Name: ______________________

Pedigree Webquest

Part One
Go to page 299 for help on pedigrees.

Go to http://www.saburchill.com/IBiology/chapters03/006.html

1. What kinds of information are found on a pedigree chart? Family of an individual for several generations; used to look at the transmission of a hereditary condition.

2. Draw the symbol that represents a male. □

3. Draw the symbol that represents a female. ○

4. What does a line in between two individuals represent? marriage

5. How is an individual that is affected by the trait shown? shaded square or circle

6. Describe how a pedigree chart differentiates between parents and offspring. Parents have a horizontal line in between them; children are connected to the horizontal line by a vertical line from the parents.

7. What is a generation? How many generations are depicted in the pedigree at the bottom of the page? generation, 4 generations.

8. Look at the top pedigree. How many children does that couple have? 5. What are the sexes of the children? 2 females; 3 males.

9. Look at the bottom pedigree. How many children does the original couple have? 5. Are any of these children affected individuals? Explain. 1 girl (shaded girl).

Part Two

Answer the following questions using the next website: http://www.ygvh.org/hemo/whatisit.htm and go to How is it inherited?

1. What is hemophilia and how is it inherited? Hemophilia is caused by a dysfunctional or absent blood clotting protein. This means that stable clots do not form over wounds.

2. How does a boy get hemophilia? If he inherits an X chromosome from his mother with the mutated Factor VIII gene.

3. How does a girl become a carrier? If she has one X with the mutated Factor VIII gene or if the gene mutates during egg production or early in the development of the embryo.

4. If a woman is a carrier and the male does not have hemophilia, draw a Punnett Square and indicate the possible outcome. 

<table>
<thead>
<tr>
<th>X^N</th>
<th>X^n</th>
</tr>
</thead>
<tbody>
<tr>
<td>X^N</td>
<td>X^nX^N</td>
</tr>
<tr>
<td>Y</td>
<td>X^N</td>
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</tbody>
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Part Three

You will use the information that you learned about Hemophilia to complete the following pedigree chart (draw on a separate piece of paper and attach to this sheet):

Draw a pedigree chart for the following family. Carlisle and Esme are grandparents. They have 3 children, Carolina, Crystal, and Ellen. Carolina is married to Jacob and they have a daughter named Leah. Crystal is married to Edward and they have 3 children, Alice, Emmitt, and John. Ellen is divorced and has 2 daughters, Isabella and Rosalie.

Please refer back to the two links if you are not sure about how to depict this information. Indicate that Carlisle, Ellen, John and Edward have hemophilia by shading in the symbols that represent them in the Pedigree Chart.

1. Explain in a sentence or two how hemophilia is inherited. Describe which parent gave John the defective allele for hemophilia and explain how you know.

   Hemophilia is inherited when a child receives an X chromosome with the recessive allele. Females must have both X chromosomes with the recessive allele while males must only have one. John would have received the defective allele from his mother because he inherits the X chromosome from his mother and the Y chromosome does not carry the allele.

2. Indicate how hemophilia is passed from generation to generation. Include the genotypes and phenotypes of his parents, Crystal and Edward, as well as his grandparents, Carlisle and Esme.