AP Environmental Science (APES) Atmospheric Pollution Practice Test (Sample)

Study Guide

BY EXAMZIFY

Everything you need from our exam experts!

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Introduction

Preparing for a certification exam can feel overwhelming, but with the right tools, it becomes an opportunity to build confidence, sharpen your skills, and move one step closer to your goals. At Examzify, we believe that effective exam preparation isn't just about memorization, it's about understanding the material, identifying knowledge gaps, and building the test-taking strategies that lead to success.

This guide was designed to help you do exactly that.

Whether you're preparing for a licensing exam, professional certification, or entry-level qualification, this book offers structured practice to reinforce key concepts. You'll find a wide range of multiple-choice questions, each followed by clear explanations to help you understand not just the right answer, but why it's correct.

The content in this guide is based on real-world exam objectives and aligned with the types of questions and topics commonly found on official tests. It's ideal for learners who want to:

- **Practice answering questions under realistic conditions,**
- **Improve accuracy and speed,**
- **Review explanations to strengthen weak areas, and**
- **Approach the exam with greater confidence.**

We recommend using this book not as a stand-alone study tool, but alongside other resources like flashcards, textbooks, or hands-on training. For best results, we recommend working through each question, reflecting on the explanation provided, and revisiting the topics that challenge you most.

Remember: successful test preparation isn't about getting every question right the first time, it's about learning from your mistakes and improving over time. Stay focused, trust the process, and know that every page you turn brings you closer to success.

Let's begin.

How to Use This Guide

This guide is designed to help you study more effectively and approach your exam with confidence. Whether you're reviewing for the first time or doing a final refresh, here’s how to get the most out of your Examzify study guide:

1. Start with a Diagnostic Review

Skim through the questions to get a sense of what you know and what you need to focus on. Your goal is to identify knowledge gaps early.

2. Study in Short, Focused Sessions

Break your study time into manageable blocks (e.g. 30 – 45 minutes). Review a handful of questions, reflect on the explanations.

3. Learn from the Explanations

After answering a question, always read the explanation, even if you got it right. It reinforces key points, corrects misunderstandings, and teaches subtle distinctions between similar answers.

4. Track Your Progress

Use bookmarks or notes (if reading digitally) to mark difficult questions. Revisit these regularly and track improvements over time.

5. Simulate the Real Exam

Once you're comfortable, try taking a full set of questions without pausing. Set a timer and simulate test-day conditions to build confidence and time management skills.

6. Repeat and Review

Don’t just study once, repetition builds retention. Re-attempt questions after a few days and revisit explanations to reinforce learning. Pair this guide with other Examzify tools like flashcards, and digital practice tests to strengthen your preparation across formats.

There’s no single right way to study, but consistent, thoughtful effort always wins. Use this guide flexibly, adapt the tips above to fit your pace and learning style. You've got this!

Questions

1. **Which best describes a natural process that adds carbon dioxide to the atmosphere?**
    A. Photosynthesis
    B. Carbon dioxide is released from the interior of Earth during volcanic eruptions
    C. Respiration of animals
    D. Dissolution in oceans

2. **Scientists have been monitoring CO2 in the atmosphere from Mauna Loa in Hawaii since 1958. Which of the following units is used by scientists to measure CO2 in the atmosphere?**
    A. Percent
    B. Parts per billion (ppb)
    C. Parts per million (ppm)
    D. Grams per cubic meter

3. **Which components of smog are most likely released from automobile exhaust?**
    A. Nitrogen oxides and volatile organic compounds
    B. Sulfur dioxide and ammonia
    C. Particulate matter and carbon monoxide
    D. Ozone and sulfur trioxide

4. **On a dark and cloudy day, what is the predicted pattern for nitrogen dioxide and ground-level ozone readings?**
    A. There will be an increase in the level of nitrogen dioxide and a decrease in the level of ground-level ozone.
    B. There will be a decrease in nitrogen dioxide and an increase in ground-level ozone.
    C. Both NO2 and O3 increase.
    D. Both NO2 and O3 decrease.

5. **What is the effect of atmospheric deposition in a northern forest?**
    A. Increased buffering capacity of the soil
    B. Decreased soil fertility
    C. Increased soil pH beyond neutral
    D. Reduced microbial activity

6. Which set of reactants forms tropospheric ozone?

- **A. NO_2 + VOCs + O_2 + sunlight**
- **B. NO + O_3 + sunlight**
- **C. NO_x + CO_2 + sunlight**
- **D. NO_2 + VOCs + O_2 + sunlight**

7. According to the author, noise pollution negatively affects wildlife by hindering which of the following activities?

- **A. Migration patterns only.**
- **B. Feeding rates only.**
- **C. Nest building and migration.**
- **D. Mating, establishing territories, and predator-prey interactions.**

8. Which parameter from water in ponds and lakes downwind of a coal-burning power plant would best indicate effects from the plant's emissions?

- **A. Temperature**
- **B. pH**
- **C. Turbidity**
- **D. Alkalinity**

9. Acid deposition would most likely result in which of the following?

- **A. The release of aluminum ions from soil**
- **B. Increase in soil pH**
- **C. Decrease in aluminum ions**
- **D. Reduction of mineral availability**

10. A dangerous indoor air pollutant is

- **A. Ozone**
- **B. Sulfur dioxide**
- **C. Nitrogen oxides**
- **D. Carbon monoxide**

Answers

1. B
2. C
3. A
4. A
5. A
6. D
7. D
8. B
9. A
10. D

Explanations

1. **Which best describes a natural process that adds carbon dioxide to the atmosphere?**

   A. Photosynthesis

   B. Carbon dioxide is released from the interior of Earth during volcanic eruptions

   C. Respiration of animals

   D. Dissolution in oceans

Volcanic eruptions release carbon dioxide stored deep in Earth's interior into the atmosphere, making it a direct natural source of CO_2. Photosynthesis removes CO_2 by converting it into organic matter, and dissolving CO_2 in oceans also lowers atmospheric CO_2, so they're sinks rather than sources. While respiration by animals does release CO_2, the clearest natural process that adds CO_2 directly to the air is outgassing from volcanic activity.

2. **Scientists have been monitoring CO_2 in the atmosphere from Mauna Loa in Hawaii since 1958. Which of the following units is used by scientists to measure CO_2 in the atmosphere?**

   A. Percent

   B. Parts per billion (ppb)

   C. Parts per million (ppm)

   D. Grams per cubic meter

The key idea is expressing the amount of CO_2 as a mixing ratio—the fraction of air that is CO_2. In the atmosphere, CO_2 is present at a few hundred molecules per million air molecules, so scientists use parts per million to describe its concentration. On the Mauna Loa measurements, reporting CO_2 in parts per million lets researchers track long-term trends precisely; for example, about 400 CO_2 molecules per 1,000,000 air molecules corresponds to roughly 0.04% of the air being CO_2. Using percent would compress that small value into a single hundredth of a percent, which is less precise for monitoring changes over decades, and parts per billion would place CO_2 far too small to be practical since its concentration is much higher than many other trace gases. Grams per cubic meter would introduce dependence on temperature and pressure, making comparisons across times and places harder. Therefore, parts per million is the standard and most informative unit for atmospheric CO_2.

3. Which components of smog are most likely released from automobile exhaust?

A. Nitrogen oxides and volatile organic compounds

B. Sulfur dioxide and ammonia

C. Particulate matter and carbon monoxide

D. Ozone and sulfur trioxide

Photochemical smog forms when nitrogen oxides and volatile organic compounds released by automobile exhaust react in sunlight to produce ground-level ozone and other oxidants. Cars emit both NOx and VOCs, so these two components are the primary precursors that drive the sunny, hazy smog associated with vehicle pollution. The other options don't fit as well: sulfur dioxide and ammonia aren't the main car exhaust precursors for smog formation; particulate matter and carbon monoxide are pollutants emitted by vehicles but not the key pair that creates the photochemical smog in sunlight; ozone is a secondary pollutant formed in the atmosphere rather than directly emitted by cars, and sulfur trioxide isn't a common vehicle emission.

4. On a dark and cloudy day, what is the predicted pattern for nitrogen dioxide and ground-level ozone readings?

A. There will be an increase in the level of nitrogen dioxide and a decrease in the level of ground-level ozone.

B. There will be a decrease in nitrogen dioxide and an increase in ground-level ozone.

C. Both NO2 and O3 increase.

D. Both NO2 and O3 decrease.

On a dark, cloudy day, the amount of sunlight is minimal, which slows the photochemical reactions that produce ground-level ozone. Ozone at the surface forms when NO2 is broken apart by photons to produce atomic oxygen, which then combines with O2 to make O3. Without enough light, this step happens less, so ozone formation drops. At the same time, nitrogen dioxide can accumulate because its destruction by photolysis is reduced and ongoing emissions keep adding NO2 to the air. Additionally, any ozone that is present can be consumed by reactions with NO to form more NO2, reinforcing the drop in ozone. So nitrogen dioxide tends to increase while ground-level ozone decreases.

5. What is the effect of atmospheric deposition in a northern forest?

A. Increased buffering capacity of the soil

B. Decreased soil fertility

C. Increased soil pH beyond neutral

D. Reduced microbial activity

Atmospheric deposition changes soil chemistry by delivering ions to the forest floor. When deposition brings in alkaline or base-forming ions such as calcium, magnesium, and potassium, these cations can replenish exchange sites on soil minerals that have lost bases through weathering and prior acid inputs. As the supply of these base cations increases, the soil becomes better at neutralizing added acids, so its ability to resist pH changes—its buffering capacity—increases. In northern forests, soils are often acidic and depleted of base cations due to weathering and leaching, so input of these base ions from deposition helps restore buffering ability. This means the soil can better dampen fluctuations in pH from ongoing atmospheric inputs, delaying acidification effects on plants and microbes.

6. Which set of reactants forms tropospheric ozone?

A. NO_2 + VOCs + O_2 + sunlight

B. NO + O_3 + sunlight

C. NO_x + CO_2 + sunlight

D. NO_2 + VOCs + O_2 + sunlight

Ozone in the lower atmosphere forms through a photochemical process that requires sunlight to drive the reactions. When sunlight breaks apart NO_2, it creates NO and a free oxygen atom. That oxygen atom then combines with O_2 to make O_3, but this would quickly stop unless NO_2 is continually regenerated. Hydrocarbons and other volatile organic compounds provide radical reactions that convert NO back to NO_2, allowing the cycle to keep producing ozone. The oxygen in ozone comes from the abundant O_2 in the air, and the energy input is the sunlight that powers the photolysis steps. So the set that yields tropospheric ozone includes NO_2, VOCs, O_2, and sunlight. The presence of VOCs is essential to sustain ozone formation; without them, ozone would not accumulate despite the sunlight.

7. **According to the author, noise pollution negatively affects wildlife by hindering which of the following activities?**

   A. Migration patterns only.

   B. Feeding rates only.

   C. Nest building and migration.

   D. Mating, establishing territories, and predator-prey interactions.

Noise pollution affects wildlife most when it blocks acoustic signals that animals rely on for important social and survival behaviors. Many species communicate through calls, songs, or other sounds to attract mates and to defend or establish a territory; when background noise drowns out these signals, mating success drops and individuals struggle to assert boundaries. Noise also disrupts predator-prey interactions because hearing is crucial for detecting threats or locating prey. If sounds are masked, animals may miss cues that would normally trigger escape, pursuit, or avoidance, leading to mixed or maladaptive responses. Taken together, these disrupted communication and signaling processes directly impact mating, establishing territories, and predator-prey dynamics, which is why that option best captures the author's point. While migration or feeding can be affected in some cases, they are not the primary activities highlighted.

8. **Which parameter from water in ponds and lakes downwind of a coal-burning power plant would best indicate effects from the plant's emissions?**

   A. Temperature

   B. pH

   C. Turbidity

   D. Alkalinity

Emissions from coal-fired power plants release sulfur dioxide and nitrogen oxides that react in the atmosphere to form acids, which come down as acid rain. When this acid rain enters ponds and lakes, it lowers the water's hydrogen ion concentration, decreasing pH and making the water more acidic. pH is the best indicator because it directly measures how acidic the water is, which is the immediate result of these emissions reaching the bodies of water. The other options don't track the emissions' chemical impact as directly: temperature might change due to heat discharge but doesn't reflect acid deposition; turbidity indicates the amount of suspended particles and can vary for reasons unrelated to emissions; alkalinity shows how well water can buffer against acids but doesn't itself show current acidity, and a high alkalinity can mask pH changes rather than reveal them.

9. Acid deposition would most likely result in which of the following?

A. The release of aluminum ions from soil

B. Increase in soil pH

C. Decrease in aluminum ions

D. Reduction of mineral availability

Acid deposition lowers soil pH by increasing hydrogen ion concentration, which displaces cations on soil particle surfaces. This proton exchange causes aluminum that is bound to minerals to be released into soil water, raising the concentration of aluminum ions in the soil solution. That release is a direct result of the acidic conditions and is a primary concern because aluminum ions can be toxic to plant roots, hindering growth and nutrient uptake. The other options don't fit as well: acid rain would not raise soil pH, aluminum ions would not decrease under these conditions, and while acidification can contribute to nutrient leaching, the most immediate and specific effect described here is the release of aluminum ions.

10. A dangerous indoor air pollutant is

A. Ozone

B. Sulfur dioxide

C. Nitrogen oxides

D. Carbon monoxide

Dangerous indoor air pollutants are often those that are invisible and tasteless, yet can disrupt the body's ability to use oxygen. Carbon monoxide fits this profile in a critical way. It is produced by incomplete combustion from common indoor sources like furnaces, space heaters, gas stoves, or a car running in an attached garage. Once inhaled, carbon monoxide binds to hemoglobin with a much higher affinity than oxygen, forming carboxyhemoglobin and dramatically reducing the blood's capacity to carry oxygen to tissues. This can cause headaches, dizziness, confusion, and at higher levels can lead to unconsciousness or death. Because it is colorless and odorless, people may not detect its presence without a detector, making it especially dangerous in enclosed spaces. Ozone, sulfur dioxide, and nitrogen oxides are irritants and can be harmful, but they don't typically pose the same immediate, stealthy risk to oxygen transport indoors as carbon monoxide.

Next Steps

Congratulations on reaching the final section of this guide. You've taken a meaningful step toward passing your certification exam and advancing your career.

As you continue preparing, remember that consistent practice, review, and self-reflection are key to success. Make time to revisit difficult topics, simulate exam conditions, and track your progress along the way.

If you need help, have suggestions, or want to share feedback, we’d love to hear from you. Reach out to our team at hello@examzify.com.

Or visit your dedicated course page for more study tools and resources:

https://apesatmosphericpollution.examzify.com

We wish you the very best on your exam journey. You've got this!