

A. IDENTIFY THE EXTERNAL BODY PARTS OF FISH

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A knowledge of fish's highly developed senses of seeing, smelling, hearing, tasting and "feeling" will help young anglers to become more skilled. Armed with this information your child's fishing experiences will sharpen and provide for more enjoyable and successful future outings.

OBJECTIVES: Kids will be able to:

- Name each of the exterior body parts of a fish.
- Give a basic explanation of how each body part works and helps fish to survive.
- Use this knowledge to become better anglers and have more success fishing.

GRADE LEVEL: Elementary to Mid-School.

METHOD: Using the "External Trout Anatomy Guides" kids can study the parts of a fish. Then, using the Activity # 1 Outline, the kids will name each external body part of a fish and write a brief description of what each body part does. They can use Activity # 2 to color the fish.

MATERIALS: A copy of the External Anatomy of a trout Guide # 1, a copy of Activity # 1, Name the Parts of a Fish, a copy of Activity # 2, Color a Trout, a pencil, crayons or color pencils.

OVERVIEW: Kids will use the two External Anatomy of Trout Guides to review and study. They will then use the blank outline of a fish to name the exterior body parts and give a basic description of how each part works. Using this information kids can learn how to develop better fishing skills and a knowledge of fish that will last a lifetime.

VOCABULARY:

Exterior – The outside of something like a house, car or a fish.

Angler – Another name for people who fish.

Dorsal – The upper side of a plant, animal or fish.

Lateral – From side to side, as in left to right.

Caudal – At or near the back of the body.

Pelvic – A body area located at the lower end of the body.

Pectoral – An area of the body at or near the chest.

Identify each of the following outer body parts of a fish and learn how each body part works.

• **FINS**

1. Dorsal Fin
2. Adipose Fin
2. Caudal Fin
5. Anal Fin
3. Pelvic Fins
6. Pectoral Fins

- **EXTERIOR BODY PARTS**

1. Operculum / Gill cover
2. Mouth
3. Lateral Lines
4. Nares / Nostrils
5. Vent
6. Eyes

EXTERNAL FISH ANATOMY:

EXTERNAL TROUT ANATOMY GUIDE:

The illustration below of a rainbow trout shows a fish's external anatomy. Fish are cold blooded vertebrates, which means they cannot control their body temperature and have backbones. Most fish species have scales to protect the body and gills to help it breath in water.

Fish have six senses which helps them perceive their surroundings and survive in their environments. In addition to taste, smell, sight, hearing and feeling, fish have a unique sensory structure, known as lateral lines, which enables them to "feel" vibrations in the water. The lateral line is referred to as the sixth sense of fish, and is an extension of their sense of hearing.

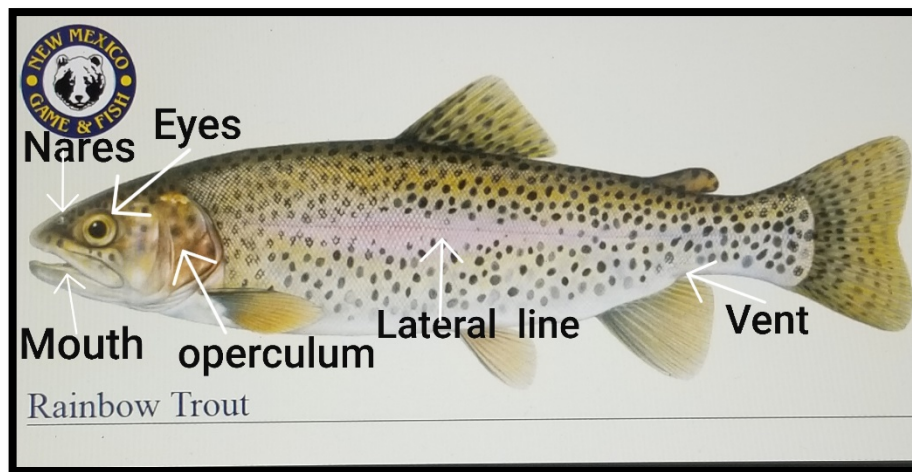


Figure # 1 – External trout anatomy guide, body parts.

EXTERNAL BODY PARTS AND THEIR FUNCTIONS:

MOUTH (TASTE)

Fish have a highly developed sense of taste and use it along with other senses to find food. Some fish, such as catfish, rely primarily on their sense of taste to find food. In fact, catfish actually have taste buds all over their bodies to help them find food in dark, murky water.

Like people, fish have tongues containing thousands of taste buds. Some fish, such as walleye, also have taste buds on their lips and faces and can taste food without ever opening its mouth.

NARES (NOSTRILS) – Fish use their noses for smelling rather than breathing. A fish's nostrils can smell food or danger from great distances. The fish will swim to the source of the smell and use its sight and taste buds to find out if it's edible.

Water passes into the nostrils, flows past the fish's sensory cells, and exits through the rear opening. Fish sniff the water coming through their nostrils to detect smells. Like taste a fish can smell 500 times better than a human!

EYES (SIGHT) – Fish can see well, but even in clear water most freshwater fish usually can see no further than fifteen feet. Like people, fish can see brightness and color. Some fish, such as shallow-water fish can detect most colors seen by humans but many other fish cannot see a full range of colors as colors fade the deeper in water they swim.

Fish lack eyelids and have fixed pupils—the eyes remain the same size regardless of the amount of light. To protect their eyes from bright sunlight, fish usually spend sunny days in deep water or in the shade of boulders, undercut banks, stumps or trees.

A fish can see in every direction except directly behind and below it. This is because its eyes are on the sides of its head, and each eye moves independently which makes it hard to sneak up on a fish.

OPERCULUM (GILL COVER) – The operculum is a series of bones found in bony fish that serves as a facial support structure and a protective covering for the very sensitive and delicate gills.

LATERAL LINES – Fish have an additional sense related to “feeling” and hearing called lateral lines. This highly developed structure is a network of ultra-sensitive nerve endings that run along both sides of the fish from the gills to the tail.

A fish's lateral line consists of tiny nerve endings beneath the skin. The sensitive hairs inside each nerve ending detect the location and direction of vibrations in the water, allowing the fish to sense the movement of other fish and aquatic organisms around them, even in dark murky water at great distances.

The combination of lateral lines, internal ears and the ability of sound to travel clearly, and faster in water helps a fish find a meal by sensing when smaller fish are swimming nearby. The lateral line also helps a fish avoid becoming a meal by sensing the presence of lurking predators.

VENT – The site of waste elimination from the fish’s body. It is also the entry to the genital tract where eggs or sperm are released.

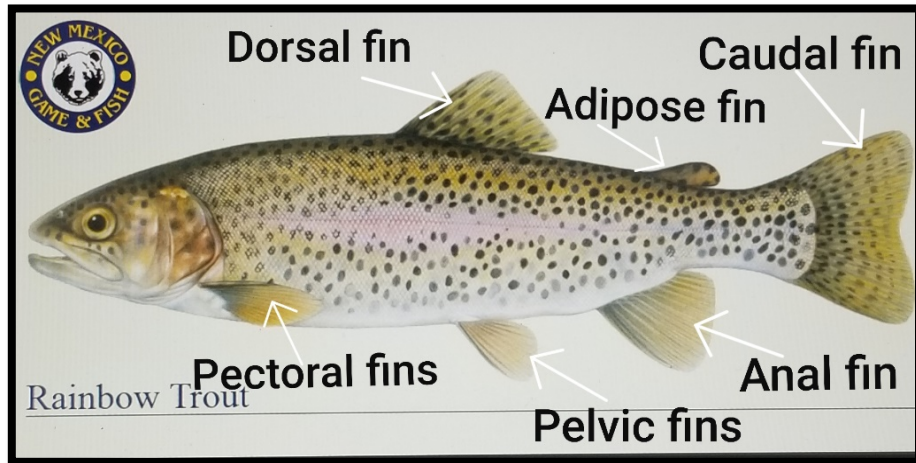


Figure # 2 – External trout anatomy guide – fins.

FINS –

- **DORSAL FIN** – The dorsal fin is located on the back, or top of a fish and is used to stabilize fish in the water and help direct the fish through turns and stops. Some fish like striped bass have two dorsal fins.
- **ADIPOSE FIN** – The adipose fin is a soft, fleshy fin, found on the back behind the dorsal fin and just forward of the caudal (tail) fin. This fin is found in only a few species of fish such as trout, salmon and catfish. Its actual purpose remains unclear.
- **CAUDAL FIN (TAIL)** – The caudal fin, or tail fin, is located at the back end of a fish and provides the power that propels the fish forward. This powerful fin also acts as a rudder to assist in direction change. Caudal fins come in varying shapes and can be rounded, forked, square or heart shaped.
- **ANAL FIN** – The anal fin is located on the back underside of a fish between the tail and pelvic fin. The anal fin helps provide stability for the fish while swimming.
- **PELVIC FINS** – Pelvic fins come in pairs and are located on the bottom of the fish between the anal and pectoral fins. These fins help balance the fish, keep it level and prevent it from rolling from side to side.

- **PECTORAL FINS** – Pectoral fins come in pairs and are located on either bottom side of the fish near the gills. Pectoral fins do everything that pelvic fins do as well as to help steer and control depth.

ACTIVITY # 1 – NAME THE PARTS OF A FISH

Use the illustration below to name the outer body parts of a trout.

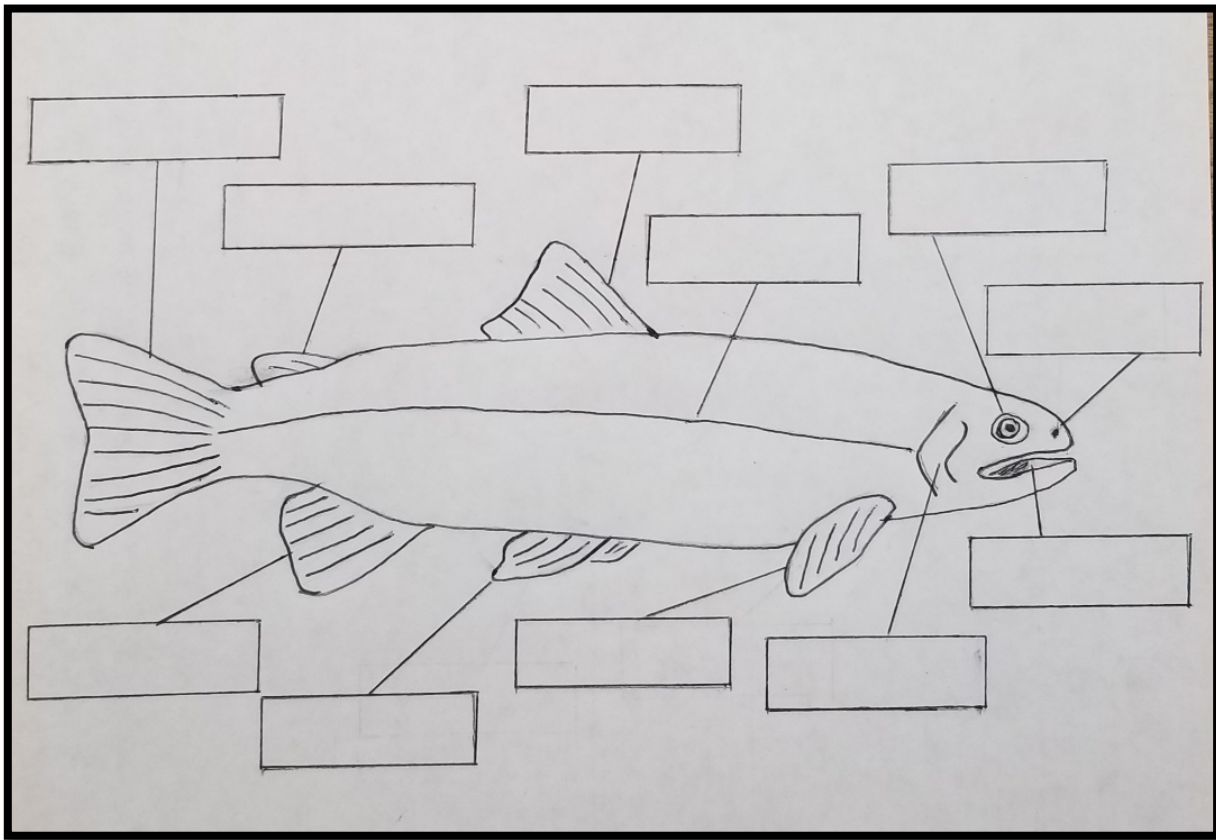


Illustration by Dennis Segura

Write a brief description of what each exterior body part does.

Eyes - _____

Mouth - _____

Nares (Nostrils) _____

Lateral Lines - _____

Fins - _____

Operculum - _____

ACTIVITY # 2 – COLOR A TROUT

Use crayons or color pencils to add spots and color the fish to look like any one of the following Trout: Rainbow, Brown, Cutthroat, Gila or Brook. Use the NMDGF website at www.wildlife.state.nm.us . Click the **Fishing Tab**, scroll to **Game Fish and Regulations**, and click **cold water species** to find illustrations for each specie.

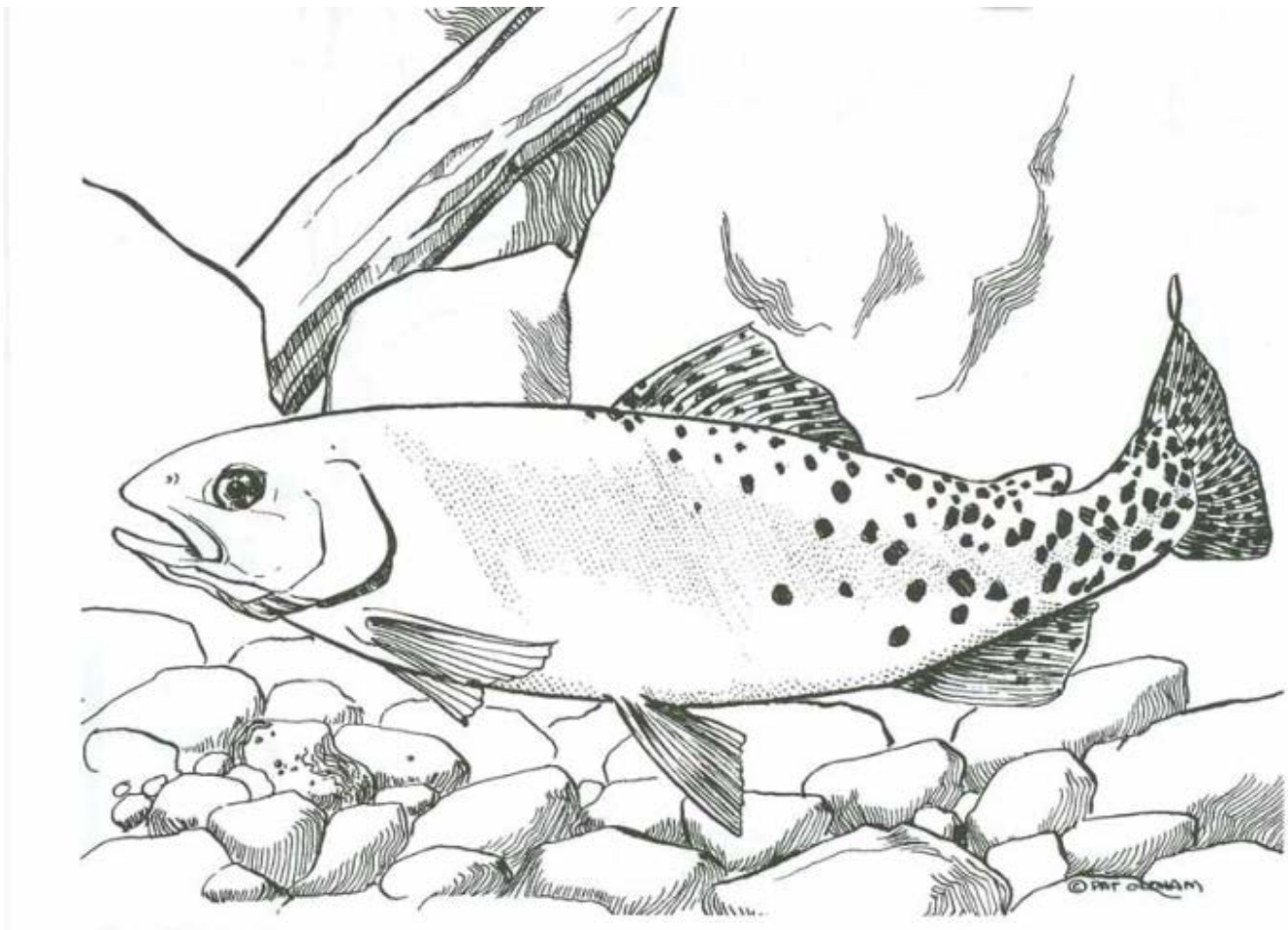


Illustration courtesy of NMDGF

EXTENSION ACTIVITY:

For older kids (Middle School)

- Have them look up more specific information about each fish's body part and describe in more detail how they work.
- Then have them explain how a knowledge of these fish senses can make them a better angler.

For younger children, have them answer the following questions related to each of a fish's senses. Being able to answer these questions will help them become more successful as anglers.

Questions:

1. If a fish can see bright colors near the surface of the water, what colors of clothes should you wear to fish so fish cannot see you as easily?
2. If fish see you and spook easily what should you do at the next fishing spot?
3. How does a fish's sense of smell help a fish find food and what type of bait should you use?
4. How can knowing about a fish's sense of taste help you catch fish?
5. How can a fish detect movement in the water and what kind of bait can you use to make sound and vibrations in the water?
6. What sensitive body part does a fish's operculum protect?
7. Why are fins on a fish important? What do they do for a fish?

Answers:

1. It is always a good idea to wear dull colors of clothing when fishing, especially river fishing.
2. You should be quiet, hide behind bushes and try to sneak up on fish.
3. Fish have an excellent sense of smell so use baits that have a strong smell and bright colors to attract fish.
4. When a fish takes your bait into its mouth the taste of the bait can affect how long it is willing to hold onto the bait. Fish will spit bait out if they do not like it so setting the hook quickly is very important to angling success. Setting the hook also prevents a fish from swallowing the hook.
5. Fish detect movement through sound and their lateral lines. Using a lure will attract a fish by its vibrations, sound and movement.

6. The operculum covers and protects the highly sensitive gills. Never touch a fish's gills if you intend to put it back in the water; they will not likely survive.
7. Fins help a fish swim to find food, keep their balance, change direction and swim away from predators.