

Pedigrees

Imagine that you are a geneticist who is interested in tracing the occurrence of a genetic disorder through several generations of a family. What would you do? **One important tool that geneticists use to trace the inheritance of traits in humans is a pedigree.** A pedigree is a chart or "family tree" that tracks which members of a family have a particular trait.

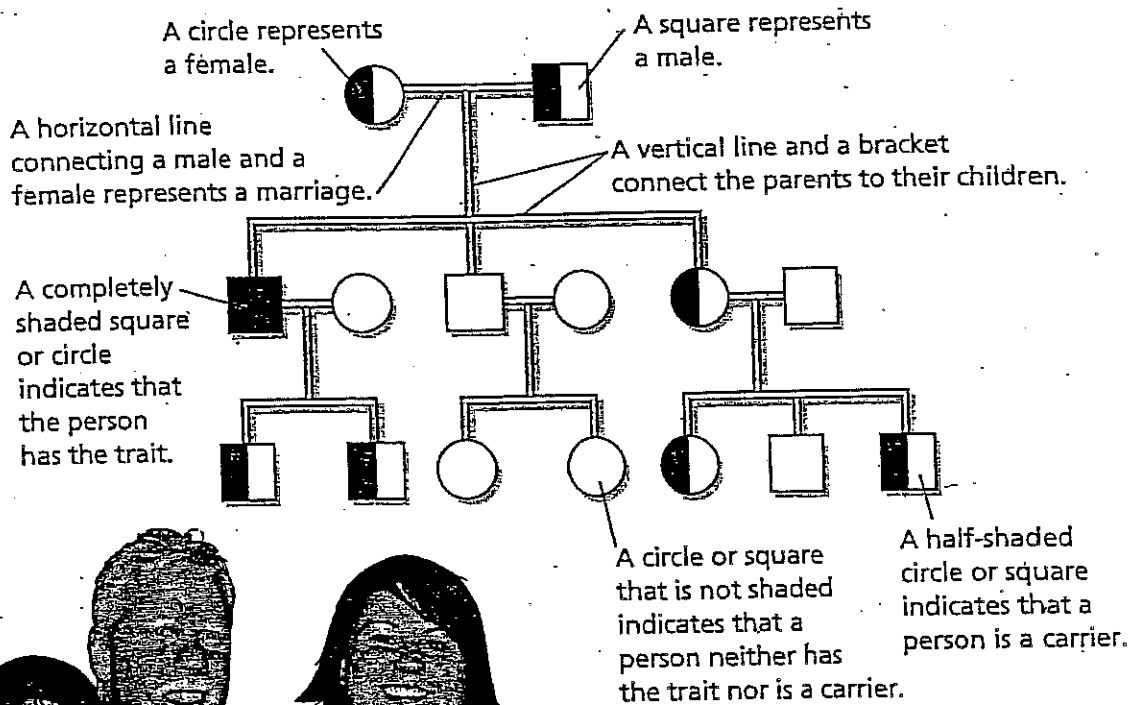
The trait in a pedigree can be an ordinary trait, such as a widow's peak, or a genetic disorder, such as cystic fibrosis. Figure 10 shows a pedigree for albinism, a condition in which a person's skin, hair, and eyes lack normal coloring.

FIGURE 10
A Pedigree

The father in the photograph has albinism. The pedigree shows the inheritance of the allele for albinism in three generations of a family. Interpreting Diagrams *Where is an albino male shown in the pedigree?*

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When reading a pedigree . . .

what does ○ represent? _____

what does ● represent? _____

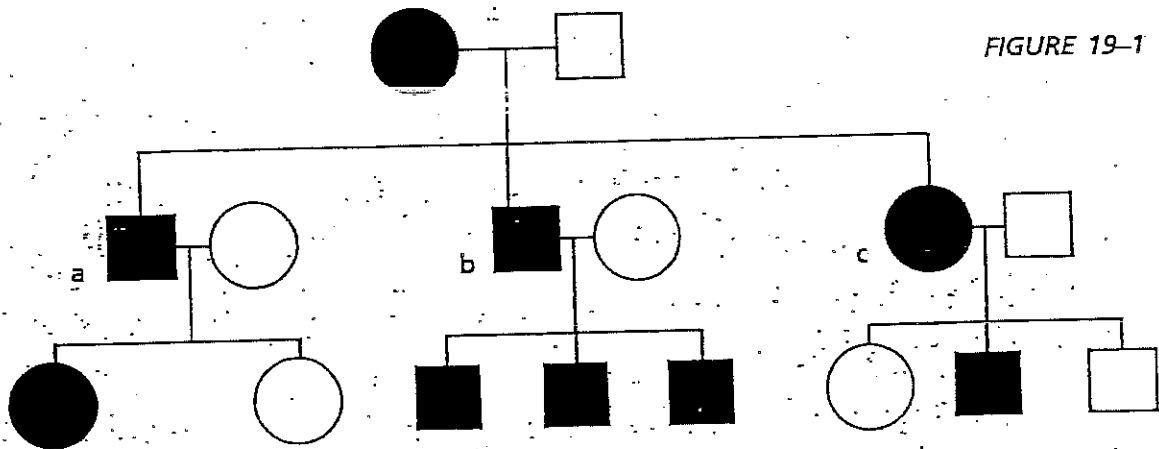
what does □ represent? _____

what does ■ represent? _____

What do horizontal lines represent? _____

What do vertical lines represent? _____

Study the pedigree below and answer the following questions.



a. Do both grandparents have the trait? _____

b. Is the trait dominant or recessive? _____

c. How many people in the three generations have the trait? _____

d. In the second generation, which person(s) is pure for the trait? Explain your answer.

e. In the second generation, which person(s) is hybrid for the trait? Explain your answer.

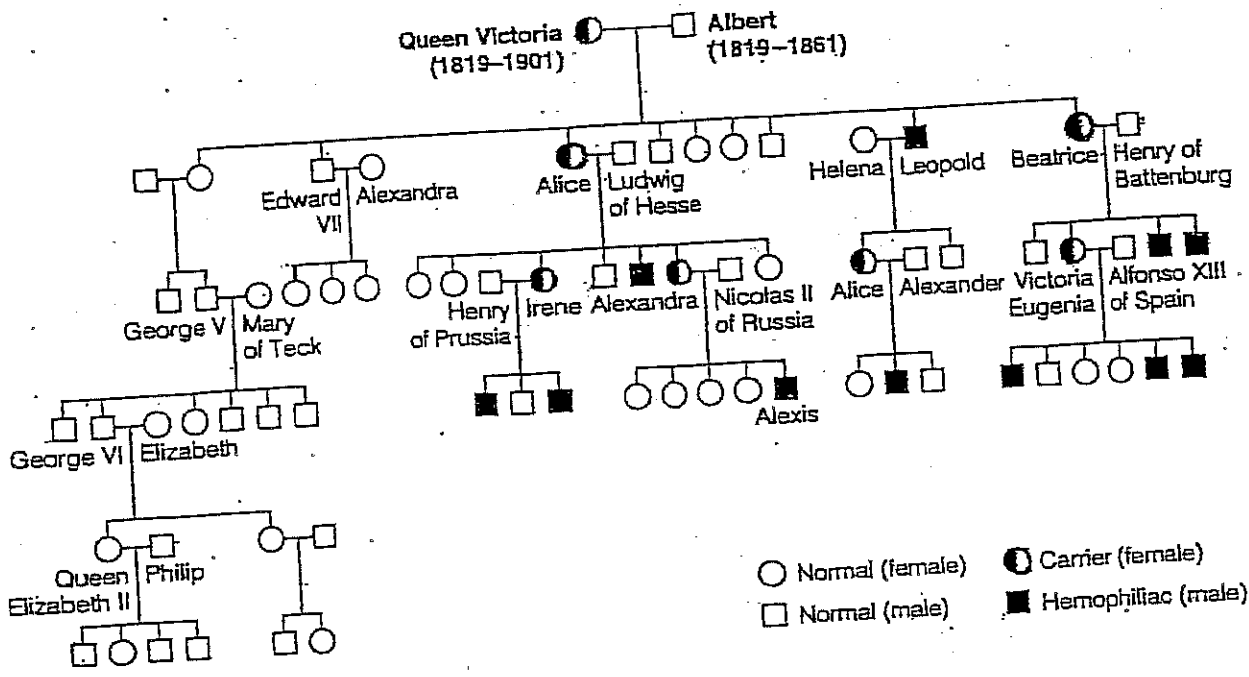


Figure 3-11 This pedigree shows how hemophilia spread in the family of Queen Victoria of England, who was a carrier. How many of Victoria's sons had hemophilia? How many grandsons?

Name _____

Date _____

Class _____

An Inherited Trait

Bob Green married Betty Smith in Boston. They were both twenty-one. Betty was color-blind, an unusual trait for a woman to have. Bob had normal vision. Betty learned ways to know when the traffic light was red or green. Betty and Bob had two children, Ted and Sue. Sometimes, when Betty bought clothes for her children, she wondered if the colors would match. Clerks often helped, and as Sue grew older, she also helped her mother in the choice of colors.

Ted married Joan after he finished school. He was twenty years old, and he was really glad that Joan was not color-blind. Joan was not a carrier of the trait, either. When their two daughters were born, Joan wondered if they would be color-blind.

Sue and Bill married two years later. Sue knew that Bill was not color-blind, but she, too, wondered about their two sons when they were born.

Draw a Punnett square for each marriage, tracing the trait for color blindness. For each Punnett square, tell if the sons and daughters would be normal, color-blind, or carriers. Then, draw a pedigree for the three generations, indicating the presence of the trait. Label the squares and circles by name. Describe the third generation. For instance, are they normal, color-blind, or carriers?

An Inherited Trait

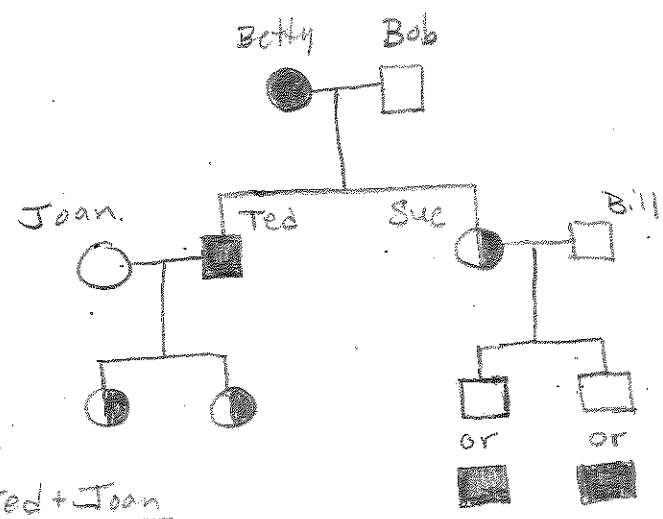
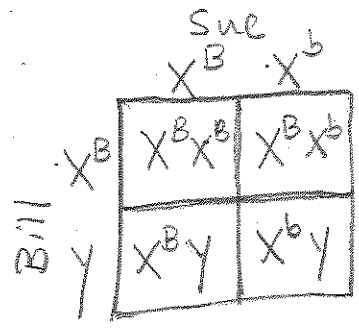
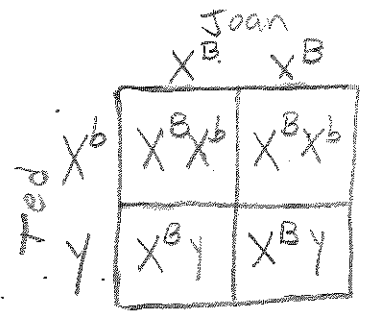
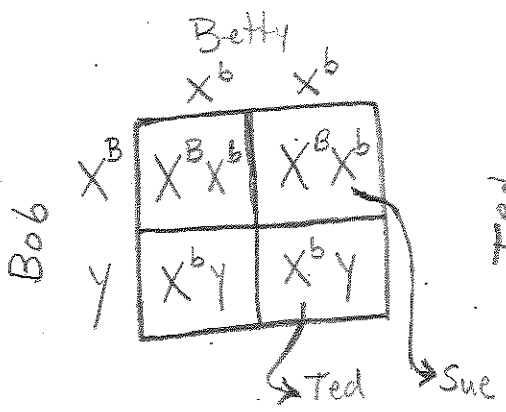
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B = Normal Vision b = colorblind



Ted + Joan
 sons - Normal vision
 daughters - Carriers

Sue + Bill
 50% chance daughter is normal or carrier
 50% chance son is normal or colorblind