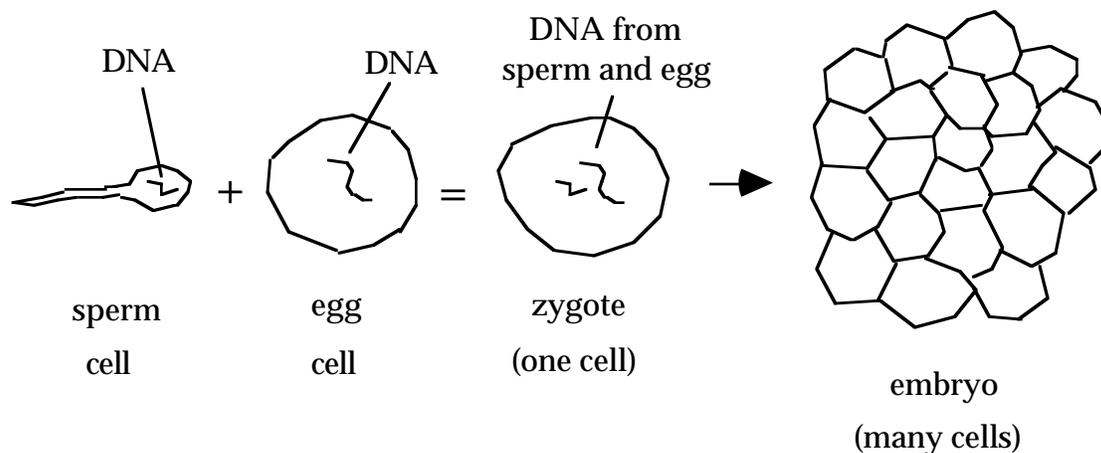


# Sexual Reproduction : Notes/W.S.-60

**Sexual reproduction** is reproduction which requires two parents. The two parents are usually a male and a female. Complex organisms use sexual reproduction to produce offspring.

In sexual reproduction, each parent contributes a cell called a **gamete**. The two gametes unite to form a single cell called a **zygote**. This is called **fertilization**. The zygote multiplies by mitosis to become an **embryo**. The embryo becomes the offspring of the parent.

The gametes from the parents are called **sex cells**. The male produces a sex cell called the **sperm**. The female produces a sex cell called the **egg**. The process by which sex cells are produced is called **meiosis**.



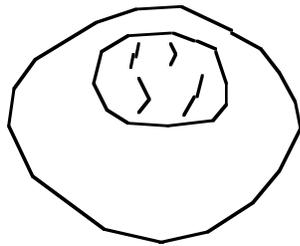
## Meiosis

In **mitosis**, certain cells of an organism, called **body cells**, reproduce themselves in such a way, that each daughter cell has the same number of chromosomes as the parent cell.

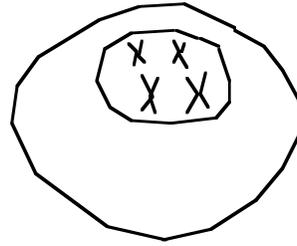
In **meiosis**, other cells in the organism, called **germ cells**, reproduce themselves in such a way, that each daughter cell (gamete) has **half** of the number of chromosomes as the parent. This is necessary so that when the two gametes meet, the number of chromosomes in the zygote will be the same as that of the parent cell. The chromosome number in the body cells will remain the same from generation to generation.

In the diagrams below, the parent cell contains four (two pairs) chromosomes.

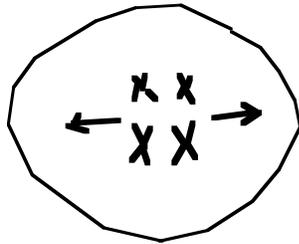
### Steps in Meiosis



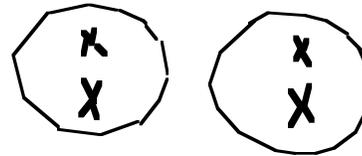
parent germ cell has four chromosomes



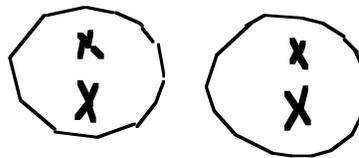
chromosomes replicate  
chromosomes pair up



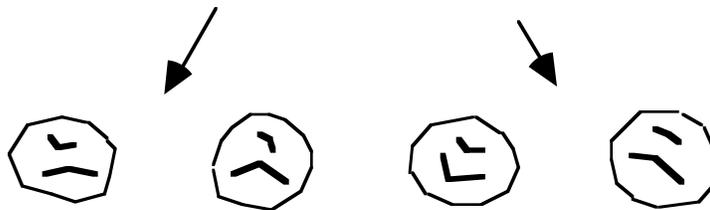
two pairs of chromosomes  
move to opposite sides  
as cell divides



meiosis I



meiosis II  
cells divide again



daughter sex cells have two chromosomes

Unlike mitosis, meiosis involves two cell divisions. The basic steps are given below.

### **Steps for Meiosis**

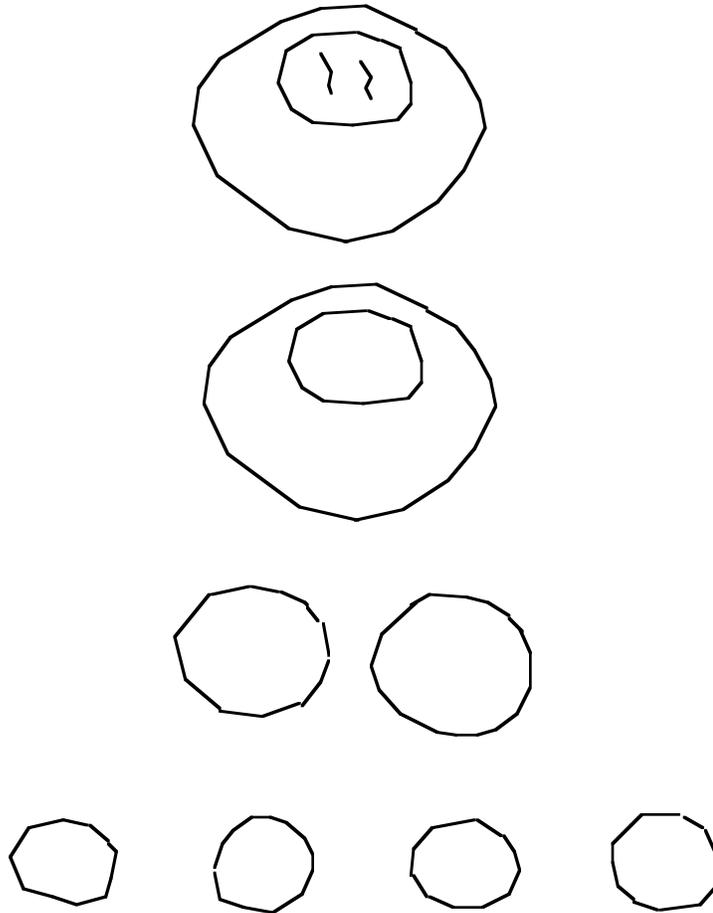
- 1) Chromosomes replicate and pair up. There are two sets of chromosomes.
- 2) During meiosis 1, the sex cell divides, each of the two new cells gets one set of chromosomes.
- 3) During meiosis 2, each of the two daughter cells divides to form four daughter cells (gametes). The number of chromosomes in each daughter is half of the number that the parent germ cell has.

Problems:

- 1) What is sexual reproduction?
- 2) Put the correct word in the blanks.

The gamete from the male is called the \_\_\_\_\_. The gamete from the female is called the \_\_\_\_\_. The two gametes meet to form a new cell called a \_\_\_\_\_. This process is called \_\_\_\_\_. The zygote multiplies by mitosis to form an \_\_\_\_\_.

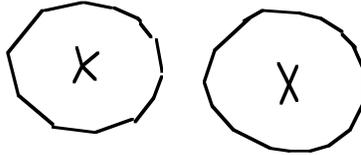
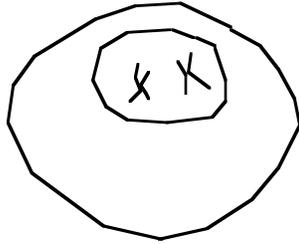
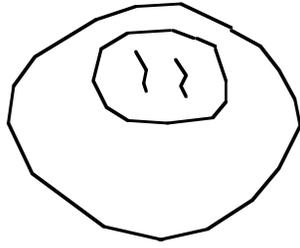
- 3) What is meiosis?
- 4) Show the steps in meiosis. Draw the chromosomes. There are two chromosomes in this sex cell.



5) The body cells of humans have 46 chromosomes. How many chromosomes are found in a human sperm cell? How many chromosomes are found in a human egg cell?

6) The sex cells of the fruit fly have 4 chromosomes. How many chromosomes do fruit fly body cells have?

Answers: 1) It is reproduction that requires two parents., 2) sperm, egg, zygote, fertilization, embryo., 3) It is the process where daughter cells, called gametes, are produced which have half the number of chromosomes of the parent germ cell., 4)



5) 23, 23, 6) 8.