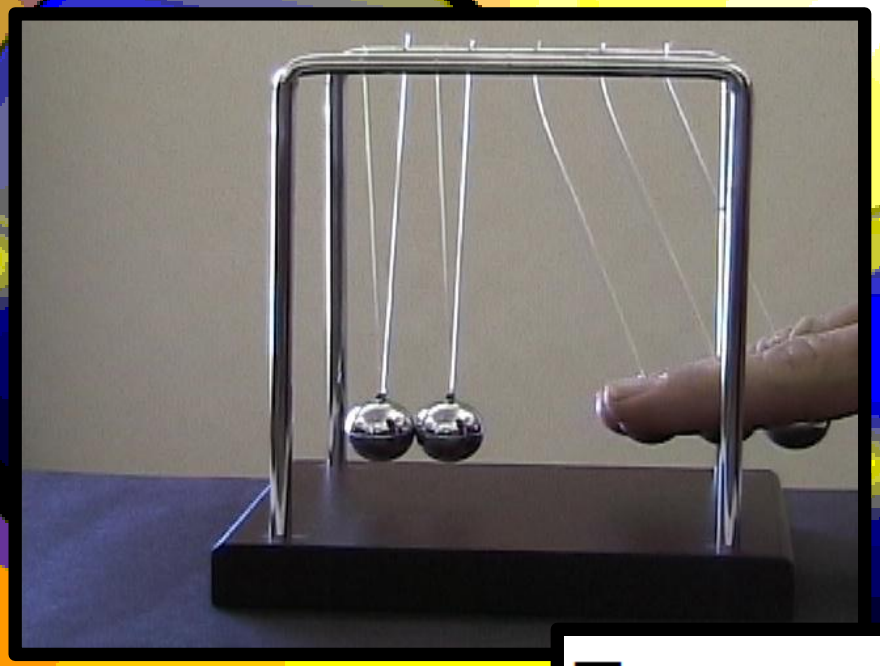
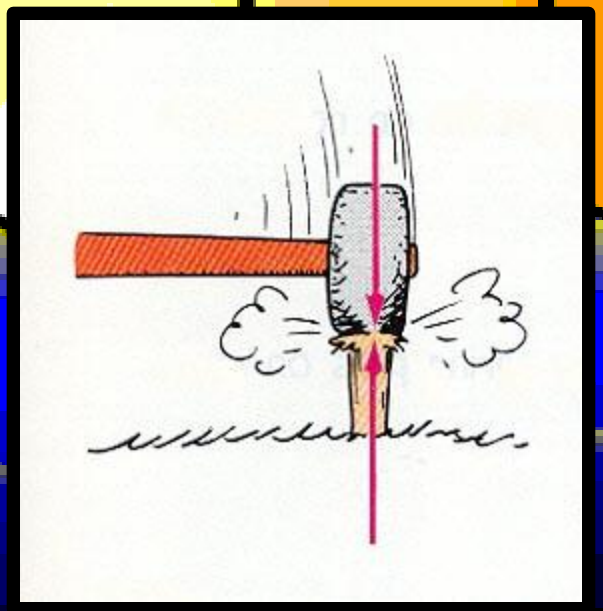
Chapter 14, Lesson 1 Newton's First Law – The Law of Inertia

force
inertia
friction
position
speed
Newton's First Law of Motion
velocity
acceleration
deceleration
incline
pendulum
gravity

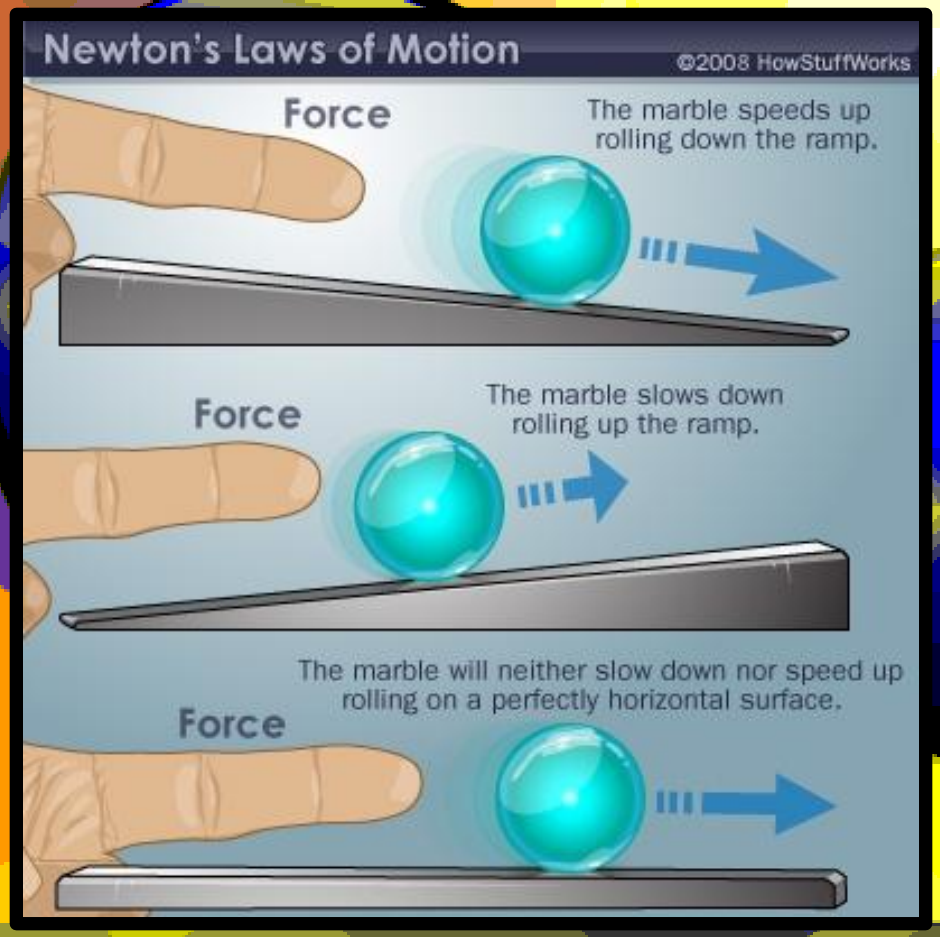
force – a pull or push that acts on an object

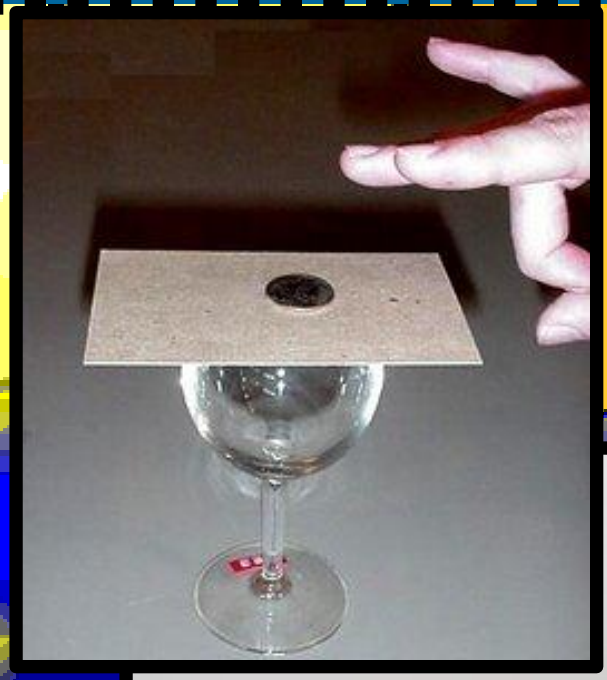


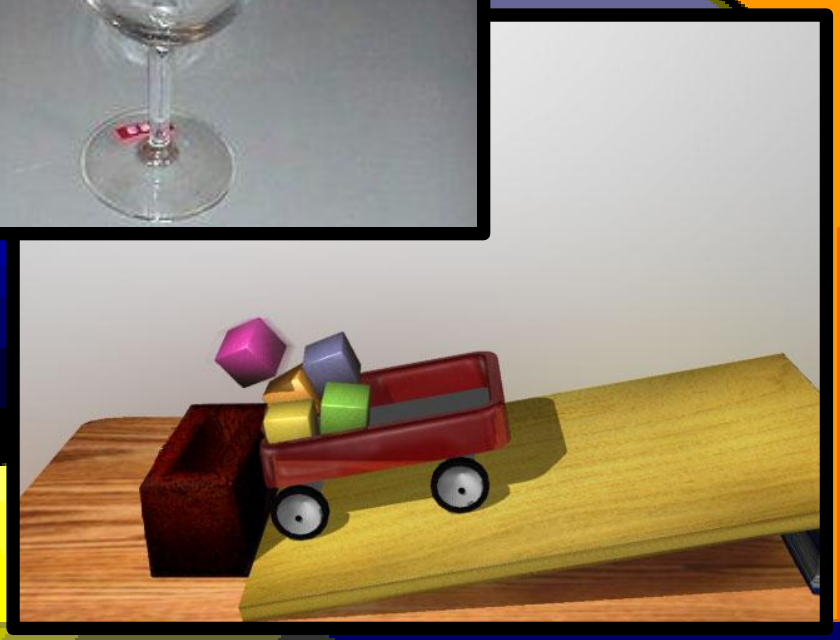


Forces are pushes or pulls

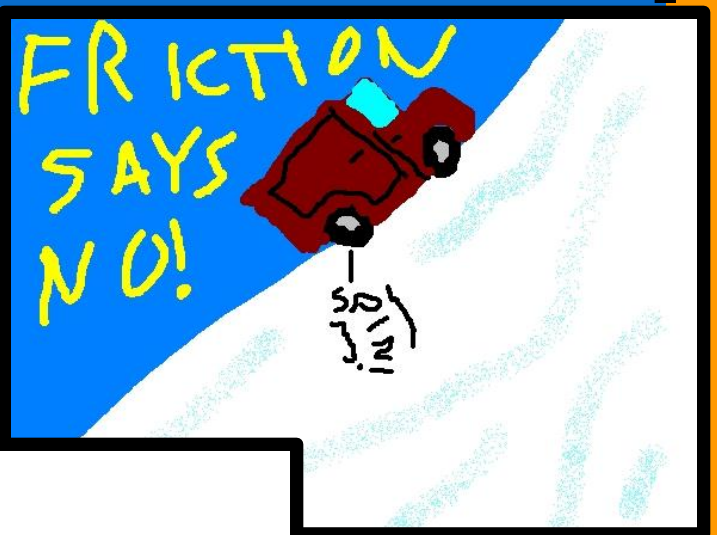
inertia – then tendency of an object to resist a change in its state of motion

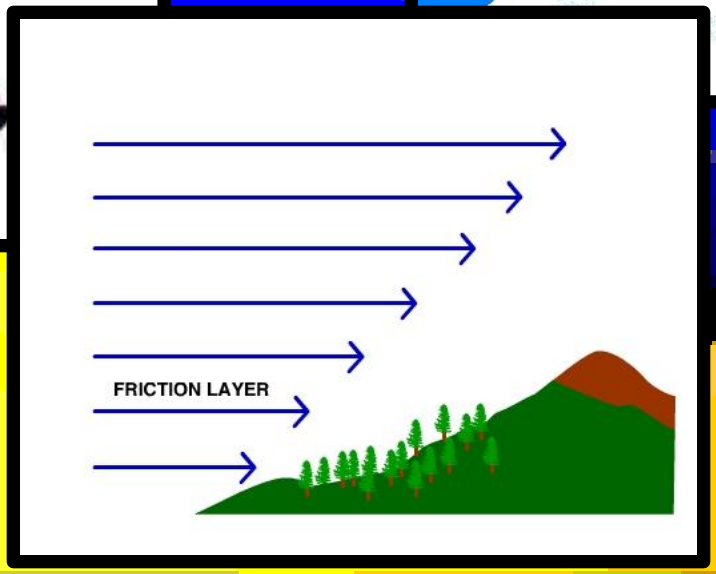




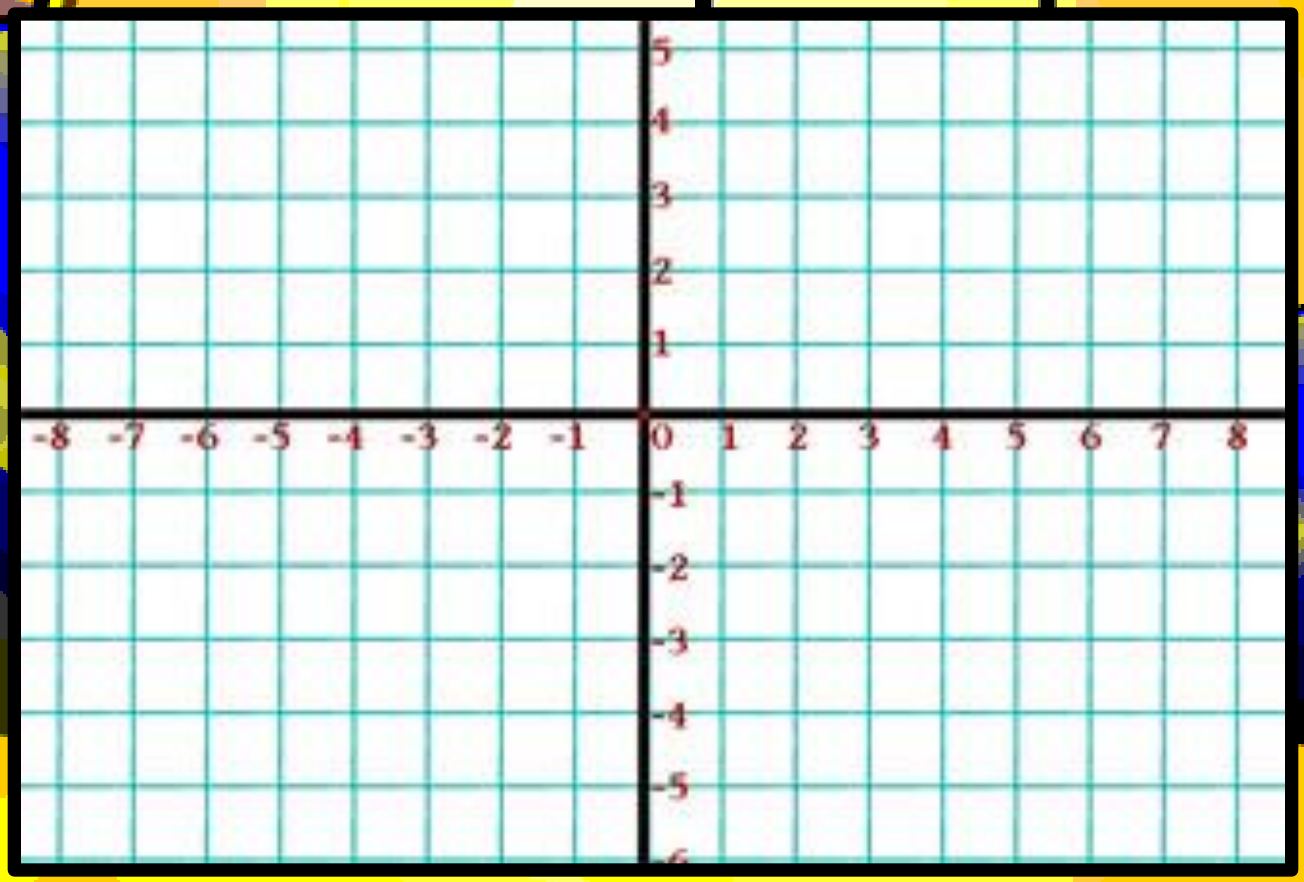


friction – a force that opposes the motion of one object moving past another





position – a comparison of an object's location on a map to other things on the map



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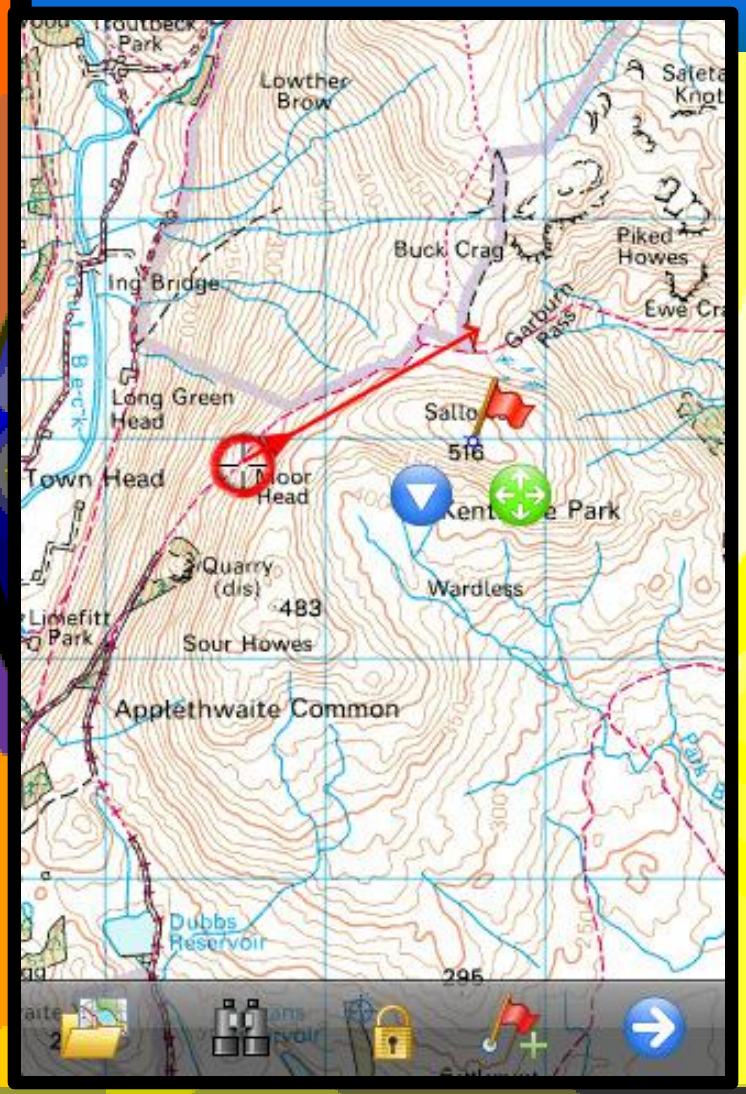
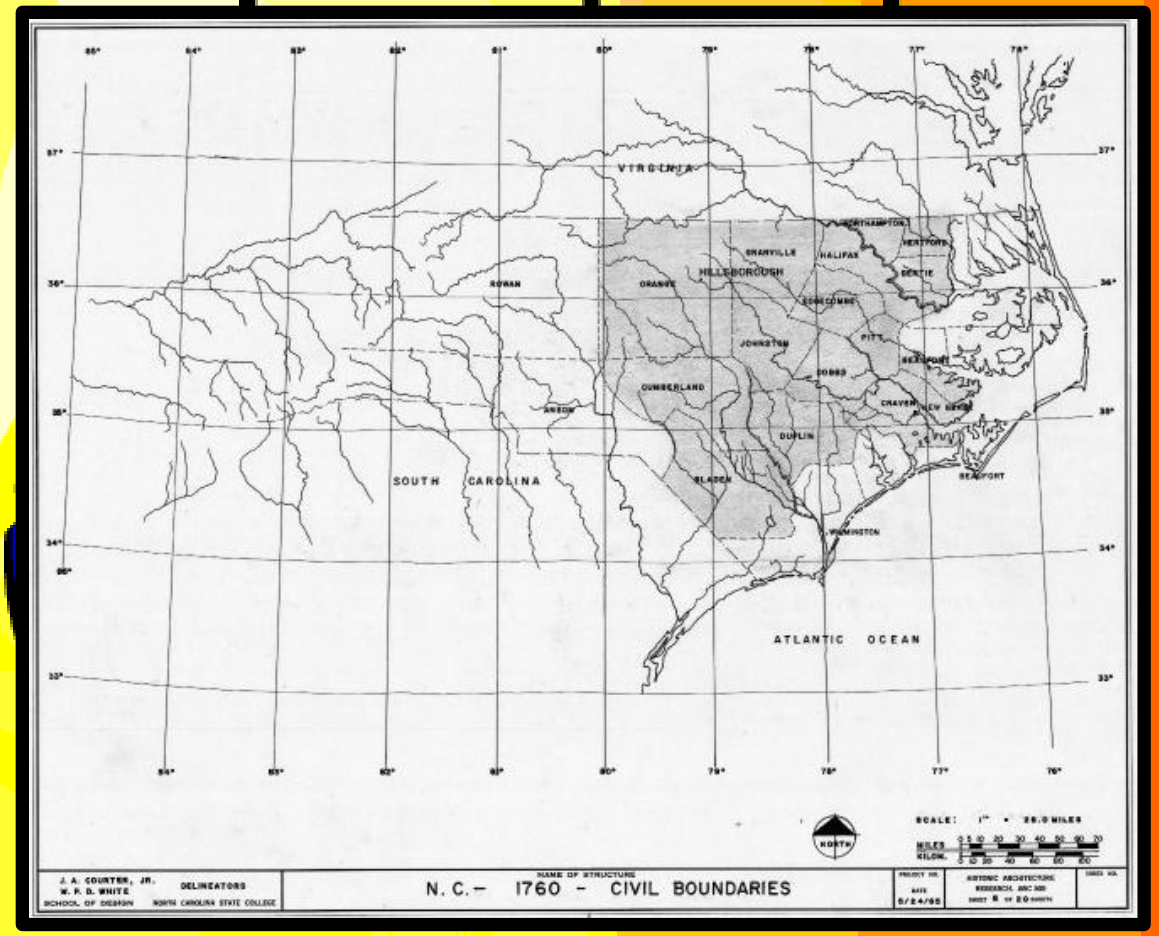




speed – how fast the position of an object changes with time at any moment

Speed formula

The formula for the average speed of an object is given below.

$$\textit{Speed} = \frac{\textit{Total distance travelled}}{\textit{Time taken}}$$

It is made up of three parts, distance, time and ofcourse speed. If we know any two of these we can find the third.

For example . If we know the speed of an object and the time over which it travelled we can work out the distance it covered. We first change the formula to make it equal to distance. This easily done by transposition. Look at the image on the right.

Ask your teacher for more information on transposing formulae.

The distance formula

$$\textit{Speed} \times \textit{Time} = \textit{Distance}$$

Try this exercise. A car travelled at an average speed of 55km/hr for 6 hours. How far did it travel?

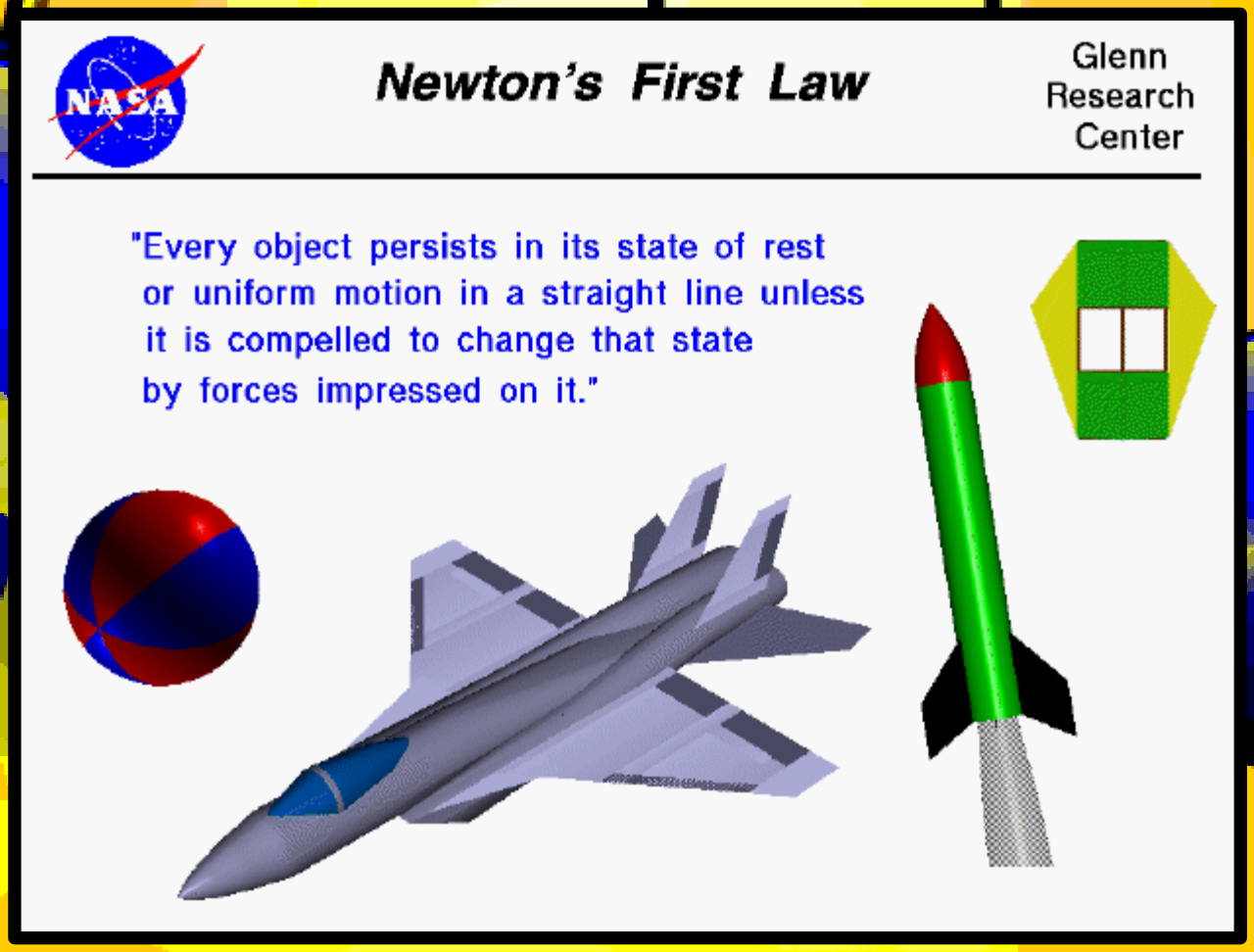
Easy. Using the formula for distance below

Distance = ***speed*** X ***time***

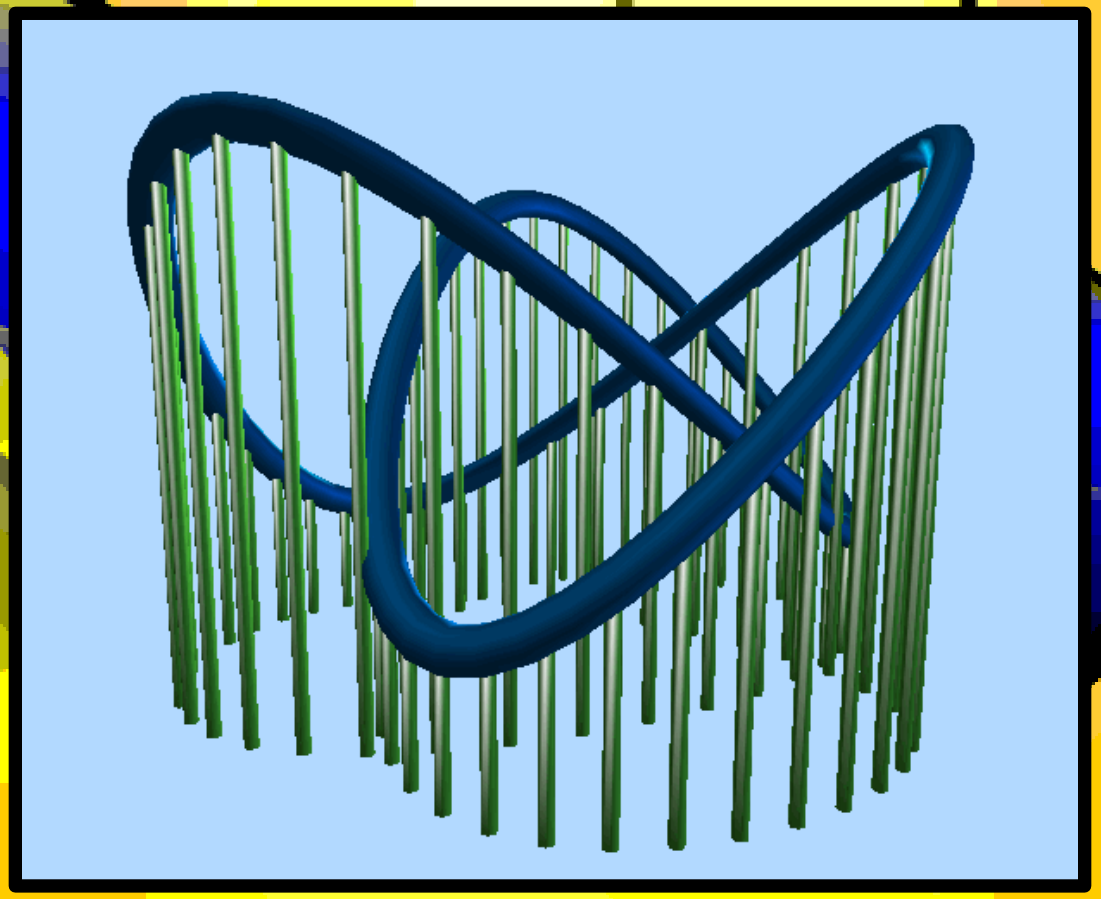
we calculate

Distance = 55 X 6 = 330 kilometres.

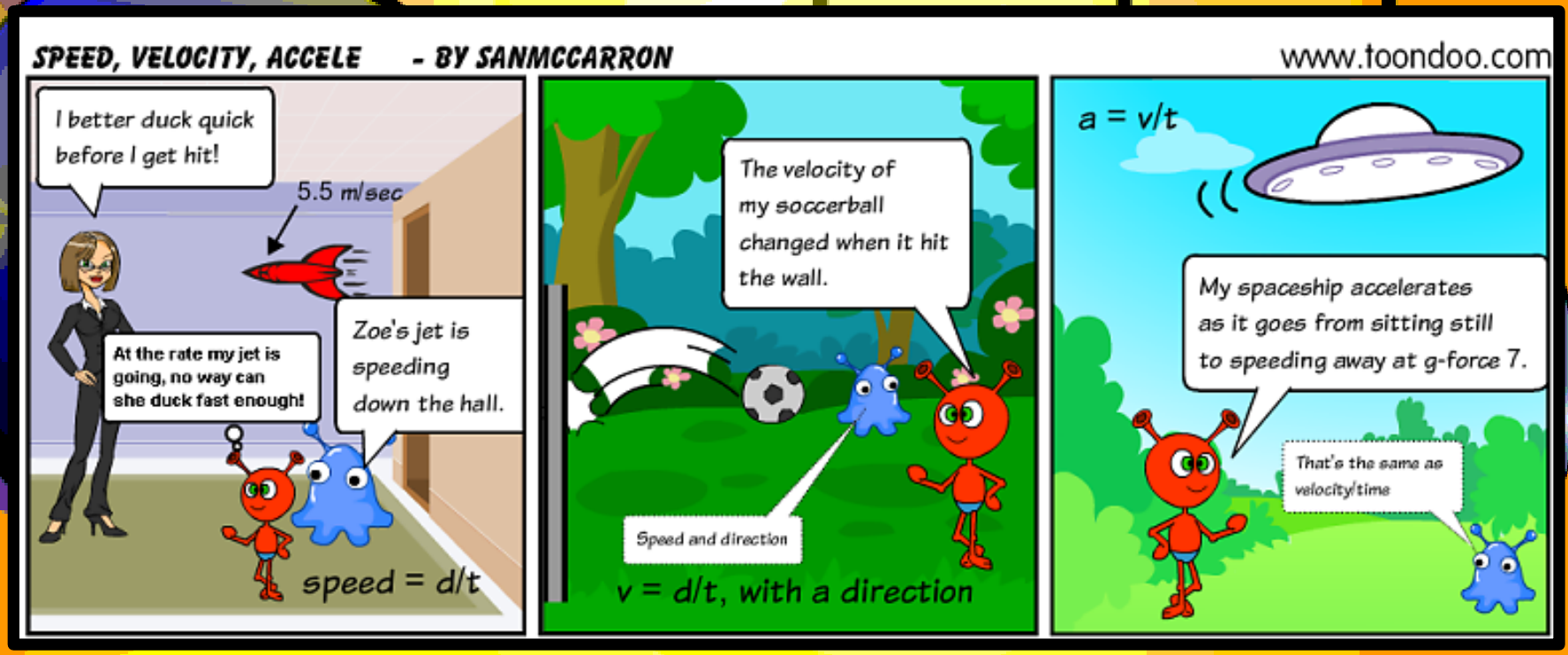
Newton's First Law of Motion – "An object at rest tends to stay at rest; an object in motion tends to stay in motion."



velocity – the speed of a moving object taken together with its direction of travel



acceleration – a change in velocity



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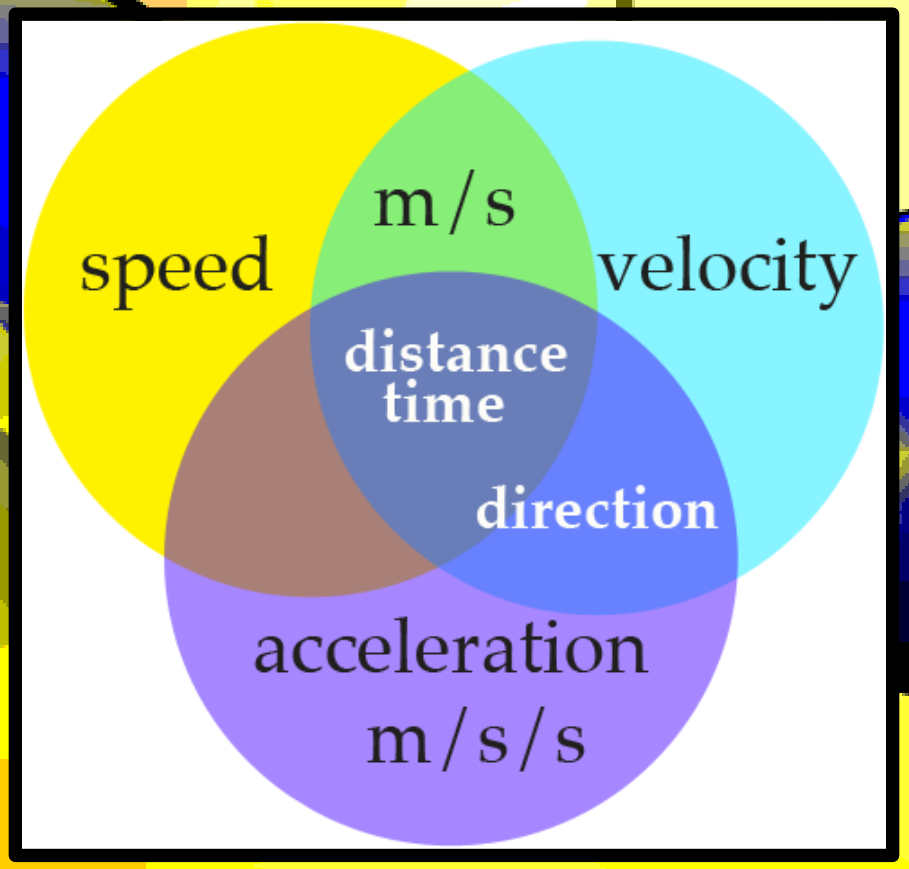
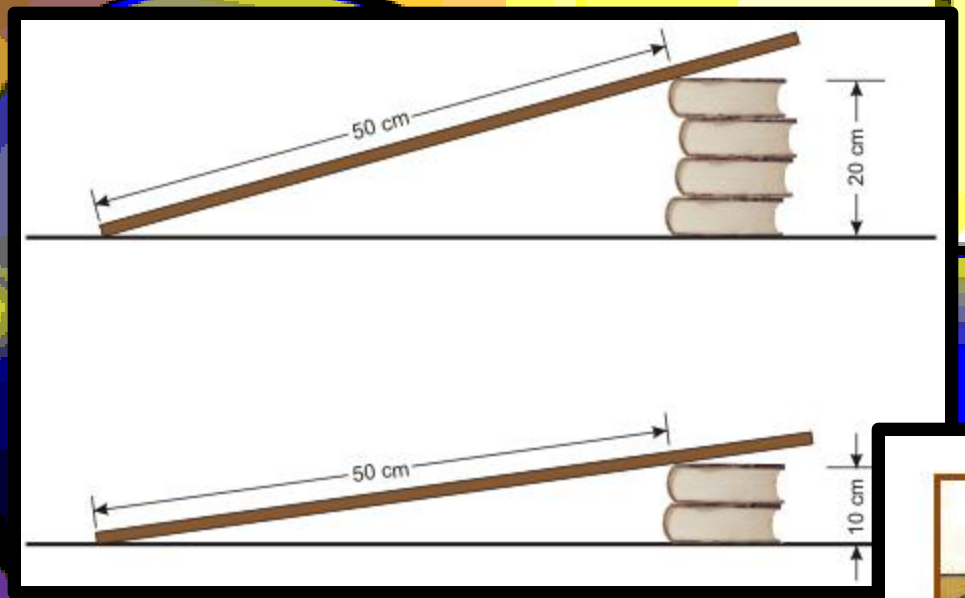
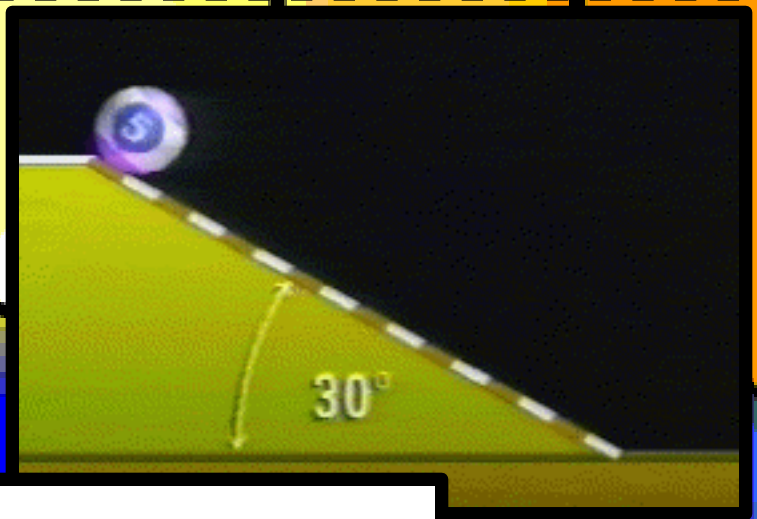
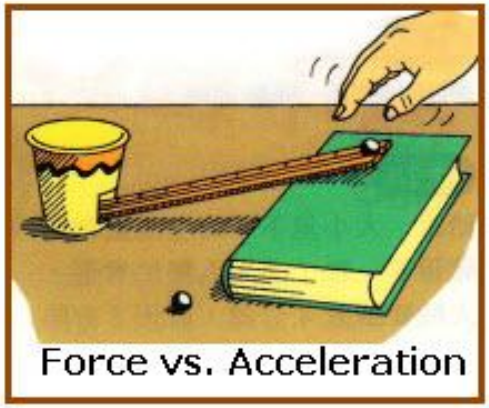


deceleration – when a force causes the speed of an object to decrease

incline – a ramp/slope





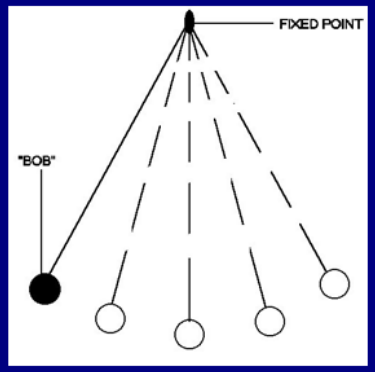


Force vs. Acceleration

pendulum – something hanging from a fixed point that swings due to gravity and then out due to inertia

Click on the picture below to check out a link on pendulums

What is a Pendulum?



A pendulum is loosely defined as something hanging from a fixed point which, when pulled back and released, is free to swing down by gravity and then out and up because of its inertia, or "tendency to stay in motion."

So, what is a pendulum good for?

gravity – something hanging from a fixed point that swings due to gravity and then out due to inertia

Click on the picture below to check out a link on gravity.