

# Make a Diorama of life in the Jurassic Sundance Seaway

**Objectives:** In this project students will combine research skills and art activities to produce a diorama showing an ancient marine ecosystem. By looking at the list of fossils found in the Sundance Seaway they will reconstruct this ancient ecosystem, showing the crucial elements of that ecosystem. They will apply the concept of uniformitarianism when reconstructing the past.



<http://phenomena.nationalgeographic.com/2014/09/12/how-to-recycle-an-ichthyosaur/>

**Background:** The meaning of the concept of uniformitarianism is much simpler than the word itself. Simply put, it means that the present is the key to the past. The theory was formulated by the Scottish geologist, James Hutton. In

1785 he stated his belief that the present is the key to the past and that processes now at work could account for all the geologic features of the earth, if sufficient time had passed. In his theory, what remains uniform are the physical and chemical laws, like gravity and weathering, that govern geologic events. A more modern term for the process is “actualism”. This term is used by some geologists because a uniform cause does not guarantee uniform results. For instance, the rate of sediment accumulation on the ocean floor today is not necessarily the same as the rate was a million years ago. Some

scientists feel that the term actualism is more accurate because it doesn't imply that the rates are uniform through time, only that the processes and physical laws have remained the same. Whichever term is used, the important concept is that **the present is the key to the past**. While Hutton was applying the principle to geology, it can also be applied, to some extent, to environmental biology and ecology, for the same laws of biochemistry, energy flow and population dynamics that affect living systems today were in effect in ancient ecosystems. However, **because organisms, as well as ecosystems, evolve and change they are not as constant through time. But, by studying a present day ecosystem, one can make some inferences about the past.**

**Materials required:** cardboard boxes, glue, construction paper, scissors, modelling clay, yarn, colours.

For research material on the Sundance Seaway, use information on this website <http://strata.uga.edu/sundance/fauna/index.html>, and for further information on the reconstruction of Jurassic marine ecosystems use other online material like:

<https://www.britannica.com/science/Jurassic-Period>

<http://www.nhm.ac.uk/discover/life-in-jurassic-oceans.html>

**Directions:** With the information you obtain, make a diorama showing the ancient ecosystem. Some things to consider are; What animals do you wish to portray? What did those animals eat? What adaptations did they have that would help them to survive? What dangers did they have to be on the look out for? What was the climate like? What was the landscape like? Look at your sources of information and decide what clues were used to come up with this information. Are there any modern day animals that are similar and that live in a similar environment? Use the present as a key to the past by researching those animals to gain insights into their lives.

**Follow-up:** After the students have completed their dioramas, ask them to give an oral presentation about what they learned, and how they applied the concept of uniformitarianism to their project.