

CHAPTER 11: INTRODUCTION TO GENETICS STUDY GUIDE KEY

Vocabulary:

1. Homologous Cells – have both sets of chromosomes; one from female and one from male.
2. Polygenic Traits – two or more genes are contributing to the phenotype.
3. Diploid Cells – cells that have both sets of homologous chromosomes.
4. Haploid Cells – cells that have only one set of genes (another words half).
5. Meiosis – the process in which the number of chromosomes per cell are cut in half in order to produce gametes.
6. Interphase – cells undergo a round of DNA replication forming duplicate chromosomes.
7. Tetrad – formed when 4 chromatids join together.
8. Principle of Independent Assortment – genes segregate independently from one another during the formation of gametes.
9. Genetics – study of inheritance.
10. Self – Pollination – occurs when male and female reproductive cells of the same plant join together to produce an embryo.
11. Pollen – male portion of the plant that contains the sperm.
12. Ova – female portion of the plant that contains the eggs.
13. Cross- Pollination – process in which the male reproductive cells join with the female reproductive cells of another plant to form a tiny embryo.
14. True – Breeding – occurs when two homozygous alleles reproduce. The offspring looks identical to the parent.
15. Fertilization – process in which male and female reproductive cells join to form a tiny embryo.
16. Hybrid – occurs when two heterozygous alleles reproduce. The offspring are a cross between the parents.
17. Trait – specific characteristic.

18. Gametes – reproductive cells.
19. Alleles – different forms of a gene.
20. Segregate – separation of gene types from one another.
21. Probability – the likelihood a certain event will occur.
22. Punnet Square – diagram showing the possible outcomes of a genetic cross.
23. Homozygous – organisms with identical alleles to each other.
24. Heterozygous – organisms with different alleles to each other.
25. Genotype – genetic makeup or code of a gene.
26. Phenotype – physical characteristics of a gene.
27. Codominance – both alleles contribute to the phenotypes.
28. Multiple Alleles – more than two possible alleles exist in a population.
29. Incomplete Dominance – neither allele is completely dominant so you get a mixture between the phenotypes.

Concepts to Know:

1. Mendel used the pea plant because it has a short life cycle, has lots of traits to study, is easy to handle in a lab, can easily be cross pollinated, reproduces sexually and produces lots of offspring.
2. He cut off the male portion of the plant (pollen) so that it was now completely female.
3. He dusted the pollen from a new pea plant onto the entirely female plant.
4. He was expecting to see a mixture between the traits. For example a yellow seed and a green seed making a lime-green seed.
5. He self pollinated the F1 generation and was able to produce all possible phenotypes and genotypes.
6. Use the Mendelian Genetics Notes (Seed Shape vs Seed Color) and the Two Factor Cross Worksheet (Hair Color vs Eye Color) from class to help you do this.

7. Be able to properly fill in a punnet square and then answer questions about it.

EXAMPLE:

You have a genetic cross between a brown haired, blue eyed person (GENOTYPE: Bbee) and a blonde haired, brown eyed person (GENOTYPE: bbEE). Fill in the following Punnet Square provided for the F1 generation.

	bE	bE	bE	bE
Be	BbEe	BbEe	BbEe	BbEe
Be	BbEe	BbEe	BbEe	BbEe
be	bbEe	bbEe	bbEe	bbEe
be	bbEe	bbEe	bbEe	bbEe

Questions:

1. What phenotypes were produced in the F1 generation?

Brown Hair, Brown Eyes and Blond Hair, Brown Eyes

2. What genotypes were produced in the F1 generation?

BbEe and bbEe

8. The probability of getting a brown haired, brown eyed person is 8/16 or 50% chance. The probability of getting a blonde haired, brown eyed person is 8/16 or 50% chance.

9. Use the flip book we made in class on Wednesday to help you study. The pictures and definitions are also found on pg 276 and 277 in the textbook.

10. Mitosis- used to replenish old, dying or injured cells. All cells except our gametes go through Mitosis. You produce two identical diploid cells to the parent.

Meiosis – used to make gametes (reproductive cells). You produce four haploid cells with exactly 1/2 the DNA as the original parent.

