

Cell, DNA. Mitosis and Meiosis worksheet

1. What is the smallest unit of life that makes up all living organisms? _____

2. Define the following terms:
 - a) Cell:

 - b) Cytoplasm:

 - c) Cellular membrane:

 - d) Nucleus:

 - e) DNA:

 - f) Chromosome:

 - g) Gene:

 - h) Nitrogen Base:

 - i) Karyotype:

 - j) Cell Division:

3. What cells in the human body are haploid? Why?

4. What cells in the human body are diploid?

5. True or false?
 - a) Within each pair of chromosomes, one comes from the mother, the other from the father.

 - b) The egg is a diploid cell. _____

6. When a new disease appears, genetic diversity becomes even more important. Why? Explain.

7. a) Describe the structure of the DNA molecule.

- b) In what part of the cell is DNA found? _____
- 8.** Which Nitrogen bases make up DNA and the genetic code? How are they paired up?
- 9.** Diploid cells contains two sets of chromosomes, one set donated from each parent.
- a) Describe which cells are diploid cell, how many are there and provide an example:
- b) How is a diploid cell represented:
- 10.** How many of the chromosomes possess a haploid cell? (a cell containing only one set of chromosomes).
- a) How are they represented?
- b) What type of human cell is haploid?
- 11.**What is the main difference between the 23 pairs of chromosomes in a female and male?
- 12.** What are the two functions of mitosis? Explain each one.
- 13.**Mitosis does not occur in all cells. Give examples of two types of cells where this process does not occur?
- 14.**Certain cells on the human body are replaced every two weeks, whereas other cells, like red blood cells, have a lifetime of 4 months. Why is the mitotic activity of these cells so different?
- 15.**What is the function of meiosis?
- 16.**What is the name given to the male gametes (sex cells)? _____
- 17.**What is the name given to the female gametes (sex cells)? _____

18. Complete the following sentences.

In order to produce daughter cells containing 23 chromosomes, the mother cell must divide twice. The first division is very similar to _____. After the DNA replication in the _____, two cells are formed, each containing _____ chromosomes. Each of these cells divides a second time without the DNA replication. Each cell randomly distributes one copy of the _____ of chromosomes to each of the four daughter cells. At the end of this process, there are _____ daughter cells which are genetically _____ and each contains _____ chromosomes.

19. Draw how a cell will be diploid then haploid then diploid again. (Use the terms meiosis, mitosis $2n$ and n in your answer).

20. Give 4 differences between the process of mitosis vs meiosis.

21. Some cats will have 19 chromosomes in their sex cells, while others will have 18 chromosomes in their sex cells. Once fertilization has occurred how many chromosomes will each type of cat have?

22. Is it possible for twins who are the opposite sex to be identical twins?