

# CALIFORNIA SCIENCE TEST (CAST) PRACTICE EXAM (SAMPLE)

## STUDY GUIDE



## SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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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

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- 1. What term describes a classification grouping that contains similar, closely related organisms?**
  - A. Prokaryote
  - B. Eukaryote
  - C. Genus
  - D. Solution
  
- 2. An upside-down image formed where light rays meet is called a**
  - A. Real Image
  - B. Focal Point
  - C. Optical Axis
  - D. Lens
  
- 3. Which term describes the process of selecting a few organisms with desired traits to serve as parents of the next generation?**
  - A. Hybridization
  - B. Clone
  - C. Selective breeding
  - D. Genetic engineering
  
- 4. What term describes a large organic molecule made from amino acids?**
  - A. Polymer
  - B. Monomer
  - C. Ester
  - D. Protein
  
- 5. Which term describes a diagram that shows how a trait is passed through generations?**
  - A. Family tree
  - B. Diagram
  - C. Pedigree
  - D. Chart

- 6. The gradual change in a species over time is known as**
- A. Evolution
  - B. Variation
  - C. Adaptation
  - D. Fossil
- 7. What term refers to the ratio of elements in the compound?**
- A. Molecule
  - B. Crystal
  - C. Subscript
  - D. Double Bond
- 8. A gene located on the X or Y chromosome is called which of the following?**
- A. Sex-linked gene
  - B. X-linked gene
  - C. Autosomal gene
  - D. Mitochondrial gene
- 9. What term describes a colored chemical compound that absorbs light and can color other materials?**
- A. Pigment
  - B. Dye
  - C. Ink
  - D. Tint
- 10. A curved piece of glass used to refract light; the flexible structure that focuses light entering the eye is the**
- A. Cornea
  - B. Iris
  - C. Lens
  - D. Retina



## **Answers**

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

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## **Explanations**

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**1. What term describes a classification grouping that contains similar, closely related organisms?**

- A. Prokaryote
- B. Eukaryote
- C. Genus**
- D. Solution

*Grouping similar and closely related organisms is described by a genus, a rank in biological classification. Genus sits above species and below family, and it collects species that share strong similarities and a common evolutionary history. For example, many species that look alike and behave in related ways are placed in the same genus. This helps scientists organize biodiversity in a systematic way. Prokaryote and eukaryote describe cellular organization—whether organisms have a nucleus and other cellular features—rather than grouping closely related organisms. A solution is just a mixture of substances and isn't a biological classification term.*

**2. An upside-down image formed where light rays meet is called a**

- A. Real Image**
- B. Focal Point
- C. Optical Axis
- D. Lens

*A real image is formed when light rays actually converge to a point in space. Because the rays cross, the image you'd see (or project onto a screen) is inverted relative to the object. This contrasts with a virtual image, which is formed by diverging rays that only appear to originate from a point and cannot be projected, and is usually upright. The focal point is simply where rays converge after reflection or refraction, the optical axis is just the reference line through the system, and a lens is the device that bends the light, not the image itself. So an upside-down image formed where light rays meet is a real image.*

**3. Which term describes the process of selecting a few organisms with desired traits to serve as parents of the next generation?**

- A. Hybridization
- B. Clone
- C. Selective breeding**
- D. Genetic engineering

*Selective breeding is choosing individuals with desirable traits to serve as parents for the next generation. By selecting those organisms that display the traits we want and allowing them to reproduce, those traits are more likely to appear in their offspring, and, over generations, become more common in the population. This is driven by humans, using natural variation that already exists. This differs from hybridization, which involves crossing individuals to combine traits and often involves different varieties or species; cloning, which creates an exact genetic copy of one organism; and genetic engineering, which directly alters genes using laboratory techniques. An example of selective breeding is choosing cows that produce a lot of milk and breeding them to increase milk yield in the herd.*

**4. What term describes a large organic molecule made from amino acids?**

- A. Polymer
- B. Monomer
- C. Ester
- D. Protein**

Molecules built from amino acids that become large and functional are proteins. Proteins are polymers formed when many amino acids link together through peptide bonds to create long chains that fold into specific three dimensional shapes. Those shapes enable a wide range of jobs in the cell, from speeding up chemical reactions (enzymes) to providing structure (collagen) and carrying substances (hemoglobin). The term here points to a particular kind of polymer that specifically consists of amino acids and has biological roles, which is why protein is the best answer. A general polymer is a large molecule made of repeating units, but it doesn't name the specific type made from amino acids. A monomer is a single amino acid, not the entire molecule. An ester is a chemical group, not the large biomolecule described.

**5. Which term describes a diagram that shows how a trait is passed through generations?**

- A. Family tree
- B. Diagram
- C. Pedigree**
- D. Chart

A pedigree is the diagram that shows how a trait is passed from one generation to the next. In pedigrees, males are usually squares and females are circles; a horizontal line connects spouses, and vertical lines link parents to their offspring across generations. Shading or other marks indicate who has the trait, making it easy to see inheritance patterns, such as whether a trait tends to appear in every generation or skip generations. This focus on inheritance across generations distinguishes it from a general family tree, which maps relationships without emphasizing how traits are transmitted. So the term that fits best is pedigree.

**6. The gradual change in a species over time is known as**

- A. Evolution**
- B. Variation
- C. Adaptation
- D. Fossil

Evolution is the gradual change in a population's inherited traits over generations. Through processes like mutation, natural selection, genetic drift, and gene flow, trait frequencies shift over time, which can lead to new adaptations and even new species. This differs from variation, which are differences among individuals within a population, and from adaptation, which is a trait that helps an organism survive in a environment and often arises through evolutionary change. Fossils provide evidence of past life and how traits or species have changed, but they are not the process itself.

## 7. What term refers to the ratio of elements in the compound?

- A. Molecule
- B. Crystal
- C. Subscript**
- D. Double Bond

The number that shows how many atoms of each element are in the formula is called a subscript. Subscripts after element symbols indicate the counts of atoms in each formula unit, which directly gives the ratio of elements in the compound. For example, in  $H_2O$  there are 2 hydrogens for every 1 oxygen, so the element ratio is 2:1. In  $CO_2$  the ratio is 1:2 (1 carbon to 2 oxygens). A molecule is a unit made of bonded atoms, a crystal is a solid with a repeating structure, and a double bond is a type of chemical bond—none of these describe the specific counts of atoms in the formula.

## 8. A gene located on the X or Y chromosome is called which of the following?

- A. Sex-linked gene
- B. X-linked gene**
- C. Autosomal gene
- D. Mitochondrial gene

Genes located on the sex chromosomes are called sex-linked. When a gene is on the X or Y chromosome, it's described in common terms as X-linked because the X chromosome carries many such genes and often drives the patterns we observe, especially in males who have only one X. This distinguishes these genes from those on autosomes, which are on the non-sex chromosomes and follow typical Mendelian inheritance. It also distinguishes them from mitochondrial genes, which reside in mitochondria and are inherited maternally. Therefore, a gene on the X or Y chromosome is best described as X-linked.

## 9. What term describes a colored chemical compound that absorbs light and can color other materials?

- A. Pigment**
- B. Dye
- C. Ink
- D. Tint

A pigment is a colored chemical compound that absorbs certain wavelengths of light and gives color to materials it's mixed with. The important point is that pigments are usually insoluble, so they color solids by dispersing tiny particles in a binder rather than dissolving. This makes pigments ideal for paints, plastics, and ceramics where you want durable color that stays put. Dyes are soluble and color materials by dissolving and bonding to them, which is common for fabrics. Inks are liquids carrying colorants for writing or printing, not solid pigments dispersed in a solid matrix. Tint just refers to a lighter shade of a color, not a separate colorant type. So the term that best fits a colored compound that absorbs light and can color other materials is pigment.

**10. A curved piece of glass used to refract light; the flexible structure that focuses light entering the eye is the**

- A. Cornea
- B. Iris
- C. Lens**
- D. Retina

*Focusing light is the job of a lens. The lens in your eye is a flexible, curved structure that can change its shape to adjust how strongly it bends light, so images land sharply on the retina. Light first passes through the cornea, which does most of the initial bending, but the lens fine-tunes focus for objects at different distances through a process called accommodation, enabled by the ciliary muscles. The iris is the colored part that controls how much light enters by changing the pupil size, not by focusing. The retina is the light-detecting layer at the back of the eye where the focused image is formed, not where the light is bent to focus.*

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## 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](mailto:hello@examzify.com).

Or visit your dedicated course page for more study tools and resources:

<https://californiacast.examzify.com>

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

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