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. **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

2. **The first phase of mitosis is what?**

   A. Prophase

   B. Metaphase

   C. Anaphase

   D. Telophase

3. **In a plant growth experiment testing the effect of light, which variable is the independent variable?**

   A. Amount of sunlight

   B. Plant height

   C. Type of soil

   D. Amount of water

4. **Which term describes the role an organism plays in its environment, including how it obtains energy and interacts with others?**

   A. Niche

   B. Habitat

   C. Population

   D. Ecosystem

5. **Which organelle is the primary site of protein synthesis in cells?**

   A. Ribosomes

   B. Endoplasmic Reticulum

   C. Golgi Bodies

   D. Nucleolus

6. Which part of the nucleus is responsible for assembling ribosomes?

A. Nucleus

B. Nucleolus

C. Chromatin

D. Nuclear Membrane

7. Which word means the study of relationships between organisms and their environment?

A. Geography

B. Ecology

C. Environment

D. Biology

8. What is the name of the process by which a seed sprouts into a plant?

A. Fermentation

B. Pollination

C. Germination

D. Transpiration

9. Which organelle produces proteins in the cell?

A. Ribosomes

B. Nucleus

C. Golgi Bodies

D. Mitochondria

10. What is an ecosystem service? Please name one example.

A. A type of predator

B. A benefit from an ecosystem, such as pollination or water purification.

C. A non-living feature of an ecosystem

D. A geographical feature

Answers

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

Explanations

1. 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.

2. The first phase of mitosis is what?

A. Prophase

B. Metaphase

C. Anaphase

D. Telophase

Prophase is the first phase of mitosis. In this stage, the long DNA strands condense into visible chromosomes, making them easier to separate later. The nucleolus disappears as the cell begins packing DNA, and the spindle apparatus starts to form outside the nucleus. The nuclear envelope breaks down so the chromosomes can move around the cell, and the replicated chromosomes, still as sister chromatids held together at the centromere, become organized and prepared for the next step. This setup is what starts the orderly process of dividing genetic material, leading into metaphase when the chromosomes move to the center.

3. In a plant growth experiment testing the effect of light, which variable is the independent variable?

A. Amount of sunlight

B. Plant height

C. Type of soil

D. Amount of water

The independent variable is what you deliberately change to see its effect. In a plant growth study focused on light, you vary how much sunlight the plants receive, so the amount of sunlight is the independent variable. The outcome you measure to see the effect of that change is plant height, which is the dependent variable. The type of soil and the amount of water are kept the same to avoid other factors influencing growth, so they're constants rather than variables being tested.

4. Which term describes the role an organism plays in its environment, including how it obtains energy and interacts with others?

A. Niche

B. Habitat

C. Population

D. Ecosystem

Understanding what an organism does in its environment centers on its niche. The niche is the specific role the organism plays, including how it gets its energy (what it eats and at what level in the food web) and how it interacts with other living things (such as prey, predators, competitors, or mutualists). For example, a bee's niche includes feeding on nectar and pollen and helping plants reproduce through pollination, while also interacting with flowers, predators, and other insects. This is different from the place where it lives (its habitat), which is simply the physical environment like a forest or meadow. It's also not about how many individuals are in an area (population) or the entire system of living things and their surroundings (ecosystem). Niche best captures the organism's functional role and its relationships in the environment.

5. Which organelle is the primary site of protein synthesis in cells?

A. Ribosomes

B. Endoplasmic Reticulum

C. Golgi Bodies

D. Nucleolus

Proteins are built by ribosomes, the cellular machines that translate the genetic message carried by mRNA into a chain of amino acids. Ribosomes can float freely in the cytoplasm or be attached to the rough endoplasmic reticulum, and in either place they form the peptide bonds that link amino acids together to make a protein. The rough ER helps with folding and processing and then passes proteins to the Golgi apparatus, which packages and ships them to their destinations. The nucleolus, instead, makes ribosome components (rRNA and ribosomal subunits) but does not perform protein synthesis itself. So the ribosome is where the actual building of proteins occurs.

6. Which part of the nucleus is responsible for assembling ribosomes?

A. Nucleus

B. Nucleolus

C. Chromatin

D. Nuclear Membrane

The main idea is that ribosome assembly happens in a specific region inside the nucleus called the nucleolus. This area is where ribosomal RNA is made and combined with proteins to form the small and large ribosomal subunits. Once those subunits are assembled, they're sent out to the cytoplasm to join together into functional ribosomes that translate genetic information into proteins. The whole nucleus houses DNA and controls cell activities, chromatin is the DNA-protein material that forms chromosomes, and the nuclear membrane is just the envelope around the nucleus—these aren't the sites where ribosome subunits are assembled.

7. Which word means the study of relationships between organisms and their environment?

A. Geography

B. Ecology

C. Environment

D. Biology

Ecology is the study of how living things interact with one another and with their surroundings—the air, water, soil, climate, and other organisms. It looks at ecosystems, energy flow, food chains, and how factors like temperature or resources affect where organisms can live and how populations grow or decline. For example, in a pond ecosystem, ecology would explore how algae provide food for tiny organisms, which feed larger ones, and how changes in sunlight or oxygen affect which species survive. The other terms describe related ideas but not the study of these relationships: geography is about places and landscapes on Earth; the environment means the surroundings; biology is the broad science of life. The focus on interactions and relationships between organisms and their surroundings is what defines ecology.

8. What is the name of the process by which a seed sprouts into a plant?

A. Fermentation

B. Pollination

C. Germination

D. Transpiration

Germination is the process by which a seed sprouts into a plant. When a seed experiences the right conditions—usually water, warm temperature, and enough oxygen—the stored nutrients inside become active. Enzymes start breaking down these nutrients to feed the growing embryo, the seed coat cracks, the root (radicle) emerges first to anchor and take up water, and then the shoot pushes upward to begin photosynthesis. This is different from fermentation (energy production without sufficient oxygen in some organisms), pollination (transfer of pollen to enable fertilization), and transpiration (water vapor loss from leaves). So the seed sprouting into a new plant describes germination.

9. Which organelle produces proteins in the cell?

A. Ribosomes

B. Nucleus

C. Golgi Bodies

D. Mitochondria

Ribosomes are the organelles that produce proteins. They are the cell's protein factories where the genetic instructions carried by mRNA are read and amino acids are linked together to form a polypeptide chain that becomes a protein. Some ribosomes float freely in the cytoplasm, while others are attached to the endoplasmic reticulum, making proteins that are exported or inserted into membranes. The nucleus stores DNA and makes the RNA templates but doesn't assemble proteins itself. The Golgi apparatus then modifies and packages these proteins for shipment, and mitochondria provide energy for the cell rather than building proteins.

10. What is an ecosystem service? Please name one example.

A. A type of predator

B. A benefit from an ecosystem, such as pollination or water purification.

C. A non-living feature of an ecosystem

D. A geographical feature

An ecosystem service is a benefit that people receive from natural processes in an ecosystem. One clear example is pollination by bees, which helps crops produce fruits and seeds. This service comes from the activities of living organisms within the ecosystem and supports food production and biodiversity. It's not a predator, not a non-living feature, and not a geographic feature; it's a useful function the ecosystem provides to humans.

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!