CALIFORNIA SCIENCE TEST (CAST) 8TH GRADE 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.

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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!

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Questions

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1. Which term describes a force that can act at a distance without direct contact?

A. Contact force

B. Noncontact force

C. Friction

D. Normal force

2. Which describes a negatively charged object?

A. Neutral

B. Negative

C. Positive

D. Ionic

3. Which term is used for the three-nucleotide sequence that codes for one amino acid in the mRNA?

A. Genetic code

B. Codon

C. Gene

D. Genome

4. Which term describes the resistive force that slows a rolling wheel on a surface?

A. Air Resistance

B. Mass

C. Rolling friction

D. Velocity

5. Which mutation occurs when a nucleotide is added, shifting the reading frame?

A. Deletion mutation

B. Insertion mutation

C. Frame-shift mutation

D. Reading frame

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6. Which option describes the attraction between particles with opposite charges or magnets?

A. Electrical force

B. Attraction

C. Magnetic force

D. Gravity

7. The law that an object will stay at rest or move in a straight line unless an outside force acts on it.

A. Newton's 3rd Law

B. Newton's 2nd Law

C. Newton's 1st Law

D. Conservation Law

8. Which friction describes objects that do not move due to weight on a surface?

A. Sliding friction

B. Rolling friction

C. Air Resistance

D. Static Friction

9. Which force is responsible for attracting or repelling magnets at a distance?

A. Electrical force

B. Gravitational force

C. Magnetic force

D. Nuclear force

10. What is the term for a small body from outer space that enters Earth's atmosphere and appears as a streak of light?

A. Meteor

B. Asteroid

C. Comet

D. Moon

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Answers

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

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Explanations

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1. Which term describes a force that can act at a distance without direct contact?

A. Contact force

B. Noncontact force

C. Friction

D. Normal force

A force that can act at a distance without direct contact is called a noncontact force. This includes gravity, which pulls objects toward each other without touching, and magnetic or electric forces that can attract or repel without contact. The other options involve forces that require touching another object: friction arises from surfaces rubbing together, and the normal force is the support force from a surface in contact with an object. So the best term for acting at a distance is noncontact force.

2. Which describes a negatively charged object?

A. Neutral

B. Negative

C. Positive

D. Ionic

A negatively charged object has an excess of electrons. Electrons carry negative charge, while protons carry positive charge. When there are more electrons than protons, the net charge becomes negative. A neutral object has equal numbers of protons and electrons, so it has no net charge. A positively charged object has fewer electrons than protons, giving a net positive charge. The term ionic isn't describing a state of charge for an object by itself; it refers to charged particles or compounds formed by ions. For a concrete example, rubbing a balloon on hair can transfer electrons to the balloon, making it negatively charged. So the description that fits a negatively charged object is having an excess of electrons.

3. Which term is used for the three-nucleotide sequence that codes for one amino acid in the mRNA?

A. Genetic code

B. Codon

C. Gene

D. Genome

Three-nucleotide units in mRNA that specify which amino acid to add next are called codons. During translation, the ribosome reads mRNA in these codons, and a tRNA with the matching anticodon brings the corresponding amino acid to build the protein. The full set of rules that maps each codon to its amino acid is known as the genetic code. A gene is a unit of heredity, and a genome is the entire set of genetic material in an organism. For example, the codon AUG signals the start of translation and codes for methionine. Therefore, the term for the three-nucleotide sequence that codes for one amino acid is codon.

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4. Which term describes the resistive force that slows a rolling wheel on a surface?

A. Air Resistance

B. Mass

C. Rolling friction

D. Velocity

Rolling friction is the resistive force that slows a rolling wheel on a surface. It occurs because the area where the wheel contacts the ground deforms as the wheel turns, and energy is lost as the wheel and ground recover from that deformation. This energy loss shows up as a small backward force that opposes the motion, slowing the wheel as it rolls. It's different from air resistance (drag from moving through air), which acts opposite motion in the air; mass is the amount of matter that affects how hard it is to change motion, not a force; and velocity is the speed and direction of motion, not a resisting force. So the term that best describes the slowing force for a rolling wheel on a surface is rolling friction.

5. Which mutation occurs when a nucleotide is added, shifting the reading frame?

A. Deletion mutation

B. Insertion mutation

C. Frame-shift mutation

D. Reading frame

Adding a nucleotide changes how the genetic code is read because nucleotides are read in groups of three (codons). Inserting one base shifts all downstream codons by one position, so the amino acids produced after the insertion are different. This specific change is called an insertion mutation, and it causes a frameshift in the reading frame. A deletion would remove a base and could also cause a frameshift if the number removed isn't a multiple of three. A frame-shift mutation describes the result of such shifts, while the reading frame itself is just the way the sequence is read, not a mutation.

6. Which option describes the attraction between particles with opposite charges or magnets?

A. Electrical force

B. Attraction

C. Magnetic force

D. Gravity

Attraction is the general pulling force that brings two things toward each other. When particles have opposite electric charges, they pull toward one another due to electromagnetic forces, and magnets exhibit a similar pulling when opposite poles face each other. Describing the interaction as attraction fits both scenarios because it's the shared idea—the objects move closer together. Naming a specific type, like electrical force or magnetic force, points to one kind of interaction rather than the overall phenomenon. Gravity is another pulling force, but it acts between masses and isn't describing the charged or magnetic interactions in this context.

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7. The law that an object will stay at rest or move in a straight line unless an outside force acts on it.

A. Newton's 3rd Law

B. Newton's 2nd Law

C. Newton's 1st Law

D. Conservation Law

Inertia is the tendency of objects to resist changes in their motion. This law says that an object at rest stays at rest, and an object moving in a straight line at a constant speed continues doing so unless a net external force acts on it to change that motion. In other words, if nothing pushes or pulls on an object, its velocity stays the same. Think about a book sitting on a table: there's no net force to move it, so it stays put. A puck sliding on smooth ice keeps moving in the same straight line because friction is minimal, until a force from friction, a collision, or a hit changes its speed or direction. This idea differs from the other statements about motion. When there is a net force, motion changes in a way described by how force and mass produce acceleration. And the third law describes forces occurring in action–reaction pairs, not the tendency to keep moving or stay still. The conservation ideas deal with quantities staying the same in a system, not this specific behavior of motion without a net external force.

8. Which friction describes objects that do not move due to weight on a surface?

A. Sliding friction

B. Rolling friction

C. Air Resistance

D. Static Friction

Static friction is the force that prevents an object from moving when it rests on a surface. When the object's weight presses it down, the surface pushes back with a normal force, and static friction acts opposite to the direction the object would slide. It can adjust its strength up to a maximum value, enough to balance the weight and any small push. If the forces trying to move the object stay below that maximum, the object stays at rest. If the push becomes large enough to exceed static friction, motion starts and the friction that acts while sliding—kinetic friction—takes over. Rolling friction would apply to objects that roll, not a block that isn't moving; air resistance only matters when moving through air; sliding friction refers to motion between surfaces, not at rest. So the description of objects not moving because of weight on a surface points to static friction.

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9. Which force is responsible for attracting or repelling magnets at a distance?

A. Electrical force

B. Gravitational force

C. Magnetic force

D. Nuclear force

Magnetic force is the force that acts through space between magnets. Magnets create magnetic fields that extend outside the material, and when another magnet (or a magnetic material) enters that field, it experiences a push or pull without touching. This is why opposite poles attract and like poles repel—the field lines interact in a way that draws the magnets together or pushes them apart, depending on orientation. The strength of this interaction decreases with distance and depends on how the poles are aligned. It helps to remember that this force comes from the magnetic field produced by moving electric charges and the intrinsic spin of electrons in the material. Gravity acts on mass and pulls things together, but it doesn't cause magnets to attract or repel each other in the way magnetic forces do. Nuclear forces act inside atomic nuclei and aren't what you feel between magnets. Electric forces play a role at the level of charges, but the characteristic attraction or repulsion of magnets at a distance is best described by the magnetic force.

10. What is the term for a small body from outer space that enters Earth's atmosphere and appears as a streak of light?

A. Meteor

B. Asteroid

C. Comet

D. Moon

That streak across the sky is called a meteor. It happens when a small piece of debris from space enters Earth's atmosphere and heats up quickly due to air friction, creating a bright, glowing trail as it burns up—often seen as a shooting star. A asteroid is a rocky body that orbits the Sun in space and doesn't become a bright streak in the atmosphere. A comet is a body made of ice and dust that develops a glowing coma and tail when it gets close to the Sun, visible in the sky but not because it's burning up in our atmosphere. The Moon, meanwhile, is Earth's natural satellite that orbits our planet and isn't created by a object entering the atmosphere.

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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.

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!

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