Name: _____ **Genetics Study Guide**

Use this checklist to help you prepare for the Genetics Unit Test:

_____1) Review the student-designed Google Docs on Mrs. Kuebler's website

_____2) Study the notes in your composition notebook

_____3) Review structure of DNA and the types of mutations.

_____4) Be familiar with the scientists in this unit and be able to explain their contributions to genetics.

- Francis Crick
- James Watson
- Rosalind Franklin
- Gregor Mendel

_____5) Review key terms such as

- gene
- allele
- dominant
- recessive
- homozygous
- heterozygous
- genotype
- phenotype
- homologous pairs
- Punnett square
- meiosis
- fertilization
- incomplete dominance
- codominance
- polygenic inheritance
- multiple alleles
- Pedigrees
- carrier

_____ 5) Complete this study guide!

DIRECTIONS: Fill in the answers to help you study.

1. Summarize Mendel's first experiment with pea plants	
2. Summarize Mendel's 2nd experiment with pea plants	
3. What is the result of meiosis?	
4. If a person is XX, what gender are they?	
5. If a person is XY, what gender are they?	
6. Relate fertilization to Punnett squares.	
7. How many total chromosomes do humans have in each body cell?	
8. How many homologous pairs of chromosomes do they have in each cell?	
9. How many chromosomes are in each sex cell?	

10. The sides of the DNA molecule are made of alternating _____ and _____ molecules.

11. _____ always bonds with guanine. _____ always bonds with thymine.

12. The two scientists given the Nobel Prize for discovering the shape of the DNA molecule are _____ and _____.

13. It was _____'s work in X-ray crystallography that gave them the final clue about the shape of the DNA molecule.

14. A nucleotide is made up of a _____, a _____ and a _____.

15. When a nitrogen base is dropped, this type of mutation is called _____.

16. When a nitrogen base is added, this type of mutation is called _____.

17. When a nitrogen base is switched, this type of mutation is called _____.

18. What would the complementary strand of RNA be for the following sequence of bases after transcription has occurred?

C T T A G G C T T A C C A

__ __ __ __ __ __ __ __ __ __ __ __ __

19. The sugar in DNA is _____

20. A gene is

a. a set of instructions for a trait.
b. instructions on how to make a protein.
c. a portion of a strand of DNA.
d. all of the above

21. DNA

a. is made up of subunits called nucleotides.
b. has a structure like a twisted ladder.
c. makes up an organisms' chromosomes.
d. all of the above

22. Mr. and Mrs. Brown brought their new baby home from the hospital, and after a day Mrs. Brown insisted that the hospital had sent home the wrong baby. Mr. Brown has type O blood, and Mrs. Brown has type A (homozygous). The baby also has type O blood. Did the Browns get the right baby? Explain your answer using a Punnett square.

23. If a person has an X and a Y chromosome, are they male or female? _____
Did they get the X chromosome from their mother or their father? _____
Who did they get their Y chromosome from? _____

24. Curly hair is a trait that has **incomplete dominance**. Draw a Punnett square showing the possible offspring of a man with curly hair and a woman with wavy hair.

a. What percentage of the children will have curly hair? _____
b. What percentage of the children will have wavy hair? _____
c. What percentage of the children will have straight hair? _____

25. Fur color in cats is a sex-linked co-dominant trait. A pure black cat mates with a pure orange cat. Predict the phenotypes of both the male and female kittens.

26. Define polygenic, and give 2 examples of polygenic traits that we've discussed in class.

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_____

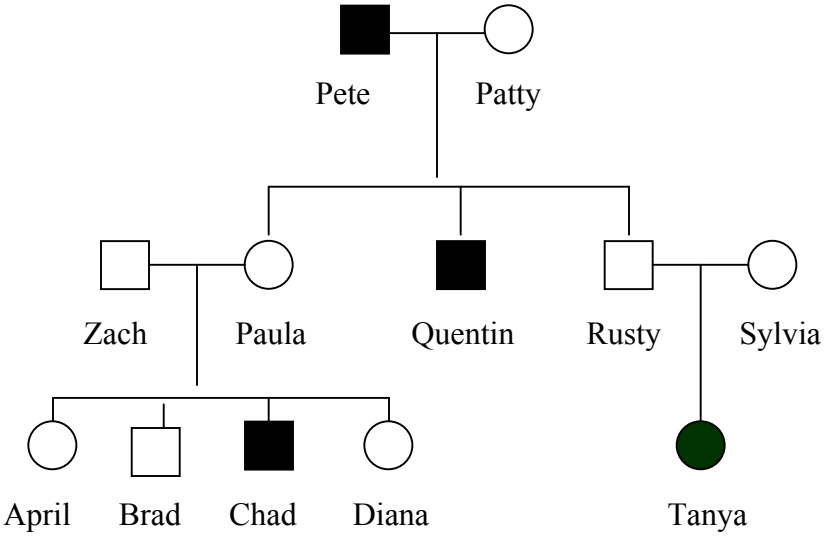
27. Examine the pedigree for the trait of **purple hair** in the Peeples family. Then, answer the questions below. To help you answer the questions, write the genotype for each family member next to their name as you figure it out.

= female with purple hair

= male with purple hair

= female with black hair

= male with black hair



a) Shade in the symbols for all the carriers.

b) What genotype is Pete? _____

c) What genotype is Patty? _____ How can you tell? _____

_____

d) Are Quentin's siblings carriers for the trait of purple hair? _____
What is Paula's genotype? _____ What is Rusty's genotype? _____

e) Since Tanya has purple hair, what genotype does Sylvia have? _____

f) Since one of Zach and Paula's four children has purple hair, what is Zach's genotype? _____

g) Could April, Brad or Diana be carriers for the trait of purple hair? _____ How can you tell?

_____

h) Brad and Chad are twins. What kind of twins are they? _____