

**20 Multiple choice questions**

Term

What is the difference between mitosis and meiosis?

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- Sister chromatids separate to form two identical daughter cells.
- Meiosis results in four haploid daughter cells, each with half the number of chromosomes.
- Mitosis produces two identical diploid cells, while meiosis produces four genetically diverse haploid cells.
- Mitosis produces four genetically diverse diploid cells, while meiosis produces two identical haploid cells.

Term

What is a chiasma?

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- A chiasma is the point where sister chromatids separate during mitosis.
- A chiasma is the point where homologous chromosomes exchange genetic material during meiosis.
- A chiasma is the region where chromosomes duplicate during meiosis.
- A chiasma is the site where chromosomes condense during cell division.

Term

What are the expected phenotypic ratios in the F<sub>2</sub> generation from a monohybrid cross?

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- The expected phenotypic ratio is 3:1 for dominant to recessive traits.
- The expected phenotypic ratio is 2:1 for dominant to recessive traits.
- The expected phenotypic ratio is 1:3 for dominant to recessive traits.
- The expected phenotypic ratio is 4:1 for dominant to recessive traits.

Term

Can two organisms have the same phenotype but different genotypes?

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- Yes, two organisms can have the same phenotype (e.g., purple flowers) but different genotypes (e.g., one homozygous dominant and the other heterozygous).
- It does not account for how traits can reappear in later generations, as traits do not blend but are inherited as discrete units.
- The centromere is the region where sister chromatids are joined and where spindle fibers attach during cell division.
- Dominant alleles are not necessarily more common; for example, polydactyl (extra fingers or toes) is a recessive trait that can be rare.

Term

What is the significance of dominant alleles in a population?

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- Dominant alleles are not necessarily more common; for example, polydactyl (extra fingers or toes) is a recessive trait that can be rare.
- Dominant alleles are always expressed; for example, red hair is a dominant trait.
- Dominant alleles are necessarily more common; for example, blonde hair is a dominant trait.
- Dominant alleles are always more common; for example, blue eyes are a dominant trait.

Term

What does the term 'genotype' refer to?

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- Genotype refers to an organism's observable behavior.
- Genotype refers to an organism's external appearance.
- Genotype refers to an organism's physical traits.
- Genotype refers to an organism's genetic makeup.

What does the term 'phenotype' refer to?

- Phenotype refers to an organism's genetic code.**
- Phenotype refers to an organism's observable traits or physical appearance.**
- Phenotype refers to an organism's DNA sequence.**
- Phenotype refers to an organism's cellular structure.**

What are the genotypes for the F1 generation when crossing PP (purple) with pp (white)?

- A Punnett square is used to predict the genotypes of offspring from a genetic cross.**
- Offspring will be a mix of PP (purple) and pp (white).**
- All offspring will be Pp (purple).**
- All offspring will be P (purple).**

What is the purpose of a Punnett square?

- A Punnett square is used to analyze the mutations in offspring.**
- A Punnett square is used to determine the physical traits of offspring.**
- A Punnett square is used to predict the environmental influences on offspring.**
- A Punnett square is used to predict the genotypes of offspring from a genetic cross.**

What is the relationship between alleles A and B in the ABO blood group?

- The ABO blood group is determined by three alleles: A, B, and i.**
- Both A and B are dominant to i and are codominant to each other.**
- Both A and B are recessive to i and dominant to each other.**
- Both A and B are recessive to i and A is dominant to B.**

What is the outcome of crossing BbCc with BbCc in terms of color in mice?

- The expected phenotypic ratio is 3 black with color: 9 black without color: 1 brown with color: 3 brown without color.**
- The expected phenotypic ratio is 12 black with color: 4 black without color: 2 brown with color: 2 brown without color.**
- The expected phenotypic ratio is 9 black with color: 3 black without color: 3 brown with color: 1 brown without color.**
- The expected phenotypic ratio is 6 black with color: 2 black without color: 6 brown with color: 2 brown without color.**

What is the blending hypothesis in genetics?

- The blending hypothesis suggests that genetic material from two parents blends together, like mixing paint.**
- The blending hypothesis suggests that genetic material is passed down unchanged.**
- The blending hypothesis suggests that genetic material duplicates exactly.**
- The blending hypothesis proposes that genetic material is randomly discarded.**

What is the role of sister chromatids during mitosis?

- Sister chromatids separate to form two identical daughter cells.**
- Sister chromatids pair up to form new cells.**
- Sister chromatids merge to create a single daughter cell.**
- Sister chromatids remain joined throughout cell division.**

How many possible genotypes can be formed from the ABO blood group alleles?

- There are 3 possible genotypes and 5 possible blood types.
- There are 6 possible genotypes and 4 possible blood types.
- There are 5 possible genotypes and 3 possible blood types.
- There are 4 possible genotypes and 6 possible blood types.

What determines the ABO blood group in humans?

- The ABO blood group is determined by a single allele: O.
- The ABO blood group is determined by two alleles: A and B.
- The ABO blood group is determined by three alleles: A, B, and i.
- The ABO blood group is determined by four alleles: A, B, O, and C.

What is the end result of meiosis?

- Meiosis results in four haploid daughter cells, each with half the number of chromosomes.
- Meiosis results in two diploid daughter cells, each with the same number of chromosomes.
- Meiosis results in four identical daughter cells, each with the full set of chromosomes.
- Meiosis results in two haploid daughter cells, each with twice the number of chromosomes.

What happens during Prophase I of meiosis?

- Homologous chromosomes separate without exchanging material.
- Homologous chromosomes condense and do not interact.
- Homologous chromosomes pair up and exchange genetic material through crossing over.
- Homologous chromosomes duplicate and remain unpaired.

What is the significance of the centromere in cell division?

- The centromere is the region where sister chromatids are joined and where spindle fibers attach during cell division.
- The centromere is the region where chromosomes duplicate before cell division.
- The centromere is the area where spindle fibers detach during cell division.
- The centromere is the site where sister chromatids separate and move to opposite poles.

What is a problem with the blending hypothesis?

- It accounts for how traits are permanently lost in offspring.
- It does not account for how traits can reappear in later generations, as traits do not blend but are inherited as discrete units.
- It explains how traits are always inherited in identical form.
- It describes how traits are always expressed equally in each generation.

What are multiple alleles?

- Most genes exist in populations in only one allelic form.
- Most genes exist in populations without any allelic variation.
- Most genes exist in populations in more than two allelic forms.
- Most genes are found in two identical allelic forms.