**7.1 What is heredity?**

Mendel: “Father of Genetics”

Heredity is the passing of physical characteristics from parents to offspring. **Explain: “Mendel wondered why different pea plants had different characteristics. Some were tall while others were short.”**

Specific characteristics such as height and color is called a trait. **Explain “just like you have some traits from your parents such as eye color or hair color, some traits are also different”**

The study of heredity is known as genetics.

Today scientists use the term gene to describe the factors that control a trait.

Alleles are different forms of a gene.

* affect inheritance.
  + An organism’s traits are controlled by the allele’s it inherits from its parents.
  + Some alleles are dominant, while other alleles are recessive.

A dominant allele is one whose trait always shows up in the organism when the allele is present. Represented with a CAPITAL letter.

A recessive allele, on the other hand is hidden whenever the dominant allele is present. Represented by the lowercase version of the same letter as used by the dominant allele.

Example of symbols for alleles: Tall=T, short=t

Why is this important?

Mendel’s discovery of genes and alleles eventually changed scientists’ ideas of heredity. **Explain: “Before Mendel, most people thought that the traits of an individual organism were simply a blend of the parents’ characteristics.”**

Mendel showed that offspring traits are determined by individual, separate alleles inherited from each parent. Because of his work, Mendel is often called the “Father of Genetics.”   
Watch video : <https://www.youtube.com/watch?v=Mehz7tCxjSE> then discuss. Good time to introduce vocab they’ll see in 7.2!   
Parent 1: YY (homozygous “purebred” dominant for yellow) Parent 2: yy(homozygous “purebred” recessive for green  
genotype- geness/alleles that make up the organism (Parent 1: YY homo dom, Parent 2: yy homo recess)  
phenotype-physical trait represented (yellow) (Parent 1: yellow, Parent 2: green) PUNNETT SQUARE

**Y Y**

y **Y**y **Y**y

y **Y**y **Y**y  
  
Now **F1** generation (F=filial=son/daughter) are hybrids (heterozygous meaning they have different types of alleles). All 4 are yellow because the dominant trait is present. Offspring= Genotype: Yy, phenotype: yellow  
Discuss what happens in **F2**. Go over on board. Students should understand that **F2** gives 3 yellow and 1 green and why. **\*have students complete assess your understanding pg. 280 & 283**

**7.2 Probability and heredity Notes:**

*How is probability related to inheritance?*

Probability: is a number that describes how likely it is that an event will occur.

The laws of probability predict what is *likely* to occur, not what *will* occur.

Ex: coin toss- 2 possible ways it can land-heads up or tails up.

*Probability & Genetics:*

Mendel was the first scientist to recognize that the principles of probability can predict the results of genetic crosses.

Explain: “A tool that can help you grasp how the laws of probability apply to genetics is called a Punnett square.”

A Punnett square is a chart that shows all the possible ways alleles can combine in a genetic cross. Explain: “Geneticists use Punnett Squares to see these combinations and to determine the probability of a particular outcome, or result.”

\*\*In a genetic cross, the combination of alleles that parents can pass to an offspring is based on probability.

*Phenotypes and Genotypes:*

An organism’s phenotype is its physical appearance, or physical traits. An organism’s genotype is its genetic makeup, or alleles. In other words, genotype is an organism’s alleles. Phenotype is how a trait looks or is expressed.

Homozygous (purebred)- an organism that has two identical alleles for a trait

Heterozygous (hybrid)- an organism that has two different alleles for a trait

\*\*Have students complete pg. 286-289 in textbook. Walk around to check figure 1 pg 286 (book check this week?)