

API® Lesson 4 | Understanding Fish Mouth Types

This lesson plan provides a basic understanding of different types of mouths in fish. The position of the mouth can be an indication of feeding habits. Based on the type of mouth one can then determine the preferred location used to secure food. The shape of the mouth such as elongated, spear-like, or tubular can also shed light on feeding habits.

For Instructor/Teacher/Parent

Make sure to read through the entire lesson plan before beginning this with students/family members as materials needed for this lesson are an aquarium to observe, and paper and pencil for drawing.

Learning Objectives

After completing the activities outlined in this lesson plan, students should be able to:

- Provide definition and description of varying fish mouth types
- Preferred location of fish for feeding based on mouth type
- Examples of teeth in fish
- Basic understanding of sensory organs and purpose in and around the mouth

Length

This activity will take about 2 hours for completion of this exercise.

Materials

- Freshwater aquarium with a few varieties of fish (top, middle and bottom feeder fish)
- Paper/Sketch Pad
- Pencil to sketch fish mouth images
- Three different food types
 - Floating food, such as API TROPICAL FLAKES
 - Sinking food, such as API BOTTOM FEEDER SINKING PELLETS
 - Bottom wafer-like food, such as API ALGAE EATER WAFERS

Key Terms

Review key terms (printable sheet included at the end of the lesson) with students/family members.

- 1) Terminal Mouth
- 2) Superior Mouth
- 3) Inferior Sub-Terminal Mouth
- 4) Barbels
- 5) Suction Mouth
- 6) Protrusible Mouth

Warm Up

Ask a couple of questions to warm up for the lesson:

- 1) Do you currently have any fish? Can you identify different mouth shapes?
- 2) What location in the aquarium do you typically see your fish intake their food?
- 3) What type of food do your fish eat?

Before You Start

1. Look at the different types of fish in the aquarium just before feeding time and predict where they will feed by looking at their mouth positions.
 - a) Make a chart with a line for each type of fish showing list the type of fish, mouth position (Upwards, straight on, downward), prediction on where it will eat.
 - b) Leave a space to mark where in the aquarium the fish most often ate their food.

Instructions for Learning Activity

- 1. Obtain three different types of food**
 - a. While observing the aquarium, sitting as still as possible, have someone feed the aquarium three types of food, a floating food, a sinking pellet, and a sinking algae eater wafer.
 - b. For the next 3 to 5 minutes observe the fish and record for each type of fish observe where they strike at what food in the aquarium.
- 2. Design and make a chart for what you observe**
 - a. With the completed chart in hand read the following and see how it compares with what you have observed. We will discuss this at the completion of the reading:

The shape of the mouth on a fish can help to judge the feeding habits and type of food that may be best for the fish. The mouth often contains a tongue and teeth, but not all fish have teeth as you think. Humans have salivary glands to help us eat but fish do not. In some fish such as goldfish and Koi their teeth are at the entrance to their esophagus. Goldfish and Koi have very blunt molar like teeth called pharyngeal teeth. They can crush their food using very strong muscles. In some fish such as puffers the teeth are more like a beak of a bird used for holding and crushing their food. In fact, their teeth continue to grow, and it is essential in the diet to have things for them to crush to help wear down their teeth. If we do not provide certain fish like puffers with something to wear down their teeth. Puffers often have problems with overgrown teeth in captivity from the lack of items to crush. Other fish can have very sharp teeth and even others can have rasping teeth to scrape algae off rocks or driftwood.

The mouth types of fish come in a variety of shapes, sizes and positionings. Knowing the type or location of the mouth can guide us about how and what the fish may eat and even the location in the water (bottom, top or mid-water) they prefer.

Terminal Mouth

Most fish have their mouth located in the front of the head pointing forward. This is called a Terminal Mouth. Fish with a terminal mouth generally eat in the water column or mid-water feeder and both their jaws are generally the same length. They can eat anywhere including the surface or bottom but prefer to eat their food floating in the water. Most fish with a terminal mouth and most fish in general are omnivores and will eat a wide variety of diets and food types. Most barbs, cichlids, gouramis, and tetras have terminal mouths.

Superior Mouth

Fish with a Superior Mouth most often have a shorter upper jaw and longer lower jaw. The mouth is designed to eat at the surface and points upwards. The type of fish with a superior mouth will often lie in wait for their prey which is often insects on top of the water. The betta fish is a fish with a superior mouth and will catch mosquitos, mosquito larva and other insects that are mainly at the surface. Some fish are even more specialized such as the Hatchet Fish which has a superior mouth but can also use it to spit at insects in the air. When their prey falls to the water surface, they can easily capture them. Other fish types with a superior mouth include many killifish, hatchet fish, and half-beaks just to name a few.

Inferior Sub-Terminal Mouth

The inferior sub-terminal mouth is most often found on bottom dwelling fish such as catfish. The lower jaw is shorter than the upper jaw and the opening is pointing downward. Some fish with an inferior sub-terminal mouth may have their entire mouth on the underside of the nose. Many fish with an inferior mouth may also have sensory appendages on or around their mouth called barbels. Barbels sometimes referred to as whiskers are used to locate food though both taste and smell often in the mud or gravel that are not easily seen. Koi (Common Carp) are an example of fish with distinct barbels at the ends of the mouth that they use to locate food on the bottom. Their upper jaw protrudes beyond their lower jaw. Another fish with an inferior mouth are Plecostomus. Their mouth is designed to eat from the bottom but also may contain rasping teeth to scrape their food. Some Plecostomus diets include algae, invertebrates and other detritus found on the bottom or growing on rocks or wood. Remember to investigate the type of fish you are thinking of keeping.

While a very limited number of Plecostomus have very sharp vampire like teeth but still have an inferior mouth are actually predators and do not eat algae as a main staple in their diet.

These are the 3 main divisions of mouth types, but each of those can be broken down even further into **beak-like, suction, and long snouts.**

Fish with beak-like shapes as mentioned earlier include puffers, another example would be a saltwater parrot fish. The parrot fish uses its beak-like mouth to break off small pieces of coral to get to the soft tissue of the coral, which it eats. Another type of fish with a beak-like mouth is the saltwater trigger fish. Trigger fish have very strong jaws and beak to crush their prey or break off small parts. Trigger fish come in many varieties, but all have a similar mouth structure. Most fish with beak like mouth are not aquarium companions with crustaceans like shrimp, crayfish or mollusks such as clams or mussels.

Fish with suction type of mouths are typically associated with an inferior sub-terminal mouth. A suction mouth is also referred to as a protrusible mouth. The Plecostomus is an example of a fish with a suction type mouth. A suction mouth can be used to help the fish hold onto surfaces in areas of fast currents or it can be used to pull in the food source. Fish that use their mouth to hold onto other fish include lampreys and remoras, neither of which are ideal choices for home aquariums. Another fish, and yes, they are a fish, with a suction mouth includes seahorses. The seahorse brings its mouth, a long snout like shape close to its food source and uses a suction action to pull its food into its mouth. Another type of fish with similar action is the pipefish.

Long snouts have a unique advantage over what we consider typical mouths in the fact they can reach in deep crevices other fish cannot. Long snouts on some fish are lined with very sharp teeth to capture and hold their prey. Many fish such as the Longnose Butterfly, Yellow Tang, Needlefish, longnose Gar and again the seahorse. Long snouts on some fish are lined with very sharp teeth to capture and hold their prey.

Questions

Pass out the Questions worksheet (printable sheet included at the end of the lesson) to each student/family member. Review the answers to the questions during the discussion section of the lesson.

1. Did your observation match up with what you read? If not, why do you think it was different?
2. Did any fish type eat at all levels?
3. Why do you think fish in nature would vary from fish in captivity, in your aquarium?
4. Could you feed one type of food to your aquarium? Is it advised?

Discussion

Once you've finished determining how your particular fish reacted to the feeding stimuli of food types you may have observed your fish with terminal mouths were more like to eat in the middle of the aquarium, fish with a superior mouth ate more often at the surface and fish with an inferior sub-terminal mouth at the bottom. But this is not always the case.

In the wild fish will react different than in captivity. Their preferred food source such as live insects may not be available, so they switch to an alternative food source to survive. Man-made foods such as pellets and flakes do not exist in the wild. When fish are placed in captivity directly from the wild, they need to learn new ways to survive and eat. In the wild they are always looking for predators, in your aquarium predators are not a concern. In the wild they may have a variety of food sources depending the time of year, in captivity a complete and balanced diet is provided to them. Fish will adapt to different foods and stimuli given the correct conditions and time.

Some fish are designed to eat only certain ways such as seahorse sucking in their prey and Plecostomus scraping at algae or wood. When these conditions or food types or sizes are not met that fish may not be able to intake their food properly. The same is for the size of pellet or flake provided as well. Imagine feed a small guppy a sinking pellet that is large than its mouth. Even though the food is complete with all the necessary nutrients if it cannot ingest it then it cannot feed properly.

Fish will adapt, when they can. An example of wild fish that will adapt is certain fish in the wild may be active feeding at night, this is called nocturnal feeding. In the wild these fish are very difficult to find during the day as they are hiding. Their protection is the darkness of night and often use their barbels to sense food as well as predators. In the aquarium overtime they will sense that they are safe and will become accustomed to feeding when the lights are on. This will take time, as they first enter into the aquarium, they may hide all day and only become active when the light goes off. To adjust the fish over to a daytime regiment, slowly provide feed just before you turn off the lights at first. Then overtime move the feeding time period with the lights on to a longer and longer time period before turning off the lights. The nocturnal fish will learn to associate that feeding with the lights on is safe.

Another factor in where a fish eats is their age. Many fish as fry, baby fish, will only eat very small materials and stay hidden so they themselves do not become prey. As they grow their food types will change and they will move to the area that best fits their needs based on mouth type and available food source. An example of this is many African Cichlids late in life as adults will swim out in the open and eat in the mid water of the aquarium but as fry, they will only eat off the bottom. Their mouth type did not change but based on the size of the mouth and their physical size the feeding options did change.

You can now see based on the type of fish, age of your fish it is a good idea to have a selection of top, middle and bottom foods for our aquarium.

Quiz

- Once you've finished the discussion, pass out the Quiz worksheet (printable sheet included at the end of the lesson) to each student/family member.
- Have them complete the quiz and then review the answers/have an open discussion about the answers with them. Answers are below.
 1. What is the name of the mouth commonly found on catfish?
 - Inferior Sub-terminal mouth
 2. Define Fish barbels and their purpose.
 - Fish barbels are sensory organs that are used by fish to locate food. Their appearance is similar to whiskers and often found surrounding the mouth or nostril area on fish.
 3. Where would a fish with a terminal mouth most often be feeding?
 - Fish with a terminal will feed most often in the water column or mid-water. Fish with a terminal mouth can eat anywhere including the surface or the bottom. So, fish with a terminal are the most versatile for food types you are feeding.
 4. Do fish in captivity always eat based on their mouth type? Why or why not?
 - In captivity fish may divert from their way of eating in natural habitats. However, based on mouth type they are most likely to eat based on the mouth type. As examples; A Betta fish would prefer to eat of the surface and a floating food is the best recommendation. Most Plecostomus with an inferior mouth in aquariums will most likely to eat off the bottom or scrape rocks or the glass of the aquarium. Feeding Plecostomus an algae eater food that sinks and they can scrape at is the best recommended food type.

KEY TERMS

TERMINAL MOUTH

The mouth is located in the front of the head of the fish pointing forward where the lower jaw and upper jaw are the same length.

SUPERIOR MOUTH

The mouth is located on top of forward tip of the fish with the upper jaw being shorter than the lower jaw.

INFERIOR SUB-TERMINAL MOUTH

The mouth is located below the forward tip of the fish with lower jaw being shorter than the upper jaw.

BARBELS

Sensory organs with a whisker-like in appearance. Typically found on the sides or surrounding the mouth which may be used to locate their food source.

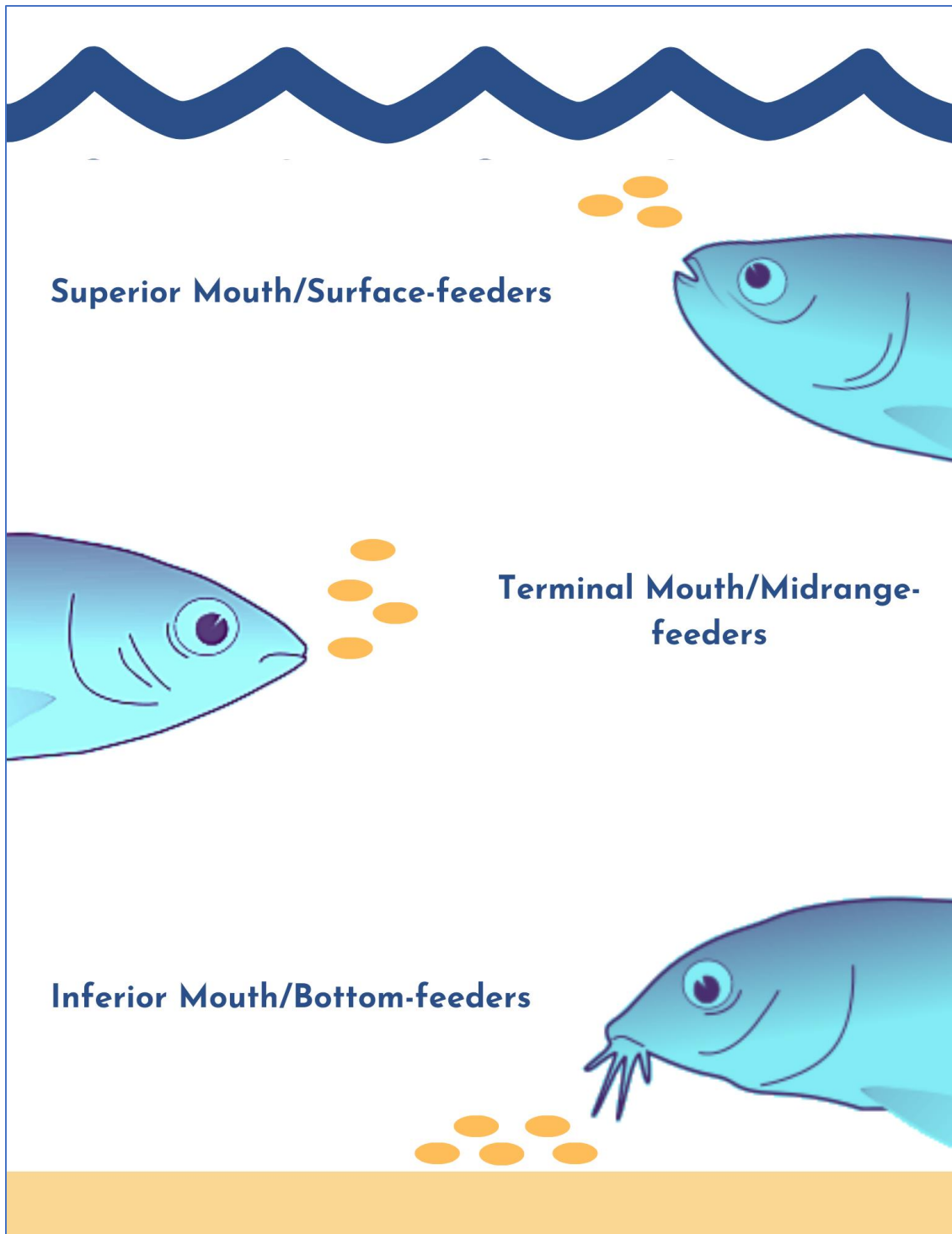
SUCTION MOUTH

Allows fish to extend their reach by creating a vacuum or suction to bring in their prey or food. Most commonly associated with fish that have an Inferior Sub-Terminal mouth.

PROTRUSIBLE MOUTH

Also called a suction mouth.

TYPES OF FISH MOUTHS



QUESTIONS

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QUIZ

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CONTACT US & ADDITIONAL RESOURCES

For more information regarding this lesson plan, API® brand, or any general fishkeeping questions and/or comments, feel free to contact us below.

- Website: <https://apifishcare.com/>
- Telephone Number: 1-800-847-0659