

Monster Genetic Lab

Goal:

Determine the appearance of a monster, given the genotype of a specific sperm and egg

General Procedure:

In pairs, each of you will flip a coin to decide which genes are present in the female monster. Using the results of the coin toss, you will determine the genotype and phenotype of the female monster.

Part 1: Determining Female Genotype and Phenotype

1. Flip a coin twice to determine the genotype for each trait and record it in the data table
Heads = dominant allele (capital letter)
Tails = recessive allele (small letter)
2. Determine the genotype and the phenotype for each characteristic.
3. Draw a picture of your monster.

Trait	Dominant Allele	Recessive Allele	Genotype	Phenotype
Eye	Two small eye (E)	One large eye (e)		
Eye Colour	Red (R)	White (r)		
Skin Colour	Green (G)	Blue (g)		
Tail Shape	Curly (C)	Straight (c)		
Tail Colour	Purple (P)	Orange (p)		
Tail	Have tail (T)	No tail (t)		
Teeth	Sharp (S)	Round (s)		
Feet	Four toes (F)	Two toes (f)		
Horn Colour	Purple (W)	White (w)		
Ear Shape	Pointy (Y)	Round (y)		
Ears	No Ears (N)	Two ears (n)		
Claws	Long (L)	Short (l)		

Part 2: Determine Male Genotype and Phenotype

The female monster is married to a male monster and they plan to have baby monsters. They are interested in finding out the probability of which traits their offspring will have.

Fill in the missing genetic information for the male monsters.

Trait	Genotype	Phenotype
Eye	Ee	
Eye Colour		White
Skin Colour		Green
Tail Shape		Straight
Tail Colour	Tp	
Tail		No tail
Teeth		Round
Feet	FF	
Horn Colour	ww	
Ear Shape	yy	
Ears		Has two ears
Claws		Short

Part 3: Predicting the Baby

Create Punnett squares (attach your work) to predict what traits would result from a cross between the two monsters for each trait below and answer the questions.

1. Eyes – what percent of offspring will have only one eye? _____
2. Eye Colour – What percent of offspring will have red eyes? _____
3. Skin colour – 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 Colour – What percent of offspring will have purple horns? _____
7. Ears – What percent of offspring will have ears? _____
8. Claws – What percent of offspring will have long claws? _____

Part 4: Analysis

1. By knowing the genotype for the monsters, you were able to figure out the phenotype. Would this work the other way? That is, by looking at the baby, could we figure out its genotype?
2. Do you feel that this activity accurately reflects the chances of receiving given characteristics? Are there any factors that it fails to take into account?