

Native vs. Non-native Fish

Native vs Non-native Fish activities are directly tied to the sixth spread - pages 11 and 12 of "Our Wetland Project".

- What makes a fish a fish?*
- Where does it live and what does it eat?*
- What makes a fish different than other animals?*

Discover the features that make a fish a unique riparian animal! In a fight for survival, students will become the fish they have studied and learn how exotic species can affect native fish populations.

Levels

All Grades

Subjects

Language Arts, Science, Mathematics

Skills

Discussing, Brainstorming, Dramatization, Assessing, Qualifying

Concepts

Scientific investigation using observations, tools
Interactions of living things and environments
Life cycles and life processes

Objectives:

- Students will be able to:
- Describe riparian organisms using their senses and observation skills
- Identify the body parts of fish
- Name two adaptations that a fish has to help it survive
- Describe how a fish is different from other animals
- Describe or demonstrate the life cycle of a fish
- Name three native Montana (or other state's) fish
- Explain the effect that exotic fish species have on native fish species

Materials (20 student class-size)

pictures of fish life cycle (egg, alevin, fry, juvenile, adult)
fish pictures - Montana and not Montana (enough for 5 groups)
Candy: Gummy Bear(s), Saltwater Taffy, Smarties, Hershey Kiss(es), Starburst, Sweet Tart(s), Jolly Rancher, Peppermint (circle with red and white strips), Dum Dum (lollipop)
Parts of a Fish Worksheet (one per student)

Time Considerations

Preparation - 30 minutes
Activity - 80 minutes

Lesson Overview

- **Fish Tales/Fish Life Cycle** (30 minutes)
- **Fish Sorting** (20 minutes)
- **Native Species Game** (30 minutes)

Background

Fish Tales Activity

Review the features of the riparian habitat.
Review what types of plants and animals are found.

Fish Tales/Fish Life Cycle Lesson Details - 60 minutes

Where are fish found in the riparian habitat?

What do fish need to survive?

STEP ONE. Briefly discuss the life cycle of a fish.

How does a fish start its life? (egg, alevin, fry, juvenile, adult)

What do fish eat?

Ask students to discuss how a fish starts its life and what it eats. Display a picture of a fish. Ask students *What makes a fish a fish?*

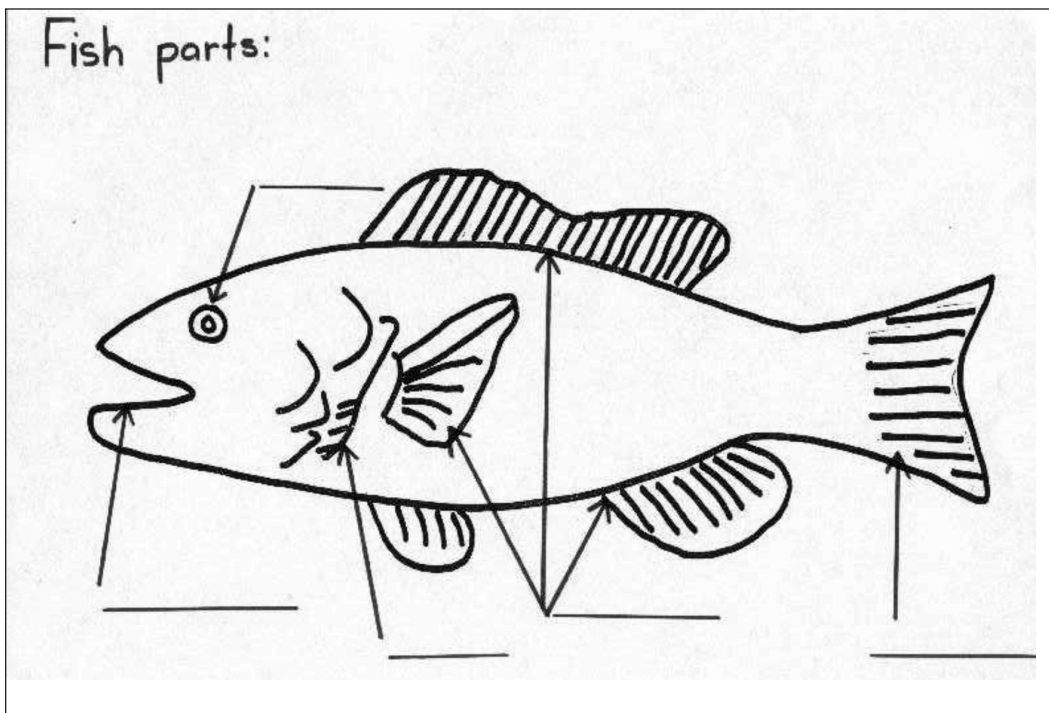
How are they different from other animals?

What does a fish use to breathe underwater?

STEP TWO. Brainstorm fish adaptations.

- streamlined shape - helps a fish move through the water
- fins - used for balance and movement
- eyes - eyes are located on opposite sides of their head, their field of vision is much larger than humans
- mouth - location of the mouth is oftentimes a clue as to how and where a fish feeds
- gills - take oxygen into the bloodstream, are red and located on the side of the head

Label and color Fish Worksheet



Fish Tales/Fish Life Cycle Lesson Details - 60 minutes *(continued)*

Background. Fish Life Cycle: Salmon Says *(Simon Says)*

STEP ONE. Introduce students to the following concepts related to fish life cycles.

- egg - Once the egg is fertilized, it begins to develop, and various organs such as eyes become visible. Depending on temperature, it takes 6 to 8 weeks from fertilization to hatch.
- egg-sac alevin - At this stage, the young fish has hatched from the egg but remains protected within the gravel bed while it retains its egg sac and relies on yolk for nutrition.
- fry - Once the egg yolk has been absorbed, the young fish emerges from the gravel to become a free swimming fry, reliant on external sources for nutrition. Young fish are generally considered fry during their first year.
- juvenile - This term refers to a particular size of fish approximately 3-4 inches in length. Hatchery managers often refer to this size for stocking purposes.
- adult - Salmonids generally spend one or more years feeding and growing either in saltwater or in larger river/lake systems prior to returning to their natal stream to spawn. The exception is resident fish (including some rainbow trout, cutthroat trout and other salmonids) which do not leave their natal system prior to spawning. Fish that undergo migration to larger systems can generally access greater food resources and therefore grow larger than resident-type populations.

STEP TWO. After reviewing the major life cycle stages (egg, alevin, fry, juvenile, adult) have students act out each stage and play Salmon (Simon) Says ...

- egg (squat down and wrap arms around your knees)
- alevin (stand up with arms at side)
- fry (stand up and put hands around mouth like gills)
- juvenile (stand up, put hands together in front of you, and make a swimming motion)
- adult (stand up with hands flapping like fins)

Fish Sorting Lesson Details - 20 minutes

STEP ONE. Break students into 5 groups and hand each of the groups a set of fish pictures. Tell students that the packet includes pictures of all different types of fish. Explain to students that their task is to sort the pictures into two piles:

- one pile of fish found in Montana's riparian habitat
- one pile of fish found elsewhere

What are some habitats where fish might be found? (oceans, lakes, ponds)

STEP TWO. After the groups have finished, review the sorting as a large group.

Which fish look like they live in Montana, which would live in the ocean?

Can you tell what these fish eat?

Where would these fish hide if a predator was chasing them?

What types of fish live in the riparian habitat in Montana? (rainbow trout, cutthroat trout, brook trout, brown trout, whitefish, paddlefish, pallid sturgeon, etc.)

How are these fish different from fish found in the ocean?

Discuss with the group how fish adaptations such as color/camouflage and body shape tell us about the habitat where they live.

This fish adaptation activity can be specific to any state by simply contacting the local U.S. Fish and Wildlife Service for native fish resources.

Native Species Game Lesson Details - 30 minutes

Materials

pictures of Montana's native and exotic fish
colored index cards
envelopes (1 per student)
exotic fish name tags
flags for game boundaries

Background

Have students hypothesize what happens when non-native species are introduced into a local stream. Students should determine that there will be competition for food, shelter, and space--leading to decline in a native population and possible extinction depending on the invasive species' characteristics.

Explain to students that one of the most serious threats to the natural communities of plants and animals today is the introduction of non-native plants and species by humans. When certain non-native species are allowed to invade a natural native plant population, the results can be devastating for the natives. Often natural diseases or predators are not brought with the invasive species to their new homes, thus allowing a tremendous growth of invasive species population. This can lead to a decrease in native plant and animal diversity in a region as these uncontrolled species increase in number. The non-native often out-competes native in obtaining the essential requirements for growth, reducing diversity.

Decrease in diversity affects many different food chains and may lead to a monoculture of plants and animals where once there was a variety. Loss of endemic or native species may mean loss of valuable genetic material, which could someday provide valuable medicines or foods. Loss of diversity makes our world a little less interesting and less beautiful. Play the Native Species Game and introduce students to the dilemma of the destructive invaders.

STEP ONE. Before Play Begins

Designate a playing area by placing cones at edges/corners of the playing field. (30' x 60' area works well for 20 students.)

Scatter playing cards throughout the area (each different colored chip represents a different need for a native fish to survive.

- white = shelter/space
- red = food
- blue = dissolved oxygen

Be sure to provide enough cards so each player may collect one card of each color during the first round in order to survive.

STEP TWO. Round One

All players will be native to the specific area. Everyone will line up along the edges of the playing field at the start of each round. At the designated signal, players will enter the playing field, collect one of the three different colored cards and return to the edge of the playing field. After all of the students return to the sideline, they return to the playing field and collect another card of a different color. Once again, they return to the sideline, returning a third time to the field to collect the third colored card.

After the player has collected all three colored cards, he or she moves to the sidelines to wait for the signal to end the round. All players should survive the first round.

Native Species Game Lesson Details - 30 minutes <i>(continued)</i>

STEP THREE. Round Two

This round will be played the same as Round One, but will now include non-native species. Two players wearing colored signs represent a non-native species. The non-native species are more aggressive and will be allowed to collect two cards per trip into the playing field. The non-native will also be allowed to return to the playing field as often as they are able but must collect three different colors in order to survive. The native species will be considered a survivor if he or she collects three different colored cards as they had done in Round One.

Give the signal to end Round Two. Identify the survivors. Evaluate by comparing population size and impact the non-native had on the natives.

STEP FOUR. Round Three

Native species that did not survive Round Two become non-native for this round. Give each new non-native a sign. Continue to play Round Three just like Round Two.

At the end of Round Three, most, if not all, of the native population should not survive. Evaluate the same as in Round Two.

After Round Three, discuss with students their observations as they played the game. As a group, ask them to figure out how and why those students who played as the initial non-native species were not only able to survive, but to actually take over the entire playing field.