Beneath the Surface

Compare two classes of fishes in a coastal bay.

ZOO.7.2 "Compare and contrast the characteristics of class Chondrichthyes and Osteichthyes."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline two features shared by both classes, then number three pairs of contrasting traits, putting the same number beside both sides of each contrast.

Fish in a Coastal Bay

1 At the mouth of a coastal bay, a small shark swims past a sea bass while a skate glides over sand. The shark and skate belong to Chondrichthyes, the cartilaginous fishes. The sea bass belongs to Osteichthyes, the bony fishes. These groups are not opposites in every way. Both have backbones, jaws, paired fins, and gills that take oxygen from water. Yet a fish's shape alone can mislead an observer: a skate's broad body looks unlike a shark's narrow one. To compare the groups, look at body structures and how the animals live.

2 A shark's skeleton is mostly cartilage, a strong, flexible tissue that also forms parts of a human nose. A skate has the same kind of skeleton, despite its different shape. In both animals, water leaves through several exposed gill openings rather than a single bony cover on each side. A sea bass has a skeleton made mainly of bone. Its gills sit beneath a bony flap called an operculum on each side of its head. Thus, a skate and shark share a skeletal material and gill arrangement, while a sea bass differs in both features.

3 Staying at a useful depth presents another contrast. Sharks and skates lack a swim bladder; oil-rich livers and body movement help them manage buoyancy. Many bony fishes, including sea bass, use a gas-filled swim bladder to adjust buoyancy with less swimming. Reproduction also varies within each group. Sharks and skates fertilize eggs inside the female's body, but some sharks give birth to live young while skates lay egg cases. Many bony fishes, including sea bass, release eggs and sperm into the water, where fertilization occurs. These are common patterns, not rules for every species in either class.

2 ANSWER WITH EVIDENCE

Use the passage

1. A skate looks unlike a shark. Which two body structures place them in the same class, and how do those structures differ in a sea bass?

2. Name two features the shark, skate, and sea bass share despite belonging to two different classes.

3. Compare how a shark or skate and a sea bass manage buoyancy. Include the structure the sea bass has that the others lack.

4. How does fertilization in sharks and skates compare with fertilization in many bony fishes such as sea bass? What difference between sharks and skates shows that members of one class can reproduce in different ways?

3 YOUR TURN

Your own words

Invent a fish that could live in the coastal bay, then write a four-sentence field guide entry. Name its class, describe two matching body traits, contrast one other trait with the other class, and name one feature both classes share.

ANSWER KEY

Beneath the Surface

PART 1 · READ AND MARK

Underline two features shared by both classes, then number three pairs of contrasting traits, putting the same number beside both sides of each contrast. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	A skate looks unlike a shark. Which two body structures place them in the same class, and how do those structures differ in a sea bass?	**Sharks and skates have skeletons made mostly of cartilage and several exposed gill openings. Sea bass have skeletons made mainly of bone and gills beneath bony covers.**
2	Name two features the shark, skate, and sea bass share despite belonging to two different classes.	**Any two of these: backbones, jaws, paired fins, or gills.**
3	Compare how a shark or skate and a sea bass manage buoyancy. Include the structure the sea bass has that the others lack.	**Sharks and skates lack swim bladders; oil-rich livers and body movement help them manage buoyancy. Sea bass can use a gas-filled swim bladder to adjust buoyancy.**
4	How does fertilization in sharks and skates compare with fertilization in many bony fishes such as sea bass? What difference between sharks and skates shows that members of one class can reproduce in different ways?	**Sharks and skates fertilize eggs inside the female's body, while many bony fishes release eggs and sperm for fertilization in water. Some sharks give birth to live young, while skates lay egg cases.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

A silver fish cruises above a pier in the coastal bay. Its skeleton is made mainly of bone, and bony flaps cover its gills, so it belongs to Osteichthyes. Unlike sharks and skates, it has a swim bladder that helps it stay at one depth. It shares jaws and paired fins with fishes in Chondrichthyes.

Accept either class in the field guide entry if its invented traits are consistent with the passage. For question 4, accept any clear distinction between live birth in some sharks and egg cases in skates.