

How do Plants and Birds Interact? Teaching Youth About Interdependent Relationships in Ecosystems

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Introduction

Background

- Non-native species are invading Iowa's grasslands leaving birds without necessary habitat and food resources (1)
- Reed canary grass (*Phalaris arundinacea*) and smooth brome grass (*Bromus inermis*) outcompete natural forbs like the common cup plant (*Silphium perfoliatum*)
- The common cup plant is used by American goldfinches (*Spinus tristis*) for food, water, and shelter

Central Concept Taught

- Organisms depend on resources for their survival

Additional Learning Objectives

- Observe how plant species affects the abundance of birds
- Interpret data by observing ecological patterns
- Identify ideal habitats for goldfinches and support claims with evidence
- Identify the services goldfinches provide to plants
- Demonstrate environmental stewardship by cleaning up our outdoor classroom before leaving it

Lesson Characteristics

- Audience consisted of 35 first grade students
- Setup time = 20 minutes, lesson time = 45 minutes
- Study site - portion of trail at Ada Hayden Heritage Park in Story County, Iowa
- Followed the Learning Cycle format (2)



Figure 1. Chalk drawings guided students to activity site and spark interest in study topic

Teaching Methods

Preparation

- Assembled small group data sheets and one large group data sheet (Fig. 2)
- Folded 45 origami finches (Fig. 3)
- Established two study plots, placing 40 finches in the cup plant plot and 5 finches in the smooth brome grass (Figs. 4 and 5)



Figure 2. Example of data summary



Figure 3. Origami goldfinch

Engagement Phase

- Greeted students and generated interest by asking questions:
 - What kinds of animals live out here?
 - What type of land and plants are here?
 - What do animals need to survive?
- Formed students into four groups, two for each plot

Exploration Phase

- Students searched for paper birds, tallying numbers of birds on group data sheets
- Students switched plots after 8 minutes and recorded numbers of birds found in the second plot

Concept Development and Application

The following questions lead students to learning the central concept:

- Did you notice any differences between the two plots?
- Why are there fewer birds in the grass plot?
- What services do birds provide plants?
- What can you do to create habitat for goldfinches?
- Finished with students cleaning up birds from plots to practice stewardship

Take Home Message

- Through this lesson, students became more aware of how different organisms depend on each other



Figure 4. Brome grass patch



Figure 5. Common cup plant patch

Connections to Next Generation Science Standards

Standards (3)

- **LS2.A:** Interdependent Relationships in Ecosystems

Application

- **LS2.A:** Students will observe that Goldfinches prefer the sites with greater abundance of *Silphium* sp. compared to the non-native grass. This is due to the plant having the resources birds need. The plants also benefit from this relationship when the goldfinches disperse their seeds