BBC BITESIZE

Velocity-time graphs

James Stewart: We can track my velocity with velocity time graphs.

Velocity time graphs show velocity on the y-axis against time on the x-axis.

Positive gradients represent an object's velocity increasing over time, known as acceleration.

A steeper line represents greater acceleration, and a less steep line represents smaller acceleration.

Flat lines represent an object keeping a constant velocity and negative gradients show the object's velocity reducing, or deceleration.

You can calculate the gradient of a velocity time graph to find acceleration.

Choose two points on the line.

Take the velocity of the second point minus the velocity of the first point and divide by time of the second point minus time of the first point to get acceleration in metres per second squared.

That's a lot of information, but don't worry, you can pause this video and rewatch as many times as you need.

Velocity is just speed in a given direction.

Here's a graph of an object moving at a constant speed.

We can calculate the distance travelled by multiplying the speed by the time, which equals the area under the graph.

If we find that area, we get the total distance travelled in metres for an object moving at a constant speed.

In a graph with a gradient, the speed is changing, so the distance equals the average speed times time.

This is also equal to the area under the graph,

But this time, you calculate this using the formula for a triangle, which is half times base times height.

Remember, velocity and speed are very similar, but velocity is just speed in a given direction.

(MUSIC)