# UNIT 3 FORCES AND THEIR EFFECTS.

## Activities

Work in pairs and discuss the following situations. Then, answer the questions below. Compare answers with the rest of your class.

**1.-** Answer the questions below:

*a)* What are the effect of forces?

*b)* If you kicked a ball on a field that had no gravity what would the ball's trajectory be?

*c)* What forces act on a book that is on top of the table?

*d)* What material would you use to make a model figure: plastic or elastic?

*e)* Give two examples of elastic objects, plastic objects and rigid solids.

**2.-** Are the following statements true or false? Explain why.

*a)* Force and acceleration are directly proportional.

*b)* The newton is the unit of mass in the International System of units.

*c)* If an object changes its speed, it means that an uncompensated force is acting on it.

*d)* A newton is the force required to move an object with a mass of 1 kg with an acceleration of 1 $m/s^2$.

*e)* If an object is in motion and no force is acting on it, we say that it has uniform rectilinear motion with constant speed.

**3.-** Listen and complete the sentences. Then say if they are true or false.

*a)* A _____ force applied to an object produces _____ in the object that is directly proportional to its _____.

*b)* X

*c)* If an object is moving and no outside _____ is acting on it, it moves with _____ _____ motion.

*d)* A force of 1 _____ applied to a mass of 1 kg causes an acceleration of _____ _____.

*e)* X

**4.-** Decide which of the following formulas is correct. Give reasons for your answer.

*a)* F x d

*b)* m = F x a

*c)* a = F x m

*d)* a = F / m

**5.-** A force of 25 N is applied to an object with a mass of 5 kg. Calculate the acceleration the object will gain.

**6.-** A trolley gains an acceleration of 0,8 $m/s^2$ when a force of 2,8 N is applied to it. Calculate its mass.

**7.-** A constant force of 500 N is applied to an object with a mass of 250 kg that is in a state of rest. Calculate:

*a)* The acceleration it acquires.
*b)* Its speed after 3 minutes.

**8.-** Two sisters are pulling on each end of a box because they want to keep it. If one of the sisters is pulling on one end of the box parallel to the ground with a force of 3 N and the other sister is pulling on the other end of the box parallel to the ground with a force of 3,5 N;

*a)* Is the box in equilibrium? Why? / Why not?
*b)* Will the box remain stationary? Why? / Why not?
*c)* Draw a simple diagram showing the situation with arrows.