Forces

2. Gravity

CONCEPT 1

FORCES AND FORCE DIAGRAMS

NOTES

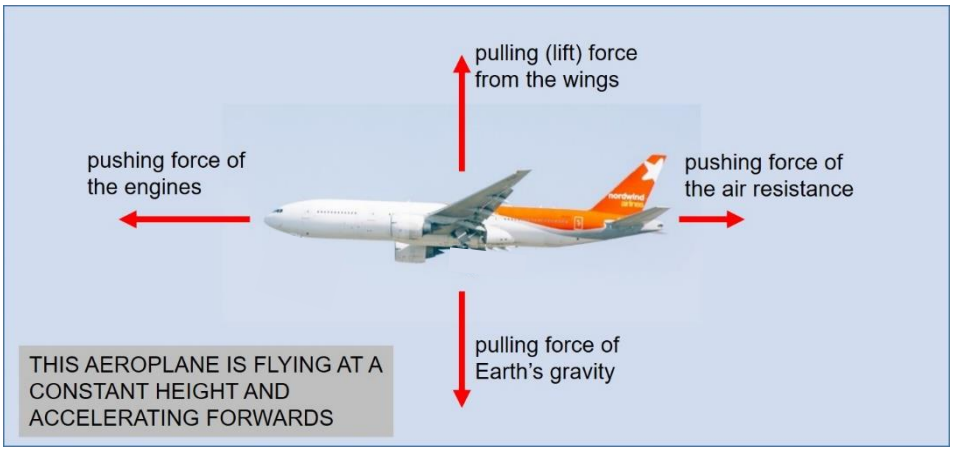
A force can either be a push or a pull. Forces can change the speed, shape and direction of an object. We measure the size of a force in newtons (N).

Pushing off the ground using your leg muscles will result in a jump. You slow down as soon as you leave the ground because there is a pulling force which changes your speed. This same pulling force will pull you back to the ground. This pulling force of the Earth is called gravity.

A number of forces may act on an object at the same time. We draw these forces with arrows of different lengths because this will indicate the size AND direction of the force.

In the diagram four forces are acting on the aeroplane. It flies at a constant height because the vertical forces are **balanced**. This means they are the same size but in opposite directions.

It accelerates forwards because the horizontal forces are **unbalanced**. This means they are not the same size.



If forces are balanced, then the object will (1) continue to stay at rest if it was stationary, or (2) continue to move in a straight line at the constant speed it was travelling at when the forces became balanced. **This is Newton's First Law of Motion.**

If forces are unbalanced, then there will be an overall **resultant force** on the object. The object will accelerate in the direction of the resultant force. If the resultant force increases the acceleration of the object will also increase. **This is Newton's Second Law of Motion.**