

Background Information

Why do people, even closely related people, look slightly different from each other? The reason for these differences in physical characteristics (called _____) is the different combination of genes possessed by each individual.

To illustrate the tremendous variety possible when you begin to combine genes, you and a classmate will establish the genotypes for a potential offspring. Your baby will receive a random combination of genes that each of you, as genetic parents, will contribute. Each normal human being has _____ chromosomes (23 pairs - **diploid**) in each body cell. In forming the _____ (egg or sperm), one of each chromosome pair will be given, so these cells have only 23 single chromosomes. (_____) In this way, you contribute half of the genetic information (genotype) for the child; your partner will contribute the other half.

BECAUSE WE DON'T KNOW YOUR REAL GENOTYPE, we'll assume that you and your partner are heterozygous for every facial trait. Which one of the two available alleles you contribute to your baby is random, like flipping a coin. In this lab, there are 36 gene pairs and 30 traits, but in reality there are thousands of different gene pairs, and so there are millions of possible gene combinations!

Procedures

*** Record all your work on each parent's data sheet.

FIRST, determine your baby's gender. Remember, this is determined entirely by the **father**. The **mother** always contributes an **X** chromosome to the child.

Heads = X chromosome, so the child is a GIRL.

Tails = Y chromosome, so the child is a BOY.

Fill in the results on your data sheet. Name the child. **THEN**, determine the child's facial characteristics by having each parent flip a coin.

Heads = child will inherit the dominant allele (i.e. B or N1) in a pair

Tails = child will inherit the recessive allele (i.e. b or N2) in a pair

On the data sheet, circle the allele that the parent will pass on to the child and write the child's genotype.

Using the information in this guide, look up and record the child's phenotype and draw that section of the face where indicated on the data sheet.

When the data sheet is completed, draw your child's portrait as he/she would look as a **teenager**. You must include the traits as determined by the coin tossing. Write your child's full name on the portrait.

Parents: _____ and _____
Child's gender _____ Child's name _____

Fill in the data table as you determine each trait (using the Guidebook). Do not simply flip the coin for all traits before reading the guide, because some traits have special instructions. Believe it or not, it will make your life easier if you follow directions! Draw your baby's FACE only.

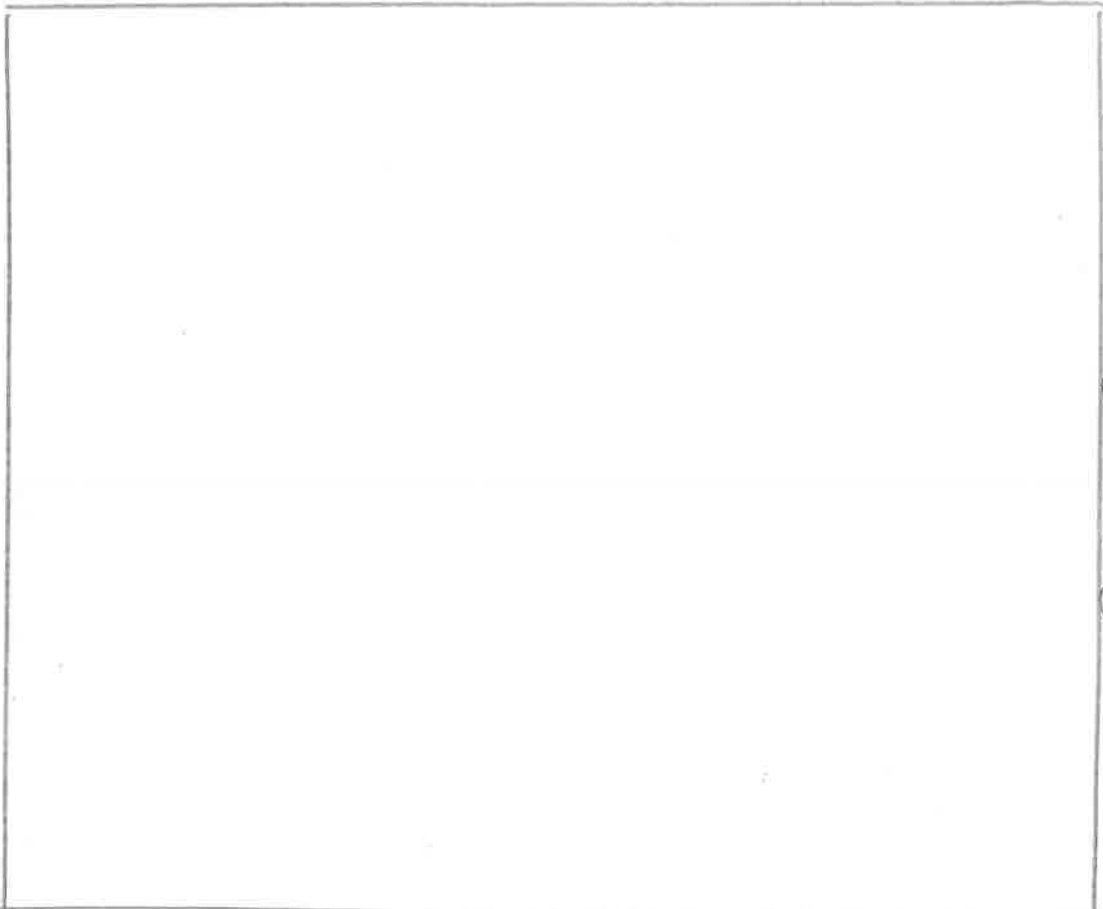
#	TRAIT	ALLELE FROM MOM	ALLELE FROM DAD	CHILD'S GENOTYPE	CHILD'S PHENOTYPE (written)	CHILD'S PHENOTYPE (draw)
1	Eye Shape	A a	A a			Get & Chn
2	Chin Shape	B b	B b			
3	Chin Shape	C c	C c			
4	Chin Shape	D d	D d			
5	Blk Color	E e F f G g	E e F f G g			
6	Hair Color	H h I i J j K k	H h I i J j K k			
7	Hair Type	L1 L2	L1 L2			hair
8	Hair Type	M1 M2	M1 M2			
9	Nose/ Peak	O o	O o			
10	Eye Color	P p Q q	P p Q q			eye & eye lashes
11	Eye Distance	R1 R2	R1 R2			
12	Eye Size	S1 S2	S1 S2			
13	Eye Shape	T t	T t			
14	Eye Shape	U u	U u			
15	Eye Lashes	V v	V v			

#	TRAIT	ALLELE FROM MOM	ALLELE FROM DAD	CHILD'S GENOTYPE	CHILD'S PHENOTYPE (traits)	CHILD'S PHENOTYPE (draw)
16	Eye color	V ₁ V ₂	V ₁ V ₂			eye color
17	Eye color Thickness	Z z	Z z			
18	Eye color Length	A a	A a			
19	Mouth Size	B ₁ B ₂	B ₁ B ₂			mouth
20	Lip Thickness	C c	C c			
21	Dimples	D d	D d			
22	Nose Size	E ₁ E ₂	E ₁ E ₂			nose
23	Nose Shape	F f	F f			
24	Nose/Slap	G g	G g			
25	Earlobe Attached?	H h	H h			ear
26	Darwin's Earlobe	I i	I i			
27	Ear Pits	J j	J j			
28	Baby Ears	K k	K k			
29	Cheek Freckles	L l	L l			
30	Forehead Freckles	M m	M m			

Questions: (answer in complete sentences)

1. What percentage does each parent contribute to a child's genotype? Explain HOW....
2. What part of the procedure represents fertilization? Why do you think that?
3. Which traits were Polygenic? How do you know?
4. Explain why there were no identical twins produced... (hint: talk about Mendel's laws!)

DRAW FACE HERE: • draw • color • details • BIG!



Child's name: _____