bite, where they not only taste, but also feel the potential prey.

- The second is a bit more complex and includes a series of canals known as the lateral line. (See next slide)

35. Lateral Line (see the red line on each shark in the slide)

- The lateral line is a series of interconnected canals that run from the back of the shark's head to its tail.

- Each canal is made up of tiny pores, which allow water to penetrate the skin.

- Tiny hairs line the canal and allow the shark to detect movement in the water.

- The shark does not have to see an animal to know it is there, but can feel it by detecting movement or disturbance in the water.

-If you are in a swimming pool and your friend does a cannon ball you feel the wave right? Imagine if you were at the opposite end of the pool and your friend wiggled his or her fingers very gently and you were able to feel that.

36. Ampullae of Lorenzini

- Sharks have what is known as a 6th sense.
- This 6th sense refers to their ability to detect electrical pulses in the water.
- The black pores you can see in the image are the sensory organs that can detect these pulses. Every living thing gives off an electrical pulse. This gives sharks another tool for finding food.
- Metal objects such as boat propellers also give off pulses.
- Hammerheads and some other sharks can actually detect the very faint pulse given off by prey hiding motionless while buried in sand on the bottom.
- Sharks that are more active hunters will have more ampullae on their snout than less active species of sharks.

SQ: Do you think a healthy fish gives off the same pulse as an injured or dying fish?

* There is a printable poster of this slide

37. How Do We Learn About Sharks?

SQ: How do you think people learn about sharks?

SQ: How could you learn about sharks?

38. Ways to Learn Collage

- These images show a variety of ways we can learn about sharks.

39. Scuba Diving & Snorkeling

- In order to study sharks some times we need to dive in and get a closer look.
- Scuba Diving: SCUBA stands for self contained underwater breathing apparatus. Divers use special equipment to be able to stay underwater, including an air tank they can breathe from.
- Snorkeling: People can use a snorkel, which looks like a pipe sticking up out of the water, to get air from the surface without having to lift their face out of the water.

SQ: Has anyone here been snorkeling? Do you have family members or friends who have been snorkeling or scuba diving?

SQ: How do you think snorkeling or scuba diving would allow people to learn about sharks?

Scuba diving and snorkeling lets people observe sharks and study them in their natural habitat. People can learn how they swim, what they eat and where they go.

40. Underwater Photo & Video

A great way to learn about any animal is by taking photos and videos.

SQ: What could we learn from looking at photos and videos of different animals?

-What they eat

-How they move

-Where they hide or spend time

-How they play

-How they act with other animals

SQ: Has anyone here ever watched an animal show on television? Were the animals underwater?

SQ: What do you think would happen if you took a regular camera underwater?

-There are special housings made for cameras, so they can go in the water. The housings keep the cameras safe and dry.

41. Science & Research

SQ: How do you think **SCIENTISTS** learn about sharks?

SQ: What do you think scientists might want to find out about sharks?

-There are lots of ways scientists can learn about sharks.

-They can **OBSERVE** and **INVESTIGATE** the sharks in their natural **ENVIRONMENT** and take notes.

-Catch the sharks and see how long they are and how much they weigh (just like when you go to the doctor).

42. Shark Tagging

- A really cool thing scientists can do is to put tags on sharks. There are lots of different tags and they can do different things.
- A simple tag might just give the shark an ID or “name.” If they catch the shark again they will know it has already been caught and they can take measurements again to see if it has grown.
- Acoustic tags for tracking animal movements over a long time period.
- There are larger tags that are actually miniature computers. They record a lot of information while attached to the shark.
 - Location
 - Water **TEMPERATURE**
 - Depth
 - Speed
- The tags do not hurt the animals, but probably feel like getting a shot or your ears pierced. Sharks also heal incredibly fast.

* Shark Tracker Website: Students can follow different tagged sharks and see where they go. As a class you can select a shark and see where it goes for a week or 2 weeks or even a month. This is a great way for students to see real life science in action. <http://www.no-va.edu/ocean/ghri/tracking/>

43. We need your help

- Sharks need your help! They are in deep trouble and many species are **ENDANGERED** or critically threatened. Without help many species face **EXTINCTION**. 25 % of all sharks and rays (their flat relatives) are threatened with extinction.

- Shark **CONSERVATION** involves protecting sharks and their habitats.

SQ: What do you think you could do to help sharks?

- Recycle
- Don't litter on land or in the water. Pick up trash you see.
- Be a junior scientist and ask good questions about sharks.

- Be a shark advocate by telling other people how cool sharks really are and that they are NOT man-eating monsters.
- Get mom and dad or other family members to use canvas grocery bags instead of plastic.
- Have a reusable water bottle instead of buying new bottles of water
- Make a shark poster to share at school. Select a favorite species or a conservation fact to share.

Lots of things YOU can do and every little bit helps. You can also take our pledge to SAVE SHARKS, which is included in this packet.

44. The End

www.sharks4kids.com



Kindergarten Vocabulary

This list of words can be used along with the *Let's Investigate Sharks* PowerPoint

1. **Apex Predator**: An animal at the top of the food chain with no natural predators. If removed from an ecosystem, can have large cascading effects on many other species within that system.
2. **Carnivore**: An animal that eats primarily other animals.
3. **Cartilage**: This is flexible connective tissue found inside the body (nose & Ears).
4. **Conservation**: The protection of plants, animals, and their habitats.
5. **Consumers**: Are animals that cannot make their own food, so they must eat other animals and plants to survive. (Food chain & food pyramid)
6. **Ecosystem**: Animals, plants and nonliving things that make up an environment and impact one another.
7. **Endangered Species**: A species that is in danger of becoming extinct if actions are not taken to protect it.
8. **Environment**: All the physical surroundings and factors that influence an organism on Earth are called the environment. The environment includes everything living and nonliving.
9. **Extinction**: When all individuals of a species die. Once a species is extinct, they are gone forever.
10. **Fins**: Flattened appendages (arms and legs) used for propulsion, steering and balance in aquatic vertebrates and some invertebrates.
11. **Fish**: Animals that spend their whole lives in the water and breathe using gills. Fish lack limbs (arms/legs) with digits (fingers/toes)

12. **Food chain:** The order in which animals eat plants and other animals.
13. **Food Pyramid:** This shows the number of organisms at each level of the food chain. There are more producers (lower levels) than consumers (higher levels).
14. **Gills:** An organ used for breathing by animals in the water.
15. **Habitat:** The specific place where an animal or plant lives.
16. **Investigate:** To examine closely in order to find something out.
17. **Observe:** To see or sense through careful observation.
18. **Ocean:** The body of salt water that covers nearly 71% of the Earth's surface.
19. **Oxygen:** A chemical element that makes up part of the air we breathe. It is needed by all plants and animals to live.
20. **Pollution:** This occurs when the environment becomes contaminated (dirty) from chemicals, garbage or other harmful substances.
21. **Predator:** An animal that kills and eats other animals.
22. **Prey:** Animal caught and eaten by other animals.
23. **Producers:** (food chain & food pyramid) Living things that can make their own food. Plants are producers that make food through a process called photosynthesis. They use water, carbon dioxide and sunlight (energy) to make sugar and oxygen.
24. **Scientist:** Someone who is very knowledgeable about science and whose job involves doing scientific research or solving scientific problems.
25. **Shark:** Sharks are fish that have skeletons made of cartilage (cartilaginous fish). There are over 500 different species of shark.
26. **Temperature:** The measure of how hot or cold something is.

Sharks4Kids Shark Needs Kindergarten Activity

K-LS1-1 From Molecules to Organisms: Structure and Processes

K-ESS3-1 Earth and Human Activity

This activity can be used with the videos of *Norman the Nurse Shark*. Vocabulary is highlighted in red and a full vocabulary list for kindergarten can be found within the curriculum packet.

SQ: Indicates questions you can ask the students to engage them in a discussion.

**Italicized text is suggested narration and questions to ask throughout to get the students involved*

***Bold text is the instruction/action**

Introduction:

All living things have basic needs such as food, water, **OXYGEN** and shelter. This activity will show students that **SHARKS** are animals that have the same basic needs as all other living organisms. This including humans and animals that are familiar to them such as dogs or cats.

Materials:

- Sludge's magnifying glass coloring sheet. This should be completed before the activity starts as it is an important prop.
- Media set-up to watch Norman's videos

Time: 30-40 minutes. This activity can be easily split into two or three lessons if it is too long for your students.

Teacher Prep:

This is an active lesson and will require students to have room to move around and act out motions. Use Norman's videos on Sharks4kids.com so demonstrate how sharks have the same basic needs as all other animals. These videos are best if viewed during the activity but they can be shown afterwards if space inside the classroom is a limiting factor. Seat the students in a way that gives them a designated spot while also allowing room for their bodies to move around. A large circle can be best for this or if the students have a lot of energy then their own seats may be best.

Activity:

Today we are going to help Sludge investigate how sharks are similar to us and other animals. Let's start with ourselves.

Food:

SQ: What's your favorite food? Is it pizza? Mac n' cheese?

Pick one student at a time to act out eating their favorite food without talking and see if the class can figure out what it is by observing with Sludge's magnifying glass.

SQ: Can we guess what he/she is eating? Luckily this student can just tell us but animals can't talk so we have to use our observational skills to find out what they like to eat. Just like us though, all animals have to eat! What happens if you don't have breakfast? If we don't eat we get really hungry and our stomachs might hurt. Food is something that we must have to live and be healthy. What about your dog or cat? Do they eat? YES! They probably don't eat the same things that you and I do, but they still have to eat every day and they eat differently than we do.

For 10 seconds have the students act out how a dog or cat might eat.

SQ: Do sharks have to eat? YES! But sharks don't have hands, and their food doesn't stay in one place in a bowl like your pet's food because they live in the water and they have to catch their food. How can they get their food? Let's look at Norman to find out how a shark gets food. Get Sludge's magnifying glass out! Remember, Norman can't tell us what he's eating so we need to observe him to find out.

Play the video of Norman eating then discuss.

SQ: What was cool or interesting about Norman? How did he eat? Why is he eating like this? Does he have hands to help him?

Water & Oxygen:

SQ: We now know that all animals need food but what do animals usually have with their food? Something to drink! What do you drink with breakfast? Milk, orange juice or water? Let's take a vote! How about your dog? What does he/she drink? Hopefully water! Do sharks need water? Let's take another look at Norman. Get Sledge's magnifying glass out!

Play the video of Norman eating again.

SQ: Was he drinking the water? No, but he still needs it. He lives in the water! So all animals need water even if they use it in different ways.

SQ: Everyone take three big breathes in and out. We are using our lungs to breathe. We need oxygen and our body is breathing all the time for us so we don't have to think about it. Does your dog breathe? YES! Your dog might even snore! They have lungs just like we do but do sharks have lungs? Let's look at Norman again!

Play the video of Norman breathing and point out his gills.

SQ: This is Norman breathing. He's a fish and fish don't have lungs. These are called gills and they use the water to breathe. Most sharks have five gill slits on each side of their bodies. We have five fingers on each hand. Hold your hands on each side of your neck and pretend your fingers are the gills moving like a shark. We can pretend to breathe like Norman is!

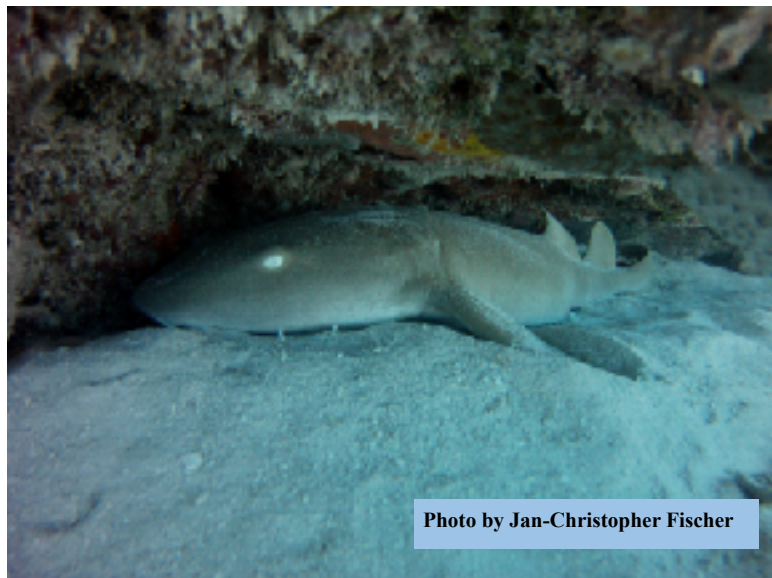
Students can act out breathing like a shark while watching Norman breath again. (Note that Nurse sharks may appear to only have four gills slits on each side but the fifth is hiding in the last slit so count carefully)



This is another way Norman uses water!

Shelter:

SQ: What do you do if it's raining outside? What if it's really cold or hot outside? We usually go inside to stay warm/cool and dry. What about your dog? He/she goes inside too! Animals need a shelter or a home to stay safe. Do sharks need to be protected? Why? There are bigger things in the ocean that might eat him so he likes to hide until he is big enough to be safe. But even big nurse sharks hang out with friends to stay safe. Lay down on your tummy like Norman would to hide!



Students can lay down on their stomachs and hide or sit close to friends next to them if you already have a buddy system in place.

Discussion:

Let's observe Norman do all of these basic life needs. When you see Norman eating, silently act out how he eats. When you see him breathing and using water, put your gills up and when you see Norman hiding lay on your stomachs to hide with him! Ready? Let's watch one more time!

SQ:

Does Norman have the same needs as us?

How did he meet his needs?

How is this different/same as us?

Play through each Norman video one more time to review all of his basic needs. Ask students to share this with their parents/family when they get home.

Sharks4Kids

Stingray Adaptations Craft

Kindergarten

K-ESS3-1 Earth and Human Activity

This craft can be used with the *Let's Investigate Sharks PowerPoint*. Vocabulary is highlighted in red and a full vocabulary list for the PowerPoint can be found within the curriculum packet.

SQ: Indicates questions you can ask the students to engage them in a discussion.

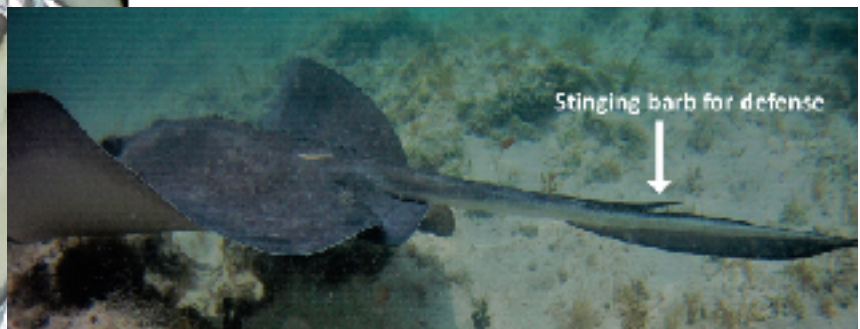
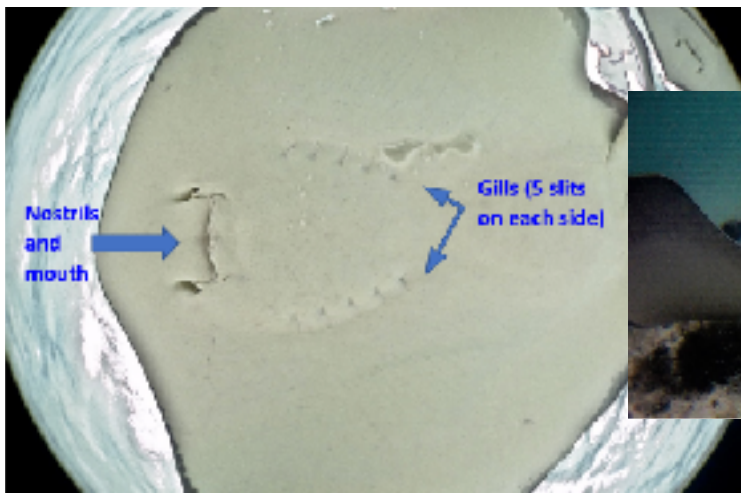
Introduction:

Stingrays are **SHARKS** too! They are made of **CARTILAGE** just like sharks are. Because of this, stingrays are sometimes nicknamed “flat sharks.” They swim gracefully through the water using their pectoral **FINS** that look like wings. These fins can be a round or diamond shaped. Stingrays come in many colors and patterns. They can blend in with their **ENVIRONMENT** or they can stand out with bright colors to warn other **PREDATORS** that they have venom. All stingrays have two eyes on top and extra **GILLS** called spiracles to help them breathe **OXYGEN** from the water. On the bottom, they have 10 gill slits, a mouth, and two nostrils. The extra gills on top allow them to be buried under the sand and still breathe. Their tail is not used for swimming like a shark but it is used for defense. Their tails can hold one or many stinging barbs at the base near their body. These barbs can break off and grow back just like your fingernails.



Materials:

- Paper plate



- Scissors
- Hole puncher
- Googly eyes (optional)
- Markers/Crayons/Colored pencils
- Pipe cleaners
- Glue

Procedure:

1. The paper plate is the body of your stingray. Cut the stingray to the shape of ray you want to design. (Pointed or rounded wings)
2. Glue or draw in eyes or your stingray and use a hole puncher to punch one hole behind each eye-these are your spiracles! Draw in gills, nostrils and a mouth on the bottom.
3. Color your stingray any color or pattern you want!
4. Take two pipe cleaners and cut one into smaller pieces. The smaller pieces are the barbs. Your stingray can have on or many barbs! Wrap each barb around the tip of one end of the long pipe cleaner to secure them in place.
5. Glue the pipe cleaners to the end of the stingray.

SQ & Discussion:

Discuss why you colored your stingray the way you did.

Did you want your stingray to be camouflaged in the sand or stand out?

What are some advantages and disadvantages of each?

How many barbs did you give your stingray?

Why would it be helpful for a stingray to have more than one barb?

