

Tunas, mackerels, and billfishes (marlins, sailfishes, and swordfish) swim continuously. Feeding, courtship, reproduction, and even "rest" are carried out while in constant motion. As a result, practically every aspect of the body form and function of these swimming "machines" is adapted to enhance their ability to swim.

**Directions:** Mark your answer by filling in the oval next to your choice.

1. The word "enhance" in the passage is closest in meaning to
- use
  - improve
  - counteract
  - balance

Tunas, mackerels, and billfishes have made streamlining into an art form. Their bodies are sleek and compact. The body shapes of tunas, in fact, are nearly ideal from an engineering point of view. Most species lack scales over most of the body, making it smooth and slippery. The eyes lie flush with the body and do not protrude at all. They are also covered with a slick, transparent lid that reduces drag. The fins are stiff, smooth, and narrow, qualities that also help cut drag. When not in use, the fins are tucked into special grooves or depressions so that they lie flush with the body and do not break up its smooth contours. Airplanes retract their landing gear while in flight for the same reason.

2. The word "they" in the passage refers to
- qualities
  - fins
  - grooves
  - depressions
3. Why does the author mention that "Airplanes retract their landing gear while in flight"?
- To show that air resistance and water resistance work differently from each other
  - To argue that some fishes are better designed than airplanes are
  - To provide evidence that airplane engineers have studied the design of fish bodies
  - To demonstrate a similarity in design between certain fishes and airplanes

Tunas, mackerels, and billfishes have even more sophisticated adaptations than these to improve their hydrodynamics. The long bill of marlins, sailfishes, and swordfish probably helps them slip through the water. Many supersonic aircraft have a similar needle at the nose.

4. The word "sophisticated" in the passage is closest in meaning to
- complex
  - amazing
  - creative
  - practical
5. According to paragraph 4, the long bills of marlins, sailfish, and swordfish probably help these fishes by
- increasing their ability to defend themselves
  - allowing them to change direction easily
  - increasing their ability to detect odors
  - reducing water resistance as they swim

Because they are always swimming, tunas simply have to open their mouths and water is forced in and over their gills. Accordingly, they have lost most of the muscles that other fishes use to suck in water and push it past the gills. In fact, tunas must swim to breathe. They must also keep swimming to keep from sinking, since most have largely or completely lost the swim bladder, the gas-filled sac that helps most other fish remain buoyant.

6. According to the passage, which of the following is one of the reasons that tunas are in constant motion?
- They lack a swim bladder.
  - They need to suck in more water than other fishes do.
  - They have large muscles for breathing.
  - They cannot open their mouths unless they are in motion.