NCFE PHYSICAL SCIENCE PRACTICE EXAM (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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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.

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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!

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Questions

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1. What is the primary characteristic of a lever?

A. It can rotate around a fixed point

B. It works under the principle of buoyancy

C. It is affected only by external forces

D. It generates electricity through motion

2. Which property can indicate the purity of a substance?

A. Density

B. Luster

C. Volume

D. Temperature

3. How does the amplitude of a wave relate to its energy?

A. Higher amplitude means lower energy

B. Higher amplitude means higher energy

C. Amplitude has no effect on energy

D. Amplitude only affects frequency

4. What formula represents kinetic energy?

A. PE = mgh

B. KE = 1/2 mv^2

C. p = mv

D. w = fd

5. According to Ohm's law, which equation represents the relationship between voltage, current, and resistance?

A. V = IR

B. I = VR

C. R = VI

D. I = R/V

6. How many electrons can the first energy ring of an atom hold?

A. 8 electrons

B. 2 electrons

C. 4 electrons

D. 10 electrons

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7. Which of the following is the SI unit of resistance?

A. Amperes (A)
B. Ohms (Ω)
C. Volts (V)
D. Fermis (fm)

8. What generally happens to energy in a closed system?

A. It can be lost as heat only
B. It is conserved
C. It can be increased at will
D. It is permanently stored

9. Which type of reaction results in the formation of new substances?

A. Decomposition reaction
B. Redox reaction
C. Synthesis reaction
D. Phase change

10. Which of the following is a characteristic of scalar quantities?

A. Described by magnitude and direction
B. Described by magnitude alone
C. Always positive values
D. Must have a reference point

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Answers

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

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Explanations

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1. What is the primary characteristic of a lever?

A. It can rotate around a fixed point

B. It works under the principle of buoyancy

C. It is affected only by external forces

D. It generates electricity through motion

The primary characteristic of a lever is that it can rotate around a fixed point, known as the fulcrum. This rotational movement allows a lever to amplify an applied force, making it easier to lift or move heavy objects. Essentially, a lever transforms the input force applied at one end into a larger output force at the other end, depending on the distances from the fulcrum. This principle is fundamental to how levers are used in various applications, from simple tools to complex machines. The other options do not accurately describe the core characteristic of a lever. The principle of buoyancy pertains to fluids and is unrelated to the mechanical advantage offered by levers. The notion that a lever is affected only by external forces does not capture its function, as the internal mechanics of the fulcrum and the lever arm are also critical to its operation. Lastly, the generation of electricity through motion describes concepts found in generators or alternators, which operate on different principles than those associated with levers.

2. Which property can indicate the purity of a substance?

A. Density

B. Luster

C. Volume

D. Temperature

Density is a key property used to indicate the purity of a substance because it is a characteristic physical property that remains consistent for pure substances at a given temperature and pressure. When a substance is pure, it will have a specific density that can be measured and compared to standard values. If the density of a sample deviates from the known density of the pure substance, it may indicate the presence of impurities or a mixture. In contrast, luster refers to the way light reflects off a substance's surface and is more related to the visual appearance of materials rather than their purity. Volume, which measures the space a substance occupies, can change with temperature and pressure and doesn't provide information about the chemical composition. Temperature, while it can affect the state of matter or the behavior of a substance, does not directly indicate purity. Therefore, density serves as a reliable indicator of substance purity due to its consistency for pure materials.

3. How does the amplitude of a wave relate to its energy?

A. Higher amplitude means lower energy

B. Higher amplitude means higher energy

C. Amplitude has no effect on energy

D. Amplitude only affects frequency

The relationship between amplitude and energy in a wave is fundamental to understanding wave behavior in various contexts, such as sound waves, light waves, and mechanical waves. Higher amplitude indicates that the wave has greater displacement from its equilibrium position. This greater displacement signifies that the wave carries more energy. In physical terms, particularly with mechanical waves, the energy is proportional to the square of the amplitude. This means that if the amplitude of a wave is increased, the energy associated with that wave increases significantly. For instance, if the amplitude doubles, the energy increases by a factor of four. This principle applies across different types of waves; a sound wave with a higher amplitude will produce a louder sound because it conveys more energy, and a light wave with a higher amplitude will appear brighter as it carries more energy. Understanding this correlation is crucial in contexts such as acoustics, optics, and wave mechanics, as it helps to predict how waves will behave and interact with their environment.

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4. What formula represents kinetic energy?

A. PE = mgh

B. KE = 1/2 mv^2

C. p = mv

D. w = fd

The formula for kinetic energy is represented as KE = 1/2 mv^2, where KE stands for kinetic energy, m represents the mass of the object, and v symbolizes its velocity. This equation indicates that kinetic energy is directly proportional to the mass of the object and the square of its speed. The reasoning behind this involves the relationship between motion and energy. As an object's mass increases, it possesses more kinetic energy at the same velocity. Similarly, even a small increase in velocity results in a significant increase in kinetic energy since the speed is squared in the formula. This reflects the nature of moving objects and how their energy is influenced by both their mass and velocity. In the context of the other formulas provided, while they relate to various physics principles, they do not define kinetic energy. For instance, the formula PE = mgh represents potential energy, specifically gravitational potential energy. The equation p = mv defines momentum, which connects mass and velocity but is distinct from energy. The formula w = fd expresses work done in terms of force and displacement. Each of these plays a role in the mechanics of physics, but only KE = 1/2 mv^2 specifically encapsulates the concept of kinetic energy.

5. According to Ohm's law, which equation represents the relationship between voltage, current, and resistance?

A. V = IR

B. I = VR

C. R = VI

D. I = R/V

Ohm's law is a fundamental principle in electrical circuits that describes the relationship between voltage (V), current (I), and resistance (R). The correct equation given by Ohm's law is V = IR, which indicates that the voltage across a conductor is equal to the product of the current flowing through it and the resistance of the conductor. In this equation, if you increase the current while keeping the resistance constant, the voltage will increase proportionally. Similarly, if you increase the resistance while maintaining a constant current, the voltage will also increase. This linear relationship illustrates how voltage, current, and resistance are interrelated in an electrical circuit. The other options presented do not accurately reflect Ohm's law. For instance, I = VR would suggest that current is equal to voltage multiplied by resistance, which is incorrect according to the fundamental equation of Ohm's law. R = VI and I = R/V also misrepresent the relationships, leading to misconceptions about how voltage, current, and resistance interact. Thus, the equation V = IR remains the essential formula that best captures the essence of Ohm's law.

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6. How many electrons can the first energy ring of an atom hold?

A. 8 electrons

B. 2 electrons

C. 4 electrons

D. 10 electrons

The first energy level, or energy ring, of an atom can hold a maximum of two electrons. This is based on the principles of quantum mechanics and the structure of atoms. Each energy level is defined by a principal quantum number, and the first energy level corresponds to the principal quantum number n=1. According to the rules of electron configuration, the maximum number of electrons that can occupy an energy level is given by the formula $2n^2$, where n is the number of the energy level. For the first level, when n=1, the calculation is $2(1)^2 = 2$. Therefore, only two electrons can occupy the first energy level, which is usually filled first before electrons are added to higher energy levels. This stable arrangement of electrons in their respective energy levels is crucial for understanding chemical bonding and the behavior of atoms in reactions.

7. Which of the following is the SI unit of resistance?

A. Amperes (A)

B. Ohms (Ω)

C. Volts (V)

D. Fermis (fm)

The SI unit of resistance is Ohms, represented by the symbol Ω. Resistance is a measure of how much a material opposes the flow of electric current. When a voltage is applied across a conductor, the amount of current that flows through it is influenced by the resistance present in that conductor. The relationship between voltage (V), current (I), and resistance (R) is described by Ohm's Law, which states that $V = I \times R$. In this equation, resistance is what dictates how effectively the current can flow for a given voltage. Other units mentioned do not measure resistance. Amperes is the unit of electric current, which quantifies the flow of electric charge. Volts is the unit for electric potential difference, which represents the work done to move electric charge between two points. Fermis, or femtometers, measure extremely small distances, typically at the subatomic scale, and are not related to electrical properties at all. Thus, Ohms is the only correct choice for the SI unit of resistance.

8. What generally happens to energy in a closed system?

A. It can be lost as heat only

B. It is conserved

C. It can be increased at will

D. It is permanently stored

In a closed system, the principle of conservation of energy applies. This means that the total energy within the system remains constant over time, although it can change forms. For instance, energy can convert from potential to kinetic energy or from thermal energy to mechanical energy, but the overall amount of energy does not increase or decrease. Understanding this concept is fundamental in physical science because it forms the basis for understanding various phenomena, such as energy transfers and transformations in systems, thermal dynamics, and mechanical work. The conservation of energy principle is foundational in both physics and engineering, allowing scientists and engineers to analyze and predict the behavior of systems. While energy can appear to be lost or stored in certain contexts, it is ultimately conserved within a closed system, which is the essence of this principle.

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9. Which type of reaction results in the formation of new substances?

A. Decomposition reaction

B. Redox reaction

C. Synthesis reaction

D. Phase change

The formation of new substances is a defining characteristic of chemical reactions, where the bonds between atoms are broken and formed, resulting in different molecular structures. A synthesis reaction, also known as a combination reaction, involves the joining of two or more simple substances (reactants) to form a more complex substance (product). This process not only rearranges the atoms but also creates entirely new chemical products with different properties compared to the reactants. In contrast, other types of reactions may involve the breaking or rearranging of bonds without producing new substances. For instance, in a decomposition reaction, a compound breaks down into simpler substances; however, this does not imply the formation of new molecular products from different elements. Redox reactions, while they may involve the transfer of electrons and changes in oxidation states, still typically deal with rearrangements of existing compounds rather than the creation of entirely new substances. A phase change involves transitions between different states of matter (solid, liquid, gas), but it does not alter the chemical identity of the substance itself. Therefore, synthesis reactions are unique in that they produce new substances, differentiating them from the other types mentioned in the options.

10. Which of the following is a characteristic of scalar quantities?

A. Described by magnitude and direction

B. Described by magnitude alone

C. Always positive values

D. Must have a reference point

A characteristic of scalar quantities is that they are described by magnitude alone. Scalars are measurements that only have size or amount, without any associated direction. For instance, when you say the temperature is 30 degrees Celsius, it conveys just the amount without any directional implication. In physics, scalar quantities include things like mass, temperature, and distance, which are fully described by their numerical value. Unlike vector quantities, which involve both magnitude and direction (such as velocity or force), scalars remain straightforward, focusing solely on numerical representation. This singular nature makes scalar quantities essential in many calculations in physical science, where directionality may not be relevant.

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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:

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

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