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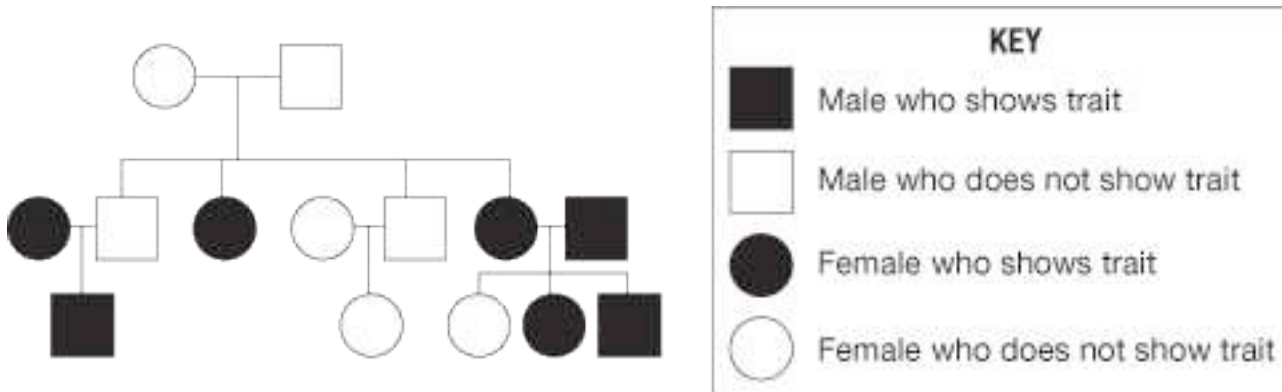
Reproduction - Heredity

Reading Pedigree Charts

Background

Pedigree charts show how a trait is inherited in a family. By studying a pedigree chart, scientists can predict how likely the trait is to appear in future generations. Pedigree charts can be made for humans and for animals and plants.

Study this example to understand the way pedigree charts are made.



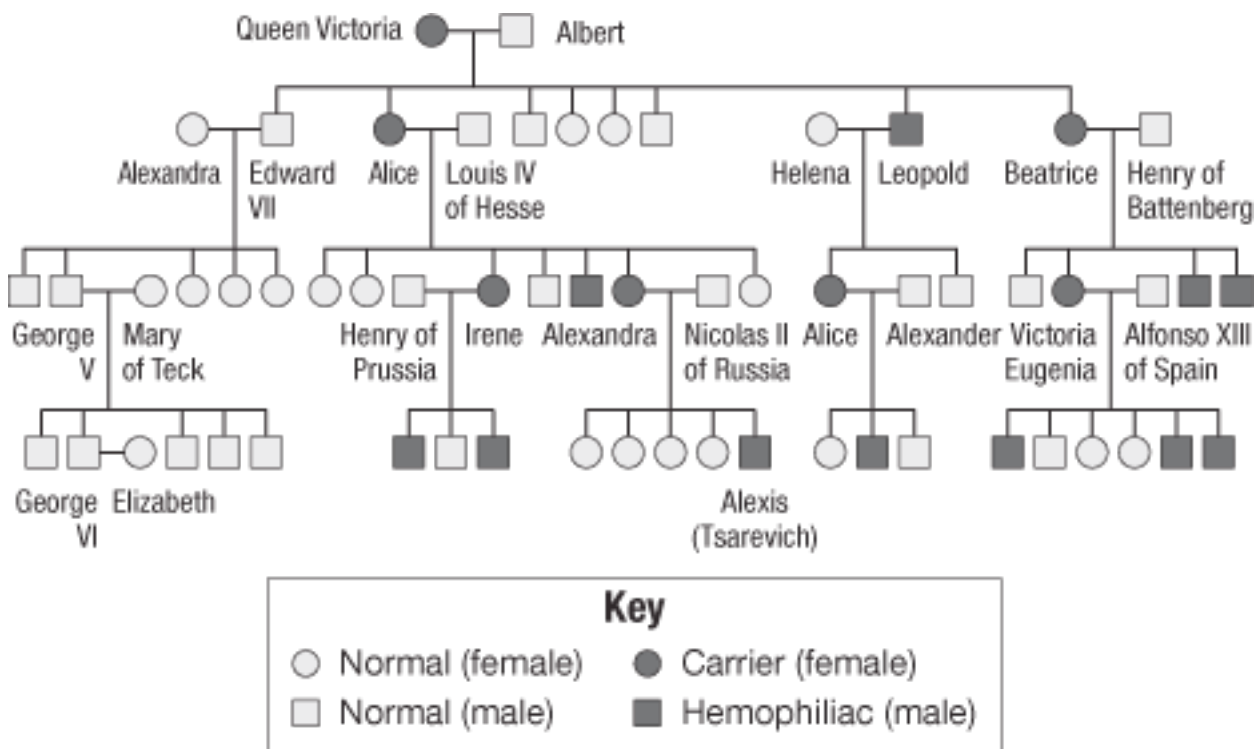
Start at the top. Squares represent males, and circles represent females. A horizontal line connecting a male and female shows that they are mates. Their offspring are shown in the next row of symbols, connected by a branching line. The mates of those offspring are shown in the same row, and the next generation of offspring is shown in the row below.

A shaded circle or square represents an organism who carries the genes for a trait. The trait could be a certain eye color or hair color. Or, it could be a hereditary disease, which is a disease caused by genes.

Procedure

Study the pedigree chart below. It shows the inheritance of hemophilia, a serious blood disease, among the descendants of Queen Victoria of England (1819–1901). People with hemophilia have blood that clots very poorly, making wounds slow to heal. For a person with hemophilia, minor injuries can in some cases lead to serious health problems or death.

Note that women can be carriers of hemophilia, but they rarely have the disease. A carrier of a disease is someone who does not suffer from the disease but who can pass on the genetic causes of the disease to offspring.



Analysis - Answer in complete sentences.

- 1 Find Alexis, the Tsarevich (prince) of Russia, in the pedigree chart. Describe how he is related to Queen Victoria. Which of his ancestors were carriers of hemophilia?
- 2 The pedigree shows four generations. Do you predict that hemophilia will continue to arise in the new generations of this family? If so, which parts of the family? Explain.
- 3 Find the four children of Queen Victoria named on this pedigree chart. How do you think historians know that Alice and Beatrice were carriers for hemophilia?
- 4 Find Alexandra and Nicolas II of Russia. They had four daughters, and then a son. After the fourth daughter, could they have known that the next child would have hemophilia? Discuss.