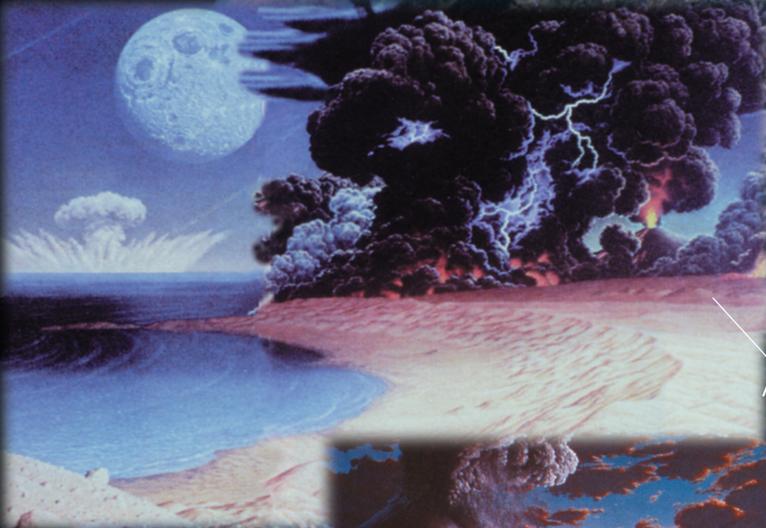
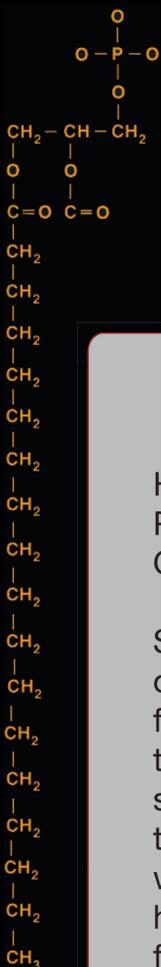
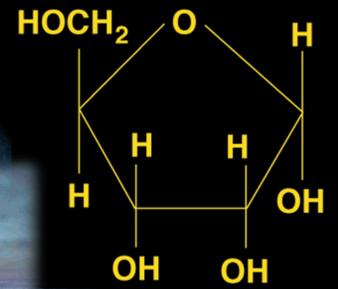
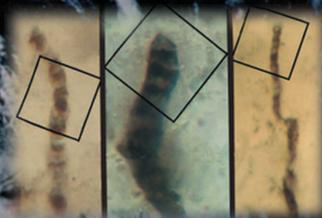


How does life begin and evolve?

Earth



Artist renditions of early Earth



Early fossils of Cyanobacteria

MISSION TO EARLY EARTH

HOW DID EARTH FORM AND HOW DID THAT PROCESS INFLUENCE THE EMERGENCE OF LIFE ON EARTH?

Since Earth is the only habitable planet that we know of, it is being studied for clues to its history of formation. The early Earth was a turbulent place in the Solar System 5 billion years ago. Starting out small, Earth grew larger as colliding particles stuck together. But, since life as we know it needs water, where did the water come from? Icy comets may have “delivered” it by colliding with Earth later in its formation.

What environments on early Earth could have provided a safe place for emerging life? If the surface was being bombarded by impactors, then perhaps life found a safe haven underground, perhaps under a primitive ocean. Today, astrobiologists are studying ancient rocks and fossils for clues to this link between early Earth and early life.

THE EMERGENCE OF LIFE

HOW COULD THE RAW MATERIALS OF EARTH GIVEN RISE TO LIFE?

Given a supply of energy and an appropriate physical environment, the rock and raw materials of Earth may have organized into primitive chemical life forms. Studied today by astrobiologists, hydrothermal vents on the ocean floors provide an exciting framework for imagining how these primitive life forms may have emerged and evolved. There are many theories about how life on Earth emerged, and it is an ongoing puzzle.