**The Wider Earth: National Curriculum links for Science**

**Key Stage 3

Working scientifically**

Through the content across all three disciplines, pupils should be taught to:

**Scientific attitudes**

* understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas, together with the importance of publishing results and peer review

### Subject contentBiologyGenetics and evolutionInheritance, chromosomes, DNA and genes

* heredity as the process by which genetic information is transmitted from one generation to the next
* differences between species
* the variation between individuals within a species being continuous or discontinuous, to include measurement and graphical representation of variation
* the variation between species and between individuals of the same species meaning some organisms compete more successfully, which can drive natural selection
* changes in the environment which 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

### Key Stage 4Working scientifically

Through the content across all three disciplines, students should be taught so that they develop understanding and first-hand experience of:

* the ways in which scientific methods and theories develop over time
* using a variety of concepts and models to develop scientific explanations and understanding
* appreciating the power and limitations of science and considering ethical issues which may arise
* recognising the importance of peer review of results and of communication of results to a range of audiences

### Subject content – Biology

* living organisms may form populations of single species, communities of many species and ecosystems, interacting with each other, with the environment and with humans in many different ways
* living organisms are interdependent and show adaptations to their environment
* evolution occurs by the process of natural selection and accounts both for biodiversity and how organisms are all related to varying degrees

#### Ecosystems

* organisms are interdependent and are adapted to their environment
* the importance of biodiversity
* methods of identifying species and measuring distribution, frequency and abundance of species within a habitat
* positive and negative human interactions with ecosystems

**Evolution, inheritance and variation**

* genetic variation in populations of a species
* the process of natural selection leading to evolution
* the evidence for evolution
* developments in biology affecting classification

**Key Stage 5**

**GCE AS and A level subject content for biology, chemistry, physics and psychology**

**8.** The skills, knowledge and understanding of each specification in the subject must, where appropriate, include the requirements set out below, and be integrated into the mandatory content indicated in the relevant appendix and any content added by the awarding organisation, where appropriate:

* use theories, models and ideas to develop scientific explanations

**Appendix 1 - biology – knowledge and understanding**

**13. Biodiversity**

* the variety of life, both past and present, is extensive, but the biochemical basis of life is similar for all living things
* biodiversity refers to the variety and complexity of life and may be considered at different levels
* biodiversity can be measured, for example within a habitat or at the genetic level
* classification is a means of organising the variety of life based on relationships between organisms and is built around the concept of species
* originally classification systems were based on observable features but more recent approaches draw on a wider range of evidence to clarify relationships between organisms
* adaptations of organisms to their environments can be behavioural, physiological and anatomical
* adaptation and selection are major factors in evolution and make a significant contribution to the diversity of living organisms

**19. Genetics and evolution**

* transfer of genetic information from one generation to the next can ensure continuity of species or lead to variation within a species and possible formation of new species
* reproductive isolation can lead to accumulation of different genetic information in populations potentially leading to formation of new species