***Mendelian Genetics* – Notes Guide** **Name: _____**

Genotypes, Phenotypes, and Mutations

Who was Gregor Mendel?

Gregor Mendel: _____

Worked with _____

Mendel studied phenotypes: _____

such as: _____ peas x _____ peas

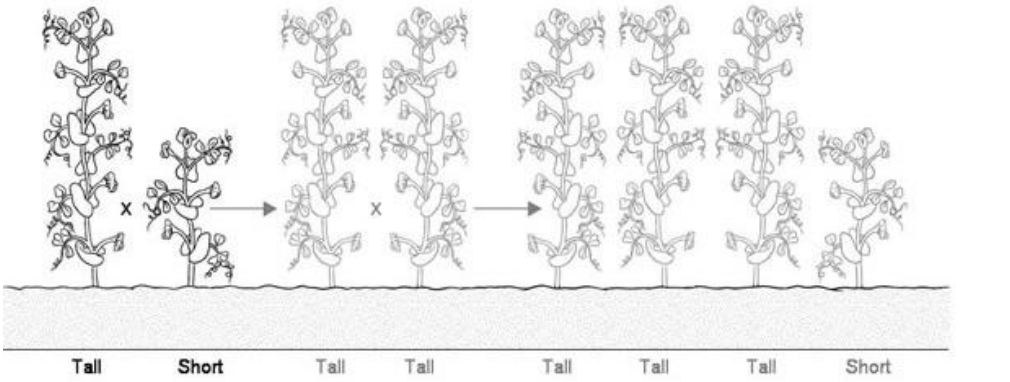
_____ pods x _____ pods

_____ plants x _____ plants

An example…

Label the plants: _____ _____ _____

Some terminology…



***Genotype**:* The genetic make-up of an individual, usually representing _____and _____ alleles by using capital and lowercase letters.

***Phenotype**:* The _____ _____ _____ that are a result of the organism's genetic make-up

***Allele**:* one _____ of a gene

***Dominant**:* An allele that _____ when _____

***Recessive**:* An allele that shows if _____ _____ _____ is present for that gene

Important terminology

Homozygous: both alleles are the _____ for the same gene (TT or tt)

Heterozygous: 2 _____ alleles for the same gene (Tt)

Autosomal: Alleles located on the _____ (non-sex chromosomes)

Sex-linked: Alleles located on one of the _____ _____

Mammals: _____ have XX, _____ have XY

Birds: _____ of mammals (Males _____, Females _____)

Phenotypes (draw arrows to the individual phenotypes:

Head color

Breast color

Body color

Breast color – _____

Head color – _____

Body color – _____ and/or _____

Breast color – Dominant: _____ Recessive: _____

Head color – Dominant: _____ Recessive: _____

Body color – Dominant: _____ Recessive: _____

Punnett Practice!

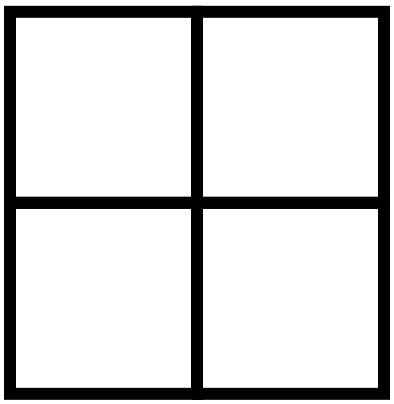
Cross a red head male who had a black head parent with a black head female.

P: _____ x _____

F_1:

Genotypic ratio: _____

Phenotypic ratio: _____



Blue and Gold Macaw

Blue and gold macaws inhabit the forests of _____

A mutation randomly appeared that eliminated the _____ coloration

The result is a mutation called "_____ macaw"

Macaw Mutation

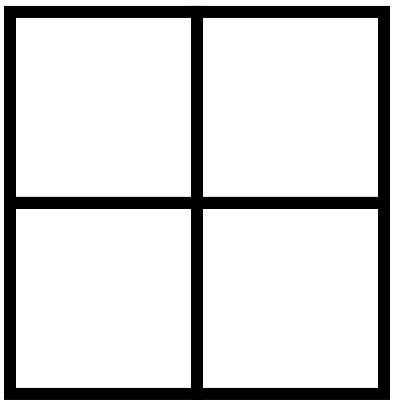
Cross a heterozygous female with a golden male.

P: _____ x _____

F_1:

Genotypic ratio: _____

Phenotypic ratio: _____

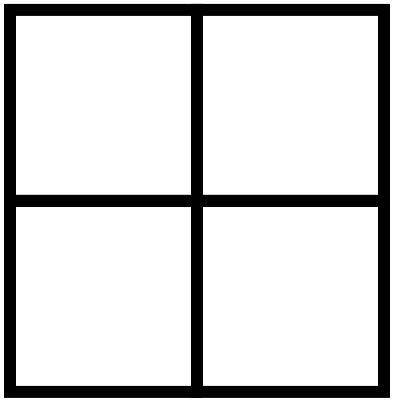


Other examples

_____ (*Forpus* spp.) are the smallest parrot in the world

The wild type is the _____ color pictured which is dominant

_____ mutations have also been bred for such as yellow, blue, and white



Parrotlet Punnett Practice!

Cross a heterozygous male with a heterozygous female.

P: _____ x _____

F_1:

Genotypic ratio: _____

Phenotypic ratio: _____

What is the chance that green offspring carry the blue gene? _____

Traits are not passed alone

In many cases, it is a _____ of genes that result in a new phenotype.

In Pacific parrotlets, the _____ mutation is actually the presence of both the _____ and the _____ mutation together.

This means the pigment _____ that would result in each color are mutated and do not function as they normally would.

Because individuals receive an allele for each gene from each parent, _____ genes would involve _____ alleles.

Two traits: Dihybrid cross

When a parrotlet shows both blue and yellow in its phenotype, a "_____" phenotype is the result.

Cross a wild type green male who is heterozygous for blue and yellow with a female of the same genotype.

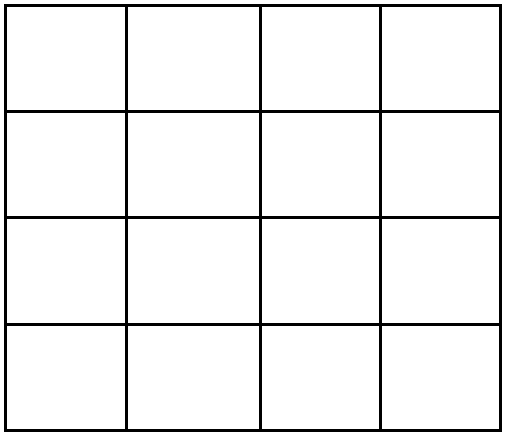
Cross a heterozygous male with a heterozygous female.

P: _____ x _____

F_1:

Genotypic ratio: _____

Phenotypic ratio: _____



What happens over generations?

Follow the story on the presentation and use the Punnett squares below to help answer the genetics questions.

Cross these 2 cockatiels (P) to show how their chicks came to look the way they did.

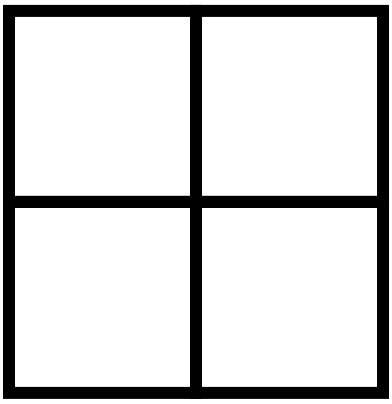
P: _____ x _____

F_1:

Genotypic ratio: _____

Phenotypic ratio: _____

What percentage of the offspring may carry the pied allele? _____



Cross these 2 cockatiels (F_1) to show how their chicks came to look the way they did.

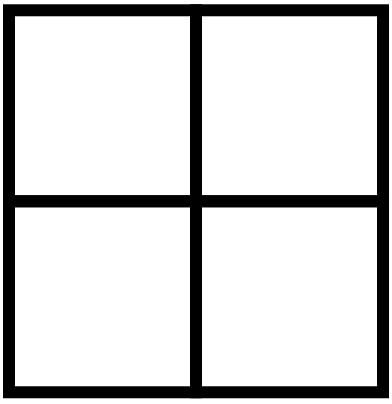
P: _____ x _____

F_1:

Genotypic ratio: _____

Phenotypic ratio: _____

What percentage of the offspring may carry the pied allele? _____



Some questions to consider:

What did this pattern of inheritance over the generations tell you about the pied allele? _____

_____

If two pied cockatiels were paired, what would the offspring look like? _____

_____