

A Fishy Twist on Adaptations

INTRODUCTION: Does the coloration of an animal effect its chances for survival? Do feeding mechanisms alter an organism's chance of living? How would an organism's reproductive strategy affect the individual? How would it affect the species? Throughout time, people have marveled at the great amount of diversity found in nature. It is adaptations, however, that have led to this vast array of variation and which have resulted in the enormous variety among species. In this activity, you will be studying the effects that an adaptation, any feature which increases an organism's reproductive success (fitness) in its environment, has on a fish's success in different habitats.

MATERIALS:

- Drawing paper (poster board)
- Large newsprint (18" X 24")
- Colored markers, crayons, or pencils
- Scissors, tape

PROCEDURE:

1. Answer question #1 using your notes or textbook before you continue with the lab.
2. Form groups of 3 or 4 students per group
3. Each group needs to get two sheets of drawing paper. A smaller piece (poster board) for designing fish, and a larger piece (newsprint) for the habitat.
4. Randomly choose one of each type of adaptation for fish-***jaw shape, body shape, coloring and reproductive strategy***— before designing your fish (see teacher for adaptation cards)
5. Complete data table #1 describing your fish's specific adaptations
6. Using the paper and colored markers provided, design, color and cut out one fish showing all of the four adaptations.
7. Assign your fish a scientific name and a common name. Write it in the space below Data Table #1 and on the back of your fish. (*see pages 448-449 for guidelines on assigning scientific names*)
8. On the larger piece of paper (18" X 24" newsprint) draw and color the ***habitat*** in which your fish would be well-suited for survival.
9. Be prepared to present your fish and habitat to the class and explain to the class how your fish is adapted for your environment. Which adaptations are most important to your fish's survival? Do any adaptations seem inconsistent with each other?
10. Trade habitats with another group, keeping the fish you designed.
11. Place your fish in the new environment and reevaluate the probability of success for your fish.
12. Answer questions 2-8 and turn in your fish and its original habitat to the teacher. (*make sure your groups names are on the back of both the fish and habitat*)

QUESTIONS:

1. Define the following terms:

- *Adaptation-*

- *Species-*

- *Natural selection-*

- *Habitat-*

- *Niche-*

- *Descendent-*

- *Fitness-*

Data Table #1

Adaptation	Description	In what type of habitat would your fish be best-suited for survival

2. How do adaptations increase the likelihood for an animals survival?

3. List and justify any adaptations which will limit the success of your fish in its new habitat.

4, List and justify any adaptations which will enhance the success of your fish in its new habitat.

5. Which adaptation is most important for the survival of the individual fish? Explain your reasoning.

6. Which adaptation is most important for the survival of your fish's species? Explain your reasoning.

7. What role do adaptations play in Darwin's Theory of Natural Selection? (be specific)

Warning Coloration

Brightly colored. Advertise that they are dangerous, poisonous, or taste bad

Cryptic Coloration

Blend with environment.
Can sometimes change coloration to match surroundings

Disruptive Coloration

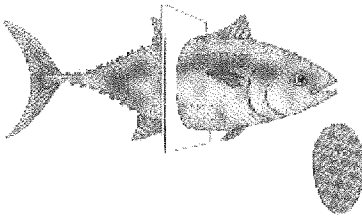
Presence of color stripes, bars, or spots that help to break up outline of a fish

Counter-shading

A form of disguise in open water.
When viewed from below-light belly blends with bright light from surface.
The dark back blends into ocean's color
As seen from above

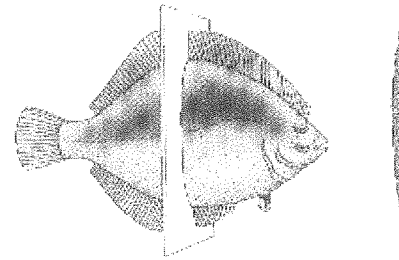
Streamlined

For fast swimming as in Tunas



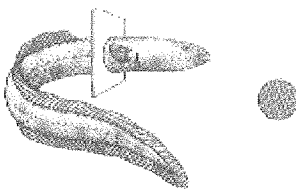
Flatfish

Often found in bottom dwellers



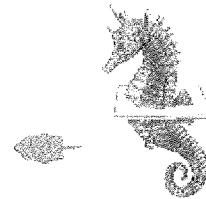
eel-like

common among fish that live in rocks or vegetation



Elongated on vertical plane

feature of a slow-swimmer



Coloration

Coloration

Coloration

Coloration

Body Shape

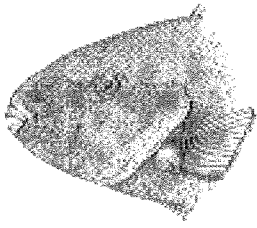
Body Shape

Body Shape

Body Shape

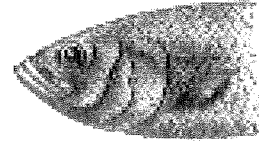
Beak-like mouth

Used to graze on small algae



Large mouth

Typically filter plankton by swimming
With their large mouths open.



Hermaphrodite

Able to fertilize their own eggs, usually breed
With one or more other individuals, ensuring
Fertilization between different individuals.
Found among deep-water fishes, an adaptation
To the depths of ocean where difficult to
Find members of opposite sex

Migrate to specific Breeding grounds

Come together during breeding season.
Many fishes change color to advertise their
Readiness to breed.

Internal fertilization

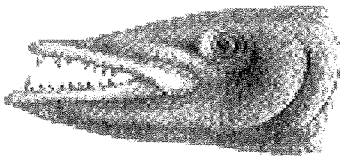
Fish generally have specialized reproductive
organs that allow male to deposit sperm
into the female during ritualized courtship

Broadcast spawners

Produce up to 100 million eggs each time it
Spawns— this insures that at least some hatch
and make it to adulthood. Often found fishes
living around coral reefs and other inshore
environments

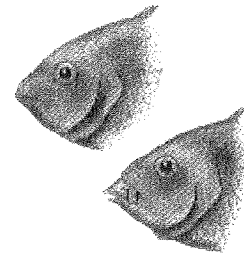
Large mouth/sharp teeth

Used to tear off chunks of prey



Protrusible mouth

Used to feed on relatively small prey



Jaw-shape

Jaw-shape

Reproductive
behavior

Reproductive
behavior

Reproductive
behavior

Reproductive
behavior

Jaw Shape

Jaw Shape