

## Definitions and Concepts for WJEC (Wales) Physics GCSE

### Topic 2.1: Distance, Speed and Acceleration

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*Definitions in **bold** are for higher tier only*

*Definitions marked by '\*\*' are for separate sciences only*

**Acceleration due to Gravity:** The acceleration,  $g$ , experienced by an object travelling in free-fall. Its value at the surface of Earth is  $10 \text{ m/s}^2$ .

**Acceleration:** The rate of change of velocity. It can be calculated from the gradient of a velocity-time graph.

**Braking Distance:** The distance a vehicle travels under the braking force. This can be affected by adverse road and weather conditions as well as the condition of the vehicle.

**Displacement:** A measure of how far an object moves in a given direction. It is the straight line between the starting and finishing points and is a vector quantity.

**Distance-Time Graph:** A plot of how an object's distance changes over time. The gradient of the graph at any point, equals the object's speed at that point.

**Distance:** A measure of how far an object moves. It doesn't depend on direction and is therefore a scalar quantity.

**Human Reaction Time:** The time it takes for the brain to react to a stimulus. Typical human reaction times are in the range of 0.2-0.9 seconds.

**Scalar Quantities:** Quantities that only have a magnitude, not a direction.

**Speed:** A scalar quantity that is a measure of the rate of change of distance. The average speed is calculated by dividing the distance travelled by the speed taken.

**Stopping Distance:** The sum of the thinking and braking distances.

**Thinking Distance:** The distance a vehicle travels during the driver's reaction time. This reaction time may be affected by tiredness, drugs or alcohol.

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**Vector Quantities:** Quantities that have both a magnitude and direction. They are represented by an arrow, with the length representing the magnitude and the arrowhead representing the direction.

**Velocity-Time Graph:** A plot of how an object's velocity changes over time. The gradient at any point, equals the object's acceleration at that point. **The area under the graph equals the object's displacement.**

**Velocity:** A vector quantity that is a measure of the rate of change of displacement. It is the speed in a given direction.

