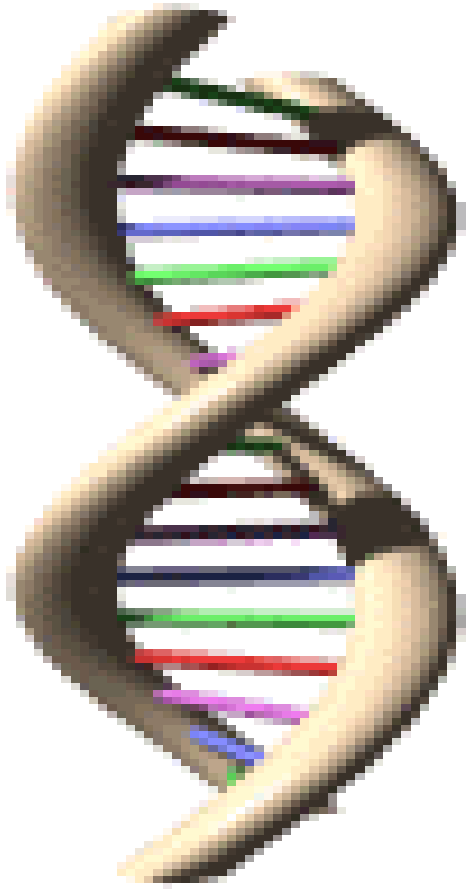
GENETICS CHP 8:



GENETICS

- FIELD OF BIOLOGY THAT TRIES TO UNDERSTAND HOW CHARATERISTICS ARE TRANSMITTED FROM PARENTS TO OFFSPRING

GREGOR MENDEL:

- FATHER OF GENETICS
- 1822-1884
- WORKED WITH GARDEN PEAS

HEREDITY:

- TRANSMISSION OF CHARACTERISTICS FROM PARENTS TO OFFSPRING

TRAIT:

- CONTRASTING OR ALTERNATING EFFECT OR RESULT
- *****A PAIR OF FACTORS CONTROLS EACH TRAIT FOUND ON THE **DNA**
- HEIGHT-SHORT VS. TALL
- EYE COLOR-BLUE VS. BROWN
- ROLLED TONGUE
- DETACHED EAR LOBES

DOMINANT TRAITS:

- A FACTOR THAT MASKS OR DOMINATES THE OTHER FACTER FOR A SPECIFIC CHARACTERISTIC
- ALWAYS SHOWN AS AN UPPER CASE LETTER (AA) (Aa)
- DOMINANT LETTER IS **ALWAYS** WRITTEN FIRST

RECESSIVE TRAIT:

- IS NOT SHOWN, HIDDEN-WILL ONLY BE SEEN OR OBSERVED WHEN TWO RECESSIVE TRAITS PAIR UP
- ALWAYS SHOWN AS A LOWER CASE LETTER (aa)

GENE:

- SEGMENT OF DNA ON A CHROMOSOME THAT CONTROLS A HEREDITARY TRAIT
- OCCURS IN PAIRS-**LETTERING**
- AN ORGANISM INHERITS 2 GENES, ONE FORM EACH PARENT FOR EVERY CHARACTERISTIC

ALLELE:

- ALTERNATE FORM OF A GENE OR TRAIT
- WHEN GAMETES FORM-ALLELES OF EACH TRAIT SEPARATE FROM ONE ANOTHER
- A SPERM OR EGG CARRIES ONLY ONE ALLELE FOR EACH INHERITED TRAIT

GENOTYPE:

- GENETIC MAKEUP OF AN ORGANISM AA OR Aa XX OR xx
- MADE UP OF ALLELES THAT IT INHERITS FROM ITS PARENTS

PHENOTYPE:

- PHYSICAL APPEARANCE OF AN ORGANISM- PURPLE FLOWERS VS. WHITE FLOWERS OR BROWN HAIR VS. BLACK HAIR

HOMOZYGOUS:

- WHEN BOTH ALLELES OR A PAIR ARE ALIKE-PP
  - HOMOZYGOUS DOMINANT-XX
  - HOMOZYGOUS RECESSIVE-xx

HETEROZYGOUS:

- WHEN THE TWO ALLELES IN A PAIR ARE DIFFERENT-Pp OR Xx

P1 GENERATION:

- PARENT ORGANISM-TRUE BREEDING PARENTS

F1 GENERATION:

- FIRST OFFSPRING GENERATION

F2 GENERATION:

- SECOND OFFSPRING GENERATION

PUNNETT SQUARE:

- WAYS TO DETERMINE INHERITED TRAITS
- IS A SQUARE USED TO SHOW ALL THE POSSIBLE COMBINATIONS OF GAMETES

A BLUE-EYED MOTHER MATES WITH A HOMOZYGOUS, BROWN-EYED FATHER. WHAT IS THE RATIO OF EYE COLORS?

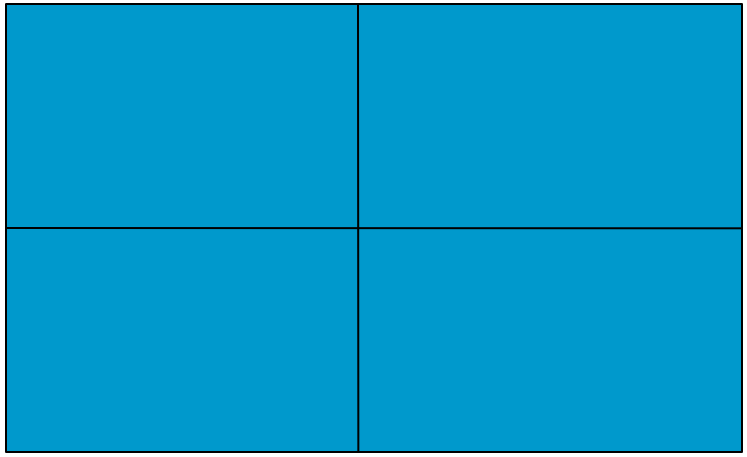
MONO HYBRID CROSS:

B-BROWN EYES b-BLUE EYES

B B

b

b

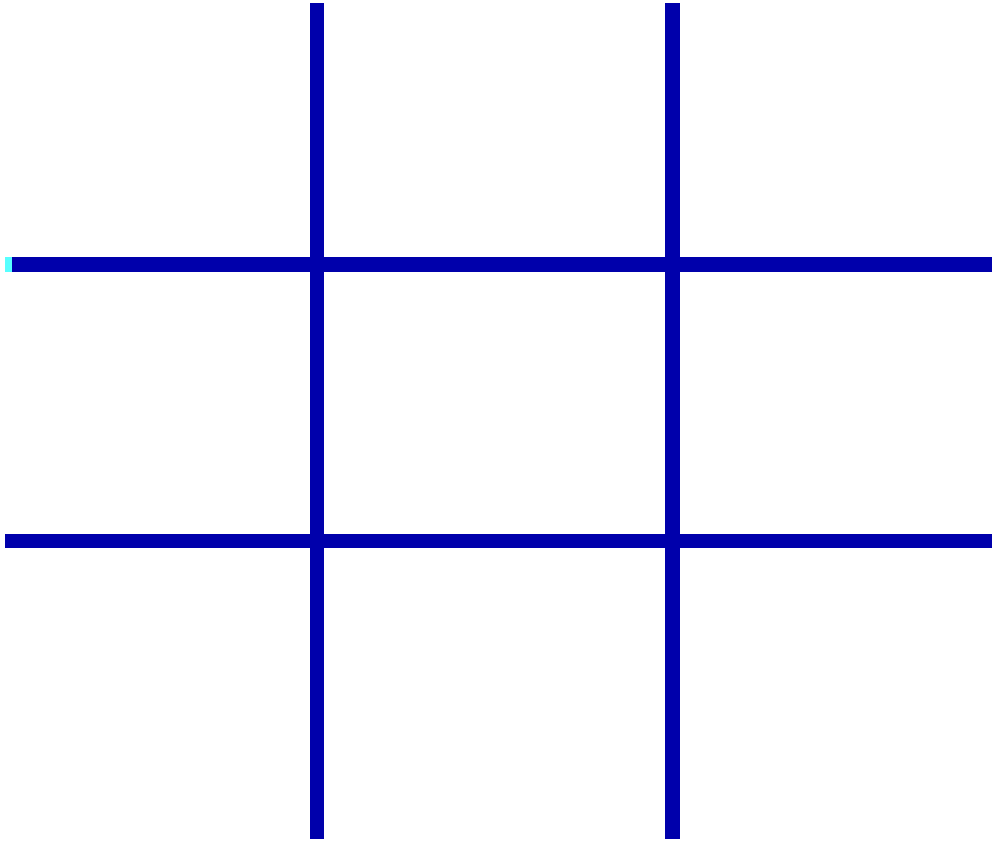


ALL EYES WOULD BE BROWN EYES

	B	B
b	Bb	Bb
b	Bb	Bb

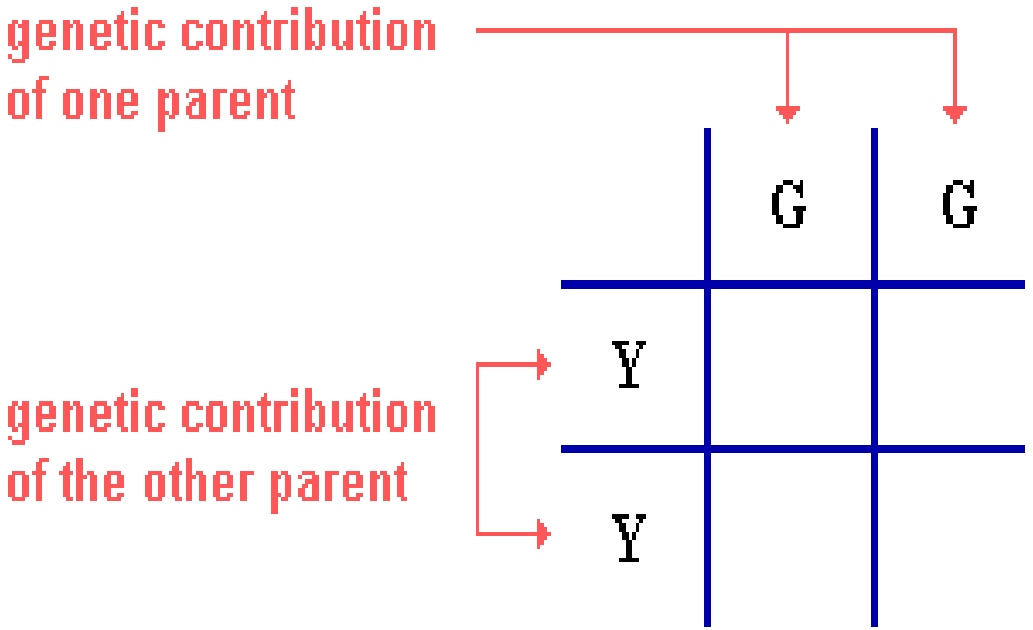
ANOTHER WAY OR MAKING A PUNNETT SQUARE

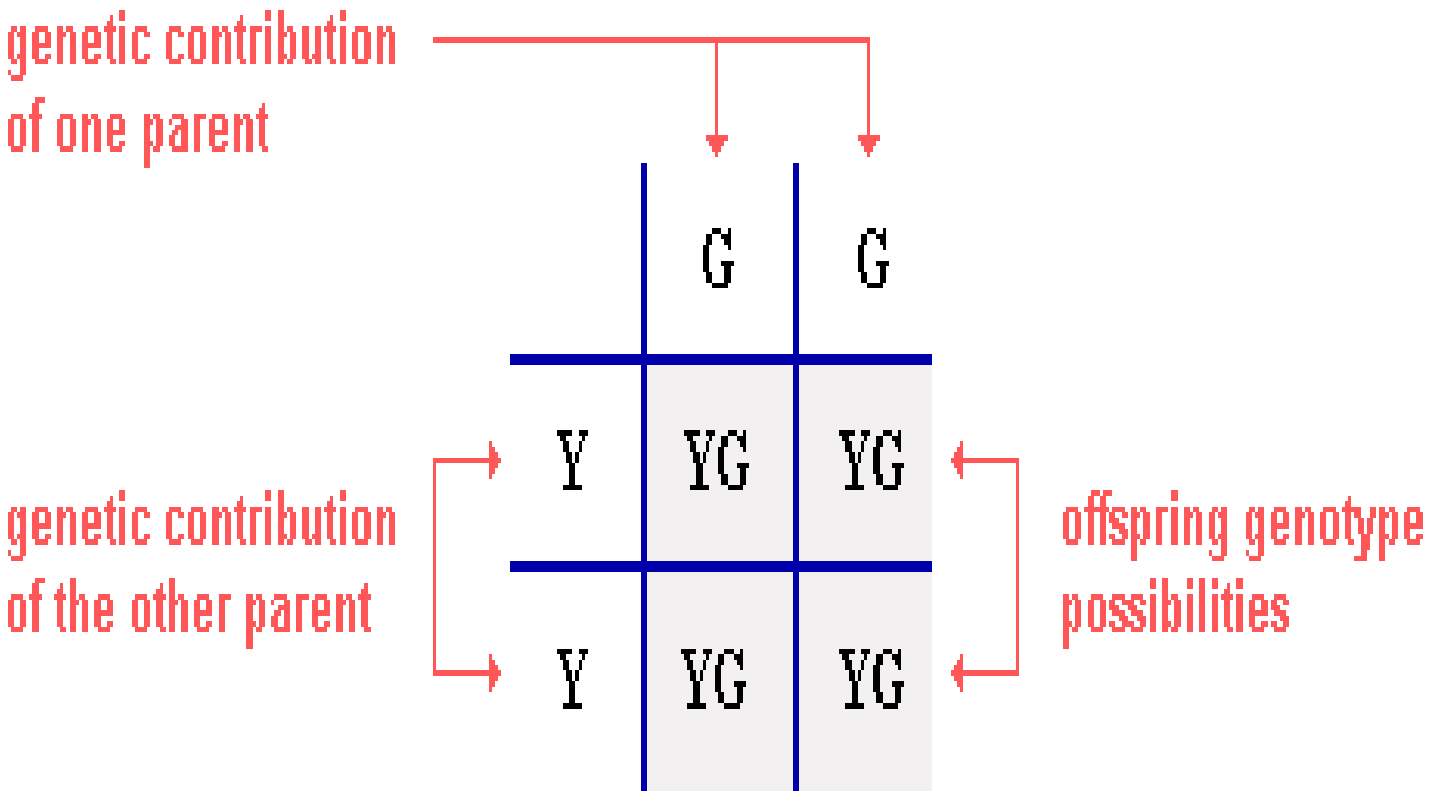
CRISS-CROSS METHOD



G-GREEN COLOR OF A PEA AND DOMINANT

y-YELLOW COLOR OF A PEA AND RECESSIVE





*****ALL WOULD BE GREEN IN COLOR

BOTH PARENTS ARE HETEROZYGOUS

	Y	G
Y	YY	YG
G	YG	GG

RATIO: 3 GREEN AND 1 YELLOW

CYSTIC FIBROSIS: GENETIC DISORDER WITH A BEING NORMAL AND a ABNORMAL

	A	a
A	AA	Aa
a	Aa	aa

RATIO: 3 NORMAL 1 ABNORMAL

*****2 ARE CARRIERS

CROSS OF HETEROZYGOUS DOMINANT WITH HOMOZYGOUS RECESSIVE

	A	a
a	Aa	aa
a	Aa	aa

INCOMPLETE DOMINANCE:

- PHENOTYPE OF THE OFFSPRING IS MIXED BETWEEN PARENTS
- R-RED r-White

THEREFORE RR-RED

Rr-PINK

rr-WHITE

CODOMINACE:

- BOTH ALLELES ARE EXPRESSED IN THE OFFSPRING
- THE ALLELES ARE NOT DOMINANT, RECESSIVE OR DO NOT BLEND-BOTH ALLELES ARE EXPRESSED IN THE PHENOTYPE
- RED AND WHITE HAIR MIXED ON A HORSE OR DOG
- RR-RED rr-WHITE GIVES Rr-BOTH RED AND WHITE HAIR IS SHOWN