# Chapter 11 – Organism Reproduction

1. Asexual Reproduction
   1. B\_\_\_\_ F\_\_\_\_
      1. The process of cell division (\_\_\_\_\_ reproduction)
      2. in \_\_\_\_\_ organisms
      3. by which the parent cell divides into two genetically \_\_\_\_\_ cells.
   2. M\_\_\_\_\_
      1. Mitosisis the process of cell division by which \_\_\_\_\_ copies of \_\_\_\_\_ are divided
      2. to create two \_\_\_\_\_ cells,
      3. each with a complete set of \_\_\_\_\_ chromosomes.
      4. Has four steps
         1. P
         2. M
         3. A
         4. T
      5. Produces two identical cells in eukaryotes
   3. Advantages and Disadvantages
      1. Advantages
         1. It is \_\_\_\_\_.
         2. \_\_\_\_\_ numbers of offspring are produced.
         3. The parent does not have to find a \_\_\_\_\_.
      2. Disadvantages
         1. All of the offspring are exactly \_\_\_\_\_ . There is not variation.
         2. The ability to \_\_\_\_\_ to a changing environment is greatly reduced.
   4. Importance to living organisms
      1. G
      2. R
      3. R
   5. Asexual reproduction results in the production of organisms that are genetically identical, called \_\_\_\_\_.
2. Sexual Reproduction
   1. Overview
      1. Sexual reproduction requires \_\_\_\_\_ parents.
      2. Each parent passes \_\_\_\_\_ of its genes to its offspring.
         1. Male produces \_\_\_\_\_.
         2. Female produce \_\_\_\_\_.
   2. Advantages/Disadvantages
      1. Advantages
         1. All of the offspring are genetically \_\_\_\_\_ from each other (\_\_\_\_\_).
      2. Disadvantages
         1. The parent must find a \_\_\_\_\_.
         2. \_\_\_\_\_ offspring will be produced.
         3. It takes \_\_\_\_\_.
   3. Chromosomes are matched in homologous pairs
      1. In humans, \_\_\_\_\_ have \_\_\_\_\_ chromosomes forming \_\_\_\_\_ of homologous chromosomes.
         1. \_\_\_\_\_ are the two copies of each chromosome, on coming from the mother and one coming from the father.
         2. \_\_\_\_\_ chromosomes are matched in
            1. \_\_\_\_\_ \_\_\_\_\_ position
            2. Staining pattern
         3. A \_\_\_\_\_ (plural, loci) is the \_\_\_\_\_.
         4. Different versions of a gene may be found at the same locus on the two chromosomes of a \_\_\_\_\_.
      2. The human Sex chromosomes \_\_\_\_\_ differ in size and genetic composition.
      3. The other 22 pairs of chromosomes are \_\_\_\_\_ with the same size and genetic composition.
   4. G\_\_\_\_\_ have a single set of chromosomes
      1. An organism’s \_\_\_\_\_ is the sequence of stages leading from the adults of one generation to the adults of the next.
      2. Humans and many animals and plants are \_\_\_\_\_ (2n), because all somatic cells contain pairs of homologous chromosomes.
      3. Gametes
         1. Are \_\_\_\_\_ and \_\_\_\_\_.
         2. Are \_\_\_\_\_ (n) because each cell has a single set of chromosomes.
      4. The human life cycle begins when a haploid sperm fuses with a haploid egg in \_\_\_\_\_.
      5. The \_\_\_\_\_ formed by fertilization, is now diploid.
      6. \_\_\_\_\_ of the zygote and its descendants generates all the somatic cells into the adult form.
      7. Gametes (haploid sex cells) are made by \_\_\_\_\_ in the ovaries and testes.
      8. Meiosis is a type of \_\_\_\_\_ that produces \_\_\_\_\_ gametes in \_\_\_\_\_ organisms
      9. Two haploid gametes may then combine in \_\_\_\_\_ to restore the \_\_\_\_\_ in the zygote.
      10. Meiosis \_\_\_\_\_ the chromosome number by half:
          1. \_\_\_\_\_ cells contain half the number of chromosomes as the \_\_\_\_\_ cell.
          2. Preceded by \_\_\_\_\_ and followed by two divisions
             1. \_\_\_\_\_
             2. \_\_\_\_\_
          3. Fertilization then restores the diploid (2n) number
   5. Meiosis reduces the chromosome number from diploid (2n) to haploid (n)
      1. Meiosis and Mitosis are \_\_\_\_\_ by the duplication of chromosomes (\_\_\_\_\_ replication).
      2. However,
         1. Meiosis is followed by \_\_\_\_\_ consecutive cell divisions.
         2. Mitosis is followed by only \_\_\_\_\_ cell division.
      3. Because in Meiosis, one duplication of chromosomes is followed by \_\_\_\_\_, each of the \_\_\_\_\_ daughter cells produced has a \_\_\_\_\_ set of chromosomes.
      4. I\_\_\_\_\_:
         1. like mitosis, meiosis is preceded by an interphase, during which the \_\_\_\_\_.
         2. Replicated copies called \_\_\_\_\_
         3. Held together at the \_\_\_\_\_
      5. Meiosis I
         1. P\_\_\_\_\_ I (key events):
            1. The \_\_\_\_\_ membrane dissolves.
            2. \_\_\_\_\_ tightly coils up.
            3. \_\_\_\_\_ chromosomes, each composed of \_\_\_\_\_ come together in pairs in a process called \_\_\_\_\_.
            4. During synapsis, chromatids of homologous chromosomes \_\_\_\_\_ in a process called \_\_\_\_\_ \_\_\_\_\_.
            5. The chromosome \_\_\_\_\_ move toward the center of the cell.
            6. Tetrads form
            7. Crossing over

\_\_\_\_\_ in a tetrad cross over each other.

Pieces of chromosomes or genes are \_\_\_\_\_

Produces \_\_\_\_\_ in the offspring.

* + - 1. M\_\_\_\_\_ I
         1. \_\_\_\_\_ align at the cell \_\_\_\_\_
         2. \_\_\_\_\_ chromosomes align
      2. A\_\_\_\_\_ I
         1. Homologous pairs \_\_\_\_\_ and move toward \_\_\_\_\_ poles of the cell.
         2. Unlike mitosis, the \_\_\_\_\_ making up each double chromosome remain attached.
         3. When the \_\_\_\_\_ are pulled apart, this reduces the diploid number (2n) to the haploid number (n).
      3. T\_\_\_\_\_ I
         1. Duplicated chromosomes have reached the \_\_\_\_\_.
         2. Usually, \_\_\_\_\_ occurs along with Telophase.
         3. These cells are \_\_\_\_\_; but there are two copies of the same \_\_\_\_\_ in the chromosomes in each of the two cells formed.
         4. \_\_\_\_\_ envelope reappears
         5. \_\_\_\_\_ disappears
    1. Meiosis II
       1. Follows meiosis I \_\_\_\_\_ chromosome duplication
       2. Each of the two \_\_\_\_\_ that are products of Meiosis I enters Meiosis II
       3. Prophase II
          1. A \_\_\_\_\_ forms and moves \_\_\_\_\_ toward the middle of the cell.
          2. \_\_\_\_\_ coils into chromosomes
       4. Metaphase II
          1. Chromosomes align at the \_\_\_\_\_ like they are in mitosis.
          2. Chromosomes attach to \_\_\_\_\_.
       5. Anaphase II
          1. Sister Chromatids \_\_\_\_\_.
          2. Individual chromosomes move toward \_\_\_\_\_ poles.
          3. \_\_\_\_\_ split.
       6. Telophase II
          1. Chromosomes have reached the \_\_\_\_\_ of the cell.
          2. A \_\_\_\_\_ envelope forms around each set of chromosomes.
          3. With cytokinesis, \_\_\_\_\_ are produced.
  1. Meiosis in Human Males
     1. Occurs in the \_\_\_\_\_
     2. Two divisions produce \_\_\_\_\_
     3. Starts at the beginning of \_\_\_\_\_
     4. Men produce about 250,000,000 sperm per day.
  2. Meiosis in human females
     1. Occurs in the \_\_\_\_\_
     2. Produces \_\_\_\_\_ that die and 1 \_\_\_\_\_
     3. Polar bodies die because of unequal division of \_\_\_\_\_
     4. Immature egg called \_\_\_\_\_
     5. Starting at \_\_\_\_\_, one oocyte matures into an egg every \_\_\_\_\_ days.
  3. Mitosis and Meiosis have important similarities and differences
     1. Mitosis and meiosis both begin with \_\_\_\_\_ (2n) parent cells that have \_\_\_\_\_ during the previous interphase.
     2. However, the end products differ:
        1. Mitosis produces two genetically identical diploid (2n) \_\_\_\_\_ daughter cells.
        2. Meiosis produces four genetically unique \_\_\_\_\_.

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| --- | --- | --- |
|  | **Mitosis** | **Meiosis** |
| **Number of divisions** |  |  |
| **Number of daughter cells** |  |  |
| **Genetically identical?** |  |  |
| **Chromosome #** |  |  |
| **Where** |  |  |
| **When** |  |  |
| **Role** |  |  |