Monster Genetics Lab

Objective: To use what you have learned in your interactive notebook and through the lessons to apply to this activity.

You have learned about different patterns of inheritance. Some are simple dominant or recessive, as in Mendelian traits. Some are more complex, such as incomplete dominance or codominant traits. In this lab you will investigate how a combination of these genes works to create an organism.

**Part 1 Procedure:**

1. Flip a coin (being responsible, respectful and safe) to determine the **genotype** for each trait and record it in the data table.

Heads = dominant, Tails = recessive

1. Determine the **phenotype** resulting from the acquired genotype.
2. Repeat steps 1-2 for each trait and complete it for the female monster’s Table 1.

**Table 1: Genotype and Phenotype for Female Monster**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Trait** | **Allele 1** | **Allele 2** | **Genotype** | **Phenotype** |
| Eye | Two small eyes (E) | One large eye (e) |  |  |
| Eye Color  (incomplete) | Red (R) | White (R’) |  |  |
| Skin Color  (codominant) | Green (G) | Blue (B) |  |  |
| Tail Shape | Curly ( C ) | Straight ( c ) |  |  |
| Tail Color | Purple (P) | Orange (p) |  |  |
| Tail | Have tail (T) | No tail (t) |  |  |
| Teeth | Sharp (S) | Round (s) |  |  |
| Feet  (incomplete) | Four toes (F) | Two toes (F’) |  |  |
| Horn Color | Purple (P) | White (p) |  |  |
| Ear Shape | Pointy (P) | Round (p) |  |  |
| Ears | No ears (N) | Two ears (n) |  |  |
| Claws | Long (L) | Short (l) |  |  |

**Part 2 Procedure:**

The female monster (described in Table 1) and the male monster (see Table 2) plan to have baby monsters. They are interested in finding out for each trait the probability that their offspring will have that trait.

1. Fill in the missing information for the male.

**Table 2: Genotypes and Phenotypes for the Male Monster**

|  |  |  |
| --- | --- | --- |
| **Trait** | **Genotype** | **Phenotype** |
| Eyes | ee | 1 eye |
| Eye color (incomplete) | **R’R’** | **White** |
| **Skin color (codominance)** |  | **Green** |
| **Tail Shape** |  | **Straight** |
| **Tail Color** | **Pp** |  |
| **Tail** |  | **No tail** |
| **Teeth** |  | **Round** |
| **Feet (incomplete)** | **FF’** |  |
| **Horn Color** | **pp** |  |
| **Ear Shape** | **pp** |  |
| **Ears** |  | **2 Ears** |
| **Claws** |  | **short** |

1. Create a Punnett Squares (attach your work to this handout) to predict what traits would result from a cross between the two monsters for each trait. Label your Punnett squares with the trait you are crossing.
   1. Eyes- What percent of offspring will have only 1 eye? \_\_\_\_\_\_\_\_\_\_
   2. Eye Color- What percent of offspring will have red eyes? \_\_\_\_\_\_\_\_\_
   3. Skin Color- What percent of offspring will have green skin? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   4. Tail- What percent of offspring will have a tail? \_\_\_\_\_\_\_\_\_\_\_\_
   5. Feet- What percent of offspring will have three toes? \_\_\_\_\_\_\_\_\_\_
   6. Horn Color- What percent of offspring will have will have purple horns? \_\_\_\_\_
   7. Ears- What percent of offspring will have ears? \_\_\_\_\_\_\_\_
   8. Claws- What percent of offspring will have long claws? \_\_\_\_\_\_\_\_\_
2. Now draw a picture of the mother monster, father monster and 1 of the offspring on computer paper. Neatness, 100% best effort for these. USE COLOR AS NEEDED.