Scheme of Learning: Inheritance, Variation & Evolution

Topic Sequence:

1	2	3	4	5	6
Forces & Interactions	Organic Chemistry	Inheritance, Variation & Evolution	Forces & Motion	Chemical Analysis	Space (Separate Physics only)

Topic Overview:

In this section we will discover how the number of chromosomes are halved during meiosis and then combined with new genes from the sexual partner to produce unique offspring. Gene mutations occur continuously and on rare occasions can affect the functioning of the animal or plant. These mutations may be damaging and lead to a number of genetic disorders or death. Very rarely a new mutation can be beneficial and consequently, lead to increased fitness in the individual. Variation generated by mutations and sexual reproduction is the basis for natural selection; this is how species evolve. An understanding of these processes has allowed scientists to intervene through selective breeding to produce livestock with favoured characteristics. Once new varieties of plants or animals have been produced it is possible to clone individuals to produce larger numbers of identical individuals all carrying the favourable characteristic. Scientists have now discovered how to take genes from one species and introduce them in to the genome of another by a process called genetic engineering. In spite of the huge potential benefits that this technology can offer, genetic modification still remains highly controversial.

Lesson Sequence:

We begin by looking at the cellular level of gamete formation and reproduction and then onto how the inheritance of alleles causes variation and inherited disorders. We learn to interpret Punnet squares and family tree diagrams. We then turn to species level inheritance with the interplay of environment and genes on variation which leads onto natural selection. We learn about the evidence for natural selection in the form of fossils and bacterial resistance to antibiotics. We again interpret diagrams in the form of evolutionary trees which leads on from an understanding of extinction. GCSE Biology pupils then have extra lessons on the various theories of evolution and scientists behind them. Everyone then goes onto learn about how inheritance can be manipulated by humans in selective breeding and genetic engineering. We finish with a lesson on classification.

Sequence of Lessons:		Resources:	
1	Meiosis	1	Worksheets in shared folder.
2	Sex Vs Asexual Reproduction ***Biology only***	2	n/a
3	DNA & Genome	3	Worksheets in shared folder.
4	DNA Structure ***Biology only***	4	Worksheets in shared folder.
5	Genetic Inheritance	5	Worksheets in shared folder.
6	Family Trees	6	Worksheets in shared folder.
7	Inherited Disorders	7	n/a
8	Variation & Natural Selection ***Mid topic assessment***	8	Exam Question In folder
9	Natural Selection & Fossils	9	n/a
10	Evolutionary Trees & Extinction	10	Worksheet in shared folder.
11	Antibiotic Resistance	11	n/a
12	Darwin & Lamarck ***Biology only***	12	Exam Q in shared folder
13	Gregor Mendel ***Biology only***	13	Exam Q in shared folder
14	Alfred Russell Wallace ***Biology only***	14	n/a
15	Selective Breeding	15	n/a
16	Genetic Engineering	16	GM organisms laminated info sheets in filing cabinet
17	Cloning ***Biology only***	17	n/a
18	Classification	18	n/a
19	Revision	19	Worksheets in shared folder.
20	Test	20	In shared folder.

Supportive Reading:

	TBC

Assessment:

Knowledge:	Multiple choice and short answer questions
Application of Knowledge:	Exam questions