



Food Build Do Waste

Grades 4th-7th

OVERVIEW:

This activity gives students a way to look at how organisms are connected to ecosystems through the cycling of matter and the flow of energy. By the end of the activity, students will be able to make distinctions between how matter and energy are used and transferred. **This activity is adapted from The Beetles Project. The original activity can be found at the link below:**

<http://beetlesproject.org/cms/wp-content/uploads/2017/02/Food-Build-Do-Waste.pdf>

Connections to NGSS:

This activity features the scientific practice Developing and using models , and the crosscutting concept Energy and Matter: Flows, Cycles and Conservation.

Intended Learning Outcomes:

Students will be able to...

- Make observations to describe connections within their ecosystem
- Understand different uses for matter and energy in an ecosystem
- Describe examples of how energy flows and matter cycles within an ecosystem

Materials List:

- ⇒ Paper
- ⇒ Pencil or other writing utensil

During this activity, you will be spending time observing organisms within your ecosystem and exploring the role they play within it. You will be able to identify how matter cycles and energy flows within an ecosystem.

Introduction:

Find a comfortable spot outside where you can sit for a few minutes. This can be on a porch, or a place on the ground, in grass or on rocks. You can also sit inside by a window where you can observe some natural space.

First, take a couple of minutes to observe the ecosystem around you. Try to answer the following questions:

What relationships do you observe?

How do you think things getting what they need to survive?

What depends on what?

Some of the connections and relationships that you observed may relate to how different organisms get their energy. Every living thing requires energy! Within an ecosystem, that energy flows through the food web. This means that food is matter and energy that organisms can digest. It is the fuel we need to survive, grow and reproduce.

Definitions:

Matter– anything that takes up space. It’s the stuff around us, both invisible (like air) and visible (like water, rocks and people).

Energy– is the ability to do things, whether it is breathing, growing, working or thinking, everything that a living things does, is fueled by energy.

Basically, matter makes us and energy fuels us!

Activity:

You are now going to explore how one particular organism in your ecosystem uses matter and energy as a cycle to thrive. Choose an example organism that you can see within your ecosystem—try to find something that is not a plant. If you cannot find anything, use a picture of an organism commonly found in that area. On a new piece of paper, draw a picture of your organism in the center. Your drawing does not need to be pretty, but try to draw as accurately as possible. You can include labels, notes and anything else that can help describe your organism.

Once you have completed your drawing, write one of the following words in each of the corners of your paper: FOOD, BUILD, DO, WASTE.

Under FOOD you will write a list of the foods your organism eats.

Under BUILD you will write a list of the body parts your organism builds (or grows) using matter from food it eats.

Under DO you will write a list of the things your organism uses energy from food to do.

Under WASTE you will write a list of the wastes your organism gives off.

If possible, try to make your lists based on your observations. If you don't observe them doing any of these things, use the knowledge that you already have or what you imagine they may do.

Tracing Matter and Energy

Now you should have some great data highlighting how your organism uses the energy and matter from food to function and grow. Next, consider the list of food that your organism eats. Choose one of those foods and ask yourself: where does that food get its matter and energy? Maybe it is from another organism, like another animal or a plant. Then, consider what food that organism required to get its matter energy. Make a short list (try to include 3-5 organisms) tracing back the flow of energy and matter in your ecosystem.

Reflection:

How are plants and animals in your ecosystem connected?

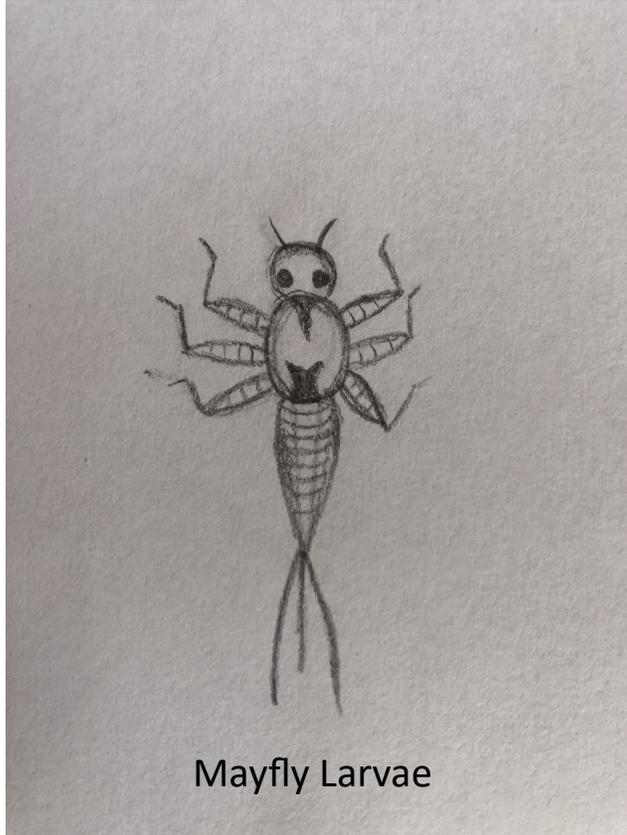
What questions do you still have about how matter cycles and energy flows in your ecosystem?

Can you think of any organisms within your ecosystem that rely on the organism that you were studying for food and matter?

Sample Food, Build, Do, Waste:

FOOD:

Algae, insects,
plants



BUILD:

Eyes, antennae,
legs, tail

DO:

Swim, grow into
a mayfly

WASTE:

Poop, pee, CO₂,
heat

Vocabulary:

Ecosystem—An ecosystem is a community of living organisms in conjunction with the nonliving components of their environment, interacting as a system

Matter— anything that takes up space. It's the stuff around us, both invisible (like air) and visible (like water, rocks and people).

Energy— is the ability to do things, whether it is breathing, growing, working or thinking, everything that a living things does, is fueled by energy.