

Monster Traits Lab

Introduction: Heredity is the passing on of traits from parent to offspring. The units of heredity that determine what traits are passed are called genes. Genes are sections of DNA in a chromosome. An allele is one form of a gene. The allele pair is called a genotype (i.e., BB, Hh, rr). The physical traits that are shown is the phenotype (i.e., blonde, spotted, 3-eyed, tall).

Types of Alleles:

Dominant Alleles are represented with "CAPITAL" letters
Recessive Alleles are represented with "lower case" letters

Homozygous: when both alleles are the same

Homozygous Dominant: When both alleles are dominant. (AA)

Homozygous Recessive: When both alleles are recessive. (aa)

Heterozygous: Both alleles are different. (Aa)

Incomplete Dominance: Heterozygous mix of alleles. A mixture of the two alleles (or an "intermediate phenotype") is produced.

Materials: 1-2 coins, lab form, blank sheet of paper, colored pencils/markers

Procedure:

1. Answer pre-lab questions below.
2. Determine your monster's gender.
3. Determine your monster's traits and fill in the chart on the back.
- a. Flip a coin TWICE for each trait.**
- b. Heads=dominant, tails=recessive.**
4. Record your results for each trait (genotype).
5. Determine the phenotype. (*Hint: what physical trait will be seen?*)
6. Using the recorded traits, draw your monster!
7. Answer the post-lab questions.

Pre-Lab Questions:

1. What are the chances that any coin tossed will land heads up? _____
2. From a heterozygote (Aa), what are the chances that they will pass on a dominant allele? _____
3. Do you think your monster will have the *exact* same traits as another monster in the room? _____
4. Why or Why not? _____

Determine Gender:

What chromosomes cause a female gender? _____

A male gender? _____

Flip a coin to determine gender

Both coins land on the same side up, your monster is a **Female**. If the coins land different sides up, your monster is a **Male**.

Gender of Monster: _____

Block: _____

Name: _____



Determine Traits: Flip a coin twice, once for each allele in the genotype; Heads=dominant, tails=recessive.

The traits below show incomplete dominance (the two alleles blend if the monster is heterozygous)

| Trait | Genotype | Phenotype |
|---|----------|-----------|
| *Body Color: Blue (Bb) Green (Bb) Yellow (bb) | | |
| *Height: Tall (TT) Average (Tt) Short (tt) | | |
| *Size: Fat (FF) Average (Ff) Skinny (ff) | | |

| Trait | Genotype | Phenotype |
|---|----------|-----------|
| Horns: Horns (H) No horns (h) | | |
| Spots: Spots (S) No Spots (s) | | |
| Fur: Furry (F) No fur (f) | | |
| # of Arms: 2 Arms (A) 4 Arms (a) | | |
| # of Eyes: 2 Eyes (E) 3 Eyes (e) | | |
| Tail: Tail (T) No Tail (t) | | |

***Draw your monster on a separate sheet of paper – show all traits neatly. Include color.**

Post-Lab Questions:

1. Compare your monster to other groups around you – is your monster identical to any others? _____

2. Out of 9 traits, how many of your traits were: _____

Homozygous dominant? _____ Homozygous recessive? _____ Heterozygous? _____

3. Assume that **your** monster mates with a monster with no spots. Complete a Punnett square to determine their offspring's possible genotypes.


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| | |

Genotypic Ratio: _____
Phenotypic Ratio: _____

4. Assume that your monster mates with a Green Color Monster. Complete a Punnett Square to determine their chances of creating a Blue, Yellow, or Green monster offspring.

| | |
|--|--|
| | |
| | |

Genotypic Ratio: _____
Phenotypic Ratio: _____



Genotypic Ratio: _____
Phenotypic Ratio: _____