MOTION

What Is Motion?

When does **motion** occur? If two birds are flying next to each other at exactly the same speed and same direction they have not moved relative to each other but they have moved relative to some object on the ground. There has to be a change in position between two objects to consider that motion has occurred.

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Speed a

When mot alculated by dividing . Velocity has an adc

To determine **velocity**, not only do you need to know the speed of an object but also its direction. Velocity tells you how fast an object is going and where it is going. Therefore, if two objects have the same speed, but are going in different directions, they will have different velocities.

Lesson Checkpoint:
What is the difference between speed and velocity?

Motion can be shown on a graph. To do this, data is plotted on two different axes. One axis plots travel time and the other plots distance traveled. To describe the speed of a car we take these two variables and say that the car is traveling at a certain number of miles per hour (mph).

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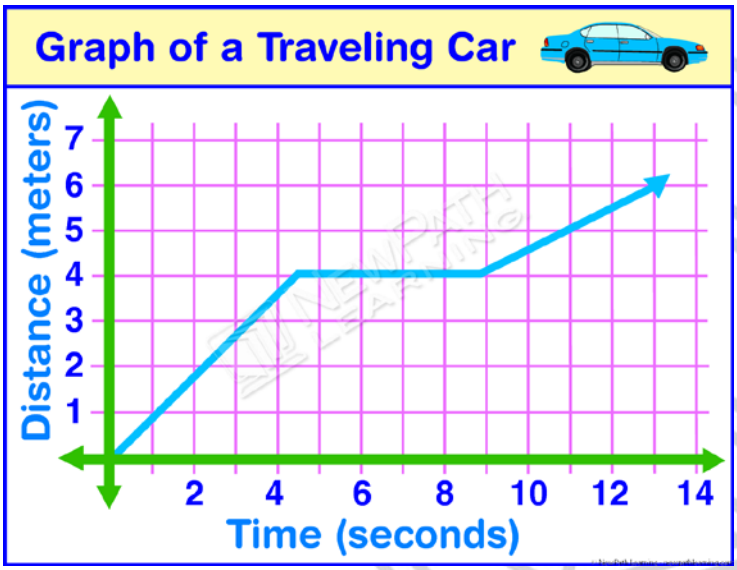

Acceleration

When there is a change in velocity, there is a change in acceleration. The rate o
accelerat locity, acceleratio nge in direction. V when it slows dow

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Even wher ion, acceleration has occurred. An example of this would be a car going around a circle at a constant speed. If acceleration does happen, it can be calculated by the formula shown below:

$$\text{acceleration} = \frac{\text{final speed - initial speed}}{\text{time}}$$

Lesson Checkpoint:
What is the relationship among speed, velocity, and acceleration?

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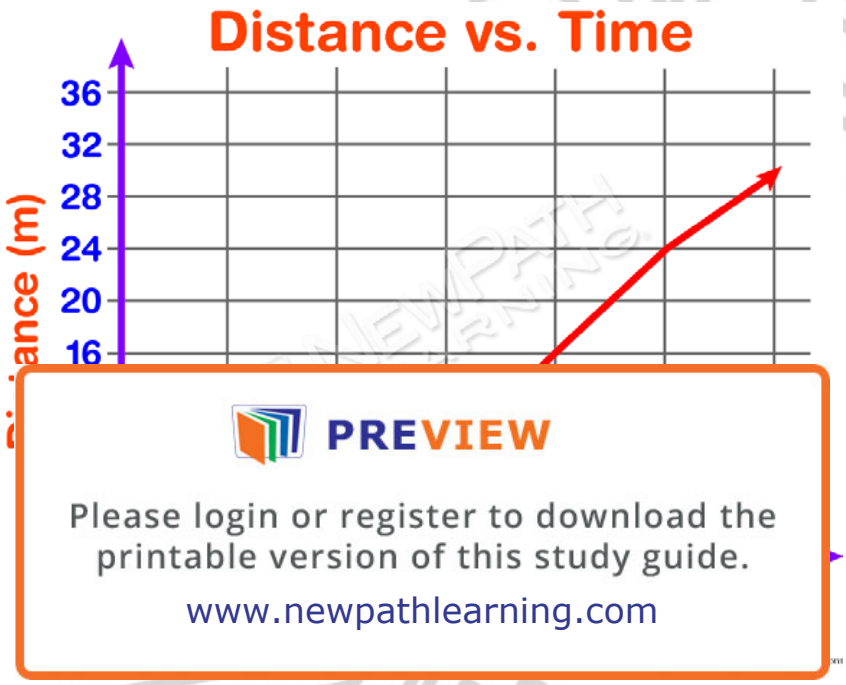
Acceleration can be plotted on a graph whose two axes are time and distance. In the graph shown below, we can tell that acceleration is occurring because the speed of the object is changing. This gradual increase in speed accounts for the change in the direction of the line on the graph. If the line was continuously straight, that would indicate no acceleration.



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