

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.