# 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** |  |  |