2017



AP Biology Sample Student Responses and Scoring Commentary

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AP[®] BIOLOGY 2017 SCORING GUIDELINES

Question 5



Figure 1. Characteristics of a pond community over time

Microcystis aeruginosis is a freshwater photosynthetic cyanobacterium. When temperatures increase and nutrients are readily available in its pond habitat, *M. aeruginosis* undergoes rapid cell division and forms an extremely large, visible mass of cells called an algal bloom. *M. aeruginosis* has a short life span and is decomposed by aerobic bacteria and fungi. **Identify** the metabolic pathway <u>and</u> the organism that is primarily responsible for the change in oxygen level in the pond between times I and II AND between times III and IV.

Identification	(2 points per row;	4 points	maximum)
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Time Period	Metabolic pathway (1 point per box)	Organism (1 point per box)
I – II	Photosynthesis	Cyanobacteria (<i>M. aeruginosis</i>)
III – IV	Cellular respiration	Decomposers/fungi/bacteria



Figure 1. Characteristics of a pond community over time

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AP[®] BIOLOGY 2017 SCORING COMMENTARY

Question 5

Overview

This question focused on analyzing data to identify the causes of change in oxygen levels in a pond community. Students were presented with a graph showing the relative concentrations of cyanobacteria, decomposers, and oxygen in a pond ecosystem over time. Students were asked to identify the metabolic pathway and the organism that was primarily responsible for the change in oxygen levels between time points.

Sample: 5A Score: 4

The response earned 1 point for identifying that the metabolic pathway responsible for the change in oxygen level in the pond between times I and II is photosynthesis. The response earned 1 point for identifying that the organism responsible for the change in oxygen level between times I and II is the photosynthetic cyanobacterium. The response earned 1 point for identifying that the metabolic pathway responsible for the change in oxygen level between times III and IV is cellular respiration. The response earned 1 point for identifying that the organism responsible for the change in oxygen level between times III and IV is cellular respiration. The response earned 1 point for identifying that the organism responsible for the change in oxygen level between times III and IV is the aerobic bacteria. The response could have earned 1 point for identifying fungi or decomposers as the organism responsible for the change in oxygen level between times III and IV, but the point had already been earned.

Sample: 5B Score: 3

The response earned 1 point for identifying that the metabolic pathway responsible for the change in oxygen level in the pond between times I and II is photosynthesis. The response earned 1 point for identifying that the organism responsible for the change in oxygen level between times I and II is *Microcystis aeruginosis*. The response earned 1 point for identifying that between times III and IV the organism responsible for the change in oxygen level is the bacteria. The response could have earned 1 point for identifying fungi as the organism responsible for the change in oxygen level is the bacteria. The response could have earned 1 point for identifying fungi as the organism responsible for the change in oxygen level between times III and IV, but the point had already been earned.

Sample: 5C Score: 2

The response earned 1 point for identifying that the organism responsible for the change in oxygen level between times I and II is the cyanobacteria. The response earned 1 point for identifying that the organism responsible for the change in oxygen level in the pond between times III and IV is the decomposers.