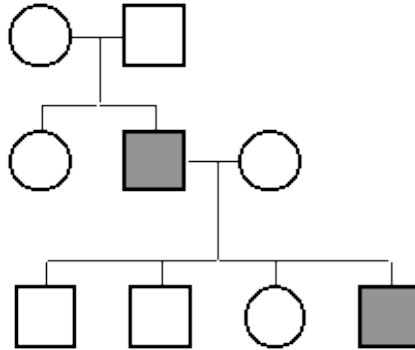


PEDIGREE LAB

A pedigree is a diagram of family relationships that uses symbols to represent people and lines to represent genetic relationships. These diagrams make it easier to visualize relationships within families, particularly large extended families. Pedigrees are often used to determine the mode of inheritance (dominant, recessive, etc.) of genetic diseases. A sample pedigree is below:

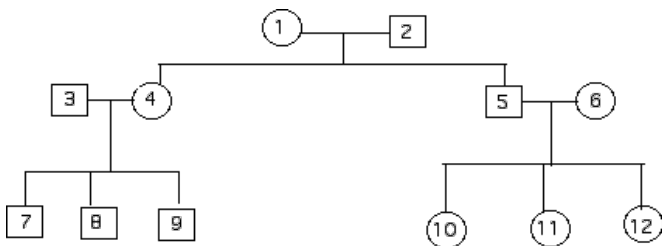


In a pedigree, **squares represent males** and **circles represent females**. Horizontal lines connecting a male and female represent mating. Vertical lines extending downward from a couple represent their children. Subsequent generations are, therefore, written underneath the parental generations and the oldest individuals are found at the top of the pedigree.

If the purpose of a pedigree is to analyze the pattern of inheritance of a particular trait, it is customary to shade in the symbol of all individuals that possess this trait. Other times, you will see the genotypes of the individuals written inside the circles or squares. If the genotype is unknown or partially unknown, a question mark is used in the pedigree.

Patterns of inheritance have the following modes of inheritance: autosomal dominant, autosomal recessive, X-linked (recessive), y-linked.

Here is a sample pedigree showing 3 generations:



What are the relationships between:

1 and 5 *Mother [1] and Son [5]* **1 and 2** _____

1 and 10 _____ **4 and 5** _____

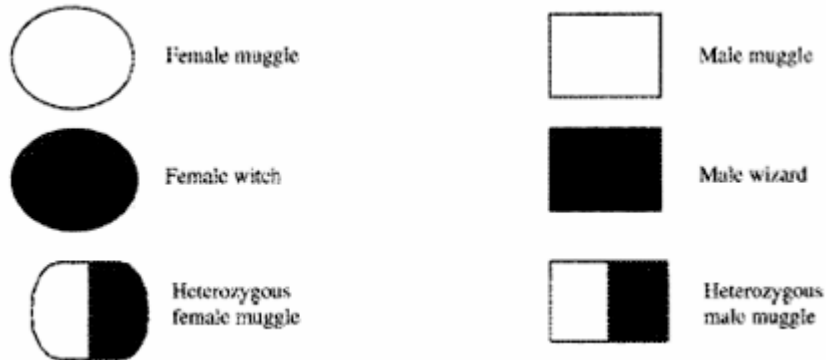
3 and 5 _____ **5 and 8** _____

8 and 10 _____ **1 and 3** _____

Now that you have had a chance to familiarize yourself with a pedigree chart, you will now apply what you have learned about genetics in the construction of pedigrees for the characters in the “Harry Potter” series.

Muggle or Magic: A Human Pedigree Activity

Assume that magical ability (m) is a recessive to non-magical ability (M). A person without any magical abilities is also known as a muggle. Use the key below to answer the questions.



1. If Mr. and Mrs. Weasley are a wizard and a witch, what are their genotypes?

Mr. Weasley _____ Mrs. Weasley _____

2. What must be the genotype of all of their children (Bill, Charlie, Percy, Fred, George, Ron, and Ginny)?
3. Draw a pedigree for the Weasley family below. Use shading to indicate genotype. Also, write the names and genotypes below each of the circles or squares.

4. Now let's look at Hermione Granger's family. Hermione is a witch but her parents are both muggles. What are the genotypes for the three member of the Granger family?

Mom _____ Dad _____ Hermione _____

5. Draw a pedigree for the Granger family below. Use shading to indicate genotype. Also, write the names and genotypes below each of the circles or squares.

6. Finally, draw a family pedigree of three generations of Harry Potter's family. Harry is a wizard. His father, James, was a wizard and his mother, Lily, was a witch. Both of Harry's dad's parents had magical abilities; however, Harry's mother's parents did not nor does her sister, Harry's Aunt, Petunia. Petunia is married to Vernon Dursley and they have a son, Dudley. None of the Dursleys have magical powers. Use shading to indicate genotype. Also, write the names and genotypes below each of the circles or squares. For those who only one allele is known, write the known allele and a question mark. Complete the pedigree a separate sheet of paper.