

# ACT Science Practice Exam (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**

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- 1. If an object with mass  $m$  strikes a wall and rebounds, what is the change in momentum if it moves from speed  $v_0$  to  $-v_0$ ?**
  - A.  $2mv_0$  Directed to the left**
  - B.  $mv_0$  Directed to the left**
  - C. Zero**
  - D.  $mv_0$  Directed to the right**
- 2. When comparing experiments, which components are essential to consider?**
  - A. The funding sources and sponsors**
  - B. The objectives, variables, results, and reliability**
  - C. The researchers' experience and reputation**
  - D. The geographical location of the experiments**
- 3. What is 'data representation' in the context of the ACT Science section?**
  - A. Passages explaining scientific theories**
  - B. Passages that analyze conflicting ideas**
  - C. Passages presenting data in graphs, tables, or charts**
  - D. Passages discussing biological concepts**
- 4. What is the force exerted on a 5-kilogram block suspended from a cord?**
  - A. Zero**
  - B. 25 N**
  - C. 50 N**
  - D. 100 N**
- 5. If an object has constant acceleration due to a constant net force absent of friction, what shape does the speed versus time graph take?**
  - A. Curved line**
  - B. Vertical line**
  - C. Straight line**
  - D. Horizontal line**

**6. What happens to gravitational force when a satellite is twice as far from the center of the Earth?**

- A. Increases four times**
- B. Decreases to one-half**
- C. Decreases to one fourth**
- D. Remains the same**

**7. How many grams of water are produced from the complete combustion of 44.0 grams of propane?**

- A. 36.0 g**
- B. 72.0 g**
- C. 50.0 g**
- D. 94.0 g**

**8. Why is it crucial to evaluate results in light of a hypothesis?**

- A. To determine financial costs associated with the experiment**
- B. To selectively accept data that supports personal beliefs**
- C. To understand whether findings validate or challenge the hypothesis**
- D. To present the findings at scientific conferences**

**9. In what way does peer review contribute to the science community?**

- A. It speeds up the publication process**
- B. It acts as a preliminary filtering system for research**
- C. It promotes collaboration among scientists**
- D. It ensures public access to all research**

**10. When evaluating conflicting evidence in scientific arguments, what should be prioritized?**

- A. Personal intuition**
- B. Popularity of the argument among peers**
- C. The quality and reliability of data presented**
- D. Historical context of the debate**

## **Answers**

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

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## **Explanations**

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**1. If an object with mass  $m$  strikes a wall and rebounds, what is the change in momentum if it moves from speed  $V_0$  to  $-V_0$ ?**

**A.  $2mV_0$  Directed to the left**

**B.  $mv_0$  Directed to the left**

**C. Zero**

**D.  $mv_0$  Directed to the right**

To understand the change in momentum when an object with mass  $m$  strikes a wall and rebounds from a speed of  $V_0$  to  $-V_0$ , we can analyze the momentum before and after the collision. Initially, when the object moves with a speed of  $V_0$  towards the wall, its momentum is calculated as:  $p_{\text{initial}} = m \cdot V_0$ . After the collision, the object rebounds with a speed of  $-V_0$ . The momentum after the collision thus is:  $p_{\text{final}} = m \cdot (-V_0) = -m \cdot V_0$ . The change in momentum ( $\Delta p$ ) is found by subtracting the initial momentum from the final momentum:  $\Delta p = p_{\text{final}} - p_{\text{initial}} = -m \cdot V_0 - m \cdot V_0 = -2m \cdot V_0$ . This negative sign indicates that the change in momentum

**2. When comparing experiments, which components are essential to consider?**

**A. The funding sources and sponsors**

**B. The objectives, variables, results, and reliability**

**C. The researchers' experience and reputation**

**D. The geographical location of the experiments**

When comparing experiments, it is crucial to consider the objectives, variables, results, and reliability because these components fundamentally shape the experimental design and outcomes. The objectives provide insight into the purpose of the experiment; understanding what the researchers aimed to discover allows for a clearer comparison between experiments. The variables, both independent and dependent, are essential as they influence how experiments are structured and what factors are being tested. Consistency in how these variables are defined and manipulated is key to making valid comparisons. Examining the results reveals the data gathered from the experiments, which must be analyzed to determine if there are significant differences or patterns. This data is what allows researchers to draw conclusions and make informed decisions about the hypotheses. Finally, the reliability of the experiments indicates how reproducible the outcomes are. This aspect is vital for determining whether the results can be trusted and if they can be generalized to wider contexts. In summary, focusing on these elements ensures that comparisons are made on a solid, objective foundation, leading to more accurate interpretations of the findings.

### 3. What is 'data representation' in the context of the ACT Science section?

- A. Passages explaining scientific theories**
- B. Passages that analyze conflicting ideas**
- C. Passages presenting data in graphs, tables, or charts**
- D. Passages discussing biological concepts**

Data representation in the context of the ACT Science section specifically refers to passages that present data in visual formats such as graphs, tables, or charts. This type of content is crucial because it allows students to interpret, analyze, and draw conclusions from numerical and graphical data. Understanding how to read and extract information from these visual data representations is essential for answering questions effectively. Graphs, tables, and charts condense complex information into digestible formats, making it easier for examinees to spot trends, make comparisons, and understand relationships between variables. Hence, the ability to accurately interpret these visuals is a significant aspect of the skills assessed in the ACT Science section, allowing students to engage meaningfully with scientific data.

### 4. What is the force exerted on a 5-kilogram block suspended from a cord?

- A. Zero**
- B. 25 N**
- C. 50 N**
- D. 100 N**

To determine the force exerted on a 5-kilogram block suspended from a cord, it is important to consider the effects of gravity. The force acting on the block due to gravity can be calculated using Newton's second law of motion, which states that force equals mass times acceleration ( $F = m * a$ ). In this scenario, the mass of the block is 5 kilograms, and the acceleration due to gravity on Earth is approximately 9.8 meters per second squared ( $m/s^2$ ). Therefore, the gravitational force acting on the block can be calculated as follows:  $F = m * a$   $F = 5 \text{ kg} * 9.8 \text{ m/s}^2$   $F = 49 \text{ N}$  This rounds to approximately 50 N, which corresponds to the weight of the block when it is in equilibrium, meaning that it is hanging silently without moving. Hence, the force exerted on the block by the cord, which supports the weight of the block, must match the gravitational force acting downward. This is why the correct answer is that the force exerted on the block is 50 N.

**5. If an object has constant acceleration due to a constant net force absent of friction, what shape does the speed versus time graph take?**

- A. Curved line**
- B. Vertical line**
- C. Straight line**
- D. Horizontal line**

When an object experiences constant acceleration due to a constant net force, it means that the rate of change of its velocity is uniform over time. In such a case, the speed versus time graph will be a straight line. This linear relationship arises because the acceleration is defined as the change in velocity over time, and with constant acceleration, each unit of time results in an equal increment of speed. The slope of the straight line on the graph represents the value of the acceleration. A positive slope indicates acceleration, while a zero slope indicates constant velocity, and a negative slope would indicate deceleration. Thus, when the speed versus time graph is a straight line, it directly demonstrates the principle of constant acceleration, confirming that the speed increases (or decreases) steadily over time as long as the net force remains unchanged.

**6. What happens to gravitational force when a satellite is twice as far from the center of the Earth?**

- A. Increases four times**
- B. Decreases to one-half**
- C. Decreases to one fourth**
- D. Remains the same**

When a satellite is moved to a distance that is twice as far from the center of the Earth, the gravitational force acting on it decreases to one fourth of what it was at its original position. This can be understood through Newton's law of universal gravitation, which states that the gravitational force between two masses is inversely proportional to the square of the distance between their centers. Mathematically, this law can be expressed as: 
$$F = \frac{G m_1 m_2}{r^2}$$
 where  $F$  is the gravitational force,  $G$  is the gravitational constant,  $m_1$  and  $m_2$  are the masses of the two objects (in this case, the Earth and the satellite), and  $r$  is the distance between their centers. When the distance  $r$  is doubled (meaning the satellite is now at a distance of  $2r$ ), the gravitational force can be recalculated as follows: 
$$F' = \frac{G m_1 m_2}{(2r)^2} = \frac{G m_1 m_2}{4r^2}$$

**7. How many grams of water are produced from the complete combustion of 44.0 grams of propane?**

- A. 36.0 g
- B. 72.0 g**
- C. 50.0 g
- D. 94.0 g

To determine how many grams of water are produced from the complete combustion of 44.0 grams of propane (C<sub>3</sub>H<sub>8</sub>), we first need to understand the combustion reaction. The combustion of propane can be represented by the balanced chemical equation:  $\text{C}_3\text{H}_8 + 5 \text{O}_2 \rightarrow 3 \text{CO}_2 + 4 \text{H}_2\text{O}$ . From this equation, we can see that one mole of propane produces four moles of water. Next, we need to convert grams of propane into moles. The molar mass of propane is calculated as follows: - Carbon: 12.01 g/mol  $\times$  3 = 36.03 g/mol - Hydrogen: 1.008 g/mol  $\times$  8 = 8.064 g/mol Adding these together gives:  $36.03 + 8.064 = 44.094$  g/mol (For practical purposes, we often round this to approximately 44.0 g/mol). Now, using the given mass of propane (44.0 grams), we find the number of moles of propane:  $\frac{\text{Moles of propane}}{\text{Mass of propane}} = \frac{44.0 \text{ g}}{44.094 \text{ g/mol}} \approx 1 \text{ mol}$

**8. Why is it crucial to evaluate results in light of a hypothesis?**

- A. To determine financial costs associated with the experiment
- B. To selectively accept data that supports personal beliefs
- C. To understand whether findings validate or challenge the hypothesis**
- D. To present the findings at scientific conferences

Evaluating results in light of a hypothesis is essential because it allows researchers to assess whether their experimental findings support or contradict the initial predictions made by the hypothesis. A hypothesis serves as a guiding framework for the experiment, and by comparing the results to this framework, scientists can derive meaningful conclusions. When results validate a hypothesis, it strengthens the theory and can lead to further exploration of the topic. Conversely, if results challenge the hypothesis, it can provide valuable insights and lead to a reassessment of underlying assumptions, prompting new questions and further experimentation. This process is foundational to the scientific method, as it fosters a deeper understanding of the phenomenon being studied and helps to ensure that conclusions drawn are based on data rather than personal bias or preconceptions. In short, understanding the relationship between experimental results and the original hypothesis is crucial for scientific progress and reliability.

## 9. In what way does peer review contribute to the science community?

- A. It speeds up the publication process**
- B. It acts as a preliminary filtering system for research**
- C. It promotes collaboration among scientists**
- D. It ensures public access to all research**

Peer review plays a crucial role in the scientific community primarily by serving as a preliminary filtering system for research. During this process, submitted studies are evaluated by experts in the same field before they are published. This evaluation ensures that the research meets certain standards of quality, validity, and reliability. Reviewers assess the methodology, data analysis, and conclusions to identify any potential flaws or biases, which helps to uphold the integrity of the scientific literature. By acting as a gatekeeper, peer review helps maintain a high standard for published research, preventing the dissemination of unverified or poorly conducted studies. This process therefore fosters trust in scholarly publications and assists researchers in building upon robust and credible findings, ultimately contributing to the advancement of knowledge in the science community.

## 10. When evaluating conflicting evidence in scientific arguments, what should be prioritized?

- A. Personal intuition**
- B. Popularity of the argument among peers**
- C. The quality and reliability of data presented**
- D. Historical context of the debate**

Prioritizing the quality and reliability of data presented is essential when evaluating conflicting evidence in scientific arguments. Science relies on empirical evidence gathered through systematic observation and experimentation. The strength of a scientific argument hinges on how well the data can be trusted, which means considering factors such as the methodology of data collection, the sample size, the presence of controls, and the reproducibility of results. High-quality data is thoroughly vetted through peer review and should be transparent, allowing for validation by other researchers. Reliable data also takes into account the potential for bias and external influences that could skew results. By focusing on the robustness of the evidence, one can distinguish between well-supported conclusions and those that are less credible. This approach underscores the objective nature of scientific inquiry, which seeks to build knowledge based on factual information rather than subjective opinions or transient trends in popularity.

# 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](mailto:hello@examzify.com).**

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

**<https://actscience.examzify.com>**

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

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