

Gregor Mendel-1860s

The "Father of Genetics"

His jobs Austrian monk, teacher, scientist, and gardener

Used easy to grow, relatively short time period per generation (3 months), because self-pollinating, and created purebreds

scientist

True-breeding 7 simple traits without genetic variation

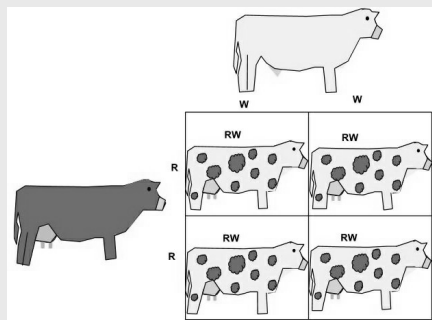
Used brushes to pollinate

P¹ parental generation

Punnet Squares - Monohybrid Cross

	T	t
t	Tt	tt
t	Tt	tt

Punnet Squares - Codominance



Chromosomes and Genes

Homologous chromosomes contain genes for the same traits

Traits are controlled by alleles

The genotype is the alleles received at fertilization

Phenotype is the physical appearance

Principle of Dominance

F¹ plants resembled one parent

F¹ hybrids contained *two* factors for each trait

1. Dominant masks recessive

2. Recessive "disappears" with dominant allele

Inheritance Patterns

Homozygous Dominant two dominant alleles (BB)

Homozygous recessive two recessive alleles (bb)

Heterozygous one dominant and one recessive allele (Bb)

Punnet Squares - Dihybrid Cross

	BbSs		BbSs	
	BS	Bs	bS	bs
BS	BBSS	BBSs	BbSS	BbSs
Bs	BBss	BBss	Bbss	Bbss
bS	BbSS	BbSs	bbSS	bbSs
bs	Bbss	Bbss	bbss	bbss

two pairs of contrasting traits

Polygenic Traits

When 2 or more genes control a trait

Skin color 4-7 genes + melanin

Eye Color blue (light melanin) + brown (a lot of melanin)

Height

Test Crosses

Unknown genotype x known genotype

important to breeders

performed with homozygous recessive

Probability

The mathematical chance of an event occurring

3 ways to express percent, decimal, or fraction

Law of Probability in the case where there are several possible outcomes and the chances are equally likely, they will even out to follow the predicted probability in large sample sizes

Incomplete Dominance

Ex.) red + white = pink

3 phenotypes

neither alleles are *completely* dominant

Alleles

homozygous dominant RR

homozygous recessive R'R'

heterozygous RR'

Codominance

neither allele is dominant or recessive

Ex.) white + red = red & white

3 phenotypes

Alleles

red coat RR

white coat RR

mixed RW

Punnet Squares - Incomplete Dominance

	R	W
R	RR	RW
W	RW	WW