KS3 SCIENCE · BIOLOGY

Genetics and evolution: exam questions

Name _____
Total: 22 marks

1 Give one example of a feature that is inherited and one example of a feature that is caused by the environment. **[2 marks]**

2 A student records the blood group of everyone in her class. Name the kind of chart she should draw, and give a reason. **[2 marks]**

3 Describe how genetic information passes from parents to their offspring. **[3 marks]**

4 A brother and a sister have the same two parents. Explain why they look alike but are not identical. **[2 marks]**

5 State what a gene is, and where in a cell genes are found. **[2 marks]**

6 Write these in order of size, starting with the largest: gene, nucleus, chromosome, cell. **[1 mark]**

7 Describe what Rosalind Franklin did, and what Watson and Crick did, to work out the structure of DNA. **[2 marks]**

8 Soot from factories turned the bark of trees dark. Over many years, dark peppered moths became more common than light ones. Use natural selection to explain why. **[4 marks]**

9 Give two reasons why a species may become extinct. **[2 marks]**

10 Explain what a gene bank is and why gene banks are useful. **[2 marks]**

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Genetics and evolution: mark scheme

Total: 22 marks

1 [2 marks]

- Inherited: for example, blood group or natural eye colour **(1)**
- Environmental: for example, a scar, a tattoo or the language a person speaks **(1)**

2 [2 marks]

- A bar chart (with gaps between the bars) **(1)**
- Blood group is discontinuous (accept: it falls into separate groups) **(1)**

3 [3 marks]

- It is carried by genes (accept: DNA or chromosomes) in the egg and the sperm (accept: gametes) **(1)**
- An egg and a sperm each carry half the number of chromosomes of a body cell (accept: 23 in humans) **(1)**
- They join at fertilisation, so the offspring has a full set, half from each parent **(1)**

4 [2 marks]

- Alike: both inherited their genes from the same two parents **(1)**
- Not identical: each egg and each sperm carries a different mix of the parents' genes (accept: each child inherits a different combination of genes) **(1)**

5 [2 marks]

- A section of DNA (that controls an inherited feature) **(1)**
- On the chromosomes (accept: in the nucleus) **(1)**

6 [1 mark]

- Cell, nucleus, chromosome, gene (all four in the right order) **(1)**

7 [2 marks]

- Franklin: took X-ray pictures of DNA (accept: Photo 51), which showed that it is a helix **(1)**
- Watson and Crick: used the evidence to build a model of DNA, the double helix **(1)**

8 [4 marks]

- Variation: some moths were light and some dark, and colour is inherited **(1)**
- Dark moths were harder for birds to see on the dark bark (accept: better camouflaged) **(1)**
- So more dark moths than light moths survived and bred **(1)**
- They passed the genes for dark colour to their offspring, so the proportion of dark moths rose with each generation **(1)**

9 [2 marks]

- A change in its environment, such as a change in climate or the loss of its habitat **(1)**
- A new predator, a new disease or a new competitor **(1)**
- Hunting by humans **(1)**

Any two of these, for one mark each.

10 [2 marks]

- A store of seeds, eggs, sperm or tissue (accept: a store of genetic material) **(1)**
- The genes of a species or variety are not lost if it dies out (accept: it may be grown or bred again, or used to breed new crops) **(1)**