

AP[®]

 CollegeBoard

2020 Exam Sample Questions

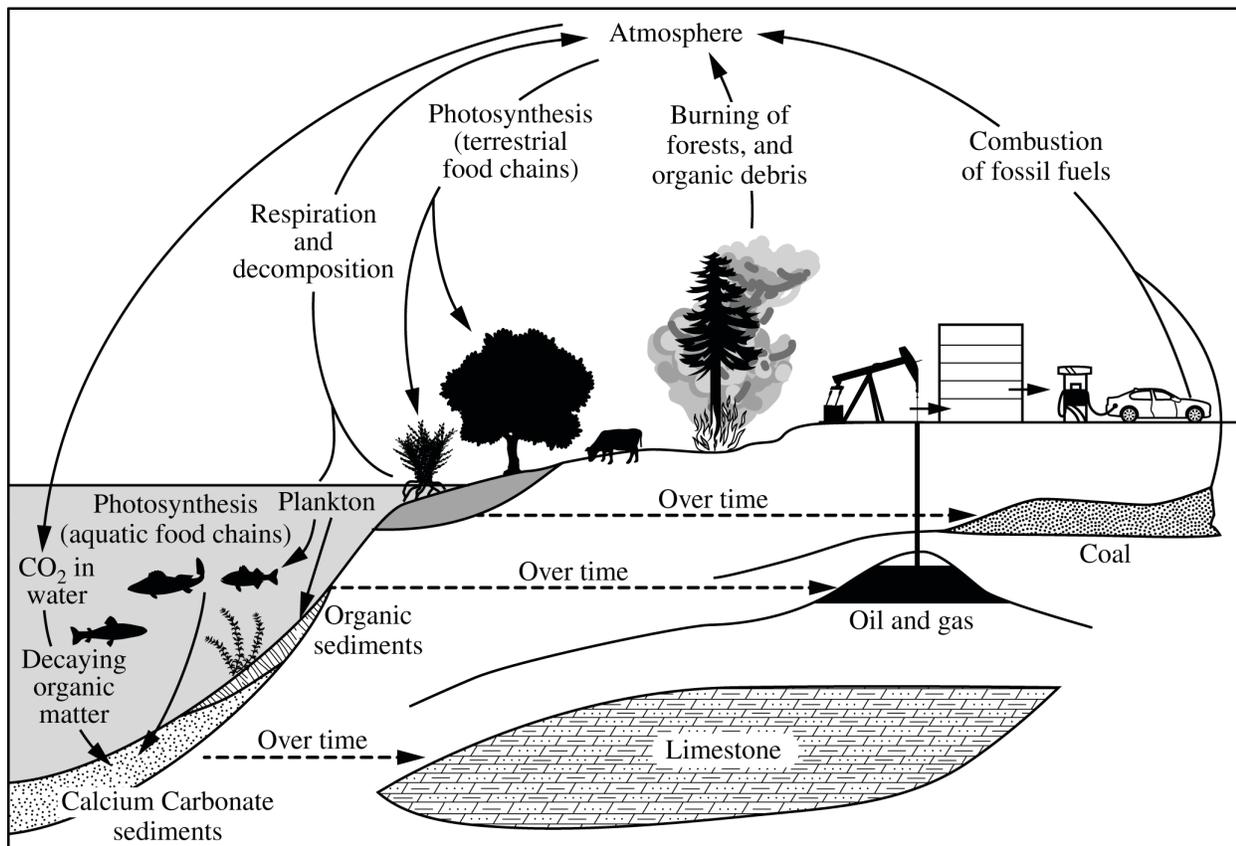
AP[®] ENVIRONMENTAL SCIENCE

Sample Question 1

(Adapted from: 2020 Practice Exam #1)

Allotted time: 25 minutes (plus 5 minutes to submit)

The diagram below shows the cycling of carbon.



- Identify** a process shown in the diagram that removes carbon from the atmosphere.
- For a process shown in the diagram that also plays a role in the hydrologic cycle, **describe** the role that process plays in the hydrologic cycle.
- Identify** a process shown in the diagram that sequesters carbon from the atmosphere for a geological period of time.
- Explain** how the rate at which fossil fuels are transferred into the atmosphere, as shown in the diagram, has altered the carbon cycle during the past 250 years.
- Identify** an energy source in the diagram commonly used to produce electricity that also causes acid rain and **describe** how it causes acid rain.
- Describe** a method for reducing the cause of acid rain you described in part (e).

Scientists are interested in investigating how limestone can be used to remediate the effects of acid rain. They collect water from a lake that has recently been exposed to acid rain. They divide the water into 10 different tanks and add different amounts of limestone to nine of the tanks. No limestone is added to one of the tanks. The pH of the water in the tanks is measured before the limestone is added and once every hour for 24 hours.

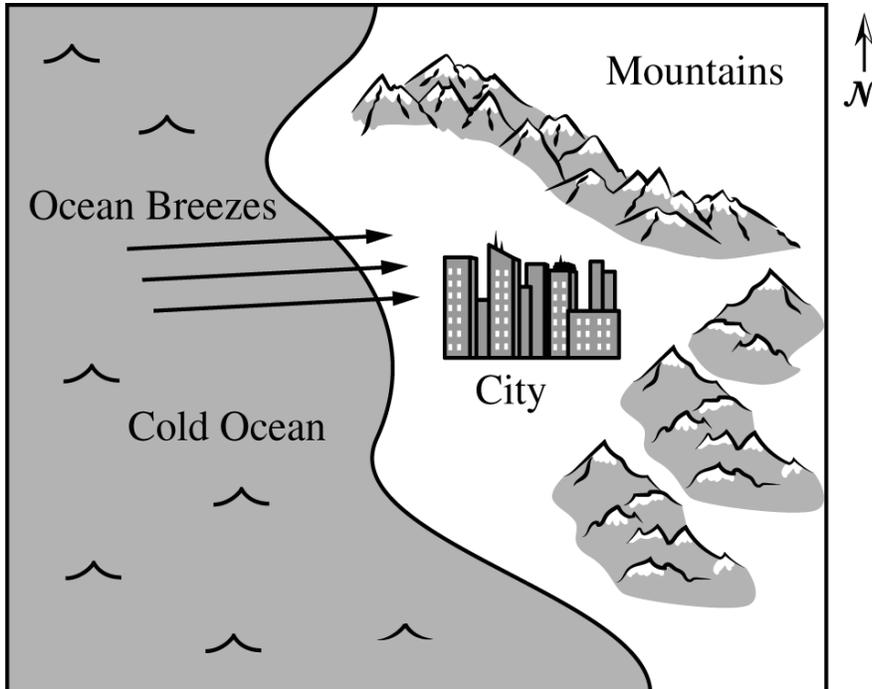
- (g) **Identify** the independent variable in this investigation.
- (h) **Identify** the dependent variable in this investigation.
- (i) **Identify** the control group in this investigation.
- (j) **Describe** how the results of the experiment would likely change if it was conducted at a lower temperature.
- (k) **Describe** one additional variable that has not been mentioned that could affect the results of the investigation.
- (l) **Describe** a modification that could be made to the investigation that would affect the results.

Sample Question 2

(Adapted from: 2020 Practice Exam #2)

Allotted time: 15 minutes (plus 5 minutes to submit)

As the human population grows, more individuals are moving into urban areas. Geographic features and climatological factors can make some locations more prone to the effects of air pollution. The diagram below illustrates a city of millions of people and its surrounding geography. Human activities in urban areas can release pollutants into the air that lead to ground-level ozone and smog formation.



- Describe** how a thermal inversion would form in the city shown in the diagram.
- Describe** the relationship between a thermal inversion and pollution.
- Explain** how one factor related to climate could make the city shown in the diagram susceptible to prolonged periods of ground-level ozone and smog.
- Explain** how a geographical feature could make the city shown in the diagram susceptible to prolonged periods of ground-level ozone and smog.
- Explain** how the average annual precipitation compares on the east and west sides of the mountains shown in the diagram.

Air pollution is not the only problem associated with urbanization. Human-made structures in urban areas can increase the amount of runoff reaching streams and lakes.

- (f) **Describe** how a common human-made structure found in urban areas contributes to urban runoff reaching streams and lakes.
- (g) **Propose a solution** to reduce the effects of urban runoff from the structure you described in part (g).
- (h) **Justify** the solution proposed in (h) by describing an additional benefit of your solution, other than reducing the effects of urban runoff.