**HUMAN GENETICS TRAITS LAB**

**Objective:** To observe different human genetics traits, find the frequency of occurrence

 among class members, and write genotypes for each trait.

**Vocabulary: DNA –** The chemical that provides the hereditary information or blueprint for the

 traits of all living things.

 **Gene –** A piece (sequence) of DNA that carries the information for one trait, like

 Tongue roller.

 **Allele –** One form (letter) of a gene, like T or t.

 **Phenotype -** The appearance of a genetic trait like Tongue Roller or Nonroller.

 **Genotype -** The genetic make-up (letters) of a trait, like TT, Tt, or tt.

 **Dominant –** A trait that is stronger, or masks the appearance of a recessive trait if

 both genes are present together, like Roller over Nonroller.

 **Recessive –** A trait that is weaker, or hidden by the presence of a dominant trait,

 like Nonroller.

 **Incomplete Dominance:** When both traits are equal, or neither trait is dominant; an

 intermediate trait or mixture is seen.

 **Pure Bred –** When both letters (alleles) are the same for a trait, like TT or tt.

 **Hybrid –** When both letters (alleles) are different for a trait, like Tt.

**Hypothesis:**  Do you predict the number of class members having each **Dominant** trait as compared to

  **Recessive** traits will be greater, equal, or the lesser in number? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

** TONGUE ROLLER (DOMINANT)**

1. (Phenotype) Can you roll your tongue? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Class results: \*Genotypes are often expressed with the capital first letter for the dominant

 trait, like R for roller.

|  |  |  |
| --- | --- | --- |
| Phenotypes:  | Roller | Nonroller |
| Class Total: # of each group:  |  |  |
| Possible Genotypes: |  or |  |

**SODIUM BENZOATE TASTING (DOMINANT)** (\*If test paper available)

2. A. First try to taste the Control paper. Can you taste any chemical on the paper? \_\_\_\_\_\_ Describe

 what you taste: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 B. (Phenotype) Next try to taste the Sodium Benzoate paper. Does this taste different than the

 Control paper? \_\_\_\_\_\_\_\_\_ If different, describe what you taste \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |
| --- | --- | --- |
| Phenotypes:  | Taster | Nontaster |
| Class Total: # of each group: |  |  |
| Possible Genotypes:  |  or  |  |

** WIDOW’S PEAK (DOMINANT)**

3. (Phenotype) Do you have a widow’s peak? \_\_\_\_\_\_\_\_\_

|  |  |  |
| --- | --- | --- |
| Phenotypes:  | Peak | No Peak |
| Class Total: # of each group: |  |  |
| Possible Genotypes:  |  or |  |

** HITCHHIKER’S THUMB (RECESSIVE)**

4. (Phenotype) Do you have a hitchhiker’s thumb? \_\_\_\_\_\_\_\_\_\_\_

|  |  |  |
| --- | --- | --- |
| Phenotypes:  | Hitchhiker’s Thumb | Straight Thumb |
| Class Total: # of each group:  |  |  |
| Possible Genotypes:  |  or |  |

** EARLOBES (DETACHED OR UNATTACHED DOMINANT)**

5. (Phenotype) Do you have unattached or attached earlobes? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |
| --- | --- | --- |
| Phenotypes:  | (Detached) Unattached Earlobe | Attached Earlobe |
| Class Total: # of each group:  |  |  |
| Possible Genotypes:  |  or |  |

**EYECOLOR (BROWN/HAZEL DOMINANT OVER BLUE/GREEN/GRAY)**

6. (Phenotype) What color eyes do you have? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |
| --- | --- | --- |
| Phenotypes:  | Brown/Hazel Eye Color | Blue/Green/Gray Eye Color |
| Class Total: # of each group:  |  |  |
| Possible Genotypes:  |  or |  |

** DIMPLES (DOMINANT)**

7. (Phenotype) Do you have one or more dimples? \_\_\_\_\_\_\_\_\_\_

|  |  |  |
| --- | --- | --- |
| Phenotypes:  | Dimple(s) | No Dimple(s) |
| Class Total: # of each group:  |  |  |
| Possible Genotypes:  |  or |  |

** FRECKLES (DOMINANT)**

8. (Phenotype) Do you have freckles? \_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |
| --- | --- | --- |
| Phenotypes:  | Freckles | No Freckles |
| Class Total: # of each group:  |  |  |
| Possible Genotypes:  |  or |  |

** STRAIGHT/WAVY/CURLY HAIR (INCOMPLETE DOMINANCE)**

9. (Phenotype) Do you have straight, wavy, or curly hair? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\*Genotypes for a trait with incomplete dominance are sometimes expressed with a different capital

 letter for each trait, so SS (straight), CC curly, or SC (wavy) hair.

|  |  |  |  |
| --- | --- | --- | --- |
| Phenotypes:  | Straight | Wavy | Curly |
| Class Total: # of each group:  |  |  |  |
| Possible Genotypes: |  |  |  |

**Analysis:**  1. Look at the Class results and fill in the following chart:

|  |  |  |
| --- | --- | --- |
| Trait | # Class members Dominant | # Class Members Recessive |
| 1. Tongue Rolling |  |  |
| 2. Sodium Benzoate |  |  |
| 3. Widow’s Peak |  |  |
| 4. Hitchhiker’s Thumb |  |  |
| 5. Earlobes |  |  |
| 6. Eyecolor |  |  |
| 7. Dimples |  |  |
| 8. Freckles |  |  |

2. For how many traits did the **Dominant** choice have a greater number than the **Recessive** choice?

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. For how many traits did the **Recessive** choice have a greater number than the **Dominant** choice?

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. Which traits had a higher number more often, **Dominant** or **Recessive? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

5. Was your original **Hypothesis** correct or incorrect? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. **Summary:** Using complete sentences, write three facts or concepts you have learned from this

 experiment.

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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7. Extra Credit: Research on the Internet or in a science book why sometimes **Dominant** traits might

 have a lower number than expected as compared to **Recessive** traits in an individual

 classroom study. Explain the answer you found below in your own words. You might

 also try to come up with a reasonable idea on your own, but it should be well-explained.