TEXAS MATH AND SCIENCE COACHES ASSOCIATION (TMSCA) SCIENCE PRACTICE EXAM (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

VISIT US ONLINE FOR THE FULL VERSION STUDY GUIDE

https://tmscascience.examzify.com

Copyright © 2026 by Examzify - A Kaluba Technologies Inc. product.

ALL RIGHTS RESERVED.

No part of this book may be reproduced or transferred in any form or by any means, graphic, electronic, or mechanical, including photocopying, recording, web distribution, taping, or by any information storage retrieval system, without the written permission of the author.

Notice: Examzify makes every reasonable effort to obtain accurate, complete, and timely information about this product from reliable sources.

SAMPLE

Table of Contents

Copyright 1

Table of Contents 2

Introduction 3

How to Use This Guide 4

Questions 5

Answers 8

Explanations 10

Next Steps 15

SAMPLE

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.

SAMPLE

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!

SAMPLE

Questions

SAMPLE

1. **Muscles that move food through the digestive system are which type of muscle?**

   A. Cardiac

   B. Skeletal

   C. Smooth

   D. Striated

2. **The day that spring begins is called which term?**

   A. Vernal equinox

   B. Winter solstice

   C. Summer solstice

   D. Autumn equinox

3. **The amount that light refracts depends on its _____.**

   A. Wavelength

   B. Frequency

   C. Amplitude

   D. Speed

4. **As the density of air decreases, its pressure**

   A. Increases

   B. Remains constant

   C. Decreases

   D. Fluctuates

5. **Which statement describes a protostar?**

   A. A matured main-sequence star

   B. A young star in early formation

   C. A dying star

   D. A star with planets

6. **Which scientist is associated with the use of disinfectants in surgery?**

   A. Louis Pasteur

   B. Robert Koch

   C. Joseph Lister

   D. Anton van Leeuwenhoek

SAMPLE

7. The block of rock that sits above a fault plane is called the hanging wall.

A. Footwall
B. Dip-slip block
C. Fault block
D. Hanging wall

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

A. Cystic fibrosis
B. Sickle cell anemia
C. Down syndrome
D. Hemophilia

9. Which of the following is a moon of Mars?

A. Deimos
B. Phobos
C. Europa
D. Ganymede

10. The type of fault produced by shear stress is called a strike-slip fault.

A. Strike-slip fault
B. Normal fault
C. Reverse fault
D. Oblique-slip fault

SAMPLE

Answers

SAMPLE

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

SAMPLE

Explanations

SAMPLE

1. Muscles that move food through the digestive system are which type of muscle?

A. Cardiac

B. Skeletal

C. Smooth

D. Striated

Smooth muscle drives movement through the digestive system. It forms the walls of hollow organs like the esophagus and intestines, and it contracts in slow, rhythmic waves called peristalsis to push food along. These contractions are involuntary, controlled by the autonomic nervous system, so you don't consciously move the food. In contrast, skeletal muscle attaches to bones and is voluntary, while cardiac muscle pumps the heart and has a striped appearance. Striations are a hallmark of skeletal and cardiac muscle, not smooth muscle. That's why smooth muscle is the type responsible for moving food through the digestive tract.

2. The day that spring begins is called which term?

A. Vernal equinox

B. Winter solstice

C. Summer solstice

D. Autumn equinox

Spring begins on the vernal equinox, the moment the Sun crosses the celestial equator moving north. On that day, day and night are about equal in length. In the Northern Hemisphere this occurs around March 20–21 each year, and from then the days start to get longer as the Sun climbs higher in the sky. The term vernal comes from Latin for spring. The other terms refer to different points in the year: the winter solstice is the shortest day around December 21, the summer solstice is the longest day around June 20–21, and the autumn equinox marks the start of fall around September 22–23, when day and night are equal again.

3. The amount that light refracts depends on its _____.

A. Wavelength

B. Frequency

C. Amplitude

D. Speed

Light bends at a boundary because its speed changes between media, and Snell's law ties that bending to the speeds (or refractive indices) in the two media. In many materials, the refractive index is different for different colors, a phenomenon called dispersion. Since wavelength determines how much the light is slowed in a given medium, the amount of refraction varies with wavelength. Shorter wavelengths bend more than longer ones, which is why a prism splits white light into a spectrum. Frequency remains unchanged across the boundary, and amplitude doesn't affect the direction of bending. So the wavelength governs how much refraction occurs.

SAMPLE

4. As the density of air decreases, its pressure

A. Increases

B. Remains constant

C. Decreases

D. Fluctuates

When a gas has lower density, there are fewer molecules in a given volume to collide with the container walls. Pressure arises from these collisions, so fewer collisions mean lower pressure. For a gas like air, and at constant temperature, pressure is proportional to density ($P = \rho RT/M$). That means as density decreases, pressure decreases. This matches everyday observations, like higher up where air is thinner and the pressure is lower. The idea that pressure would stay constant or vary unpredictably doesn't fit the direct link between how many molecules are present and how hard they push on the walls. Therefore, pressure decreases.

5. Which statement describes a protostar?

A. A matured main-sequence star

B. A young star in early formation

C. A dying star

D. A star with planets

A protostar is a young star in the early stages of formation. It forms when a dense region of a molecular cloud collapses under gravity, heating as it contracts. The energy mainly comes from gravitational contraction, and hydrogen fusion hasn't started yet, so it's not a fully formed, stable star. Protostars are often surrounded by an accretion disk and envelope of gas and dust, and they shine mainly from the heat of collapse rather than sustained nuclear fusion. As the core becomes hot enough for fusion, it will settle onto the main sequence. The other descriptions describe later stages or different features (a mature main-sequence star is already fusing hydrogen, a dying star is in late-stage evolution, and having planets isn't what defines a protostar).

6. Which scientist is associated with the use of disinfectants in surgery?

A. Louis Pasteur

B. Robert Koch

C. Joseph Lister

D. Anton van Leeuwenhoek

Antiseptic technique in surgery is about preventing infection by using disinfectants and clean methods during operations. Joseph Lister popularized this approach, using carbolic acid (phenol) to disinfect wounds, instruments, and the operating environment, which dramatically reduced post-operative infections. This practice arose from Pasteur's idea that microbes cause disease, and it showed how controlling microbes can save lives. While Pasteur helped establish the theory and Koch advanced understanding of specific pathogens, Lister was the one who applied disinfectants directly to surgical care. Anton van Leeuwenhoek first observed microbes, but it was Lister who connected disinfection to better surgical outcomes.

SAMPLE

7. The block of rock that sits above a fault plane is called the hanging wall.

A. Footwall

B. Dip-slip block

C. Fault block

D. Hanging wall

Rocks separated by a fault form two blocks, defined by their position relative to the fault plane: the block that sits above the plane is called the hanging wall, and the block below is the footwall. The hanging wall name comes from mining terminology, where the rock above the fault plane would "hang" over the plane if not supported. So the statement identifying the block above the fault plane as the hanging wall matches this convention. The other terms don't specify this vertical relation: a dip-slip block isn't a standard descriptor for position, and a fault block is a general term for either side of a fault.

8. 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.

9. Which of the following is a moon of Mars?

A. Deimos

B. Phobos

C. Europa

D. Ganymede

Phobos is a moon of Mars. Mars has two tiny moons, Phobos and Deimos. The other two options orbit Jupiter. So Phobos is the correct pick because it is a natural satellite of Mars, unlike the others which belong to Jupiter. Phobos is the larger of Mars's two moons and orbits very close to the planet.

SAMPLE

10. The type of fault produced by shear stress is called a strike-slip fault.

A. Strike-slip fault

B. Normal fault

C. Reverse fault

D. Oblique-slip fault

Shear stress makes adjacent blocks slide past each other horizontally. When that horizontal motion dominates, the fault that forms has a vertical plane and movement along the fault is mainly lateral, which is called a strike-slip fault. A famous example is the San Andreas Fault, where blocks slide past one another side to side. If the stress were pulling the crust apart, you'd get a normal fault with the hanging wall moving down. If the crust is being squeezed, a reverse fault forms with the hanging wall moving up. When motion includes both horizontal sliding and some vertical movement, that's oblique-slip. So the fault produced by shear stress is strike-slip.

SAMPLE

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!

SAMPLE