ACTIVITY 1

MENDEL'S LAWS OF INHERITANCE

Directions: Perform the following instructions. Write your answers on a sheet of paper and submit it to your teacher.

1. Compare the following pairs of terms:
   a. gene / allele
   b. genotype / phenotype
   c. dominant / recessive
   d. purebred / hybrid
   e. homozygous / heterozygous
   f. cross pollination / self pollination
   g. F_1 generation / F_2 generation

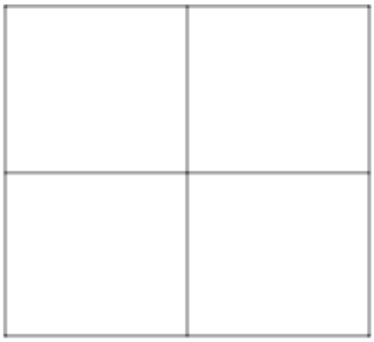
2. In pea plants, two stem lengths are possible: tall (T) and dwarf (t). Tall is dominant to dwarf.
   a. In a purebred tall plant, what gametes are possible? _____
   b. In a purebred dwarf plant, what gametes are possible? _____
   c. What is the genotype of a purebred tall plant? _____
   d. What is the genotype of a purebred dwarf plant? _____

3. Use a Punnett square to show all the possible genotypes of the F_1 generation produced by a cross between these two plants: (TT x tt):
   a.

   b. What is/are the possible phenotype(s) of the F_1 generation? _____

4. Now use a Punnett square (on the next page) to show all the possible genotypes of the F_2 generation that would result from a cross between two plants from the above F_1 generation:

a.



b. What are the likely ratios of genotypes of the F_2 generation? _____

c. What are the likely ratios of phenotypes of the F_2 generation? _____

5. If four plants grew up from this same F_2 generation, would it be possible for all those offspring to be dwarfs? Why or why not?

6. Use a Punnett square to show all the possible genotypes of a cross between a dwarf pea plant and a heterozygous tall pea plant:

a.

b. What are the likely ratios of the genotypes of their offspring? _____

c. What are the likely ratios of the phenotypes of their offspring? _____

7. Use a Punnett square to show all the possible genotypes of a homozygous tall pea plant crossed with a heterozygous tall pea plant:

a.

b. What are the likely ratios of the genotypes of their offspring? _____

c. What are the likely ratios of the phenotypes of their offspring? _____

TRUE OR FALSE

Write true if the statement is true or false if the statement is false.

_____ 1. The rules of probability apply to genetics.
_____ 2. If an individual has a Gg genotype, half of his gametes should have the G allele, and the other half should have the g allele.
_____ 3. A Punnett square is a chart that allows you to easily determine the expected genotypes in the offspring of two parents.
_____ 4. In a cross between two homozygous dominant individuals, 25% of the offspring may have the recessive phenotype.
_____ 5. A parent cell makes gametes through the process of mitosis.
_____ 6. It is entirely likely for a gene to have more than two alleles.
_____ 7. Incomplete dominance occurs when the recessive allele is not completely dominant.
_____ 8. Your height and skin color are not just due to your genes.
_____ 9. In a cross between an individual homozygous dominant for two characteristics and an individual homozygous recessive for the same characteristics, all of the F1 offspring will have the dominant phenotypes.
_____ 10. All genetics is fairly straightforward and follows the patterns Mendel observed in pea plants.
_____ 11. Codominance occurs when, essentially, there is no recessive allele.
_____ 12. If one parent is MM and the other parent is mm, the only possible phenotype of their offspring is Mm.
_____ 13. The probability of inheriting either an A, B, or O allele for blood type from your parent is 33.33%.
_____ 14. In any cross between two heterozygous parents, half the offspring should have the dominant phenotype and half the offspring should have the recessive phenotype.
_____ 15. When you toss a coin in the air, it should turn up tails 50% of the time.

SOURCE:

https://www.pdffiller.com/jsfiller-desk17/?projectId=618bffd4222056541004cfdb&lp=true#e0261e0b38a0462887535b4de77452a8

https://www.cusd80.com/cms/lib/AZ01001175/Centricity/Domain/4939/Chapter%206%20%20CK-12%20Biology%20Chapter%206%20Worksheets.pdf