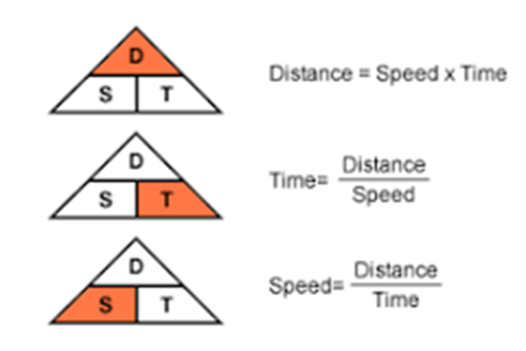
**IGCSE Physics Year10**

**Forces and Motion**

**Movement and Position**

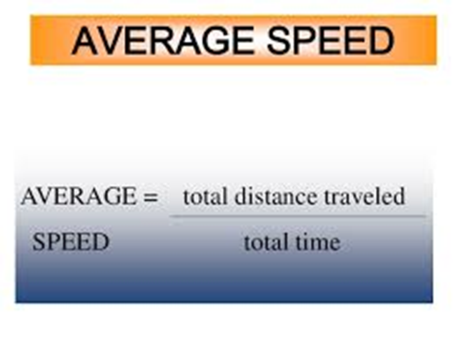
**What is speed?**

The speed of an object is how fast or slow it's moving. You can calculate speed using the equation **'speed = distance/time**'. Distance-time graphs illustrate how an object moves. They show how the distance moved from a starting point changes over time.



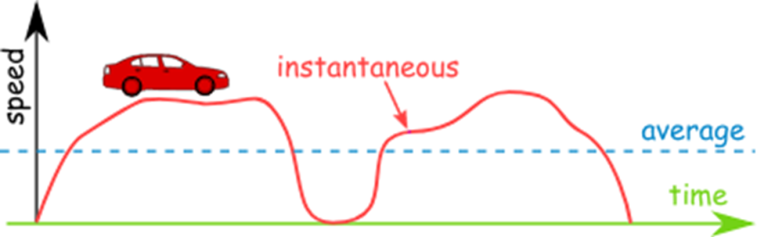
What is **average** speed?

Common units for metric system include meters per second (m/s), or kilometers per hour(km/h). As for your brand-new red sports car, your friend was exactly right in his calculation of the average speed. He used the distance traveled by the car (45 km) divided by elapsed time (1.25 hours). So regardless how many stops you had, your ‘average speed’ was Vav = 45/1.25 km/h



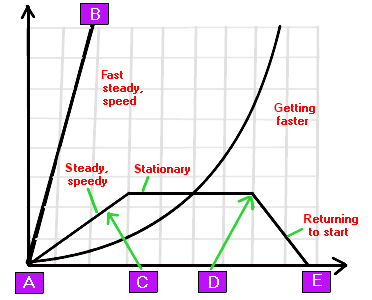
**Alternatively:**

Add the two speeds together. Then, divide the sum by two. This will give you the average speed for the entire trip. So, if Ben traveled 40 km/h for 2 hours, then 60 km/h for another 2 hours, his average speed is 50 km/h.



**Distance-time graphs**

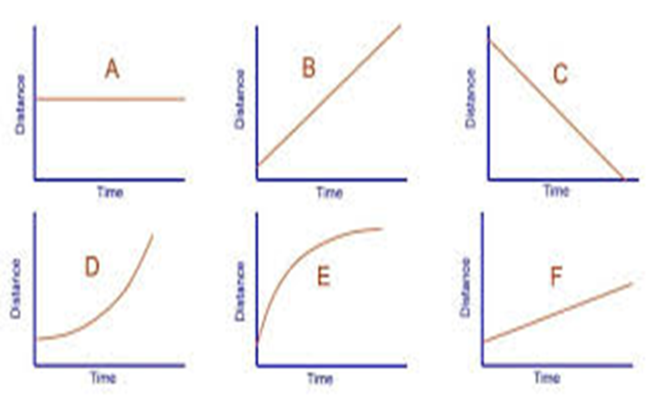
* The **gradient** of a **distance-time** graph represents the **speed** of an object. The velocity of an object is its speed in a particular direction. The slope on a **velocity-time** graph represents the acceleration of an object. The **distance** travelled is **equal to the area under a velocity-time graph**.



**Interpretation of the graphs**

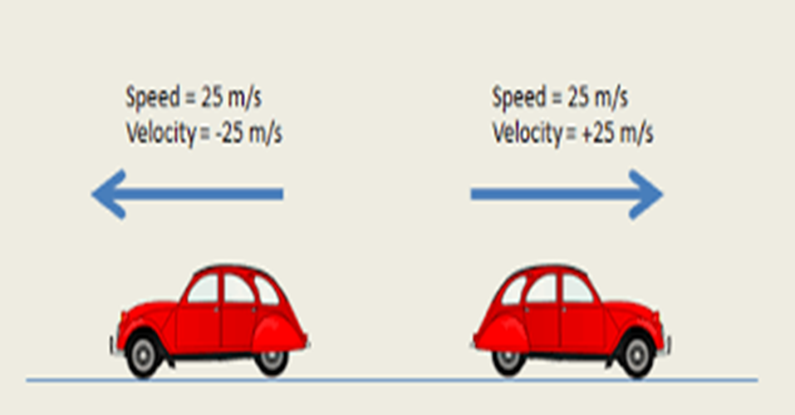
* A distance-time graph tells us how far the object moved with time.
* The steeper the graph, the faster the motion.
* A horizontal line means the object is not changing its position that means it is not moving.
* A downward sloping line means the object is returning to its initial position.

**Can you identify this motion?**



**What is the difference between speed and velocity?**

* The short answer is that velocity is the speed with a direction, while speed does not have a **direction**. Speed is a **scalar** quantity -- it is the **magnitude** of the velocity. Speed is measured in units of distance divided by time, e.g. miles per hour, feet per second, meters per second, etc....



**What is the difference between displacement and distance?**

* **Distance** is a **scalar** quantity that refers to "how much ground an object has covered" during its motion. **Displacement** is a **vector** quantity that refers to "how far out of place an object is"; it is the object's overall change in position.

