Create a Baby Lab
Artwork by Maria Rascon

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.
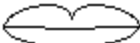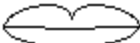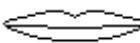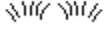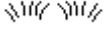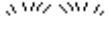
Materials: Two pennies, paper.
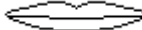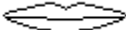
Procedure:

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 gender of the baby is a special case and is determined by dad alone. Boys are XY and girls are XX. Mom can give only an X but dad can give either an X or a Y.)

2) Record the alleles which resulted from the coin flips, and put "sperm and egg" together. (You cannot pick the traits you want; life doesn't work that way!) Write down baby's genotype for each trait in Table 1. Heads represents allele #1 and tails represents allele #2.

3) Record the baby's phenotype in Table 1 by looking up the genotype you got in the Genotype/Phenotype Reference Sheet. 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 that represents the traits you got - not a child's or an adult's (no tattoos, no mustaches, no piercings, etc., and not too much hair!)

Genotype/Phenotype Reference Sheet

Trait	Genotype/Phenotype (Homozygous for Allele 1)	Genotype/Phenotype (Heterozygous)	Genotype/Phenotype (Homozygous for Allele #2)
Face Shape	RR Round	Rr Round	rr Square
Chin Shape	NN Noticeable	Nn Noticeable	nn Less Noticeable
Chin Dimple	AA Absent	Aa Absent	aa Present
Freckles	FF Present	Ff Present	ff Absent
Cheek Dimples	DD Present	Dd Present	dd Absent
Lip Thickness	TT Thick	Tt Thick	tt Thin
Eye Brows	BB Bushy	Bb Bushy	bb Fine
Eye Shape	WW Wide	Ww Wide	ww Round
Eyelashes	LL Long	Ll Long	ll Short
Ear Shape	RR Long	Rr Long	rr Round
Ear Lobes	FF Free	Ff Free	ff Attached
Widow's Peak	WW Present	Ww Present	ww Absent
Hair Curliness	C_1C_1 Curly	C_1C_2 Wavy	C_2C_2 Straight

Eyebrow Color	D_1D_1 Darker than hair	D_1D_2 Same as hair	D_2D_2 Lighter than hair
Eye Width	W_1W_1 Close Together	W_1W_2 Average	W_2W_2 Far apart
Eye Size	S_1S_1 Large	S_1S_2 Medium	S_2S_2 Small
Mouth Size	M_1M_1 Wide	M_1M_2 Medium	M_2M_2 Narrow
Nose Size	P_1P_1 Small	P_1P_2 Medium	P_2P_2 Large
Birth Mark (mole)	B_1B_1 Left cheek	B_1B_2 Absent	B_2B_2 Right cheek
Skin Tone	S_1S_1 Light	S_1S_2 Medium	S_2S_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