Create a Face Lab

Introduction:
Why do people look so different from each other? Even close relatives often look very different from each other. This happens because a very large variety of traits exist in the human population and new variations are created as humans reproduce. Remember during meiosis there can be reshuffling and even crossing over of genes. In this activity, we will learn why brothers and sisters have different **genotypes** (genetic messages on their DNA) and **phenotypes** (physical appearances), even when the share the same parents.

So… CONGRATULATIONS! You are a parent! You will have one **dominant** and one **recessive** gene for each facial feature illustrated in this lab. Amazing coincidence, huh? As you already know this means you are **heterozygous** for each trait.

Materials:

- ❑ A lab sheet
- ❑ Two pennies
- ❑ crayons

Procedure:

1. Obtain your materials.

2. Find out the sex of your child.
    - Remember your mom's genotype is XX and dad's is XY. So only Dad flips the coin.
    - Heads represents Y sperm, which means the child will be a boy.
    - Tails represents X sperm, which means the child, will be a girl.

3. Discover the facial features your child will have by flipping the coin as directed by the following pages. For purposes of the rest of the activity:
    - Heads will represent the **dominant** trait shown in capital letters.
    - Tails will represent the **recessive** trait shown in lowercase letters.

4. On the ***Face Lab Data Sheet*** record the genetic contributions (results from the flips of the coins) Circle the genotype and phenotype for each. Some of the traits exhibit codominance (or incomplete dominance) and show a blend of the dominant and recessive traits. To determine the color of eyes, skin, hair, or any other trait controlled by more than 1 gene, you will need to flip the coin for each gene pair. Dominant alleles represent color; recessive alleles represent little or no color.

5. Draw your child's senior picture on the back of the lab data sheet once you have determined the features of your child's face.

Facial Features

Face Shape Round (RR , Rr) Square (rr)

Chin Shape

Prominent (PP, Pp)

Weak (pp)

Chin Shape II – only if your child's chin is prominent (PP, Pp)

Round Chin (RR, Rr)

Square Chin (rr)

Cleft Chin

Present (CC, Cc)

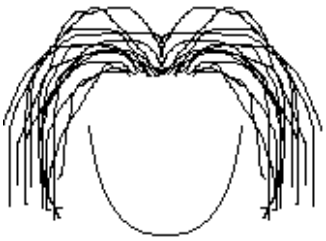
Absent (cc)

Hair Type: incomplete dominance

Curly (CC)

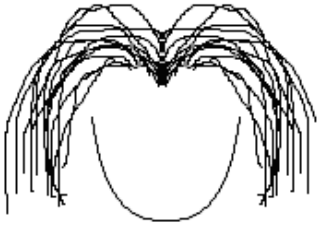
Wavy (Cc)

Straight (cc)

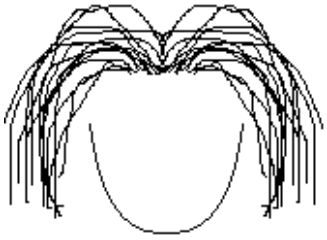


Widow's Peak: The hair comes to a point…like Eddie Munster or Dracula

Present (WW, Ww)



Absent (ww)



Eye Distance:

Close together (EE)

Average (Ee)

Far apart (ee)

Eye Size:

Large (LL)

Average (Ll)

Small (ll)

Eye Shape:

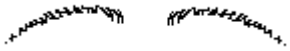
Almond (AA, Aa)

Round (aa)

Eyebrow Thickness:

Bushy (BB, Bb)

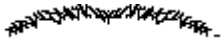
Fine (bb)



Eyebrow Placement:

Not connected (NN, Nn)

Connected (nn)



Eyelashes:

Long (LL, Ll)

Short (ll)

Mouth Size:

Large (LL)

Medium (Ll)

Small (ll)

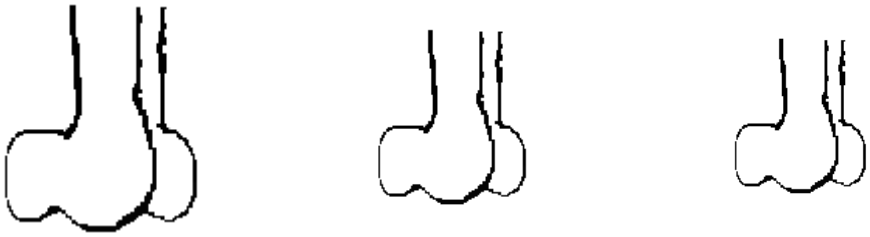
Lip Thickness:

Thick (TT, Tt)

Thin (tt)

Nose Size:

Big (BB) | Average (Bb) | Small (bb)



Earlobe Attachment:

Free (FF, Ff) | Attached (ff)

HAIRY EARS: Males Only

Present (KK, Kk) | Absent (kk)

Freckles on cheeks:

Present (CC, Cc) | absent (cc)

Freckles on forehead:

Freckles (FF, Ff) | No freckles (ff)

To determine the color of eyes, skin, hair, or any other trait controlled by more than 1 gene, you will need to flip the coin for each gene pair. Dominant alleles represent color; recessive alleles represent little or no color.

EYE COLOR:

Assume that there are two gene pairs involved, the capital letters represent more color and the lower case, less color. Dark eyes are dominant over light. Assume that there are two layers of color on the iris of the eye. The first alleles (AA, Aa, or aa) code for the front of the iris and the second alleles (BB, Bb, or bb) code for the back of the iris. Determine the first layer, A, then the second layer, B. In reality eye color is much more complex than even this.

AABB	Dark brown
AABb	Dark brown
AAbb	Brown with blue flakes
AaBB	Brown with green flakes
AaBb	Hazel
Aabb	Dark blue
aaBB	Green
aaBb	Grey blue
aabb	Light blue

SKIN COLOR: Determined by 3 gene pairs

a. First coin toss determines whether the child inherits CC, Cc, or cc.
b. Second coin toss decides DD, Dd, or dd inheritance.
c. Third coin toss determines inheritance of EE, Ee, or ee.

6 dominant alleles - black
5 dominant alleles - very dark brown
4 dominant alleles - dark brown
3 dominant alleles - medium brown
2 dominant - light brown
1 dominant - light tan
0 dominant - white

HAIR COLOR: Determined by 4 gene pairs.

a. First coin toss determines whether the child inherits FF, Ff, or ff.
b. Second coin toss decides GG, Gg, or gg inheritance.
c. Third coin toss determines inheritance of HH, Hh, or hh.
d. Fourth coin toss determines inheritance of II, Ii, or ii.

8 dominant - black
7 dominant - very dark brown
6 dominant - dark brown
5 dominant - brown
4 dominant - light brown
3 dominant - brown mixed w/blonde
2 dominant – blond
1 dominant - very light blond
0 dominant - silvery white

RED COLOR TINTS IN THE HAIR: This trait is only visible if the hair color is light brown or lighter (4 or less dominant alleles for hair color). If you have 5 or more dominant alleles for hair color you do not toss coins for red tint.

Dark red tint (JJ) Light red tint (Jj) No red tint (jj)