Physics

Motion forces and conservation of energy

Distance, displacement, speed and velocity

To understand the difference between distance and displacement and speed and velocity you must first understand the difference between scalar quantities and vector quantities

Vector have the magnitude and direction

example of vector quantities are

- **Force**
- **Velocity**
- **Displacement**
- **Weight**
- **Acceleration**
- **momentum**

Some quantities only have magnitude no direction

those quantities are called scalar quantities

example

- **Speed**
- **Distance**
- **Mass**
- **Energy**
- **Temperature**

- time

Velocity is vector but speed is scalar

Two objects can move at same speed but have different velocity If they move in different directions

Distance is scalar, displacement is vector

- **Distance is how far an object moves and it is scalar quantity so direction does not matter**
- **Displacement is a vector quantity because**
- **Because it my years the distance moved, the direction moved in a straight line from the starting point to a finishing point**
- **For example**
- **the plane flew 50 m north direction can be given using words or using bearing**
- **If you walk 5 M north and 5 M south the distance travelled will be 10m and displacement 0m**

Speed and velocity both