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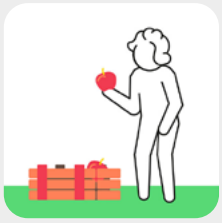
Basics

8 lessons



Movement

Objects at rest and in motion
Distance and trajectory
Speed
Speed, distance, time
Straight-line and curvilinear motion
Uniform and non-uniform motion
Types of motion
Average and current speed

Mass

In preparation

Physical quantities

In preparation

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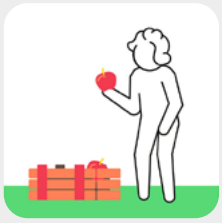
Forces

34 lessons



Force and its expressions

Force and its representation
Gravitational force
Force of gravity
Gravitation and gravitational force
Weightlessness
Combining forces in the same direction
Combining forces in opposite directions 1
Combining forces in opposite directions 2
Combining forces in different directions
Pressure and compressive force 1
Pressure and compressive force 2
Friction and frictional force
The magnitude of frictional force

Newton's laws

The law of inertia 1
The law of inertia 2
Galileo's experiment
The law of power
The law on mutual interaction of forces 1
The law on mutual interaction of forces 2
The law on mutual interaction of forces 3
Jumping in space

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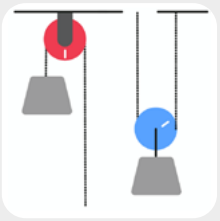
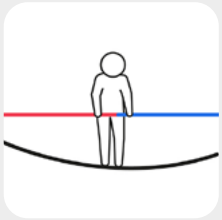
Forces

34 lessons



Rotational forces

Turning effect of forces
The lever
Balance on the lever
Moment of force
The decimal balance
The pulley
Fixed a moveable pulleys
Block and tackle 1
Block and tackle 2



Centre of gravity

Centre of gravity 1
Centre of gravity 2
The centre of gravity of the human body
The toy

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Liquids and gasses

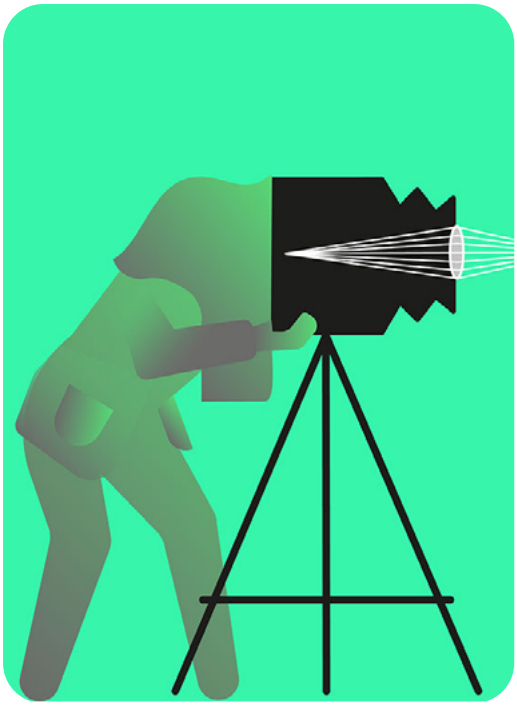
21 lessons

Mechanical properties of liquids

Hydrostatic pressure
Hydrostatic compressive force
Why water is buoyant
The magnitude of buoyant force
Archimedes' principle
Floating, submersion and objects suspended in liquid 1
Floating, submersion and objects suspended in liquid 2
Floating, submersion and objects suspended in liquid 3
Pascal's law
Hydraulic machinery
The hydrostatic paradox
Pascal's experiment
Joined vessels

Mechanical properties of liquids

The atmosphere
Buoyant force in the atmosphere
Overpressure and underpressure
Effects of atmospheric compressive force
Experiment with vacuum pump
How straws work
Pumping
How pumps work



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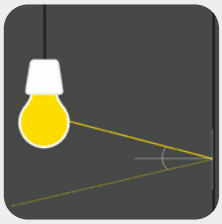
Optics

22 lessons

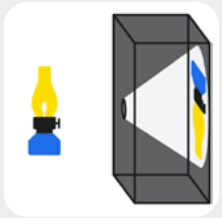
Creation and spread of light

Radiation
Light sources
Propagation of light
Optical environments
Shadows and penumbra



Reflection of light

Reflection of light
How mirrors work
One-way mirror
Curved mirrors
Uses for curved mirrors

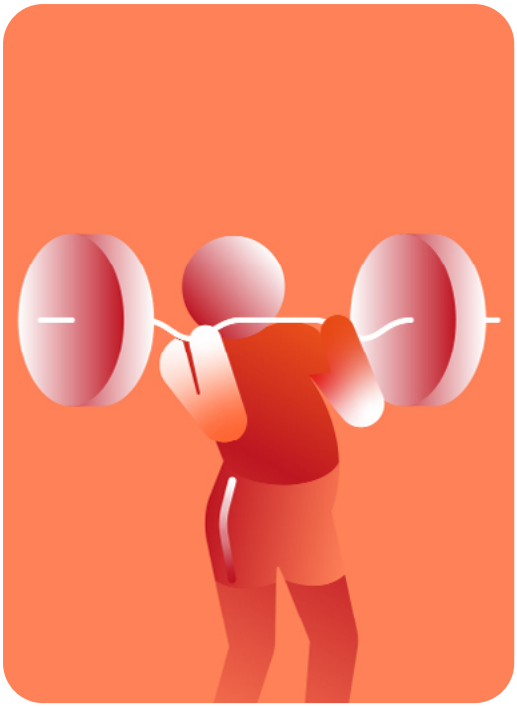


Refraction of light and image capturing

Light refraction
How light is refracted?
Lenses
Camera obscura
Creating real image with lenses
Using lenses to create a virtual image
How cameras work
Focus
Correcting eye deffects

Colors

Dispersion of white light
The colour of objects
RGB colour composition



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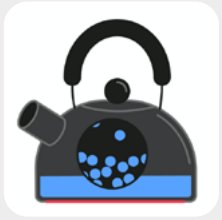
Energy

38 lessons

Mechanical energy

Energy
Kinetic (motion) energy
Gravitational potential energy
Conversions of mechanical energy
Losses of mechanical energy
The law of conservation of energy
Mechanical work 1
Mechanical work 2
Perpetual motion machines
Power 1
Power 2
Efficiency

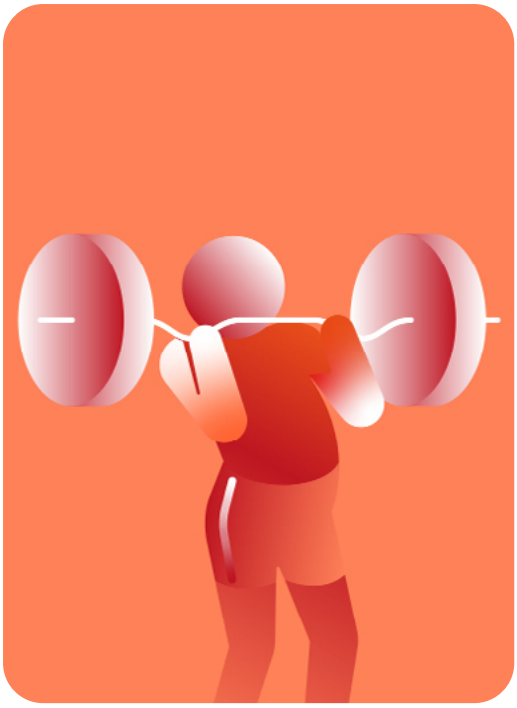


Thermal physics

Internal energy
Heat exchange
Specific heat capacity
Heat transfer by conduction
Heat transfer by convection
Heat transfer by radiation
Coolers
Thermal insulation
Thermos

Change of state

Changing states
Weird water facts
Water solidification
Latent heat of melting
Evaporation
Latent heat of vaporisation
Sauna
Boiling



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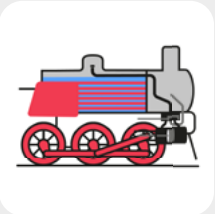
Energy

38 lessons

Simple machines

- Inclined plane
- Threads and convolution
- Block and tackle
- Lever
- Wheel and axle
- Simple transmission



Heat engines

- Steam engine
- Four-stroke engine
- Two-stroke engine