A Bug's Life

Goals:

This lesson will foster care and awareness for local ecology. By playing the role of different bugs and insects and performing skits based on observation of local ecosystems, students will become more familiar with the bugs and insects in their own backyards, and how they interact with each other.

Objectives

- Students will identify animal habitats
- Students will collect and observe insects using the proper equipment ● Students will identify the interactions between different species in the ecosystem ● Students will be able to distinguish between primary and secondary consumers ● Students will discuss animals to learn about more in-depth and create characters ● Students will work in groups to create skits based on their observations

Audience ID:

Grade 6 (Ages 11-12), Sobel's Early Adolescence Development Stage, maximum of 32 students, could be run with both school and summer camp groups.

Duration:

Bug catching introduction: 1 hour
Bug catching: 30 minutes
Identification and observation: 30 minutes
Release bugs: 15 minutes
Project introduction: 15 minutes
Costume creation: 1 hour 15 minutes
Lunch break: 1 hour
Skit creation: 1 hour
Skit presentation and evaluation: 1 hour

Location:

Bugs would be collected from an environment surrounding a rotting log in the forest, observations, planning, and performance would take place outside in a field

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Equipment:

- Butterfly nets, breathable insect containers
- Insect ID key or guides, magnifying glass
- Old newspapers, recycled cardboard, tape, recycled fabric, recycled plastic, hot glue gun

Content:

The lesson will begin with an introduction to the different types of insects and their roles in the environment (primary consumers vs. secondary consumers, etc.) and their habitats (Purdue, 2014). Students will then be asked to classify different insect species common in the area as one of the roles they learned about. The students will learn how to use the materials (nets and trays), as well as how to appropriately treat the captured animals, as seen in the video presented to them (Corp, 2011). Training on how to properly treat the captured animals will consist of ensuring that the students know the importance of handling them carefully to avoid crushing them. Students will go outdoors and apply this knowledge by searching for and capturing insects with the equipment provided. Insects will be placed into breathable insect containers for observation. Afterwards, the students will return to the field classroom and be split into groups of 4 students by educators. These students will be given time to create an educational 2-3 minute skit based on their observations of insects and their habitats, as well as costumes for this skit. At the end of the day, the students will perform these skits in front of the group, and be asked to draw a picture of an insect they found particularly relatable for their family.

Methods

<u>8:00am - 9:00am: Introduction to bugs, insects, and bug catching</u>

Students are introduced to bugs and insects and the roles they play in the environment (primary consumer, secondary consumer, etc.). Several examples of insects present in the area are provided to students, and they are asked to classify them into one of these roles. Students are then taught to use the nets to catch bugs by showing them the video mentioned in the content section, and then practicing it with the equipment provided. After the students are familiar with the roles of insects and how to properly treat them, they are led outside to the previously identified location for bug catching. Before leaving, students will be split into groups of 4 at random by the educators for bug catching. They will stay in these groups all day to create the skits.

9:00am - 9:30am: Bug catching

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At the location previously identified, students are encouraged to observe bugs and insects in their natural environment. The students then catch bugs and insects with the nets provided using the methods that they were previously taught. After they are caught, the bugs and insects are placed in breathable insect containers for observation.

9:30am - 10:00am: Identification and observation

Using the insect ID provided, have students identify the species they have caught. Use the see-through containers to observe insect interactions with the aid of magnifying glasses. Students are encouraged to describe what the insects are doing and how this relates to the terms they were taught earlier (predation, symbiosis, etc).

10:00am - 10:30am: Release bugs/clean up/snack

Captured bugs are returned to the environment that they were taken from. Kids are led back to the initial meeting place where they are given a snack.

10:30am - 10:45am: Introduction to the project

Students are given specific details on the guidelines for the skit they will be creating. They are told that they will be creating a skit 2-3 minutes in length based on observed habitats, insect interactions, food webs, life cycles, or any other topic they observed earlier in the day. Students are told they have to have people playing at least 2 different types of insect and at least 1 abiotic factor. All students will be required to have a speaking line in their skit. 10:45am - 12:00pm: Planning and costume making

Students decide which role each of them will play in their skit. Once students decide on their roles, they are given recycled cardboard, plastic, and fabrics with which to create costumes for their skit, as well as tape and hot glue guns. Staff members will explain the importance of using recycled materials in the costumes.

12:00pm - 1:00pm Lunch

1:00pm - 2:00pm Refine and rehearse projects

Students complete the creation of their skits and rehearse them in their groups for the final performance.

2:00pm - 3:00pm Presentation and evaluation

Each group of students presents their skit to the rest of the group. After presentations are done, students are asked the questions outlined in the evaluation section. Students will then draw a picture of an insect they particularly relate to, and produce a drawing of this insect and write a description of why this insect is like them.

Management and Safety:

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First-aid and materials in the case of bug bites/bee stings. Students should come prepared with appropriate shoes, socks, and pants. Tick checks will be performed after the bug catching segment. Students operating the hot glue gun will have an adult supervising. Educators running this activity should examine the area where they will be conducting it to check for any additional safety concerns present and plan accordingly.

Foul Weather Alternative:

Instead of bug catching, use field guides and identification books. Have videos on ecosystems prepared. Skits will be performed indoors, and students will be given extended time to create costumes and props.

Evaluation:

During the bug and insect collection and observation, educators will be walking around to different groups and asking them to describe what they are observing. During the creation and rehearsals of the skits, educators will be checking in on groups to ensure they are meeting the requirements for the skit and that all group members are being included. After each presentation, ask students to say what they learned or something they liked. At the end of the lesson, there will be a final reflection where students are encouraged to name their favorite part of the day.

Question prompts:

- What insects did you see today? Which was your favorite?
- What roles do insects play in their environment? How do they interact with the world around them?

Students will also select an insect they particularly identify with and draw it to bring home, as well as creating a description of why that insect is like them. They will then share this drawing with each other in small groups, as well as in front of the whole group. After the completion of the activity, educators will meet in order to debrief the day and discuss any problems that came up, as well as ways to improve this program in the future.

Follow Up:

Students will be directed towards resources to further learn about insects and bugs

(*Pennsylvania insects* 2022), and are encouraged to tell their families about what they learned during this activity by presenting the drawing they created at the end of the day. If students are

visiting from a school, recommend additional lesson plans on bugs and insects for future use for students.

<u>Connection to PA standards (Ecology)</u>

The Environment

Standard - 4.1.6.D Explain the costs and benefits of recycling in controlling resource use. - By using recycled materials to build the costumes, students will gain a better understanding of how materials can be reused for future purposes.

- **4.1.7.A** Describe the relationships between biotic and abiotic components of an ecosystem. Compare and contrast different biomes and their characteristics. Describe symbiotic and predator/prey relationships.
  - By observing the interactions between different insects, such as symbiotic and predator/prey relationships, this program will enable students to describe these relationships based on their observations. By observing insects in their natural environment, students will be able to describe the relationships between biotic and abiotic components of the ecosystem.

Energy Flow

- **4.1.7.C** Explain the flow of energy within an ecosystem. Compare and contrast the flow of energy between organisms in different habitats. Explain the concept of trophic levels. ○ Observing the interactions between insects and their natural environment allows students to see energy flowing between organisms in real time

Science as Inquiry

- **4.1.8.F** Compare and contrast scientific theories. Know that both direct and indirect observations are used by scientists to study the natural world and universe. Identify questions and concepts that guide scientific investigations. Formulate and revise explanations and models using logic and evidence. Recognize and analyze alternative explanations and models.

Reference materials:

Corp, M. (2011, July 18). *Sweep net technique - youtube*. YouTube. Retrieved January 28, 2022, from https://www.youtube.com/watch?v=c5dVt3n1_EE

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Pennsylvania insects. Insect, Bugs and Spider Identification - North America. (2022). Retrieved February 3, 2022, from https://www.insectidentification.org/insects-by-state.php?thisState=Pennsylvania

Purdue. (2014). Who let the bugs out?: Purdue: Entomology: Insect: Collect: Supplies: Specimen: Mounting: Identifying: Displaying: Preserve: Labels. Purdue. Retrieved January 28, 2022, from https://extension.entm.purdue.edu/radicalbugs/index.php?page=importance_of_insects#:~:text=Insects%20pollinate%20many%20of%20our%20fruits%2C%20flowers%2C%20and%20vegetables.&text=Insects%20are%20very%20important%20as,it%20would%20be%20messy%20indeed