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… CONGRATUALTIONS! You are a parent! You and your lab partner represent a couple that each 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 partner
- A penny
- Colored pencils

Procedure:

1. Obtain a partner and the rest of your materials. Decide which of you will contribute the genes of the mother and with will contribute the genes of the father.
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. Give your bouncing baby name.
4. 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.
5. On the ***Face Lab Data Sheet*** record the genetic contributions (results from the flips of the coins) in the columns labels ***Gene(s) from Mother*** and ***Gene(s) from Father***. Record the actual genetic message in the genotype column, and record the appearance in the phenotype column.
6. Draw your child's Senior Picture. When you have determined all the features of your child's face, draw and color the way your baby will look when he/she has reached their senior year of high school.
7. Complete the analysis section of the lab. Then, attach the lovely drawing of your child to the data sheet and turn it in.

Facial Features

1. Face Shape — Round (RR , Rr) — Square (rr)

2. Chin Shape — Prominent (PP, Pp) — Weak (pp)

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

Round Chin (RR, Rr) — Square Chin (rr)

4. Cleft Chin — Present (CC, Cc) — Absent (cc)

5. Skin Color:

Skin color involves 3 gene pairs. Each parent need to flip the coin 3 times, and record the A, B, and C alleles. For example the result of the first pair of coin flips might be AA, Aa, or aa. Record the first coin flip then do two more alleles B and C.

Each capital letter represent an active gene for melanin production (color).

6 capitals	Very dark black skin
5 capitals	Very dark brown
4 capitals	Dark brown
3 capitals	Medium brown
2 capitals	Light brown
1 capitals	Light tan
0 capitals	White

6. Hair Color:

Like skin color hair color is produced by several genes (polygenic or multiple alleles). For the purpose of this activity we will assume that 4 pairs are involved (more are likely). So, each parent will have to flip the coins 4 times for the A, B, C and D alleles. As before, the capital letters (dominant) represent color while the lower case (recessive) represent little or no color.

8 capitals	Black
7 capitals	Very dark brown
6 capitals	Dark brown
5 capitals	Brown
4 capitals	Light brown
3 capitals	Honey blond
2 capitals	Blond
1 capitals	Very light blond
0 capitals	White

7. Red Hair Color

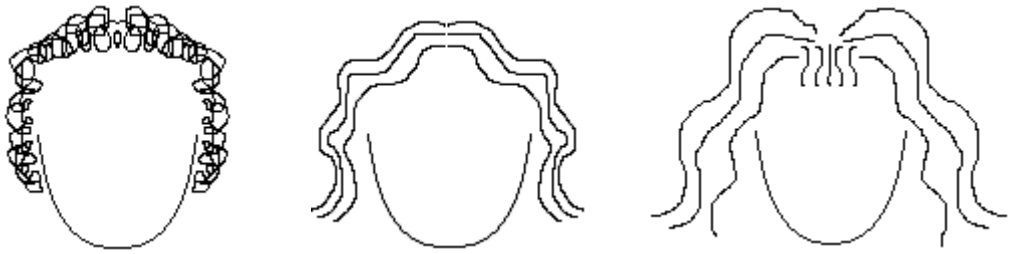
Red hair seems to be caused by a single gene with two alleles:

Dark red (RR) Light red (Rr) No red (rr)

Red hair is further complicated by the fact that brown hair will mask or hide red hair color. The lighter the hair color the more the red can show through. If your child has 3 or less capitals (for hair color, see number 6), and RR is tossed your child will have flaming red hair. (Have fun with your colored pencils!)

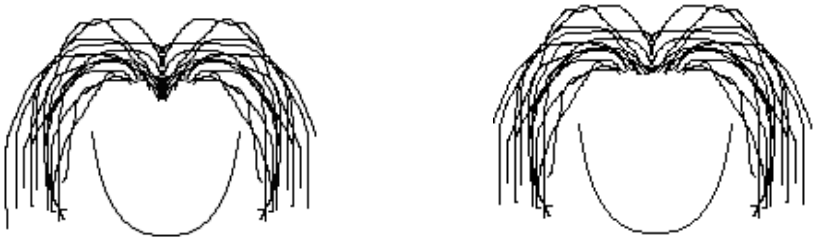
8. Hair Type: incomplete dominance

Curly (CC) Wavy (Cc) Straight (cc)



9. Widow's Peak: The hair comes to a point…like Eddie Munster

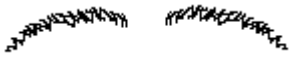
Present (WW, Ww) Absent (ww)

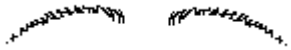


10. Eyebrow Color: incomplete dominance

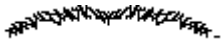
Dark (DD) Medium (Dd) Light (dd)

11. Eyebrow Thickness: Bushy (BB, Bb) Fine (bb)





12. Eyebrow Placement: Not connected (NN, Nn) Connected



13. 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 (A or a) code for the front of the iris and the second alleles (B or b) 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 this.

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

14. Eye Distance:

Close together (EE) Average (Ee) Far apart (ee)

15. Eye Size:

Large (LL) Average (Ll) Small (ll)

16. Eye Shape: Almond (AA, Aa) Round (aa)


17. Eye Tilt: Horizontal (HH, Hh) Upward slant (hh)


18. Eyelashes: Long (LL, Ll) Short (ll)


19. Mouth Size:

Long (LL) Average (Ll) Short (ll)



20. Lip Thickness: Thick (TT, Tt) Thin (tt)


21. Lip Protrusion:

Very protruding (PP) Slightly protruding (Pp) Absent (pp)

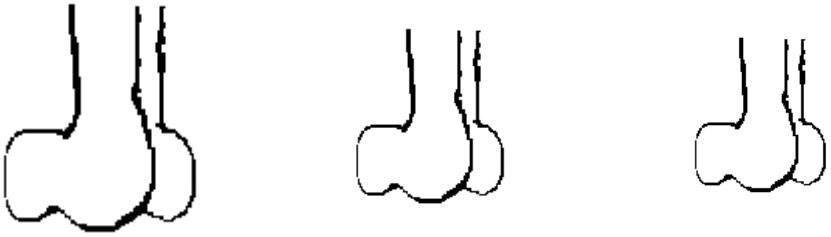


22. Dimples:

Present (PP, Pp) Absent (pp)


23. Nose Size:

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



24. Nose Shape: Rounded (RR, Rr) Pointed (rr)

25. Nostril Shape: Rounded (RR, Rr) Pointed (rr)

26. Earlobe Attachment:

Free (FF, Ff) Attached (ff)

27. Darwin's Ear Point:

Present (PP, Pp) Absent (pp)

28. Ear Pits: Present (PP, Pp) Absent (pp)

29. Hairy Ears: This sex-linked and only occurs in males so if your baby girl skip this. If your baby is a boy, only mom flips.

Present (P) Absent (p)

30. Freckles on Cheeks:

Present (PP, Pp) Absent (pp)

31. Freckles on Forehead:

Present (PP, Pp) Absent (pp)