

Biology 1113 Midterm #3 Study Guide

Each topic is the focus of each section from the book. The questions answered are from the concept questions at the end of the chapter. I don't claim that my answers are the only right answer. The guide follows a numerical order in which the chapters were taught. This guide utilizes concepts and concept questions from Campbell Biology, "Biology" by Reece, Urry, Cain, Wasserman, Minorsky, and Jackson. It also involves information learned from Professor Ball's lectures. Any of their work shown here is copyrighted and belongs to them respectively. I do not own any of this information. All images were acquired from Google images and their respective sources and they are also copyrighted and belong to them. I do not own any of these images.

Biology 1113

Reading Notes

2/27/14

Chapter 13: Meiosis and Sexual Life Cycles

Variations on a Theme:

Key characteristic life is the ability to reproduce

Organisms represent their parents more than other individuals

Heredity- The transmission of genes from one generation to the next (also known as inheritance)

Variation- Sons and daughters are not identical copies of either parent or any siblings

Genetics- The scientific study of heredity and hereditary variation

Concept 13.1: Offspring Acquire Genes from Parents by Inheriting Chromosomes

Inheritance of genes:

Genes- Hereditary units that contain coded information

- Examples are eye color and freckles
- Genes have specific sequences of nucleotides that determine traits
- Most genes program cells to synthesize specific enzymes and other proteins

Gametes- Reproductive cells are the "vehicles" that transmit genes from one generation to the next

- Gametes unite during fertilization

Somatic cells- All cells of the body except gametes and their precursors

Locus- A genes specific location along the length of a chromosome

Comparison of Asexual and Sexual Reproduction

Asexual reproduction- A single individual is the sole parent and passes copies of all its genes to its offspring without the infusion of gametes

- Offspring are genetic copies of their parents

Clone- A group of genetically identical individuals

- Created by individuals that reproduce asexually

Sexual Reproduction- Two parents give rise to offspring that have unique combinations of genes inherited from two parents.

- Genetic variation

Concept Check 13.1:

1. Explain what causes the traits of parents to show up in their offspring.

Answer: This is caused by the genes passed onto the offspring. Since they are sexually reproduced in this situation they are not genetically identical to their parents. Their nucleotide sequences in their DNA are unique.

2. How do asexually reproducing organisms produce offspring that are genetically identical to each other and their parents?

Answer: There is only one parent that undergoes mitotic cell division. This means there is no possible way for genetic variation to occur.

3. A horticulturist breeds orchids trying to obtain a plant with a unique combination of desirable traits. After many years, it works. To produce more plants like this one, should she cross breed it with another plant or clone it? Why?

Answer: She should clone it if she has what she wants for her orchids in regards to their traits. This is because if she cross breeds it these traits could no longer be present because cross breeding would result in genetic variation.

Concept 13.2: Fertilization and Meiosis Alternate in Sexual Life Cycles

Life cycle- Generation to generation sequence of stages in reproductive history of an organism, from conception to production of its own offspring.

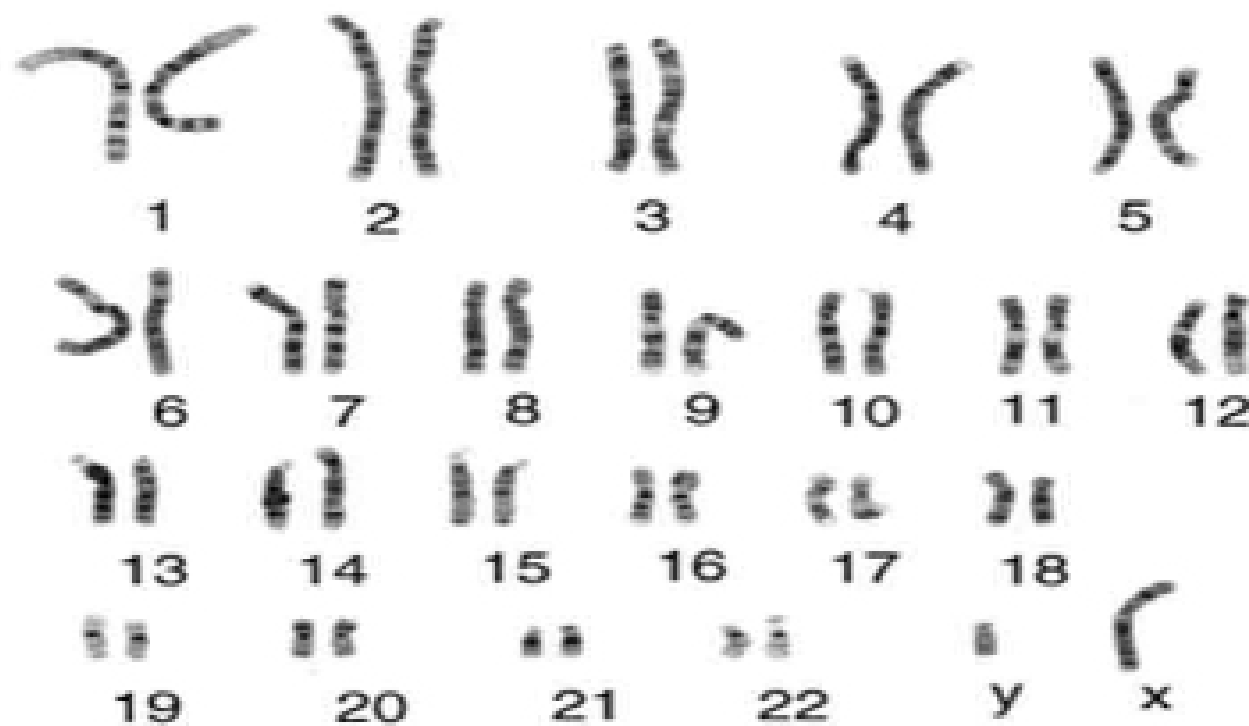
Sets of Chromosomes in Human Cells

Somatic cells in humans have 46 chromosomes

- 23 chromosomes from each parent

Karyotype- Images of chromosomes arranged in pairs starting with the longest chromosomes

Below is an image of a normal human karyotype



Homologous chromosomes- The two chromosomes composing a pair have the same length, centromere position, and staining pattern.

- Each chromosome codes for the same traits
 - o Example: If one codes for eye color the other also codes for eye color

Sex chromosomes- X & Y chromosomes

- XX=female
- XY=male

Autosomes- All other chromosomes

Number of chromosomes in a single set is represented by n

Diploid cell- Two chromosome sets

- Human diploid number is 46

Haploid cells- Half the number of the diploid

- Human haploid cells have 23 chromosomes