



Aquarium Webcam Resource Kit
Lesson Outline: *Fish for a Day*
K-2nd Grade

Next Generation Science Standards:

- **K–2-ETS1-2** Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
- **K–2-ETS1-3** Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.
- **1-LS1-1** Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.

Key Words:

- **Adaptation:** something an organism has on or inside its body, or a behavior to help it survive in its habitat
- **Dive Regulator:** instrument that controls the pressure of breathable gas used while SCUBA diving
- **Habitat:** the natural home or environment of an animal, plant, or other organism
- **Insulation:** the ability to keep an object warm
- **Predator:** the preying of one animal on others
- **SCUBA:** acronym for **S**elf-**C**ontained **U**nderwater **B**reathing **A**pparatus. An apparatus utilizing a portable supply of compressed gas (such as air) supplied at a regulated pressure and used for breathing while swimming underwater

Supplies:

- *Fish for a Day* video
- Worksheets: *Fish for a Day Worksheet*, *Fish for a Day Fin Activity Worksheet*, *Fish for a Day Insulation Activity Worksheet* (optional extension activity)
- Extension Insulation Activity supplies (optional)
 - 1 large container of water (ice water if you have it)
 - 2-3 materials to test (pieces of material, feathers, Crisco*, plastic, etc.)
 - Small sealable plastic bags (one for each material you will test)
 - 3-4 thermometers (one for the water, and one for each of the materials)
- Computer & projector to show the Tropical and Coral Predators exhibit
<http://www.aquariumofpacific.org/exhibits/webcams>

Step 1: Play *Fish for a Day* Video & Follow up

- Prompts
 - How do fish move through the water? What did Scuba Shara use?

Fish swim using their fins. Ask students if they remember examples of the different ways fish use their fins to move. To mimic fish, divers use a manmade “fin” to attach to the end of their feet.

- What do fish have on the outside of their bodies for protection? What do we have?
Most fish have scales for protection. Divers use a special dive suit for protection. The dive suit also keeps a diver warm.
- What special parts do fish have to breathe underwater?
Have the students think about their lungs and the way they breath in comparison to fish gills. Under water, divers carry their air in a container on their back, called an air tank.
- How does scuba gear help humans to explore the ocean?
The ocean isn't the natural habitat for a human. We can't breathe underwater, we don't have blubber, and we don't swim as fast as a fish. SCUBA gear helps humans to breath, stay warm, and swim faster underwater.

Step 2: Webcams and Ocean Ranger Worksheet: Fish for a Day (Page 1)

- Watch the webcams while students work on the Ocean Ranger Worksheet: Fish for a Day page 1.

Directions:

- Pick two animals to observe and draw. Looking at these two fish, what do you notice is the same (*fins, gills, scales, eyes*), and what is different (*shape, color, mouth*)?
- Compare a SCUBA diver to a fish. This can be done as a group or individually.
- Draw yourself as a SCUBA diver. Think of the parts that you will need.
- Class discussion:
 - How does the flat and long shape of the SCUBA fin help a diver to swim?
 - What would you like to explore underwater if you were a SCUBA diver?

Step 3: Class Discussion & Ocean Ranger Worksheet: Fish for a Day (Page 2)

- What special parts do fish have? Brainstorm to create a list of special parts that fish use to survive. These are called adaptations! *Scales, fins, eyes, body shape, etc.*
- Ocean Ranger Worksheet: Fish for a Day page 2
As students design a fish, have them consider what their fish eats based on the habitat they picked, mouth size, and how fast it swims. Then have students think about how it would defend itself from a predator. What adaptations would help it?

Step 4: Best Fin Design

- Print the *Fish for a Day Fish Fin Activity* for each student or one set for a pair of students. Cardstock works best but is optional.
- Hypothesis/prediction:
 - Which design do you think will move the most air?
 - *“I think fin number ____ will move the most amount of air because _____”*
- Have students cut out each fin design. Feel free to allow them to create their own design on a blank paper.

- In pairs, have one student hold the fin with two hands and move the fin up and down, similar to the motion of swimming fins in the water. The other student will stand in front of the fin to feel any breeze generated from the “swimming”
- Which fin design moves the most air? That fin design is the winner!
- Class Discussion:
 - How does the shape of the winning fin design help it to move the most air?
 - What do you notice about the design of the fin that moves less air?
 - What might it be like to swim with fins of each shape?

Extended Activity: Insulation

- A SCUBA wetsuit was designed to keep a diver warm. Unlike fish, people are warm blooded, which means we need to stay the same temperature inside our bodies all the time. This is a challenge when diving, as the ocean can be very cold. Scientists had to test different materials to see what would help keep a person warm in cold water.
- During this science experiment, students will explore the question, “What material would keep you the warmest while SCUBA diving?”
- Supplies:
 - 1 large container of water (ice water if you have it)
 - 2-3 materials to test (pieces of material, feathers, Crisco*, plastic, etc.)
 - Small sealable plastic bags (one for each material you will test)
 - 3-4 thermometers (one for the water, and one for each of the materials)
 - Fish for a Day Insulation Experiment Worksheet
- Directions:
 - Students will start by observing and describing each of the materials they will be testing.
 - *“I notice _____ material is _____” (soft, thick, hard, soft, clear, etc.)*
 - Students will then make prediction about which material will keep the center of the bag the warmest:
 - *“I think _____ will keep it the warmest because _____”.*
 - Place the first thermometer in the tub with the cold water (and ice).
 - Prep each material by stuffing it into the small plastic bag and placing a thermometer inside at the center before sealing it.
 - Place all the bags into the cold water.
 - After five minutes, record the temperature of the water.
 - Take out each of the bags and record the temperatures.
 - Compare and contrast each of the materials and discussed the results. Which material stayed the warmest?
- Connections to the lesson
 - A typical wetsuit is made of neoprene, which is a thick material with tiny bubbles inside that help trap a person’s heat.
 - *Crisco is very similar to how marine mammals keep warm. These mammals have a specialized fat layer called blubber.
 - Fish are cold blooded, meaning they are the same temperature as their habitat and do not need to stay warm.