Genetics Review

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GVC 4- Students will understand that genetic information coded in DNA is passed from parents to offspring by sexual and asexual reproduction. The basic structure of DNA is the same in all living things. Changes in DNA may alter genetic expression.

1. What 2 processes allow for **offspring to inherit chromosomes** from each parent to create new combinations.
2. Genes give us **variation,** list 2 ways that this variation can be seen in humans.

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| Explain one **advantage** of **sexual** reproduction | Explain one **disadvantage** of **sexual** reproduction | Explain one **advantage** of **asexual** reproduction | Explain one **disadvantage** of **asexual** reproduction |

1. Mutations can be used to produce desirable traits. Give an example of a desirable trait that might be achieved. How could this be considered a **bioethical** issue?
2. Mendel discovered that genes are **segregated**, what does that mean?
3. Mendel also assumed that every trait was inherited separately or **randomly** from every other. We now know that is there is an exception to that, what is it?
4. 2 corn plants are bred and the trait for seed color is observed as a **monohybrid** trait. The two possible colors are yellow and white. Both plants are heterozygous yellow.

Complete the **punnett square** below.

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Phenotypic ratio:

Genotypic ratio:

Dominant trait:

Recessive trait:

1. Complete the pea plant **dihybrid** cross for seed color and seed texture. The first plant has green seeds and is wrinkled (rrtt), the second plant has yellow seeds and is also wrinkled (Rrtt).

Complete the **punnett square** below.

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| --- | --- | --- | --- |
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Phenotypic ratio:

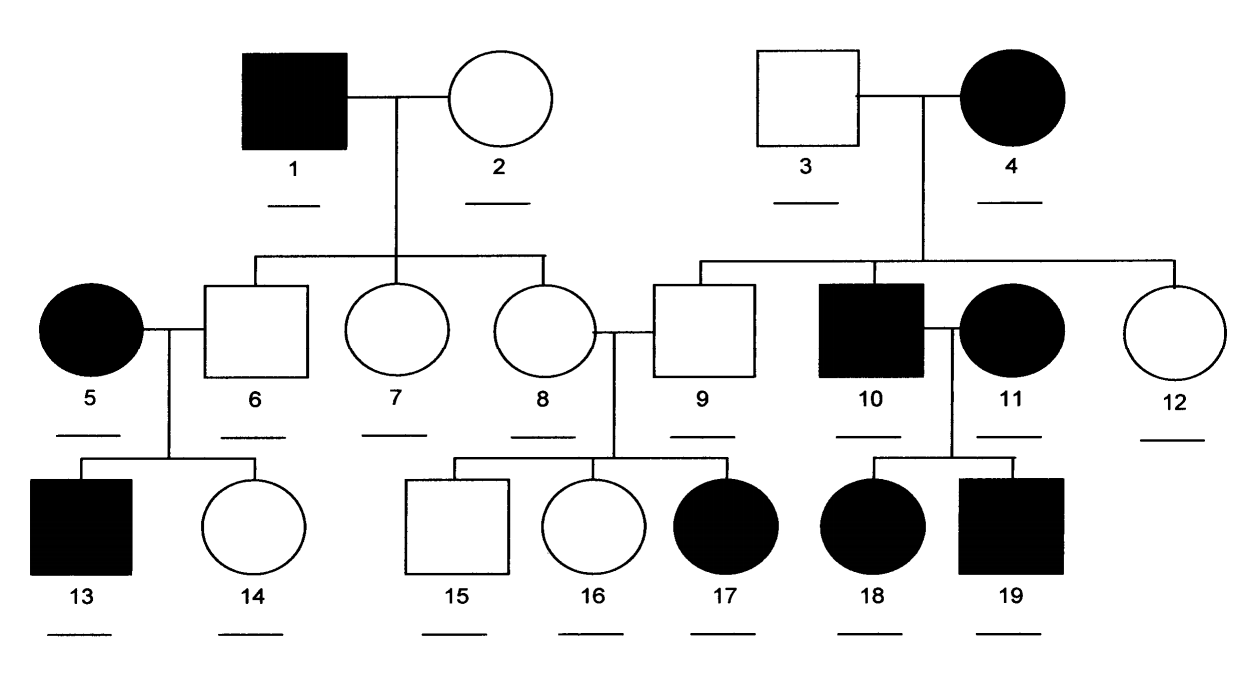
Genotypic ratio:

Dominant traits:

Recessive traits:

1. Complete the following **pedigree chart**, determine what type of trait the chart is showing.

(autosomal recessive, autosomal dominant, sex-linked recessive, sex linked dominant)



10. What is the genotype of the female sex chromosomes? \_\_\_\_\_\_\_\_ What is the genotype of the male sex chromosomes? \_\_\_\_\_\_\_\_ What chromosome are sex-linked traits found on? \_\_\_\_

11. Give an example of each of the following.

Codominance-

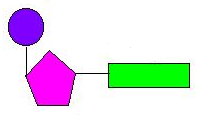
Incomplete dominance-

Sex-linked trait-

12. What are advantages of **selective breeding**?

13. Give an example of a “**bioethical issue,**” what does that mean?

14. Label the DNA nucleotide below. (hint: a nucleotide is a small section of DNA or RNA)



15. Compare and contrast RNA and DNA.

16. Complete the strand with complimentary base pairs for **DNA replication**. (DNA->DNA)

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

17. DNA replication creates new DNA, what is it needed for?

18. Complete the strand with complimentary base pairs for **transcription**. (DNA->RNA)

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

19. Complete the mRNA strand with complimentary tRNA for **translation**. (RNA->RNA)

U G C U A G A C U G G U G C A C A U G

20. What happens next in **translation?**

20. What is a **mutagen**? Give an example.