There is no pairing of homologues in Meiosis II as they are located in separate cells.

| FEATURE | MITOSIS | MEIOSIS | |
|---|---|---|---|
| | | Division I | Division II |
| Halving the chromosome number | absent | present | absent |
| Centromeres divide | present | absent | present |
| Homologous chromosomes move to opposite poles of spindle | absent | present | absent |
| Pairing of homologous chromosomes | absent | present | absent |
| Single chromatids (now chromosomes) move to opposite poles of spindle | present | absent | present |

| MITOSIS | MEIOSIS |
|---|---|
| 1. 2 cells produced | 4 cells produced |
| 2. Diploid | Haploid |
| 3. Same as parent | Different to parent cell |
| 4. One division only | Two divisions |
| 5. No pairing | Homologues pair |
| 6. Daughter cells identical | Daughter cells differ from each other |

## Define gamete, fertilization and zygote

- Gamete: A mature haploid male or female germ cell that is able to unite with another of the opposite sex in sexual reproduction to form a zygote.
- Fertilisation: Creation by the physical union of male and female gametes

- Zygote: A diploid cell resulting from the fusion of two haploid gametes; a fertilized ovum.

## Explain the functional differences between male and female human gametes

| Ovum | Sperm |
|---|---|
| Bigger | Smaller |
| Ovaries produce 1 per month | Testes produce millions |
| Egg is moved by follicles | Sperm moves by itself through cervix to fallopian tube |
| 1 week life span in vagina | 24-48 hour lifespan in vagina |
| Provide genetic information from female | Main function is to carry male genes to female's egg |
| Large surface area easily accessible by sperm – contains cytoplasm which it uses as food while waiting for sperm. A lot of cytoplasm in it as it needs to divide many times to make an embryo. | Assigns gender |
| Membrane allows only one sperm to enter. Hardens after fertilization so other sperm can't enter it as we only want 1 set of chromosomes. | Uses capsule with special membrane to burrow through shell of egg and enzymes on surface to digest its way through outer eggshell, then enters main part (ooplasm) = fertilisation |