

VARIATIONS OF THE HUMAN FACE

OBJECT: to recognize the relationship between an individual's genotype and a phenotype by creating a hypothetical offspring's facial characteristics.

APPARATUS AND MATERIALS: - pencil crayons, coin (for tossing)

PROCEDURES:

Each "couple" will draw the face of their offspring in the following manner:

1. Determine the child's sex first. Since only the father determines the sex of the child, he will flip the coin: heads will be a boy; tails will be a girl. Record the child's sex on the data table provided.
2. Examine the chart handout carefully. The face to be drawn will be based on the traits shown here.
3. Determine the genotype and phenotype for face shape. Each parent will flip the coin to determine the type of gene contributed by his/her gamete.
 Heads - gamete contains the dominant allele *Capital*
 Tails - gamete contains the recessive allele *Lower Case*
4. Record the allele for face shape (R or r) contributed by each parent in the data table.
5. Repeat procedures 3 and 4 for the other traits listed on the chart.
6. Once you and your partner have determined all of the features for your child's face, draw in all of the structures for that child's face after it has reached high school age.
7. As a couple, you have both decided to have a second child. Repeat procedures 1-6 for this particular child.

QUESTIONS:

1. a) Which traits were controlled by two or more genes acting together?

- b) Which traits illustrated incomplete dominance?

2. a) Did your first child look exactly like your second child? Why?

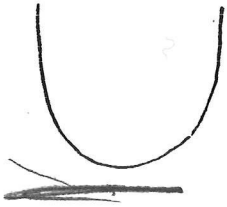
- b) Under what conditions would two offspring have the same genotype and phenotype?

	FIRST CHILD		SECOND CHILD	
	FATHER	MOTHER	FATHER	MOTHER
Sex Chromosome Contribution		X		X
Sex of Child				
Gene Contribution	FATHER	MOTHER	FATHER	MOTHER
Face Shape				
Chin Shape (1)				
Chin Shape (2)				
Cleft Chin				
Hair Body				
Widow's Peak				
Hair Colour				
Eye-Brows (1)				
Eye-Brows (2)				
Eyebrow Colour				
Eye Distance				
Eye Size				
Eye Shape				
Eye Lant				
Eye Colour				
Eye Lashes				
Mouth				
Mouth Size				
Mouth Shape				
Mouth Colour				
Mouth Lashes				
Mouth Size				
Mouth Shape				
Mouth Colour				

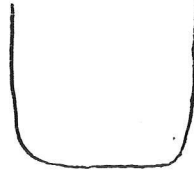
PHENOTYPE CHART

Face Shape:

Round (RR, Rr)

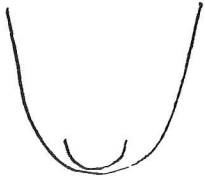


Square (rr)



Chin Shape (1):

Very prominent (VV, Vv)

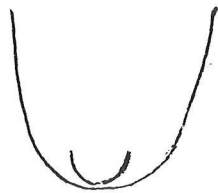


Less prominent (vv)

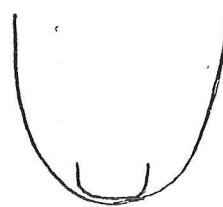


Chin Shape (2): - only flip coin if Chin Shape (1) is VV or Vv

round (RR, Rr)

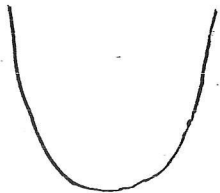


square (rr)

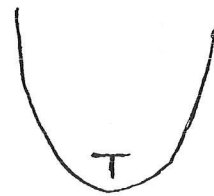


Cleft Chin:

absent (AA, Aa)



present (aa)



Hair Body:

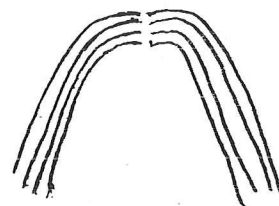
curly (CC)



wavy (Cc)



straight (cc)



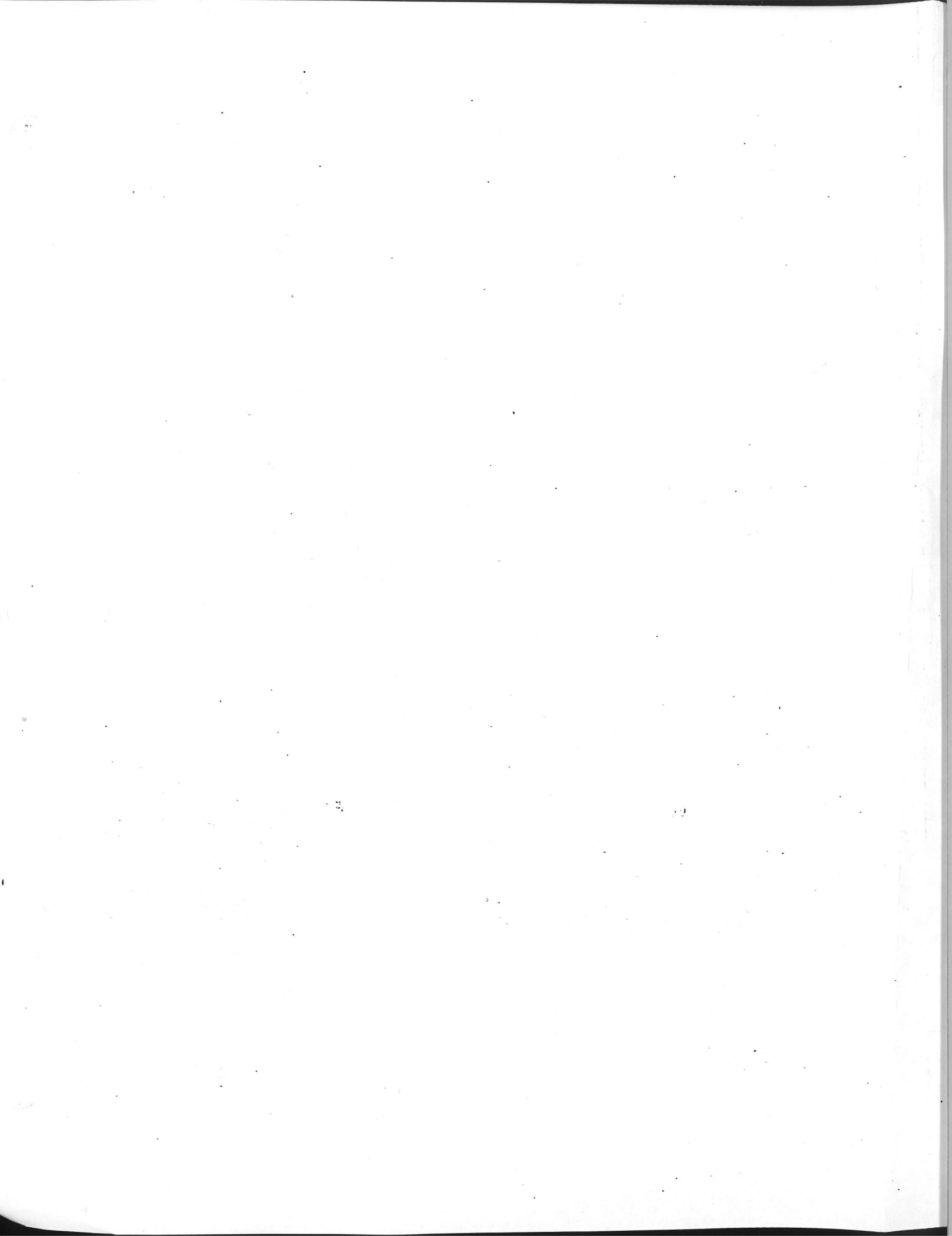
Widow's Peak:

present (WW, Ww)



absent (ww)





Eye Colour: - again, assume there are two gene pairs involved, one which codes for depositing the pigment in the front of the iris and another for the back of the iris. Follow these steps:

1. Flip your coin to determine the first pair of genes (AA, Aa, aa).
2. Flip your coin to determine the second pair of genes (BB, Bb, bb) and match your combination with the list below to determine the colour of your child's eyes.

AABB - intense brown
 AABb - intense brown
 AAbb - brown

aaBB - green
 Aabb - gray-blue
 AaBb - brown

aaBb - dark blue
 aabb - pale blue
 AaBB - brown with green flakes

Eyelashes:

long (LL, Ll)

short (ll)

Mouth Size:

long (MM)

average (Mm)

short (mm)



Lip Size:

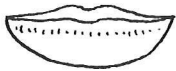
thick (LL, Ll)

thin (ll)

Hapsburg Lip: - narrow, lower jaw and protruding underlip protrudes (HH)

protrudes a bit (Hh)

absent (hh)



Dimples:

present (DD, Dd)

absent (dd)



Nose Size:

large (NN)

medium (Nn)

small (nn)

Ear Size

large (Ll)

medium (ll)

small (ll)

Earlobe:

free lobe (LL, Ll)

attached (ll)



Hair Colour: - assume there are two gene-pairs involved, and follow these steps:

1. Flip your coin to determine the first pair of genes (AA, Aa, aa).
2. Flip your coin to determine the second pair of genes (BB, Bb, bb) and match your combination with the list below to determine your child's hair colour.

AABB - black
 AABb - black
 AAbb - red

AaBB - brown
 Aabb - normal blonde
 AaBb - brown

aaBB - dark blonde
 aaBb - normal blonde
 aabb - light blonde

Eyebrows (1):

bushy (BB, Bb)

eww

fine (bb)



Eyebrows (2):

not connected (NN, Nn)

connected (nn)

eww



Eye Brow Colour:

darker than hair (HH)

same colour as hair (Hh)

lighter than hair (hh)

Eye Distance:

close together (EE)

average (Ee)

far apart (ee)



Eye Size:

large (EE)

medium (Ee)

small (ee)

Eye Shape:

almond/wide (AA, Aa)

round/narrow (aa)



Eye Slant:

horizontal (HH, Hh)

upward (hh)

