***Fish Adaptations***

**Time Frame:** 35-45 minutes
**Grade:** 6th-8th
**Class Size:** 20-30 students
**Setting:** Indoors
**Staff:** 1
**Use:** In-class

**NYS Education Standards:**
MST-Section 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 3*: Individual organisms and species change over time.

**Objectives:**
- ✓ Students will be able to identify 1-3 fish specific to fishing site
- ✓ Students will be able to adapt a fish using 3-5 external anatomy features of a fish
- ✓ Students will be able to explain how adaptations help fish survive
- ✓ Students will be able to compare and contrast adaptations of different fish species

**Motivation:** Drawing, coloring

**Materials:** *Fish Anatomy worksheet*, *Fish Parts worksheet*, *Survival of the Fish worksheet*, fish models/posters/dead on ice

**Lesson Procedures**:
*Introduction (1-2 minutes)*
1. Introduce yourself and the I FISH NY program.
2. Introduce day's activities:
    a. Prep for upcoming fishing trip
    b. Fish identification
    c. External anatomy
    d. Adaptations

*Adaptations (4-5 minutes)*
1. Introduce the word "adaptations" or the phrase "to adapt." Ask students to define these concepts in relation to organisms.
    a. Say: Organisms adapt or change in order to survive. Adaptations take place over thousands of years.
    b. If need be discuss the difference between an adjustment and an adaptation. For example, when we are cold we adjust and put a jacket on.

2. Discuss the adaptations each of these animal groups has gone through to survive in its environment. Ask students to brainstorm what each group of organisms has done as a whole in order to survive.
    a. Group: Large Cats (Family Felidae): tiger, cheetah, jaguar, lion – long, slender body, fast runner, retractable claws, sharp teeth, camouflage
3. After students have brainstormed regarding groups, ask what one individual animal from that group has done to survive.
    a. Individual: Cheetah – very fast, different pattern of camouflage

*Fish Discussion (10-15 minutes)*

1. Continue the adaptation discussion with a focus on fish. Ask what fish have done as a whole to survive.
    a. Group: Bony Fish (Family Osteichthyes): bluefish, striped bass, weakfish – gills, fins, slime, 5 senses
        i. Use one fish model/pix/dead on ice as an example. Most students will suggest fins and gills.
        ii. Items to go over <u>briefly</u>:
            1. The different fins and their function
            2. Slime layer and its importance
            3. 5 senses
2. After general fish adaptation discussion, talk about the different ways 2-3 different fish types adapted in order to survive (aside from the gills, slime, etc.). If possible show 1-2 fish that have adapted significantly such as those fish from the flatfish family.
    a. Examples in saltwater: striped bass, bluefish, summer flounder, sea robin, etc.
    b. Examples in freshwater: largemouth bass, trout, brown bullhead, etc.

*Survival of the Fish (15-20 minutes)*

1. Introduce next activity, the fish adaptation worksheet.
    a. <u>Say:</u> Now that you have learned about fish adaptations and some of the different features of fish; you are going to apply your new skills and adapt a fish of your own.
2. Hand out *Survival of the Fish worksheet*. Read directions aloud. Have students read different environments to choose from.
3. After reading, point out area to create fish and questions to be answered. Students must start with the questions and then create their fish.
4. Hand out *Fish Parts worksheet*. Students can use the mouth, body, and tail shapes from the worksheet. Parts can be morphed together, made larger, smaller, etc.
    a. Fish must be realistic
5. Give students 10-12 minutes to create their fish.
    a. Circulate and assist students.
6. Debrief activity.

*Fishy Identification Share (5 minutes)*

1. If time permits, have a few share their creations and tell why the fish has certain adaptations.

*Conclusion (3-5 minutes)*

1. Go over fishing trip details with students.
    a. What to bring on the trip
    b. What to wear on the trip
2. Field any questions.
3. Thank students.