|  |  |  |
| --- | --- | --- |
| **Interaction and Definition** | **Phenotype** | **Example with Genotypes** |
| Incomplete dominance  1. | 2. | 3. |
| Codominance:  4. | 5.. | 6. |

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Block\_\_\_\_\_\_\_\_

**Codominance and Incomplete Dominance**

**Part I:** Identify if the following are Codominance or Incomplete Dominance

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Flowers that are Red have a genotype of AA, White-aa, and Pink, Aa
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Cows that that have Red hair genotype CRCR White hair CWCW and Roan CRCW
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Star bellied Sneech genotype is BSBS, Circle Bellied BCBC, CircleStar Belly BSBC
4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_A yellow Sneech with Genotype YY, blue sneech yy, Green sneech Yy

**Part II:** Practice setting up keys for the phenotypes listed in each set. Remember that the "medium" trait must always be heterozygous. **Hint: you can choose the allele that represents each gene**

5. Birds can be blue, white, or white with blue-tipped feathers.

**Example: Blue= BB White = WW Blue-tipped =BW**

6. Flowers can be white, pink, or red.

7. A Hoo can have curly hair, spiked hair, or a mix of both curly and spiked.

8. A Sneech can be tall, medium, or short.

9. A Bleexo can be spotted, black, or white.

Now, can you figure out in the above list, which of the questions 5-9 represent codominant traits and which are incomplete.

10. Codominant \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Incompletely Dominant \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Multiple Alleles, Polygenic Traits, and Epistasis**

|  |  |  |  |
| --- | --- | --- | --- |
| Multiple Alleles | Definition | Phenotype | Genotype |
| Polygeneic traits | Definition | Phenotype | Genotype |
| Epistasis | Definition | Phenotypes | Genotypes |

**Part II: Identify the following genetic situations**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Skin color is determined by 6 different alleles for example aaaaaa = Pale white Aaaaaa = Tan, and AAAAaa =light black

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Height is controlled by genes T and S where the capital letter represent alleles which speed up growth, lower case letters represent the slowing down the growth. for example: TTSS = Tallest >6’5”, TTss =Avg Heigth 5’10”, TtSs =5’10”, Ttss=Short, 5’9”-5’2 ttss = Shortest <5’1”

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Having a LL or Ll means you have a very prominent chin and can have the chance of a Cleft (butt) chin while ll means you don’t have a chin therefor you cannot have a cleft chin.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_In mice at least five different genes interact to produce the phenotype. Two genes give the mouse its general color, one gene affects the shading of the color, and one gene determines whether the mouse will have spots. But the fifth gene in mouse fur color can overshadow all the other and will interfere with the expression of the other color genes resulting in an albino mouse.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Eye Color is determined by three genes GEY on Chromosome 19 where the green allele is dominant over the blue, BEY1 on Chromosome 15 is the central brown color gene, and BEY2 also on chromosome 15 where brown is dominant over blue. (order of dominance: brown>green>blue)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Labrador retriever dogs have 3 main colors – Black, Chocolate, and yellow. The black gene (B) exhibits simple dominance over the brown gene (b). Thus a chocolate lab is a homozygous recessive (bb). The overall expression of the black and brown pigmentation is controlled by a third gene though (E or e). The dominant form of this gene must be present for the dog to produce black or brown pigmentation, thus being homozygous recessive (ee) results in a yellow lab regardless of the genes carried on the other chromosome.