

A look at the native fish of Arizona and their successful adaptations

Fashion-A-Fish

(Part of this lesson has been adapted from Project WILD Aquatic's "Fashion a Fish" © Council for Environmental Education, 2000)

LESSON OVERVIEW

Students will look at some fish body adaptations and try to explain how they would help the fish to survive in its environment. Then, the students will use these adaptations to create a new fish. Finally, the students will look at native Arizona fish and determine what adaptations they have.

SUGGESTED GRADE LEVELS

- K – 5

ENDURING UNDERSTANDINGS

- All organisms have adaptations that allow them to survive in particular environments.

OBJECTIVES

Students will:

- Describe various fish adaptations.
- Describe the importance of adaptations to the survival of fish.

ARIZONA DEPARTMENT OF EDUCATION STANDARDS

Grade	Science	Writing
K	S4-C3-O1	S3-C1-O1
1	S4-C1-O2; S4-C3-O1	S3-C2-O1
2	S4-C1-O1	S3-C2-O1
3	S4-C3-O5; S4-C4-O1	None
4	S4-C4-O1; S4-C4-O2	None

Note: The full text of these standards can be found in Appendix A.

TIME FRAME

- 1 – 2 days (30 – 45 minutes each day)

MATERIALS

- *Fish Adaptation Guides: Body Shape, Coloration, and Mouth Design* (1 per group)
- Arizona Native Fish Poster or Booklet

TEACHER PREPARATION

- Make enough copies of the Fish Adaptation Guides for each group.



A look at the native fish of Arizona and their successful adaptations

- Divide the class into groups of about three to four students.

SUGGESTED PROCEDURES

1. Ask two or three students to come to the front of the class and draw a picture of a fish. It is best if the students do not see each other's drawings.
2. When all of the drawings are finished, ask the class if they are the same fish. If they say that they are, then you will need to indicate differences between the drawings.
3. Ask the students how we know that they are different fish. Make a list of differences. Ask the students why they think there are so many differences between fish.
4. Inform the students that we are now going to look at three of these differences in detail: body coloration, body shape, and mouth design. In small groups, you will have the opportunity to look at a few different types within each of these categories and try to determine how they would be beneficial to a fish.
5. Assign the students to groups and hand out a set of the Fish Adaptation Guides to each group.
6. Instruct the students that they will have about 10 minutes to look at each of the different adaptations and come up with some advantages that each one has. Why would a fish want to look like that?
7. Give the students about 10 minutes to work.
8. When all of the groups have had enough time to finish, discuss their answers. Write down each adaptation on the board and some of the benefits that the students have identified.
9. Inform the students that they are now going to go on a pretend adventure. They have been traveling along a river in Arizona when they see a fish. They look through their field guides and realize that it has not been discovered yet. Since it is a new species, it must be documented. However, their camera is broken. They must draw a picture of the fish. In addition, they need to describe the fish in detail. They should include what type of water it lives in (fresh, salt, lakes, rivers, etc.), what it eats, what eats it, and anything else they can think of. Since they are the discoverers of the fish, they have the right to name it. They must come up with a descriptive scientific name in proper format (*Genus species*) as well as the common name that most people will call it.
10. Give the students plenty of time to complete their drawings and descriptions.
11. When they have finished, have each group share their discoveries with the class.
12. Show the students some pictures of actual native Arizona fish. Have them try to find the adaptations described in class and identify the habitat that these fish live in.

ASSESSMENT

- Class discussion
- Group presentations
- Native fish adaptations



A look at the native fish of Arizona and their successful adaptations

EXTENSIONS

- Have the students identify other adaptations not discussed in class and find fish with those adaptations. These could include reproduction and fins. See if the students can identify their purpose.
- Have the students identify adaptations in non-aquatic animals to see if they can determine their purpose.
- Allow the students to research non-native fish and how the human-altered environment has allowed these fish to out-compete the native fish.



Appendix A: Arizona Department of Education Standards – Full Text

A look at the native fish of Arizona and their successful adaptations

Science Standards

Grade	Strand	Concept	Performance Objective
K	4	3 – Organisms and Environments	1 – Identify some plants and animals that exist in the local environment.
1	4	1 – Characteristics of Organisms	2 – Compare the following observable features of living things: <ul style="list-style-type: none"> • movement – legs, wings • protection – skin, feathers, tree bark • respiration – lungs, gills • support – plant stems, tree trunks
		3 – Organisms and Environments	1 – Identify some plants and animals that exist in the local environment.
2	4	1 – Characteristics of Organisms	1 – Identify animal structures that serve different functions (e.g., sensory, defense, locomotion).
3	4	3 – Organisms and Environments	5 – Describe how environmental factors (e.g., soil composition, range of temperature, quantity and quality of light or water) in the ecosystem may affect a member organism’s ability to grow, reproduce, and thrive.
		4 – Diversity, Adaptation and Behavior	1 – Identify adaptations of plants and animals that allow them to live in specific environments.
4	4	4 – Diversity, Adaptation and Behavior	1 – Recognize that successful characteristics of populations are inherited traits that are favorable in a particular environment. 2 – Give examples of adaptations that allow plants and animals to survive. <ul style="list-style-type: none"> • camouflage – horned lizards, coyotes • mimicry – Monarch and Viceroy butterflies • physical – cactus spines • mutualism – species of acacia that harbor ants, which repel other harmful insects



A look at the native fish of Arizona and their successful adaptations

Writing Standards

Grade	Strand	Concept	Performance Objective
K	3	1 – Expressive	1 – Create narratives by drawing, dictating, and/or emergent writing.
1	3	2 – Expository	1 – Create expository texts (e.g., labels, lists, observations, journals) through drawing and/or writing.
2	3	2 – Expository	1 – Write expository texts (e.g., labels, lists, observations, journals).



Appendix B: Worksheets and Overheads

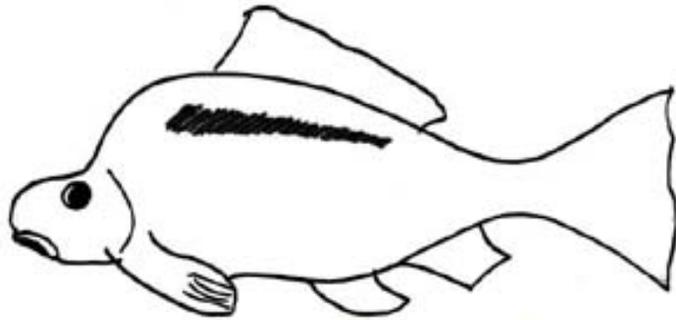
*A look at the native
fish of Arizona and
their successful
adaptations*

The pages that follow contain the worksheets listed below:

- A. *Fish Adaptations Guide: Body Shape* – Examples of some of the different body designs that fish may have (1 page)
- B. *Fish Adaptations Guide: Coloration* – Examples of some of the different body colorations that fish may have (1 page)
- C. *Fish Adaptations Guide: Mouth Design* – Examples of some of the different mouth designs that fish may have (1 page)



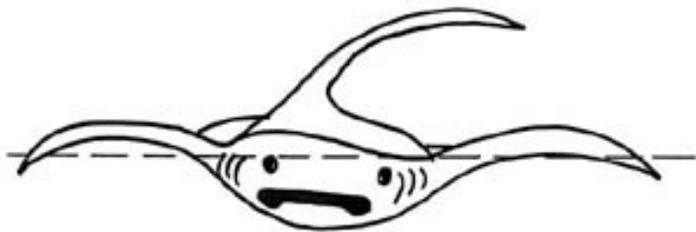
BODY SHAPE



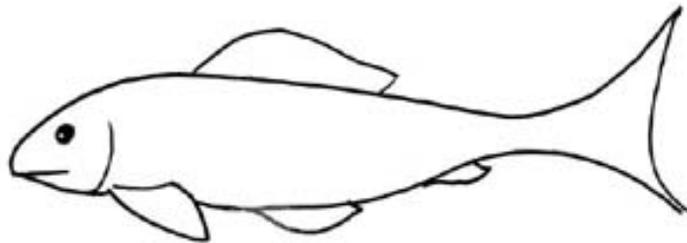
Hump-backed



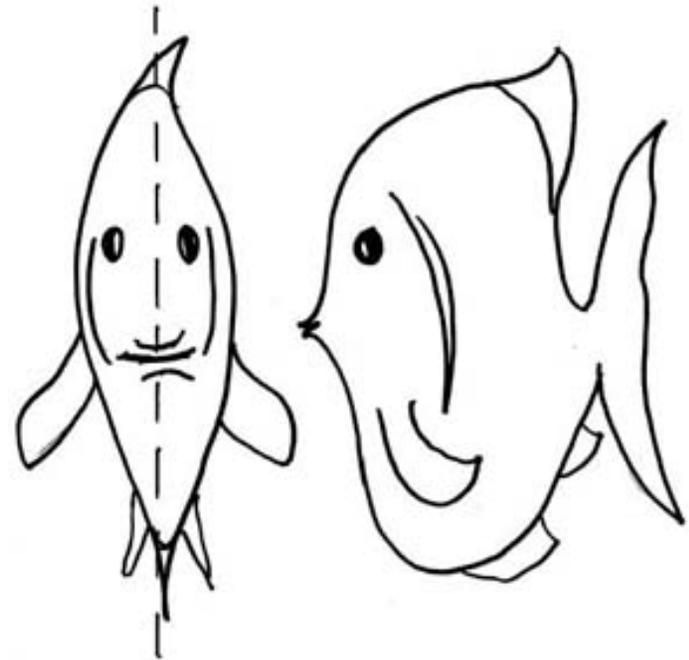
Flat Bellied



Horizontal

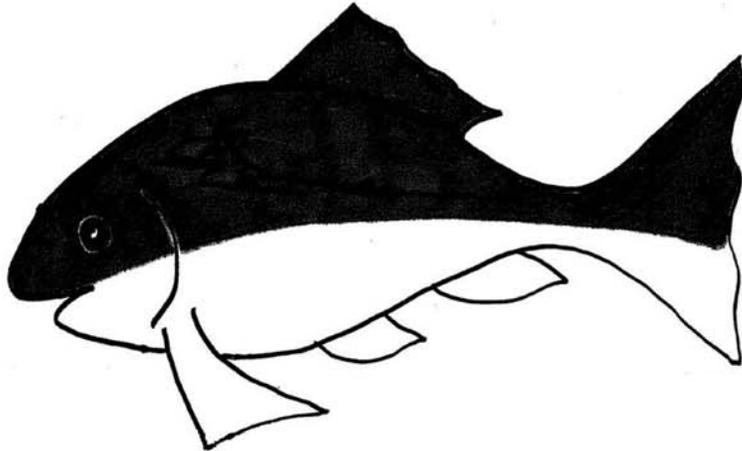


Torpedo

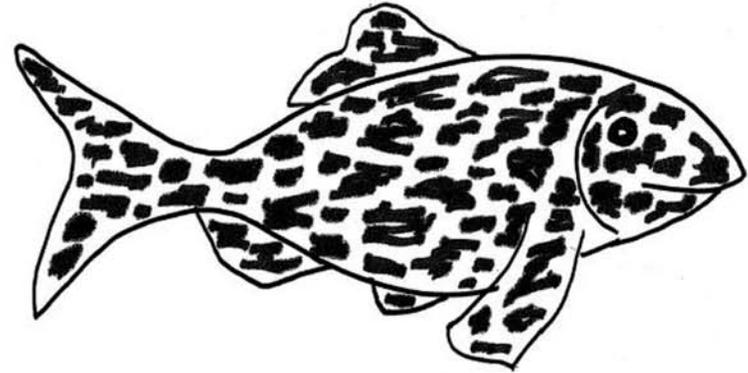


Vertical

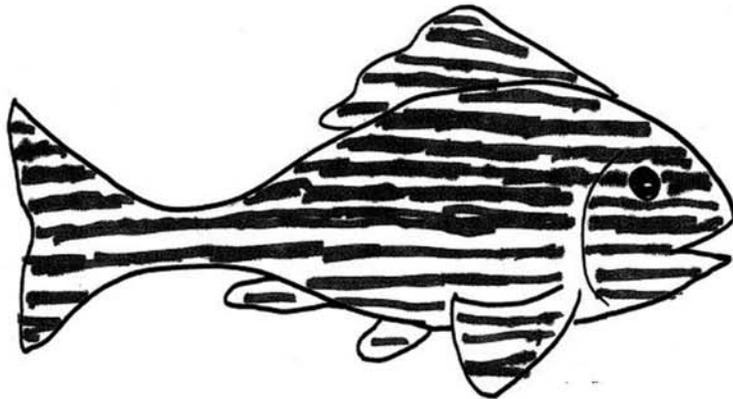
COLORATION



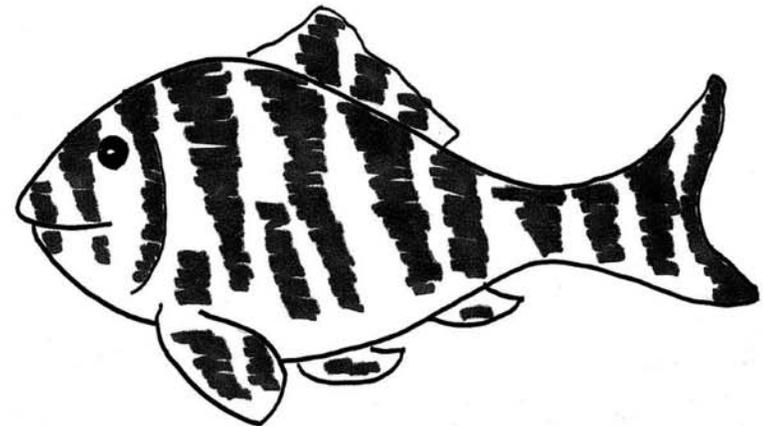
Top Dark, Bottom Light



Mottled



Horizontal Stripes

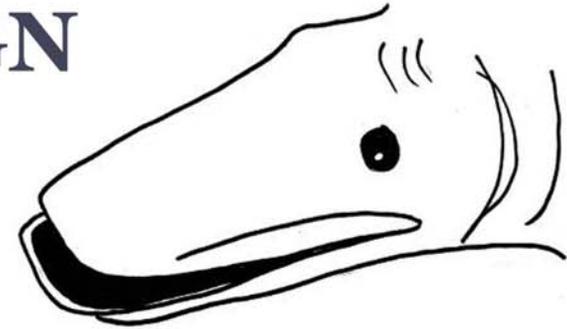
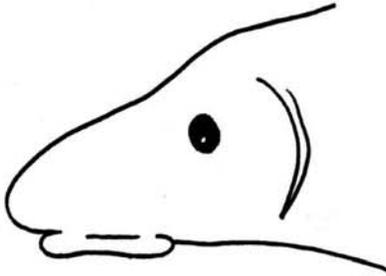


Vertical Stripes

MOUTH DESIGN



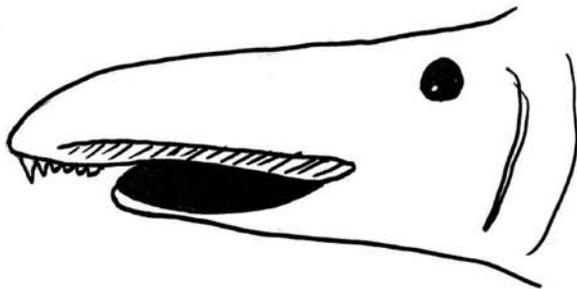
Sucker Shaped Jaw



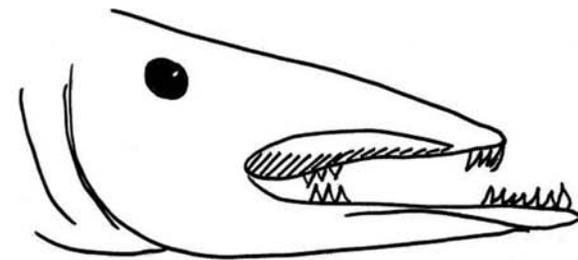
Duckbill Jaw



Extremely Large Jaw



Elongated Upper Jaw



Elongated Lower Jaw