

Name _____

Date _____ Per _____ Asst _____

GREGOR MENDEL

Answer Key

1. The basic laws of heredity were formed by an Austrian monk named *Gregor Mendel*.

Because his work laid the foundation to the study of heredity, Mendel is referred to as the *Father of Genetics*.
2. Mendel based his laws on the study of pea plants because they *reproduce rapidly* and they have many *visible traits*.
3. Examples of traits that Mendel observed were *pod shape, pod color, seed color, seed shape and plant height*.
4. Mendel termed plants that produce offspring with traits exactly like parent plants to be *purebred*.
5. In Mendel's first experiment, Mendel crossed purebred short with purebred tall plants.

These plants were termed the *parental* generation, or *P* generation.
6. The offspring produced by a cross of a purebred tall and short plant were all *tall*.
7. The generation of offspring produced by this first cross were called the first *filial* generation, or the *F1* generation. The word "filial" means *son*.
8. In Mendel's second experiment, he crossed two *F1* plants produced from his first experiment.
9. This second generation of plants are called the *second filial* generation, or the *F2* generation.
10. To his surprise, Mendel observed that the offspring of these two tall plants were both *tall and short*.

11. Mendel's first law is called the *Law of Segregation*. It has three parts. They are:
 1. Plant traits are handed down through *hereditary factors*.
 2. Because offspring obtain hereditary factors from both parents, each plant must contain *two* factors for every *trait*.
 3. The factors in a pair *separate*, or *segregate* during the formation of sex cells, and each sperm or egg receives only one member of the pair.
12. Today, scientists refer to the "factors" that control traits as *genes*.
13. The different forms of a gene are called *alleles*.
14. Alleles that hide or mask other alleles are said to be *dominant*.
15. A *recessive allele*, such as the short allele in pea plants, is masked or covered up whenever the dominant allele is present.
16. Purebred plants have two *identical* genes for a particular trait. Another term for purebred is *homozygous*.
17. When both alleles for a trait are present, the plant is said to be a *hybrid* for that trait. Hybrid alleles are also called *heterozygous*.
18. Mendel's second law is the *Law of Independent Assortment*. It states that the gene pairs will separate *independently* of each other in the production of sex cells.
19. Based on the alleles of the four traits shown in the frame, this plant has the color *yellow* seeds, the color *green* pods. In addition, it has a pod shape of *puckered*, and a seed shape of *round*.
20. According to Mendel's second law, is it possible for this plant to donate a yellow seed allele along with a green pod allele? *Yes*