

# Predator Prey

Grade Level(s): 3-6  
Time: 30 - 45 minutes  
Group Size: 10-20  
Setting: Indoors (gym)/Outdoors

## NYS Learning Standards Core Curriculum MST

### Standard 4: Living Environment

Students will: understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.

- *Key Idea 1:* Living things are both similar to and different from each other and nonliving things.
- *Key Idea 5:* Organisms maintain a dynamic equilibrium that sustains life.
- *Key Idea 6:* Plants and animals depend on each other and their physical environment.

## Summary

Students will learn an example of each a predator and prey species that they can catch in a local water body. Students will be introduced to aquatic predator-prey relationships by playing a tag game. Predator and prey defensive traits will also be introduced (camouflage, schooling, external anatomy).

## Objectives

- Students will be able to identify 1-3 species of fish specific to fishing area
- Students will discuss fish as an aquatic resource in their area
- Students will be able to describe characteristics about the fish that inhabit their area ecosystems
- Students will be able to explain the predator-prey interaction that occurs in the ecosystem

## Materials

- Large playing area
- Fish models or pictures (one predator and one prey species)
- Food tokens (laminated colored paper, game chips, or plastic bugs to represent food) for 4-6 tokens per child
- 4-5 Hula-hoops or other structures to symbolize shelters
- 4 cones or natural structures to symbolize boundaries

## Vocabulary

- **Camouflage**- Disguising one's appearance to hide from others
- **Countershading**-camouflage pattern in animals, darker on top (dorsal side), lighter on bottom (ventral side)
- **Ecosystem**- Community of organisms that interact together in a specific environment
- **Habitat**- Place in the environment where an organism naturally thrives
- **Predator**- Animal that obtains food by the killing of another animal
- **Prey**- The animal that is taken for food by another
- **Schooling**-fish swimming in same direction in a coordinated matter

## *Background*

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An **ecosystem** is a complex network or web of interrelated and interdependent animals and plants within a common environment. Organisms in the environment rely on other organisms for food. Predators are animals or organisms that kill and eat other organisms. Prey are organisms that are killed and eaten by other organisms. For example, a freshwater predator – prey relationship may include pumpkinseed sunfish eating aquatic insects or largemouth bass eating pumpkinseed and bluegill sunfish. A saltwater predator – prey relationship may include bluefish eating silversides or striped bass eating American eels.

### **Predator – Prey Relationship**

At some point in each fish's life, it is food (or **prey**) for other fish species. Larger, stronger fish or **predators** seek out and eat smaller fish or prey. The term prey fish is actually a loose term used by anglers to refer to certain non-game fish species that are the main food items for popular sportfish. As a rule, a fish is considered a prey fish if it remains small enough in size during its entire life cycle and it occurs in large enough numbers to adequately feed a predator fish population. But while prey fish are mostly considered a significant food source for popular gamefish, it is important to remember that they are also an essential and integral part of a healthy fish community. Prey fish help maintain balance in the fish community by playing the role of predator, eating the larvae of other fish species, as well as the role of competitor by eating the same foods as other fishes. If something happens to the prey fish population, the entire fish community is affected.

Animals display a variety of behaviors during predator – prey relationships. These behaviors are adaptations to survive. Some prey behaviors are: signaling to others, posturing in a fighting position, and even “freezing” on the spot to escape detection or capture by predators. Shelter or **camouflage** may also make fish invisible to the predator when they freeze. Another behavior which is often utilized is **schooling**. For example, a potential predator hunting for a meal might become confused by a closely spaced school, which can give the impression of one vast and frightening fish. Schooling behavior is based on the concept “safety in numbers”—a predator cannot consume an unlimited quantity of prey. Predatory fish also gain from schooling because it gives them the ability to travel in large numbers in search of food. Bluefish in pursuit of menhaden are a good example.

## *Main Activity*

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### **Pre-Lesson Procedures:**

1. Find natural boundaries for playing field or use cones to mark out boundaries.
2. Disperse “food” tokens on one end of the playing field
3. Place “shelters” (hoola hoops) throughout playing field

### *Introduction*

1. Introduce yourself
2. Discuss the two major types of water
  - a. Say: What are the two types of water? Can anyone give me an example of fresh water environment? What about a saltwater environment?

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3. Tell students we are going to learn about some fish that live in the type of water right around us and that there will be a game to simulate the predator-prey relationship

## *Predator-Prey Distinction*

1. Introduce predator fish and discuss:
  - a. Types of food it eats
  - b. How it obtains the food
  - c. Where in the water the fish lives based on body shape and colorings
2. Introduce prey fish and discuss:
  - a. Types of food it eats
  - b. How it obtains the food
  - c. Where in the water the fish lives based on body shape and colorings
3. Say:
  - a. Why do you think this fish has stripes or other markings? What do you think they are used for?
  - b. Why do you think the fish is dark on the top and light on the bottom?
  - c. What does the word “camouflage” mean?
  - d. What is a predator? Is this fish a predator?
  - e. What is a prey species? Is this fish a prey species?
4. Be sure to discuss proper handling techniques, safety for students and safety for fish (external anatomy feature=its function=action to follow):
  - a. Slime layer=protection=wet hand, no rag or shirt to handle
  - b. Dorsal fin=protection=slide hand over fin
  - c. Gills=breathing=do not hold by gills
  - d. Teeth=eating/protection=do not hold by mouth and what to use for bait
  - e. Body shape=where lives=where to fish

## *Predator-Prey Game (5-10 minutes)*

1. Introduce the game:
  - a. The field will represent a waterbody near or around the location.
  - b. There are two types of fish, one the predator and one the prey
2. Participants will represent the prey species and the facilitator will be the predator. For example in freshwater, the largemouth bass can take on the role of the predator while the bluegill sunfish can take on the role of the prey species.
3. Explain that the object of the game is for each player to cross the water to the other side, pick up ONE food card (show cards) and make it back to your nest or home and back to the food area. The catch is that the predator is out there, lurking, trying to “eat” or tag its prey.
4. There are 3-5 hula-hoops out in the water that represent shelter areas where the fish likes to hide; i.e. for freshwater: aquatic plants, stumps, and fallen trees. You can stop there to escape the predator on your journey to obtain food. You are not allowed to stay there for more than 5 seconds. The predator won’t “babysit” the safe areas.
5. There is no running, only “swimming” where everyone’s feet must stay on the ground at all times. Have students practice “swimming.” The predator must also “swim” this way.
6. Remind players they must swim to the other side and grab ONE piece of food and make it back to their nests. Players will repeat the process until the food is gone. If a player

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goes out of bounds (as marked by cones), starts running, or is tagged, then that player is out and must sit on the side until another round of play.

7. Ask if there are any questions.
8. If there is extra time, ask a parent, teacher or other student to play the role as the predator or predators. (Tip: There can be more than one predator).

## **Lesson Procedures:**

**Adapted from:** Project Wild; Quick Frozen Critters lesson plan

## *Wrap up*

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Ask students to raise hands to indicate who collected one piece of food, two pieces of food, and so on. Ask students what might happen to the fish that didn't obtain any food.

- a. Say: Was it easier to stay alive when you were swimming in a school? Rather than by yourself?
- b. Say (if more than one predator): Was this round harder or easier than the last round? Why? What about in nature?

## **Review**

- Ask the students to identify 1-3 species of fish specific to fishing area
- Have students describe characteristics about the fish that inhabit their area ecosystems
- Ask the students to describe the predator-prey interaction that occurs in the ecosystem

## **Questions for Discussion**

Q: Define predator, define prey

A: A predator is an animal that obtains food by the killing of another animal, while a prey is an animal that is taken for food by another.

Q: What are some characteristics of prey species that help them escape from predators?

A: schooling, fast moving, spiny dorsal fin, camouflage, countershading

Q: What are some characteristics of predator species that help them catch prey?

A: schooling, fast moving, camouflage, countershading, teeth

Q: What is structure and how do fish use it to escape predators?

A: shelter that fish use to hide from predators: rocks, plants, docks, etc.

Q: What is an ecosystem?

A: A community of organisms that interact together in a specific environment

Q: Name a prey species that you might catch today (site specific)

Q: Name a predator species that you might catch today (site specific)

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## **Additional Resources**

“Common Prey Fish of New York.” New York State Department of Environmental Conservation. 2013. January 8 2013 <<http://www.dec.ny.gov/animals/7031.html>>.

Project Wild. “Quick Frozen Critters”. Contact Region 1 Environmental Educator Ron Gelardi at 631-444-0347 for Project Wild lesson plan information.