Genetics Study Guide

Pick <u>30</u> questions to answer. You must include the ones with a ⭐.

Mendel's Work, Sexual and Asexual Reproduction

1. Define trait.

2. Define gene.

⭐3. Define phenotype.

⭐4. Define genotype.

5. Define dominant (include letter type).

6. Define recessive (include letter type).

7. Purebred/homozygous.

8. Hybrid/heterozygous.

9. Give three reasons Mendel used pea plants to study inheritance.

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10. What did Mendel conclude from his experiment?

⭐11. What is the difference between sexual and asexual reproduction?

⭐12. Which type of reproduction allows for more diversity? Why?

13. Which type of reproduction allows for no diversity; the daughter cells are identical to the parent cells?

14. What are the four nitrogenous bases of DNA?

⭐15. How do the base pairs in DNA pair up?

⭐ 16.   Complete the chart comparing mitosis and meiosis. Use the options listed.

Meiosis	Question	Mitosis
	How do the number of chromosomes in the resulting cells compare to the original cell?	
	What is the end result if you started with 46 chromosomes?	
	Where in the body does the process take place?	
	What is the purpose of this process?	

A. 23 chromosomes

B. 46 chromosomes

C. Same number

D. Half the number

E. Reproductive Organs

F. All throughout the body

G. Create sperm and egg cells for reproduction

H. Create body cells for growth, development, and repair

Probability and Patterns of Inheritance

17.   What is probability?

⭐ 18.   Complete the Punnett square with the letter H. A recessive giggle gobble is crossed with a hybrid giggle gobble that has horns.

⭐ 19.   Use the Punnett square in 19 to answer:

- What is the recessive trait?

- What is the dominant trait?

- How do you know which is dominant and which is recessive?

⭐ 20.   Use the Punnett square in 19 to list the genotypes of the offspring.

_____ = _____ %

_____ = _____ %

_____ = _____%

⭐ 21.   Use the Punnett square in 19 to list the phenotypes of the offspring.

_____ = _____%

_____ = _____%

22.   Create a Punnett square using two DIFFERENT purebred parents for a new generation.

N = normal joints, n = double jointed

23.   Use the Punnett square in 23 to list the phenotypes and genotypes of the offspring.

Genotypes   **Phenotypes**

NN = _____%   _____ = _____%

Nn = _____%   _____ = _____%

nn = _____%

⭐ 24.   A child is born with a genetic disease, however, neither of the parents have the disease.

Set up a Punnett square to show how this is possible. Use the letter D.

⭐ 25.   A trait on the X or Y chromosome is known as a _____ trait.

26.   People who have one gene for a disease but show no symptoms are called _____.

27.   What do you use to show how a trait is distributed within a family?

28.   Describe the parts of a pedigree below:

- Half-shaded circle
- Blank square
- Shaded circle
- Horizontal line

⭐ 29.   Give 3 important facts about cloning. (make sure you include a definition)

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Genetic Diseases and Disorders

30.   What is a mutation?

⭐ 31. Give an example of a when a mutation causes:

- No effect

- Minor effect

- Major effect

32. As a result of a mutation, an arctic fox is born with brown fur that will never lighten to white fur. How would this mutation affect the animal's ability to survive in its environment? Give at least two ways that fur color impacts the fox in the arctic environment.

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⭐ 33. Define genetic disease/disorder.

34. What is cancer?

⭐ 35. What is Down syndrome?

36. What is hemophilia?

37. What is sickle cell anemia?

38. Match the following conditions with an environmental factor that may have caused it.

_____ heart disease   a. poor nutrition

_____ short height   b. lack of folic acid

_____ diabetes   c. poor diet and lack of exercise

_____ skin cancer   d. poor diet and lack of exercise

_____ spina bifida   e. exposure to ultraviolet radiation

⭐ 39. Explain how a trait that is controlled by more than one gene (polygenic) has a wider variety of phenotypes. You can create an example to help you explain.