# Objectives:

• Deﬁne force, and give examples of forces.

• Describe how forces combine and affect motion.

• Describe friction and how it opposes motion.

• Identify types of friction.

• Deﬁne gravity.

• State Newton’s law of universal gravitation.

• Explain how gravity affects the motion of objects.

• Deﬁne elasticity and elastic force.

• Describe uses of elastic force.

• State Newton’s ﬁrst law of motion.

• Deﬁne inertia, and explain its relationship to mass

• State Newton’s second law of motion.

• Identify the relationship between acceleration and weight

• State Newton’s third law of motion.

• Describe momentum and the conservation of momentum.

# Examples of Test questions

1. Explain Newton's idea of why the apple falls to earth.
2. Explain why the moon does not fall to earth.
3. Explain how the earth is falling.
4. State Newton's law of universal gravitation.
5. Can a volkswagon have the same momentum of a semi truck? Explain.
6. Why are cars made with bumpers that can be pushed during a crash?
7. State the law of conservation of momentum.

Instructions:  Answer the following questions.  Consider how each of these questions relates to Newton's first law when you answer, and answer in terms of this law.

1. You are riding in a car and the driver slams on the brakes.  What happens to you? Why?
2. You are in a car and go around a corner very fast.  What happens to you?  Why?
3. You give a wagon a push on a level surface.  What happens to the wagon?  Why?

Instructions:  Answer the following questions.  Consider how each of these questions relates to Newton's third law when you answer, and answer in terms of this law.

1. A diver dives off of a raft - what happens to the diver?  The raft?  How does this  relate to Newton's Third Law?
2. What action-reaction forces are involved when a rocket engine fires?  Why doesn't a rocket need air to push on?
3. What forces are acting on a book sitting on a table?  Are action-reaction forces involved in this situation?
4. How does an object’s mass affect its inertia?
5. Describe how the net force acting on an object is related to its acceleration.
6. If the mass of an object increases, how is its acceleration affected, assuming the net force acting on the object remains the same?
7. What is weight?
8. If you double the velocity of a moving object, how is its momentum affected?
9. . Explain why friction occurs.
10. Compare and contrast the four types of friction described in this lesson.
11. Explain why the moon keeps orbiting Earth.
12. Describe how elastic force and elasticity are different.
13. What is a newton?
14. What is net force?
15. Describe how balanced forces and unbalanced forces affect motion.