MSTEP Science Practice Test (Sample)

Study Guide

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 energy type is stored due to position, such as height?**

   A. Kinetic Energy

   B. Chemical Energy

   C. Thermal Energy

   D. Potential Energy

2. **Which structure acts as the gatekeeper of the cell, controlling what enters and leaves?**

   A. Cell Membrane

   B. Nucleus

   C. Cytoplasm

   D. Ribosome

3. **What term describes the total of all forces acting on an object?**

   A. Balanced Forces

   B. Inertia

   C. Net Force

   D. Gravity

4. **What process is heat transfer through direct contact between solids?**

   A. Conduction

   B. Radiation

   C. Convection

   D. Reflection

5. **Which statement best describes a non-renewable resource?**

   A. Replenished quickly

   B. Can be recycled indefinitely

   C. Coal, Oil, and Natural Gas

   D. They are resources that cannot be replenished on a human time scale

6. Which is an example of a renewable resource?

A. Wind

B. Fossil Fuels

C. Solar Energy

D. Natural Gas

7. Which statement best defines a chemical change?

A. A physical change

B. A change in color only without forming a new substance

C. A reaction that produces a new substance

D. A change in temperature without new substances

8. Which term describes when waves bend or change direction as they enter a new material due to a change in speed?

A. Absorption

B. Refraction

C. Transmission

D. Reflection

9. Which boundary occurs when tectonic plates move toward each other and can form mountains or volcanoes?

A. Divergent Boundary

B. Transform Boundary

C. Subduction Zone

D. Convergent Boundary

10. Which type of eclipse occurs when the Earth blocks sunlight from reaching the Moon?

A. Lunar Eclipse

B. Solar Eclipse

C. Partial Eclipse

D. Total Eclipse

Answers

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

Explanations

1. Which energy type is stored due to position, such as height?

A. Kinetic Energy

B. Chemical Energy

C. Thermal Energy

D. Potential Energy

Energy stored because of position is potential energy. When an object is higher, it has gravitational potential energy that depends on its mass, height, and the strength of gravity; this energy can become kinetic energy if the object starts moving, such as it falling. In contrast, kinetic energy is energy of motion, chemical energy is stored in chemical bonds, and thermal energy comes from temperature and the random motion of particles. Because the question focuses on energy stored due to position, potential energy is the correct idea.

2. Which structure acts as the gatekeeper of the cell, controlling what enters and leaves?

A. Cell Membrane

B. Nucleus

C. Cytoplasm

D. Ribosome

Movement of substances into and out of a cell is controlled by the cell membrane, which acts as the gatekeeper. This membrane is a phospholipid bilayer with proteins that function as channels, doors, and pumps, giving the cell selective permeability. It allows essential nutrients to enter, wastes to exit, and helps maintain the right balance of ions and water. Some substances move by diffusion or osmosis, while others require energy or specific transport proteins to cross the membrane. This transport control is key to keeping the cell's internal environment stable and responsive. The nucleus stores genetic material and directs cellular activities, but it doesn't regulate traffic across the membrane. The cytoplasm is the internal fluid where many reactions happen, and ribosomes are the protein-building factories—neither handles the gatekeeping of entry and exit.

3. What term describes the total of all forces acting on an object?

A. Balanced Forces

B. Inertia

C. Net Force

D. Gravity

Net force is the total of all forces acting on an object, found by adding every force as a vector and accounting for direction. This net force determines how the object's motion changes: if it's zero, the object doesn't accelerate and keeps moving at a constant velocity or stays at rest; if it's not zero, the object accelerates in the direction of the net force, with acceleration proportional to the net force divided by the object's mass (F_net = m a). Gravity is just one of the forces that can be part of that total, and it may be balanced by other forces (like the normal force), resulting in a zero net force. Inertia is the property of matter that resists changes in motion, not the sum of forces, and balanced forces describe a situation where forces cancel to produce zero net force, not the total itself.

4. What process is heat transfer through direct contact between solids?

A. Conduction

B. Radiation

C. Convection

D. Reflection

Conduction is heat transfer through direct contact between solids. When a hotter object touches a cooler one, the particles at the interface collide and exchange energy, so the hotter object cools down a bit and the cooler one warms up. In metals, free electrons move energy rapidly and help spread it quickly through the material. An everyday example is a metal spoon warming up from hot soup because the heat moves from the soup into the spoon through contact. Radiation transfers heat as infrared waves and can occur without contact, even in a vacuum. Convection involves the movement of a fluid, like air or water, carrying heat as it flows. Reflection is not a heat-transfer process.

5. Which statement best describes a non-renewable resource?

A. Replenished quickly

B. Can be recycled indefinitely

C. Coal, Oil, and Natural Gas

D. They are resources that cannot be replenished on a human time scale

Non-renewable resources are finite and cannot be replenished on a human time scale. They form over millions of years from ancient organic material, so once we use them, the remaining supply won't be replaced quickly. Coal, oil, and natural gas illustrate this trait well, since their formation and restoration take geological timescales. That defining idea—they cannot be replenished within a timeframe meaningful to humans—is why this statement is the best description. By contrast, renewable resources replenish relatively quickly, and recycling, while useful, does not make non-renewables replenishable.

6. Which is an example of a renewable resource?

A. Wind

B. Fossil Fuels

C. Solar Energy

D. Natural Gas

Renewable resources are those that can be replenished naturally on a human timescale. Solar energy is a clear example: the sun provides energy continually, and we can capture it with solar panels to generate electricity without using up a finite supply. Fossil fuels and natural gas come from ancient organic matter and are finite; once burned, they aren't quickly replaced. Wind is also renewable, but solar energy is a straightforward illustration of a resource that can be continually harnessed as long as the sun shines.

7. Which statement best defines a chemical change?

A. A physical change

B. A change in color only without forming a new substance

C. A reaction that produces a new substance

D. A change in temperature without new substances

A chemical change happens when the matter undergoes a transformation in which the substances present at the start become substances with different identities. This occurs because bonds are broken and new bonds form, producing materials with new properties and formulas. That's why a statement describing a reaction that produces a new substance best defines a chemical change—it directly states that the matter's identity changes. In contrast, a physical change only alters form or state without changing what the substance is (for example, melting, freezing, or dissolving a substance). A color change can happen during physical changes too, so it doesn't by itself prove a new substance has formed. Energy changes, like heat being released or absorbed, often accompany chemical changes but aren't the defining feature by themselves; the crucial idea is the creation of new substances.

8. Which term describes when waves bend or change direction as they enter a new material due to a change in speed?

A. Absorption

B. Refraction

C. Transmission

D. Reflection

When a wave enters a different material, its speed changes because the medium affects how quickly the wave can move. If the wave meets the boundary at an angle, this change in speed makes the path bend, so the wave changes direction. This bending is refraction. A familiar example is light looking bent when it goes from air into water. If the wave hits the boundary straight on, it doesn't bend, though it still passes through. Absorption would involve the wave's energy being taken up by the material rather than changing direction. Transmission is just the wave passing through, and reflection is the wave bouncing back from the boundary.

9. Which boundary occurs when tectonic plates move toward each other and can form mountains or volcanoes?

A. Divergent Boundary

B. Transform Boundary

C. Subduction Zone

D. Convergent Boundary

Moving toward each other creates compression that pushes rock upward, building mountains, and can melt rock to feed magma that forms volcanoes. This happens at convergent boundaries, where plates collide. A subduction zone is a specific type of convergent boundary where one plate dives beneath another, and that process also produces volcanic activity and mountain-building. Divergent boundaries involve plates moving apart, and transform boundaries slide past each other, typically causing earthquakes rather than creating mountains or volcanoes. So the boundary described is convergent boundary.

10. Which type of eclipse occurs when the Earth blocks sunlight from reaching the Moon?

A. Lunar Eclipse

B. Solar Eclipse

C. Partial Eclipse

D. Total Eclipse

Eclipses happen when the Sun, Earth, and Moon line up just right so shadows form. If the Earth sits between the Sun and the Moon, Earth blocks sunlight from reaching the Moon, causing a lunar eclipse. The Moon can appear totally dark, partially shadowed, or just faintly dim depending on how deeply it passes through Earth's shadow. This scenario describes a lunar eclipse, not a solar eclipse (which occurs when the Moon blocks sunlight from reaching Earth).

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://mstepscience.examzify.com

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