



MONO-HYBRID CROSS

GAMETE ALLELE
FORMATION

MONO-HYBRID CROSS




P1 = BB x bb



PUNNETT SQUARE



 = **GAMETE**

MONO-HYBRID CROSS

B
B



P1 = BB x bb

BB – MEIOSIS →

?



PUNNETT SQUARE

?

?





= GAMETE

MONO-HYBRID CROSS

^

?

P1 =  BB x  bb

BB – MEIOSIS → B



PUNNETT SQUARE

B

B



= GAMETE

MONO-HYBRID CROSS



P1 = **BB** x **bb**

?

?

PUNNETT SQUARE

B

B

= **GAMETE**

MONO-HYBRID CROSS

b
b



P1 = **BB** x **bb**

bb – MEIOSIS →

?

?

?

PUNNETT SQUARE

B

B

--

= **GAMETE**

MONO-HYBRID CROSS



P1 = **BB** x **bb**

bb – MEIOSIS →

b

b

b

PUNNETT SQUARE

B

B

= GAMETE

MONO-HYBRID CROSS

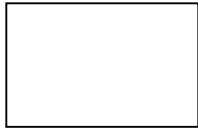


P1 = BB x bb

b

b

B



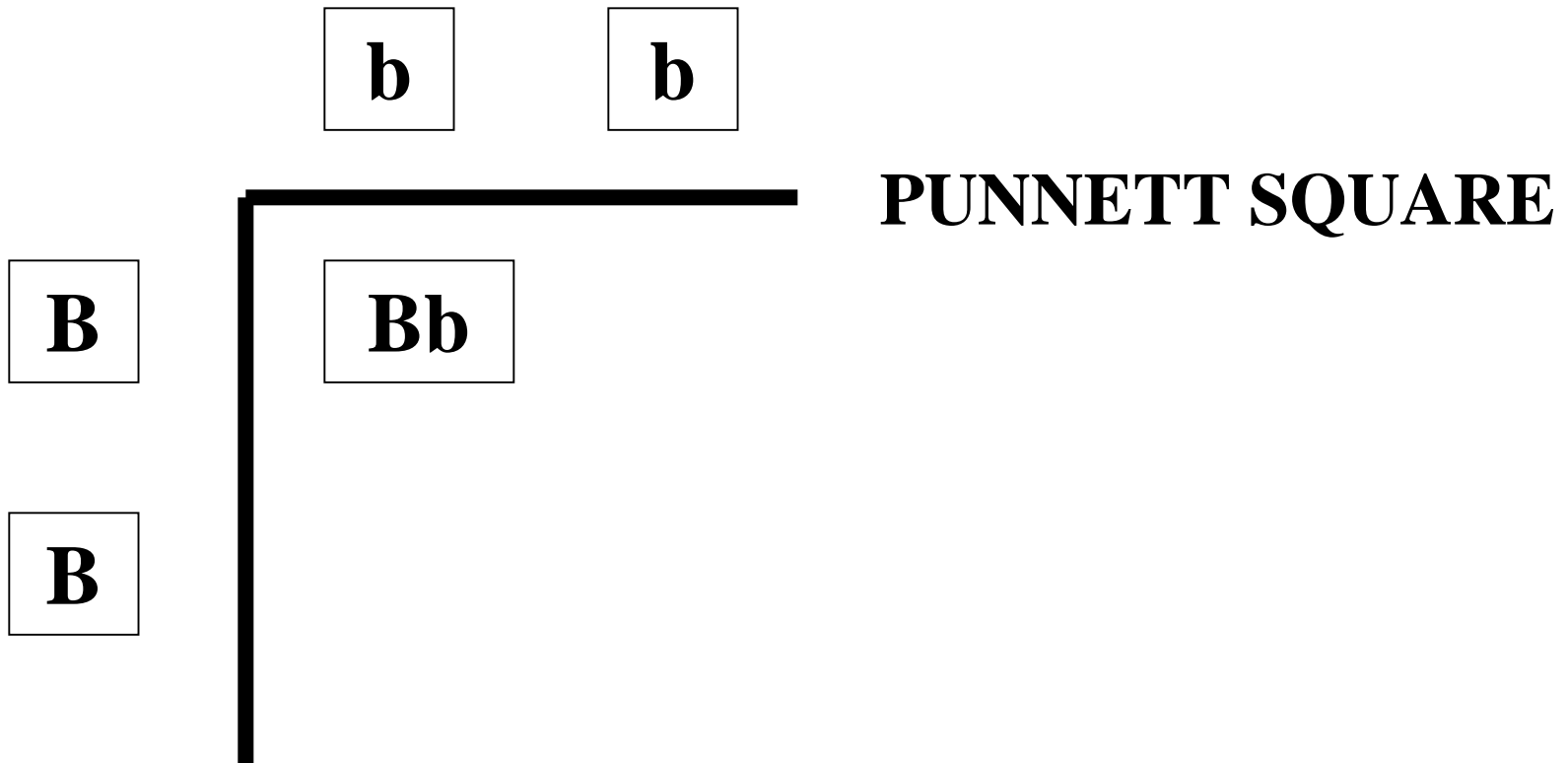
B

PUNNETT SQUARE

MONO-HYBRID CROSS



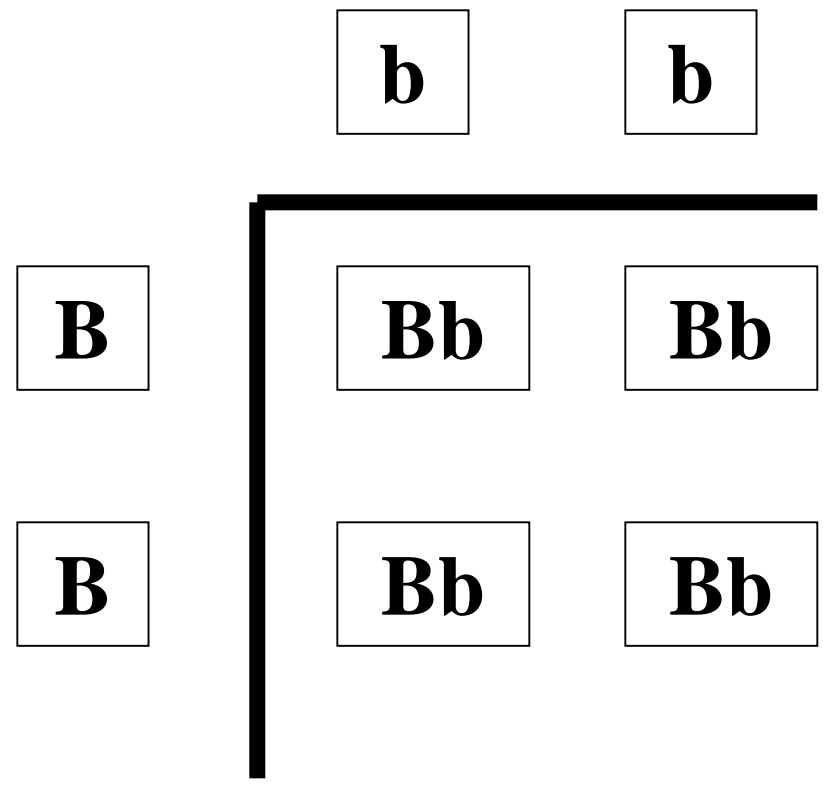
P1 = **BB** x **bb**



MONO-HYBRID CROSS



P1 = **BB** x **bb**

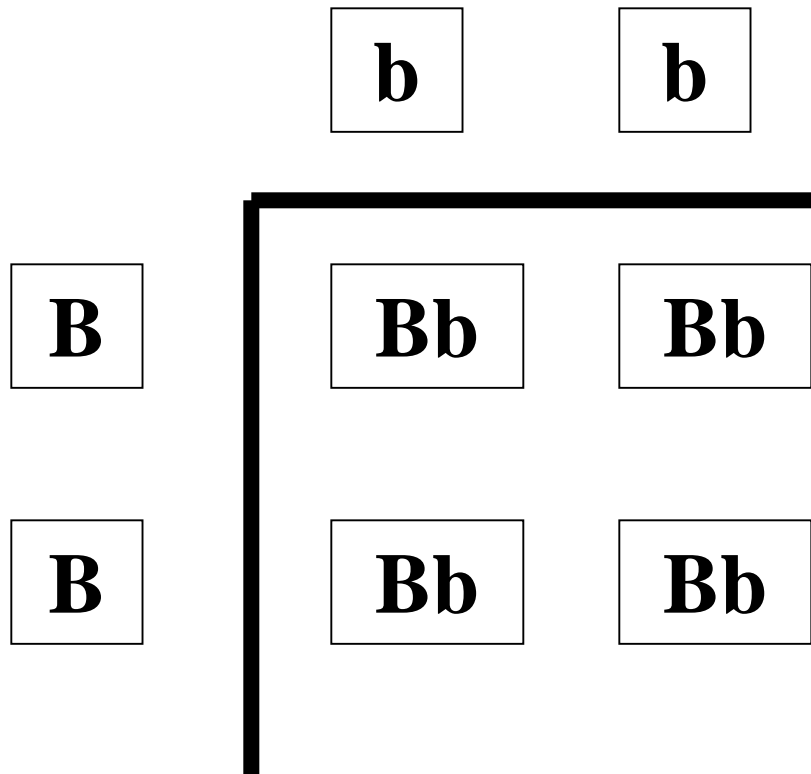


PUNNETT SQUARE

MONO-HYBRID CROSS



P1 = BB x bb



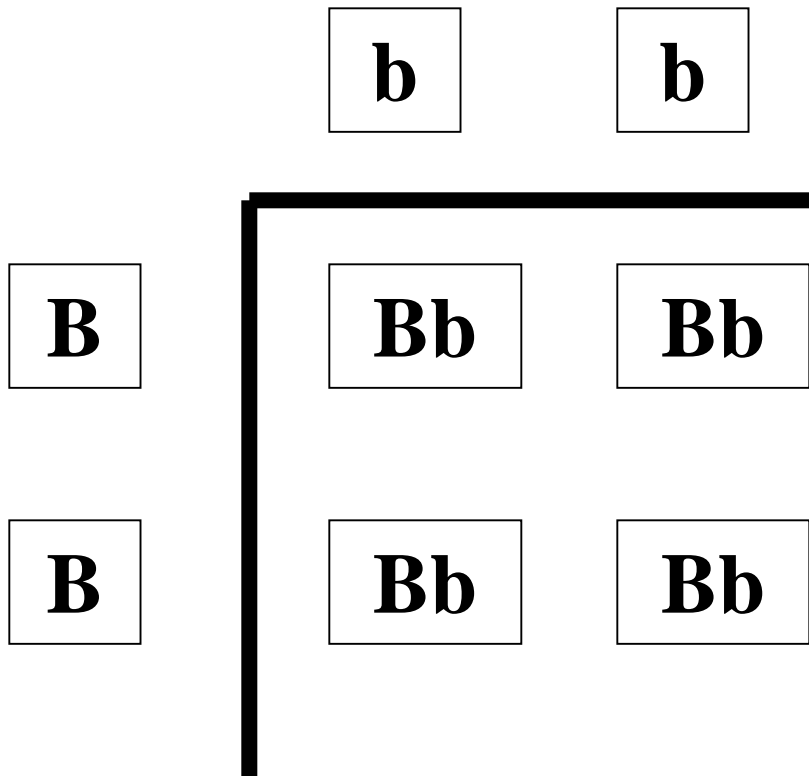
F1
1ST GENERATION
OFFSPRING

MONO-HYBRID CROSS

B
b



P1 = BB x bb

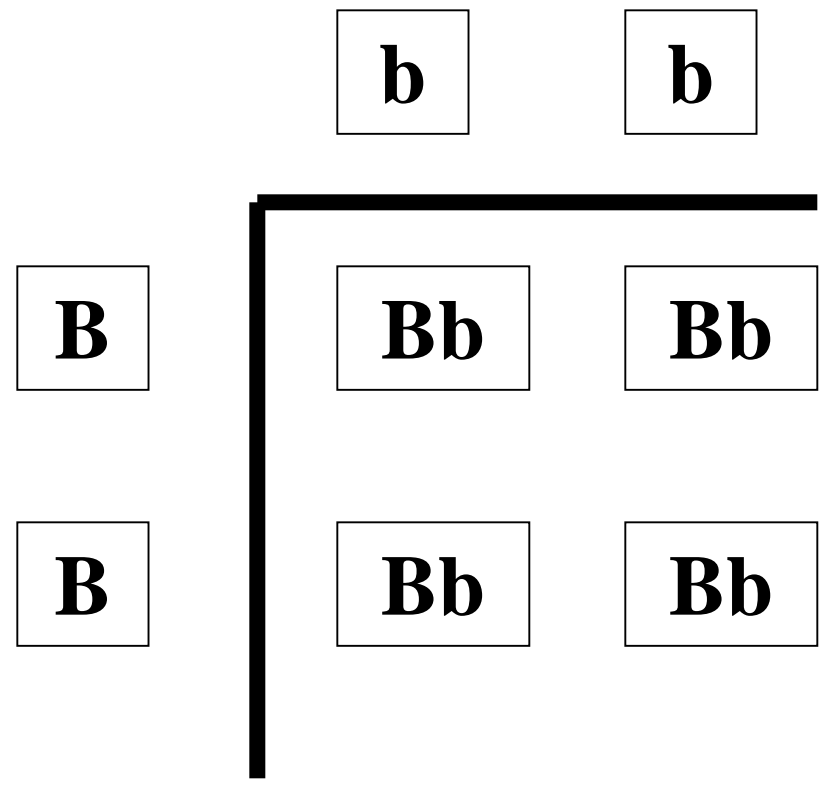


**F1
GENOTYPE:**

MONO-HYBRID CROSS



P1 = BB x bb

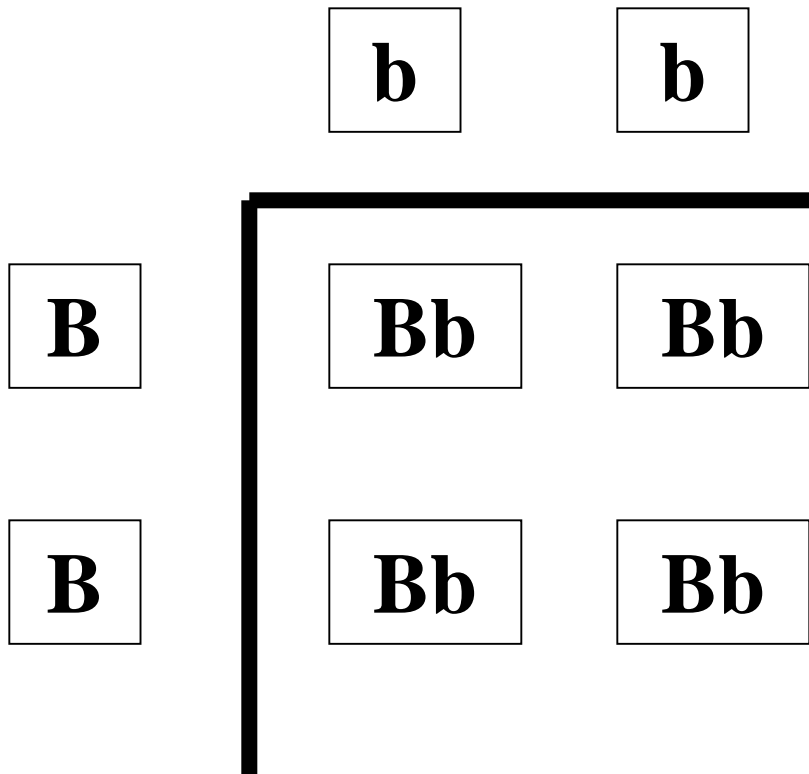


**F1
GENOTYPE:
ALL = Bb**

MONO-HYBRID CROSS



P1 = BB x bb



F1
GENOTYPE:
ALL = Bb

PHENOTYPE:

MONO-HYBRID CROSS



P1 = BB x bb

b

b

B

Bb

Bb



B

Bb

Bb

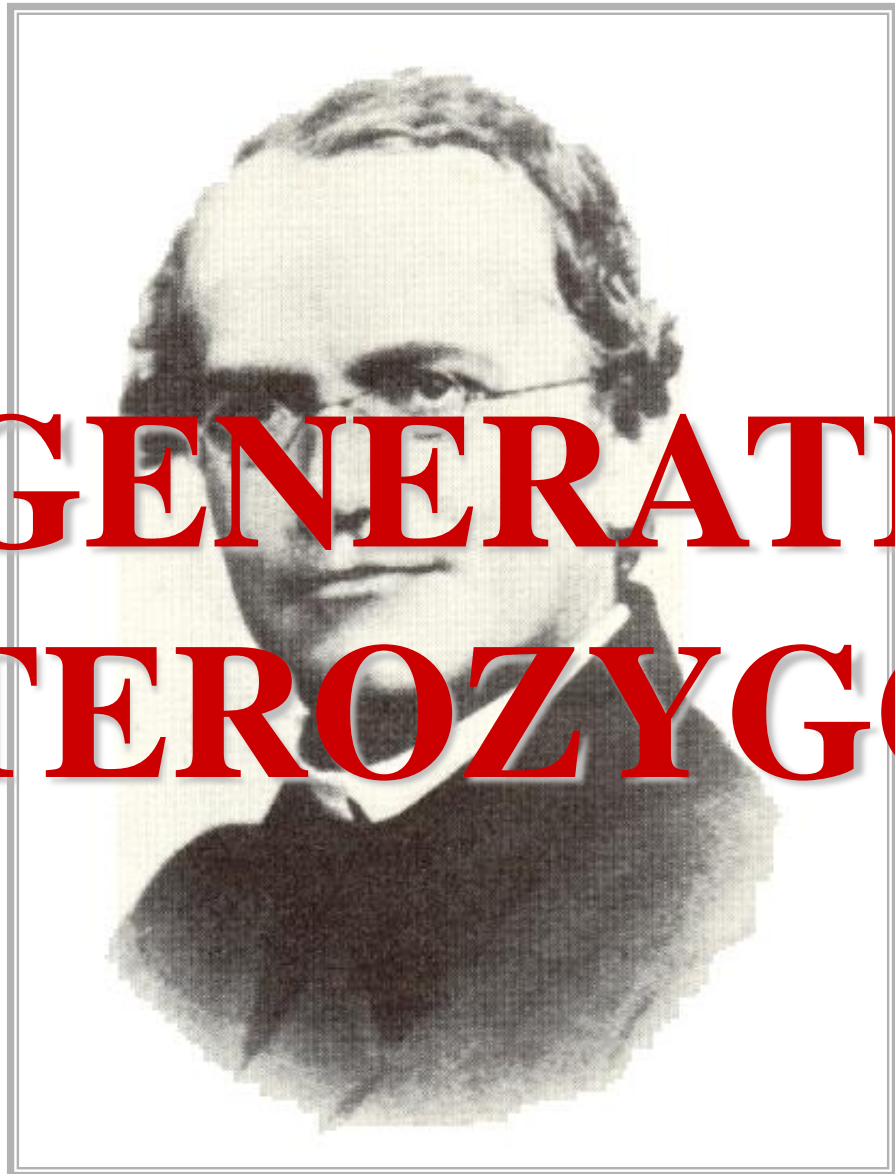


F1
GENOTYPE:
ALL = Bb

PHENOTYPE:
ALL = BR



**HOMOZYGOUS
DOMINATE
X
HOMOZYGOUS
RECESSIVE**



**F1 GENERATION
HETEROZYGOUS**



MONO-HYBRID CROSS EXAMPLE #2

CROSS F1 GENERATION

MONO-HYBRID CROSS



P1 = BB x bb

b **b**

B

Bb

Bb



B

Bb

Bb



F1
GENOTYPE:
ALL = Bb

PHENOTYPE:
ALL = BR



**HETEROZYGOUS
INDIVIDUAL
X
HETEROZYGOUS
INDIVIDUAL**

MONO-HYBRID CROSS

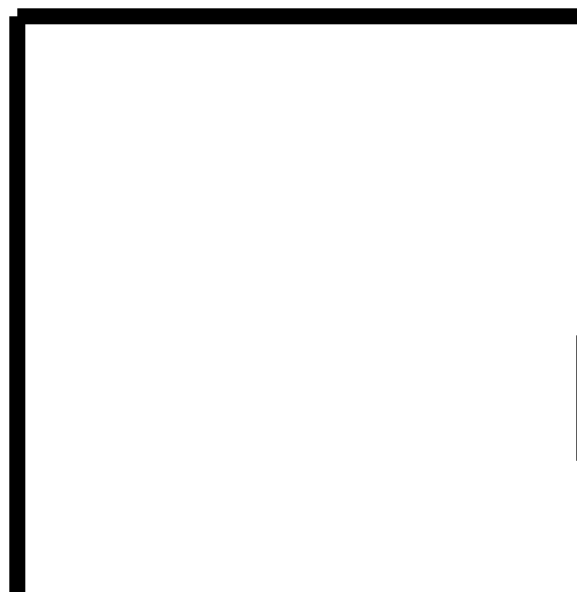


F1 = Bb x Bb

MONO-HYBRID CROSS



F1 = Bb x Bb



PUNNETT SQUARE

 = **GAMETE**



MONO-HYBRID CROSS

**GAMETE ALLELE
FORMATION**

MONO-HYBRID CROSS



F1 = Bb x Bb



PUNNETT SQUARE

?

?

= **GAMETE**

MONO-HYBRID CROSS

B
b



F1 = Bb x Bb

Bb – MEIOSIS →

?

 OR

?



PUNNETT SQUARE



= GAMETE



MONO-HYBRID CROSS



F1 = Bb x Bb

Bb – MEIOSIS → B OR b



PUNNETT SQUARE

B

b

= GAMETE

MONO-HYBRID CROSS



F1 = Bb x Bb

?

?

PUNNETT SQUARE

B

b

= GAMETE

MONO-HYBRID CROSS

B
b



F1 = Bb x Bb

Bb – MEIOSIS →

?

 OR

?

?

?

PUNNETT SQUARE

B

b

--

 = GAMETE

MONO-HYBRID CROSS



F1 = Bb x Bb

Bb – MEIOSIS →

B

OR

b

B

b

PUNNETT SQUARE

B

b



= GAMETE

MONO-HYBRID CROSS



F1 = Bb x Bb

B	b
----------	----------

B

--

b

PUNNETT SQUARE

MONO-HYBRID CROSS



F1 = Bb x Bb

B	b
----------	----------

B

BB

b

--

PUNNETT SQUARE

MONO-HYBRID CROSS



F1 = Bb x Bb

	B	b
B	BB	
b	Bb	

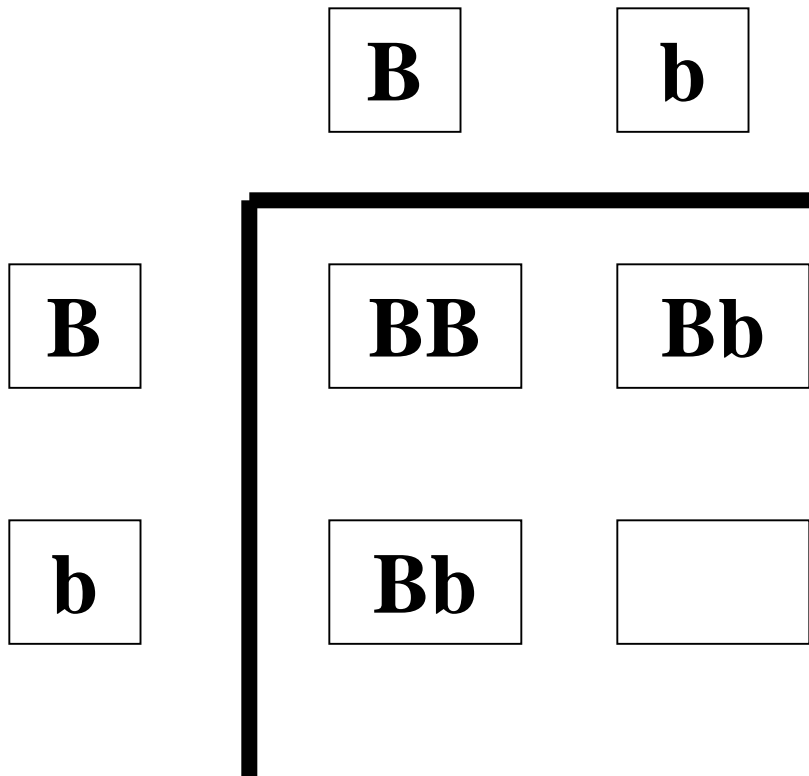
PUNNETT SQUARE



MONO-HYBRID CROSS



F1 = Bb x Bb



PUNNETT SQUARE

MONO-HYBRID CROSS



F1 = Bb x Bb

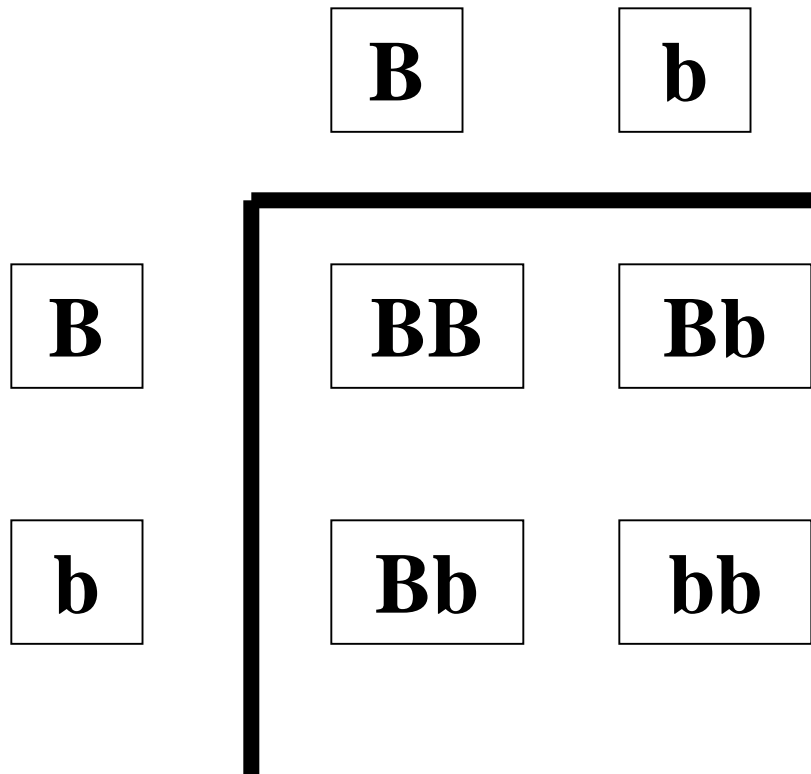
	B	b
B	BB	Bb
b	Bb	bb

PUNNETT SQUARE

MONO-HYBRID CROSS



F1 = Bb x Bb



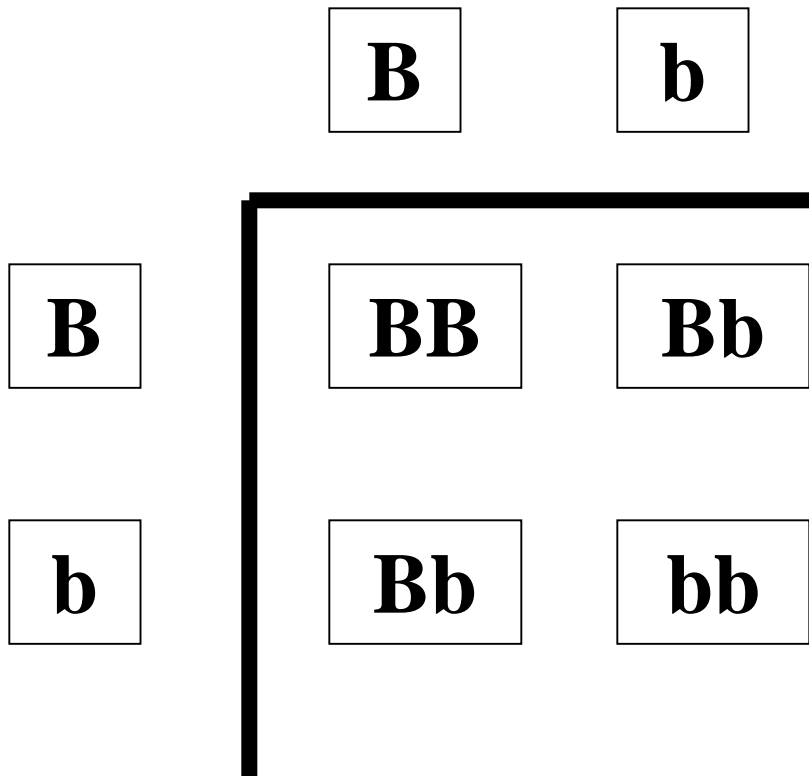
**F2
2ND GENERATION
OFFSPRING**

MONO-HYBRID CROSS

B
B
?



F1 = Bb x Bb

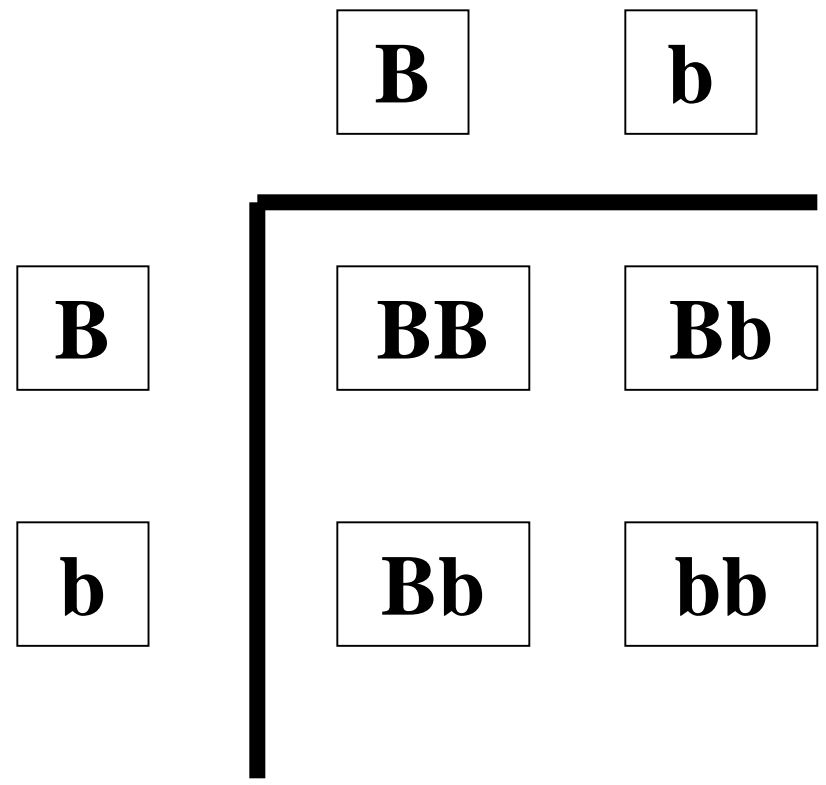


**F2
GENOTYPE:**

MONO-HYBRID CROSS



F1 = Bb x Bb



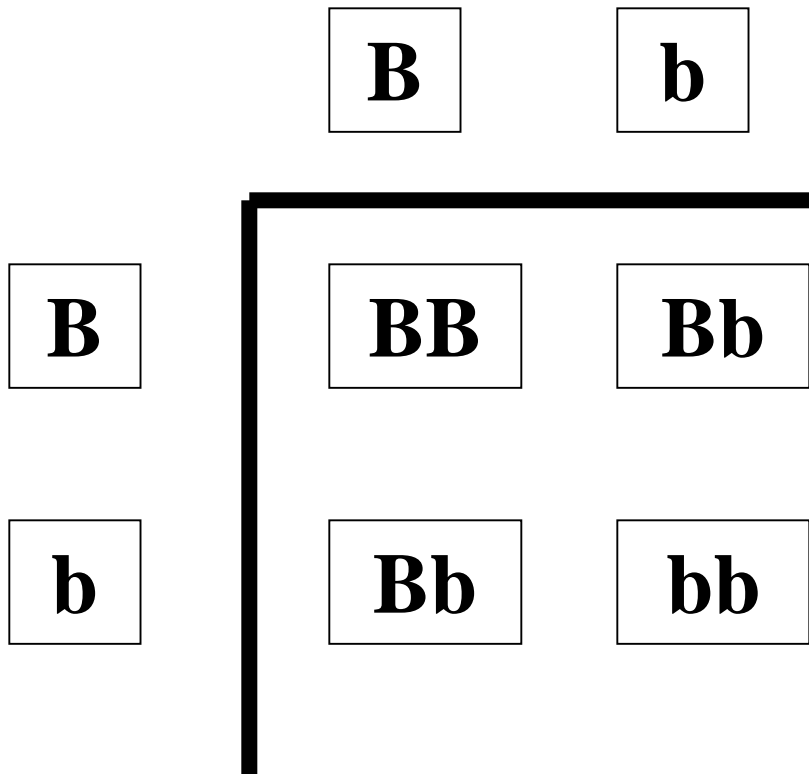
**F2
GENOTYPE:
BB = ?**

MONO-HYBRID CROSS

B
b
?



F1 = Bb x Bb

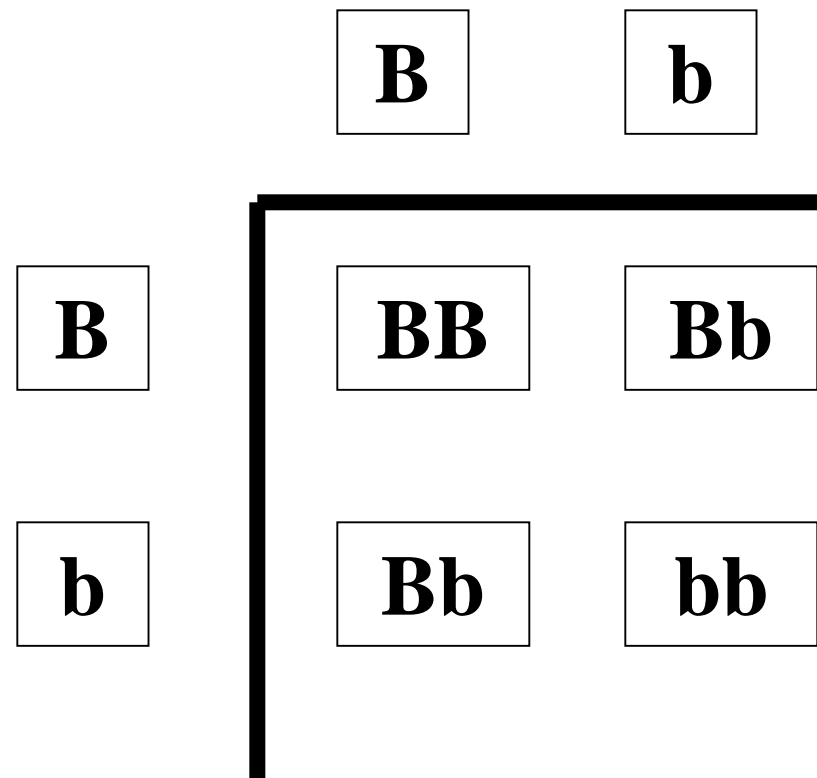


**F2
GENOTYPE:
BB = 1**

MONO-HYBRID CROSS



F1 = Bb x Bb



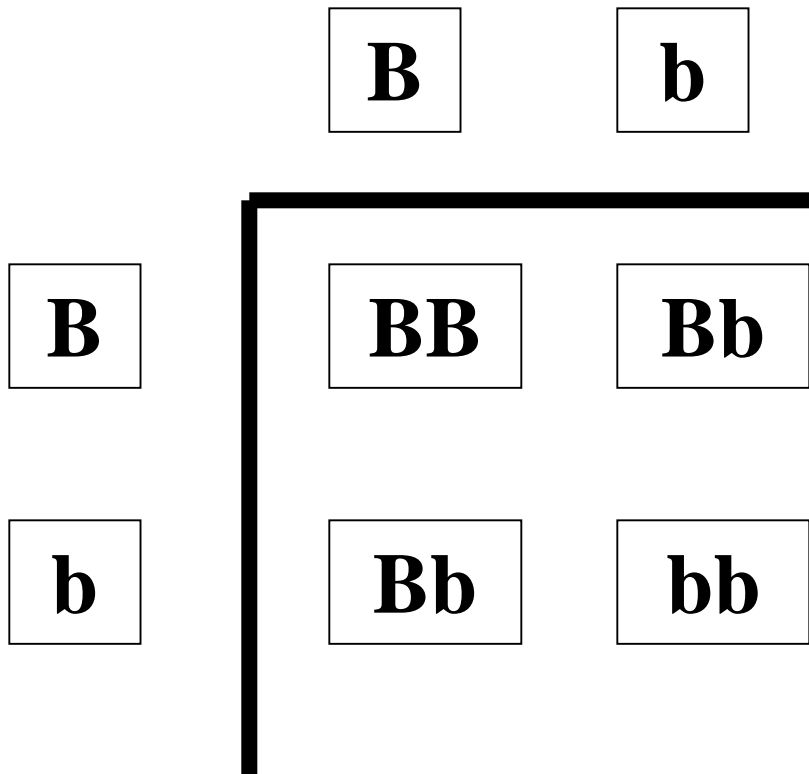
**F2
GENOTYPE:
BB = 1 Bb = ?**

MONO-HYBRID CROSS

b
b
?



F1 = Bb x Bb

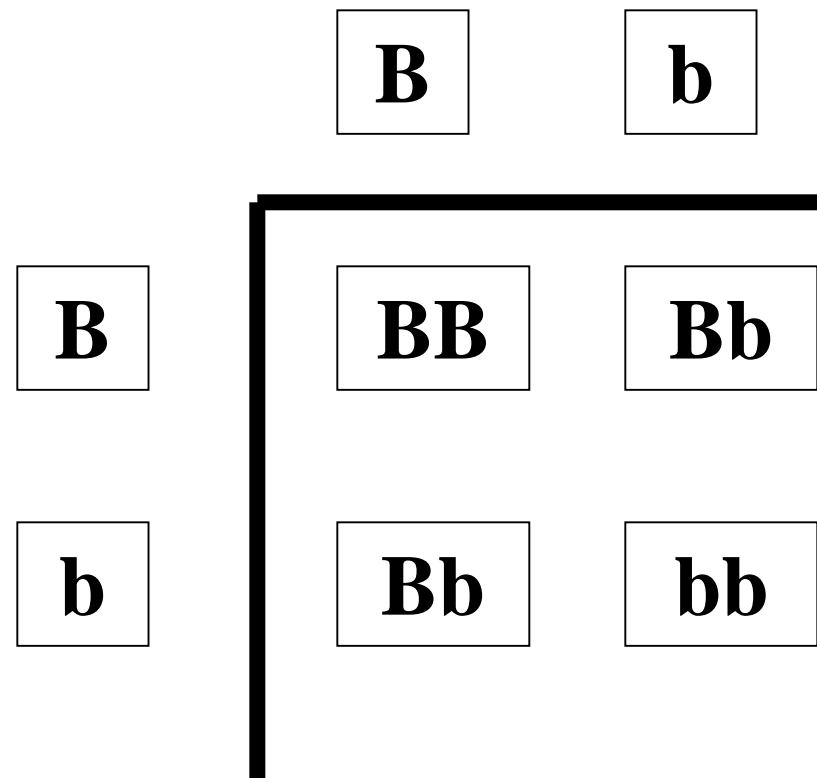


F2
GENOTYPE:
BB = 1 Bb = 2

MONO-HYBRID CROSS



F1 = Bb x Bb

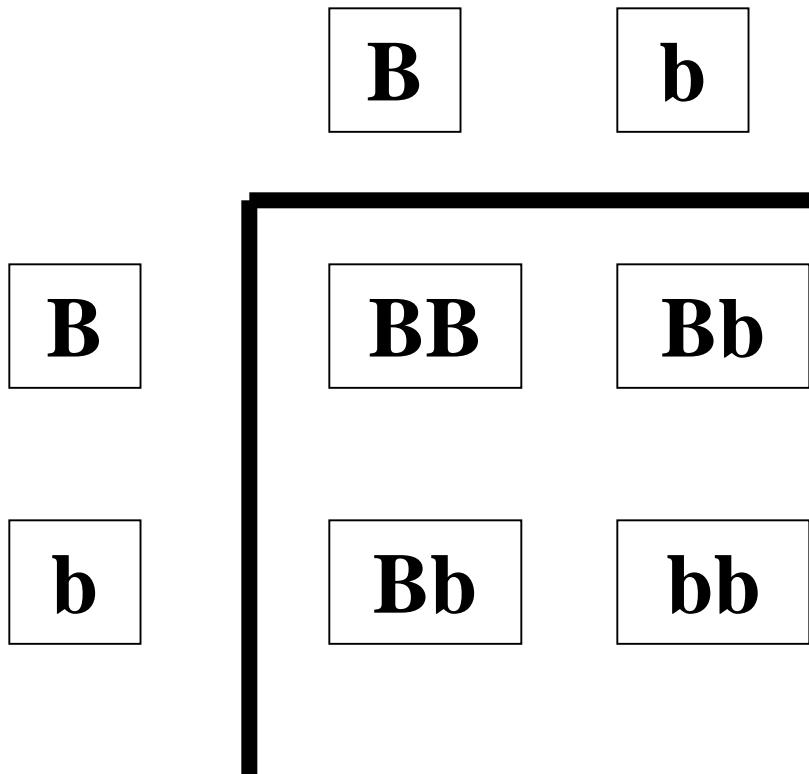


**F2
GENOTYPE:
BB = 1 Bb = 2 bb = ?**

MONO-HYBRID CROSS



F1 = Bb x Bb



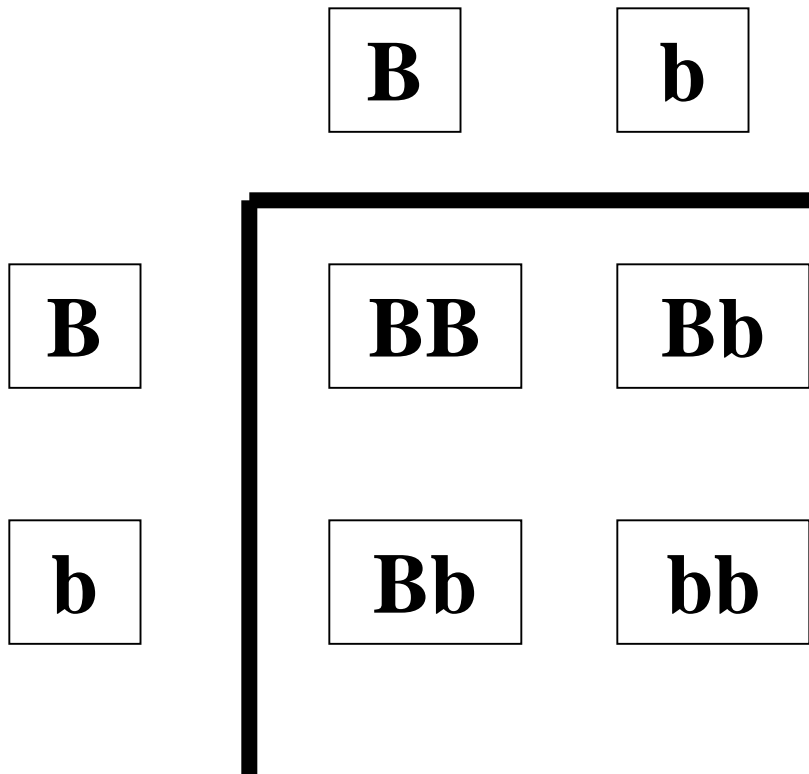
F2
GENOTYPE:
BB = 1 Bb = 2 bb = 1

MONO-HYBRID CROSS

?



F1 = Bb x Bb



F2

GENOTYPE:

BB = 1 Bb = 2 bb = 1

PHENOTYPE:

MONO-HYBRID CROSS



F1 = Bb x Bb

B **b**

B

BB

Bb



b

Bb

bb



F2
GENOTYPE:
BB = 1 Bb = 2 bb = 1
PHENOTYPE:
BR = ?

MONO-HYBRID CROSS



F1 = Bb x Bb

B **b**

B

BB

Bb



b

Bb

bb



F2

GENOTYPE:

BB = 1 Bb = 2 bb = 1

PHENOTYPE:

BR = 3

MONO-HYBRID CROSS



F1 = Bb x Bb

B **b**

B

BB

Bb



b

Bb

bb



F2

GENOTYPE:

BB = 1 Bb = 2 bb = 1

PHENOTYPE:

BR = 3 BL = ?



MONO-HYBRID CROSS



F1 = Bb x Bb

B	b
----------	----------

B

BB

Bb



b

Bb

bb



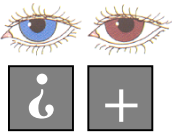
F2
GENOTYPE:
BB = 1 Bb = 2 bb = 1

PHENOTYPE:
BR = 3 BL = 1

MONO-HYBRID TEST-CROSS

MONO-HYBRID TEST-CROSS

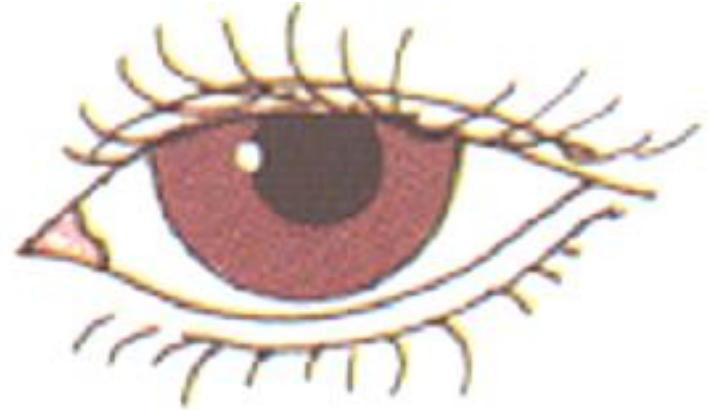
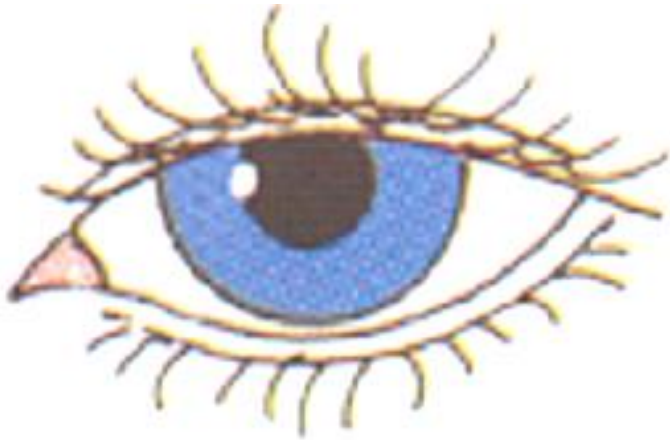
MONO-HYBRID TEST-CROSS



UNKNOWN GENOTYPIC
INDIVIDUAL IS CROSSED
WITH A KNOWN
HOMOZYGOUS RECESSIVE

MONO-HYBRID
TEST-CROSS

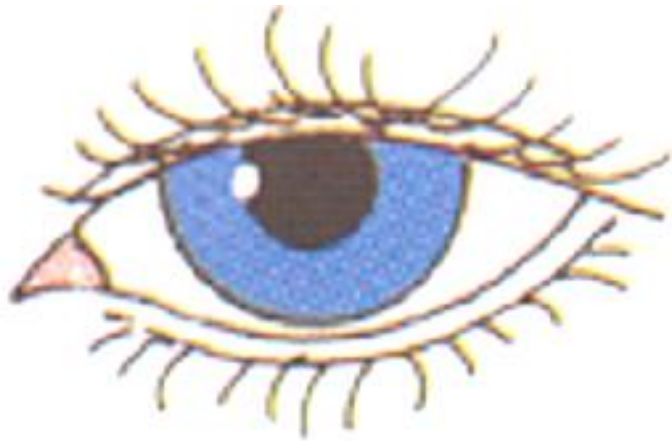
MONO-HYBRID TEST-CROSS



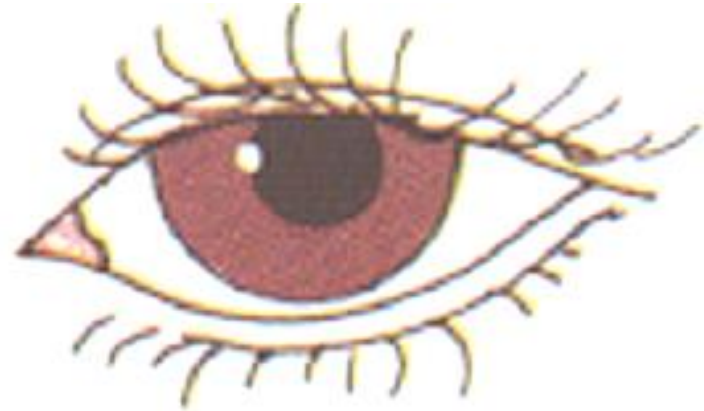
BB – Bb – bb



MONO-HYBRID TEST-CROSS

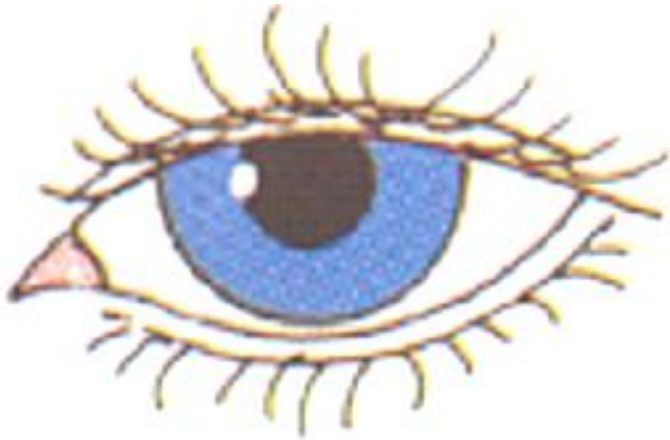


bb

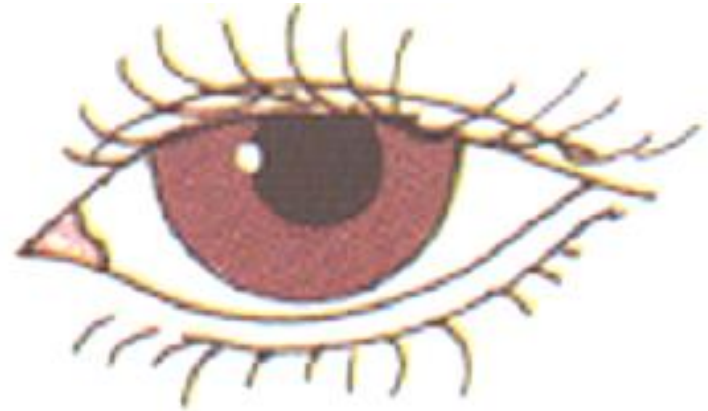


BB – Bb – bb

MONO-HYBRID TEST-CROSS



bb



BB or Bb

BB – Bb – bb



**MONO-HYBRID
TEST-CROSS
EXAMPLE #1**

MONO-HYBRID TEST-CROSS



P1 = ? x bb



= BB or Bb

MONO-HYBRID TEST-CROSS



P1 = ? x bb

 = BB or Bb

b	b
---	---

?

?

PUNNETT SQUARE

--

 = GAMETE

MONO-HYBRID TEST-CROSS



P1 = ? x bb

 = BB or Bb

b b

?

Bb

Bb



?

Bb

Bb



PUNNETT SQUARE

MONO-HYBRID TEST-CROSS



P1 = ? x bb

 = BB or Bb

b b

?

Bb

Bb

F1



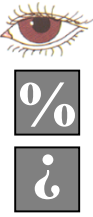
?

Bb

Bb



MONO-HYBRID TEST-CROSS



P1 = ? x bb

 = BB or Bb

b b

?

Bb

Bb



?

Bb

Bb



**F1
PHENOTYPE:**

MONO-HYBRID TEST-CROSS



P1 = ? x bb

= BB or Bb

b

b

?

Bb

Bb



?

Bb

Bb



F1
PHENOTYPE:
100% = BR

MONO-HYBRID TEST-CROSS

B
b
%
?



P1 = ? x bb



= BB or Bb

b

b

?

Bb

Bb



?

Bb

Bb



F1

PHENOTYPE:

100% = BR

GENOTYPE:



MONO-HYBRID TEST-CROSS



P1 = ? x bb



= BB or Bb

b

b

?

Bb

Bb



?

Bb

Bb



F1

PHENOTYPE:

100% = BR

GENOTYPE:

100% = Bb

MONO-HYBRID TEST-CROSS



P1 = ? x bb



= BB or Bb

b

b

?

Bb

Bb



?

Bb

Bb



F1

PHENOTYPE:

100% = BR

GENOTYPE:

100% = Bb

UNKNOWN PARENT GENOTYPE = ?



MONO-HYBRID TEST-CROSS



P1 = ? x bb

 = BB or Bb

b	b
---	---

?

Bb

Bb



?

Bb

Bb



F1
PHENOTYPE:
100% = BR

GENOTYPE:
100% = Bb

UNKNOWN PARENT GENOTYPE = BB



**MONO-HYBRID
TEST-CROSS
EXAMPLE #2**

MONO-HYBRID TEST-CROSS



P1 = ? x bb



= BB or Bb

MONO-HYBRID TEST-CROSS



P1 = ? x bb

 = BB or Bb

b	b
---	---

?

?

PUNNETT SQUARE

--

 = GAMETE

MONO-HYBRID TEST-CROSS



P1 = ? x bb

 = BB or Bb

b b

?

Bb

Bb



?

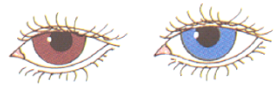
bb

bb



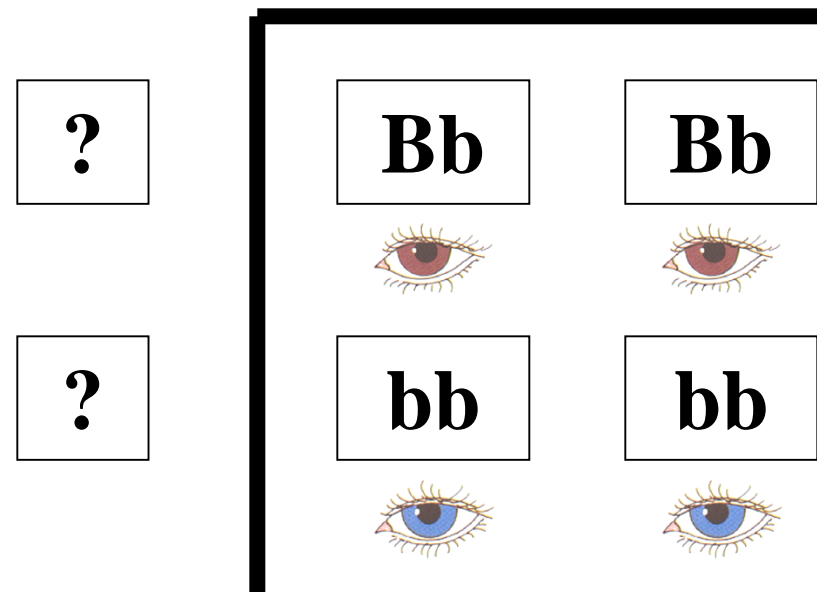
PUNNETT SQUARE

MONO-HYBRID TEST-CROSS



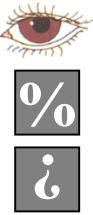
P1 = ? x bb

 = BB or Bb



F1

MONO-HYBRID TEST-CROSS



P1 = ? x bb

 = BB or Bb

b b

?

Bb

Bb

**F1
PHENOTYPE:**



?

bb

bb



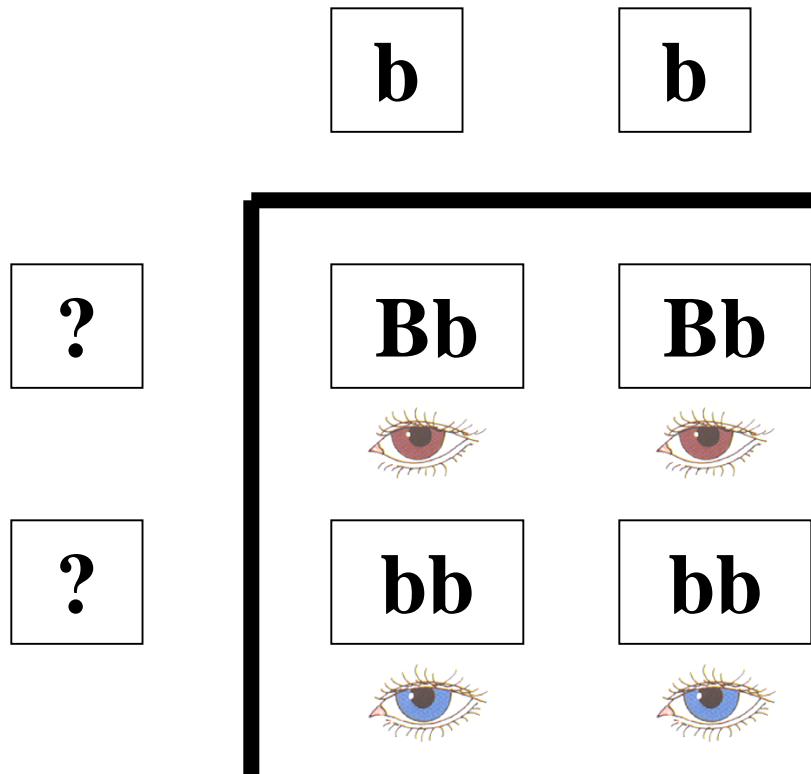
MONO-HYBRID TEST-CROSS



P1 = ? x bb



= BB or Bb



F1
PHENOTYPE:
50% = BR 50% = BL

MONO-HYBRID TEST-CROSS

B
b
%
?



P1 = ? x bb



= BB or Bb

b

b

?

Bb

Bb



?

bb

bb



F1

PHENOTYPE:

50% = BR 50% = BL

GENOTYPE:



MONO-HYBRID TEST-CROSS



P1 = ? x bb

 = BB or Bb

b b

?

Bb

Bb



?

bb

bb



F1
PHENOTYPE:
 50% = BR 50% = BL
GENOTYPE:
 50% = Bb 50% = bb

MONO-HYBRID TEST-CROSS



P1 = ? x bb



= BB or Bb

b

b

?

Bb

Bb



?

bb

bb



F1

PHENOTYPE:

50% = BR 50% = BL

GENOTYPE:

50% = Bb 50% = bb

UNKNOWN PARENT GENOTYPE = ?



MONO-HYBRID TEST-CROSS



P1 = ? x bb



= BB or Bb

b

b

?

Bb

Bb



?

bb

bb



F1

PHENOTYPE:

50% = BR 50% = BL

GENOTYPE:

50% = Bb 50% = bb

UNKNOWN PARENT GENOTYPE = Bb



**MONO-HYBRID
TEST-CROSS
EXAMPLE #3**

MONO-HYBRID TEST-CROSS



P1 = bb x bb



= BB or Bb



DAD & MOM = BL EYES

YOU = BR EYES

MONO-HYBRID TEST-CROSS



P1 = bb x bb

 = BB or Bb

YOU = BR EYES



DAD

b

b

MOM

b

bb

bb



b

bb

bb



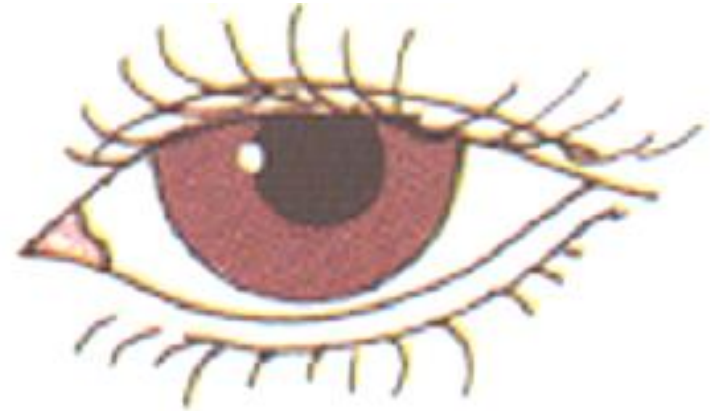
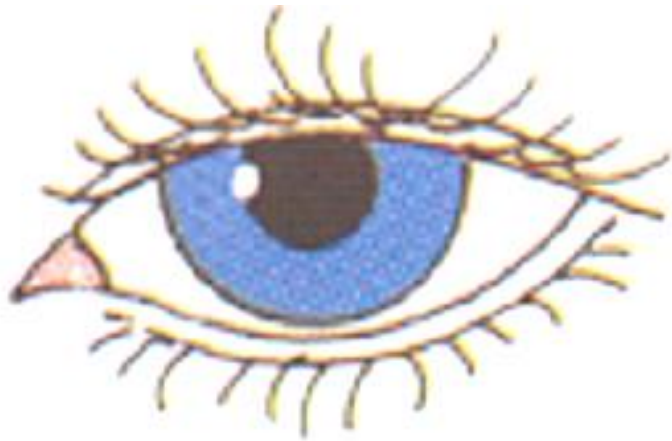
F1
PHENOTYPE:

100% = BL

GENOTYPE:

100% = bb

HUMAN EYE COLOR



**EYE COLOR
CONTROLLED
BY MORE THAN
ONE GENE**

HUMAN EYE COLOR



AABB



AABb



AaBB



AaBb



AABb



AAbb



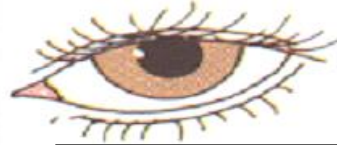
AaBb



Aabb



AaBB



AaBb



aaBB



aaBb



AaBb



Aabb



aaBb



aabb

HUMAN EYE COLOR



AABB



AABb



AaBB



AaBb



AABb



AAbb



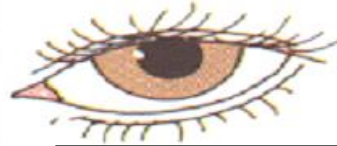
AaBb



Aabb



AaBB



AaBb



aaBB



aaBb



AaBb



Aabb

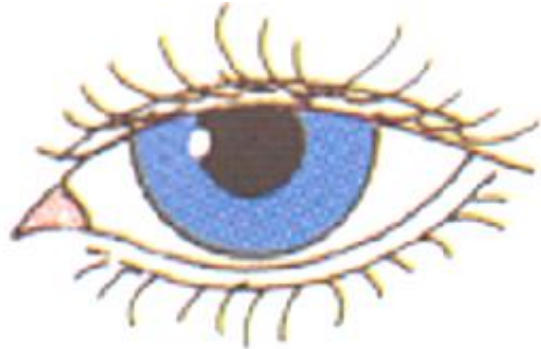


aaBb



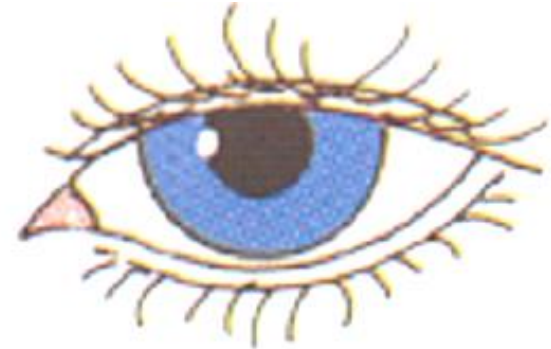
aabb

HUMAN EYE COLOR



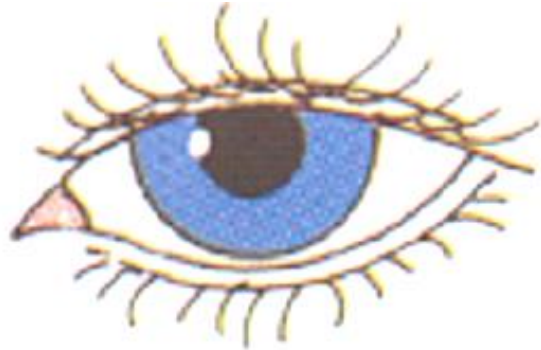
Aabb

X



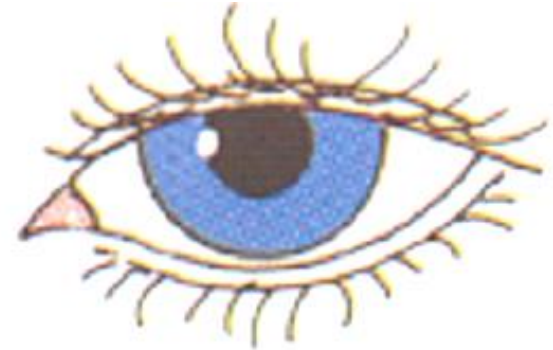
aaBb

HUMAN EYE COLOR



Aabb

X



aaBb



GENOTYPE
PHENOTYPE

aB

ab

aB

ab



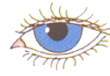
Ab

AaBb

Aabb

AaBb

Aabb



Ab

AaBb

Aabb

AaBb

Aabb



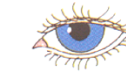
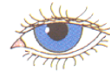
ab

aaBb

aabb

aaBb

aabb



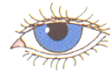
ab

aaBb

aabb

aaBb

aabb



GENOTYPE
PHENOTYPE

aB

ab

aB

ab

\$



Ab

AaBb

AaBb



Ab

AaBb

AaBb



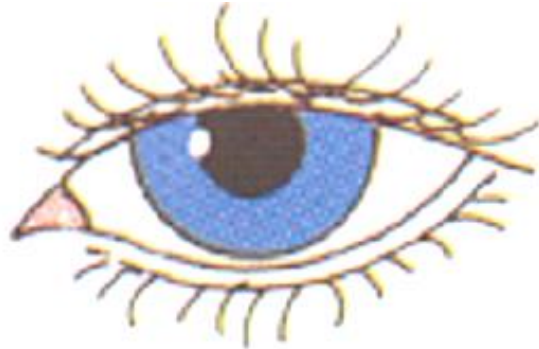
ab

ab

HUMAN EYE COLOR

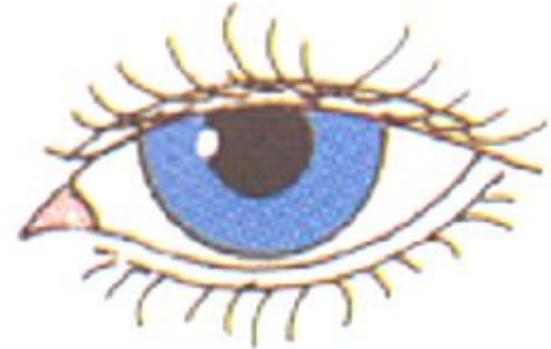


a



Aabb

X

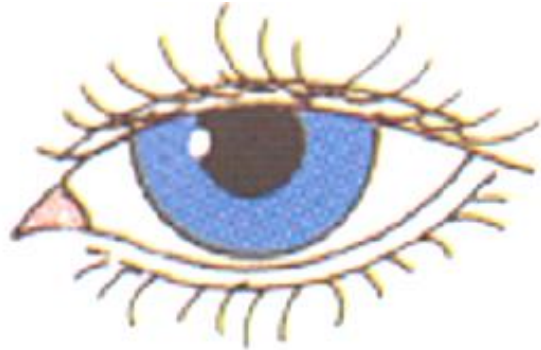
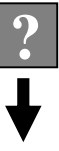


aaBb



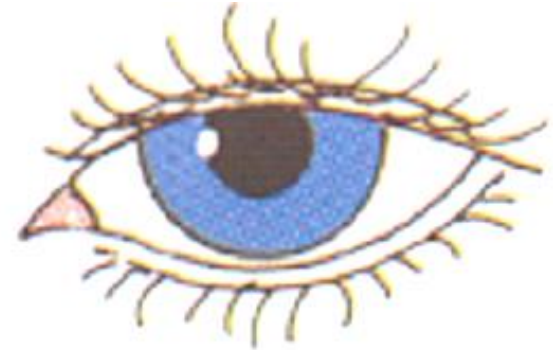
AaBb

HUMAN EYE COLOR



aabb

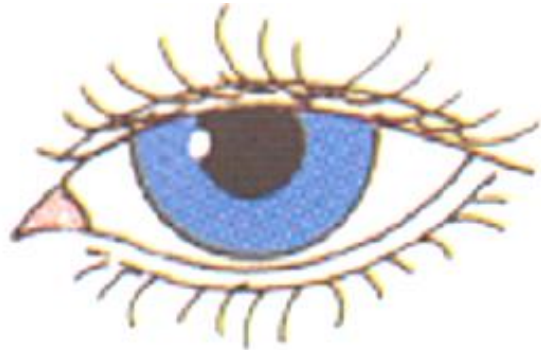
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aabb

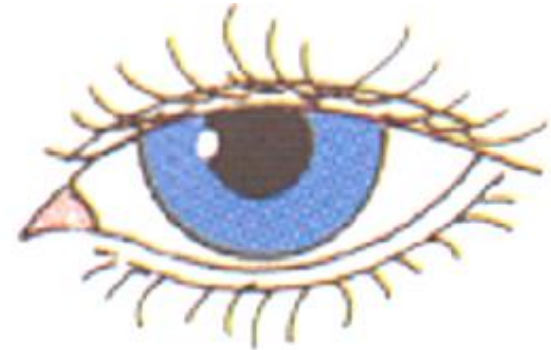
HUMAN EYE COLOR

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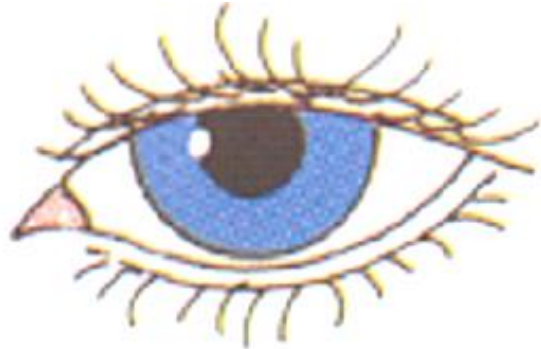


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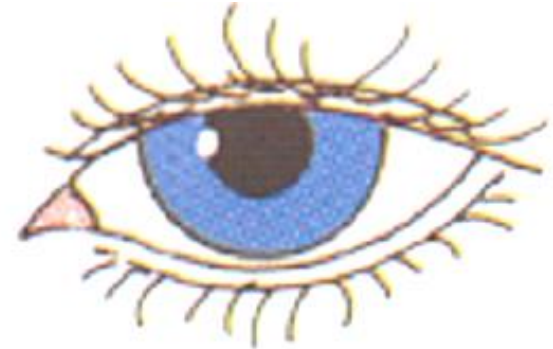
GENOTYPE
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HUMAN EYE COLOR



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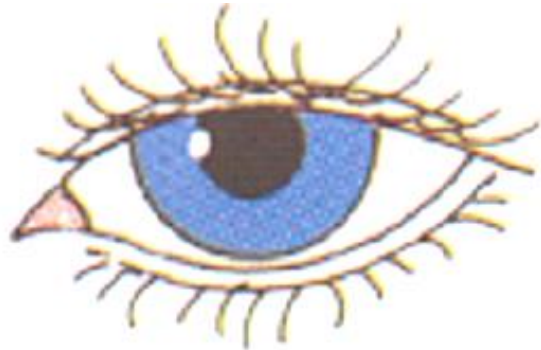


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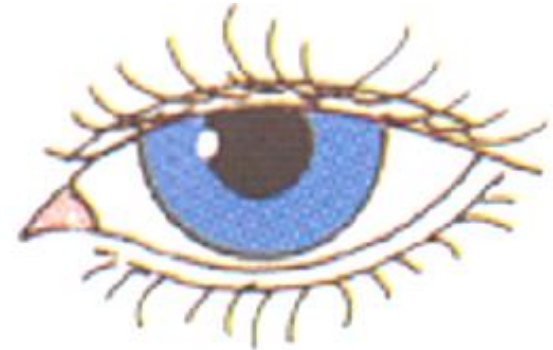
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HUMAN EYE COLOR

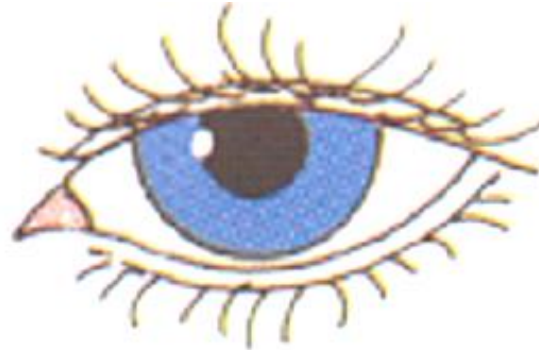


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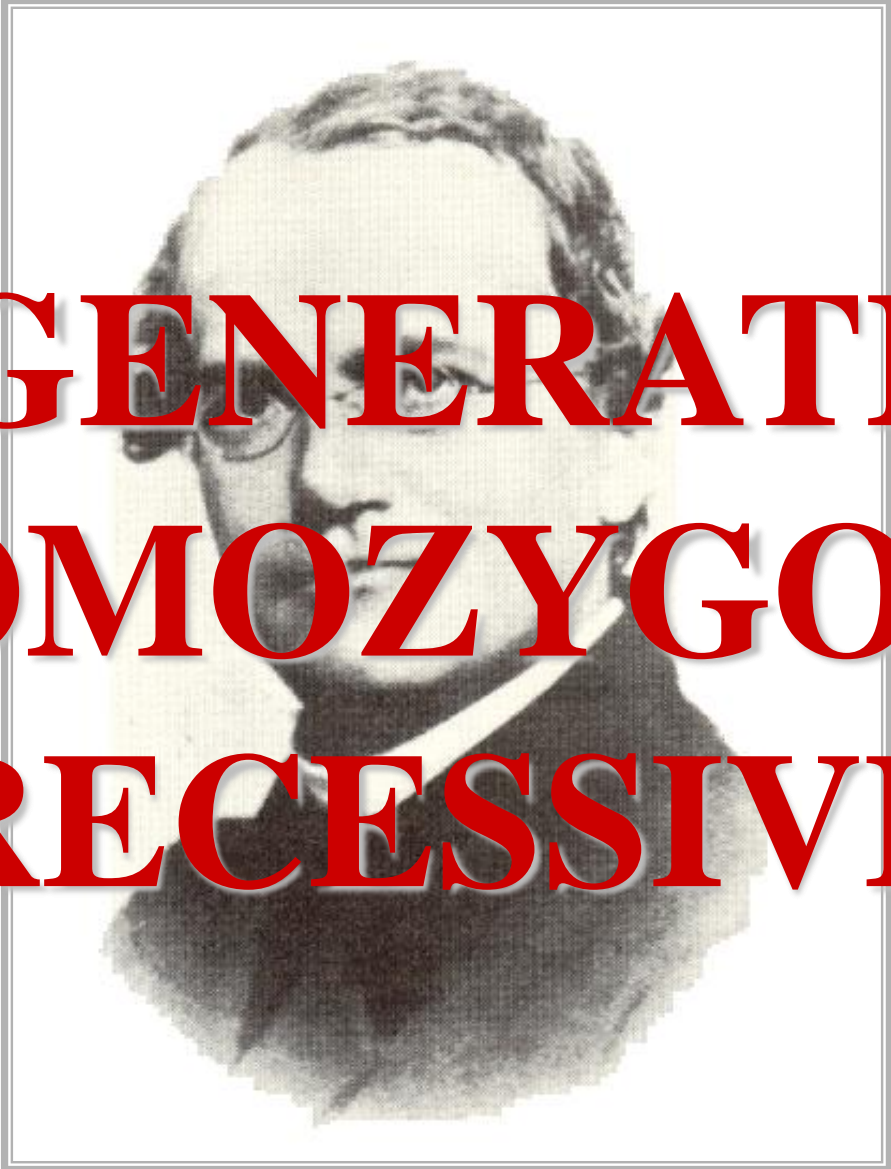
aabb



aabb



**HOMOZYGOUS
RECESSIVE
X
HOMOZYGOUS
RECESSIVE**

A black and white portrait of Gregor Mendel, a man with glasses and a dark suit, looking slightly to the right. The portrait is framed by a thin grey border.

F1 GENERATION
HOMOZYGOUS
RECESSIVE

HUMAN EYE COLOR



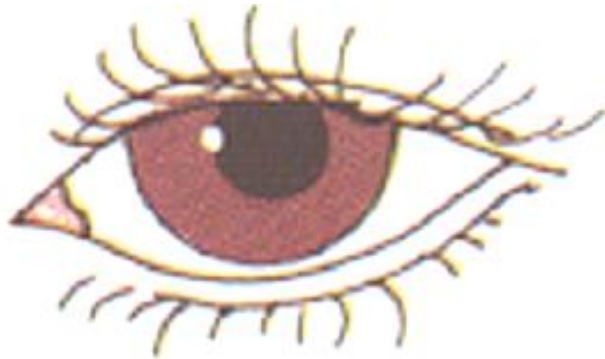
AABB

X



AABB

HUMAN EYE COLOR



AABB

X



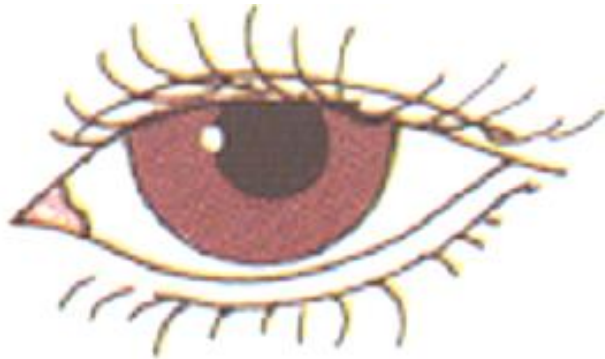
AABB



GENOTYPE

?

HUMAN EYE COLOR



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HUMAN EYE COLOR



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AABB

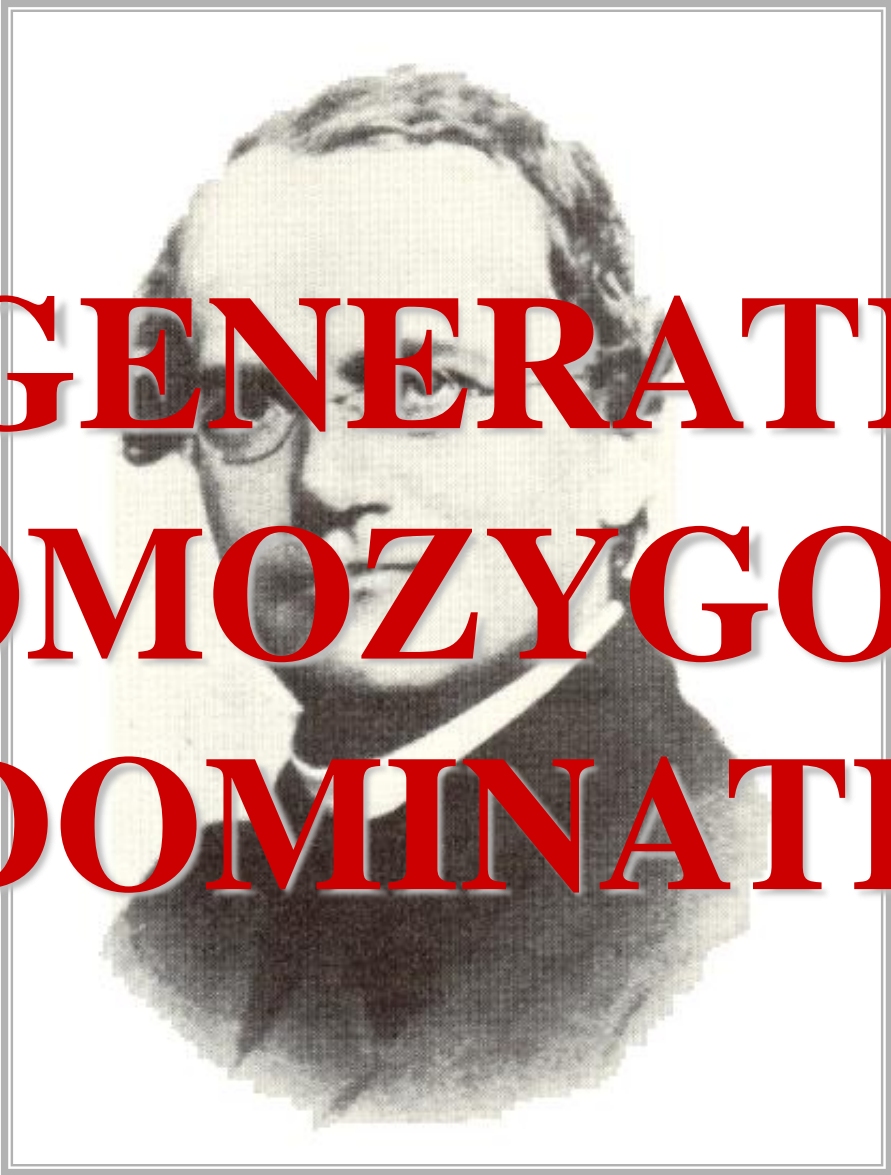


AABB



**HOMOZYGOUS
DOMINATE
X
HOMOZYGOUS
DOMINATE**





**F1 GENERATION
HOMOZYGOUS
DOMINATE**

DI-HYBRID CROSS