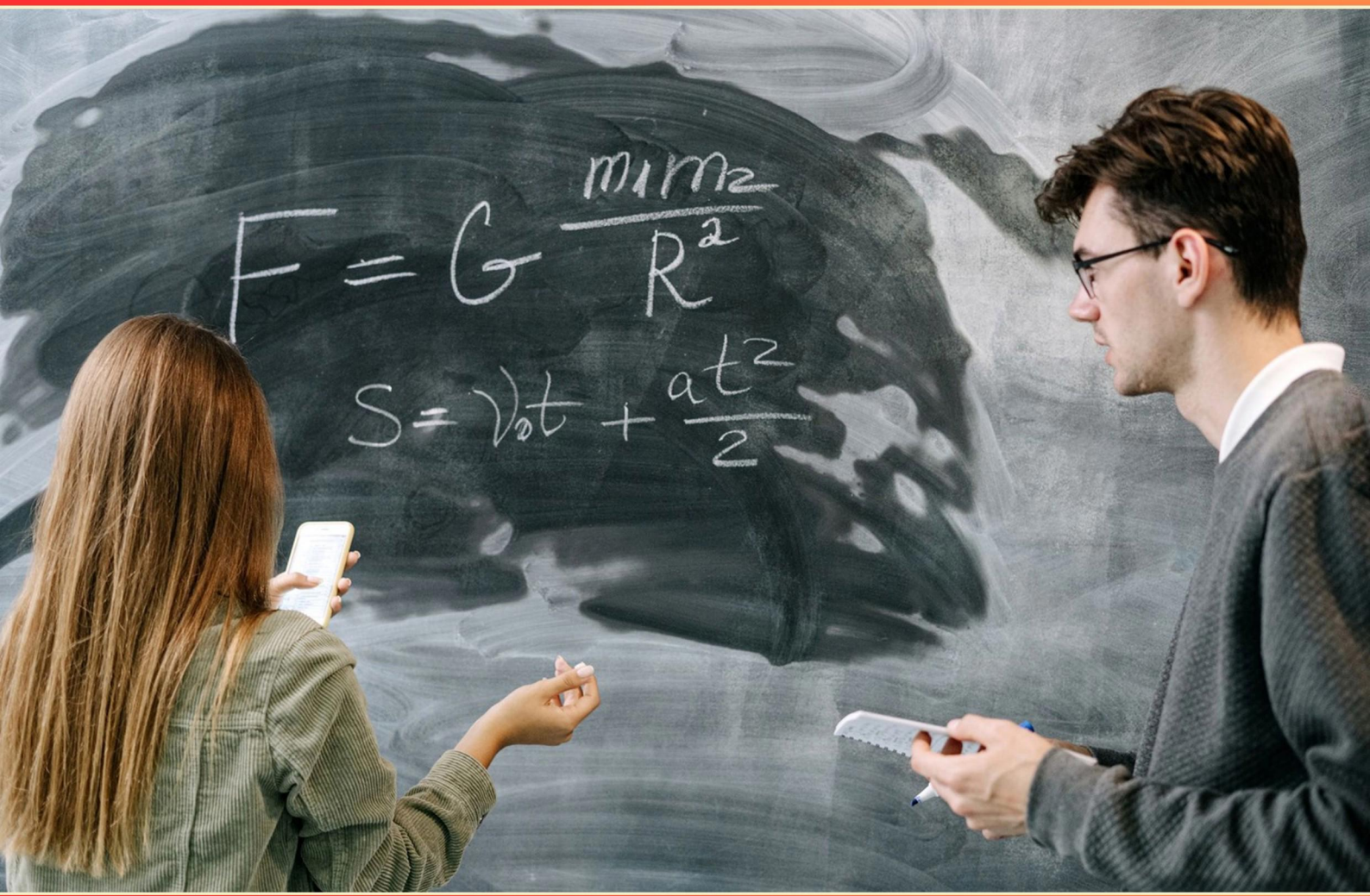
YEAR 10 FORCE AND MOTION PRACTICE TEST (SAMPLE)

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. Why does weight change with location but mass does not? (Moon example)

A. Mass remains constant; weight changes with gravitational field strength; on the Moon gravity is weaker, so weight is less.

B. Mass changes with location; weight remains constant.

C. Mass increases with altitude; weight stays the same.

D. Mass and weight both change with location equally.

2. In a one-dimensional collision between two carts, which quantities are conserved in a perfectly elastic collision?

A. Only momentum is conserved.

B. Momentum and kinetic energy are conserved in an ideal elastic collision.

C. Neither momentum nor kinetic energy is conserved.

D. Kinetic energy is conserved but momentum is not.

3. What term describes the distance travelled over the time taken?

A. Distance

B. Time

C. Acceleration

D. Speed

4. Momentum is defined as p = m v. On which quantities does momentum depend?

A. Mass and velocity.

B. Time and acceleration.

C. Mass and position.

D. Force and velocity.

5. How many forces act on a stationary object?

A. One

B. Three

C. Four

D. Two

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6. Which statement correctly describes the difference between mass and weight?

A. Mass is the amount of matter; weight is the gravitational force on the mass.

B. Mass and weight are the same quantity measured in newtons.

C. Weight is the amount of matter; mass is the gravitational force.

D. Mass is measured in newtons; weight is measured in kilograms.

7. What is the direction of the support force on an object resting on a surface?

A. Left

B. Right

C. Downwards

D. Upwards

8. If height doubles, gravitational potential energy relative to the ground changes by what factor?

A. Halves

B. Doubles

C. Triples

D. Quadruples

9. At terminal velocity, what happens to the net force on the falling object?

A. Net force increases.

B. Net force equals weight.

C. Net force is zero.

D. Net force equals drag.

10. Balanced forces have what in force diagrams?

A. Unequal Length Arrows

B. Arrows in Opposite Directions

C. Equal Length Arrows

D. Arrows of the Same Color

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Answers

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

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Explanations

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1. Why does weight change with location but mass does not? (Moon example)

A. Mass remains constant; weight changes with gravitational field strength; on the Moon gravity is weaker, so weight is less.

B. Mass changes with location; weight remains constant.

C. Mass increases with altitude; weight stays the same.

D. Mass and weight both change with location equally.

Weight is the gravitational force acting on an object, while mass is the amount of matter the object contains. The two are related by the equation F = m g, where F is weight, m is mass, and g is the local gravitational field strength. Mass stays the same no matter where you are, but g changes with location. On the Moon, gravity is weaker than on Earth, so the same mass experiences a smaller pull, meaning a smaller weight. For example, a person with mass stays constant, but their weight on the Moon is much less than on Earth because g is smaller there. This is why weight varies by location while mass does not.

2. In a one-dimensional collision between two carts, which quantities are conserved in a perfectly elastic collision?

A. Only momentum is conserved.

B. Momentum and kinetic energy are conserved in an ideal elastic collision.

C. Neither momentum nor kinetic energy is conserved.

D. Kinetic energy is conserved but momentum is not.

In a perfectly elastic collision, both momentum and kinetic energy are conserved. The collision between the carts involves no external forces along the track, so the total momentum (the combined mass times velocity) before and after the collision stays the same. At the same time, no energy is lost to deformation, heat, or sound in an ideal elastic collision, so the total kinetic energy before equals the total kinetic energy after. That combination—momentum conservation from the internal impulses and kinetic energy conservation from the absence of energy loss—defines the ideal elastic case. The other descriptions miss one of these essential features: momentum alone ignores the energy bookkeeping, or kinetic energy alone ignores that momentum must also be preserved in the absence of external forces.

3. What term describes the distance travelled over the time taken?

A. Distance

B. Time

C. Acceleration

D. Speed

Speed is the rate at which distance is covered. When you divide the distance travelled by the time it takes, you obtain speed. This doesn't include direction—that would be velocity. For example, traveling 100 meters in 20 seconds gives a speed of 5 meters per second. Distance describes how far you went, time describes how long it took, and acceleration describes how quickly your velocity is changing.

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4. Momentum is defined as p = m v. On which quantities does momentum depend?

A. Mass and velocity.

B. Time and acceleration.

C. Mass and position.

D. Force and velocity.

Momentum depends on mass and velocity because it is the product p = m v. If you increase the mass while keeping velocity the same, momentum goes up; if you increase velocity with the same mass, momentum also goes up. Time, acceleration, position, or force don't set the current momentum directly (time and acceleration describe how momentum changes, and force relates to that change via F = dp/dt). In short, the current momentum is determined by how much matter there is (mass) and how fast it's moving (velocity).

5. How many forces act on a stationary object?

A. One

B. Three

C. Four

D. Two

Staying at rest happens when the total force on the object is zero. For a stationary object on a surface, gravity pulls downward while the surface pushes upward with a normal force. These two forces balance each other, so the net force is zero and there is no acceleration. That's why two forces are acting in this common scenario. If other interactions were present (like a push or friction), there could be more forces, but in the simple case of a stationary object on a surface, two forces balance to keep it at rest.

6. Which statement correctly describes the difference between mass and weight?

A. Mass is the amount of matter; weight is the gravitational force on the mass.

B. Mass and weight are the same quantity measured in newtons.

C. Weight is the amount of matter; mass is the gravitational force.

D. Mass is measured in newtons; weight is measured in kilograms.

Mass is the amount of matter in an object, which doesn't change with location. Weight is the gravitational force acting on that mass, so it can change if gravity changes. This is why the correct description is that mass is the amount of matter and weight is the gravitational force on that mass. Weight can vary with where you are (Earth, Moon, etc.) because gravity differs, while mass stays the same. Mass is measured in kilograms, and weight is measured in newtons (weight = mass × gravitational acceleration). The other choices mix up these ideas: mass and weight aren't the same quantity and aren't both measured in newtons; weight isn't the amount of matter; and the units are swapped in the remaining option.

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7. What is the direction of the support force on an object resting on a surface?

A. Left

B. Right

C. Downwards

D. Upwards

The normal (support) force is a contact force that acts perpendicular to the surface, pushing the object away from the surface. On a flat horizontal surface, this direction is straight upward, opposing the weight pulling the object downward. This upward push is why the object can rest without sinking. Left or right would be tangential directions related to other horizontal forces, and downward would imply the surface pushing into the object, which doesn't occur.

8. If height doubles, gravitational potential energy relative to the ground changes by what factor?

A. Halves

B. Doubles

C. Triples

D. Quadruples

Gravitational potential energy near Earth's surface scales linearly with height: PE = m g h. If you double the height, you replace h with 2h, giving PE′ = m g (2h) = 2 m g h, which is twice the original energy. This assumes mass and the gravitational field strength g stay constant. So the potential energy doubles when height doubles. The other options would require different changes in height or different g/mass values, which aren't the scenario here.

9. At terminal velocity, what happens to the net force on the falling object?

A. Net force increases.

B. Net force equals weight.

C. Net force is zero.

D. Net force equals drag.

When an object falls in air, gravity pulls down and air drag pushes up. The net force is the downward weight minus the upward drag (mg − D). As speed increases, drag grows until it equals the weight. At that point, the forces balance and the net force is zero, so there is no further acceleration and the velocity remains constant—the terminal velocity. So, the net force at terminal velocity is zero.

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10. Balanced forces have what in force diagrams?

A. Unequal Length Arrows

B. Arrows in Opposite Directions

C. Equal Length Arrows

D. Arrows of the Same Color

Balanced forces mean the total force on an object is zero, so the force vectors in a diagram must cancel each other out. The length of an arrow shows how strong the force is, and the direction shows where it acts. For balance you need equal magnitudes in opposite directions, so the arrows are the same length and point opposite ways. Color doesn't carry a physical meaning in these diagrams. If the arrows were different lengths or not opposite, there would still be a net force.

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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://yr10forceandmotion.examzify.com

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

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