

Beaker Babies

Purpose:	To introduce the basic mechanisms by which genetic traits are inherited.
Technique:	Role play. Students will be “parents” with specific phenotypes and genotypes. The offspring will inherit traits carried by each parent.
Materials:	2 beakers, scissors, pen, masking tape

Definitions:

<i>Phenotype:</i>	All of your physical traits (i.e. what you look like).
<i>Genotype:</i>	All of the genes in your DNA that determine your phenotype.
<i>Gene:</i>	Short stretch of DNA that determines one particular trait.
<i>Allele:</i>	Specific version of a gene. You generally have two versions of each gene (one from your mother and one from your father).
<i>Chromosome:</i>	Long stretch of DNA that has genes. Humans have 46 chromosomes.

Marking Key:

Your final assignment should have the following parts and will be marked according to the accompanying criteria.

Item	Value
Complete Table 1 (One copy from each partner) (2 each)	4 marks
Complete Table 3	3 marks
Drawing of your child <ul style="list-style-type: none"> all 12 traits present and accurate (12) neatness(2) creativity (2) artistic style (2) 	18 marks
Total For Assignment	25 marks

Procedure:

Get together with your "spouse" at your lab station.

Note: There should be one 'male' and one 'female' for each pair. If you are in a group with two females or two males, decide on one person to play to the opposite gender.

Beakers:	use the masking tape and a pen to label the beakers at your lab station as MALE and FEMALE .
Table 1 (Your Phenotype and Genotype):	<ol style="list-style-type: none"> determine your personal phenotype by circling the appropriate square for each trait. record the genotype that you circled (letters in the square) in the last column.
Table 2 (Your Chromosomes):	<ol style="list-style-type: none"> record your genotype in the chromosome columns (one letter per box). cut along the dashed lines to produce your alleles. Place your alleles into the appropriate beaker (MALE for male parent and FEMALE for female parent).
Beakers:	shake the beakers to mix the alleles. Randomly draw alleles from the MALE beaker.
Table 3 (Your Child):	<ol style="list-style-type: none"> record the alleles drawn from the MALE beaker in appropriate column. <i>If you draw a repeat allele (letter), record the first allele drawn for that trait.</i> Repeat with the alleles from the FEMALE beaker.
Figure 1 (Your Child):	draw a detailed and coloured picture of your offspring. This drawing should be based on the traits from Table 3 (Your Child) . Use arrows to label all 12 traits of your offspring. Neatness counts.

Your final assignment should have the following parts and will be marked according to the accompanying criteria.

Item	Value
Complete Table 1 (One copy from each partner) (2 each)	4 marks
Complete Table 3	3 marks
Drawing of your child <ul style="list-style-type: none"> all 12 traits present and accurate (12) neatness(2) creativity (2) artistic style (2) 	18 marks
Total For Assignment	25 marks

Table 1. Your Phenotype and Genotype

Circle your own personal phenotype and genotype on the chart below. Write the alleles (genotype) in the last column.

Example: if you are female, circle XX = female and write XX in the last column.

Trait	Homozygous Dominant	Heterozygous	Homozygous Recessive	Your Genotype (case sensitive)
(X) Sex	XX female	XY male		
(B) Hair color	BB black	Bb brown/red	bb blond	
(C) Hair curl	CC curly	Cc wavy	cc straight	
(D) Dimples	DD present		dd absent	
(E) Eye color	EE brownish	Ee greenish	ee blue	
(F) Earlobes	FF free		ff attached	
(H) Finger hair	HH hair on mid-section		hh no hair on mid-section	
(L) Toe length	LL longer 2 nd toe		ll shorter 2 nd toe	
(N) Nose	NN convex		nn straight or concave	
(P) Hair line	PP widow's peak		pp straight	
(R) Tongue roll	RR roller		rr non-roller	
(T) Thumb	TT bent back		tt straight	

Table 2. Your Alleles

Trait	Genotype*	
	Chromosome 1	Chromosome 2
(X) Sex		
(B) Hair color		
(C) Hair curl		
(D) Dimples		
(E) Eye color		
(F) Earlobes		
(H) Finger hair		
(L) Toe length		
(N) Nose		
(P) Hair line		
(R) Tongue roll		
(T) Thumb		

*After you have completed the Genotype columns, cut along the dashed lines

Table 3. Your Child

Trait	Genotype		Phenotype
	Male Beaker	Female Beaker	
(X) Sex			
(B) Hair color			
(C) Hair curl			
(D) Dimples			
(E) Eye color			
(F) Earlobes			
(H) Finger hair			
(L) Toe length			
(N) Nose			
(P) Hair line			
(R) Tongue roll			
(T) Thumb			

Figure 1. Your Child.

