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THEME 1 – A1 / THEME 1 – A3: GENETICS.
Série S/ES/L

Why is meiosis important?

In meiosis, variation occurs, because each gamete (either sperm or egg) contains a mixture of genes from two different parent chromosomes in sexual reproduction. [...] A new combination of genetic information is produced in the gametes. [...] It enables individuals to produce physically and genetically unique offspring. Because of this, a high genetic diversity of a population is maintained.

5 With only mitosis, there would have been no sharing of genetic information, only division would have been possible. In such a situation, there would have been only clonal populations, which would eventually suffer from diseases or natural disasters.

[...] Genetic variation plays the role of a raw material for natural selection. Some individuals who are favored by natural selection have greater fitness than others because of their alleles (pair of
10 alternative forms of gene). In case of animals, males that are unable to compete for mates, for example, succumb to predation or disease or fail to reproduce; small and weak organisms don't survive for long time. [...] You can also take an example of a disease to which some individuals will be at least partially resistant while others are susceptible to it. Populations can adapt to changes in the environment as a result of the genetic variation resulting from meiosis. However, in clonal
15 asexual populations, organisms are not able to adapt to changes without mutations. Organisms which adapt to changes in the environment, survive, while others get eliminated by natural selection. In this way, a population contains fit individuals and the process continues for generations together. The diversity afforded by meiosis is beneficial for the population as a whole.

By Saurabha Palekar

<http://www.buzzle.com/articles/why-is-meiosis-important.html>

Sum up this article and explain the main ideas using your scientific knowledge.