

Newton's Second Law

$$F = ma$$

1. What do the symbols F, m and a stand for?
2. What are the units of F, m and a?
3. Rearrange $F=ma$ to find expressions for m and a
4. Calculate the resultant force required to accelerate an object with mass 4.5kg at 6.0m/s^2 .
5. Calculate the acceleration when a resultant force of 72N is applied to a mass of 18kg.
6. A resultant force of 42N causes an object to accelerate at 2.8m/s^2 . Calculate the mass of the object.
7. Calculate the acceleration of a 48g mass when it is pulled with a force of 10N, but a frictional force of 2.8N acts in the opposite direction.
8. A car of mass 1200kg is travelling at 15m/s. The brakes are applied and the car comes to a rest in 8.0s. Calculate the resultant force on the car.

Newton's First Law



A person is sitting on a chair. The resultant force on her is zero. What will happen to her?



A car is slowing down as it approaches a roundabout. Is there a resultant force on the car?

If there is, show its direction with an arrow.



A rocket is taking off. It is accelerating upwards. Is there a resultant force on the rocket?

If there is, show its direction with an arrow.



A skydiver is falling at a constant speed of 120mph. Is there a resultant force on her?

If there is, show its direction with an arrow.



A car is driving at 30mph. The forces on it are balanced. What will happen to it?



The resultant force on this lorry is shown in green. What will happen to the lorry?