FOOD/ENERGY PYRAMID/CYCLE OUTDOOR LAB
LESSON PLAN
(OPTIONAL)

Subject Areas: Aquatic food web and energy transfer
Grade Level: Middle School
Season: Spring
Instructional Time: 45 minutes

A. Learning Goal: Learners will be able to differentiate segments of a food web and make connections between terrestrial and aquatic ecosystems.

B. Objectives:

- Learners will learn to differentiate between energy and matter.
- Learners will learn that the ultimate source of energy is the sun.
- Learners will learn the flow of matter and energy through an ecosystem.
- Learners will learn the differences between producers, consumers and decomposers.

C. State Standards

- SCI.CC4.m – Students understand systems may interact with other systems: They may have sub-systems and be a part of larger complex systems. They use models to represent systems and their interactions — such as inputs, processes, and outputs — and energy, matter, and information flows within systems. They also learn that models are limited in that they only represent certain aspects of the system under study.
- SCI.CC5.m – Students understand matter is conserved because atoms are conserved in physical and chemical processes. They also understand that within a natural or designed system the transfer of energy drives the motion and cycling of matter. Energy may take different forms (e.g., energy in fields, thermal energy, and energy of motion). The transfer of energy can be tracked as energy flows through a designed or natural system.
- SCI.SEP2.m – Developing and using models.
- SCI.LS1.C.m – Plants use the energy from light to make sugars through photosynthesis. Within individual organisms, food is broken down through a series of chemical reactions that rearrange molecules and release energy.
- SCI.LS2.A.m – Organisms and populations are dependent on their environmental interactions both with other living things and with nonliving factors, any of which can limit their growth. Competitive, predatory, and mutually beneficial interactions vary across ecosystems but the patterns are shared.
- SCI.LS2.B.m – The atoms that make up the organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem. Food webs model how matter and energy are transferred among producers, consumers, and decomposers as the three groups interact within an ecosystem.

D. Setting/Area: Classroom.

E. Materials/Resources: Students divided into small groups

- Learners will need just a pencil and the enclosed lab.
- Set of preserved skulls, if available (from museum, etc.).

F. Delivery:

Introduction of Lesson:

- Learners should discuss the difference between energy and matter (food).
- Learners should discuss the source of energy…sun.
- Learners should discuss cycles.
- Learners should discuss producers, consumers and decomposers as listed on the lab sheet.

Class Activity:

Large Group: Review and introduce content listed above.

Small Group: Learners will work on enclosed lab with their groups. Interaction and discussion within their group is encouraged.

G. Extended Student Options: Learners find representatives in the classroom and list them.

H. Assessment: Learners discuss how human activity might disturb the living cycles of an aquatic environment. Have an informal discussion of what they learned and how they can apply what they learned.