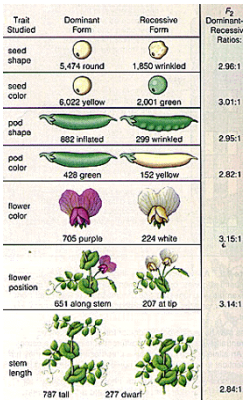
NOTES: 11.1 - THE WORK OF GREGOR MENDEL



Vocabulary:

- Genetics
- True-breeding
- Trait
- Hybrid
- Gene
- Gamete
- Allele
- Segregation

Key Concepts:

•What is the principle of dominance?
•What happens during segregation?

Background

• Mendel was an Austrian monk who was in charge of the monastery garden.

• His work with pea plants has led to him being considered the "Father of Modern Genetics."

• Genetics:_____

Pea plant structure:

• Reproduction occurs through_____

• Male part of the flower contains pollen →_____

• Female part of the flower contains _____ → female sex cells

• When pollen fertilizes an egg cell, a seed for a new plant is formed

• Pea plants normally fertilize by _____ (pollen and egg are from the same flower)

• When Mendel took charge of the monastery garden, he had several_____ plants (if allowed to self-pollinate, offspring would be identical)

➔ Some would produce only green seeds, others only yellow, some tall, and some only short

Mendel's Experiments

- Mendel controlled the reproduction of pea plants
- He would _____plants (pollen and egg from different pea plants)
  - –Two different pea plant parents
  - –_____plants from self-pollinating

GENES & DOMINANCE

• Mendel studied several different pea plant traits

-**Trait**: _____ (ex: seed color or plant height) that _____ from one individual to another

• Mendel's Labels for pea plant generations

–Original pair of plants:_____

–Offspring of "P" generation:_____

–Offspring of crosses between true-breeding parents with_____traits

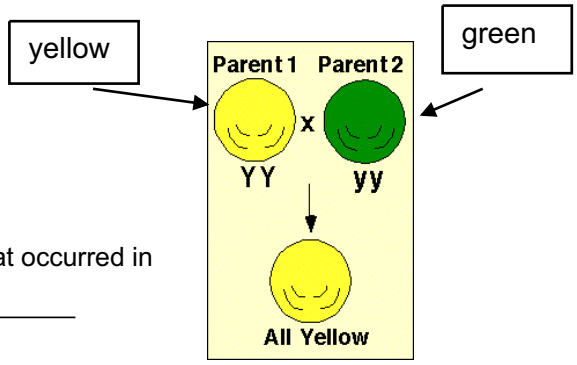
(ex: yellow x green seeds):_____

HYBRIDS

• What were the F_1 hybrids like? Did the characters of the parent plants blend in the offspring?

•_____!! All of the offspring had the character of only _____; the character of the other parent seemed to have_____.

Mendel's 2 Conclusions



#1) Biological inheritance is determined by "_____"

that are passed from one generation to the next

–"factors" = _____determine traits

–Each of the traits Mendel studied was controlled by one **GENE** that occurred in

_____

• EX: **GENE** = seed color ; 2 contrasting forms = _____

–2 contrasting forms: _____

•ALLELE #1: _____ ALLELE #2: _____

#2) _____: some alleles are dominant and others are recessive

–Inherit 2 dominant alleles: _____

–Inherit 2 recessive alleles: _____

–***Inherit 1 dominant and 1 recessive allele, the*** _____ ***!***

Dominant vs. Recessive

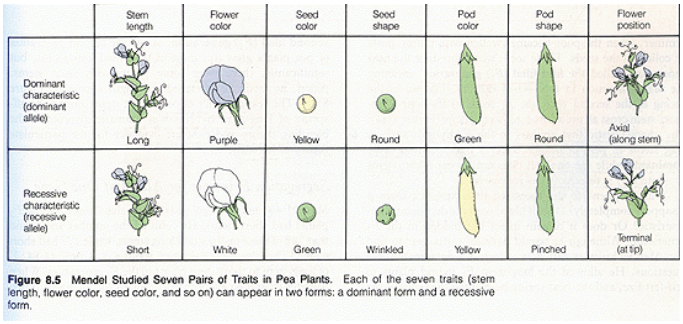


Figure 8.5 Mendel Studied Seven Pairs of Traits in Pea Plants. Each of the seven traits (stem length, flower color, seed color, and so on) can appear in two forms: a dominant form and a recessive form.

➡ DOMINANT

➡ recessive

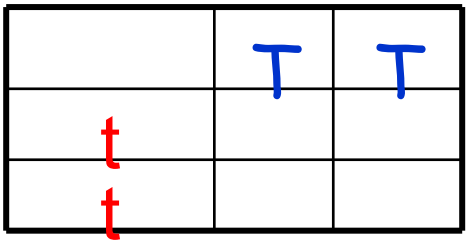
Segregation

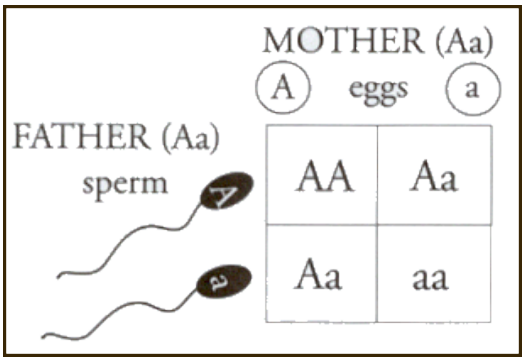
• This led Mendel to ask: *Had the recessive alleles disappeared forever?*

• To answer this he allowed the F_1 hybrid plants to _____ to produce an_____.

HOW DID THE RECESSIVE ALLELE COME BACK?

~~LABEL THESE~~





• When each F_1 plant flowers, the 2 alleles are_____(_____) from each other so that each _____ (**SEX CELL**) carries only a single copy of each gene

• Therefore, each F_1 plant produces _____

–those with an allele for _____

–those with an allele for _____

• ALLELES: _____