Form and Function

Time Frame: 35-45 minutes
Grade: 3rd-5th
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 construct a fish using 3-5 external anatomy features of a fish
✓ Students will be able to explain how body form influences body function
✓ Students will be able to compare and contrast adaptations of different fish species

Motivation: Drawing, coloring

Materials: Fish Anatomy worksheet, Fish Parts worksheet, Fish Planets 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. Form equates function

External Anatomy Features Overview (10-13 minutes)
1. Introduce external anatomy features while introducing fish species. Focus on mouth, body, and tail fin shapes.
   a. Start with one fish and go over all of the features.
   b. Introduce 2-3 other species; review features.
2. Discuss how the forms are different on some of the fish but the function is similar. Be sure to address adaptations over time; adaptation vs. adjustment.
3. Discuss proper handling techniques, safety for students and safety for fish, and how knowing external anatomy features can help with fishing.
a. Slime layer = protection = wet hand, no rag or shirt
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
e. Body shape = where lives = where to fish
f. What fish eats = what to use as bait

Different Planets of New Fish (15-20 minutes)
1. Introduce next activity: fish creation.
   a. Say: Once students have learned features, now going to apply skills to create their own fish.
2. Hand out *Fish Planet 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.
   a. Students must answer questions thoroughly.
   b. Worksheets will be collected after class and possibly posted on website or used as display materials.
4. Hand out *Fish Parts worksheet*. Students must use the mouth, body, and tail shapes from the worksheet. All other fins and protection mechanisms are left to the student to decide. All fins must be included.
   a. Be creative!
   b. Not a judge of artistic skills; application of external features and form / function.
5. Give students 10-12 minutes to create their fish.
   a. Walk around and assist students.
   b. Helpful tips:
      i. Start with selecting planet
      ii. Decide what your fish will eat = mouth
      iii. Decide where your fish will live = body
      iv. Decide how your fish will move = tail fin
      v. Decide how your fish will protect itself
      vi. Sometimes it is easier to start with answering the questions and then drawing the fish
6. Debrief activity
   a. Say: By simply knowing the external anatomy features of a fish, it can help us with fishing. For example, if a fish lives at the bottom of a waterbody where would you fish?

Fishy Identification Share (5-10 minutes)
1. After students have created their fish, 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.