

Genetics

KS3 Biology · Follows the national curriculum

Name _____ Class _____ Date _____

1. Worked example

Put these in order from largest to smallest: gene, cell, chromosome, nucleus.

Step 1 · Largest

The cell contains the nucleus.

Step 2 · Inside the nucleus

Chromosomes, each made of DNA.

Step 3 · Smallest

A gene is a short section of a chromosome.

Answer: Cell → nucleus → chromosome → gene

Check: DNA is the molecule that chromosomes and genes are made of.

2. Now try one with the steps

Why do children look a bit like both of their biological parents?

Step 1 · Gametes

Step 2 · Fertilisation

Step 3 · Result

Answer:

3. Practice

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

1. What is heredity? [1]

2. Where in a cell are chromosomes found? [1]

3. How many chromosomes are there in a normal human body cell? [1]

4. What is a gene? [1]
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-
5. What shape is a DNA molecule? [1]
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6. How many chromosomes are in a human sperm cell? [1]
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7. Which scientist took the X-ray image ('Photo 51') that helped show DNA's structure? [1]
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-
8. Which two scientists built the first correct model of DNA in 1953? [1]
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9. Explain why siblings with the same parents are not identical. [2]
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-
10. Why was Rosalind Franklin not awarded the 1962 Nobel Prize? [1]
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11. Why don't red blood cells contain any DNA? [1]
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12. Humans have about 20 000 genes across 23 pairs of chromosomes. On average, about how many genes are on each chromosome (count each of the 23 types once)? Give your answer to the nearest whole number. [2]
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13. Explain how the DNA story shows that scientists build on each other's evidence. [2]
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14. STRETCH: Two parents who are both carriers (Ff) for cystic fibrosis have a child. What is the probability (as a percentage) that the child has cystic fibrosis? [2]
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4. Before you hand it in

"A gene is bigger than a chromosome."

A chromosome contains hundreds or thousands of genes. Order: nucleus > chromosome > gene; all are made of DNA.

"Watson and Crick discovered DNA."

Watson and Crick worked out its STRUCTURE (1953), using evidence from Franklin and Wilkins.

"You inherit more genes from your mother."

You get 23 chromosomes from each parent (a tiny amount of extra DNA in mitochondria comes from your mother only — a fun fact, not needed at KS3).