**Living things** are distinguished from non-living in that they have biological processes (functions such as metabolism, growth, reproduction, etc.)





The smallest unit of life is called an organism.





- General and unifying <u>concepts</u> recognized in modern biology:
  - the cell is the basic unit of life
  - gene is the basic unit of heredity
  - evolution is the engine that propels the synthesis and creation of new species
  - Although more than 99% of all species ever to have lived are estimated to be extinct, there are currently well over 10 million species of living organisms on the Earth.

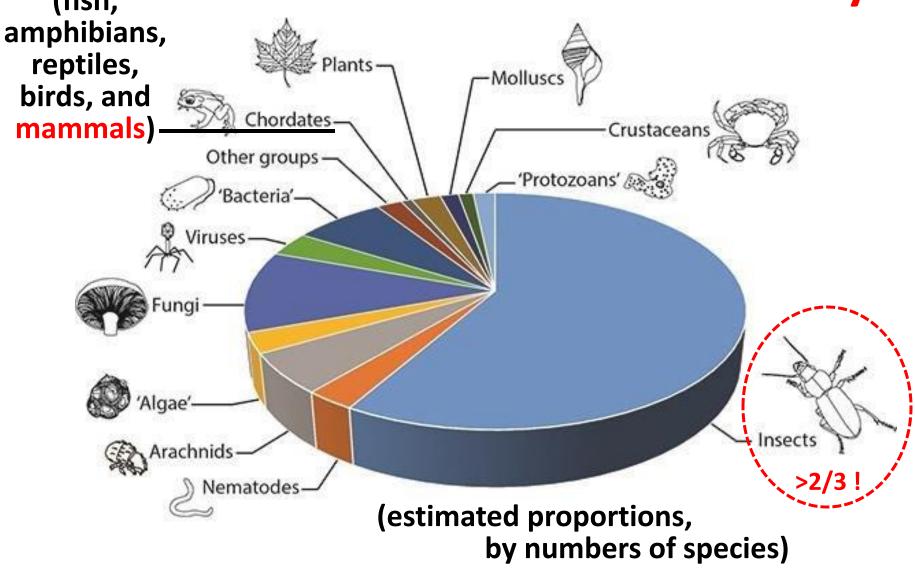
## **Biodiversity:** the variety and variability of life on Earth.



## genetic diversity

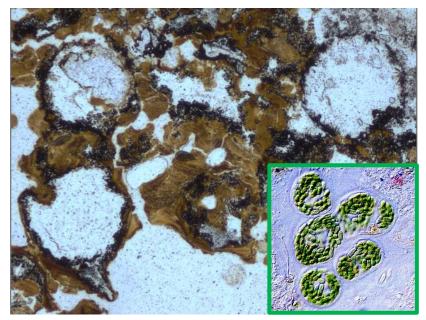
species diversity ecosystem diversity

## Different groups of organisms (fish, on Earth today



## Life on Earth

- There is direct evidence of life existing on Earth some 3.5 billion years ago.
- Additional findings suggest life appeared even earlier, about 4.2 billion years ago, just after the formation of the Earth's ocean.



microfossils of microorganisms

- The mechanism by which life began on Earth is unknown. Modern science is discussing at least TWO hypotheses:
  - 1. A set of hypotheses stating that life begun in another part of the Universe and arrived on Earth by chance with the crash of a comet or a meteorite.
  - 2. The <u>most common</u> life began here on Earth as the result of a complex sequence of chemical reactions.