Introduction to the Genetic Code

Read the following introduction and answer the questions that follow:

The genetic code is a fundamental concept in biology that plays a crucial role in the development, growth, and function of all living organisms. It is a set of rules that dictates how the sequence of nucleotides in DNA is translated into the sequence of amino acids in proteins.

1. What is the genetic code?

2. What is the significance of the genetic code?

Genetic Code Scavenger Hunt

Find the following terms related to the genetic code in the word search below:

A E L M O R T C A E H L O I T C G T A C G T A C G T T A C G T A C G T A C G T E H L O R T C A E H L O R
T C A E H L O R T C A E H L O R T C A E H L O R T C A E H L O R T C A E H L O R T C A E H L O R T C A E

- DNA
- RNA
- Protein
- Gene
- Codon

Genetic Code Matching

Match the following terms related to the genetic code with their definitions:

1. DNA
2. RNA
3. Protein
4. Gene
5. Codon

Definitions:

- A sequence of nucleotides that codes for a protein
- A molecule that contains the genetic instructions for an organism
- A sequence of amino acids that makes up a protein
- A molecule that plays a crucial role in protein synthesis
- A unit of heredity that carries information from one generation to the next

Genetic Code Basics

Read the following text and answer the questions that follow:

DNA (deoxyribonucleic acid) is a molecule that contains the genetic instructions for an organism. It is made up of two strands of nucleotides that are twisted together in a double helix.

1. What is DNA?

2. What is the structure of DNA?

DNA Model Building

Build a model of the DNA double helix using the following materials:

- Two strands of paper or string
- Nucleotide bases (A, C, G, and T)
- Glue or tape

RNA Sequencing

Sequence the following RNA nucleotides:

A U G C A U G C C G U A C G U A G U A C G U A C U A C G U A C G

Gene Expression and Regulation

Read the following text and answer the questions that follow:

Gene expression is the process by which the information in a gene is converted into a functional product, such as a protein.

1. What is gene expression?

2. What is the significance of gene expression?

Genetic Engineering

Read the following text and answer the questions that follow:

Genetic engineering is the use of technology to manipulate an organism's genes. This can be done to develop new treatments for genetic disorders, improve crop yields, or develop new biofuels.

1. What is genetic engineering?

2. What are the potential applications of genetic engineering?

Genetic Research Ethics

Discuss the following topic:

What are the potential consequences of genetic research and its applications?

Informed Consent

Read the following scenario and answer the questions that follow:

A patient is considering undergoing genetic testing to determine their risk of developing a genetic disorder. What information should they be provided with in order to give informed consent?

1. What is informed consent?
2. What information should be provided to a patient in order to give informed consent?

Genetic Counseling

Read the following scenario and answer the questions that follow:

A patient has undergone genetic testing and has been diagnosed with a genetic disorder. What information and guidance should they be provided with?

1. What is genetic counseling?

2. What information and guidance should be provided to a patient who has been diagnosed with a genetic disorder?

Conclusion

Summarize what you have learned about the genetic code and its significance: