

## Mendel and the Gene Idea

### Chapter 14

1. Define P generation, F<sub>1</sub> and F<sub>2</sub> generation, allele, dominant, recessive, homozygous, heterozygous, phenotype, and genotype.
2. Describe Mendel's laws of segregation and independent assortment.
3. Explain how one allele can result in a dominant phenotype while another can result in a recessive phenotype.
4. Describe how a testcross can be used to determine the genotype of an individual with a dominant phenotype.
5. Pea plants heterozygous for flower position and stem length (AaTt) are allowed to cross-pollinate, and 400 of the resulting seeds are planted. Draw a Punnett square for this cross. Predict the number of offspring that will have terminal flowers and be dwarf.
6. Pattypan squash is either white or yellow. In growing the plants, you notice that if you want to get white fruit at least one of the parents must be white. State which color is dominant.
7. For any gene with a dominant allele A and recessive allele a, predict the proportion of the offspring from an AA x Aa cross that would be homozygous dominant, homozygous recessive, and heterozygous.
8. Determine the probability of obtaining the indicated offspring in each of the following crosses:

Cross	Offspring	Probability
AAbb x AaBb	AAbb	
AaBB x AaBb	aaBB	
AABbcc x aabbCC	AaBbCc	
AaBbCc x AaBbcc	aabbcc	

9. Describe the difference between incomplete dominance and codominance.
10. If a man has blood type AB has a child with a woman with blood type O. Identify the possible blood types of the child and determine the probability of each occurring.
11. A rooster and hen, both with grey feathers, produce 15 grey, 6 black, and 8 white chicks. Explain the inheritance pattern observed. Predict the offspring of a cross between a grey rooster and a black hen. The black and white alleles are incompletely dominant, with heterozygotes being gray in color.