

Create a Baby Lab

Name_____ Per ____

Purpose: To demonstrate the principles of Mendelian genetics and sex determination, including the concepts of allele, phenotype, genotype, dominant, recessive, codominant, homozygous and heterozygous by creating a simulated baby.

Materials: Two pennies, art supplies, paper.

Procedure:

- 1) Working with a partner, determine the genotype of the baby by flipping pennies. “Mom” flips one penny to choose an allele for her egg and “Dad” flips the other to choose an allele for his sperm. (Note that the sex of the baby is determined by dad alone. Boys are XY and girls are XX. Mom can give only an X but dad can give an X or a Y chromosome.)
- 2) Record the alleles which resulted from the coin flips, and put “sperm and egg” together. Write down baby’s genotype for each trait in Table 1. Heads represents allele #1 and tails represents allele #2.
- 3) Record the resulting phenotype in Table 1. Note: Dominant alleles are written with an uppercase letter and recessive alleles are written as lowercase letters. Dominant alleles mask the expression of recessive ones. Co-dominant alleles are written as uppercase letters with a subscript. Co-dominant alleles result in a phenotype that is blended.
- 4) Repeat steps 1, 2, and 3 for all traits and then draw, color, and name your creation. Remember that you are drawing a baby’s face—not a child’s or an adult’s (no tattoos, pierced ears, mustaches, etc.)

Concluding Questions:

1. Why is the coin flip used to represent the selection of alleles?
2. Define the following terms:
 - allele-
 - phenotype-
 - genotype-
 - dominant-
 - recessive-
 - codominant-
 - homozygous-
 - heterozygous-
 - chromosome-
 - locus-
 - gene-

Results:

Table 1: **Circle here** whether you are the mom or dad and fill in the data below.

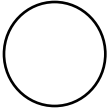
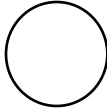









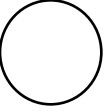


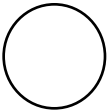













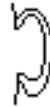




Mom's Name: _____ Dad's Name _____ Per. _____




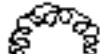



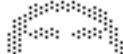
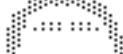






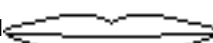
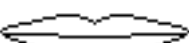





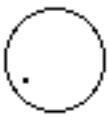

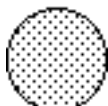
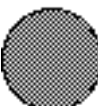
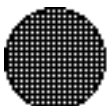
Baby's Name: _____

<u>Trait</u>	<u>Allele from Mom</u>	<u>Allele from Dad</u>	<u>Genotype</u>	<u>Phenotype</u>
Sex	X	_____	_____	_____
Face Shape	_____	_____	_____	_____
Chin Shape	_____	_____	_____	_____
Chin Dimple	_____	_____	_____	_____
Freckles	_____	_____	_____	_____
Cheek Dimples	_____	_____	_____	_____
Lip Thickness	_____	_____	_____	_____
Eye Brows	_____	_____	_____	_____
Eye Shape	_____	_____	_____	_____
Eyelashes	_____	_____	_____	_____
Ear Shape	_____	_____	_____	_____
Ear Lobes	_____	_____	_____	_____
Widow's Peak	_____	_____	_____	_____
Hair Curliness	_____	_____	_____	_____
Eyebrow Color	_____	_____	_____	_____
Eye Width	_____	_____	_____	_____
Eye Size	_____	_____	_____	_____
Mouth Size	_____	_____	_____	_____
Nose Size	_____	_____	_____	_____
Birth Mark	_____	_____	_____	_____
Skin Tone	_____	_____	_____	_____

<u>Polygenic Trait</u>	<u>Alleles from Mom</u>	<u>Alleles from Dad</u>	<u>Genotype</u> 1st / 2nd	<u>Phenotype</u>
Hair Color	#1____ #2____	#1____ #2____	____ / ____	_____
Eye Color	#1____ #2____	#1____ #2____	____ / ____	_____

Create a Baby Lab: Genotype/Phenotype reference sheet

Trait	Homozygous for Allele #1	Heterozygous	Homozygous for Allele #2
Face Shape Genotype: Phenotype:	RR Round 	Rr Round 	rr Square 
Chin Shape Genotype: Phenotype:	NN  Noticeable	Nn  Noticeable	nn  Less Noticeable
Chin Dimple Genotype: Phenotype:	AA  Absent	Aa  Absent	aa  Present
Freckles Genotype: Phenotype:	FF  Present	Ff  Present	ff  Absent
Cheek Dimples Genotype: Phenotype:	DD  Present	Dd  Present	dd  Absent
Lip Thickness Genotype: Phenotype:	TT  Thick	Tt  Thick	tt  Thin
Eye Brows Genotype: Phenotype:	BB  Bushy	Bb  Bushy	bb  Fine
Eye Shape Genotype: Phenotype:	WW  Wide	Ww  Wide	ww  Round
Eyelashes Genotype: Phenotype:	LL  Long	Ll  Long	ll  Short
Ear Shape Genotype: Phenotype:	RR  Long	Rr  Long	rr  Round
Ear Lobes Genotype: Phenotype:	FF  Free	Ff  Free	ff  Attached

Trait	Homozygous for Allele #1	Heterozygous	Homozygous for Allele #2
Widow's Peak			
Genotype:	WW	Ww	ww
Phenotype:	Present 	Present 	Absent 
Hair Curliness			
Genotype:	C ₁ C ₁	C ₁ C ₂	C ₂ C ₂
Phenotype:	Curly 	Wavy 	Strait 
Eyebrow Color			
Genotype:	D ₁ D ₁	D ₁ D ₂	D ₂ D ₂
Phenotype:	Darker than hair 	Same as hair 	Lighter than hair 
Eye Width			
Genotype:	W ₁ W ₁	W ₁ W ₂	W ₂ W ₂
Phenotype:	Close Together 	Average 	Far apart 
Eye Size			
Genotype:	S ₁ S ₁	S ₁ S ₂	S ₂ S ₂
Phenotype:	Large 	Medium 	Small 
Mouth Size			
Genotype:	M ₁ M ₁	M ₁ M ₂	M ₂ M ₂
Phenotype:	Wide 	Medium 	Narrow 
Nose Size			
Genotype:	P ₁ P ₁	P ₁ P ₂	P ₂ P ₂
Phenotype:	Small 	Medium 	Large 
Birth Mark (mole)			
Genotype:	B ₁ B ₁	B ₁ B ₂	B ₂ B ₂
Phenotype:	Left cheek 	Right cheek 	Absent 
Skin Tone			
Genotype:	S ₁ S ₁	S ₁ S ₂	S ₂ S ₂
Phenotype:	Light 	Medium 	Dark 
Hair Color	AABB=Black AABb=Black AAbb=Red	AaBB=Dark Brown AaBb=Light Brown Aabb=Dark Blond	aaBB=Blond aaBb=Blond aabb=white (albino)
Eye Color	AABB=Deep Brown AABb=Deep Brown AAbb=Brown	AaBB=Greenish Brown AaBb=Light Brown Aabb=Gray-Blue	aaBB=Green aaBb=Light Blue aabb=Pink