Variation

KS3 Biology · Follows the national curriculum

Name _____ Class _____ Date _____

1. Worked example

Is each of these continuous or discontinuous: height, eye colour, blood group, mass?

Step 1 · Can it take any value in a range?

Height and mass — yes. They are continuous.

Step 2 · Does it fall into separate groups?

Blood group (A, B, AB, O) — yes, discontinuous. Eye colour is usually treated in simple surveys, though shades vary.

Answer: Continuous: height, mass. Discontinuous: blood group, eye colour (simplified)

Check: If you can measure it with a ruler or scales, it is usually continuous.

2. Now try one with the steps

What causes variation? Give an example of each cause.

Step 1 · Genetic (inherited)

Step 2 · Environmental

Step 3 · Both

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. What is variation? [1]

2. Is height an example of continuous or discontinuous variation? [1]

3. Is blood group continuous or discontinuous? [1]

4. What type of graph should be used for discontinuous data? [1]

5. What type of graph should be used for continuous data? [1]

6. Give ONE example of variation caused only by the environment. [1]

7. What is a species? [1]

8. Hand spans of 30 pupils were grouped: 16–17 cm: 2, 17–18 cm: 6, 18–19 cm: 10, 19–20 cm: 7, 20–21 cm: 3, 21–22 cm: 2. Which group has the most pupils? [1]

9. Explain why identical twins can be used to study environmental variation. [2]

10. Pupils' masses: 42, 45, 47, 50, 51 kg. What is the mean, in kg? [1]

11. What is the range of the masses in question 10, in kg? [1]

12. Height is affected by genes and environment. Give ONE environmental factor that affects height. [1]

13. Explain why a lion and a tiger are different species even though they can produce 'ligers' in zoos. [2]

14. A student measured 5 people and concluded 'most Year 8s have a hand span of 19 cm'. Suggest TWO improvements. [2]

4. Before you hand it in

Drawing a histogram with gaps between bars.
Histogram bars touch because the ranges join on to each other (16–17, 17–18…).

"All variation is inherited."
Some variation is genetic, some environmental, and most features depend on both.

"Animals that can breed together are always the same species."
Horse × donkey → mule (infertile). Horses and donkeys are different species.