Section 9.5

Relating Speed to Distance and Time

Units for Distance and Time

Quantity Quantity Symbol Sample Unit Unit Symbol

|  |  |  |  |
| --- | --- | --- | --- |
| Distance | d | millimeter  centimeter  meter  kilometer | mm  cm  m  km |
| Time | T | second  minute  hour  year | s  min  h  a |
| Speed | V | meters per second  kilometers per hour | m/s  km/h |
| other |  |  |  |

Average Speed

Average speed – total distance divided by the total time for a trip or other extended time period

Average velocity – the resultant displacement divided by the total time from start to finish: the overall rate of change of position.

*Vav (average* velocity) = <(delta)d divided by <(delta)t

Vav average speed

< delta triangle is read as change in

<d change in distance

<t change in time

Manipulate the formulas to find the different variables:

V

<d

<t

Quantity symbols: Are italic letters used to represent quantities such as distance, time and speed. They are always typed in italic letters but can sometimes represent different values.

Instantaneous speed: Is the speed at which an object is travelling at a particular instant in time. It is measured by speedometers and radar guns.

Constant speed: When the instantaneous speed remains the same over a period of time. Few objects remain at constant speed because of friction

Friction: Force that exerts drag on and objects and affects velocity. Examples of friction include wind tires on the ground… other?

Sample problem:

Johnny roller blades to school going down Union street till the lights and then up King Street. This is a total distance of 4.5 km but could seem longer if the pavement is wet. He has to slow down twice to cross busy streets, but overall the journey to school takes 0.62h. What is Johnny’s average speed while rollerblading to school on dry ground.

Steps

1. Record the formula
2. Fill in the important and relevant information
3. Manipulate the formula
4. Solve for the required variable