

B. Critical Thinking

1. What is the relationship between a DNA molecule and a chromosome?

- The chromosome is a threadlike structure in the nucleus that consists of DNA molecules for genetic instructions or information. It means that DNA or genetic material is cited at each chromosome.

2. In what conditions does asexual reproduction of genetically identical plants become useful to human? How can it be proven harmful to food supply?

- Asexual reproduction in plants creates genetically identical to the parent plant due to unaccepted intercourse or mixing of male and female gametes. The benefit of asexual reproduction in plants is to become sturdy and expanded its masses. It became well-built because of the maturity of a particular plant. It extends because cells grow and divide quickly; therefore, plants get bigger. Also, it grants the right balance of water, sunlight, air, soil nutrients.

C. Essential Questions

3. How do human maintain the normal number of chromosomes across generations?

- Both the father and mother must have 23 chromosomes, equivalent to 46 chromosomes. Cellular division and fertilization act as a significant part of the human cycle. The new nucleus in the zygote must contain the correct number of chromosomes to produce a healthy individual. Mitosis is responsible for the development of the embryo. Also, it continues the process of forming new tissues and organs to repair the damaged parts. In meiosis, it is significant to lessen the number of chromosomes to restore chromosome number, once the sperm meets with the egg cell. In conclusion, the precise number of chromosomes is sustained through mitosis, meiosis, and fertilization in the human life cycle.

4. How are sex cells differentiated?

- Sex cells are different from somatic or body cells. Somatic cells consist of body tissues and organs such as nerve cells, cardiac muscle cells, bone cells, and blood cells. On the other hand, sex cells or gametes can be sperm cells or egg cells. The egg cell is the female sex cell, while the sperm cell is the male sex cell.

5. Why is it important for gametes to be haploid cells?

- Meiosis is making and forming a component of sex cells with haploid chromosomes. In this kind of process, the sex cells develop genetically special haploid cells, which will undergo further maturation in the ovaries and testes. Considering the fact that meiosis is responsible for dividing the number of chromosomes into halves to formulate gametes.

6. How are sperm and egg cells produced in the sex organs?

- Meiosis is part of the process of gamete formation. Given the circumstances that gamete formation is essential for sexual reproduction. During intercourse between females and males, sperm cells go through the vagina to the uterus and fallopian tubes. The formation of the sperm cell is termed "Spermatogenesis", while the formation of eggs or ova is termed "Oogenesis." In conclusion, Gametogenesis is a process wherein haploid cells undergo further development to form mature gametes. Furthermore, Gametogenesis needs meiosis to support the maturation of sex cells or gametes.

7. How do meiosis and sexual reproduction produce genetic variability?

- The process of meiosis makes the genetic combinations possible for the sex cells to develop. Genetic variability is surrounded by living organisms that are essential for survival and reproduction in a changing environment. Genetic variations lead to independent assortment, crossing-over, and random fertilization. In order to break and rejoin the chromosomes, it will cross-over to trade some of their genes.

8. How do abnormalities in chromosomes happen?

- Chromosome abnormalities are results of errors in cell division. Mistakes during the process of meiosis can cause an odd or irregular number of chromosomes. It can be more and less than the number of chromosomes. This process can relate to nondisjunction, where chromatids or chromosomes fail to separate or segregate during anaphase stage.