# Virginia 7th Grade Science SOL 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. **What type of organisms expedite the decay process and return nitrogen to the soil?**

   **A. Decomposers**

   **B. Producers**

   **C. Primary consumers**

   **D. Consumers**

2. **Which term refers to all individuals of a single species living in a given area?**

   **A. Population**

   **B. Habitat**

   **C. Community**

   **D. Ecosystem**

3. **In a cross where both parents are heterozygous for a trait with dominant allele T, what is the probability of the recessive phenotype?**

   **A. 0 percent**

   **B. 75 percent**

   **C. 25 percent**

   **D. 50 percent**

4. **What is the cell's control center that directs all cell activities?**

   **A. Mitochondria**

   **B. Golgi Apparatus**

   **C. Endoplasmic Reticulum**

   **D. Nucleus**

5. **What is the primary difference between a control group and an experimental group in a scientific investigation?**

   **A. The control group is not exposed to the independent variable and serves as a baseline.**

   **B. The control group is tested with the independent variable to measure its effect.**

   **C. The control group is usually larger than the experimental group.**

   **D. The control group receives more data collection than the experimental group.**

**6. Organisms that produce their own food through photosynthesis are called what?**

**A. Producers**

**B. Consumers**

**C. Decomposers**

**D. Predators**

**7. Which are necessary for photosynthesis to occur?**

**A. Oxygen, Light energy, and Carbon dioxide**

**B. Light energy, nitrogen, and Carbon dioxide**

**C. Light energy, Water, and Carbon dioxide**

**D. Light energy only**

**8. Which type of rock forms from the cooling and solidification of molten rock?**

**A. Sedimentary rock**

**B. Gypsum**

**C. Igneous rock**

**D. Metamorphic rock**

**9. Which layer of the Earth's atmosphere is where most weather occurs?**

**A. Stratosphere**

**B. Thermosphere**

**C. Troposphere**

**D. Mesosphere**

**10. This is used to describe the shape of a DNA molecule.**

**A. Single Strand**

**B. Triple Helix**

**C. Helical Ladder**

**D. Double Helix**

# Answers

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

# Explanations

## 1. What type of organisms expedite the decay process and return nitrogen to the soil?

**A. Decomposers**

**B. Producers**

**C. Primary consumers**

**D. Consumers**

**Decomposers are the microorganisms and fungi that break down dead organisms and waste. As they digest these materials, nitrogen that was locked in proteins and DNA is released into the soil mainly as ammonia, which becomes ammonium. This process, called ammonification, returns nitrogen to the soil so other organisms, like plants, can reuse it. While other creatures such as earthworms help by physically breaking down litter, the specific role of decomposers is to chemically decompose organic matter and recycle nitrogen back into usable forms. Examples include bacteria and fungi.**

## 2. Which term refers to all individuals of a single species living in a given area?

**A. Population**

**B. Habitat**

**C. Community**

**D. Ecosystem**

**A population refers to all individuals of a single species living in a given area. This focuses on who is there and how many of that species occupy a specific space. Habitat, on the other hand, is the place where organisms live and the resources and conditions there. A community includes all the different species living together in that area, while an ecosystem combines the community with the physical environment and how they interact, including energy flows and nutrient cycles. For example, in a meadow, the population of meadow voles means all the voles in that meadow; the habitat is the meadow itself; the community includes voles plus grasses, insects, and birds; the ecosystem covers the meadow plus sunlight, soil, water, and the processes that connect them. So the term that matches the description is population.**

## 3. In a cross where both parents are heterozygous for a trait with dominant allele T, what is the probability of the recessive phenotype?

**A. 0 percent**

**B. 75 percent**

**C. 25 percent**

**D. 50 percent**

**When both parents are heterozygous (Tt), each parent can pass either the dominant T or the recessive t allele. Crossing Tt × Tt gives four equally likely genotype outcomes: TT, Tt, Tt, and tt. Only the tt genotype shows the recessive phenotype, so one out of four offspring will display it. That's a quarter, or one in four.**

## 4. What is the cell's control center that directs all cell activities?

**A. Mitochondria**

**B. Golgi Apparatus**

**C. Endoplasmic Reticulum**

**D. Nucleus**

**The nucleus serves as the cell's control center because it houses the DNA, which contains the instructions for building proteins and directing cellular activities. By controlling which genes are turned on or off, the nucleus determines what proteins are made and when, guiding the cell's functions and responses. In short, it sets the plan and oversees how the cell carries it out. Other organelles do important jobs too—mitochondria provide energy, the Golgi apparatus packages and ships proteins, and the endoplasmic reticulum helps build and transport molecules—but the nucleus is the main command hub that directs everything.**

## 5. What is the primary difference between a control group and an experimental group in a scientific investigation?

**A. The control group is not exposed to the independent variable and serves as a baseline.**

**B. The control group is tested with the independent variable to measure its effect.**

**C. The control group is usually larger than the experimental group.**

**D. The control group receives more data collection than the experimental group.**

**When scientists design an experiment, they compare a group that receives the factor being tested to a group that does not in order to see what changes occur. The key point is that the independent variable is applied to the experimental group, while the control group is not exposed to that variable. This setup creates a baseline so any differences in outcomes can be attributed to the variable being tested rather than to other factors like water, light, or temperature. For example, if you're testing whether fertilizer helps plants grow taller, one group gets the fertilizer and the other group does not, while both groups receive the same amount of water and light. If the fertilized plants grow taller, you can link that change to the fertilizer because the only major difference between the groups was the presence of the fertilizer. The other choices don't fit the main idea: applying the independent variable to the control group would defeat its purpose, and the control group's size or data-collection frequency isn't what defines it—the essential idea is that it is not exposed to the independent variable and serves as a baseline for comparison.**

## 6. Organisms that produce their own food through photosynthesis are called what?

**A. Producers**

**B. Consumers**

**C. Decomposers**

**D. Predators**

**Organisms that produce their own food through photosynthesis are called producers. Plants and some algae capture sunlight and use it to convert water and carbon dioxide into glucose, a stored form of chemical energy, with oxygen released as a byproduct. These organisms are autotrophs, meaning they make their own food rather than getting energy from others. Their energy then flows to other organisms when consumers eat them, starting the transfer of energy through the food web. The other roles described—consumers that eat other organisms, decomposers that break down dead material, and predators that hunt prey—rely on producers for the energy that starts the chain.**

## 7. Which are necessary for photosynthesis to occur?

**A. Oxygen, Light energy, and Carbon dioxide**

**B. Light energy, nitrogen, and Carbon dioxide**

**C. Light energy, Water, and Carbon dioxide**

**D. Light energy only**

**Photosynthesis needs energy from light to drive the chemical changes, and it uses water and carbon dioxide as the raw materials to build sugar. In the chloroplasts, light energy powers the reactions that split water, providing electrons and hydrogen; this splitting also releases oxygen as a byproduct. Carbon dioxide supplies the carbon atoms to form glucose, the sugar plants store as food. If any of these inputs are missing, the process can't proceed. Oxygen is produced, not required as an input, and nitrogen isn't involved in this main process. So the combination of light energy, water, and carbon dioxide is essential for photosynthesis.**

## 8. Which type of rock forms from the cooling and solidification of molten rock?

**A. Sedimentary rock**

**B. Gypsum**

**C. Igneous rock**

**D. Metamorphic rock**

**Igneous rocks form when molten rock cools and solidifies. When magma stays underground and cools slowly, it creates coarse crystals; when lava erupts onto the surface and cools rapidly, it forms small crystals or even volcanic glass. This cooling-and-solidification process is what makes igneous rocks distinct from sedimentary rocks, which come from compacted sediments, and metamorphic rocks, which are transformed by heat and pressure without melting. Gypsum, on the other hand, is a mineral that forms through evaporation or precipitation, not by cooling molten rock.**

## 9. Which layer of the Earth's atmosphere is where most weather occurs?

**A. Stratosphere**

**B. Thermosphere**

**C. Troposphere**

**D. Mesosphere**

**Weather happens mainly in the troposphere, the lowest layer of the atmosphere. This is where most of Earth's air mass, moisture, and energy are concentrated, so clouds form and weather systems like rain, storms, and wind develop there. Warm air near the surface rises, cools, and condenses into clouds, driving the convection and movement that create daily weather. The troposphere extends from the ground up to about 8 to 15 kilometers (roughly 5 to 9 miles), with the top boundary called the tropopause. Above it, the stratosphere, mesosphere, and thermosphere have much thinner air and less moisture, so they don't produce the same weather phenomena.**

## 10. This is used to describe the shape of a DNA molecule.

**A. Single Strand**

**B. Triple Helix**

**C. Helical Ladder**

**D. Double Helix**

**DNA's shape is described as a double helix. This means two long strands wind around each other like a twisted ladder. The sides of the ladder are the sugar-phosphate backbones, and the rungs are pairs of bases that pair specifically (A with T, C with G). This two-stranded, twisting structure helps store genetic information efficiently and provides a reliable template for copying during cell replication. The idea of a single strand would apply to RNA or DNA before strands pair; a triple helix would involve three strands and isn't the common form of DNA; a "helical ladder" isn't the standard term used. The double helix best describes both the two-stranded nature and the characteristic twist of DNA.**

# 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://va7thgradesciencesol.examzify.com**

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