

Motion

Printable revision sheet — Galaxscia

LEVEL 1

What is motion?

An object is in **motion** when it changes position over time relative to another object chosen as a reference. This object of comparison is called the **frame of reference**.

Examples : - A car drives along a road: the road is chosen as the frame of reference. - A plane flies in the sky: the ground is chosen as the frame of reference.

The trajectory

The trajectory is the set of all the positions taken by an object during its motion. It traces a line followed by the moving object.

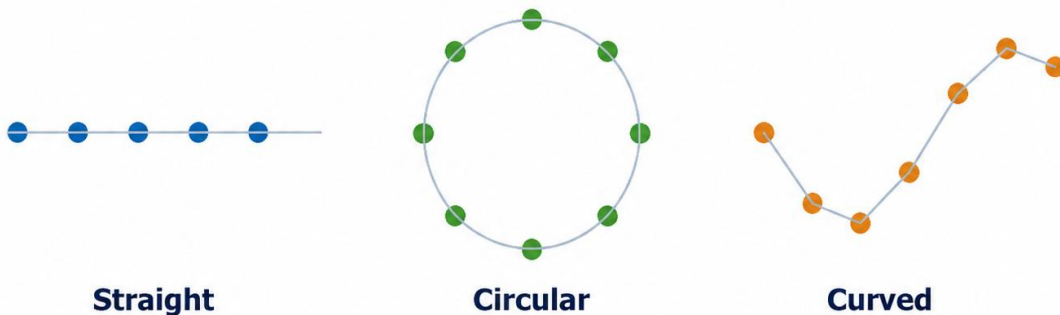
It can be:

Rectilinear: shaped like a straight line

Circular: shaped like a circle

Curvilinear: shaped like any curve

Three types of trajectories



Key points — revision questions

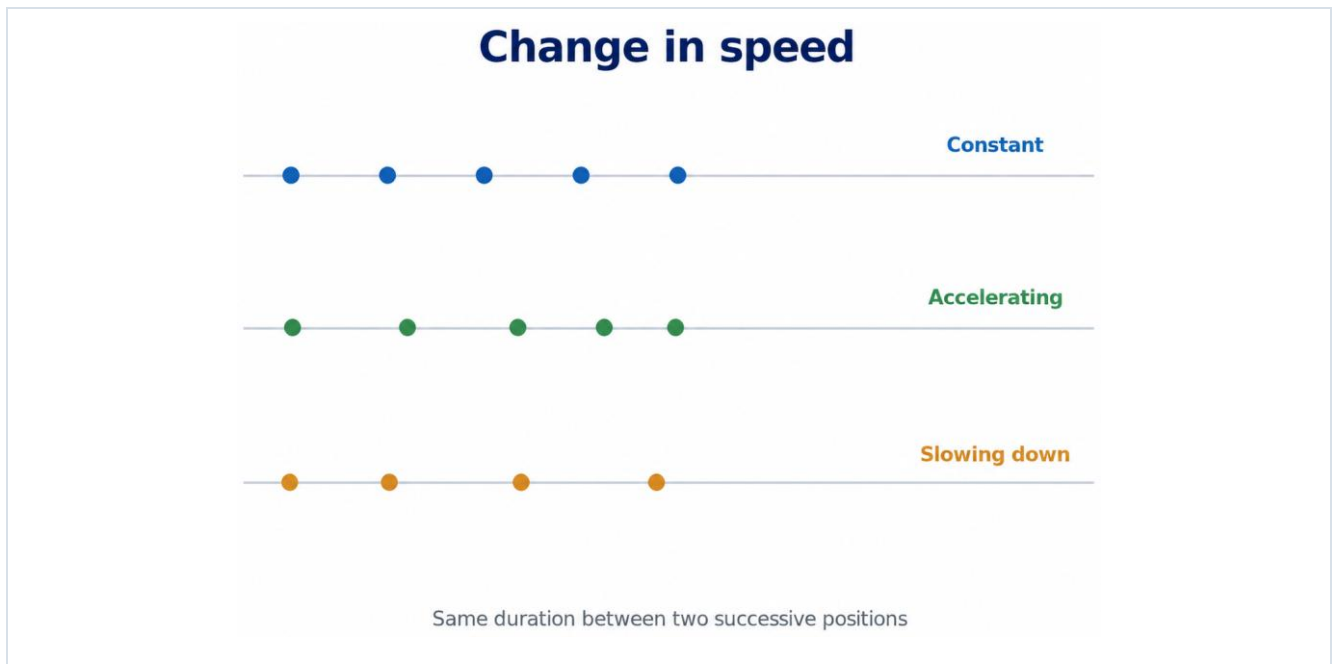
What is a frame of reference? Give an example.

What is a trajectory? Name its three main types.

When can we say that an object is in motion?

LEVEL 2

How speed changes.



A motion is uniform if the speed stays constant

(e.g. a car driving steadily at 50 km/h).

A motion is accelerated if the speed increases

(e.g. a car speeding up).

A motion is decelerated / slowed down if the speed decreases

(e.g. a car braking).

Key points — revision questions

What is the difference between uniform motion and accelerated or slowed motion?

What happens to the gap between the object's positions during accelerated motion?

LEVEL 3

Average speed

To describe a motion, we use its **speed**. The average speed is given by the formula:

$$v = d/t$$

where:

d is the distance travelled

t is the duration of the journey.

Example : If a car travels 120 km in 2 h, then $v = 120/2 = 60$ km/h

Average speed

$$v = d / t$$

distance d



time t

$$1 \text{ m/s} = 3.6 \text{ km/h}$$

Units of speed

The official unit of speed in the International System is the **metre per second (m/s)**. In everyday life, the **kilometre per hour (km/h)** is often used.

Conversion: $1 \text{ m/s} = 3.6 \text{ km/h}$

Key points — revision questions

What is the formula for average speed? What do the letters stand for?

What is the official unit of speed? Which unit is most often used in everyday life?

How do you convert a speed from m/s into km/h?

LEVEL 4