ADVANCED BIOLOGY: MENDEL AND THE GENE IDEA

(USE CHAPTER 14 AS A RESOURCE)

MENDEL USED THE SCIENTIFIC APPORACH TO IDENTIFY TWO LAWS OF INHERITANCE

1. Mendel’s Experimental, Quantitative Approach
2. Character
3. Trait
4. Mendel’s controls
5. True-breeding
6. Hybridization
7. P generation
8. F1 generation
9. F2 generation
10. The Law of Segregation

Dominant trait

Recessive trait

1. Mendel’s Model

(1)

(2)

(3)

(4)

1. Useful Genetic Vocabulary
2. Homozygous
3. Heterozygous
4. Phenotype
5. Genotype
6. The Test Cross
7. The Law of Independent Assortment
8. Monohybrids/monohybrid cross
9. Dihybrids/dihybrid cross
10. Law of Independent Assortment

THE LAWS OF PROBABILITY GOVERN MENDELIAN INHERITANCE

1. The Multiplication and Addition Rules Applies to Monohybrid Crosses
2. Multiplication Rule
3. Addition Rule
4. Solving Complex Genetics Problems with the Rules of Probability

INHERITANCE PATTERNS ARE OFTEN MORE COMPLEX THAN PREDICTED BY SIMPLE MENDELIAN GENETICS

1. Extending Mendelian Genetics for a Single Gene
2. Degrees of Dominance
3. Complete dominance
4. Incomplete dominance
5. Codominance
6. The Relationship between Dominance and Phenotype
7. Frequency of Dominant Alleles
8. Multiple Alleles
9. Pleiotropy
10. Extending Mendelian Genetics for Two or More Genes
11. Epistasis
12. Polygenic Inheritance
13. Nature and Nurture: The Environmental Impact on Phenotype
14. Integrating a Mendelian View of Heredity and Variation

MANY HUMAN TRAITS FOLLOW MENDELIAN PATTERNS OF INHERITANCE

1. Pedigree Analysis



1. Recessively Inherited Disorders
2. Albinism
3. Cystic Fibrosis
4. Sickle-Cell Anemia
5. Tay-Sach’s Disease



1. Dominantly Inherited Disorders
2. Achodroplasia
3. Polydactyl
4. Huntington’s Disease



1. Multifactorial Disorders
2. Genetic Counseling Based On Mendelian Genetics