

# OCR (B) Biology GCSE

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

Flashcards

# State the two types of cell

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## 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?

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## 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?

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## 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