Revised 4/20/20
Neal Smith National Wildlife Refuge

Discovering Diversity

5th Grade

60 Minutes

Spring

Summary

During this investigation, students conduct small transects with sweep nets in two pre- selected plant communities. One of the communities is a lawn grass habitat and the other is a restored prairie. They observe, collect, and record the number of different types of prairie insects they find at each location. Inside, the field leader uses a Venn diagram to compile a class set of data. One side of the Venn diagram is labeled "Location 1" and the other is labeled "Location 2." Students share their findings of insect diversity from each location, as the field leader records these into the appropriate category. Students speculate what types of environmental factors or variables contributed to the patterns in the diversity of prairie insects. From their evidence, students work to draw a conclusion about how plant communities might affect prairie insect life.

Iowa Core and Next Generation Science Standards

Next Generation Science

- **3-5-ETS1-1**
    - Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- **3-5-ETS1-2**
    - Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- **3-5-ETS1-3**

- Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Literacy

Writing

- **W.5.1**
  - Write opinion pieces on topics or texts, supporting a point of view with reasons and information.
- **W.5.4**
  - Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.

Speaking and Listening

- **SL.5.1**
  - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.
- **SL.5.4**
  - Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

Materials and Resources

- Blank paper or nature journals
- Pencils
- White board
- Dry erase marker
- Bug boxes
- Sweep nets
- Insect ID sheets or field guides

Presentation

Explain to students that today they are going to be doing an investigation about how plant communities might affect prairie insect life. Write the question, "How do plant communities affect prairie insect life?" on the board. Help students deconstruct the questions. Ask them what are plant communities? What is an insect? Ask students to predict- how might the plants found in an area change the insects found there as well? What factors might influence this?

Directions

1. Thank students for coming. Ask what they already know about the Refuge. What did they notice outside?

2. Discuss habitat, and how the grasses and flowers they saw outside provide what animals need to survive.

3. Today, we'll be talking about one of the most common animals on the prairie: insects. What do we already know about insects? Write down student's answers. Make sure students at least know that insects have **6 legs, 3 body parts, 2 antennae, an exoskeleton, and are cold-blooded.** Mention a few examples of insects, like ants, beetles, bees, etc.

4. Many insects call the refuge home, and the tallgrass prairie supplies many of their needs. We can even find insects in the lawn grass around the building, which makes them an easy animal to study.

5. We're interested to know if the insects found in the tallgrass are different from those in the lawn grass. So today, we'll be comparing and contrasting the insects in both habitats!

6. Before we begin, we should talk about the limits on our study. Will we be able to study every possible insect living in the lawn grass and prairie? Probably not. Can we search the entire prairie in 60 minutes? No. For this reason, we will study samples from each habitat.

7. Explain to students the procedure of the investigation. One group will be

going to a certain location outside and another group will be going to a different location. Draw a Venn Diagram on the board. Label one side of the Venn Diagram "Location 1" and other side "Location 2". Each group will have sweep nets to collect insects and each group will be in charge of recording the number of different types of insects they find at their location. Explain that once they come back inside, they will share their data to fill in the Venn Diagram and compare the locations as a class.

8. Hold a discussion about the best way to record the number of insects. Will we know every type of insect we find? No. Can we decide on 4 types of insects we might find? Possible categories include winged, ants, beetles, butterflies, grasshoppers, others, etc. From the answers they generate, help students prepare their journal entries by modeling it on the board. Include: name, date, location, weather conditions.

9. Distribute sweep nets and insect ID sheets or field guides to each group before going outside. Make sure that the students have all of their materials. Remind students that naturalists are happy outside, explorers, adventurers, respectful, prepared, responsible and quiet. They ask questions, use words, numbers and pictures, and share their discoveries.

10. When outside, direct adult chaperones where you would like them to go. Provide them with boundaries. While the students are journaling and collecting insects, rotate among groups. Ask students questions and try to help with any problems they have with identifying insects.

11. After about 10 minutes, ask students and adult chaperones to line up to head back inside. Instruct students that while they are walking to go back inside, they should think about the discoveries they made and get ready to share them with the other students/naturalists.

12. Once inside, ask the students to consider the question posed at the beginning of the activity and share what they discovered. Record their answers in the appropriate place on the Venn Diagram.

13. Discuss as a class why students may have found different insects at different

locations. What would influence it? Why might they not have found one of the categories they decided to look for?

14. Instruct students to write a few sentences about what they discovered. Provide starters for them if they need help "We found different insect diversity at each location because_____(there were different plants, soil, sunlight, management, public use etc.)"

15. At the end of the lesson, explain to students that today they did the same investigation that scientists are asking all over the world. And at Neal Smith NWR, we are still investigating the question of how plant communities are affecting insect populations. Maybe they could be the person to research it and find us answers!

Resources

Journal Prompt

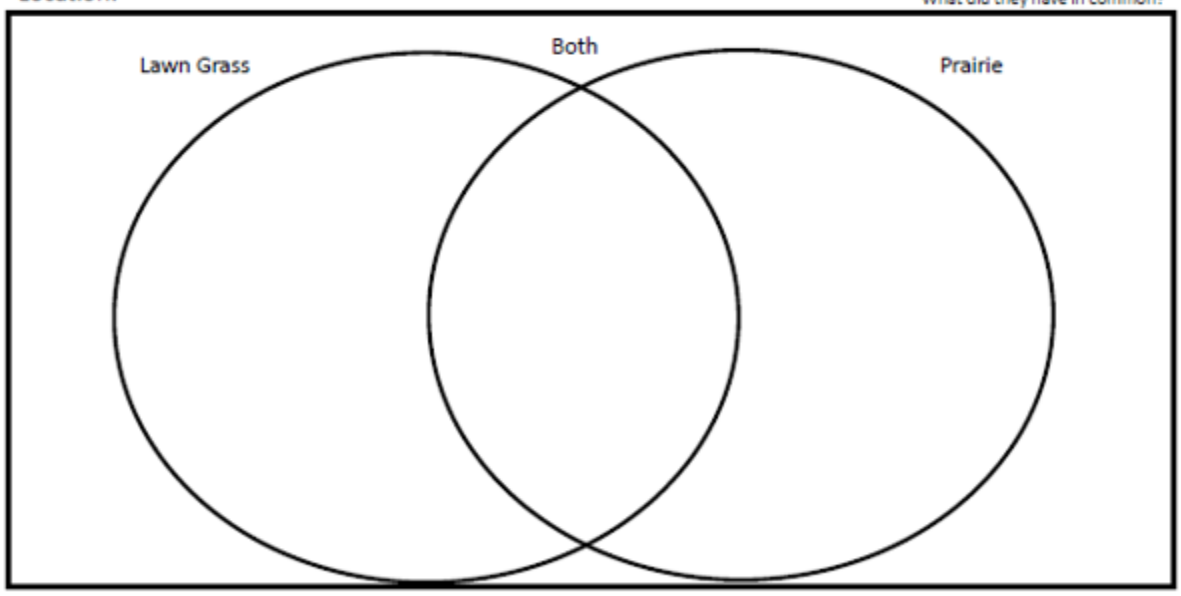
Name: Time:

Date: Weather:

Location:

Discovering Diversity

Write the insects you found in your test area. Then, share with a group that tested the opposite area and record what they found. What did they have in common?



"We found different insect diversity at each location because_____."