

**Newton's 1<sup>st</sup> Law:** Understand when forces are balanced and unbalanced

Given forces, know when an object remains at rest, when it moves with constant velocity, and when it moves with a constant acceleration

Understand the difference between static and dynamic equilibrium.

**Newton's 2<sup>nd</sup> Law:** Know acceleration is proportional to force (as force increases, acceleration increases) and inversely proportional to mass (mass increases, acceleration decreases)

Be able to calculate any value given the other two

$$\Sigma F = ma$$

**Newton's 3<sup>rd</sup> Law:** Identify action-reaction pairs and when two forces are not an action-reaction pair

**Normal force** – Know how to calculate normal force on an incline, when an object is at rest, and in an elevator

**Friction** – Know how to calculate the coefficient of friction given a mass of an object

Understand friction opposes the motion of an object (static friction opposes the potential motion of an object)

**Tension** – Understand how to find the tension in a rope looped over a pulley  
The tension in a length of rope is constant across the whole rope

**Free body diagrams** – Know how to make a free body diagram and identify the direction of all forces acting on an object

Do calculations for the forces and the overall acceleration for an object on an inclined plane or for an object moving horizontally.

Study Lectures and HWs