Energy Breakdown: The Composition of Decomposition *2022

Grade: 5th
Setting: Pineridge or other natural area with a variety of habitat/landscapes
Theme (Bottom Line): Decomposition is a valuable transfer of energy in Nature that allows for nutrients to cycle and living organisms to thrive.
Description: Students learn about the benefits of decomposition and the key players in Natural Areas that fill decomposition roles.
Recommended Time- 30 minutes
Recommended Group Size: 15
State Standards: **Life Science Grade 5.2.2** Matter cycles between air and soil and among plants, animals and microbes as these organisms live and die. **Earth and Space Science 5.3.5** Societal activities have had major effects on land, ocean, atmosphere and even outer space

Materials list:

- Pictures of Rotting Fruit
- Pictures of Insect Tracks on a Log
- White Boards/Markers
- Magnifying Glasses
- Decomposition/Energy Flow Chart
- Display of Items and How Long They Take to Break Down

Getting Ready:

1. Identify areas to easily spot signs of decomposition (insects on logs, fungi on trees, animal scat, etc.) NA staff will have suggestions of where to find these signs.

Welcome students and introduce yourself and any other volunteer. Encourage Adults to participate by giving them each a task. Remind them of the difference between a Natural Area and a Park. Explain the theme of the lesson and begin.

ENGAGE (Introduction)- 5 mins.
Get the students focused with these leading questions.

- Who knows what the term decomposition means? The breakdown of organic material into simpler parts especially by other living things (can also be caused by wind, water, etc.- more commonly called erosion.)

- Can you think of any examples that might happen around your house? (rotting fruits or vegetables- if they can't think of examples, instructor could ask leading questions about what happens to produce if it sits around too long and isn't consumed.)
- What causes this decomposition process? (bacteria, mold, fungus in the air need a variety of factors to thrive, including the "stuff" found in foods whose chemical compounds mutate as they ripen).
- Can you think of any decomposers you may find in this Natural Area? (insects, bacteria, fungus (mushrooms), mold)

Explain that decomposers are the final links in the food chain. These organisms use dead plants and animals as food, ultimately releasing locked up nutrients to be used again by plants. Among the decomposers are fungi, which include molds, mildews, mushrooms, rusts, and smuts. Because they lack chlorophyll and can't carry out photosynthesis, fungi feed on once-living materials or act as parasites on living organisms. Some fungi can be seen by the unaided eye, but other decomposers, such as bacteria, are so small that a mere teaspoon of soil may contain billions of them. Insects can also act as decomposers by eating and burrowing on/in logs and other plants. Today we are going to search for evidence of decomposers/decomposition and seek to better understand the importance of how this cycle enriches the habitat for new plants and other animals to thrive.

EXPLORE: 5-10 mins.
For this initial exploration, students are partnered with another classmate (or 2), a whiteboard, and magnifying glass. Students are given boundaries and encouraged to search for signs of decomposition and their decomposers in this area. Questions to pose as the leader walks around to the various groups:

- What are the decomposers doing?
- Does decomposition look the same from organism to organism?
- How many signs of decomposition do you see in your area?
- How are nutrients released back into the environment by these decomposers (to be used again by other organisms)?

Students will use these questions to locate signs of decomposition and record their findings on the white board. Students should share duties switching white board and scribing for the magnifying glass half-way through the activity.

EXPLAIN: 5-10 mins.
Gather students back up to discuss their findings. A few topics to go over now:

- What signs of decomposition/decomposers did you find and why is this significant to Natural Areas? (without decomposition there would be dead things everywhere, clogging up trails and habitats so that nothing could get by or live. Nutrients would be locked up and unavailable for new plants and animals to use to survive)
- Decomposition is an important part of the nutrient cycle, why? (breakdown of nutrients goes back into the soil to aid in plant growth and new life and

heat/energy is produced from this decomposition- show food chain/decomposition chart)

ELABORATE: 5 mins.

Now that students better understand the benefits of decomposition in nature and how energy cycles when decomposition happens naturally, they can play a guessing game using the display of man-made items to figure how long it takes for each item to decompose in Nature.

- Pose the question: What happens when man-made items are left in nature to decompose? Trash and litter don't decompose the same way and often take many years to biodegrade if left in the wild.
- Let's play a guessing game to see who can come the closest to the correct answer. (Partner up kids and have them use their white board to write down how long they think each item takes to decompose).
- Explain that picking up after yourself (trash) and putting waste in proper disposal areas is important to ensure that these things aren't left in nature to ruin habitat and the views of those who visit.

EVALUATE: 5 min.

- Have students remind you what decomposition is and a few of the examples they found today in our natural area.
- Ask students why decomposition is important in the energy cycle.
- Ask students why picking up and disposing of trash is important.
- Answer any remaining questions.