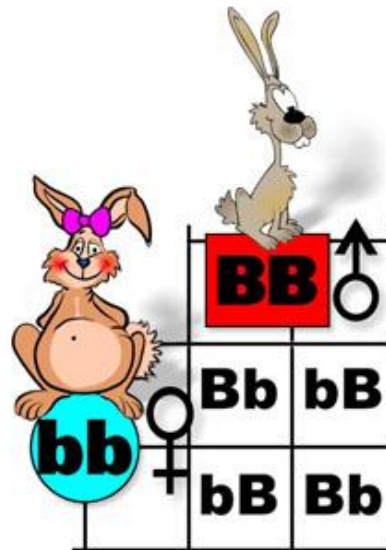
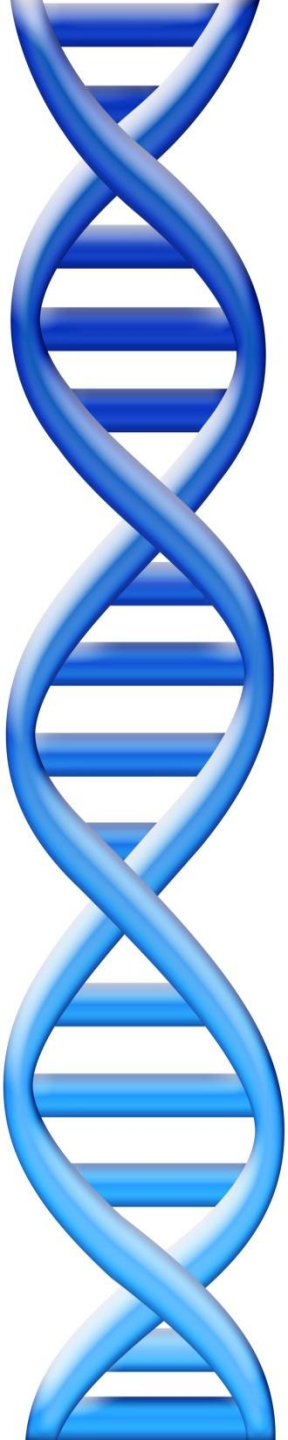


Genetic Crosses

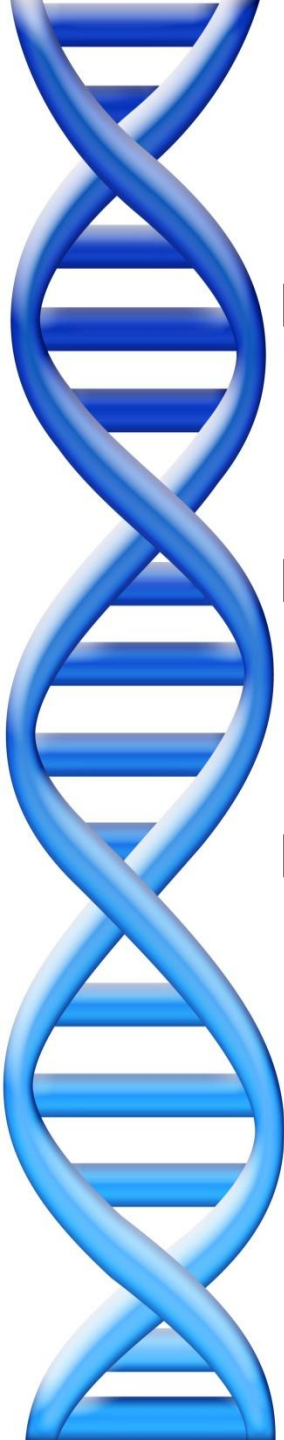
Honors Biology
Facilitator- Mr. Lee
Room 320





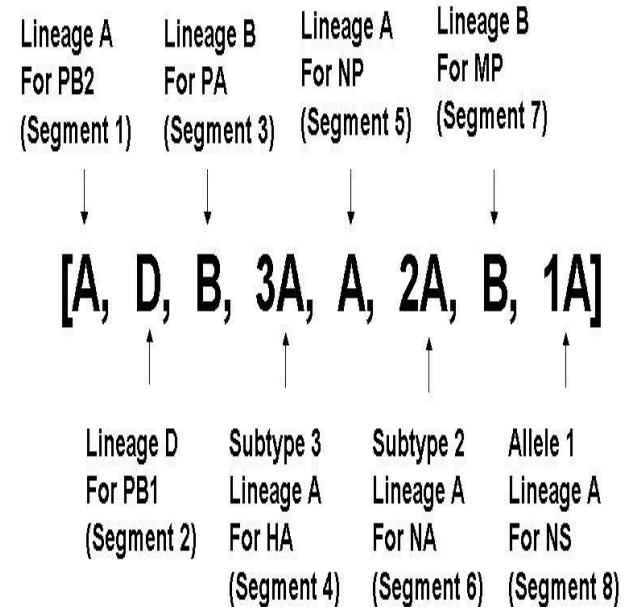
Objectives

- ▶ **Be able to use a Punnett square to predict the results of monohybrid genetic crosses**
- ▶ **Explain the difference between codominance and incomplete dominance**
- ▶ **Explain the difference between genotype and phenotype**
- ▶ **Explain how probability is used to predict the results of genetic crosses**



Genotype

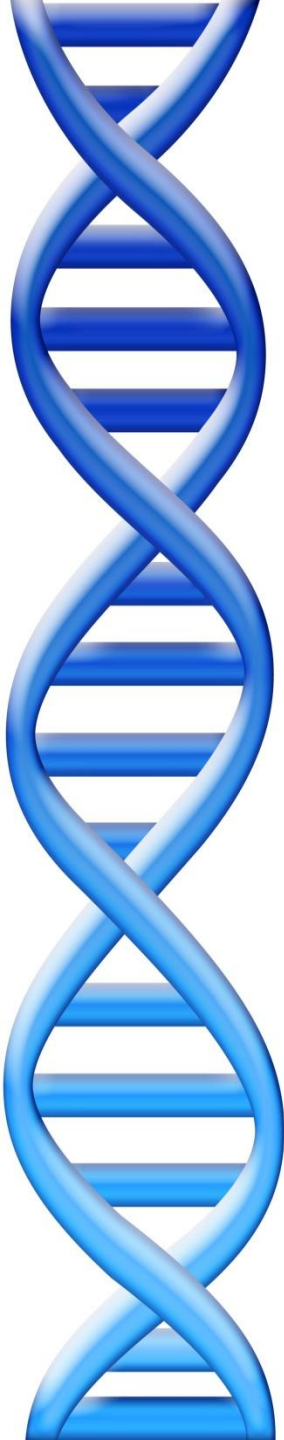
- ▶ **Genotype is the genetic makeup of an organism**
- ▶ **Alternative forms of genes are called alleles**
- ▶ **Genotype consist of the alleles that the organism inherits from H1N1 its parents**



BB

Bb

bb



Genotype...

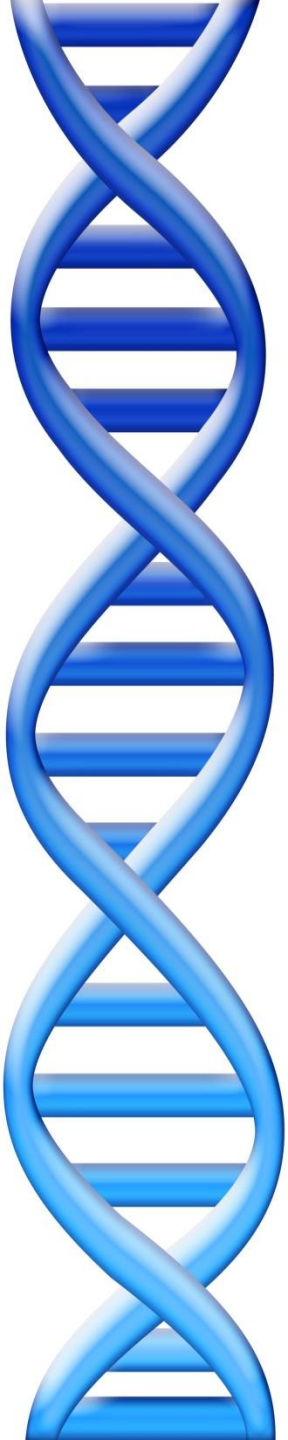
- ▶ **Homozygous-** both alleles are alike (also called purebred)
 - ▶ **Examples are AA, or aa**
- ▶ **Heterozygous-** the two alleles in the pair are different
 - ▶ **Example is Aa**
- ▶ **Remember:**
 - ▶ **Capital letters are used for dominant traits**
 - ▶ **Lowercase letters are used for recessive traits**

	A	a
A	AA	Aa
a	Aa	aa

Phenotype

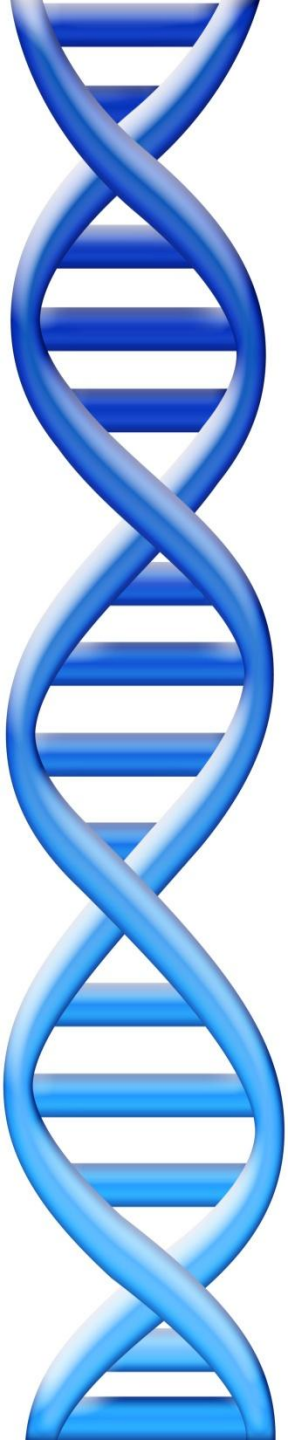
- ▶ **Phenotype is the appearance of an organism as a result of its genotype**
- ▶ **The genotype is expressed (shown) as the phenotype**
- ▶ **The phenotype blue eyes is the expression of the genotype bb**





Probability

- ▶ **Probability is the likelihood that a specific event will occur**
- ▶ **Mendel's experiments showed that in the F₂ generation, the dominant trait will be expressed about 75% of the time (3/4), and the recessive trait about 25% (1/4)**



Monohybrid Crosses

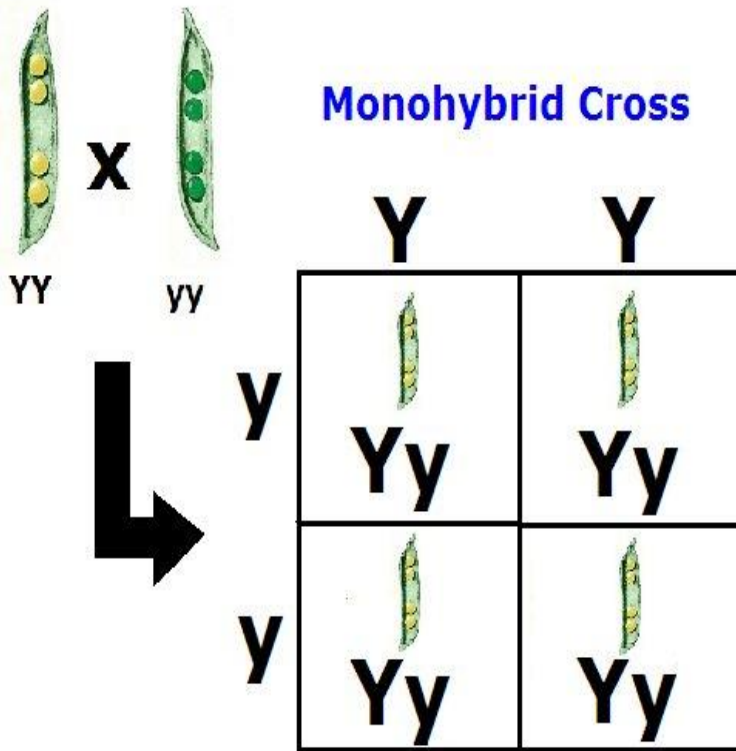
- ▶ **A cross between individuals that involve only one pair of contrasting traits is called a monohybrid cross**
- ▶ **Biologists use diagrams called Punnett Squares to help predict the probability of traits being inherited**

Father's Genes

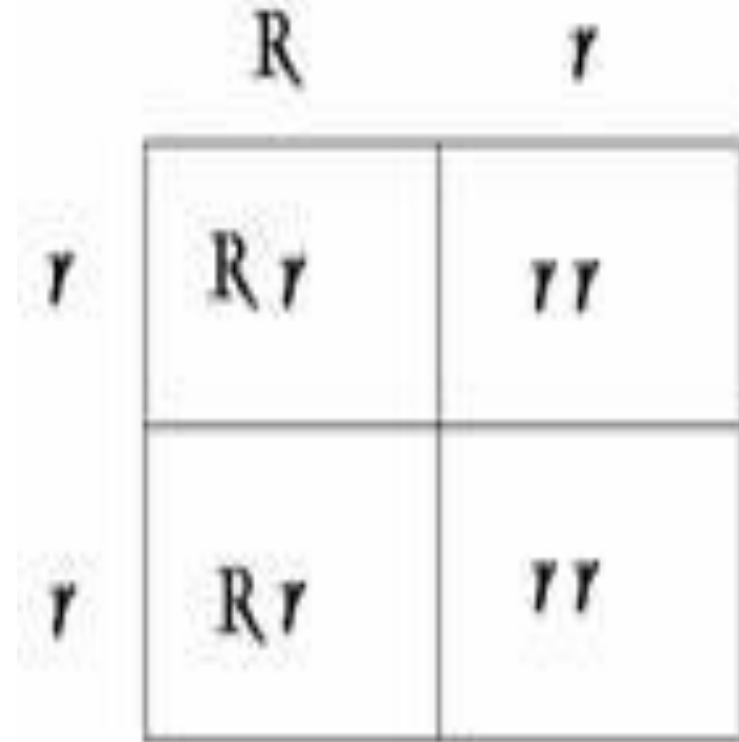
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Monohybrid Crosses...

Homozygous x
homozygous



Homozygous x
heterozygous



Monohybrid Crosses...

Heterozygous x heterozygous

	B	b
B	BB	Bb
b	Bb	bb

- ▶ **Genotypic ratio-** the ratio that appears in the offspring
- ▶ **Phenotypic ratio-** the ratio of the offsprings' phenotypes

Monohybrid Cross Practice

- A black coat (B) is **DOMINANT** in guinea pigs
- A brown coat (b) is **RECESSIVE**
- What is the genotype of a **HOMOZYGOUS BLACK** guinea pig? BB
- What is the genotype of a **HETEROZYGOUS BLACK** guinea pig?
Bb
- What is the genotype of a brown guinea pig? bb



Monohybrid Cross Practice...

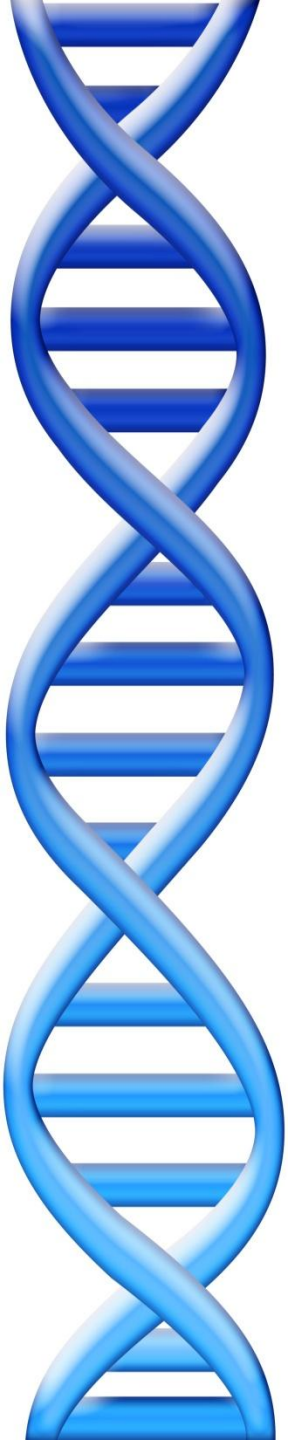
- ▶ Make a cross between TWO HETEROZYGOUS BLACK guinea pigs: black dominant (B), brown recessive (b)

	B	b
B	BB	Bb
b	Bb	bb



▶ Possible Offspring

- ▶ Genotype BB Bb bb
- ▶ Phenotype Black Black Brown



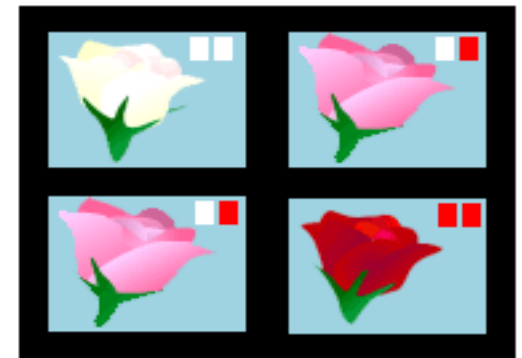
Testcross

- ▶ **Used to determine genotypes**
- ▶ **Individual with an unknown genotype is crossed with a homozygous recessive individual**
- ▶ **Can determine the genotype of any individual whose phenotype is dominant**

Incomplete Dominance

- ▶ The phenotype is in between that of the parents
 - ▶ 2 Red flowers (Rr), making a White flower (rr) , 2 Pink flowers (Rr), and 1 Red flower (Rr)
 - ▶ Occurs when two or more alleles influences the phenoc

	r	R
r	rr	Rr
R	Rr	RR



Codominance

- ▶ Both alleles for a gene are expressed in heterozygous offspring
- ▶ Red flowers (RR) and White flowers (WW) making Red and White flowers (RW)

	R	R
W	RW	RW
W	RW	RW





Review

- ▶ Be able to use a Punnett square to predict the results of monohybrid genetic crosses
- ▶ Explain the difference between codominance and incomplete dominance
 - ▶ **Codominance:**
 - ▶ Both alleles for a gene are expressed in heterozygous offspring
 - ▶ Red flowers (RR) and White flowers (WW) making Red and White flowers (RW)
 - ▶ **Incomplete dominance:**
 - ▶ The phenotype is in between that of the parents
 - ▶ 2 Red flowers (Rr), making a White flower (rr) , 2 Pink flowers (Rr), and 1 Red flower (Rr)
 - ▶ Occurs when two or more alleles influences the phenotype



Review...

- ▶ **Explain the difference between genotype and phenotype**
 - ▶ **Genotype is the genetic makeup of an organism**
 - ▶ **Phenotype is the appearance of an organism as a result of its genotype**
- ▶ **Explain how probability is used to predict the results of genetic crosses**
 - ▶ **Mendel's experiments showed that in the F₂ generation, the dominant trait will be expressed about 75% of the time (3/4), and the recessive trait about 25% (1/4)**



Learn Long
Live Long

