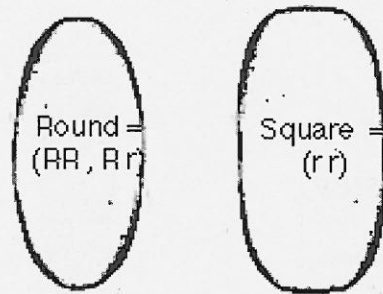
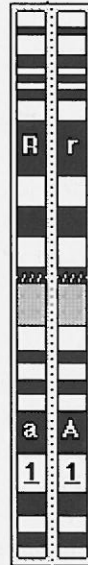


Face and Chin Determination



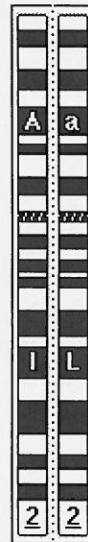
#1 Face Shape

Chromosome #1 contains the genetic information in a gene we will call "R". This information determines the general shape of the face. Place your baby's genotype for face shape in the data table.

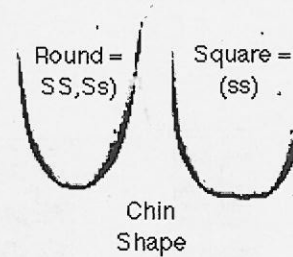


#2 Chin Shape

Chromosome #2 contains the chin shape gene "L." The genotype "ll" prevents the expression of the next two pairs of genes. Place your baby's genotype for chin shape in the data table. The control of one set of genes by another is called *epistasis*. If you landed the genotype "ll" then skip the next two and start on Skin Color.



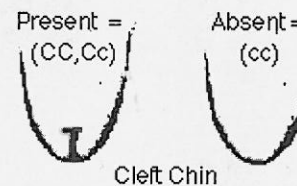
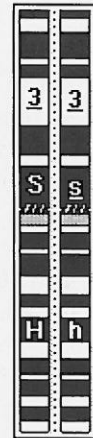
Chin Shape Determination



Chromosome #3 contains the "S" gene. This gene controls the shape of the chin, round or square. These genes are activated only if the dominant "L" on chromosome #2 is present.

Place your baby's genotype for chin shape in the data table.

The control of one set of genes by another is called *epistasis*.

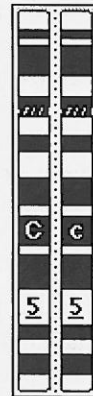


Chromosome #5 carries the "C" gene. The "C" gene controls the development of the cleft chin phenotype.

Remember these "C" genes are activated only if the dominant "L" on chromosome #2 is present.

Place your baby's genotype for chin shape in the data table.

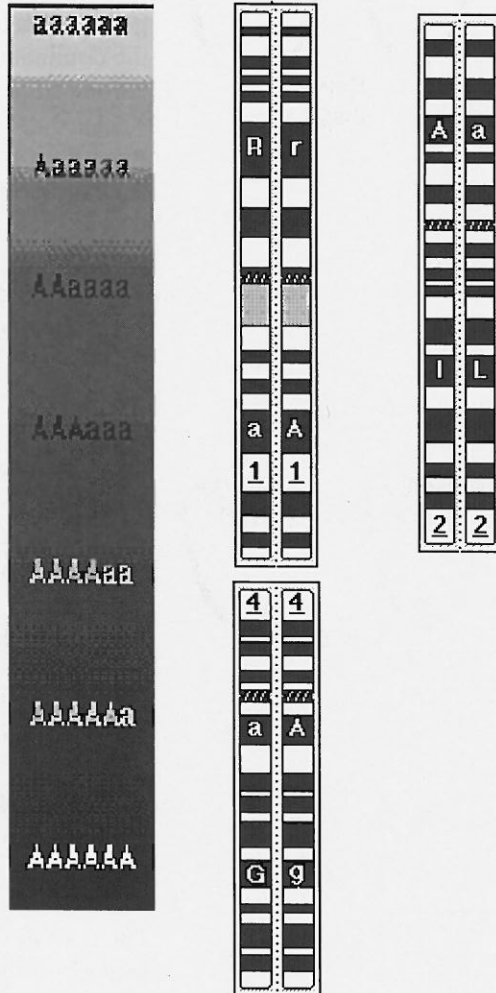
The control of one set of genes by another is called *epistasis*.



Skin Color Determination

Skin color is determined by three sets of genes on chromosomes #'s 1, 2, and 4. Since this trait is determined by several genes, it is known as *polygenic inheritance*. The dominant genetic code, gene "A" translates into a protein called melanin. This dark pigment is like a natural UV blocker. The greater the number of dominant genes one has, the greater the amount of melanin, the darker the skin, and the more UV protection a person has. These genes have been selected-for near the Earth's equator where the intense UV photons can cause a great deal of damage to lighter skin.

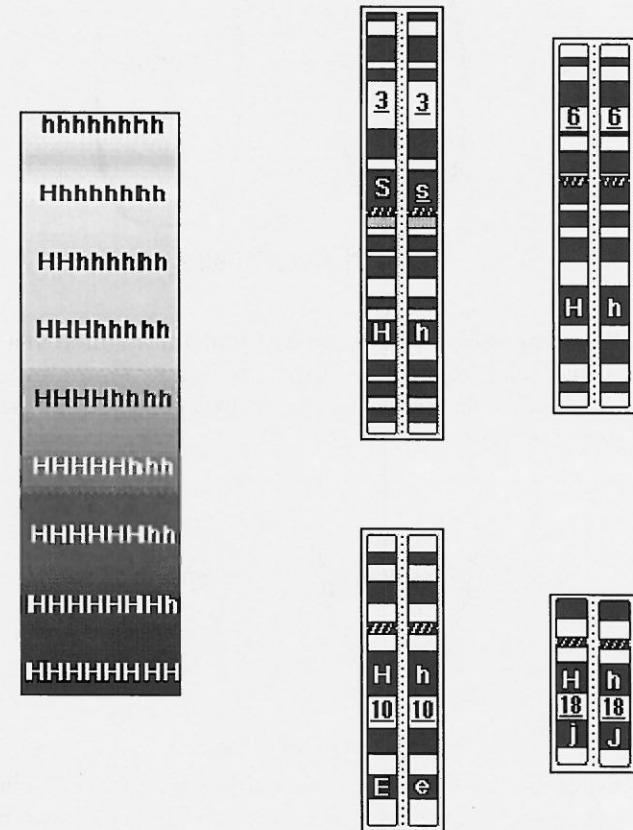
Count up the number of dominant and recessive genes and place your baby's genotype for skin color in the data table.



Hair Color Determination

The hair color gene, like skin color, is *polygenic*. The same genetic code is found on chromosome #'s 3, 6, 10 and 18. This code translates into pigment which is incorporated into the hair as it is growing. The greater the number of dominant alleles, the darker the hair. Hair color varies from black to white.

Count up the number of dominant and recessive genes and place your baby's genotype for hair color in the data table.



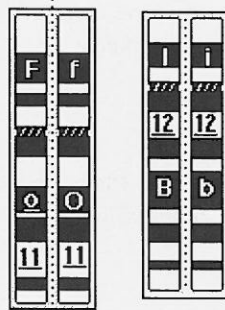
Eye Color Determination

Chromosomes #'s
11 and 12 contain
Eye Color Genes:
Darker eyes are
produced in the
presence of more
active alleles. In this
situation, the
Capital letters (F or
B) represent alleles
which are active in
depositing dark
pigment. Lower
case letters (f or b)
represent alleles
which deposit little
pigment. To
determine the color
of the eyes, assume
there are two gene
pairs involved, one
of which codes for
depositing pigment
in the front of the
iris, and the other
codes for depositing
pigment in the back
of the iris.

Determine the
genotype of the first
pair (FF,Ff,ff). and
then the second
(BB,Bb,bb). If your
genotype is in the
first column then
check your eye
color in the second
column.

Column #1	Column #2
Genotypes	Protein Phenotypes
FFBB	Dark brown
FFBb	Brown
FFbb	Brown
FfBB	Brown
FfBb	Dark Blue
Ffbb	Dark Blue
ffBB	Light Blue
ffBb	Light Blue
ffbb	Pale blue

Place your baby's genotype for
eye color in the data table.

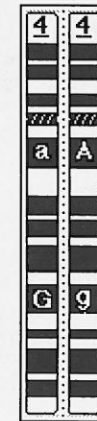


Red Hair Determination

Red Hair: Red hair is another
gene for hair color present on a
different chromosome. It blends
its effect with other hair colors.
Redness of the hair seems to be
caused by a single gene pair with
two alleles, red (G) or no red (g),
and displays incomplete
dominance. Thus, if a person has
two genes for red (GG), the hair
will be a more intense red than if
they have a single gene (Gg). If a
person has no genes for red (gg),
then the hair does not show as
red at all. Red hair is
complicated by the fact that dark
pigment, controlled by the many
hair color genes, may mask or
hide the red color. The darker the
brown, the less the red shows
through, although more shows
with (GG) than with (Gg). As the
hair becomes lighter in color,
more red shows through. If your
child is blond as evidenced by 3
Capitals or less above and (GG)
lands facing up, then your child
will probably have flaming red
hair. Auburn might be (Gg) with
the lighter shades of
pigmentation.



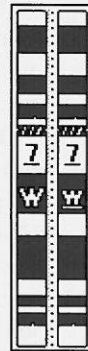
GG = Heavy Red Pigment
Gg = Medium Red Pigment
gg = No Red Pigment



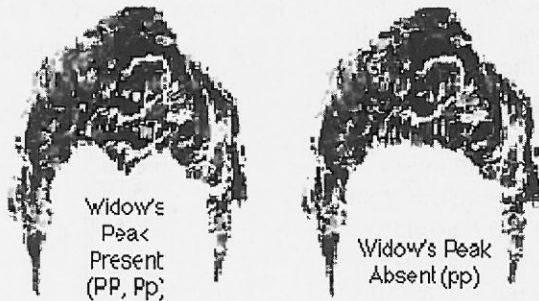
Hair Type Determination



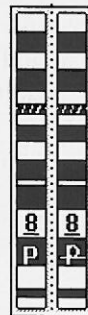
Chromosome #7 contains the genetic code for hair type. The "W" hair-making DNA codes for amino acids which contain a sulfur atom which causes cross links between amino acids in the hair..... thus curly hair! Straight hair lacks the many sulfur amino acids and does not make as many cross links.



Place your baby's genotype for hair type in the data table.



Chromosome #8 contains the genetic code for Widow's Peak. If your baby has a dominant "P" then he or she will possess that trait. (Notice that there is a line through the recessive small "p" on the paper chromosome.)



Place your baby's genotype for Widow's Peak in the data table.

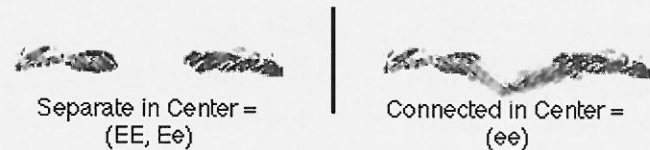
Eyebrow Shape Determination



Chromosome #9 carries a gene for eyebrow thickness called "T". It works with complete dominance.



Place your baby's genotype for eyebrows in the data table.

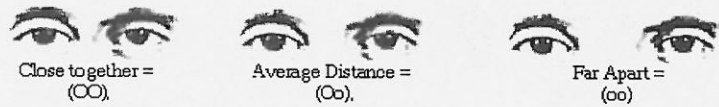


Chromosome #10 has the gene for eyebrow placement. "E" separates and lack of "E" causes connected eyebrows.



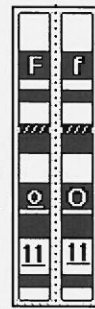
Place your baby's genotype for eyebrow placement in the data table.

Eye Spacing & Measurement Determination



Chromosome #11 has the gene for eye placement. The dominant gene places the eyes close together, the recessive, far apart.

Place your "baby's" genotype for eye placement in the data table.



Chromosome #12, beside carrying one of the pigment genes for eye color, also carries the gene "I" for eye size.

Place your "baby's" genotype for eye size in the data table.

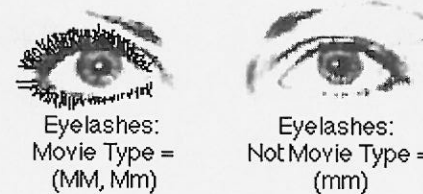
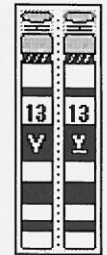


Eye Shape and Lash Determination



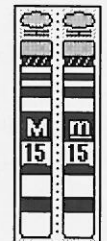
Chromosome #13 has the eye shape gene "V." Dominant genes code for almond shape and homozygous recessive is round.

Place your baby's genotype for eye shape in the data table.

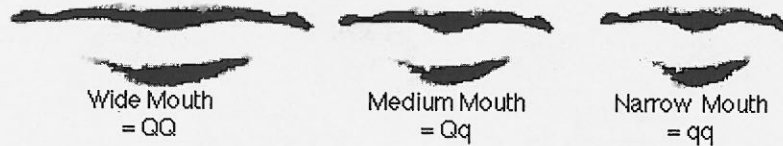


Movie star eyelashes are found on chromosome #15. Dominant "M" genes place your kid on the way to stardom!

Place your baby's genotype for eyelashes in the data table.

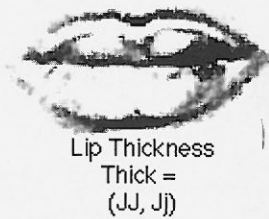
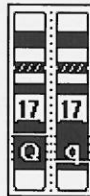


Mouth Size & Shape Determination



Chromosome #17's "Q" gene controls the width of the mouth. The dominant gene imparts width.

Place your baby's genotype for mouth width in the data table.

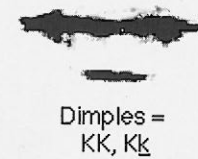
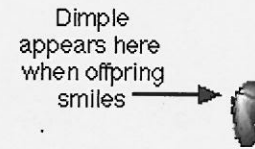


Chromosome #18's gene "J" adjusts the thickness of the lips.

Place your baby's genotype for fullness of lips in the data table.



Dimples and Nose Determination



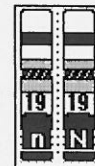
Chromosome #16 contains genetic information regarding the construction of dimples.

Place your baby's genotype for dimples in the data table.



Chromosome #19 contains genetic information regarding the construction of nose size

Place your baby's genotype for nose size in the data table.



Nose and Ear Shape Determination



Nose Shape
Rounded =
(UU, Uu)



Nose Shape
Pointed =
(uu)



Your baby's nose shape is determined by a gene on chromosome #14. The allele "U" imparts a rounded shape to the nose.

Place your baby's genotype for nose shape in the data table



Lobed
Ears = ZZ, Zz



Attached
Ears = zz

Chromosome #22 carries the gene for free ears. The gene "Z" causes the earlobe to hang free at the side of the head.

Place your baby's genotype for earlobe attachment in the data table.



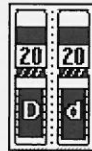
Hairy Ears
Present =
(DD, Dd)



Hairy Ears
Absent =
(dd)

Chromosome #20 contains DNA information encoded in a gene called "D". This information, if in its dominant form, causes the ear to grow a large amount of fuzzy hair.

Place your baby's genotype for hairy ears in the data table.



Freckle Determination



Freckles on
Cheeks =
\$\$, \$\$



No Freckles on
Cheeks = \$\$

Chromosome #21 contains a gene, "\$" which causes uneven pigment to form in the cheek region. If "\$" is present then your child will have cheek freckles.

Place your baby's genotype for freckles in the data table.



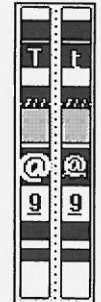
Freckles on
forehead =
@@, @@



Freckles absent
= @@

Finally on chromosome #9 there is data in the form of a gene "@". If your baby has "@" there will be freckles on the forehead! ("@@" underlined, represent the recessive genes)

Place your baby's genotype for freckles in the data table.



Let's Make a Face: Traits Chart

Trait	Genotype/Phenotype						
Gender	Female XX		Male XY				
Face Shape	Round RR	Round Rr	Square rr				
Chin Shape	Very Prominent LL	Very Prom. Ll	Not Prom. ll				
Chin Shape If LL or Ll only	Round SS	Round Ss	Square ss				
Cleft Chin If LL or Ll only	Cleft CC	Cleft Cc	No Cleft cc				
Skin Color Polygenic	Very, Very Dark Brown AAA AAA	Very Dark Brown AAA AA/a	Dark Brown AAA A/aa	Med. Brown AAA /aaa	Light Brown AA /aaaa	Light Light Brown A/a aaaa	Very Very Light Brown aaa aaa
Hair Color Polygenic	Black Dark HHHH HHHH	Very Brown HHHH HHH/h	Dark Brown HHHH HH/hh	Brown HHHH H/hhh	Light HHHH hhhh	Honey HHHH/HHH/h hhhh	Blond HH/h hhhhh
	Very Light Blond H/hh hhhhh	VERY light! Platinum hhhh hhhh					
Nose Size	Big NN	Average Nn	Small nn				
Nose Shape	Rounded Uu, Uu	Pointed uu					

Eye Color	Dark Brown FFBB	Brown FFBb	Brown FFbb	Brown FfBB	Dark Blue FfBb	Dark Blue Ffbb	Light Blue ffBB
	Light Blue FfBb		Pale Blue ffbb				
Red Hair	Red Pigment GG	Less Red Pigment Gg		No Red Pigment gg			
Hair Type	Curly WW	Wavy Ww		Straight ww			
Widow's Peak	Present PP	Present Pp		Absent pp			
Eyebrow Thickness	Thick TT		Thick Tt	Thin tt			
Eyebrow Placement	Apart EE	Apart Ee	Touching in Middle ee				
Eye Distance	Close OO	Less Close Oo	Far Apart oo				
Eye Size	Large II	Medium Ii	Small ii				
Eye Shape	Almond VV	Almond Vv	Round vv				
Eyelashes	Movie Type MM, Mm		Not movie type mm				
Mouth Shape	Wide QQ	Medium Qq	Narrow qq				
Lip Thickness	Thick JJ, Jj		Thin jj				
Dimples	Present KK, Kk		Absent kk				

Earlobe Type Lobed Attached
 ZZ, Zz zz

Ear Hair Present Absent
 DD, Dd dd

Freckles (cheek) Present Absent
 \$\$, \$\$ \$\$

Freckles (forehead) Present Absent
 @@, @@ @@

Record the genotype and phenotype of your child here:

TRAIT	GENOTYPE	PHENOTYPE
Face Shape		
Chin Shape (prominence)		
Chin Shape (roundness)		
Cleft Chin		
Skin Color		
Hair Color		
Eye Color		
Red Hair		
Hair Type		
Widow's Peak		
Eyebrow Shape		
Eyebrow Placement		
Eye Spacing		
Eye Size		
Eye Shape		
Eyelash Type		
Mouth Shape		
Lip Thickness		
Dimples		
Nose Size		
Nose Shape		
Earlobe Type		
Ear Hair		
Cheek Freckles		
Forehead Freckles		