Significance of meiosis

(I) During meiosis the no of chromosome is reduced to half. Thus each gamete (♂ or ♀) contains haploid number of chromosomes. And during fertilization a ♂ gamete fuses with ♀ gamete to form a zygote (2n). This way meiosis helps in maintaining the specific diploid number of each and every organisms.

(II) During meiosis crossing over occurs. In crossing over there is an exchange of chromosomal segments between two homologous chromosomes. This way meiosis helps in the recombination of characters. And this recombination in characters causes alteration in the features of organisms.

(III) Meiosis provides evidence in favour of the fact that genes are linearly arranged in the chromosome.

Difference between Mitosis and Meiosis

Mitosis	Meiosis
1. It occurs in the somatic cells.	1. It occurs in the reproductive cells.
2. In mitosis there is no reduction in the no. of chromosome.	2. In meiosis the no. of chromosome is reduced to half.
3. In mitosis one cell (2n) divides into two daughter cells (2n).	3. In meiosis one cell divides into four daughter cells.
4. Mitosis is completed in only one division.	4. Meiosis is completed in two divisions i,e Meiosis I and meiosis II

Mitosis	Meiosis
4. Prophase of Mitosis is comparatively of short duration.	5. Prophase I of meiosis is comparatively of long duration. It has five sub phases. i.e Leptotene zygotene, Pachytene, Diplotene and Diakinesis.
5. No pairing of homologous chromosome occurs.	6. pairing of homologous chromosome occurs in the zygotene of prophase I.
6. No chiasmata formation occurs in prophase.	7. Chiasmata formation does occur in due to — Crossing over in Prophase I.
8. In the metaphase of mitosis chromosomes get arranged at equatorial plate. Particularly the centromere remain at equator.	8. Here also in metaphase I. chromosomes gets arranged at equatorial Plate but the centromere remains directed to the pole of its side and arms of the chromosome at the equator
9. Centromere of each chromosome divides into two equal halves in metaphase.	9. No division of Centromere.
10. In anaphase chromatids go to opposite pole.	10. In anaphase I — chromosomes goes to the opposite poles.