

## Year 8 Scheme of Work

### Units ABCFGKL will be completed by January

#### PHYSICS

##### 8L Heat transfers

Topic 8La considers the difference between heat and temperature, and reminds pupils that heat energy is always passed from a hotter to a cooler object. Could level work looks at specific heat capacity, and at the Kelvin temperature scale and the concept of absolute zero.

Topic 8Lb discusses the conduction of heat and its explanation in terms of particles, and how insulation materials such as down jackets work. Could level work looks at some of the adaptations of penguins to living in a cold environment.

Topic 8Lc looks at convection and explains how convection currents form as a result of density changes. It applies this to the use of trapped air for insulation, and why warm clothing should not be too baggy. The topic also considers some uses of convection.

Topic 8Ld looks at the energy changes connected with changes of state, including why sweating helps to cool us down and the use of wicking garments and breathable fabrics.

Topic 8Le introduces radiation and asks pupils to investigate why fire fighters or vulcanologists sometimes wear silvery suits. The unit concludes by asking pupils to consider the effect that modern clothing technology may have on the environment, in terms of making it possible for tourists to visit places like Antarctica that were previously only accessible to a few hardy explorers.

##### 8L On the move

Topic 8Ja introduces the theme of the unit by looking at different forms of transport and how we use them, and then goes on to look at the cause of drag and how it can be reduced. Practical work is based on investigating the drag of different shapes.

Topic 8Jb looks at forces applied over large and small areas in the context of tracked vehicles and railways, and also looks at the application of high pressure in more everyday items such as knives.

Topic 8Jc looks at maglev trains as a way of revising KS2 work on magnets and magnetism. It introduces electromagnets, and the rules for attraction and repulsion between the ends of magnets. The application of electromagnets in bells, relays and circuit breakers is also considered.

Topic 8Jd looks at the idea of magnetic fields, in the context of the use of compasses for navigation. Practical work involves finding the shape of magnetic fields of a magnet or of combinations of magnets.

Topic 8Je looks at the turning effect of forces in the context of controlling the attitude of aircraft and in more domestic contexts. Practical work on levers is included.

##### 8L Light fantastic

Topic 8Ka starts by revising the fact that we see things when light enters our eyes, and looks at some historical ideas about light and attempts to measure its speed. Practical work is based on investigating the factors that affect the size of a shadow.

Topic 8Kb revises the fact that light can pass through some materials but not others. It goes on to explain how pinhole cameras work and links this to how the eye works.

Topic 8Kc begins with a comparison between the way light is reflected by rough and smooth surfaces and then explores the way light is reflected in a plane mirror. The law of reflection is introduced and investigated in the practical work

Topic 8Kd looks at refraction in the context of camera lenses, and then develops these ideas via practical work.

Topic 8Ke looks at dispersing white light using prisms, making coloured light using filters and how coloured objects look in different coloured light. The unit concludes by discussing the different uses of images in society, and asking pupils to debate their usefulness.

### **8L Sound**

Topic 8La introduces the nature of sound with a particular focus on bats and how they use ultrasound to 'see'. The terms 'intensity' and 'pitch' are introduced.

Topic 8Lb covers the units for measuring frequency and the use of an oscilloscope for displaying sound waves. The loudness and amplitude of notes are introduced, and the term wavelength.

Topic 8Lc compares differences between the properties of light and sound. The particle model is developed to explain the variation of the speed of sound travelling through different materials.

Topic 8Ld looks at how the ear works, and then looks at temporary and permanent damage to the ear.

Topic 8Le concentrates on noise and how it is measured. The threshold of hearing is discussed and a decibel scale is introduced.