

# 2014 AHS KS3 curriculum

## Year 9

### Biology

#### **9.1 Genetics**

9.1  $\Rightarrow$  heredity as the process by which genetic information is transmitted from one generation to the next

9.1  $\Rightarrow$  a simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model

9.1  $\Rightarrow$  differences between species

9.1  $\Rightarrow$  the variation between individuals within a species being continuous or discontinuous, to include measurement and graphical representation of variation

9.1  $\Rightarrow$  the variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection

9.1  $\Rightarrow$  changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction

#### **9.2 Health**

9.2  $\Rightarrow$  the structure and functions of the human skeleton, to include support, protection, movement and making blood cells

9.2  $\Rightarrow$  biomechanics – the interaction between skeleton and muscles, including the measurement of force exerted by different muscles

9.2  $\Rightarrow$  the function of muscles and examples of antagonistic muscles.

9.2  $\Rightarrow$  the impact of exercise, asthma and smoking on the human gas exchange system

9.2  $\Rightarrow$  the role of diffusion in the movement of materials in and between cells

9.2  $\Rightarrow$  the effects of recreational drugs (including substance misuse) on behaviour, health and life processes.

9.2  $\Rightarrow$  the structure and functions of the gas exchange system in humans, including adaptations to function

9.2  $\Rightarrow$  the mechanism of breathing to move air in and out of the lungs, using a pressure model to explain the movement of gases, including simple measurements of lung volume

9.2  $\Rightarrow$  the role of diffusion in the movement of materials in and between cells

9.2  $\Rightarrow$  aerobic and anaerobic respiration in living organisms, including the breakdown of organic molecules to enable all the other chemical processes necessary for life

9.2  $\Rightarrow$  a word summary for aerobic respiration

9.2  $\Rightarrow$  the process of anaerobic respiration in humans and micro-organisms, including fermentation, and a word summary for anaerobic respiration

9.2  $\Rightarrow$  the differences between aerobic and anaerobic respiration in terms of the reactants, the products formed and the implications for the organism.

### Chemistry

#### **9.3 Patterns of Reactivity**

9.3  $\Rightarrow$  thermal decomposition and displacement reactions

9.3  $\Rightarrow$  reactions of acids with metals to produce a salt plus hydrogen

9.3  $\Rightarrow$  reactions of acids with alkalis to produce a salt plus water

9.3  $\Rightarrow$  what catalysts do.

9.3  $\Rightarrow$  the chemical properties of metal and non-metal oxides with respect to acidity.

9.3  $\Rightarrow$  the order of metals and carbon in the reactivity series

9.3 ☐ the use of carbon in obtaining metals from metal oxides

#### **9.4 Fuels**

9.4 ☐ combustion and oxidation reactions

9.4 ☐ energy changes on changes of state (qualitative)

9.4 ☐ exothermic and endothermic chemical reactions (qualitative).

9.4 ☐ properties of ceramics, polymers and composites (qualitative).

### **Physics**

#### **9.5 Electricity and Magnetism**

9.5 ☐ comparing energy values of different foods (from labels) (kJ) ☐ comparing power ratings of appliances in watts (W, kW)

9.5 ☐ comparing amounts of energy transferred (J, kJ, kW hour)

9.5 ☐ domestic fuel bills, fuel use and costs

9.5 ☐ fuels and energy resources.

9.5 ☐ using physical processes and mechanisms, rather than energy, to explain the intermediate steps that bring about such changes.

9.5 ☐ electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge

9.5 ☐ potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current

#### **9.6 Applied Forces**

9.6 ☐ simple machines give bigger force but at the expense of smaller movement (and vice versa): product of force and displacement unchanged

9.6 ☐ moment as the turning effect of a force

9.6 ☐ force-extension linear relation; Hooke's Law as a special case

9.6 ☐ work done and energy changes on deformation

9.6 ☐ atmospheric pressure, decreases with increase of height as weight of air above decreases with height

9.6 ☐ pressure in liquids, increasing with depth; upthrust effects, floating and sinking

9.6 ☐ pressure measured by ratio of force over area – acting normal to any surface.

9.6 ☐ opposing forces and equilibrium: weight held by stretched spring or supported on a compressed surface.