Freshwater Field Clues

Classify stream and lake zones using current, depth, and temperature.

MAQ.3.4 "Classify zones of freshwater sources based on the velocity of current, depth, and temperature."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline clues about current, circle clues about depth, and number clues about temperature with a small 3. Use your marks to compare freshwater zones.

A Survey from Stream to Lake

1 Walk along a stream and its changing shape becomes a speed test. In a riffle, shallow water tumbles quickly over an uneven bed. A run is usually deeper than a riffle, with a steadier current that is slower than a riffle's but faster than a pool's. A pool is a deeper stretch where water moves more slowly. These zones can repeat along one channel, so the name of the river does not tell you the zone. Shade, weather, and groundwater affect temperature, so a fast riffle is not always colder than a quiet pool.

2 A lake has zones, too, but its currents are generally weaker than a stream's flow. The littoral zone borders the shore and is shallow enough for sunlight to reach the bottom; rooted plants may grow there. Farther out, the limnetic zone is sunlit open water above the dark depths. The profundal zone is deep, open water below the sunlit layer. Wind can stir the upper lake, while water far below the surface may move more slowly. A shallow shore can warm quickly on a sunny day, yet its temperature depends on shade, season, and location.

3 Picture a summer survey made during one calm afternoon. A thermometer near the lake's surface may register warmer water than a thermometer far below, because sunlight heats the upper water. In many deep lakes, these layers stay separate through summer; in autumn, cooling and wind can mix them. A shallow pond might not form lasting layers at all. To classify a location, use the freshwater source first, then compare current and depth with nearby water. Use temperature as supporting evidence, not a rule that overrides the other clues. Measurements from one day do not give a zone a permanent temperature.

2 ANSWER WITH EVIDENCE

Use the passage

1. At a creek crossing, shallow water rushes over stones. Which stream zone fits? Compare its current and depth with both a run and a pool.

2. Downstream, water moves steadily through a stretch deeper than a riffle but shallower than a pool. Classify this zone and compare its current with the other two stream zones.

3. On a summer lake survey, a sampler is far from shore in warm, sunlit water above a colder, dark layer. The water is lightly stirred by wind. Which zone is the sampler in? Compare its depth and temperature with the dark layer.

4. On the same survey, a second sampler is in deep, dark open water. Its water is cold and moves less than the wind-stirred water above. Classify this zone, then compare its current, depth, and temperature with the sunlit open water above.

3 YOUR TURN

Your own words

Invent a same-day summer survey of a stream pool and a lake's shallow shore. In four sentences, give a plausible depth, current, and temperature for each site, then explain why each belongs to its zone.

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PART 1 · READ AND MARK

Underline clues about current, circle clues about depth, and number clues about temperature with a small 3. Use your marks to compare freshwater zones. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	At a creek crossing, shallow water rushes over stones. Which stream zone fits? Compare its current and depth with both a run and a pool.	**It is a riffle. Its current is faster than a run's and a pool's, and it is shallower than both.**
2	Downstream, water moves steadily through a stretch deeper than a riffle but shallower than a pool. Classify this zone and compare its current with the other two stream zones.	**It is a run. Its current is slower than a riffle's but faster than a pool's.**
3	On a summer lake survey, a sampler is far from shore in warm, sunlit water above a colder, dark layer. The water is lightly stirred by wind. Which zone is the sampler in? Compare its depth and temperature with the dark layer.	**The sampler is in the limnetic zone. It is shallower and warmer than the deep, dark profundal zone in this survey.**
4	On the same survey, a second sampler is in deep, dark open water. Its water is cold and moves less than the wind-stirred water above. Classify this zone, then compare its current, depth, and temperature with the sunlit open water above.	**The sampler is in the profundal zone. Its water moves less, is deeper, and is colder than the sunlit limnetic water above.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

The stream site is 2 meters deep, moves slowly, and measures 18°C. Its depth and slow current fit a pool, though its temperature could change with the weather. The lake site is 0.5 meter deep, has a weak wind-driven current, and measures 21°C. Sunlight reaches its bottom near shore, so it belongs to the littoral zone; the warmer reading fits this sunny afternoon.

Accept plausible invented measurements, not a fixed temperature for either zone. Look for a slow, relatively deep stream pool and a shallow lake site near shore where sunlight reaches the bottom.