Genetics Vocabulary Worksheet Questions and Answers PDF

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Part 1: Building a Foundation

What is the basic unit of heredity in a living organism?

Hint: Think about the smallest functional unit that carries genetic information.

- ◯ A) Chromosome
- ◯ **B) Gene ✓**
- ◯ C) Alleles
- ◯ D) DNA

> The basic unit of heredity is a gene.

Which of the following are components of a chromosome?

Hint: Consider the materials that make up the structure of chromosomes.

- ☐ **A) DNA ✓**
- ☐ **B) Protein ✓**
- ☐ C) Lipids
- ☐ D) RNA

> Chromosomes are made up of DNA and proteins.

Explain the difference between a genotype and a phenotype.

Hint: Consider how genetic makeup differs from observable traits.

A genotype is the genetic makeup of an organism, while a phenotype is the observable characteristics.

List two types of cell division and briefly describe their purpose.

Hint: Think about the processes that lead to cell reproduction.

1. Type of cell division 1

mitosis

2. Purpose of cell division 1

growth and repair

3. Type of cell division 2

meiosis

4. Purpose of cell division 2

producing gametes

The two types of cell division are mitosis (for growth and repair) and meiosis (for producing gametes).

Part 2: Understanding and Interpretation

Which of the following best describes an allele?

Hint: Consider the variations of a gene.

- ◯ A) A type of cell division
- ◯ **B) A form of a gene ✓**
- ◯ C) A protein structure
- ◯ D) A genetic disorder

An allele is a form of a gene that can exist in different versions.

Which scenarios demonstrate dominant allele expression?

Hint: Think about traits that appear in offspring.

- ☐ A) A brown-eyed child from two blue-eyed parents
- ☐ **B) A tall plant from a short and tall parent ✓**
- ☐ C) A white flower from two white-flowered parents
- ☐ **D) A red flower from a red and white-flowered parent ✓**

Dominant alleles are expressed when at least one dominant allele is present.

Describe how linked genes can affect inheritance patterns.

Hint: Consider the relationship between genes on the same chromosome.

Linked genes tend to be inherited together, affecting the expected ratios of traits.

Part 3: Application and Analysis

If a child inherits one allele for brown eyes and one for blue eyes, which eye color is likely to be expressed?

Hint: Consider which allele is dominant.

- ◯ A) Blue
- ◯ **B) Brown ✓**
- ◯ C) Green
- ◯ D) Hazel

> Brown is likely to be expressed because it is typically the dominant allele.

In a genetic cross between two heterozygous individuals (Aa), what are the possible genotypes of the offspring?

Hint: Think about the combinations of alleles that can result from this cross.

- ☐ **A) AA ✓**
- ☐ **B) Aa ✓**
- ☐ **C) aa ✓**
- ☐ D) AaBb

> The possible genotypes are AA, Aa, and aa.

Apply your understanding of incomplete dominance to predict the phenotype of offspring from a cross between a red-flowered plant and a white-flowered plant.

Hint: Consider how incomplete dominance results in a blend of traits.

> **The offspring would likely have pink flowers due to incomplete dominance.**

Which process increases genetic variation during meiosis?

Hint: Think about the mechanisms that shuffle genetic material.

- ◯ A) DNA replication
- ◯ B) Mutation
- ◯ **C) Cross-over ✓**
- ◯ D) Cell division

> Cross-over increases genetic variation by exchanging genetic material between homologous chromosomes.

Which of the following are examples of polygenic traits?

Hint: Consider traits that are influenced by multiple genes.

- ☐ **A) Eye color ✓**
- ☐ B) Blood type
- ☐ **C) Skin color ✓**
- ☐ **D) Height ✓**

> Examples of polygenic traits include eye color, skin color, and height.

Analyze how mutations can lead to genetic disorders. Provide examples.

Hint: Consider the types of mutations and their effects on genes.

> **Mutations can disrupt normal gene function, leading to disorders such as cystic fibrosis and sick cell anemia.**

Part 4: Evaluation and Creation

Which of the following best evaluates the impact of genetic engineering on agriculture?

Hint: Consider the benefits and drawbacks of modifying crops.

- ◯ A) It has no impact
- ◯ B) It only benefits large corporations
- ◯ **C) It can increase crop yields and resistance to pests ✓**
- ◯ D) It is detrimental to all ecosystems

> Genetic engineering can increase crop yields and resistance to pests.

Which strategies could be used to predict the likelihood of inheriting a genetic disorder?

Hint: Consider methods used in genetics to assess risk.

- ☐ **A) Pedigree analysis ✓**
- ☐ **B) Genetic counseling ✓**
- ☐ C) Random guessing
- ☐ **D) DNA sequencing ✓**

> Strategies include pedigree analysis, genetic counseling, and DNA sequencing.

Propose a method for using genetic information to address a real-world problem, such as a hereditary disease or agricultural challenge. Describe the steps and potential outcomes.

Hint: Think about how genetic research can lead to solutions.

> **A method could involve gene therapy for hereditary diseases, which includes identifying the mutation, designing a corrective gene, and delivering it to the patient.**