

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.

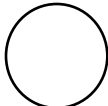
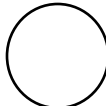









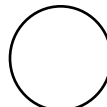


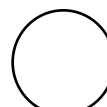
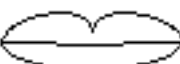
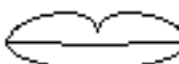











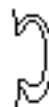




Mom's Name: _____ Dad's Name _____ Per. _____








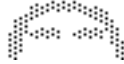







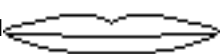
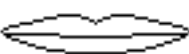





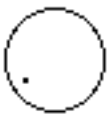

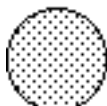
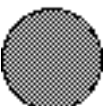
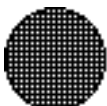
Baby's Name: _____

<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: Phenotype:	WW Present 	Ww Present 	ww Absent 
Hair Curliness Genotype: Phenotype:	C ₁ C ₁ Curly 	C ₁ C ₂ Wavy 	C ₂ C ₂ Strait 
Eyebrow Color Genotype: Phenotype:	D ₁ D ₁ Darker than hair 	D ₁ D ₂ Same as hair 	D ₂ D ₂ Lighter than hair 
Eye Width Genotype: Phenotype:	W ₁ W ₁ Close Together 	W ₁ W ₂ Average 	W ₂ W ₂ Far apart 
Eye Size Genotype: Phenotype:	S ₁ S ₁ Large 	S ₁ S ₂ Medium 	S ₂ S ₂ Small 
Mouth Size Genotype: Phenotype:	M ₁ M ₁ Wide 	M ₁ M ₂ Medium 	M ₂ M ₂ Narrow 
Nose Size Genotype: Phenotype:	P ₁ P ₁ Small 	P ₁ P ₂ Medium 	P ₂ P ₂ Large 
Birth Mark (mole) Genotype: Phenotype:	B ₁ B ₁ Left cheek 	B ₁ B ₂ Right cheek 	B ₂ B ₂ Absent 
Skin Tone Genotype: Phenotype:	S ₁ S ₁ Light 	S ₁ S ₂ Medium 	S ₂ S ₂ 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