Ingenious Genes Curriculum Links for OCR A-Level Biology A (H420)

2.1.2 Biological molecules
2.1.3 Nucleotides and nucleic acids
2.1.6 Cell division, cell diversity and cellular organisation
6.1.1 Cellular control
6.1.2 Patterns of inheritance

2.1.2 Biological molecules
(b) the concept of monomers and polymers and the importance of condensation and hydrolysis reactions in a range of biological molecules.
2.1.3 Nucleotides and nucleic acids
(a) the structure of a nucleotide as the monomer from which nucleic acids are made
(d) (i) the structure of DNA (deoxyribonucleic acid)
(f) the nature of the genetic code. To include the triplet, non-overlapping, degenerate and universal nature of the code and how a gene determines the sequence of amino acids in a polypeptide (the primary structure of a protein)
(g) transcription and translation of genes resulting in the synthesis of polypeptides. To include, the roles of RNA polymerase, messenger (m)RNA, transfer (t)RNA, ribosomal (r)RNA.
2.1.6 Cell division, cell diversity and cellular organisation
(f) the significance of meiosis in life cycles. To include the production of haploid cells and genetic variation by independent assortment and crossing over
(g) the main stages of meiosis. To include interphase, prophase 1, metaphase 1, anaphase 1, telophase 1, prophase 2, metaphase 2, anaphase 2, telophase 2 (no details of the names of the stages within prophase 1 are required) and the term homologous chromosomes.
6.1.1 Cellular control
(a) types of gene mutations and their possible effects on protein production and function. To include substitution, insertion or deletion of one or more nucleotides AND the possible effects of these gene mutations (i.e. beneficial, neutral or harmful).
6.1.2 Patterns of inheritance
(a) (i) the contribution of both environmental and genetic factors to phenotypic variation

(ii) how sexual reproduction can lead to genetic variation within a species. Meiosis and the random fusion of gametes at fertilisation
(b) (i) genetic diagrams to show patterns of inheritance. To include monogenic inheritance, dihybrid inheritance, multiple alleles, sex linkage and codominance.
(e) the factors that can affect the evolution of a species (Genetic bottlenecks).