

# Genetics and Probability



# Learning Objectives

- Describe how geneticists use Punnett squares

# Genetics and Probability

**Probability** - the likelihood that a particular event will occur.

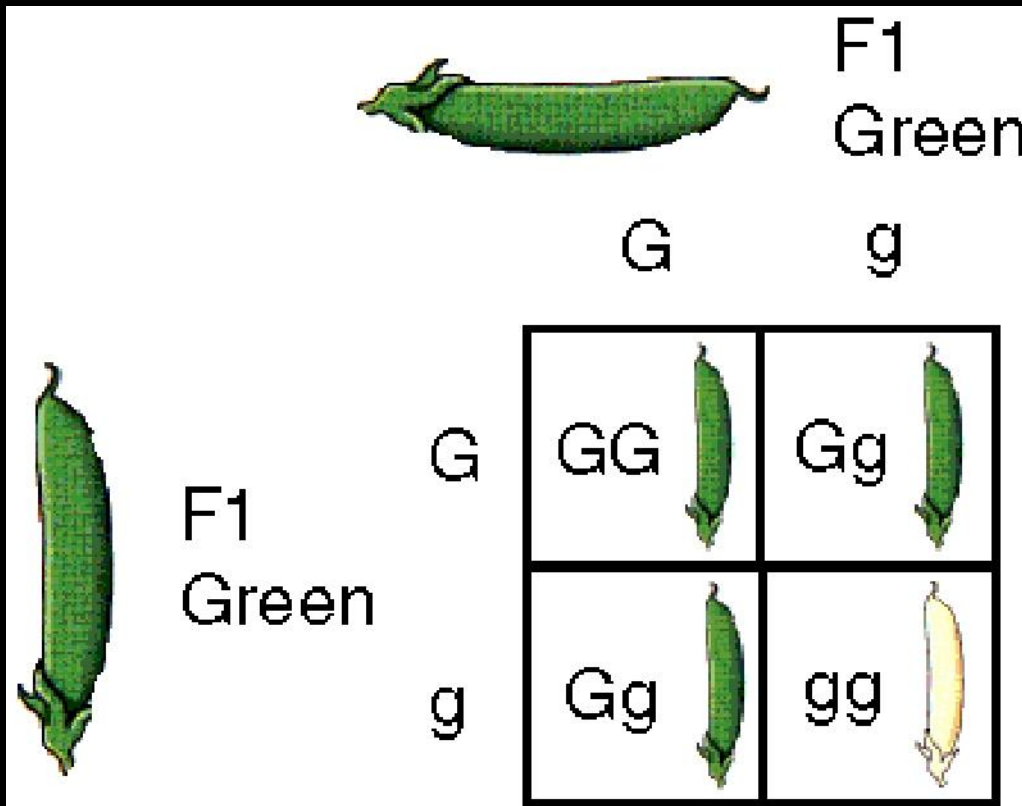
The principles of probability can be used to predict the outcomes of genetic crosses.

**PUNNETT SQUARES!**



# Punnett Squares

Punnett squares can be used to predict and compare the genetic variations that will result from a cross.

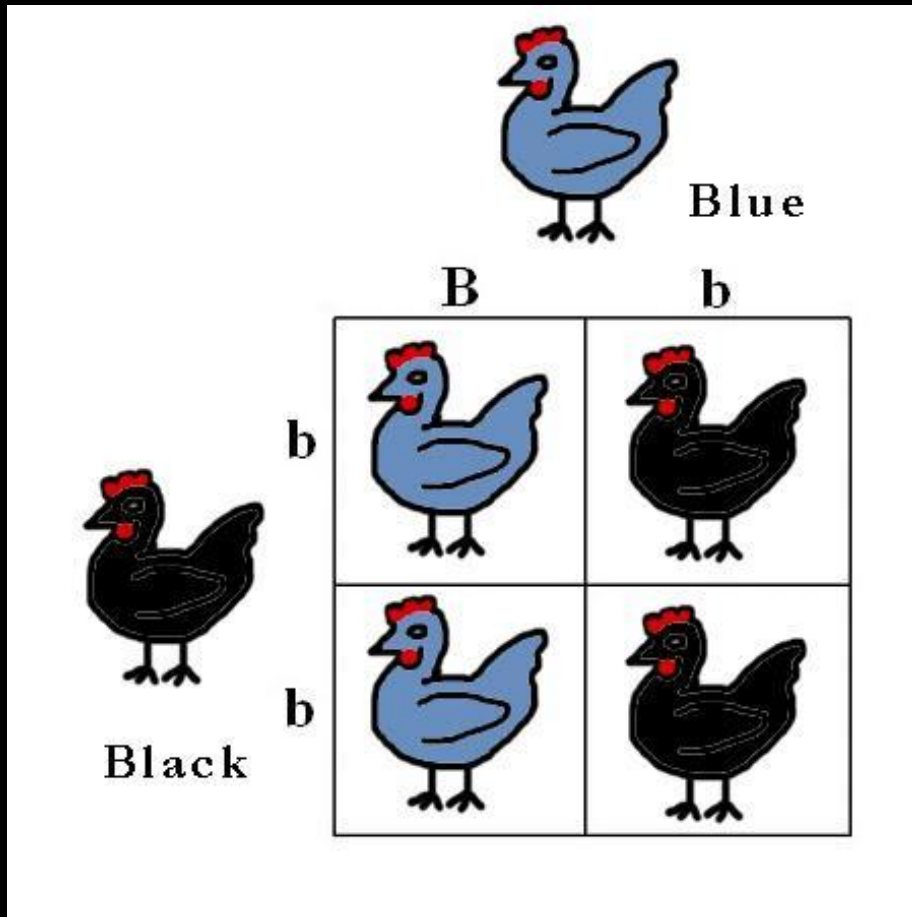


Capital letter (G) = dominant allele for green

Lowercase letter (g) = recessive allele for yellow

The dominant allele will mask the recessive allele

# How to Make a Punnett Square



Blue (Bb) = Dominant  
Black (bb) = Recessive

	B	b
b	Bb	bb
b	Bb	bb

Bb X 2 or 2/4 or 50%

bb X 2 or 2/4 or 50%

# Punnett Square Practice

Yellow (A) = Dominant  
Green (a) = Recessive

	A	a
A	AA	Aa
a	Aa	aa

What are the phenotype(s) and genotype(s) of the offspring?

Yellow and Green  
AA, Aa and aa

Identify the percentages for each genotype.

AA – 1/4 or 25%

Aa - 2/4 or 50%

aa – 1/4 or 25%

# Punnett Square Practice

Tall (T) = Dominant  
Short (t) = Recessive

	T	T
t	Tt	Tt
t	Tt	Tt

What are the phenotype(s) and genotype(s) of the offspring?

Tall  
Tt

Identify the percentages for each genotype.

Tt - 4/4 or 100%

# YouTube Video

Genetic Series - Video 1

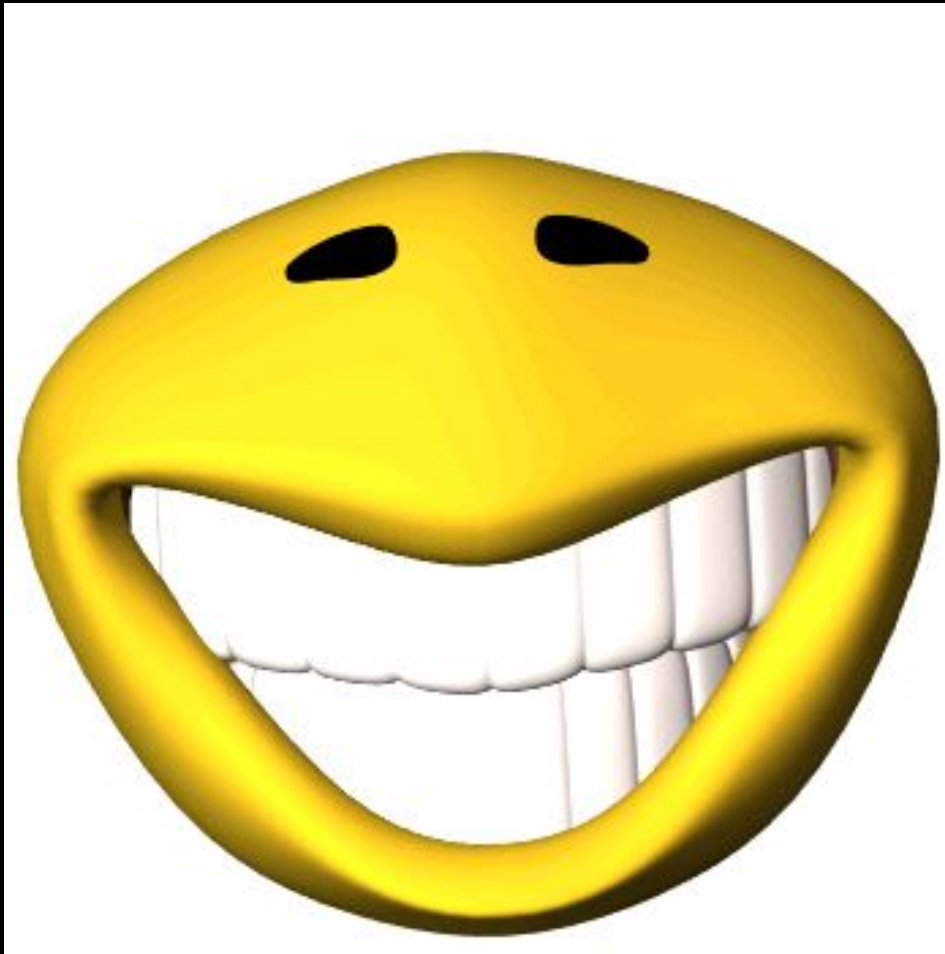
A Punnett square diagram for a monohybrid cross of hamsters. The top parent is homozygous dominant (HH) and the bottom parent is homozygous recessive (hh). The Punnett square shows all offspring are heterozygous (Hh).

H	H	H	H
h	Hh	Hh	Hh

**Monohybrid Crosses**  
With the Amoeba Sisters







Stop Here



# Punnett Square Example

Tall (T) = Dominant  
Short (t) = Recessive

Tt crosses with Tt

		T	t
T	 TT 25%	 Tt 25%	
t	 Tt 25%	 tt 25%	

TT	Tt
Tt	tt

TT X 1 or 1/4 or 25%

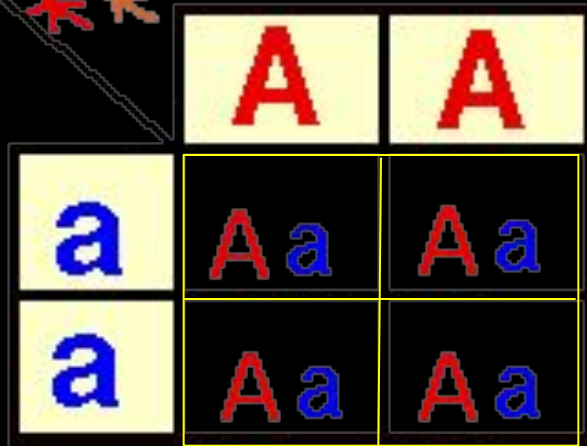
Tt X 2 or 2/4 or 50%

tt X 1 or 1/4 or 25%

# Punnett Square Example

Red (A) = Dominant  
Blue (a) = Recessive

AA crosses with aa



	A	A
a	Aa	Aa
a	Aa	Aa

Aa	Aa
Aa	Aa

Aa X 4 or 4/4 or 100%  
All offspring will be red

YouTube Video

What are Punnett  
Squares?