

UNIT 2**MOTION AND SPEED.****Activities**

1.- A girl leaves her house at 9,30 h to go to the sports centre and play a game of basketball that starts an hour later.

- a) Will she arrive on time if she walks at 30 m/min and the sports centre is 2 km away from her house?
- b) How quickly must she walk to reach the sports centre in 45 minutes?

2.- Which speed is greater than the other?.

- a) 90 km/h or 24 m/s.
- b) 36 km/h or 12 m/s.
- c) 72 km/ or 18 m/s.

3.-  Calculate the average speed of the following. Listen and check.

- a) An athlete who runs 100 m in 10 s.
- b) A lorry that travels 320 km in 4 hours.

4.-  Listen and write the correct symbols from the terms you hear.

5.- Train A leaves the station. Five minutes later, train B leaves the same station and travels in the same direction as train A at the same speed. They both travel without changing their speed along the same train track.

- a) Will trains A and B ever meet?
- b) Is train A in motion compared with the station?
- c) Is train B in motion compared with train A?
- d) Is the station in motion compared with train A?

6.- A moving object completes the first part of a trajectory with a constant speed of 25 km/h. It travels along the second part of the trajectory at a constant speed of 435 m/min. This object takes 3 min. to cover the first part and 5 min. to cover the second part.

- a) What is the total distance covered?
- b) What is the average speed?

7.- In Río de Janeiro 2016 Olympic Games, Usain Bolt run 100 m in 9,80 s and 200 m in 19,79 s.

- a) What was the average speed in each race? Express the results in km/h.
- b) Draw a s-t graph and compare both situations.

8.- A speed racing car leaves a state of rest and moves with uniformly accelerated rectilinear motion. After 1 second it reaches a speed of 5 m/s.

- a) What is the acceleration of the object?
- b) How fast is it moving after 10 seconds?
- c) According to a v-t graph, how far has it travelled after 10 seconds?

9.- A stone that is dropped from a tower takes 4 seconds to reach the ground. The acceleration of free fall is $g = 9,8 \text{ m/s}^2$.

- a) What will the stone's speed be when it reaches the ground?
- b) How tall is the tower?

10.-  Copy and complete the following sentences in your notebook. Listen and check.

- a) The displacement of a moving object is always a _____ line.
- b) In URM, the trajectory is _____ and the same as _____. Speed is _____.
- c) In UARM, the _____ is straight, _____ is constant and positive, and _____ is variable.

11.-  Listen and complete the sentences in your notebook. Then ask and answer the questions *c*, *d* and *f* with a partner.

- a) An object moves with uniformly accelerated _____ motion (UARM) and travels 100 m in 5 seconds. What is its _____?
- b) A vehicle travels at a _____ of 80 km/h. It accelerates and has a _____ acceleration of 2 m/s^2 . How far will it have travelled after 30 minutes?
- c) At a specific moment, a _____ reaches a speed of 16 m/s. After 10 seconds, its speed is 25 m/s. What is the object _____ acceleration?
- d) An object leaves a position of _____ and moves in a _____ line with a constant _____ of 2 m/s^2 . How far will it travel after 15 minutes?
- e) A body moves from a position of rest and has a constant acceleration of 5 _____. What is the acceleration in _____ and in _____? What will its speed be after 5 seconds?
- f) An object moves from a position of rest with _____ accelerated rectilinear _____. After the first second its speed is 5 m/s. What is the object's acceleration? What will its _____ be after 10 seconds after it starts to move?

12.-  Work with a partner and do the following calculations. Listen and check.

- a) The speed of boats is expressed in knots (1 knot = 1 maritime mile/hour and 1 maritime mile = 1,852 km). How fast is a boat travelling in km/h if it has a speed of 35 knots?
- b) The speed of light is 300 000 km/s. What is the speed of light in km/h and in m/s?
- c) The speed of sound through air is 340 m/s. What is the speed of sound in km/h?