

## Mass Extinction :

- \* Extinction is the process of evolution that leads to the disappearance of a population or species.
- \* When a species become extinct, all its genetic heritage is lost. The species evolve into new species in order to adapt to the environmental changes. Over 99% of all the species that once lived on earth amounting to over 5 billion species are estimated to be extinct.
- \* There are number of causes of extinction which include; asteroid strikes, climate change, disease, loss of habitat, Lack of genetic diversity, competition, pollution etc.
- \* The extinction of a large number of animals altogether is known as mass extinction. As the new species start evolving, the old species get depleted from the earth. More than 90% of the species are believed to have become extinct in the last 500 million years. Mass extinctions are deadly events.

Six Mass Extinctions have occurred upto now;

1. Ordovician - Silurian Extinction : (extinction of small aquatic organisms)
2. Devonian Extinction : (extinction of tropical marine life forms)
3. Permian - Triassic Extinction : (extinction of wide range of species, including vertebrates). It is the largest mass extinction in which about 96% of the marine and terrestrial animal species become extinct. It is also known as "Great Dying".
4. Triassic - Jurassic Extinction : (extinction of terrestrial and marine reptiles and plants species)  
It took place 18 million years ago and dinosaurs were wiped out.

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5. Cretaceous-Tertiary Extinction: (Extinction of non-avian dinosaurs) occurred at the end of Cretaceous period and the beginning of the Tertiary period. Hence called KT extinction.

6. Sixth Mass Extinction: Currently we are in the middle of the sixth mass extinction and humans are the major cause of it.

Causes of Mass Extinction: changes in sea levels, meteorite attacks on the earth and increase in temperatures leading to the melting of glaciers.

KT mass Extinction: The Cretaceous-Tertiary extinction occurred about 65.5 million years ago. It is known as K-T extinction event. It was one of the Big Five extinctions. Although not the largest, it may be one of the most significant; because

- It caused a major change in both marine and land ecosystems. It paved the way for human evolution as it led to extermination of dinosaurs
- It marks the end of Cretaceous period and the beginning of the Tertiary period. In fact, it changed the ecosystems so much that it is regarded as the boundary between Mesozoic and Cenozoic eras.

Palaentologists speculated and theorized for many years about the plausible reason for the occurrence of KT extinction. Then, in 1980 Walter Alvarez and Louis Alvarez reported their discovery that the peculiar sedimentary clay layer that was laid down at the time of the extinction showed an enormous amount of the rare element iridium. Firstly, it was reported in the layer near Italy, the

enhancement was soon discovered to be world wide in that one particular (1cm) layer, both on land and at sea. They suggested that the enhancement was the product of a huge asteroid impact. Iridium is extremely rare in the earth's crust because it is very dense and therefore most of it sank into the earth's core while the earth was still molten. The Alvarez impact theory is supported by the composition of K-T boundary layer

- isotopic composition of iridium in asteroids is similar to that of the K-T boundary layer but differs from that of iridium in the earth's crust.
- Chromium isotopic anomalies found in K-T boundary sediments also support the impact theory and suggest that the impact object must have been an asteroid.
- Quartz granules, glass spherules are common in deposits ~~in~~ around the caribbean.

Evidences that support the KT extinction are;

- i) In addition to such dinosaur fossils, there are reduction in the plant fossils across the K-T boundary.
- ii) Mass extinction of marine plankton occurred.
- iii) Most of the bivalves got extinct

Thus, it is concluded that KT mass extinction which occurred 65 million years ago ~~which~~ led to the extinction of dinosaurs was an extra terrestrial event that occurred over a very short span of time.