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**Topic:** Autosomal Pedigrees Worksheet

**Summary:** Students will learn how to use autosomal pedigrees to trace a gene as it is passed down from generation to generation. Students will also learn about genetic disorders.

**Goals & Objectives:** Students will be able to trace a gene as it is passed down from generation to generation.

**NGSS Standards:** *HS-LS-3.3:* Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.

**Time Length:** 15 minutes

**Prerequisite Knowledge:** Students know how to complete a Punnett square for dominant and recessive traits. Students know vocabulary words like homozygous, heterozygous, dominant, recessive, genotype, and phenotype.

**Materials:**

Class notes or textbook or online textbook:

- <https://flexbooks.ck12.org/cbook/ck-12-biology-flexbook-2.0/section/3.11/primary/lesson/mendelian-inheritance-in-humans-bio/>

**Procedures:**

1. Students work on the handout by themselves.

**Accommodations:** Students with an IEP can take the handout home if they need extra time, and/or do the even-numbered questions.

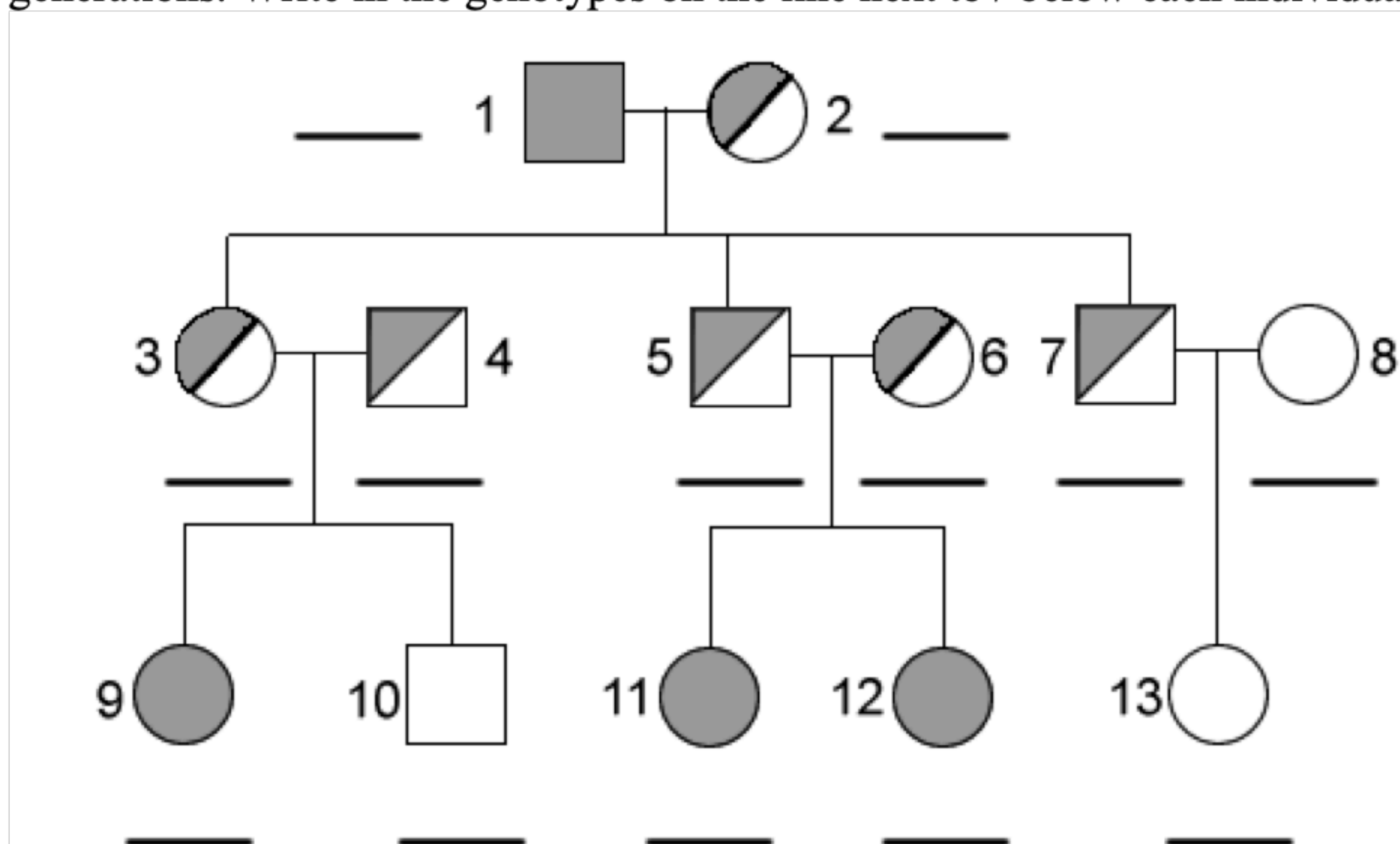
**Editable DOCX File and Answer Key:**

Available at [www.ngsslifescience.com](http://www.ngsslifescience.com)

## Autosomal Pedigrees Worksheet

**Background Information:** Pedigrees are used to trace a gene as it is passed down from generation to generation. The squares represent a male and the circles represent a female. In the examples on this handout, the shaded circles and squares will represent having the disorder. Half shaded circles and squares are carriers. A person can be a carrier of a trait, meaning they have heterozygous alleles. Make sure to read each question to find out if a disorder is caused by dominant alleles or recessive alleles.

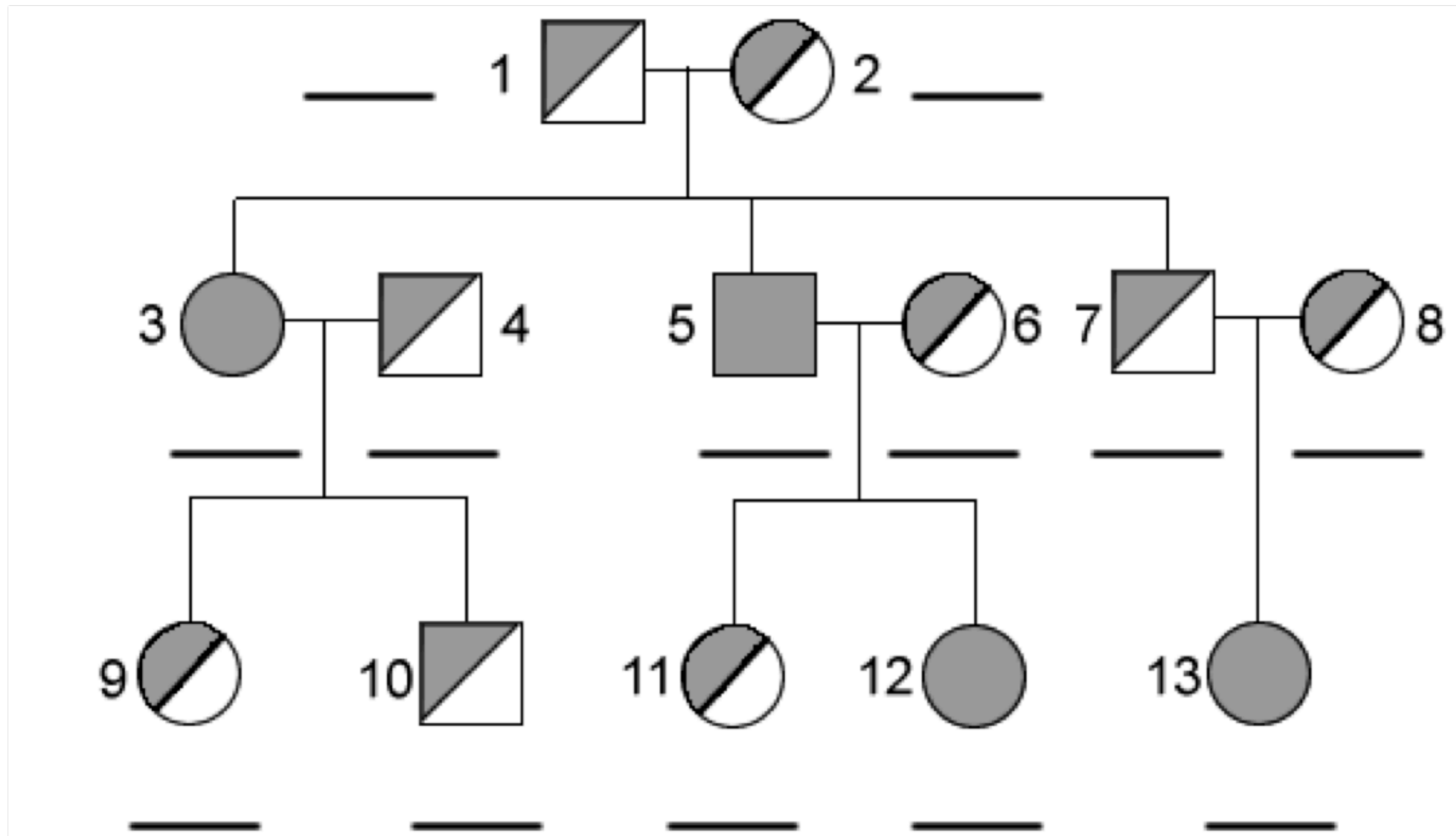
1) Albinism (Albino) causes a deficiency of pigmentation in skin, hair, and eyes. Albinism is recessive and autosomal. When a single gene affects many traits, like albinism, it is called pleiotropy. Below is an autosomal pedigree tracing the passing of the albinism gene through 3 generations. Write in the genotypes on the line next to / below each individual.



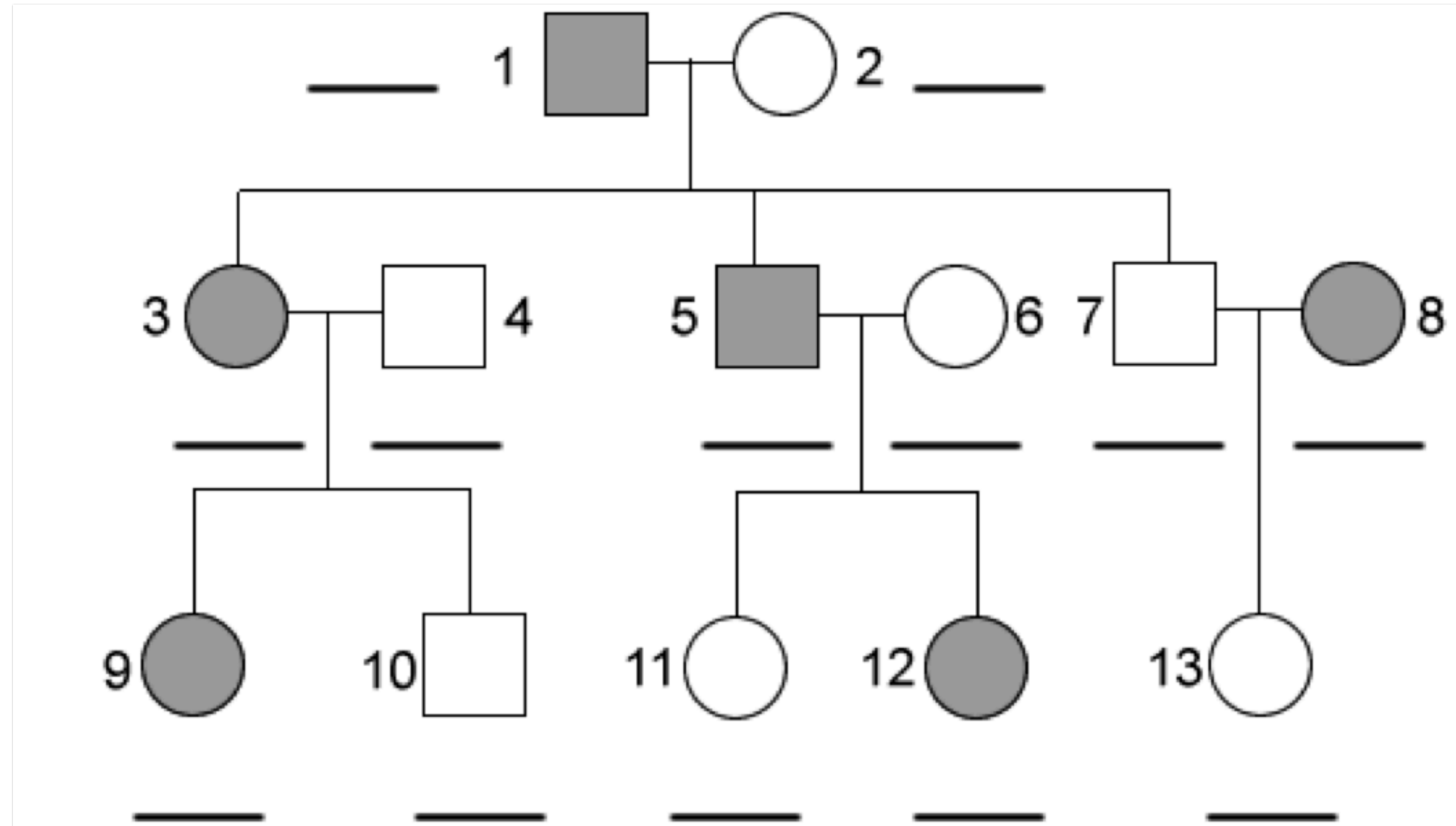
**For all phenotype questions below, answers include: wild type, carrier, albino.**

- 2) What is the phenotype of individual 1? \_\_\_\_\_
- 3) What is the phenotype of individual 2? \_\_\_\_\_
- 4) What is the phenotype of individual 5? \_\_\_\_\_
- 5) What is the phenotype of individual 8? \_\_\_\_\_
- 6) Why did individuals 9, 11, and 12 get the disorder but their parents did not have the disorder?  
 \_\_\_\_\_  
 \_\_\_\_\_

7) Sickle-cell anemia is an autosomal recessive genetic disorder that causes red blood cells to change shape, which can cause the red blood cells to become stuck in blood vessels. Write in the genotypes on the line next to / below each individual.



8) Below is an autosomal pedigree tracing the passing of the Huntington disease gene through 3 generations. Write in the genotypes on the line next to / below each individual.



9) Did the pedigree in question 8 represent a dominant or recessive disease? \_\_\_\_\_

10) Explain how you know. \_\_\_\_\_