

**Aim:**

**DO - “dissolved oxygen”** - the free, non-compound oxygen present in water

- an important parameter in assessing water quality (2-9 ppm for animal survival)

**BOD - “biochemical oxygen demand”** -

the amount of dissolved oxygen used by bacteria to decompose the organic matter in the water

- can be used as a measure of the degree of pollution

### Steps in Cultural/Artificial Eutrophication

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_



## Sources of Nitrogen and Phosphorus

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

## Cultural/Artificial Eutrophication: Prevention and Remediation

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_

## Cultural Eutrophication Review Questions

- Which of the following would be a reactive way of dealing with cultural eutrophication?
  - skimming and dredging waterways
  - making stricter laws concerning land use
  - making stricter regulations regarding the amount of phosphorus used in detergents
  - planting vegetative barriers to reduce runoff from farmland
  - improving wastewater treatment to remove more organic wastes from urban sewage
- Which of the following are sources of nutrients that promote algal blooms?
  - fertilizers
  - detergents
  - animal wastes
  - I, only
  - I and II, only
  - I and III, only
  - II and III, only
  - I, II, and III
- Which of the following represents some of the steps that lead to cultural eutrophication in the order that they occur?
  - runoff of fertilizer → algal bloom → increased dissolved oxygen → fish die
  - decreased dissolved oxygen → algae dies → increase of bacteria → fish die
  - runoff of fertilizer → algal bloom → algae die → decrease in dissolved oxygen → fish die
  - increase of bacteria → decrease of dissolved oxygen → algae die → CO<sub>2</sub> increases → fish die
  - runoff of fertilizer → algae die → bacteria die → fish die
- Although it is not one of the major causes of eutrophication, some water environments, such as the Yellow Sea are affected by cultural eutrophication because of
  - runoff of phosphate detergents
  - acid rain
  - oil spills
  - thermal pollution from nearby factories
  - agricultural runoff
- As the number of bacteria in an aquatic system increase
  - BOD and DO increase
  - BOD and DO decrease
  - BOD increases and DO decreases
  - BOD decreases and DO increases
  - BOD and DO remain unaffected

6. Chemical fertilizers affect nutrient cycles because they are rich in
- (A) nitrogen and sulfur
  - (B) phosphorus and carbon
  - (C) sulfur and carbon
  - (D) phosphorus and nitrogen
  - (E) potassium and carbon dioxide
7. Fish farming is also known as
- (A) aquaculture, which does not contribute to eutrophication
  - (B) aquaculture, which contributes to eutrophication
  - (C) hydroculture, which does not contribute to eutrophication
  - (D) hydroculture, which contributes to eutrophication
  - (E) none of the above
8. How is dredging organic material different from skimming?
- (A) dredging is a proactive means of dealing with eutrophication, while skimming is reactive
  - (B) dredging is a reactive means of dealing with eutrophication, while skimming is proactive
  - (C) dredging requires the scooping of organic material from the bottom of an aquatic environment, while skimming deals with organic growth on the surface of an aquatic environment
  - (D) skimming requires the scooping of organic material from the bottom of an aquatic environment, while dredging deals with organic growth on the surface of an aquatic environment
  - (E) dredging is only performed in lakes, while skimming is only performed in bays and oceans
9. Aerating ponds and lakes is
- (A) a proactive way of decreasing dissolved carbon dioxide in the water
  - (B) a reactive way of decreasing dissolved carbon dioxide in the water
  - (C) a proactive way of decreasing dissolved oxygen in the water
  - (D) a reactive way of increasing dissolved carbon dioxide in the water
  - (E) a proactive way of increasing dissolved oxygen in the water
10. Which of the following is not one of the steps in cultural eutrophication?
- (A) algal blooms increase photosynthesis which depletes dissolved oxygen
  - (B) fish suffocate due to hypoxia (lack of oxygen)
  - (C) fertilizer runoff enters an aquatic ecosystem
  - (D) BOD by bacteria increases
  - (E) dissolved oxygen decreases as a result of an increased BOD by bacteria