

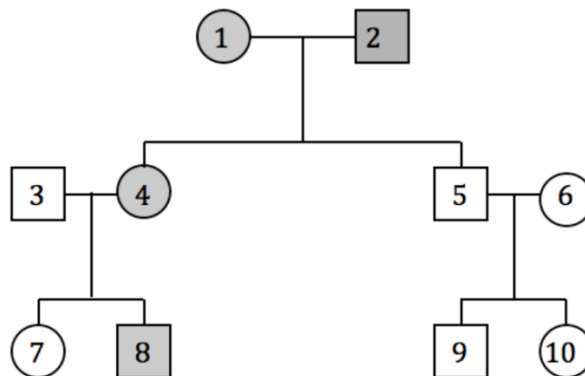
SBI3U Pedigree Assignment

Name: _____ Date: _____ Overall Level: _____

Rubric:

	Level 1	Level 2	Level 3	Level 4
Knowledge <ul style="list-style-type: none"> Be able to distinguish between autosomal inheritance and sex-linked inheritance Be able to use correct symbols to construct pedigree 				
Application <ul style="list-style-type: none"> Be able to use the information provided to create correct pedigree among different generations. 				
Thinking <ul style="list-style-type: none"> Be able to identify genotype of individuals and provide sound reasoning. Be able to predict the possibility of certain trait to be passed on to descendants. 				
Communication <ul style="list-style-type: none"> Neatly organize answers No grammar errors 				

- The trait represented by the colored circles and squares below is inherited as a dominant allele. This is not a sex-linked trait. Shaded individuals show the dominant trait. What is the probably genotype of each individual?



- Are there any homozygous dominant individuals in the pedigree above? How do you know?
- What is the probability of the trait appearing in offspring if 7 should marry 9?
- What is the probability of the trait appearing in offspring if 8 should marry 10?

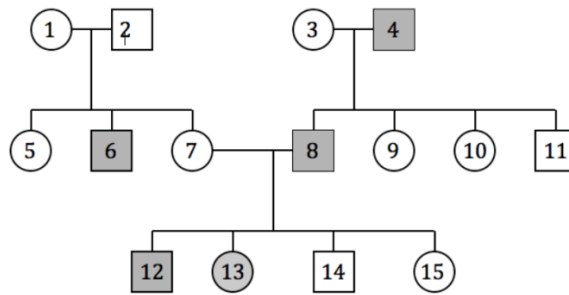
2. Use the information provided below to create a pedigree. Then answer the question at the end of each description.

- a. The ability to roll your tongue is dominant to not being able to roll your tongue.
Draw a pedigree to show the inheritance of this trait, given the following family history:

Grandpa Snow is a tongue roller but Grandma Snow is not. They have four children (2 sons and 2 daughters) who are all rollers. Their last daughter, Judy, married John Flake. John's parents are both rollers, but John's two sisters are non-rollers. John is a roller. John and Judy Snow-Flake have three children named Crystal Snow-Flake (a non-roller), Pretty Snow-Flake (a roller) and Jake Snow-Flake (a roller).

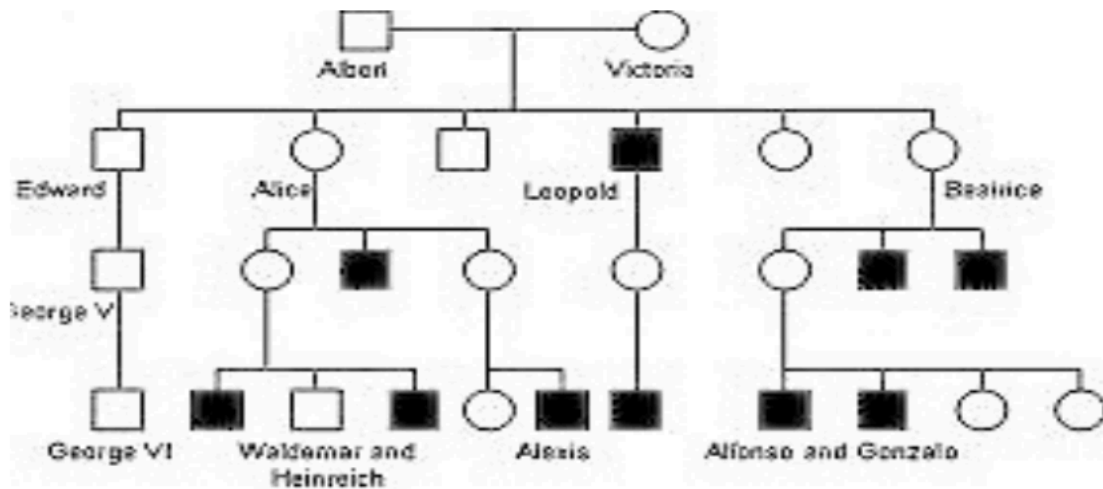
- b. A man and woman marry. They have five children, 2 girls and 3 boys. The mother is a carrier of hemophilia, an X-linked disorder. She passes the gene on to two of the boys who died in childhood and one of the daughters is also a carrier. Both daughters marry men without hemophilia and have 3 children (2 boys and a girl). The carrier daughter has one son with hemophilia. One of the non-carrier daughter's sons marries a woman who is a carrier and they have twin daughters. What is the percent chance that each daughter will also be a carrier?
- c. The great-great maternal grandmother of a boy was a carrier for colour-blindness, an X-linked disorder. His great uncle on his mother's side was colourblind but his great uncle's father was unaffected. The boy's mother has 2 brothers (1 colourblind, 1 unaffected) and 1 sister (unaffected). The boy's grandmother on his mother's side had 1 brother who was colourblind and 3 sisters. Two of these sisters were unaffected and one was a carrier. The boy's great grandmother on his mother's side had 4 sisters. The boy has one unaffected sister and he is colourblind. What is the probability of the boy's sons being colourblind if he marries a non-carrier?

3. The pedigree seen below is for colorblindness. Shaded individuals are colorblind. First, determine the probable genotype of persons 1 – 15; then, answer the questions below the table.



- How did you determine the genotype of the mother at 3?
- Number 8 was colorblind just like his father. Where did the son at 8 get his allele for colorblindness?
- Neither numbers 1 nor 2 were colorblind. How did they have a colorblind son 6?
- What must be the genotype of the parents of a colorblind daughter? Explain.
- If number 13 marries a normal man, what is the probability that their sons will be colorblind?

4. Queen Victoria was the world's most famous carrier of hemophilia. Her son, Leopold, and two carrier daughters, Alice and Beatrice, spread the gene fairly widely through the royal families of Europe, Prussia and Russia. Fortunately, no modern monarchs have inherited the allele. Indicate the probably genotype of each of the people below. Remember, hemophilia is a sex-linked trait and shaded individuals have the disease.



5. The pedigree table below shows the blood types of three generations of family members. Notice that some of the blood type phenotypes have been given to you. What is the genotype of the individuals 1 - 6? Give the probable genotype of all other family members.

