The World of Sharks

Close your eyes and think of a shark.

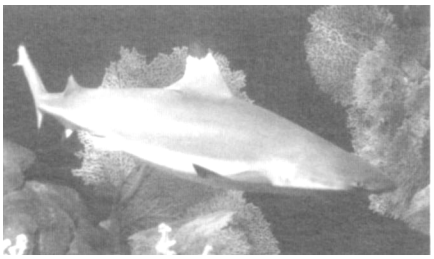
What do you picture? When we think of sharks, we usually think of sleek, large species that stalk the seas for fishes and marine mammals. Some do just that. But not all. The huge basking shark feeds on plankton. And the small horn shark crushes and eats clams, lobsters, and crabs. Some sharks are giants — longer than a school bus. Some are tiny enough to hold in your hand. Some spend their entire lives in motion. And some rarely stir from the sea bottom. Yet they are all sharks.

Where do sharks live?

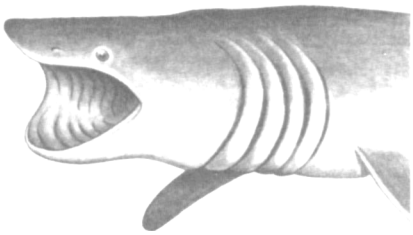
Sharks live all over the world, from warm, tropical lagoons to polar seas. Some even inhabit freshwater lakes and rivers!

The better to see you with, my dear.

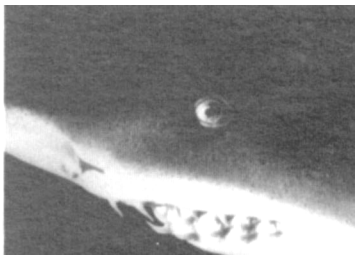
Scientists who have studied sharks by tagging them have found that most sharks are most active during the twilight and dark hours. A shark's eyes are well suited for seeing in dim light. They are particularly sensitive for seeing moving objects.



Pacific blacktip sharks live in warm, tropical waters.



Basking sharks filter and eat plankton.



A shark's eyes are suited for seeing in dim light.

When Sharks Go Swimming . . .

OBJECTIVE: Students will be able to creatively portray a shark's ecosystem.

MATERIALS: construction paper, hole punch, crayons, pencils, fasteners (yarn, brads, or clasp-rings)

ACTION: First, discuss with your students what kinds of other animals sharks eat and what a shark might see in the ocean.

As a class, make a shark book. Use construction paper for the covers. Title your book, ***"When Sharks Go Swimming . . ."***

At the top of a piece of paper, write the phrase: "This shark sees _____." Copy and distribute one sheet to each student.

Older students can complete the phrase on their own. For younger students, read the phrase to them, and write their word(s) in the blank. Students draw a picture of their shark's environment in the blank space on the page.

Punch holes along the left side or the top of each page and put the book together with rings, brads, or yarn. Place the finished book in your classroom's reading area or library.

Sharks are Sense-ational

Sharks have remarkable senses that help them find food and avoid predators.

No need to shout!

Do sharks have ears? Yes! You just can't see them, because they're deep inside the shark's head. But sound is often the first thing that attracts a shark to its food.

Something smells fishy . . .

Sharks are well known for their ability to smell even the tiniest amounts of blood in the water. Blood may lead a shark to an injured animal — and injured animals are easier to catch and eat than healthy ones.

It Makes Sense to Me

OBJECTIVE: Given various materials, students will explore their sense of smell.

MATERIALS: apple slices, orange and grapefruit wedges, diced onions, vanilla soaked on a cotton ball, cinnamon oil on cotton ball, spray perfume or cologne (or cotton balls soaked in various extracts), matches, stopwatch, small closed containers for each substance except perfume and matches.

Tell your students that they're going to be scientists studying a human's sense of smell. How will they do it? Brainstorm with your students ways that they can test which kinds of smells people are best adapted for smelling. List each of their ideas on the board. (After you do this activity you may decide to try one of their suggestions.)

To begin this activity, have students form a circle in the center of the room. Then students turn around so that they are facing the walls of the room. Explain to the students that you will be releasing a variety of smells, one at a time, in the center of the classroom. When they smell something, they should raise their hands.

As you release the smells, time the interval it takes for the students to raise their hands. Ask the first person to raise his or her hand to identify the smell. Write the name of the substance and the time interval on the board. Proceed with the next substance. (Recommended sequence: apple, grapefruit, orange, vanilla, cinnamon, onion, perfume, sulfur/match)

Discuss the results. Which substances could the students smell after the shortest time? Which took the longest to smell? Graph the results on the board.

A sense of smell is what leads many animals to their food. Sharks use smell to find prey, as do many other fishes. Sharks can smell certain substances, such as blood, in the water from hundreds of feet away. Are there substances we can smell from far away? What are some examples? *(Examples: tarring a roof, coffee brewing, popcorn popping, bacon frying, afire burning, cookies baking, pine trees)* Are there some items that we aren't well adapted for smelling? (For example, what does an aluminum can smell like? What does a plastic bowl smell like? a rock?)

When It's Time to Eat. . .

Sharks are predators.

Animals that eat other animals are called predators. The animals predators eat are called prey.

Some sharks are probably not very picky about what they eat. But certain kinds of sharks eat some foods more than others. For example, hammerhead sharks eat mostly stingrays. Tiger sharks eat mostly sea turtles. And whale sharks eat plankton.

Many sharks prey most often on the weakest members of a population. They eat weak, ill, or injured animals because they're easiest to catch.

These predators have poor appetites.

Sharks eat far less than most people imagine. Remember, sharks are cold-blooded. Cold-blooded animals have a much lower metabolism than warm-blooded animals. So sharks just don't need enormous amounts of food. Many sharks probably go several weeks between meals!

What's for Lunch?

OBJECTIVES: Given the materials listed below, the student will be able to create a shark and discuss what sharks eat and one way humans may affect sharks.

MATERIALS: 12- x 18-inch construction paper one sheet per student), wax paper, tissue paper, liquid starch, sponges, glue, crayons, patterns (on page 9).

Prepare materials first: Trace food patterns onto tissue paper and cut them out. Enlarge the shark pattern until it is 18 inches long. Fold the construction paper in half lengthwise to measure 18 x 16 inches.

Have students trace the shark pattern onto construction paper, placing the first dorsal fin on the fold. Help students cut out the shark. Cut out an opening to represent the shark's stomach.

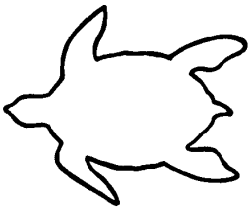
Give each student a piece of wax paper. Students use sponges to put liquid starch onto their wax paper. Then they place one of each of the food items in the starch on the wax paper. Give each student a second piece of wax paper. Students place the second piece of wax paper on top of the first and gently press out bubbles of starch.

Students open their sharks. They draw a circle of glue around the center hole and place the wax paper on top of the glue. Then they glue the two shark halves together. When the glue is dry, have the students draw nostrils and gill slits on their sharks.

Discuss why a shark might eat a tin can. What other animals eat trash made by humans? (Sea turtles ingest plastic bags because they look like jellyfish; seabirds eat small pieces of plastic that look like fish eggs.) What can we do to keep trash out of the ocean?

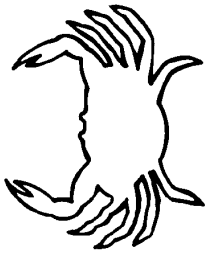
What's for Lunch?

pattern sheet

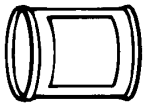


turtle

squid

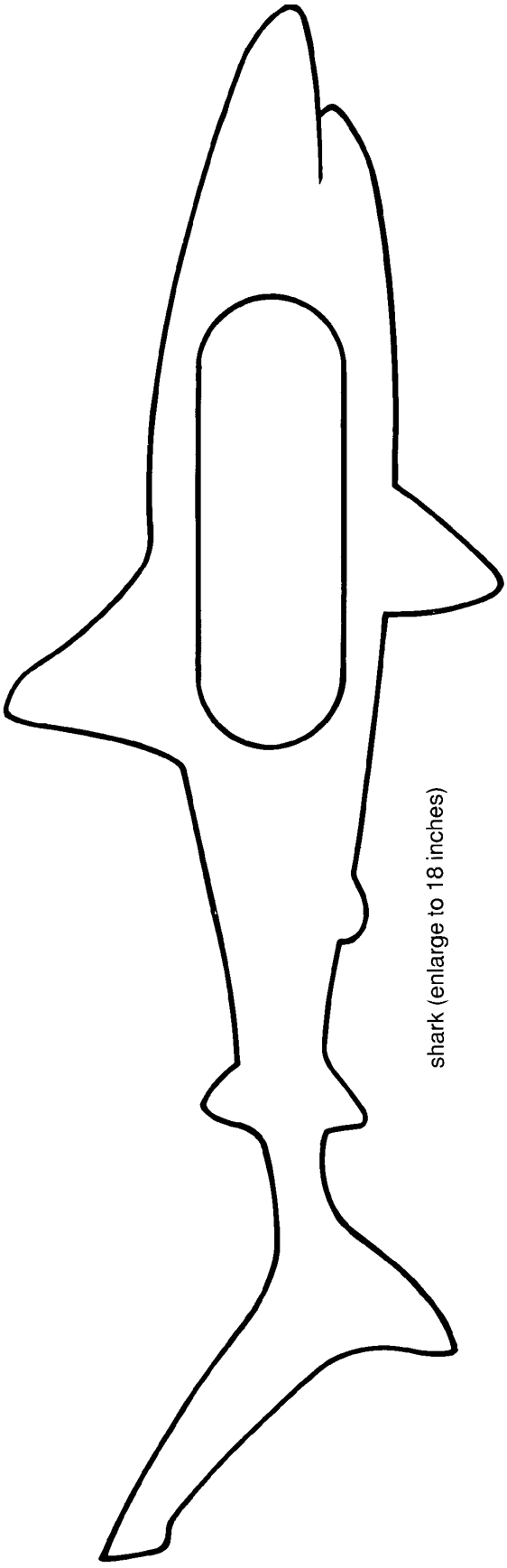


crab



tin can

fish



shark (enlarge to 18 inches)

Fingerprint Fish

OBJECTIVE: Given art materials, students will show how schooling behavior is an adaptation for avoiding predators.

MATERIALS: white construction paper, pencils, cardboard or tagboard, fish pattern, nontoxic red or orange stamp pads (about one for every five students), one nontoxic black stamp pad, thin markers, crayons or nontoxic tempera paint and brushes.

(RECOMMENDED PRE-ACTIVITY: read *Swimmy* by Leo Lionni— see page 15.)

Before class, make fish templates for students to trace: enlarge the outline drawing at the bottom this page to make a pattern about 10 inches long. Trace the pattern onto cardboard or tagboard to make templates. Make one fish template for every five students.

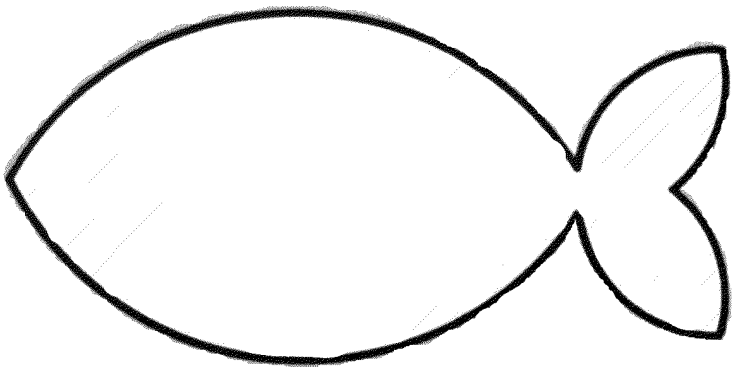
Give each student a piece of white construction paper and a pencil. Students trace the outline of the fish onto their paper, using the template.

Each student places a thumb on the black stamp pad, inking it well. Then they stamp their black thumbprint on their paper where their fish's eye would be.

Students add red or orange thumbprints all around their black thumbprint and inside of their fish pattern. After the students have filled the pattern with their thumbprints have them wash their hands.

Students use a thin marker to add fins, a tail, and a mouth to each of their thumbprints, turning them into little fish. (All of their little fish should be swimming in the same direction.) They can fill in the background (corals, seaweed, ocean, other fish, etc.) using crayons or tempera paint and brushes.

Standing at the front of the class, hold up a student's paper. What does it look like to students in the back row? (*One big fish*) What does it look like to students in the front row? (*A school of smallfish*) How does swimming in a school protect small fishes from predators like sharks? What would a shark see? (*A shark might think it's looking at a fish that's too big to eat.*)



Shark Attack!

Sharks have lots of teeth.

Sharks have several rows of teeth. Eventually teeth in the outer row fall out. But sharks grow new teeth all the time! So when they lose a tooth, one from the row behind just moves up. Some sharks may go through as many as 30,000 teeth in a lifetime.

Who needs silverware?

Think of a shark's lower jaw teeth as a fork, and its upper jaw teeth as a knife. As a shark's jaws extend to bite its prey, teeth of the lower jaw puncture and hold the prey. The upper jaw teeth slice.

Sharks don't eat people... very often.

Only 32 kinds of sharks have ever been known to attack people. Like other wild animals, most sharks would rather avoid you. Those that have attacked people are mostly large sharks that mistook people for food or attacked to protect their territory.

What happens when a shark loses a tooth? One from the row behind moves up to take its place!

Secret Shark Attack

OBJECTIVE: Students will use movement to reinforce the concept of predator/prey.

MATERIALS: paper, pencil or pen.

ACTION: First, prepare small slips of paper with words (or for nonreaders, drawings — see patterns on page 9) on them. Only one slip says ***shark*** (or shows a picture of a shark). The other slips say the names of (or show pictures of) prey items: turtle, fish, squid, seal, etc. Fold each slip of paper in half and put them all in a bag, bowl, or hat.

Review what sharks eat. Then, each student chooses a slip of paper. They keep their identity a secret. Explain these directions to your students:

1. Players walk around shaking hands with each other.
2. The *shark* is to lightly scratch the palm —two times— of every hand that he or she shakes.
3. If a player's palm is scratched, that player takes at least three steps away from the shark before gasping, fainting, and falling to the ground. The player is "eaten" and stays on the ground.

4. When someone who has not been "eaten" thinks, they know who the shark is, they say, "I know who the Predator is!" Everyone freezes. The accuser points to the shark. If they guess right, the game is over. If they guess wrong, the guesser "is eaten," and the game continues until the shark is discovered or until the shark has "eaten" all of its prey.