SCIENCE FOUNDATIONS

DNA structure

Difficulty level: Intermediate

Science Foundations

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Overview of the concept

This is how the instructions for building and running your body are stored, in a twisted ladder of code that is copied every time a cell divides. The order of the code letters is what makes your instructions different from anyone else's. A forensic lab uses those differences to match a DNA sample to a person. Knowing the structure tells you how so much information fits into something so small, and how it can be read and copied reliably.



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Worked examples

EXAMPLE 1

Q Write the complementary strand for A T C G.

SOLUTION

Pair each base: A with T, T with A, C with G, G with C.

Write the partners in order: T A G C.

Check: every pair follows A-T and C-G.

The result is complementary strand T A G C.

EXAMPLE 2

Q Write the complementary strand for G G A T.

SOLUTION

Pair each base: G with C, G with C, A with T, T with A.

Write the partners in order: C C T A.

Check: every pair follows the rules.

The result is complementary strand C C T A.

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Practice questions

1 DNA shape?

- A A single strand
- B Double helix
- C Triple helix
- D A flat sheet

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2 A pairs with what?

- A Adenine
- B Cytosine
- C Thymine
- D Guanine

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3 What holds the two strands of DNA together?

A The base pairs

B The sugar backbone

C The phosphate groups

D The cell wall

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4 Complementary strand for C A T G?

A C A T G

B G T A C

C G A T C

D T A C G

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5 A DNA strand reads T T C G. What was the original strand it pairs with?

- **A** A A G C
- **B** T T C G
- **C** A A C G
- **D** U U C G

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6 Backbone made of what?

- **A** Protein and fat
- **B** Sugar and phosphate
- **C** Bases only
- **D** Water and salt

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7 What carries instructions?

A The cell wall

B The phosphate groups

C The sugar backbone

D The base sequence

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8 How many strands in DNA?

A One

B Two

C Three

D Four

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9 What is a base?

A A sugar in the backbone

B A whole chromosome

C A letter unit in the DNA sequence

D A protein that copies DNA

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10 Adenine, thymine, cytosine, guanine: what are they?

A The four amino acids

B The four DNA bases

C The four sugars

D The four cell types

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ANSWER KEY

1. Double helix

2. Thymine

3. The base pairs

4. G T A C

5. A A G C

6. Sugar and phosphate

7. The base sequence

8. Two

9. A letter unit in the DNA sequence

10. The four DNA bases

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