Texas Math and Science Coaches Association (TMSCA) 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

1. The steep side of a sand dune is called the _____.

A. Slip face

B. Crest

C. Leeward slope

D. Dune toe

2. The north star, polaris, is part of the _____ of stars called Ursa Minor

A. Galaxy

B. Nebula

C. Solar system

D. Constellation

3. When a star is approaching Earth, its spectrum is shifted toward which end of the spectrum?

A. Infrared

B. Blue

C. Ultraviolet

D. Red

4. The bronchioles carry air from the bronchial tubes to the _____.

A. Alveoli

B. Larynx

C. Pharynx

D. Trachea

5. One disease/disorder caused by a chromosome defect is

A. Cystic fibrosis

B. Sickle cell anemia

C. Down syndrome

D. Hemophilia

6. The two upper chambers of the heart that receive blood from the veins are called _____.

A. Auricles

B. Ventricles

C. Atria

D. Atriums

7. Which type of plate boundary is associated with subduction and volcanic activity?

A. Transform boundary

B. Convergent boundary

C. Divergent boundary

D. Passive boundary

8. The 180th longitude line is commonly known as which geographic boundary?

A. Prime Meridian

B. International Date Line

C. Equator

D. Tropic of Cancer

9. Lines from east to west across maps are called

A. Latitudes

B. Longitudes

C. Parallels

D. Meridians

10. Which function is not associated with the semicircular canals?

A. Detect angular rotation

B. Detect linear acceleration

C. Help maintain balance

D. Detect sound vibrations

Answers

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

Explanations

1. The steep side of a sand dune is called the _____.

A. Slip face

B. Crest

C. Leeward slope

D. Dune toe

The steep side is the slip face. Sand is moved up the windward side until the slope reaches the angle where loose sand becomes unstable, and gravity causes an avalanche down the leeward side. This rapid downslope movement builds the steep face known as the slip face. The top edge is the crest, the downwind side as a whole is the leeward slope, and the bottom edge where the dune meets the ground is the dune toe.

2. The north star, polaris, is part of the _____ of stars called Ursa Minor

A. Galaxy

B. Nebula

C. Solar system

D. Constellation

A group of stars that forms a recognizable pattern in the night sky is called a constellation. Ursa Minor is one of these patterns, the shape known as the Little Dipper, and Polaris sits at the end of its handle. Because Polaris is a star within that pattern, Ursa Minor is classified as a constellation. It's not a galaxy (an enormous system of stars scattered across the universe), not a nebula (a cloud of gas and dust), and not a solar system (a star with its orbiting planets). Constellations are useful for identifying parts of the sky and helping with navigation, with Polaris near the north celestial pole guiding directions.

3. When a star is approaching Earth, its spectrum is shifted toward which end of the spectrum?

A. Infrared

B. Blue

C. Ultraviolet

D. Red

Light from a star forms a spectrum across the colors we can see. If the star is coming toward us, the light waves are squeezed a bit as they travel to Earth, so their wavelengths shorten. That shift to shorter wavelengths is called blueshift, and it moves the spectrum toward the blue end of the visible range. The closer the star is to us, or the faster it moves toward us, the more noticeable the blue shift becomes. If the star were moving away, the spectrum would shift toward the red end (redshift), meaning longer wavelengths.

4. The bronchioles carry air from the bronchial tubes to the _____.

A. Alveoli

B. Larynx

C. Pharynx

D. Trachea

Air travels from the larger airways into progressively smaller passages until it reaches the alveoli, tiny sacs where gas exchange occurs. The walls of the alveoli are extremely thin and surrounded by a dense network of capillaries, which lets oxygen diffuse into the blood and carbon dioxide diffuse out to be exhaled. The bronchioles are the last airways before this exchange surface, so their job is to deliver air right to the alveoli. The other structures are parts of the airway system that don't participate directly in gas exchange: the larynx is at the top and houses the vocal cords, the pharynx is the throat region, and the trachea is the main windpipe leading to the bronchi. Therefore, the correct completion is alveoli.

5. One disease/disorder caused by a chromosome defect is

A. Cystic fibrosis

B. Sickle cell anemia

C. Down syndrome

D. Hemophilia

Changes in chromosome number or structure are chromosome defects. Down syndrome is a classic example because it results from having an extra copy of chromosome 21 (trisomy 21). That extra chromosome changes the amount of genetic material in every cell, leading to the developmental differences associated with the condition. Most cases happen when nondisjunction occurs during the formation of eggs or sperm, producing a fertilized egg with three copies of chromosome 21. The other conditions are caused by mutations in specific genes rather than whole chromosomes: cystic fibrosis arises from a mutation in the CFTR gene on chromosome 7, sickle cell anemia from a mutation in the beta-globin gene on chromosome 11, and hemophilia from mutations in genes on the X chromosome. So Down syndrome is the one caused by a chromosome defect.

6. The two upper chambers of the heart that receive blood from the veins are called _____.

A. Auricles

B. Ventricles

C. Atria

D. Atriums

The main idea is identifying the receiving, upper chambers of the heart. These chambers are the atria. Blood returning from the body via veins enters the right atrium, while blood coming from the lungs via the pulmonary veins enters the left atrium. The atria are thinner-walled and designed to receive blood and pass it to the ventricles below, where it's pumped onward. The term auricle refers to the small ear-like extensions on the atria, not the chambers themselves. The ventricles are the lower chambers that actually pump blood out to the lungs and the rest of the body. The standard plural for these chambers is atria, not atriums.

7. Which type of plate boundary is associated with subduction and volcanic activity?

A. Transform boundary

B. Convergent boundary

C. Divergent boundary

D. Passive boundary

Convergent boundaries involve two tectonic plates colliding, with one plate sinking into the mantle in a subduction zone. This sinking slab releases water and other volatiles into the overlying mantle, lowering its melting point and generating magma. The magma rises to the surface to form volcanoes, often in a chain called a volcanic arc, and deep trenches form where subduction occurs. That combination—subduction and volcanic activity—is why this boundary type is the correct choice. Transform boundaries slide plates laterally past one another, causing earthquakes but not typically subduction or volcanism. Divergent boundaries have plates moving apart, with magma rising to create new crust and volcanic activity at mid-ocean ridges, but there is no subduction. Passive boundaries are tectonically quiet margins with little subduction or volcanic activity.

8. The 180th longitude line is commonly known as which geographic boundary?

A. Prime Meridian

B. International Date Line

C. Equator

D. Tropic of Cancer

Lines of longitude run from the North Pole to the South Pole and measure how far east or west you are from the Prime Meridian at 0° longitude. The line directly opposite that, at 180° longitude, is known as the International Date Line. Its main role is in timekeeping: crossing it changes the calendar date. The other two options are different kinds of lines—the Prime Meridian is 0° longitude, the Equator is 0° latitude, and the Tropic of Cancer is a latitude around 23.5°N.

9. Lines from east to west across maps are called

A. Latitudes

B. Longitudes

C. Parallels

D. Meridians

Lines that run from east to west on a map are lines of latitude, which are also called parallels. They form circles around the globe and lie parallel to the equator, which is why they're described as parallels. These lines show how far north or south you are from the equator. In contrast, lines that run north to south are longitudes (meridians), which measure east–west position and converge at the poles. The term parallels is the precise description for those east–west lines, making it the best choice.

10. Which function is not associated with the semicircular canals?

A. Detect angular rotation

B. Detect linear acceleration

C. Help maintain balance

D. Detect sound vibrations

The semicircular canals are specialized to sense rotational movement of the head. When you rotate, the fluid inside lags and bends hair cells in the ampullae, signaling angular velocity to the brain. This helps with balance and stabilizing vision as you move. They're not built to detect straight-line motion—that role belongs to the otolith organs (utricle and saccule) that sense linear acceleration and gravity. They also don't handle hearing; sound vibrations are detected by the cochlea, where pressure waves move hair cells that transduce sound into neural signals. So the function not associated with the semicircular canals is detecting sound vibrations.

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://tmscascience.examzify.com

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