Romanov Project Brittany Schrader

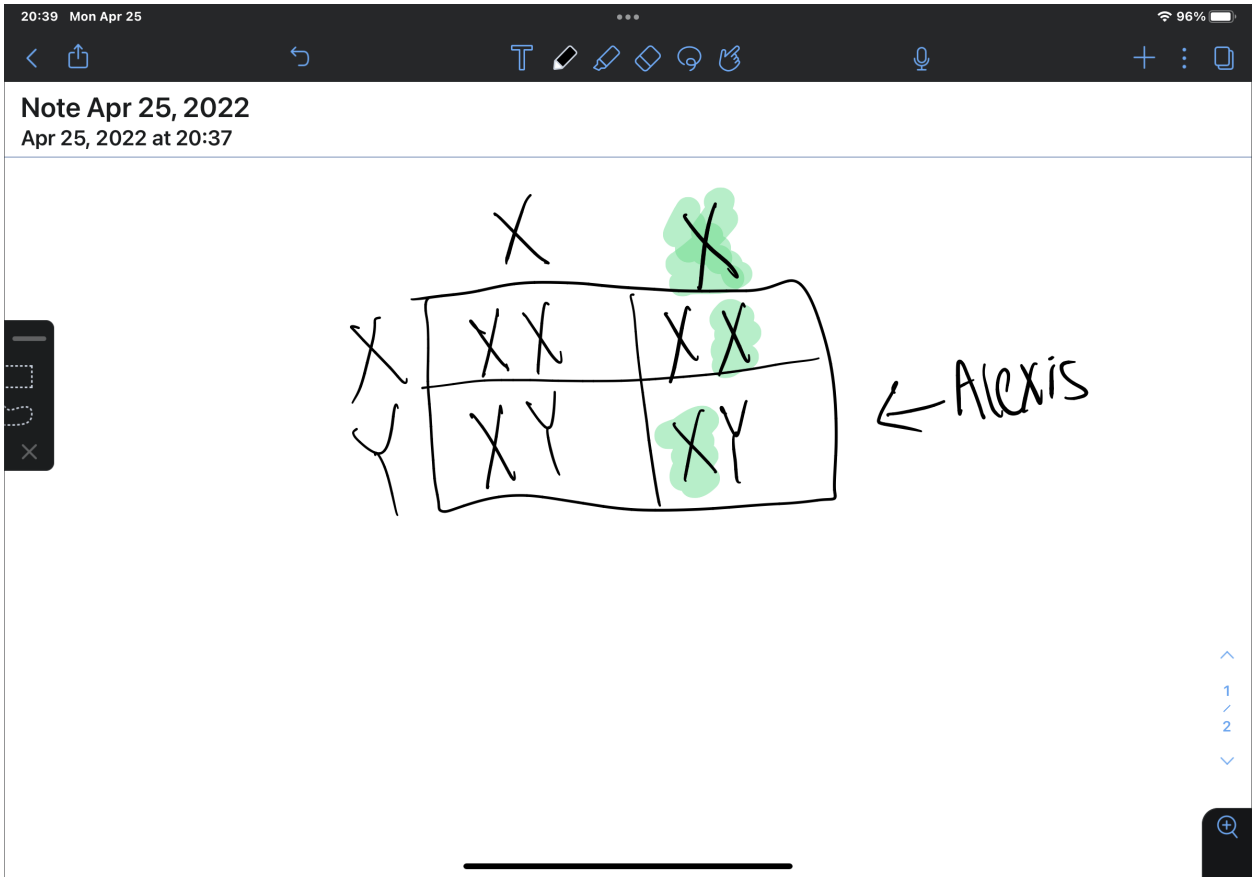
History

1. Nicholas II was the last czar to hold power in Russia. How long had the Romanov family been in power in Russia? Answer: They ruled for over 300 years.
2. Nicholas II abdicated the throne. Who took power then? He abdicated the throne in favor of his brother, who declined the throne.
3. Describe what happened to Nicholas II and his family after he abdicated the throne? The family were held in exile.
4. One of the reasons that the family of Nicholas II was executed (vs. just imprisoned) was because there was a fear that the White Russian Army would save them. Who was the White Russian Army? They fought against the Red Russian army for control of Russia

Hemophilia

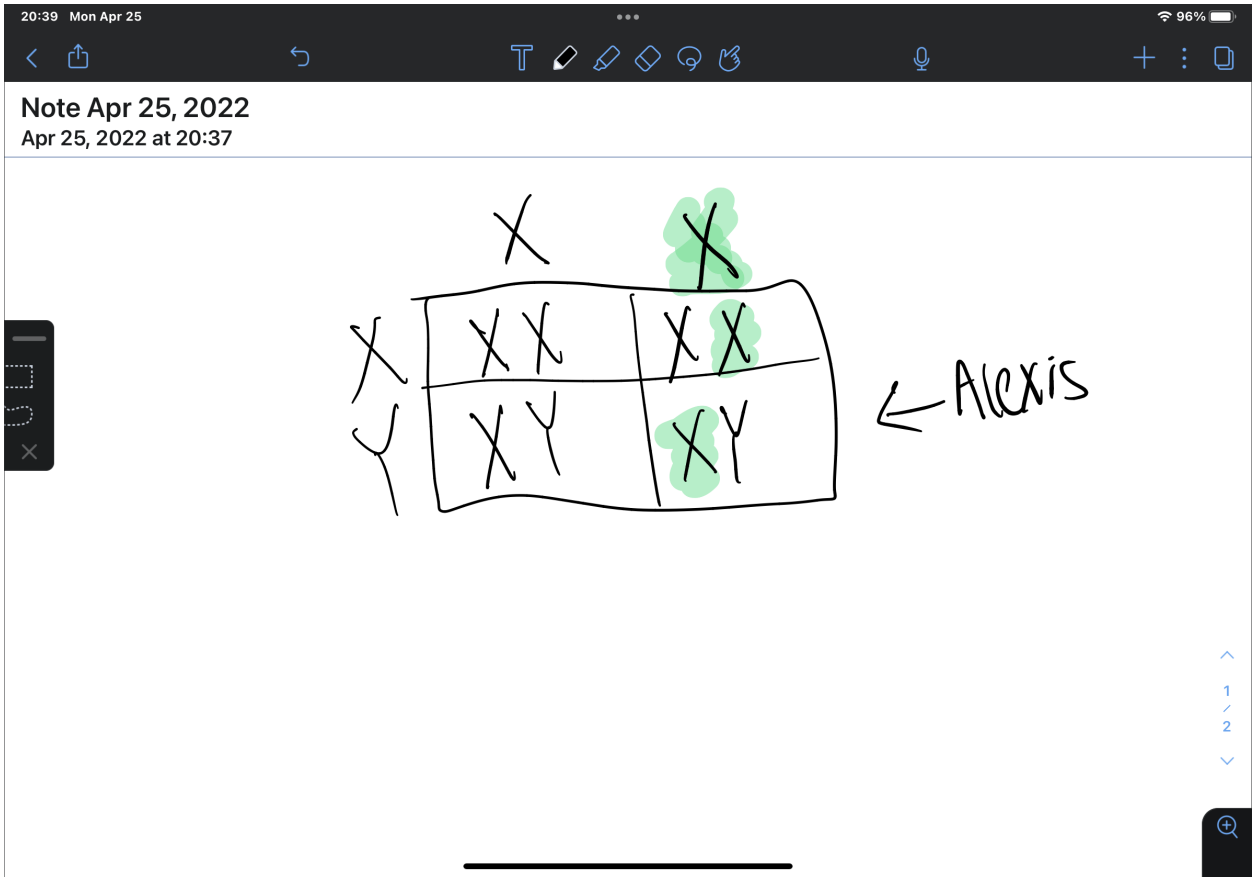
5. How was Alix, the wife of Nicholas II, related to Queen Victoria of England? Queen Victoria was her Great grandmother.
6. On what chromosome is the gene that, when mutated, causes hemophilia, and how does this contribute to its inheritance pattern? It's a sex linked recessive on a X chromosome. Females can be carriers but since they have two X chromosome its unlikely. Males can have it because they only have one X chromosome.
7. What does it mean to be a carrier for a disease? Carrier means that the female can pass on the disease and not have the disease
8. Why aren't males considered carriers for hemophilia? Males only have one X chromosome so if they have it on that X chromosome they have the disease.
9. In a couple of sentences, describe the physiology of the disease hemophilia. There is a mutation in a gene that provides information on the clotting factor proteins needed to form clots, the mutation causes or can prevent the clotting protein to work properly or it can be a missing protein.
10. What type of hemophilia (A or B) is (probably) represented in the pedigree chart? Hemophilia A is represented by the chart
11. Describe the mutation (at the molecular level) that apparently caused hemophilia in Alix, (and probably all of the European families that had hemophilia). Alix was a carrier of hemophilia due to her mother Alice being a carrier of the gene.
12. How could the mutation you described in #12 result in a faulty gene product? If the mutation caused Alix to have it and she passed it down to her son that would continue to pass the gene through inheritance. Or it can also the following daughter to be carriers of the mutated gene as well.
13. The Romanov's son, Alexis, had hemophilia. Describe how Alexis genetically acquired hemophilia. (Use a Punnett square. You can either draw a table or line up the genotypes.) Alexis received it from one of the recessive X chromosome from his mother

Alix. The X that is highlighted below represents the mutated recessive X chromosome.



14. Using a Punnett square (again, draw a table or line up the genotypes), explain why only males in the pedigree chart have hemophilia. the pedigree chart, and show his parents in the Punnett square.) Using the same punnett from above Alexis had hemophilia due

to have the x linked mutated gene from his mother



15. Is it possible for a female to inherit hemophilia, and, if so, how? It could be possible that a female inherited it. If a hemophiliac male and a carrier female had a female it could be possible.
16. Some historians speculate that Alexis' hemophilia condition could have led to the Russian Revolution. Explain. Tsar Nicholas had a sick son, Alexis. His son needed healing so the family sought help of Rasputin, a fath healer. Rasputin, among many other things, used his connections to influence many government affairs. Some historians allude to the idea that Rasputin used his connections to favor his self-interest. This made the public weary and question the officials in power which would cause the revolution.
17. Two "graves" were discovered near Yekaterinburg, Russia. When were these graves discovered, and how many bodies were found in each grave? There were 2 graves discovered near Yekaterinburg Russia, 1 grave had 9 bodies, the other had just two bodies.They were discovered in 1991, the second in 2007.
18. What type of testing was done to confirm sex and familial relationships among the remains found in the mass grave? To confirm the sex and the familial relationship of the remains with in the mass grave nuclear DNA testing of five STR markers were conducted.
19. HRH Prince Philip, the Duke of Edinburgh, provided mitochondrial DNA used to identify Alix and her three daughters. HRH Prince Philip, the Duke of Edinburgh, is married to

Queen Elizabeth II of England. Wait, isn't Queen Elizabeth II related to Queen Victoria? So why was Prince Philip's mitochondrial DNA used? (To help you answer this question, look at the second pedigree chart.) Literally OMG, the inter workings of the two families. Queen Elizabeth II and Prince Phillip are related very distantly. Queen Elizabeth's great great grandfather is the brother of Prince Phillips great grandmother. Which would make them related and thus being able to his DNA for family evidence. Holy smokes.

20. Who was missing from the mass grave (the one with the most skeletons)? It's frequently debated that Anastasia or Maria, they only know it is a female sister of Alexis
21. The Duke of Fife and Princess Xenia provided mitochondrial DNA used to identify Nicholas. One of these is a female and another is a male. Does that matter? What general statement can you make about their genetic relationship to Nicholas and Alexandra? yes, it does matter. In general the duke of Fifie and Princess Xenia would both have strong genetic relationships with Nicholas. Princess Xenia would share mitochondrial DNA with Nicholas as children receive maternal mtDNA
22. What was discovered in the mitochondrial DNA of Nicholas that was not identified in either the Duke of Fife or Princess Xenia?They found a single point heteroplasmy (presence of more than 1 mtDNA genome in a cell) at position 16169 (C/T= "Y"). This differs from both the Duke of Fife and Princess Xenia as they were, according to this source, "fixed for 16169 T"
23. What is the term given to the existence of two (or more) genetically different mitochondria in the cell?The term for two or more genetically different mitochondria in the cell is called heteroplasty. I'm not sure if the second part of this is asking if there are current treatments or older treatments for hemophilia. For modern day, yes there are treatments that increase clotting factors. However, back in this time period there was little to know effective treatment.
24. What three types of DNA were used to test the remains found in a second grave? using mitochondrial DNA (mtDNA), autosomal STR, and Y- STR testing
25. Of the three types of DNA you listed in the previous answer, which one would have been used specifically to identify Alexis and why? It was combined with the additional testing material from 1991
26. Was Anastasia in the grave in which Alexis was found? It remains unknown which sister was in the grave, its only known to be one of his sisterss
27. Give a brief history (2-3 sentences) of Anna Anderson-both her claims and what is thought to be true.Anna Anderson was an imposter who pretended to be Anastasia. In fact, that was only one of her claims, her pseudonym was also a false claim as her real name was Franziska Schanzkowska, a polish factory worker. She was born in Poland and eventually settled in the United States in Virginia.
28. Where in the US did Anna Anderson eventually settle and why? Charlottesville, Virginia.
29. What were the sources of Anna Andersons's nuclear DNA? hair and intestine samples.
30. What were the sources of Nicholas' and Alix's nuclear DNA? skeletal, bone, samples.
31. What type of analysis was done on DNA from Anna Anderson, Nicholas, and Alix? Both mtDNA and STR analysis were done on all three.

32. Anna Anderson's mitochondrial DNA was compared to the mitochondrial DNA of what two "other" people? Anna's mtDNA was compared to Carl Maucher's and to the great nephew of Tsarina (Duke of Edinburgh).
33. A hypervariable region of the mitochondrial DNA was analyzed. Define a hypervariable region.According to Arizona state a hypervariable region is one that "[has]… a high ratio of different amino acids in a given position, relative to the most common amino acid in that position".
34. What were the conclusions from the mitochondrial DNA comparisons?That Anna Anderson was not related to Anastasia and was in fact Franziska Schanzkowska, a polish factory worker.
35. The article which describes the analysis of Anna Anderson's DNA was published in 1995. When were all of Nicholas' and Alix's children finally accounted for? All of the children were accounted for in 2007, though there is not clarity on which remains belong to which person between Anastasia and Maria.

What was the most surprising thing that you learned from doing this assignment. The most surprising thing in this assignment was looking at the Punnett square and seeing the relationship between Prince Phillip and Queen Victoria II (question #19)

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