Ocean Zone Detective

Classify ocean locations by shore, depth, light, and temperature.

MAQ.3.3 "Classify zones of the ocean based on distance from shorelines (i.e., intertidal, neritic, oceanic, and benthic zones), temperature, and light availability (i.e., epipelagic, mesopelagic, bathypelagic, abyssopelagic, and hadopelagic)."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the four location labels in the passage, circle the five depth-and-light labels, and number the circled labels from 1 at the surface to 5 at the greatest depth.

From Shore to Deep Sea

(1) From a rocky beach, a research vessel heads toward deep water. The **intertidal zone** is the strip between high and low tide marks, exposed and covered as tides change. Seaward of that strip, the **neritic zone** includes water above the continental shelf, the shallow submerged edge of a continent. Beyond the shelf break, water belongs to the **oceanic zone**, even if land is still visible. These names describe position relative to shore and the shelf. A different label, **benthic zone**, means the seafloor itself. It can lie beneath neritic or oceanic water.

(2) Depth and light supply another set of labels for the water column, measured downward from the surface. The **epipelagic zone** runs from the surface to about 200 meters; enough sunlight reaches part of it for photosynthesis. From about 200 to 1,000 meters, the **mesopelagic zone** receives dim, fading light but not enough for photosynthesis. The **bathypelagic zone** extends from about 1,000 to 4,000 meters, in darkness. The **abyssopelagic zone** extends from about 4,000 to 6,000 meters. Below 6,000 meters in deep ocean trenches is the **hadopelagic zone**. Neither of these last two zones receives sunlight.

(3) Scientists lower a sensor to compare water above the shelf with water far offshore. At the surface, temperatures vary with season and latitude, so a polar surface can be cold despite bright summer light. In many regions, temperature falls sharply below the sunlit surface, and most deep water is cold. Depth alone does not give an exact temperature, but light usually dwindles with depth until sunlight disappears. A sensor drifting through the water samples a pelagic zone; if it touches the seafloor, it also reaches the benthic zone. These labels overlap rather than compete.

2 ANSWER WITH EVIDENCE

Use the passage

1. A stretch of rocky shore is underwater at high tide and exposed at low tide. Which zone is it in? Explain using the tides.

2. A sensor samples water 80 meters below the surface above the continental shelf. Name its shore-based zone and depth-and-light zone. Is sunlight available there?

3. A sensor drifts 700 meters below the surface beyond the continental shelf. Name its shore-based zone and depth-and-light zone, then describe the light there.

4. A sensor touches the seafloor in a trench 6,700 meters below the surface, beyond the continental shelf. Give its shore-based zone, the depth-and-light zone of the water there, and the zone for the seafloor. Is there sunlight?

3 YOUR TURN

Your own words

Write a four-sentence field log with three stops: a tide-washed shoreline, water above the continental shelf, and water beyond the shelf. Choose depths for the two water stops, name the zones at each stop, include one stop at the seafloor, and compare light and temperature at the two water stops.

ANSWER KEY

Ocean Zone Detective

HIGH SCHOOL · MAQ.3.3

PART 1 · READ AND MARK

Underline the four location labels in the passage, circle the five depth-and-light labels, and number the circled labels from 1 at the surface to 5 at the greatest depth. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	A stretch of rocky shore is underwater at high tide and exposed at low tide. Which zone is it in? Explain using the tides.	**It is intertidal because it lies between the high and low tide marks.**
2	A sensor samples water 80 meters below the surface above the continental shelf. Name its shore-based zone and depth-and-light zone. Is sunlight available there?	**Neritic and epipelagic. Sunlight is available at that depth.**
3	A sensor drifts 700 meters below the surface beyond the continental shelf. Name its shore-based zone and depth-and-light zone, then describe the light there.	**Oceanic and mesopelagic. Light is dim and insufficient for photosynthesis.**
4	A sensor touches the seafloor in a trench 6,700 meters below the surface, beyond the continental shelf. Give its shore-based zone, the depth-and-light zone of the water there, and the zone for the seafloor. Is there sunlight?	**The water is oceanic and hadopelagic; the seafloor is benthic. No sunlight reaches it.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

At low tide, I step onto an exposed stretch of the intertidal zone. Above the continental shelf, my sensor samples neritic water at 10 meters in the epipelagic zone. Beyond the shelf, it touches the benthic seafloor at 4,800 meters beneath oceanic, abyssopelagic water. Sunlight reaches my shelf stop but not the deep stop, where the water is generally colder.

Accept approximate depth boundaries as stated in the passage. For the field log, check that benthic describes the seafloor and that oceanic or neritic describes the water's position relative to the shelf.