

6F: Inheritance Patterns



Mendelian Inheritance

In Activity: How are traits carried in the DNA of organisms?

Father of Modern Genetics

Name and occupation:

Year:

Plant studied:

Conclusions drawn:



Genes and Alleles

Genes:

Alleles:

Remember: How many copies of each allele are in gametes (sex cells)?

Dominant vs Recessive

Dominant Alleles:

1. Represented by a _____ letter.

2. Trait will _____ appear. Only _____ allele is needed.

Recessive Alleles:

1. Represented by a _____ letter.

2. Trait will not appear unless _____ alleles are present.

GENOTYPES: Label the following pairs of alleles as homozygous (purebred) or heterozygous (hybrid).

- TT _____
- Tt _____
- tt _____

PHENOTYPES: If the "T" allele represents "tall" and the "t" allele represents "short," write whether the following plants will be tall or short.

- TT _____
- Tt _____
- tt _____

Genotype vs Phenotype

Using the previous example, what definition would you give the word "genotype"?:

Using the previous example, what definition would you give the word "phenotype"?:

Monohybrid Cross: Cross two hybrid tall plants.

Tall is dominant to short

Phenotypic Ratio:

	T	t
T		
t		

_____ : _____
Tall Short

Genotypic Ratio:

_____ : _____ : _____
TT Tt tt

TT= homozygous dominant = ___ of 4 = ___%

Tt= heterozygous dominant = ___ of 4 = ___%

tt= homozygous recessive = ___ of 4 = ___%

Probability of tall plant: ___ of 4 = ___%

Probability of short plant: ___ of 4 = ___%

Dihybrid Cross: Cross one homozygous dominant plant and one homozygous recessive plant.

Before starting, you must

F _____
O _____
I _____
L _____

Parent 1 _____ Parent 2 _____
FOIL 1 FOIL 2

Smooth & Yellow: _____ of 16

Smooth & Green: _____ of 16

Wrinkled & Yellow: _____ of 16

Wrinkled & Green: _____ of 16

Phenotypic Ratio: _____ : _____ : _____ : _____

6F: Inheritance Patterns



Practice: Mendelian Genetics

MONOHYBRID CROSSES:

Crosses looking at _____ pair of alleles.

Distinguishing F₁ from F₂ Generations:

"F" stands for filial, which refers to generations

- F₁ Cross:** Tall is dominant to short . Cross a homozygous tall plant with a homozygous short plant.

Phenotypic Ratio:

_____ : _____
Short Tall

Genotypic Ratio:

_____ : _____ : _____
tt Tt TT

TT= homozygous dominant = ___ of 4 = ___%

Tt= heterozygous dominant = ___ of 4 = ___%

tt= homozygous recessive = ___ of 4 = ___%

Probability of tall plant: _____ of 4 = ___%

Probability of short plant: _____ of 4 = ___%

- F₂ Cross:** Pick two genotypes from the F₁ cross and complete the Punnett square below.

Phenotypic Ratio:

_____ : _____
Short Tall

Genotypic Ratio:

_____ : _____ : _____
tt Tt TT

TT= homozygous dominant = ___ of 4 = ___%

Tt= heterozygous dominant = ___ of 4 = ___%

tt= homozygous recessive = ___ of 4 = ___%

Probability of tall plant: _____ of 4 = ___%

Probability of short plant: _____ of 4 = ___%

DIHYBRID CROSSES:

Crosses looking at _____ pairs of alleles.

- Cross between 2 heterozygous parents.

R = Smooth
G = Green

r = Wrinkled
g = Yellow

Before starting,
you must

Parent 1 _____ Parent 2 _____

FOIL 1

FOIL 2

F _____

O _____

I _____

L _____

Smooth & Green: _____ of 16

Phenotypic Ratio:

Smooth & Yellow: _____ of 16

Wrinkled & Green: _____ of 16

Wrinkled & Yellow: _____ of

- SHORTCUT!** Cross a homozygous smooth and green plant with a heterozygous round, homozygous green plant. What fraction will be wrinkled and green?

Parent 1 _____ x Parent 2 _____

Fraction of wrinkled x fraction of green = # wrinkled and green