National Institute of Open Schooling
Secondary Course: Science and Technology
Lesson 10 – Force and Motion
Worksheet-10

1. Though a force is not visible; its effect can be seen or experienced. Observe your surroundings and mention different kind of effects of force on different objects.

2. Write an activity for understanding the concept of balanced and unbalanced forces. Based on observations of above activity, differentiate between balanced and unbalanced forces.

3. There are three solids made of different materials such as fiber, plastic and wood having the same shape and same volume. Which of them would have highest inertia and why?

4. While traveling in a train, keep three balls of the same size but of different materials, i.e. marble, rubber and iron on the smooth floor of moving train. The brakes are applied suddenly to stop the train. Observe, will the balls start rolling or will stay at same position? If the balls start rolling, in which direction it will move? Support your answer with suitable reasons.

5. Why a fielder in a game of cricket pulls his hands backwards after catching a fast moving cricket ball? It's an example of second law of motion. In our everyday life we see many applications of second law of motion. Observe your surroundings and give examples of applications of second law of motion in day to day life.

6. Using second law of motion, derive the relation between force and acceleration. A bullet of 10g hits an object with the speed of 130 ms^{-1} and gets embedded after travelling 5 cm. Calculate-
   The resistive force exerted by the sand on the bullet
   The time taken by the bullet to come to rest

7. A book exerts a force of 2N downwards, into a chair that exerts a force of 5N downwards to the floor it stands on. What is the force that the floor exerts upwards on the chair? Also describe the phenomenon of a seat belt keeping someone restrained in their seat during a car crash. In other words, why did the person not leave their seat?

8. Two cars, one of mass 500kg and another of mass 250kg, collide head on. Describe which car will experience more force and more acceleration with respect to the other car and why?

9. First law of Motion or Law of Inertia states that "an object continuous to be in a state of rest or of uniform motion in a straight line unless it is acted upon by a net external force". Now roll a ball along the ground and observe its motion. Explain, why ball comes to rest after travelling some distance without any external force acted upon it?

10. Observe your surroundings and give two examples of friction that are useful and two examples of friction that are not useful. In case of useful how you will increase friction? In case of not useful, write the method to reduce friction.