Fish Anatomy

**Scales**
They are covered in a mucus layer which helps protect them from bacteria and parasites in the water.

**Dorsal Fin**
Located on the back, they're used to maintain equilibrium. One of the fins is spiny, and also serves as a form of protection and the other is soft.

**Lateral Line**
A sensory organ used in the detection of movement, vibrations and changes of pressure in the water.

**Nostrils**
Sensory organs, only used for smelling.

**Operculum**
Bony plates that cover the gills, an organ used to extract oxygen from the water.

**Pelvic Fins**
Located on the belly, they're used for equilibrium and direction.

**Pectoral Fins**
Located on the side, they're used for propulsion.

**Anal Fin**
Located close to the anus, they're used for equilibrium and direction.
**Morphological Diversity**

**Mouth**
- **Superior** mouth indicates a fish that eats at the surface of the water.
- **Terminal** mouth indicates a fish that eats in front of themselves.
- **Inferior** mouth indicates a fish that eats downward.

**Body**
- **Elongated** ideal for short sprints and ambushing prey.
- **Fusiform** ideal for fast swimming over long periods of time.
- **Ovate/Compressed** ideal for rapid manoeuvring and hard for predators to eat.

**Caudal Fin**
- **Forked** ideal for really fast swimming.
- **Truncated** ideal for turning and accelerating.
- **Rounded** ideal for turning and sprinting.
- **Pointed** ideal for sneaking through crevices.
Fish of the Future

Now you know enough about the morphology of fish that you can create your own species perfectly adapted to one of these environments!

The Colorado River

Before being dammed, the Colorado River was known for having big changes in the water flow that would carry large amounts of silt (fine dirt). Several species of fish had adapted to the muddy waters, but now dams have changed the river and the habitat for these fish. The river now doesn’t carry much silt, the water is warmer, and without the occasional high water levels some spawning and migration areas aren’t available. How will fish adapt to these changes?

Upper Lake Mary

Created by a small dam near Flagstaff, Upper Lake Mary is about five miles long and 2000 feet wide when full. But the lake shrinks during dry times and with increased drought, the water levels have been going down. Currently nine species of fish live in Upper Lake Mary, including black crappie, bluegill, green sunfish, catfish, pike, walleye, bass and perch. How will the fish adapt if the droughts continue and the lake continues to become shorter and shallower?

Oak Creek

Gila trout are a native fish species that like continuously running, fast-moving mountain streams with cool water (below 77°F), clean gravel to spawn, and shaded pools to hide in. They also need the water to be free from contaminants, have sufficient overhanging roots and vegetation to provide them shelter, and lots of insects to eat. Other introduced trout species have been competing with the Gila trout in Oak Creek for food. Heavy use of the area by people also stirs up dirt in the stream, pollutes the water, and damages the vegetation that shades the river. How will gila trout adapt?
Create Your Fish

Using the environment that you chose, you need to decide what your fish eats (the position of its mouth), where and how it lives (the shape of its body), how it moves (the shape of its caudal fin) and how it defends itself (its mode of protection).

Draw your fish in its habitat

Where and what food does your fish eat?
How does your fish move?
How does your fish defend itself?