

# Mendelian Genetics

<https://www.youtube.com/watch?v=Mehz7tCxiSE>







# Gregor Mendel (1822-1884)

- Austrian monk
- Studied the Inheritance of Traits in pea plants
- Developed the Laws of Inheritance
- Mendel's work was not recognized until the 20th century



# Genetics Terminology





- trait- any characteristic that can be passed from parent to offspring
- heredity- the process of passing traits from parent to offspring
- genetics- study of heredity

		 pollen ♂	
		B	b
 pistil ♀	B	 BB	 Bb
	b	 Bb	 bb

# Types of Crosses

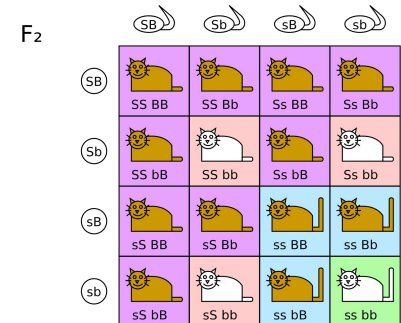
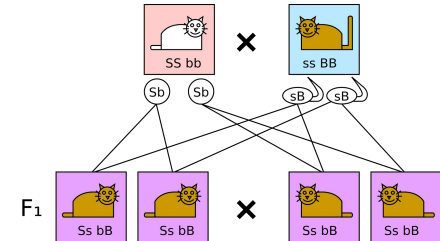
- **Monohybrid cross**- cross involving a single trait

- Example: Flower color

		pollen ♂	
		B	b
pistil ♀	B	 BB	 Bb
	b	 Bb	 bb

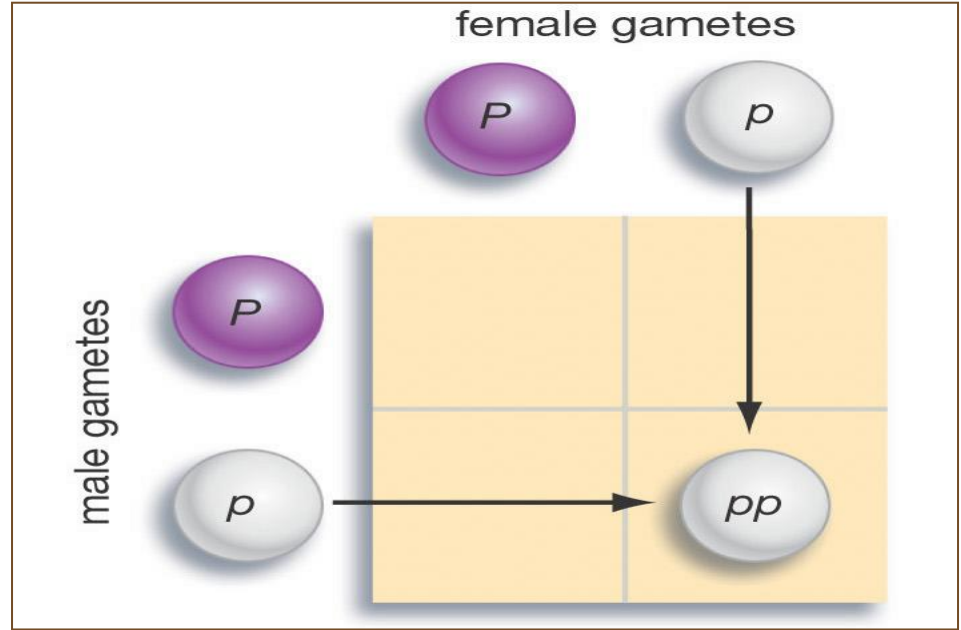
- **Dihybrid cross**- cross involving two traits

- Example: flower color and plant height



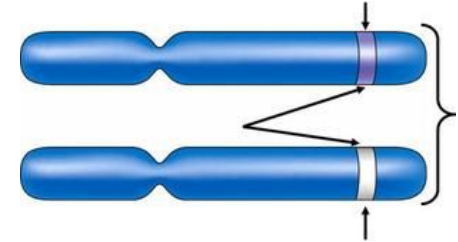
# Punnett Square

Used to help solve genetics problems



# Genetics Terminology

- **Allele** - two forms of a gene (dominant and recessive)
- **Dominant**- stronger of two genes expressed in a hybrid
  - represented by a capital letter (example: R)
- **Recessive**- gene that shows up less often in a cross
  - represented by a lowercase letter (example: r)

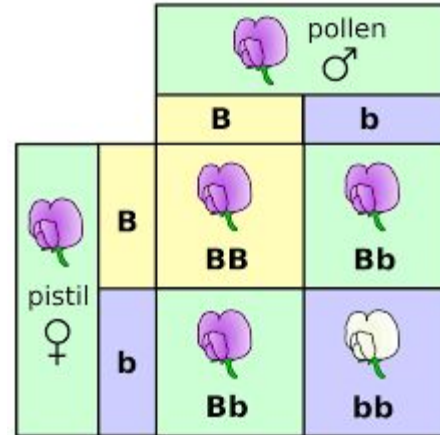


	R	r
R	RR	Rr
r	Rr	<del>rr</del>

		Father's Gametes	
		D	d
Mother's Gametes	D	DD	Dd
	d	Dd	dd

# Genetics Terminology

- **Genotype**- gene combination for a trait (i.e. RR, Rr, rr)
- **Phenotype**- the physical feature resulting from a genotype (i.e. red, white)



# Genotype and Phenotype in Flowers

Genotype of alleles:

**R** = red flowers

**r** = yellow flower

- All genes occur in pairs, so 2 alleles affect a characteristic.
- Possible combinations are:

GENOTYPES:

**RR**

**Rr**

**rr**

PHENOTYPES:

Red

Red

Yellow





# Genetics Terminology

- **Homozygous Genotype**- gene combination involving 2 dominant or 2 recessive genes

- Example: RR or rr
- Also called pure



- **Heterozygous Genotype**- gene combination of one dominant and one recessive allele

- Example: Rr
- Also called hybrid

