SB3 Genetics

SB3a Sexual and asexual reproduction

Step	Learning outcome	Had a look	Nearly there	Nailed it!
	Describe features of asexual reproduction (rapid reproductive cycle, no need for mate, no variation of offspring).	☐	☐	☐
	Explain how some features of asexual reproduction can be advantageous or disadvantageous.	☐	☐	☐
	Describe features of sexual reproduction (slower reproductive cycle, requires mate, variation in offspring).	☐	☐	☐
	Explain how some features of sexual reproduction can be advantageous or disadvantageous.	☐	☐	☐
	Compare the advantages and disadvantages of asexual and sexual reproduction in evaluating the life cycle of an organism.	☐	☐	☐

SB3b Meiosis

Step	Learning outcome	Had a look	Nearly there	Nailed it!
	Recall that gametes are produced by meiosis.	☐	☐	☐
	Describe what happens in meiosis. [without details of the stages]	☐	☐	☐
	Explain why haploid gametes are needed for sexual reproduction.	☐	☐	☐
	Recall what an organism's genome is.	☐	☐	☐
	Describe where genes are found.	☐	☐	☐
	Recall the function of genes.	☐	☐	☐

SB3c DNA

Step	Learning outcome	Had a look	Nearly there	Nailed it!
5th	Recall where DNA is found in a eukaryotic cell.	☐	☐	☐
7th	Name the bases in DNA.	☐	☐	☐
7th	Recall the pairing of bases in DNA.	☐	☐	☐
7th	Describe how DNA strands are held together.	☐	☐	☐
8th	Describe the overall structure of DNA.	☐	☐	☐
7th	*Describe how DNA can be extracted from fruit.*	☐	☐	☐

SB3d Protein synthesis

Step	Learning outcome	Had a look	Nearly there	Nailed it!
8th	H Recall where proteins are made.	☐	☐	☐
9th	H Describe how the shape of a protein is determined.	☐	☐	☐
9th	H Explain how the order of amino acids in a protein is determined.	☐	☐	☐
9th	H Describe what happens during the transcription stage of protein synthesis.	☐	☐	☐
9th	H Describe what happens during the translation stage of protein synthesis.	☐	☐	☐

SB3e Genetic variants and phenotypes

Step	Learning outcome	Had a look	Nearly there	Nailed it!
8th	H Describe what a mutation is.	☐	☐	☐
9th	H Recall some ways in which mutations occur.	☐	☐	☐
10th	H Describe possible effects of mutations on amino acid sequences.	☐	☐	☐
9th	H Describe how gene transcription is regulated.	☐	☐	☐
11th	H Explain the effects of mutations on protein activity.	☐	☐	☐
11th	H Explain how mutations can influence RNA polymerase binding and so alter protein production.	☐	☐	☐

SB3f Mendel

Step	Learning outcome	Had a look	Nearly there	Nailed it!
	Recall who discovered the basis of genetics.	☐	☐	☐
	Describe how breeding pea plants was used to work out the basis of genetics.	☐	☐	☐
	Describe why it was difficult to understand inheritance before the idea of genes.	☐	☐	☐

SB3g Alleles

Step	Learning outcome	Had a look	Nearly there	Nailed it!
	Describe the difference between a gene and an allele.	☐	☐	☐
	Explain the effects of alleles on inherited characteristics.	☐	☐	☐
	Describe the relationship between a genotype and a phenotype.	☐	☐	☐
	Identify homozygous and heterozygous genotypes.	☐	☐	☐
	Use genetic diagrams to work out possible combinations of alleles in the offspring of parents.	☐	☐	☐
	Explain why the effects of some alleles in an organism's genotype are not seen in its phenotype.	☐	☐	☐

SB3h Inheritance

Step	Learning outcome	Had a look	Nearly there	Nailed it!
	Use Punnett squares to work out possible combinations of alleles in the offspring of parents.	☐	☐	☐
	Interpret family pedigree charts to work out possible inherited genotypes and phenotypes.	☐	☐	☐
	Describe how sex is determined in humans.	☐	☐	☐
	Calculate ratios of phenotypes (controlled by alleles of a single gene) when organisms are crossed.	☐	☐	☐
	Calculate probabilities of certain phenotypes occurring when organisms are crossed.	☐	☐	☐

SB3i Multiple and missing alleles

Step	Learning outcome	Had a look	Nearly there	Nailed it!
7th	Describe ABO blood groups as an example of multiple alleles for one gene.	☐	☐	☐
7th	Describe how ABO blood groups are inherited.	☐	☐	☐
6th	Explain the inheritance of codominance.	☐	☐	☐
9th	H Give examples of sex-linked genetic disorders.	☐	☐	☐
9th	H Explain why some genetic disorders are sex-linked.	☐	☐	☐

SB3j Gene mutation

Step	Learning outcome	Had a look	Nearly there	Nailed it!
6th	Give examples of characteristics controlled by multiple genes.	☐	☐	☐
6th	Define the term mutation.	☐	☐	☐
6th	Describe some potential applications of mapping human genomes.	☐	☐	☐
9th	Explain how a mutation can cause variation (limited to changes in the protein formed, which can affect processes in which that protein is needed).	☐	☐	☐
7th	Give examples of mutations in human genes that affect the phenotype, and examples of those that have little or no obvious effect.	☐	☐	☐
8th	Explain why many mutations have no effect on the phenotype.	☐	☐	☐

SB3k Variation

Step	Learning outcome	Had a look	Nearly there	Nailed it!
4th	Distinguish between genetic variation and environmental variation.	☐	☐	☐
5th	Distinguish between continuous and discontinuous variation.	☐	☐	☐
6th	Describe the causes of genetic variation (mutation and sexual reproduction).	☐	☐	☐
6th	Describe the causes of environmental variation (differences in the environment, acquired characteristics).	☐	☐	☐
7th	Analyse the contribution of genes and environment to the variation in a characteristic.	☐	☐	☐