

## **Kinematics**

Definitions

Position-time graphs

Velocity-time graphs

Acceleration

Algebraic kinematics

Projectile motion

## **Forces and Newton's Laws**

Force and Net Force

Solving problems with forces

A free-body diagram includes:

Mass and Weight

Normal force

Friction force

Inclined Planes

Newton's Third Law

gravitational force

gravitational field

Gravitational and inertial mass

Uniform circular motion

Force of a spring

### **Impulse, momentum, collisions**

Momentum

Impulse

Conservation of momentum in collisions

Center of mass

### **Work-Energy Theorem**

Definition of Work

Equations for different forms of energy

Vertical springs

Power

Rotational KE

## **Waves**

Simple harmonic motion

Wave definitions

Equations relating frequency, period, wavelength, wave speed

Transverse/longitudinal waves

Interference

Doppler Effect

Sound

Standing Waves

## **N2L for Rotation**

Definitions

Relationship between angular and linear motion

Torque

Rotational Inertia

## **Angular momentum**

Equations

Conservation

Angular “impulse”

## **Charge**

Smallest possible charge

Charge is conserved

Coulomb's law for force between charges

## **Circuits**

Non-rigorous definitions of voltage, current, resistance

Rigorous definitions of voltage, current, resistance

Resistors in series

Resistors in parallel

Ammeters and Voltmeters

Power and Brightness

Kirchoff's loop rule

Kirchoff's junction rule

## **Resistivity**

Resistivity is a property of the material a resistor is made out of

Equation for the resistance of a length of wire