PROJECT O*CEANOLOGY*

Tree of Life: Middle School

Overview

In this hands-on exercise, students closely observe a diverse set of marine organisms and then work together in small groups to construct models (phylogenetic trees) that predict evolutionary relationships between the organisms.

Alignment with NGSS

Performance Expectations

MS-LS4-2 Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships

This lesson focuses on the first half of this performance objective. Students will identify similarities and differences between organisms, and then learn how to use these to construct visual hypotheses about evolution (phylogenetic trees)

Science and Engineering Practices

Constructing explanations

Students will apply scientific ideas about evolution to construct an explanation for the similarities and differences that they observe between organisms.

Developing and using models

Students will construct models (phylogenetic trees) that predict evolutionary relationships between the organisms.

Engaging in argument from evidence

Students will present and defend their models (phylogenetic trees), using scientific evidence to support their hypotheses.

Crosscutting Concepts

Patterns: patterns can be used to determine cause and effect relationships

Students will identify patterns of similarity and difference, and relate those patterns to evolutionary history.

Disciplinary Core Ideas

LS4.A Evidence of common ancestry and diversity: Anatomical similarities and differences between various organisms living today and between them and organisms in the fossil record enable the reconstruction of evolutionary history and the inference of lines of evolutionary descent.

This lesson focuses on how we can use traits of living organisms to develop hypotheses about their evolutionary histories.

Nature of Science:

Scientific knowledge assumes an order and consistency in natural systems: Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation.

We will discuss the reliability of physical similarities and differences as indicators of shared common descent.