California Science Test (CAST) 8th Grade Practice Exam (Sample)

Study Guide

Everything you need from our exam experts!

Table of Contents

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. Which phrase best defines the waves that travel through a medium and cause your eardrum to vibrate?

A. Light Waves

B. Sound Waves

C. Radio Waves

D. Ultraviolet Waves

2. A boulder at the top of a hill stores what kind of energy due to its position?

A. Kinetic energy

B. Potential energy

C. Thermal energy

D. Chemical energy

3. Which quantity is measured in hertz?

A. Frequency

B. Wavelength

C. Amplitude

D. Energy

4. What term describes a mutation that does not change the amino acid sequence?

A. Mutation

B. Gene expression

C. Substitution mutation

D. Silent mutation

5. An organism's visible traits are its _____.

A. Genotype

B. Genetic variation

C. Phenotype

D. Wave

6. Which term describes the speed and direction of an object's motion?

A. Velocity

B. Mass

C. Air Resistance

D. Static Friction

7. Which term describes storing or transmitting information by discrete impulses?

A. Analog

B. Digital

C. Continuous

D. Binary

8. What is the force between particles with like charges called?

A. Attraction

B. Magnetic force

C. Electrical force

D. Repulsion

9. A wave in which the vibration is at right angles to the direction of travel?

A. Longitudinal Wave

B. Transverse Wave

C. Rarefaction

D. Density

10. What is the highest point of a wave above the resting point called?

A. Peak

B. Apex

C. Maximum

D. Crest

Answers

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

Explanations

1. Which phrase best defines the waves that travel through a medium and cause your eardrum to vibrate?

A. Light Waves

B. Sound Waves

C. Radio Waves

D. Ultraviolet Waves

Sound waves are mechanical waves that travel through a medium like air, water, or a solid. When something vibrates, it creates compressions and rarefactions in the surrounding matter, and these pressure changes move as a wave. When that wave reaches the ear, it makes the eardrum vibrate, and those vibrations are turned into nerve signals the brain interprets as sound. Light, radio, and ultraviolet waves are electromagnetic and can travel without a medium, so they don't produce the vibrating eardrum we associate with hearing.

2. A boulder at the top of a hill stores what kind of energy due to its position?

A. Kinetic energy

B. Potential energy

C. Thermal energy

D. Chemical energy

Energy stored because of position is gravitational potential energy. A boulder at the top of a hill has this energy because its height gives it the potential to do work as it moves. The amount depends on its mass, the strength of gravity, and how high it sits (PE = mgh). As it starts to roll down, that potential energy can be converted into kinetic energy—the energy of motion. Thermal energy is related to temperature and microscopic motion inside the object, and chemical energy is stored in chemical bonds, not simply because of height.

3. Which quantity is measured in hertz?

A. Frequency

B. Wavelength

C. Amplitude

D. Energy

Hertz measures how often something repeats in one second. That makes it a unit for frequency—the number of cycles or oscillations per second. For waves, frequency is how many wave crests pass a point each second, so a higher pitch sound has a higher frequency and is described in hertz. For example, a tuning fork vibrating at 440 Hz repeats 440 times each second. Wavelength, on the other hand, is the distance between successive crests and is measured in meters. Amplitude is how far the wave moves from rest, measured in displacement or pressure units, not in hertz. Energy is the capacity to do work and is measured in joules.

4. What term describes a mutation that does not change the amino acid sequence?

A. Mutation

B. Gene expression

C. Substitution mutation

D. Silent mutation

A silent mutation is described here. The genetic code is degenerate, meaning multiple codons can encode the same amino acid. When a single base in a codon changes but still codes for the same amino acid, the resulting protein sequence stays unchanged. For example, GAA and GAG both code for glutamic acid; changing GAA to GAG does not alter the amino acid sequence. Because the protein remains the same, this mutation doesn't affect the primary structure of the protein. Other terms describe broader concepts (a general mutation), processes (gene expression), or a mutation type that can affect amino acids but isn't inherently silent, so the precise term for no change in amino acid sequence is silent mutation.

5. An organism's visible traits are its _____.

A. Genotype

B. Genetic variation

C. Phenotype

D. Wave

Visible traits are the phenotype. The phenotype is everything you can observe about an organism—things like color, height, shape, or patterns. It's the outward expression of the organism's genetic information (the genotype) and can also be influenced by the environment. So while the genotype is the set of genes an organism carries, the phenotype is what those genes look like when expressed. Genetic variation means differences in DNA among individuals, which underpins how phenotypes can differ. A wave isn't related to describing traits here.

6. Which term describes the speed and direction of an object's motion?

A. Velocity

B. Mass

C. Air Resistance

D. Static Friction

Velocity describes how fast something is moving and which way it's going. It's a vector, so it has both a magnitude (the speed) and a direction. For example, a car moving at 60 miles per hour toward the north has a velocity of 60 mph north. If you only say 60 mph, that's speed—just how fast, with no direction. Mass is how much matter an object has, not how it's moving. Air resistance is the drag force that acts opposite to motion and slows things down, involving forces rather than just describing motion. Static friction is the force that keeps an object at rest until a threshold is passed, also about starting movement rather than describing ongoing motion.

7. Which term describes storing or transmitting information by discrete impulses?

A. Analog

B. Digital

C. Continuous

D. Binary

The main idea is how information is carried using separate, distinct signals rather than a smooth, continuous variation. Digital describes storing or transmitting information with discrete impulses, encoding data in on/off pulses that create distinct values. This stands in contrast to analog, where signals vary continuously in amplitude or other properties rather than in steps. While binary is a common way to implement digital data using two states, the overall term for this approach is digital.

8. What is the force between particles with like charges called?

A. Attraction

B. Magnetic force

C. Electrical force

D. Repulsion

Like charges push away from each other. This push is called repulsion. Electric charges create fields, and identical charges exert a repulsive force that grows stronger as the charges get larger and come closer. While we can call the overall interaction an electrical force, the specific name for how like charges behave is repulsion. Magnetic force describes interactions involving magnets and magnetic fields, not the direct interaction of electric charges.

9. A wave in which the vibration is at right angles to the direction of travel?

A. Longitudinal Wave

B. Transverse Wave

C. Rarefaction

D. Density

In a transverse wave, the vibration is at right angles to the direction the wave travels. The medium moves up and down (or side to side) while the wave moves forward, creating crests and troughs that are perpendicular to the travel direction. This is different from a longitudinal wave, where the particles move back and forth along the same line as the wave travels, with compressions and rarefactions along the path. A rarefaction is simply one region of lower density within a longitudinal wave, not a description of the wave's motion direction itself. Density describes how much matter is in a given space, which is a property of the medium, not a type of wave.

10. What is the highest point of a wave above the resting point called?

A. Peak

B. Apex

C. Maximum

D. Crest

In wave motion, the medium oscillates around a resting position, and the point where it reaches its highest displacement above that level is called the crest. The crest is the top of the wave, while the lowest point is the trough. Crest is the standard term used to name this feature, whereas peak or apex are more general, and maximum refers to a size rather than the specific point on the wave.

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://cast8thgrade.examzify.com

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