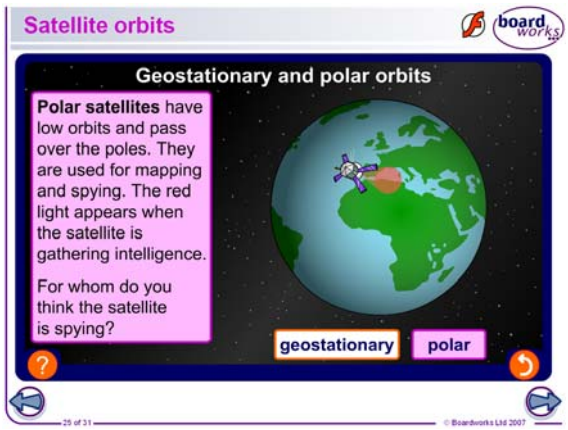
Telecommunication Using Waves

31 slides, 7 Flash activities

This presentation is designed to teach:

- how radiowaves and microwaves are transmitted
- about amplitude, wavelength and frequency
- how to test the speed of sound using an experiment
- how to carry out calculations using wave speed = frequency × wavelength
- how to investigate diffraction using a wave tank
- the differences in the level of diffraction occurring in radio and television communications
- about mobile phone communications.

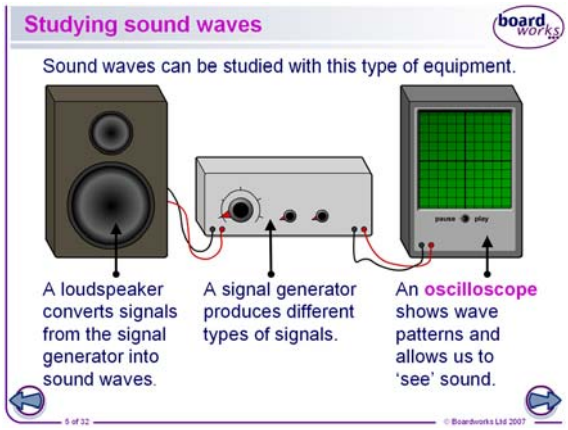


Telecommunication Using Cables

32 slides, 11 Flash activities

This presentation is designed to teach:

- how sound waves can be displayed on an oscilloscope
- about optical fibres
- about the sequence of events involved in the transmission of a signal along an optical fibre, from the signal being created by one computer, to it being decoded by another
- about total internal reflection in optical fibres, and how this also takes place in other materials.

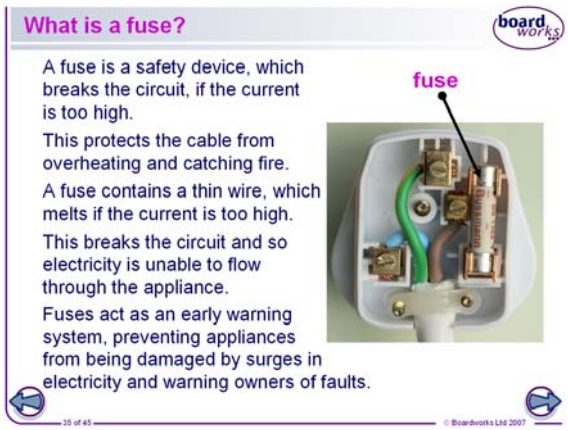


Using Electricity – Useful Circuits

45 slides, 11 Flash activities

This presentation is designed to teach:

- what a series circuit is
- what a parallel circuit is
- that in a parallel circuit, voltage is the same in all parts of the circuit, but current is not
- the differences between a.c. and d.c. supplies, and their uses
- the different parts of a plug
- about safety, fuses, earth, double insulation, and circuit breakers.

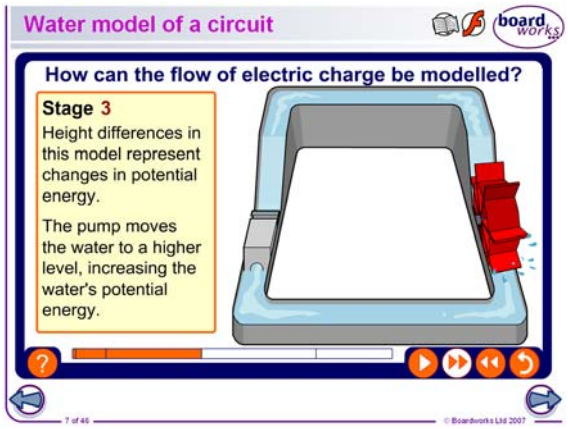


Using Electricity – Current, Voltage, Resistance

46 slides, 14 Flash activities

This presentation is designed to teach:

- that current is the flow of electric charge, and that voltage is a measure of potential difference
- the different circuit symbols
- how to use the equation power = current × voltage in calculations
- what causes resistance
- how to carry out calculations using Ohm's Law
- how to use equations to calculate total resistance in series and parallel circuits
- the uses of resistance, such as for an electric light bulb.

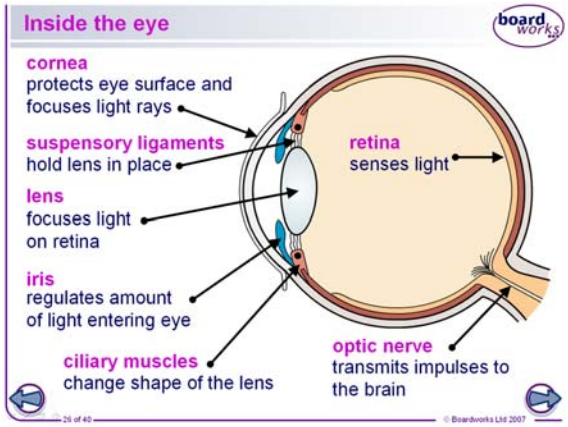


Health Physics – Sight and Sound

40 slides, 16 Flash activities

This presentation is designed to teach:

- that different amounts of light pass through different materials
- the characteristics that make some materials more reflective than others
- how to carry out calculations investigating angles of incidence, reflection and refraction
- how lens focus light on the retina in the eye
- the range of frequencies that can be heard by people and animals, and how hearing loss can occur.

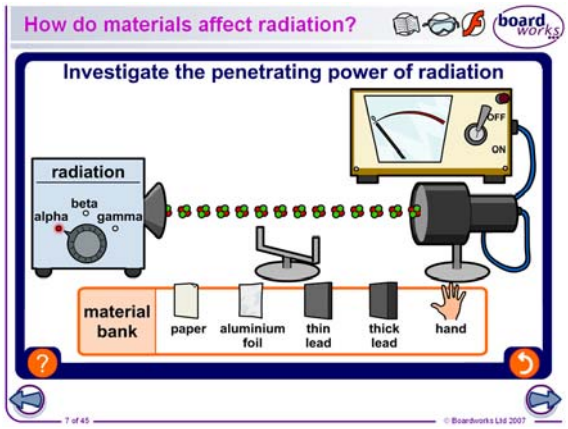


Health Physics – Nuclear Radiation

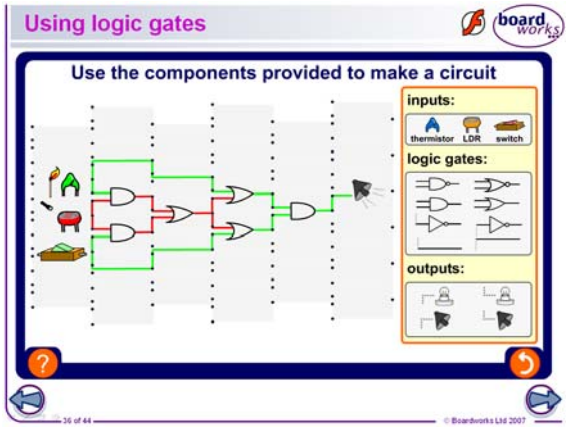
45 slides, 17 Flash activities

This presentation is designed to teach:

- about alpha, beta and gamma radiation
- how to test for radiation using a Geiger-Müller tube
- about half-life and radioactive decay, and how to carry out half-life calculations
- the dangers and uses of ionizing radiation, including X-rays
- precautions to take when using radiation, and how to calculate radiation exposure
- uses of radiation, including carbon dating, hospital X-rays and sterilizing equipment.



Electronics



42 slides, 10 Flash activities

This presentation is designed to teach:

- that an electronic system consists of an input, process and output
- examples of typical input, process and output devices
- common components in a circuit, and the symbols that are used to represent them
- how the current and voltage of a circuit are linked
- how 7-segment displays work
- how transistors can be used as switches
- what a logic gate is
- how clock signals are produced.

Transport – On the Move

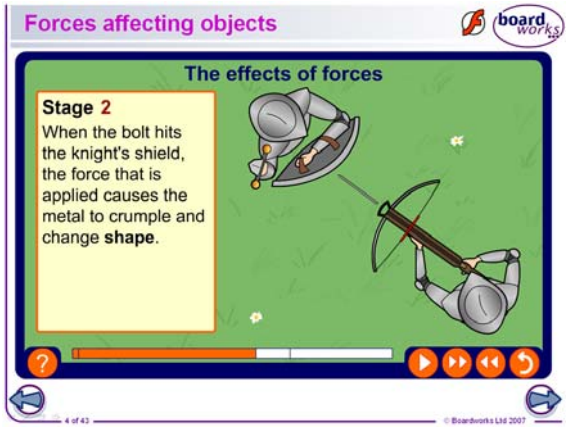
43 slides, 17 Flash activities

This presentation is designed to teach:

- how to calculate speed using the equation distance = speed ÷ time
- how to use distance–time graphs
- what acceleration is and how to use the equation acceleration = change in speed ÷ time
- how to use speed–time graphs, both to find acceleration and distance travelled
- how to calculate stopping distance; the factors affecting thinking and braking distance.

Transport – Forces at Work

43 slides, 13 Flash activities

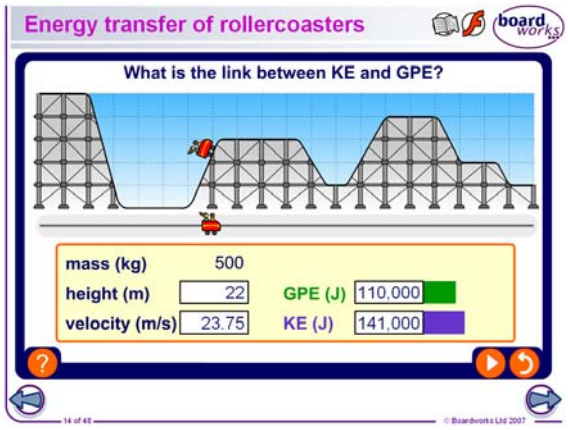


This presentation is designed to teach:

- what balanced, unbalanced and resultant forces are
- the causes and effects of friction
- Newton's First Law, and how this can be applied to the motion of a skydiver, including terminal velocity
- about momentum
- Newton's Second Law and the equation force = mass × acceleration
- calculations using force = mass × acceleration.

Transport – Movement Means Energy

48 slides, 14 Flash activities



This presentation is designed to teach:

- what gravitational potential energy (GPE) is
- how to carry out calculations using the equation GPE = mass × gravitational field strength × height
- the Law of Conservation of Energy
- what kinetic energy is
- how to carry out calculations using the equation: work done = force × distance moved
- that power is the rate at which work is done
- how to carry out calculations using the equation power = work done ÷ time taken.

Energy Matters – Generating Electricity

43 slides, 12 Flash activities

This presentation is designed to teach:

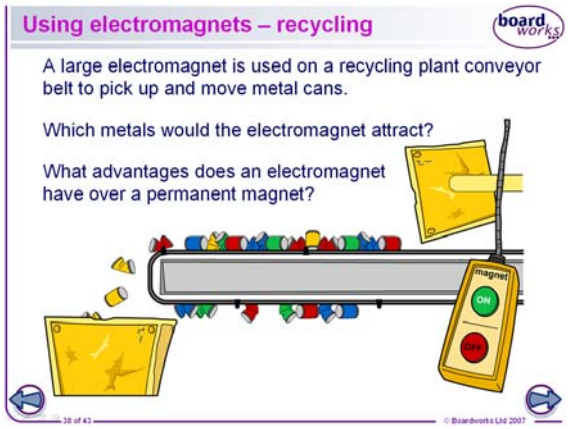
- how energy resources can be divided between renewable and non-renewable types
- how to compare different energy resources in terms of reliability and how much energy is produced
- about a range of renewable energy resources including solar, hydroelectric, wind and tidal
- how electricity is produced from fossil fuels, nuclear power and hydroelectric power
- about different energy transfers within electricity generation.

Energy Matters – Source to Consumer

43 slides, 18 Flash activities

This presentation is designed to teach:

- about a.c. and d.c. electricity
- how transformers work and their applications
- how magnetism, current and force affect a wire, and how to use Fleming's Left Hand Rule
- about electricity generation and how to use Fleming's Right Hand Rule
- about a.c. electricity generation and how to increase it
- how a d.c. motor works
- using electromagnets.

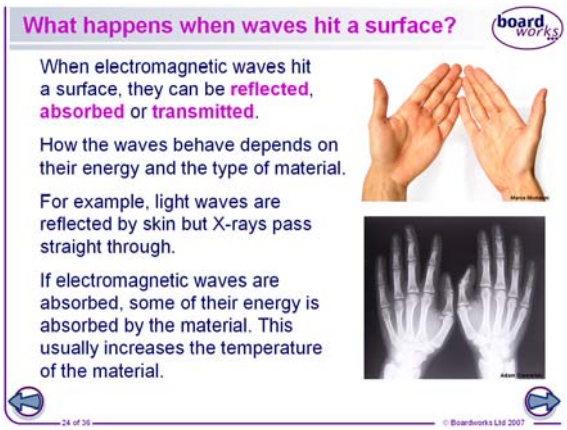


Space Physics – Signals from Space

36 slides, 14 Flash activities

This presentation is designed to teach:

- about stars, planets and galaxies
- that distances in the universe can be measured in light years
- about splitting light using a prism, ordering coloured light according to the electromagnetic spectrum, and mixing different colours
- about the relationship between frequency and wavelength
- the different waves of the electromagnetic spectrum
- about using electromagnetic waves to gather information from space.



Space Physics – Space Travel

22 slides, 8 Flash activities

This presentation is designed to teach:

- about action-reaction pairs and Newton's Third Law
- what gravitational field strength is, and how it varies between different planets
- that the gravitational field strength experienced by a rocket weakens as it gets further from the Earth
- how gravitational fields can be modelled
- how to carry out calculations using weight = mass × gravitational field strength.