

OCR (B) Biology GCSE

Topic B1.1: What is the genome and what does it do?

Flashcards

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State the two types of cell



State the two types of cell

Eukaryotic (animals and plants) and
prokaryotic



What is the difference between a eukaryotic and prokaryotic cell?



What is the difference between a eukaryotic and prokaryotic cell?

A eukaryotic cell contains a nucleus and membrane-bound organelles. A prokaryotic cell does not.



How can the structure of eukaryotic cells be observed?



How can the structure of eukaryotic cells be observed?

Using a light microscope



How is genetic information stored in a eukaryotic cell?



How is genetic information stored in a eukaryotic cell?

Within the nucleus, arranged in chromosomes



How is genetic information stored in a prokaryotic cell?



How is genetic information stored in a prokaryotic cell?

Found free within the cytoplasm as:

- Single large loop of circular DNA
- Plasmids



What are plasmids?



What are plasmids?

- Small, circular loops of DNA found free in the cytoplasm and separate from the main DNA
- Carry genes that provide genetic advantages e.g. antibiotic resistance



Define genome



Define genome

The entire genetic material of an organism



What is a chromosome?



What is a chromosome?

A long, coiled molecule of DNA that carries genetic information in the form of genes



What is DNA?



What is DNA?

A double-stranded polymer of nucleotides, wound to form a double helix



Define gene



Define gene

A section of DNA that codes for a specific sequence of amino acids which undergo polymerisation to form a protein



What are alleles?



What are alleles?

Different versions of the same gene



Define genotype



Define genotype

An organism's genetic composition,
describes all alleles



Define phenotype



Define phenotype

An organism's observable characteristics due to interactions of the genotype and environment (which can modify the phenotype)



What are the monomers of DNA?



What are the monomers of DNA?

Nucleotides



What are DNA nucleotides made up of?
(biology only)



What are DNA nucleotides made up of?
(biology only)

- Common sugar
- Phosphate group
- One of four bases: A, T, C or G



Describe how nucleotides interact to form a molecule of DNA (biology only)



Describe how nucleotides interact to form a molecule of DNA

- Sugar and phosphate molecules join to form a sugar-phosphate backbone in each DNA strand
- Base connected to each sugar
- Complementary base pairing: A pairs with T, C pairs with G



Explain how a gene codes for a protein
(biology only/higher)



Explain how a gene codes for a protein (biology only/higher)

- A sequence of three bases in a gene forms a triplet
- Each triplet codes for an amino acid
- The order of amino acids determines the structure and function of protein formed



Describe the differences between mRNA
and DNA (biology only/higher)



Describe the difference between mRNA and DNA
(biology only/higher)

- mRNA is single stranded whereas DNA is double stranded
- mRNA uses U whereas DNA uses T



What is protein synthesis? (biology only/higher)



What is protein synthesis? (biology only/higher)

The formation of a protein from a gene



Outline protein synthesis (biology only/higher)



Outline protein synthesis (biology only/higher)

1. In the nucleus, DNA is used as a template to form mRNA
2. mRNA exits the nucleus, moving into the cytoplasm where it attaches to a ribosome
3. The ribosome joins amino acids in a specific order, dictated by mRNA to form a protein.



Why does mRNA rather than DNA join to
a ribosome in the cytoplasm
(biology only/higher)



Why does mRNA rather than DNA join to a ribosome in the cytoplasm? (biology only/higher)

DNA is too large to leave the nucleus so cannot reach the ribosome



What is a mutation? (biology only/higher)



What is a mutation? (biology only/higher)

A random change to the base sequence of DNA which results in genetic variants



State the three types of gene mutation
(biology only/higher)



State the three types of gene mutation
(biology only/higher)

- Insertion
- Deletion
- Substitution



Describe the effect of a gene mutation in coding DNA (biology only/higher)



Describe the effect of a gene mutation in coding DNA

(biology only/higher)

- If a mutation changes the sequence of amino acids, protein structure and function may change
- If a mutation does not change the sequence of amino acids, there is no effect on protein structure or function



What is non-coding DNA? (biology only/higher)



What is non-coding DNA? (biology only/higher)

DNA which does not code for a protein
but instead controls gene expression



Describe the effect of a gene mutation in
non-coding DNA (biology only/higher)



Describe the effect of a gene mutation in non-coding DNA (**biology only/higher**)

Gene expression may be altered, affecting protein production and the resulting phenotype

