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SPECA

GCSE Combined Science (AQA Trilogy) · Biology

Inheritance, Variation and Evolution · Tiered Worksheet

Section A: Foundation

Reproduction and genetics

1) State one difference between sexual and asexual reproduction in terms of the number of parents involved and the genetic variation in the offspring. **[2]**

2) Name the type of cell division that forms gametes, and the type of cell division involved as an embryo grows after fertilisation. **[2]**

3) Explain how meiosis and fertilisation, together, keep the chromosome number the same from one generation to the next. **[2]**

4) Define a gene and a genome. **[2]**

5) Define the terms allele, dominant, recessive, and genotype. **[4]**

6) Guinea pig fur colour is controlled by a single gene, with black fur (C) dominant to brown fur (c). Two heterozygous guinea pigs (Cc) are crossed. Complete the Punnett square below for this cross and state the ratio of black to brown offspring predicted. **[4]**

	C	**c**
C		
c		

7) Polydactyly is caused by a dominant allele, and cystic fibrosis is caused by a recessive allele. Explain what this means for how likely a child is to inherit each disorder from parents who do not have the disorder themselves. **[3]**

8) State how many chromosomes are found in a normal human body cell, and explain how the sex of a baby is determined. **[3]**

Variation, evolution, and selective/genetic breeding

9) Explain what is meant by genetic variation within a population, and state where all variants ultimately come from. **[2]**

10) Describe the process of natural selection. **[3]**

11) Explain what selective breeding is, giving one example, and state one risk associated with it. **[3]**

12) Describe what genetic engineering is, giving one example of its use. **[3]**

Evidence for evolution, and classification

13) Describe three types of evidence that support the theory of evolution by natural selection. **[3]**

14) Explain why the fossil record is incomplete. **[3]**

15) Explain why bacteria are able to evolve resistance to antibiotics relatively quickly, and describe one measure used to slow the spread of resistant strains. **[3]**

16) Name, in order, the seven levels of the Linnaean classification system, from broadest to most specific. **[3]**

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Section B: Higher (in addition to Section A)

Constructing Punnett squares

17) In pea plants, tall stem height (T) is dominant to short stem height (t). A homozygous tall plant is crossed with a homozygous short plant. Construct a Punnett square for this cross, and state the phenotype ratio of the offspring. **[4]**

18) Two heterozygous tall pea plants (Tt) are crossed. Construct a Punnett square to predict the phenotype ratio of their offspring. **[3]**

Genetic engineering in depth

19) Describe the main mechanical steps involved in genetically engineering a crop plant to be resistant to a particular pest. **[4]**

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