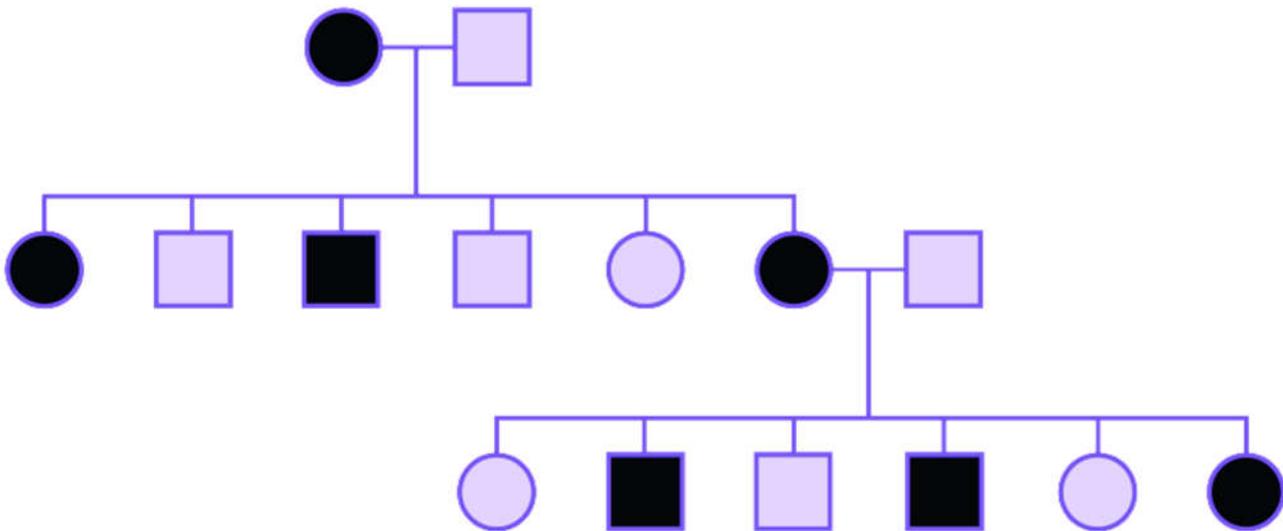


### Pedigrees

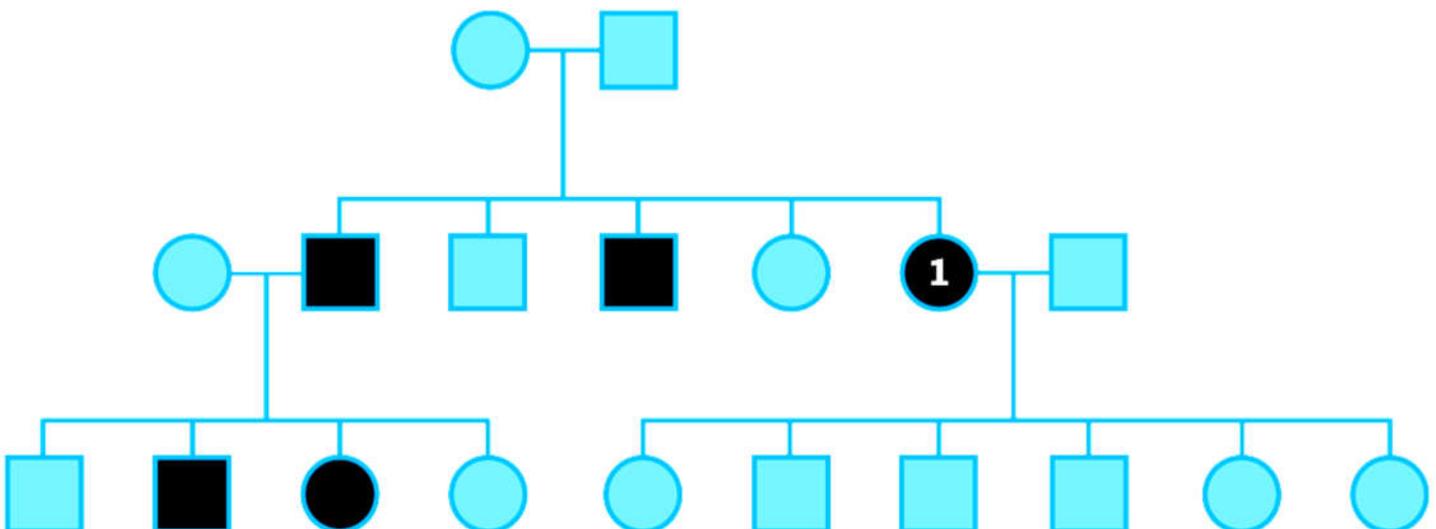
- A pedigree is a family tree that traces traits from one generation to the next.
- Basic Symbols:
  - The offspring are depicted below the parents with a vertical line.
  - Shading in the symbol indicates the expression of the studied trait.
  - If you cannot determine the full genotype, you can represent one alleles with “\_” or “?”

Examples:

#### 1) Determining Genotypes for an Autosomal Dominant Condition



#### 2) Determining Genotypes for an Autosomal Recessive Condition



In humans, albinism is a recessive trait. The disorder causes a lack of pigment in the skin and hair, making an albino appear very pale with white hair and pale blue eyes. This disorder also occurs in animals, a common albino found in a laboratory is the white rat. The pedigrees below trace the inheritance of the allele that causes albinism.

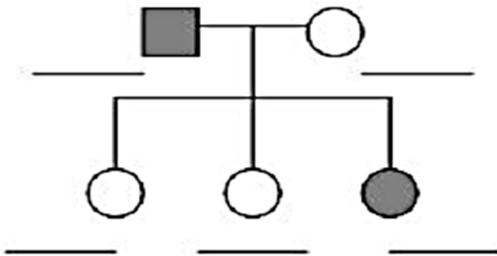
1. Given the following genotypes, describe the phenotypes (normal or albino)

AA = \_\_\_\_\_

Aa = \_\_\_\_\_

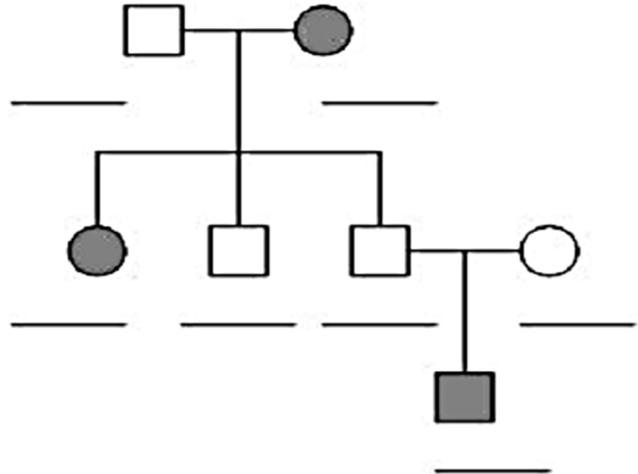
aa = \_\_\_\_\_

2. Fill out the blanks on the pedigree below.



3. How many children does this family have? \_\_\_\_\_  
 What are the sexes of the children? \_\_\_\_\_

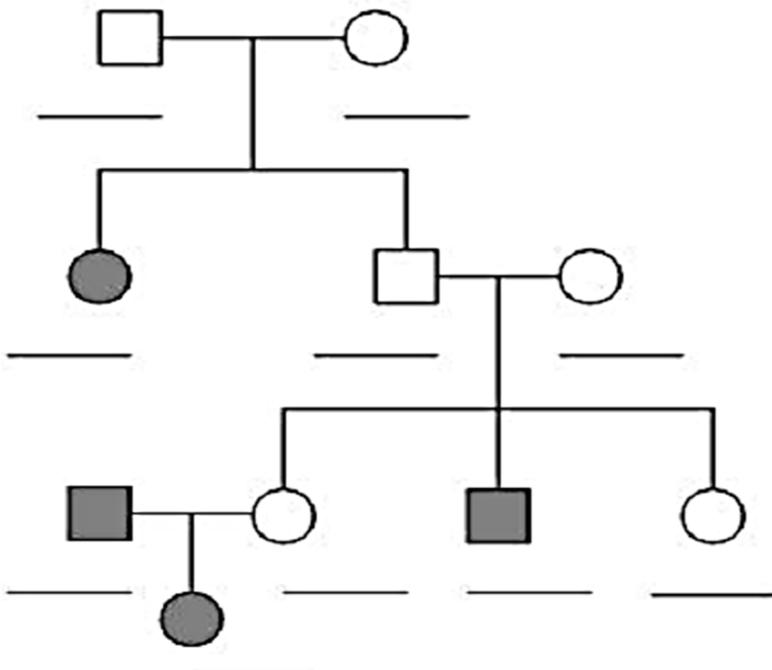
4. Fill out the blanks of the pedigree below (AA, Aa, or aa)



5. How many children does the original couple have? \_\_\_\_\_

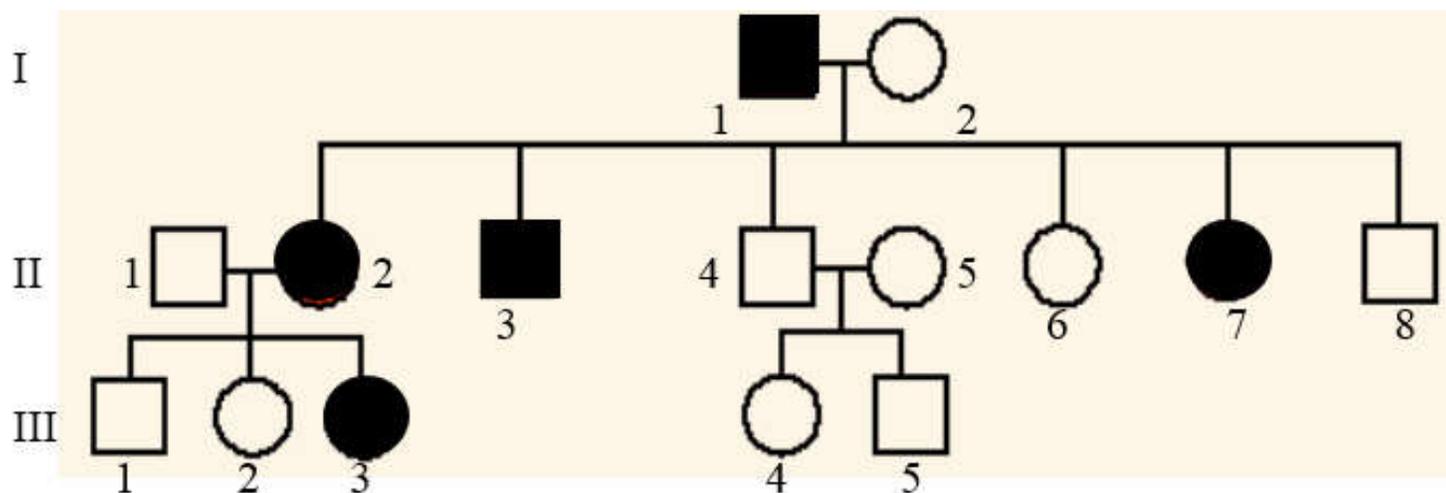
6. How many grandchildren does the original couple have? \_\_\_\_\_  
 What is the sex of the grandchild? \_\_\_\_\_

7. Fill out the blanks of the pedigree below (AA, Aa, aa)



8. How many children does the original couple have? \_\_\_\_\_

9. How many grandchildren? \_\_\_\_\_



1. There are no carriers for Huntington's Disease- you either have it or you don't. With this in mind, is Huntington's disease caused by a dominant or recessive trait?

2. Determine the phenotype associated with each genotype below:

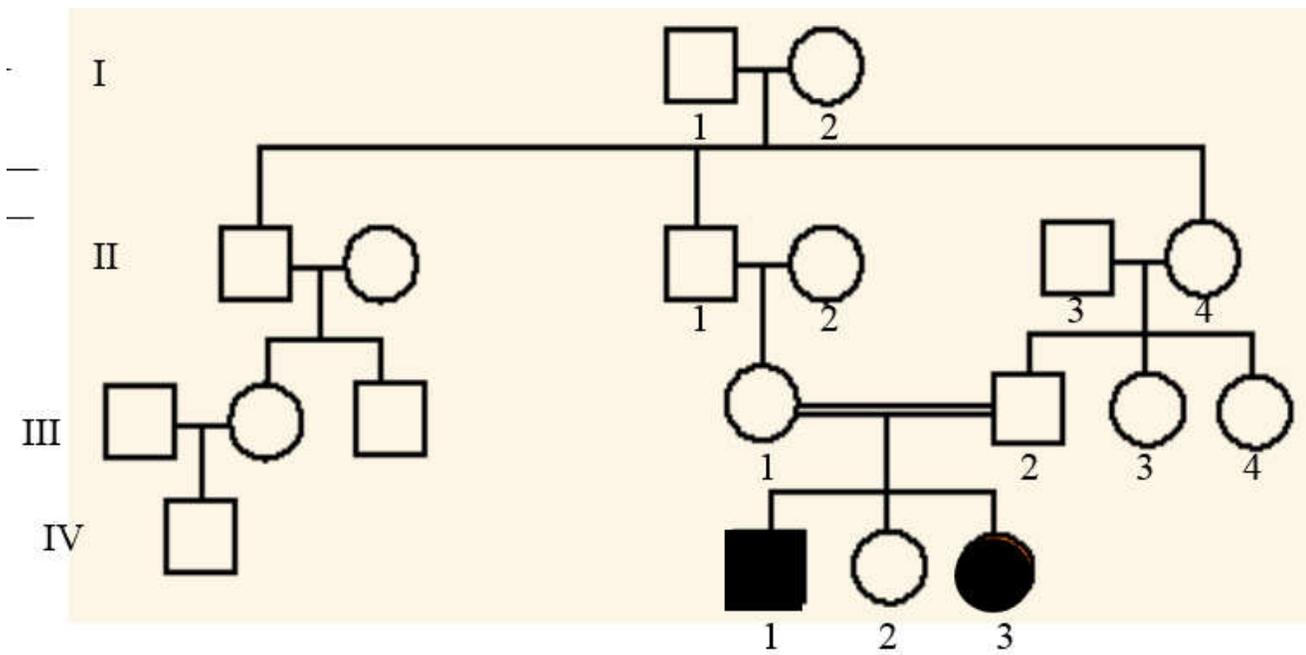
a. HH =

b. Hh =

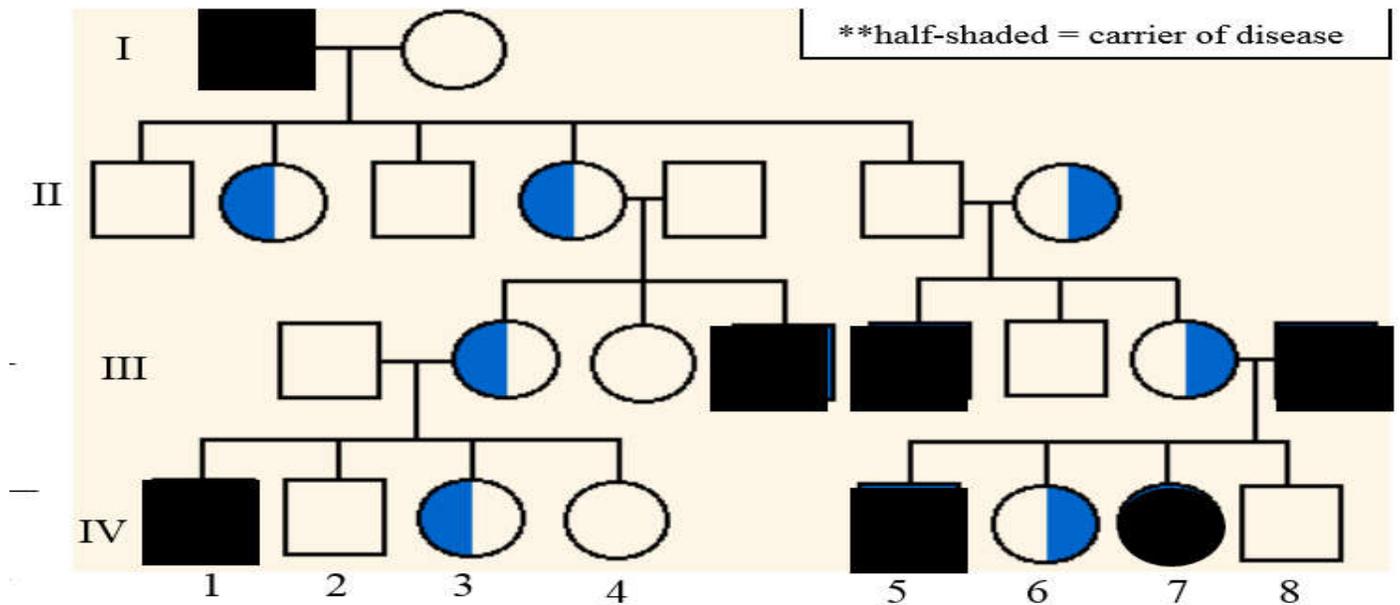
c. hh =

3. Using your answer to the questions above, determine the genotypes for the individuals in the pedigree above. Use H and h to discern between the dominant and recessive alleles.

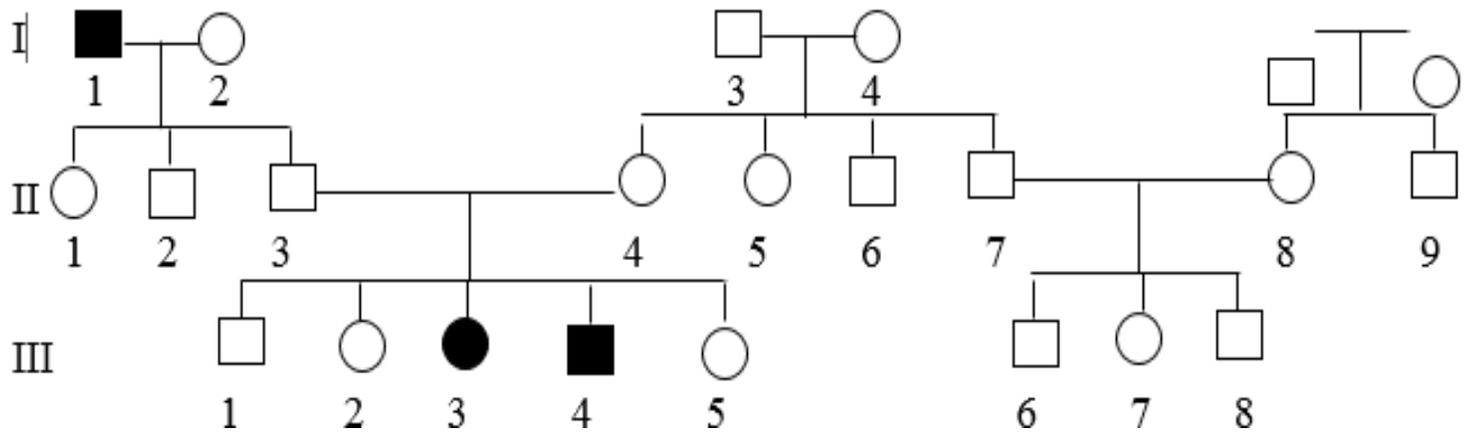
4. Is it possible to be a carrier for Huntington's disease?



1. A family's pedigree for Hitchhiker's Thumb is shown. Is this trait dominant or recessive? How do you know?
2. Determine the phenotype associated with each genotype below:
  - a.  $TT =$
  - b.  $Tt =$
  - c.  $tt =$
3. Using your answer to the question above, determine the genotypes for the individuals in the pedigree above. Use T and t to discern between the dominant and recessive alleles.
4. List the two individuals who are carriers for hitchhiker's thumb.



1. The pedigree shows a family's pedigree for colorblindness. Which sex can be carriers of colorblindness and not have it?
2. With this in mind, what kind of trait is colorblindness (use your notes)?
3. Using your answer to the questions above, determine the genotypes for the individuals in the pedigree above. Use  $N$  and  $n$  to discern between the dominant and recessive alleles and  $X$  and  $Y$  to discern between female and male chromosomes. Make a key for the phenotype associated with each genotype below:
4. Why does individual IV-7 have colorblindness?
5. Why do all the daughters in generation II carry the colorblind gene?



Try to identify the genotypes of the individuals in the pedigree above.

1. Is this trait dominant or recessive? Explain your answer.

2. How can you know for sure that individuals II-3 and II-4 are heterozygous?

3. Brown eyes are a dominant eye-color allele and blue eyes are recessive. A brown-eyed woman whose father had blue eyes and whose mother had brown eyes marries a brown-eyed man whose parents are also brown-eyed. They have a son who is blue-eyed. Please draw a pedigree showing all four grandparents, the two parents, and the son. Indicate which individuals you are certain of their genotype and where there are more than one possibilities.