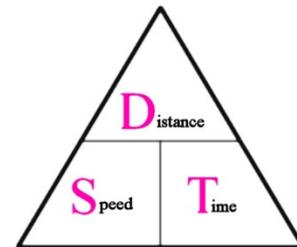


SPEED

If the overall, resultant force on an object is not zero, its motion changes and it slows down, speeds up or changes direction.



$$\text{Speed} = \text{Distance} \div \text{Time}$$

Keywords

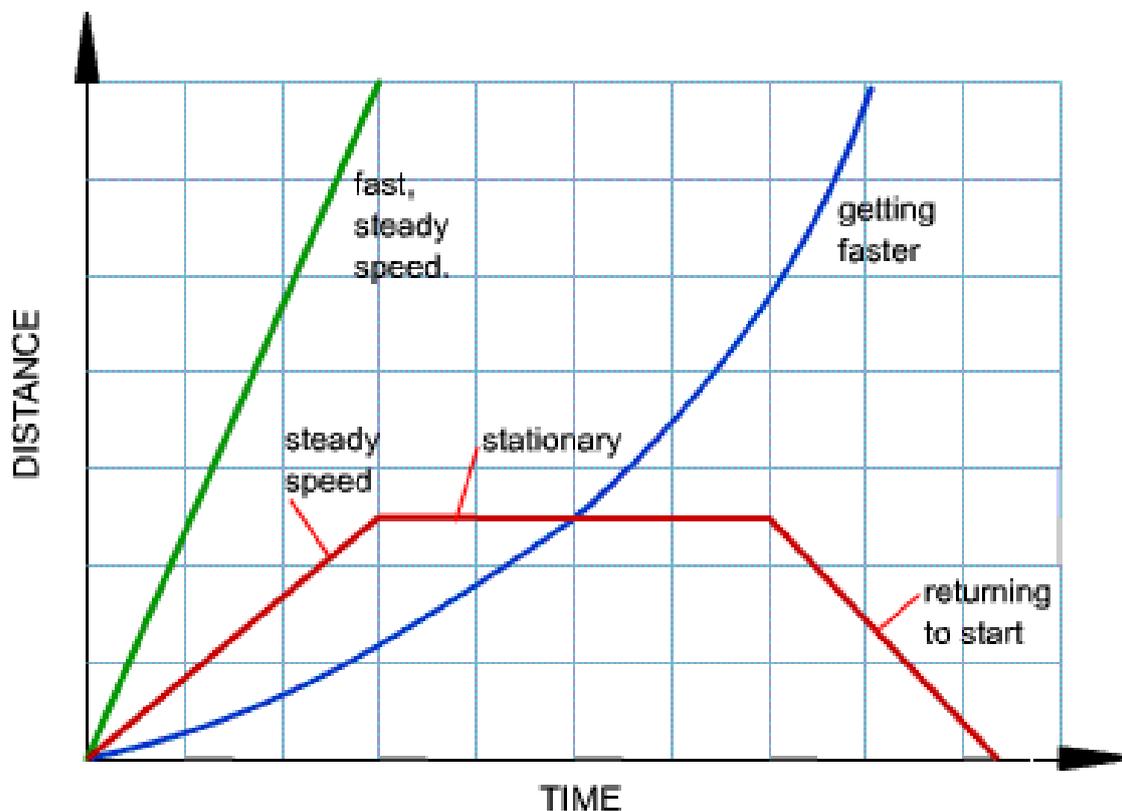
Speed: How much distance is covered in how much time.

Average speed: The overall distance travelled divided by overall time for a journey.

Relative motion: Different observers judge speeds differently if they are in motion too, so an object's speed is relative to the observer's speed.

Acceleration: How quickly speed increases or decreases.

A straight line on a distance-time graph shows constant speed, a curving line shows acceleration. The higher the speed of an object, the shorter the time taken for a journey.



GRAVITY

Mass and weight are different but related.

Mass is the amount of matter in an object and is measured in kilograms (kg).

Weight is a force caused by the pull of gravity acting on a mass. It is measured in Newton's (N).

Gravity is an attractive force. It acts between all objects that have mass.

All objects produce a gravitational force. This is very large for huge masses such as planets.

Force also pulls the Earth towards you!

Gravity holds planets and moons in orbit around larger bodies (planets and stars).

Gravity on Earth = 10 N/kg. On the moon it is 1.6 N/kg.

Keywords

Weight: The force of gravity on an object (N).

Non-contact force: One that acts without direct contact.

Mass: The amount of stuff in an object (kg).

Gravitational field strength, g: The force from gravity on 1 kg (N/kg). **Field:** The area where other objects feel a gravitational force.

$$\begin{matrix} \text{Weight} & = & \text{Mass} & \times & \text{Gravitational Field Strength} \\ \text{(N)} & & \text{(kg)} & & \text{(N/kg)} \end{matrix}$$

| Subject | Year 7 Forces |
|---|----------------------|
| Complete this equation: Speed = <input type="text"/> ÷ <input type="text"/> | Distance ÷ Time |
| We travel 100m in 5s. What is our average speed? | 100m ÷ 5s = 20m/s |
| Key Word Definition. The amount of matter in an object. | Mass |
| Key Word Definition. The force of gravity acting on a mass. | Weight |
| Distance-Time Graph. What does a straight diagonal line show? | Steady speed |
| Distance-Time Graph. What does a straight horizontal line show? | Stationary |
| What force pulls you down to Earth? | Gravity |
| We travel for 50s and go 25m. What is our average speed? | 25m ÷ 50s = 0.5m/s |
| We travel at 15m/s for 6s. How far do we go? | 15m/s x 6s = 90m |
| We travel for 2s at 330m/s. How far do we go? | 330m/s x 2s = 660m/s |
| Complete this equation: Distance ÷ Speed = <input type="text"/> | Time |
| We travel at 60m/s for 240m. How long does it take? | 240m ÷ 60m/s = 4s |
| The amount of matter in an object is measured in what units? | Kilograms (kg) |
| The force of gravity acting on a mass is measured in what units? | Newtons (N) |
| Distance-Time Graph. What does a steeper diagonal line show? | Faster steady speed |
| Why is gravity bigger on the Earth than the Moon? | Earth is bigger |
| Mass (kg) X Gravitational Field Strength (N/kg) = <input type="text"/> | Weight (N) |
| How could we simplify the phrase Gravitational Field Strength? | GFS |
| GFS on Earth is 10N/kg. What is the weight of a 50kg person? | 50kg X 10N/kg = 500N |
| GFS on the Moon is 1.6N/kg. What is the weight of a 10kg dog? | 10kg X 1.6N/kg = 16N |

| Subject | Year 7 Forces |
|---|---------------|
| Complete this equation: Speed = <input type="text"/> ÷ <input type="text"/> | |
| We travel 100m in 5s. What is our average speed? | |
| Key Word Definition. The amount of matter in an object. | |
| Key Word Definition. The force of gravity acting on a mass. | |
| Distance-Time Graph. What does a straight diagonal line show? | |
| Distance-Time Graph. What does a straight horizontal line show? | |
| What force pulls you down to Earth? | |
| We travel for 50s and go 25m. What is our average speed? | |
| We travel at 15m/s for 6s. How far do we go? | |
| We travel for 2s at 330m/s. How far do we go? | |
| Complete this equation: Distance ÷ Speed = <input type="text"/> . | |
| We travel at 60m/s for 240m. How long does it take? | |
| The amount of matter in an object is measured in what units? | |
| The force of gravity acting on a mass is measured in what units? | |
| Distance-Time Graph. What does a steeper diagonal line show? | |
| Why is gravity bigger on the Earth than the Moon? | |
| Mass (kg) X Gravitational Field Strength (N/kg) = <input type="text"/> . | |
| How could we simplify the phrase Gravitational Field Strength? | |
| GFS on Earth is 10N/kg. What is the weight of a 50kg person? | |
| GFS on the Moon is 1.6N/kg. What is the weight of a 10kg dog? | |

| Subject | Year 7 Forces |
|---|---------------|
| Complete this equation: Speed = <input type="text"/> ÷ <input type="text"/> | |
| We travel 100m in 5s. What is our average speed? | |
| Key Word Definition. The amount of matter in an object. | |
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