# Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Monster Genetics Lab

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

**Part 1: Mom**

1. Flip a coin twice to determine the **genotype** for each trait and record it in the data table.

Heads = Dominant Trait

Tails = Recessive Trait

1. Determine the **phenotype** resulting from the allele pair for each trait.

**Table 1: Genotypes & Phenotypes for Female Monster**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Trait** | **Allele 1** | **Allele 2** | **Genotype** | **Phenotype** |
| Eye # | Two small eyes (E) | One large eye (e) |  |  |
| Eye Color | Red (R) | White (r) |  |  |
| Skin Color | Green (G) | Blue (g) |  |  |
| Tail Shape | Curly (J) | Straight (j) |  |  |
| Tail Color | Purple (R) | Orange (r) |  |  |
| Teeth | Sharp (E) | Round (e) |  |  |
| Feet | Four Feet (F) | Two feet (f) |  |  |
| Horn Color | Purple (Q) | White (q) |  |  |
| Ear Shape | Pointy (B) | Round (b) |  |  |
| Ear Location | Top of Head (A) | Side of head (a) |  |  |
| Claws | Long (L) | Short (l) |  |  |
| Body Shape | Round (B)  | Oval (b) |  |  |
| Number of Arms | Four (D) | Two (d) |  |  |
| Fur or Scales | Fur (H) | Scales (h)  |  |  |

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/ 28 Points (1 Point/ Blank) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Part 2: Dad**

The female monster (described in Table 1) and a male monster (see Table 2 below) 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 genetic information in the table for the male.

**Table 2: Genotypes & Phenotypes for Male Monster**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Trait** | **Allele 1** | **Allele 2** | **Genotype** | **Phenotype** |
| Eye # | Two small eyes (E) | One large eye (e) | ee |  |
| Eye Color | Red (R) | White (r) |  | White |
| Skin Color | Green (G) | Blue (g) |  | Heterozygous Green |
| Tail Shape | Curly (J) | Straight (j) |  |  |
| Tail Color | Purple (R) | Orange (r) |  |  |
| Teeth | Sharp (E) | Round (e) |  | Round |
| Feet | Four Feet (F) | Two feet (f) | FF |  |
| Horn Color | Purple (Q) | White (q) | qq |  |
| Ear Shape | Pointy (B) | Round (b) | bb |  |
| Ear Location | Top of Head (A) | Side of head (a) |  | Side of Head |
| Claws | Long (L) | Short (l) |  | Homozygous Long |
| Body Shape | Round (B) | Oval (b) | BB |  |
| Number of Arms | Four (D) | Two (d) | DD |  |
| Fur or Scales | Fur (H) | Scales (h)  |  | Heterozygous Fur |

\_\_\_\_\_\_\_\_\_\_\_\_\_ / 12 Points ( 1 Point/ Blank) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Part 3: Punnett Squares**

Create Punnett squares to predict what traits would result from a cross between the two monsters for each trait, and fill in the following Punnett Squares. **Please put mother’s alleles on side and father’s alleles on top.**

Eye Number Eye Color Skin Color

  

 Tail Shape Tail Color Teeth

  

 Feet Horn Color Ears Shape

  

 Ear Location Claws Body Shape

  

  

Fur or scales

Number of Arms

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ / 36 Points (Each Square is 3 points each) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Teacher Intials

**Part 4: Punnett Squares Probability**

After creating the Punnett squares answer the following questions:

1. Eye # – What are the chances of only one eye? \_\_\_\_\_\_\_\_\_
2. Eye Color – What are the chances of red eyes? \_\_\_\_\_\_\_\_\_
3. Skin Color – What are the chances of green skin? \_\_\_\_\_\_\_\_\_
4. Tail Shape – What are the chances of a curly tail? \_\_\_\_\_\_\_\_\_
5. Tail Color- What are the chances of an orange tail? \_\_\_\_\_\_\_\_\_
6. Teeth- What are the chances of sharp teeth? \_\_\_\_\_\_\_\_\_
7. Feet – What are the chances of two feet? \_\_\_\_\_\_\_\_\_
8. Horn Color – What are the chances of purple horns? \_\_\_\_\_\_\_\_\_
9. Ears Shape – What are the chances of pointy ears? \_\_\_\_\_\_\_\_\_
10. Ear Location- What are the chances of ears on the side of their head? \_\_\_\_\_\_\_\_
11. Claws – What are the chances of long claws? \_\_\_\_\_\_\_\_\_
12. Body Shape – What are the chances of a round body? \_\_\_\_\_\_\_\_\_
13. # of Arms- What are the chances of two arms? \_\_\_\_\_\_\_\_\_\_
14. Fur or Scales- What are the chances of scales? \_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_/ 24 Points (2 Points per question) \_\_\_\_\_\_\_\_\_\_\_\_\_

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**Part 5: 3-D Model**

Create a 3-D model of one of the possible offspring of your Monster, choosing the traits as you go. You must use at least two different materials in your model, and that does not include the glue or tape that you might use. (Some great examples for materials would be Play-doh, candy, pipe cleaners, construction paper, cereal boxes, Fabric, paper mache, etc….be creative!)

Use the box below to plan out what your monster looks like. This must be completed before you may move on to the creation of it.

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/ 14 Points \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 (14 Points for Model having correct traits) Teacher Initials