## Core Science P1: Physics

### Transfer of Energy in Heating
- State what infrared radiation is and that objects emit and absorb it.
- Describe how the amount of infrared radiation can vary.
- Describe how different surfaces vary in their absorption of infrared radiation.
- Describe how different surfaces vary in their reflection of infrared radiation.
- Describe the particle arrangement and different levels of energy in the states of matter.
- Explain the different energy states using the kinetic theory.
- Describe the bonds between particles in the different states of matter.
- Describe what is meant by conduction, in terms of particles, including the role of free electrons.
- Describe what is meant by convection, in terms of particles, including explaining changes in density.
- Describe how energy is transferred in evaporation and condensation and factors affecting each.
- Describe the factors that affect the rate of heat transfer from an object.
- State the use of U-values.
- Describe how solar panels work.
- Describe what is meant by specific heat capacity and use the equation.

### Energy and Efficiency
- Describe how energy is wasted and what happens to it.
- Calculate and read information from a Sankey diagram.
- Calculate the efficiency of a device using the equation.
- Describe payback time and calculate it.

### Usefulness of Electrical Appliances
- Describe energy transfers in everyday electrical appliances.
- Link the amount of energy transferred to the power and the amount of time switched on.
- Calculate the energy transferred when you know the time and power.
- Calculate the cost of electricity given the cost per kilowatt-hour.

### Generating Electricity
- State some energy sources that are used to generate electricity (heat water).
- Describe the processes that occur in different power stations.
- Describe alternative methods of generating electricity.
- Evaluate alternative methods of generating electricity.
- Explain what a pumped storage system does.
- Explain the advantages and disadvantages of small scale energy production.
- State what the National Grid is.
- Label the different essential parts of the National Grid.
- Explain the use of transformers.

### Using Waves
- Describe the difference between and transverse and longitudinal wave, using sound and electromagnetic waves as examples.
- Define and calculate the speed, frequency or wavelength of a wave.
- State the speed of an electromagnetic waves and describe what is meant by the electromagnetic spectrum.
- State which electromagnetic waves are used for communication.
- Describe the hazards associated with electromagnetic waves.
- Describe what happens when a wave is reflected including law of reflection and images in a plane mirror.
- Explain how waves can be refracted.
- Explain how waves can be diffracted.
- Describe what is meant by frequency and how this relates to pitch.
- Describe what an echo is.
- Explain the Doppler Effect and relate this to frequency and wavelength of waves.
- Explain how the evidence from red-shift supports the Big Bang Theory.
- Describe what Cosmic Microwave Background Radiation (CMBR) is.