Create a Face Lab

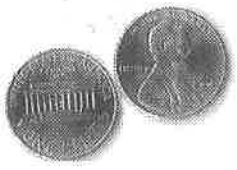
Introduction:

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.

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

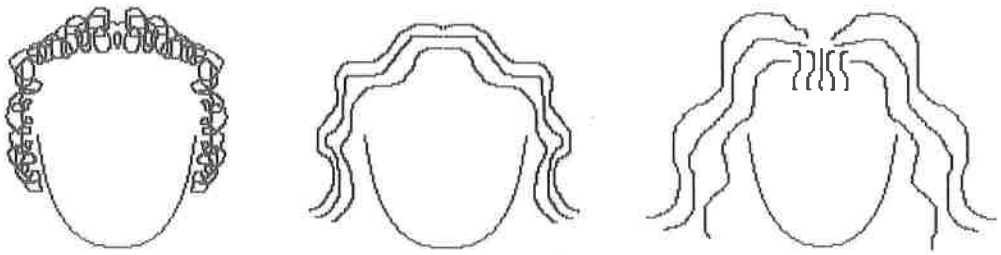
Red hair seems to be caused by a single gene with two alleles:

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!)

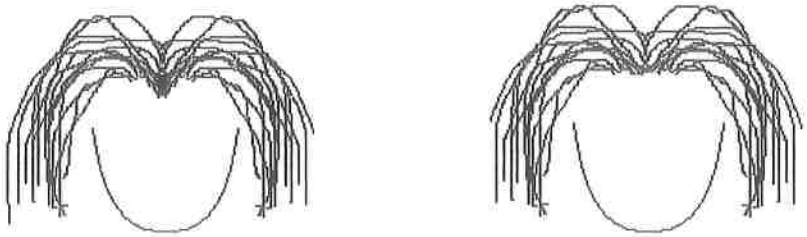
8. Hair Type: incomplete dominance

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



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

Present (WW, Ww) Absent (ww)



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)


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)

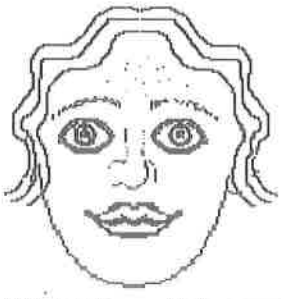
30. Freckles on Cheeks:

Present (PP, Pp)

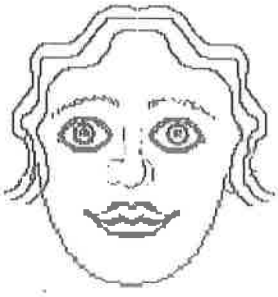
Absent (pp)

31. Freckles on Forehead:

Present (PP, Pp)



Absent (pp)



FACE LAB PART 2 – BODY LAB

Use the following to determine the traits of your babies body characteristics

32. Neck type:	Long (LL, Ll)		Short (ll)
	Thin (TT, Tt)		Fat (tt)
33. Shoulders:	Wide (WW)	Muscular (Ww)	Narrow (ww)
34. Arms:	Long (LL, Ll)		Short (ll)
	Fat (FF)	Muscular (Ff)	Skinny (ff)
35. Hands:	Long (LL)		Short (ll)
	Fat (FF, Ff)		Skinny (ff)
36. Fingers:	Long (LL)		Short (ll)
	Fat (FF, Ff)		Skinny (ff)
37. Trunk:	Long (LL)	Muscular (Ll)	Short (ll)
	Fat (FF)	Medium (Ff)	Skinny (ff)

Parent Names:

_____

_____

Baby's Name: _____

Create A Face Lab Data Sheet

Facial Trait	Genes from Mother	Genes from Father	Genotype	Phenotype
1. Face Shape				
2. Chin Shape				
3. Chin Shape II				
4. Cleft Chin				
5. Skin Color				
6. Hair Color				
7. Red Hair				
8. Hair Type				
9. Widow's Peak				
10. Eyebrow Color				
11. Eyebrow Thickness				
12. Eyebrow Placement				
13. Eye Color				
14. Eye Distance				
15. Eye Size				
16. Eye Shape				
17. Eye Tilt				
18. Eyelashes				
19. Mouth Size				
20. Lip Thickness				
21. Lip Protrusion				
22. Dimples				
23. Nose Size				
24. Nose Shape				
25. Nostril Shape				
26. Earlobe Attachment				
27. Darwin's Ear Point				
28. Ear Pits				
29. Hairy Ears				
30. Freckles on Cheeks				
31. Freckles on Forehead				

Create a Body Lab Data Sheet

Body Trait	Genes from Mother	Genes from Father	Genotype	Phenotype
32. Neck Type				
Length				
Girth				
33. Shoulders				
34. Arms				
Length				
Girth				
35. Hands				
Length				
Girth				
36. Fingers				
Length				
Girth				
37. Trunk				
Length				
Girth				
38 Legs				
Length				
Girth				
39. Feet				
Length				
Girth				
40. Toes				
Length				
Girth				
41. Polydactyly				

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35. Hands:	Long (LL)		Short (ll)
	Fat (FF, Ff)		Skinny (ff)
36. Fingers:	Long (LL)		Short (ll)
	Fat (FF, Ff)		Skinny (ff)
37. Trunk:	Long (LL)	Muscular (Ll)	Short (ll)
	Fat (FF)	Medium (Ff)	Skinny (ff)

38. Legs:	Long (LL, Ll)		Short (ll)
	Fat (FF)	Muscular (Ff)	Skinny (ff)
39. Feet:	Long (LL)		Short (ll)
	Fat (FF, Ff)		Skinny (ff)
40. Toes:	Long (LL)		Short (ll)
	Fat (FF, Ff)		Skinny (ff)

41. Polydactyly: Polydactyly is the condition of having 6 toes and 6 fingers. It is controlled by dominant genes. If your child has BOTH long/skinny fingers and toes you will flip for polydactyly. If both parents flip a PP (two heads) your child has the 6 finger and toes trait.

Analysis:
The traits in this activity were created to illustrate how human heredity works in a simple model. In real life, the heritance of facial features is much more complex and is determined by the way several sets of genes work together.

1. How much does each parent contribute to a child's genetic make-up?

Define the following terms IN YOUR OWN WORDS:

2. Genotype:

3. Phenotype:

4. Dominance:

5. Recessive:

6. Incomplete Dominance:

STAPLE YOUR CHILD'S PICTURE HERE