F.I.S.H. ACTIVITIES FOR THE CLASSROOM

Fun, **I**nteresting, **S**urprising, & **H**ands-On, these activities are all about **F.I.S.H.**

SUBJECTS AREAS:

Science

Fish Food Web:
Lesson and activities with further investigation into freshwater fish anatomy and fish life cycles

Skills targeted:
Identification, Prediction, Observation, Discussion, Investigation

PLUS: Downloadable Resources

Fish Food Web

Purpose:

To identify different fish species and other species in a freshwater habitat that are predators (or prey) for fish, thus increasing students' knowledge of an aquatic food web.

Grades: Elementary - Middle

State Standards Met: Life Science 2.3B.1, L.3.4.1, L.5.3B Materials

Provided:

- Cards for rings – ***(See page 5)***
- *Fish ID* book – **(*See "resources" section*)**
- String
- Additional activities for students – **(*See "resources" section*)**

Materials Provided by Teacher/School:

- Scissors
- Extra string (or yarn)
- Metal Rings (optional)
- Stick glue

Time: 1 hour

Background Information:

A **food web** is several food chains that interconnect.

Food webs differ depending on their environments. Each environment is very diverse. **Biodiversity** is a term used when referring to the various species (plant and animal) that coexist in a single habitat.

Optional:

The *Fish ID* book can be displayed on a whiteboard or other projection screen to review fish species in the lesson, before or after the activities.

Learning Objectives:

- Identifying different species and how they are connected to (or dependent on) other species in the food web
- Determining how an invasive species harm food webs

Key Terms:

- **Invertebrates** – Animals that have no internal skeleton with a backbone; some have an external casing known as an exoskeleton
- **Fish** – An animal that is a vertebrate (has a skeleton with a backbone), fins and gills
- **Invasive species** – Non-native species that invades a habitat or an ecosystem, possibly causing severe damage to the food web

Note: *This food web is an example with some predators and prey listed for individual species. Food webs are very diverse making it difficult to cover every species in one activity. For the purpose of this activity, all "connections" are in* ***bold blue*** *on the cards.*

Activity:

Part 1:

Students stand in the middle of the room (based on their position in the food web, they may move as needed for the activity.)

One student (or the teacher) will "link" all the other students with the string or yarn.

Each student will become one "link" and have one card. Start with the plankton (the base of the food web), then proceed to the insects, shad, crawfish, bluegill, etc. . . . . continue until the web is complete.

Remember: One student is placed at the side of the room. This student is the invasive Asian carp!

On back of cards is a description of the animal in the picture with notes identifying it as a predator, prey, or both. For example, a student may be a bluegill. This student will be a predator to some animals while falling prey to other animals.

Students will "link" themselves to the predator and prey listed on the card by calling out species that they prey upon or that they may fall prey to. The student (or teacher) assigned the string will then tie sections of string to the rings. In this way, students create their own "food web."

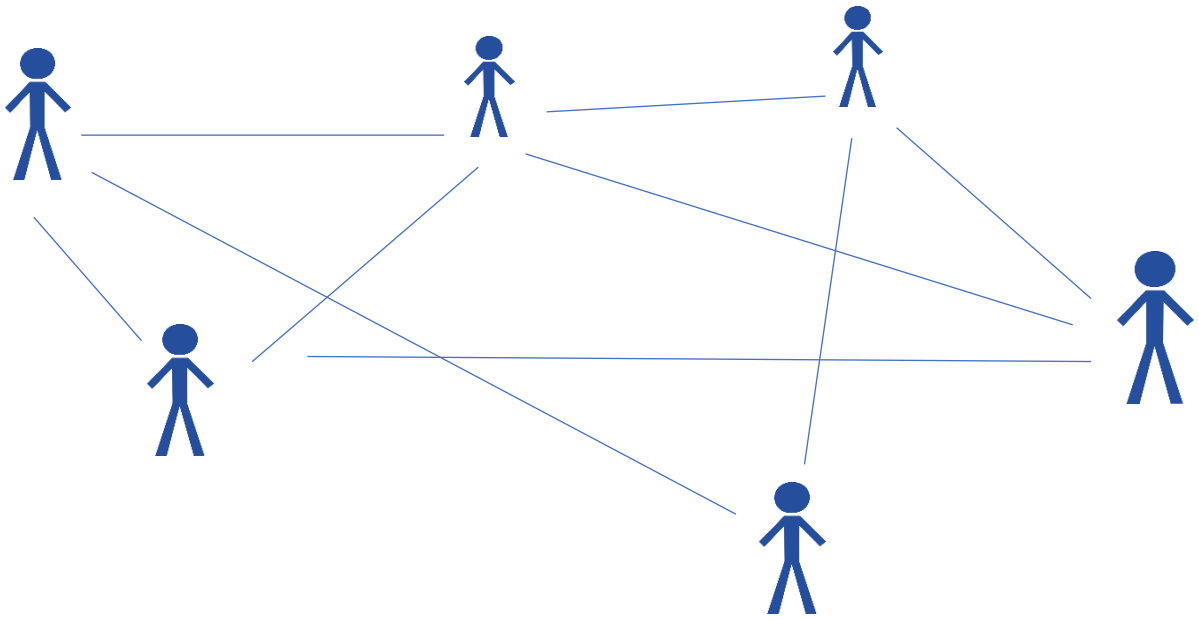
Once web is created, students explain "who" they are and why they are "connected" to other species.

For example:

I am a fish species known as a largemouth bass. I feed mostly on other fish and large invertebrates like crawfish, but I also feed on frogs. Did you know that I am the state fish of Mississippi?

Teachers may use some or all the cards. The more cards used, the longer the activity lasts. (*Difficulty level of activities is based on age and ability of students and is determined by the teacher.)*

Example Diagram:



Part 2:

Invasion! The student standing by as the Asian carp explains who he/she is.

Questions for students: What do you think will happen to the food web if we introduce this invasive species? Will all species be affected?

Students hold cards and rings **very loosely** in their hands.

The “Asian carp” takes the plankton ring and pulls. He/She will pull at the entire web.

Time for comments/discussion. Sample questions:

- Were the students right?
- Was there any species not affected by the introduction of the invasive species?
- What species were affected first? What species are connected to the plankton?
- Would other species in the web be affected?
- What would happen if another species in the web were to disappear?

Largemouth Bass

Predators: **Alligator gar**, **bald eagle**, **alligator snapping turtle**, **great blue heron,** and other predators

Prey: Large invertebrates (e.g. **crawfish**), **frogs**, small snakes, smaller fish (e.g. **bluegill**, **shad**)

Interesting Facts:

- The largemouth bass is the state fish of Mississippi.
- This fish lives in a variety of habitats including streams, rivers, lakes, and reservoirs.

American Eel

Predators: **Alligator gar**, **alligator snapping turtle**, **great blue heron** and other predators

Prey: **Aquatic insects,** larger invertebrates (e.g. **crawfish**), and small fish (e.g. **bluegill**, **shad**)

Interesting Facts:

- The freshwater, American eel is not electric.
- This fish lives in a variety of habitats.

Front ***Back***

Bluegill

Predators: Alligator gar, alligator snapping turtle, largemouth bass, great blue heron, bald eagle and other predators

Prey: Smaller bluegill feed on insect larvae. Larger bluegill feed on smaller fish (e.g. shad) and aquatic insects.

Interesting Facts:

- Nicknames for the bluegill are bream and blue sunfish.
- Crickets and earthworms are excellent baits to use when fishing for bluegill.

Sturgeon

Predators: Larger catfish can eat small sturgeon.

Prey: Aquatic insects

Interesting Facts:

- Sturgeon are protected in Mississippi. It is illegal to keep sturgeon.
- This fish has a "sucker-like" mouth.

Front ***Back***

Threadfin Shad

Predators: Various birds (e.g. **great blue heron**) and fish (e.g. **bluegill**, **largemouth bass**, **alligator gar**, **American eel**)

Interesting Facts:

- Threadfin shad are very small fish that feed primarily on **phytoplankton** (**plant portion of plankton**) and algae.
- Threadfin shad are abundant in most of Mississippi's rivers, streams, lakes, and reservoirs.

Bald Eagle

Interesting Facts:

- The bald eagle is the national bird of the United States.
- Eagles feed on fish like the crappie, **bluegill**, **eel**, and **largemouth bass**.
- Eagles are protected.

Front ***Back***

Aquatic Insects

Predators:

Fish fingerlings and adult fish like the **bluegill**, **sturgeon**, and **shad** feed on an assortment of insects and insect larvae including caddisflies, damselflies, midges, mayflies, dragonflies, and stoneflies.

Prey:

Many insect larvae feed on other insect larvae or on smaller **plankton** in the water.

Alligator Gar

Predators: Alligators, other alligator gar, **alligator snapping turtle**

Prey: Mostly fish (other gar, **largemouth bass**, **bluegill**, **shad**, and other species), ducks, turtles, and other prey

Interesting Facts:

- The alligator gar is the largest freshwater fish in North America. An alligator gar was caught in 2011 that weighed 327 pounds.
- This fish's name reflects the shape if its head.

Front ***Back***

Asian Carp

Predators: **Alligator gar**, **alligator snapping turtle**

Prey: **Plankton**

Interesting Facts:

- The Asian carp are a non-native, invasive species that feeds greatly on plankton, the base of the aquatic food chain.
- The Asian carp compete with other native fish for this food source.

Great Blue Heron

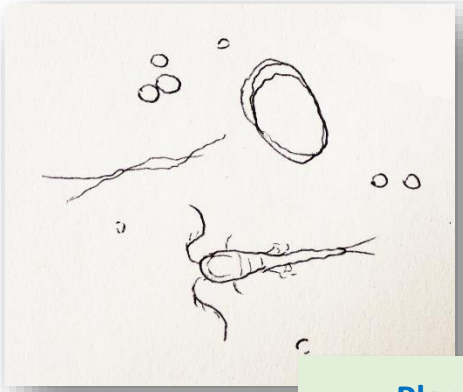
Predators: Alligators and other predators. **Eagles** will sometimes prey on small herons.

Prey: **Aquatic insects** (dragonflies), larger invertebrates (e.g. **crawfish**), and small fish (e.g. **bluegill**, **shad, eel**), **frogs**

Interesting Facts:

- This heron uses its pointed bill to spear fish and other prey.
- Other creatures like the racoon also prey on heron

Front ***Back***



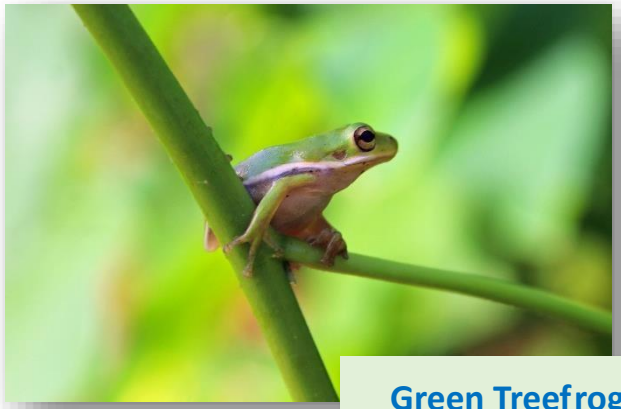
Plankton

Predators: Young fish, small fish **(shad)**, **crawfish**

Prey: Zooplankton feed on smaller phytoplankton and zooplankton.

Interesting Facts:

- **Plankton are the base of the aquatic food chain.**
- Plankton is made of microscopic plants (**phytoplankton**) and animals (**zooplankton**) in the water.



Green Treefrogs

Predators: **Great blue heron** and other birds.
Larger fish (e.g. **largemouth bass**)

Prey: Insects

Interesting Facts:

- The color of most frogs allows them to blend in (camouflage) with their surroundings.
- Small fish eat frog eggs and tadpoles in the water. Larger fish can be predators for the adult frogs.

Front ***Back***

Lamprey

Predators: Larger fish like the **largemouth bass**

Prey: Other fish (e.g. buffalo, catfish, **bluegill**)

Interesting Facts:

- A lamprey is a fish that is parasitic in nature. It feeds off the body liquids of other fish.
- Very young lamprey, like other smaller fish, feed on **plankton**.

Alligator Snapping Turtle

Predators: Smaller turtles are prey to larger fish other predators.

Prey: Other turtles, fish (e.g. **largemouth bass**, **bluegill**, **shad**), snakes, and other prey

Interesting Facts:

- Their tongue looks like a worm. They use it to lure fish into their mouths.
- Racoons feed on eggs and newly hatched turtles.

Front ***Back Front***

Back

Crawfish

Predators: Larger fish (e.g. **largemouth bass**), **eel**, **great blue heron**, and other predators

Prey: Tadpoles, insect larvae, dead fish, plants

Interesting Facts:

- This crustacean has different names such as crawfish, crayfish, crawdad, and mudbug.
- Crawfish will use logs and rocks to hide from predators.

Directions: *Fold cards in the middle; use the glue to stick the front and back together. Use a hole puncher on the corner for the yarn/rings.*

Further Investigation: *All About Freshwater Fish* activity book

State Standards Met: Life Science 2.1.2, L.2.3B.1, L.3.1, L.3.2.1, L.4.2.1, Biology & Aquatic Science Classes

Materials Provided:

- *All About Freshwater Fish* book with information and additional activities – **(*See "resources" section*)**
- Printable posters provide specific information on fish life cycles. Posters used to launch further discussions. – **(*See "resources" section*)**

Learning Objectives:

Using the activities, diagrams, and descriptions in this resource, students will:

- Identify the three characteristics that make a fish a fish.
- Learn more about fish anatomy, internal and external.
- Learn how biologists determine the age of a fish.
- Understand the fish life cycle from egg to adult.
- Define herbivores, planktivores, carnivores, and omnivores.

Resources:

Downloadable Resources | Mississippi Department of Wildlife, Fisheries, and Parks (mdwfp.com)

BOB TYLER FISH HATCHERY
Visitor Education Center

Resources: Mississippi Department of Wildlife, Fisheries, and Parks, *Inland Fishes of Mississippi*, Stephen T. Ross, *Sharing Nature with Children* by Joseph Cornell, Montana Natural History Center & the "Exploring Wetlands Curriculum," Epply Institute for Parks and Public Lands, University of Michigan, Museum of Zoology website (Created in part through the National Science Foundation)

Photos: MDWFP Personnel