

Alternate Field Investigation



Saguaro Cactus

ACTIVITY OVERVIEW

In this investigation, students venture outside for a teacher–led, plant and animal buddies discovery walk in their own schoolyard. This activity is offered as an alternative field investigation for classes unable to visit the Desert Botanical Garden. The purpose of this activity is to get students outside and involved in real, hands–on field investigations about plants and animals. It is suggested that classes first conduct the *Plants and Animals are Buddies, Inquiry Stage 1* – Introductory Activity in preparation for this investigation. Although that introductory activity is primarily for classes visiting the Desert Botanical Garden, it provides foundational concepts and vocabulary which are further explored in this investigation.

TEACHER PREPARATION

The purpose of the plant and animal buddies discovery walk is for students to see real-life examples of "buddy" relationships in nature. For the purposes of this investigation, the term "buddy" is used to describe symbiotic relationships in which both "buddies" benefit. Most of the examples provided are about buddy relationships between a plant and an animal. However, there are many buddy relationships between two animals or between two plants and if encountered, these may also be pointed out to students.

It is suggested that teachers first scout the school grounds before taking the students outside. Decide on a route that would be good for a plant and animal buddies discovery walk. It is recommended that at least three specific places or "stops" be identified along the route that would serve as focal points to discuss buddy relationships between 1) birds and plants; 2) insects and plants; and 3) mammals and plants. Teaching stops should be chosen based on the inherent opportunity to convey the *Teaching Points* presented for each of the buddy relationships. Teachers should feel free to use more than one stop for each buddy relationship if they find additional examples that convey the teaching points. Suggestions of example relationships and specific things to look for at each stop are presented under the respective stop descriptions below.



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Gila Woodpecker

GENERAL PROCEDURES

Guide students on an outdoor walk following your pre-planned route. At each stop, conduct an inquiry to convey the *Teaching Points* presented for that stop. Although you may not find examples of every buddy relationship listed in the teaching points, they may still be conveyed in the discussion. Following each discussion, conduct one or more of the suggested activities. Because many of the suggested activities are similar for each stop, you might "mix it up" by choosing the activities that are most appropriate for a particular stop. Wrap up your walk by discussing students' discoveries and reviewing the *General Teaching Points*. When the class is back inside, review the entire investigation by walking students through the *Concluding Activity*, which replaces Stage 3 of *Inquiry in the Garden*.

Plant and Animal Buddies Discovery Walk - General Teaching Points

- Living things are interconnected in many ways.
- Living things rely on each other for their survival.
- Plants and animals help each other out in unique and interesting ways.



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Cactus Wren

GENERAL PROCEDURES

Birds and Plants Stop

Description

The birds and plants stop is best located where there are obvious signs of birds in or near plants. Base your stop on a chosen plant or plants but be prepared to stop when a bird is seen elsewhere on your route to take advantage of the "teachable moment." As you choose your stop (or stops) look for plants with the following bird sign:

- A tree with a bird's nest in it
- A tree with obvious woodpecker holes
- A saguaro cactus with holes in it (likely made by a woodpecker)
- A cholla cactus, bush, or other plant with a bird's nest in it
- A plant with berries or other fruit on it
- A plant that frequently has birds perching on it (look for bird droppings beneath the plant)
- A plant with large colorful flowers on it (could be pollinated by hummingbirds)
- A plant with chewed leaves (birds might eat the insects that eat plants)

Teaching Points

- Plants help birds by providing food and shelter for them.
- Birds help plants by pollinating flowers, eating harmful insects, and dispersing seeds.
- Some birds build nests in the branches of a tree or bush.
- Some birds (woodpeckers) peck out holes in tree branches or cactus stems as their home.
- Some birds remove and eat insects from plants that could otherwise harm the plant.
- Some birds drink nectar from flowers and pollinate the plant as they do so.
- Some birds eat a plant's fruits and spread the seeds by defecating them in another location.



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Gambels's Quail

GENERAL PROCEDURES

Discussion and Activity Suggestions.

At the birds and plants stop, conduct an inquiry using the teaching points as your guide. Questions to help students arrive at the key points for this stop, could include the following:

What signs do you see on this plant that a bird might have been here?

What does this _____ (bird sign such as a nest)

tell us about how this plant helps the bird?

What do these chewed leaves on this plant indicate and how might a bird help?
What are the holes in the trunk of this tree and what might have made them?

How might these fruits / berries help a bird?

What might a bird do to this flower to help this plant?

How might this bird help the plant?

How might this plant help the bird?

How do this plant and this bird help each other? Are they buddies?

After students have had a chance to discuss bird and plant buddies, choose and conduct one or more of the following suggested activities. Have students...

- Sit quietly for 5 minutes and observe birds interacting with plants.
- Count all the birds they see for a specified period of time (1–5 minutes).
- Count all the birds they see for a specified distance (from here to there).
- Draw a picture of a chosen plant and bird buddy relationship.
- Count how many different signs they can find that suggest bird and plant buddies.
- Choose a partner and act out a bird / plant buddy relationship.
 Like "Charades", have the other students guess the relationship



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Monarch butterfly

GENERAL PROCEDURES

Insects and Plants Stop

Description

The insects and plants stop would be best located in an area where there are either obvious sign of insects interacting with plants or many blooming plants (to discuss pollination). However, there are many plants that, by their very presence, suggest the activity of insects. Suggestions for insects and plants stops include:

- A flowering plant (look for even the tiniest of flowers)
- A plant with chewed leaves (sign of insects harming plants not a true "buddy" relationship)
- Common landscape plants (not necessarily in bloom) such as sages, lantana, and cactus (typically pollinated by butterflies, bees, or other insects)
- A paloverde tree (its flowers are pollinated by bees and other insects)
- A mesquite tree (its flowers are pollinated by bees, bruchid beetles, and other insects)
- Any plant with fruit / berries on it

Teaching Points

- Plants help insects by providing food, nectar, and shelter for them.
- Insects help plants by pollinating them and sometimes protecting them from other harmful insects.
- Some insects eat a plant's fruit and help spread the plant's seeds.
- Butterflies and bees drink plant nectar and pollinate plants while doing so.
- Many desert trees are pollinated by insects.



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Monarch larva

GENERAL PROCEDURES

Discussion and Activity Suggestions

At the insects and plants stop, conduct an inquiry using the teaching points as your guide. Questions to help students arrive at the key points for this stop, could include the following:

What signs do you seen on this plant that an insect might have been here?

What do these chewed leaves indicate? Is it a buddy relationship if the insect harms the plant?

How might these fruits / berries help an insect?

What might an insect do to this flower to help this plant?

How does this plant's flower help the insect?

How might this insect help the plant?

How might this plant help the insect?

How do this plant and this insect help each other? Are they buddies?

After students have had a chance to discuss insects and plants, choose and conduct one or more of the following suggested activities.

Have students...

- Sit quietly for 5 minutes and observe insects interacting with plants.
- Count all the insects they see for a specified period of time (1–5 minutes).
- Count all the insects they see for a specified distance (from here to there).
- Draw a picture of a chosen plant and insect buddy relationship.
- Count how many different signs they can find that suggest insect and plant buddies.
- Choose a partner and act out an insect / plant buddy relationship.
 Like "Charades", have the other students guess the relationship



Alternate Field Investigation



Round-Tailed Ground Squirrel

GENERAL PROCEDURES

Mammals and Plants Stop

Description

Signs of mammals may be less common in schoolyards than signs of birds and insects. Burrows of small rodents or squirrels may be the only direct sign of mammal presence. However, the presence of certain plants suggest plant / mammal buddy relationships. As you locate your stop(s), look for the following:

- Small holes (burrows) under the base of a bush (it's cooler and more protected under bushes)
- Pile of sticks at the base of a bush or cactus (could be a packrat midden {nest})
- Tall columnar cactus (some cacti are pollinated by bats)
- Signs of chewing on cactus pads (packrats and javelina will eat cactus not a true "buddy" relationship as it can harm the cactus)
- Any bush that has shady space underneath (many animals rest and cool off in the shade of plants).
- Any plant with fruit / berries on it (food for mammals).

Teaching Points

- Plants help mammals by providing food and shelter for them.
- Mammals help plants by dispersing seed, helping root growth, and pollinating flowers.
- Small mammals, such as rodents or ground squirrels, often build their burrows in the shade of bushes where it is cooler and more protected.
- Mammal burrows loosen the soil around plant roots, helping them to grow.
- Mammals often eat a plant's fruit which helps spread the seeds.
- Some bats drink nectar from certain cactus flowers pollinating them as they do so.
- Some mammals rest in the shade of plants.
- Packrats use plant parts in their "nests" which helps to disperse (spread) the plants.



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Newborn cottontail

GENERAL PROCEDURES

Discussion and Activity Suggestions

At the mammals and plants stop, conduct an inquiry using the teaching points as your guide. You may need to review the characteristics of mammals and have students name some common mammals before beginning your inquiry. Questions to help students arrive at the key points for this stop, could include the following:

What mammal might lay in the shade under this plant?

What mammal might have made these holes in the ground under this plant?

How might these holes in the ground help the plant?

How might these fruits / berries help a mammal?

What mammal might pollinate the night-blooming flowers at the top of this cactus?

How might this mammal help the plant?

How might this plant help the mammal?

How do this plant and this mammal help each other? Are they buddies?

After students have had a chance to discuss mammals and plants, choose and conduct one or more of the following suggested activities. Have students...

- See how many different burrows (likely made by mammals) they can find under or near plants.
- Stand for one minute in the shade of a plant, then stand for one minute in the sun. Describe how they felt in each location. Do students think other mammals might feel similar?
- Draw a picture of a chosen plant and mammal buddy relationship.
- Choose a partner and act out a mammal / plant buddy relationship.
 Like "Charades", have the other students guess the relationship.



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Saguaro Cactus

GENERAL PROCEDURES

CONCLUDING ACTIVITY

Procedures

- 1. Review and discuss the students' experiences during their Introductory Activity (Stage 1).
- 2. Review main concepts and terms and how they applied to the *Plant and Animal Buddies Discovery Walk* (the investigation).
- 3. They should then consider the discoveries they made during the investigation and review their findings. What did students discover during their investigation?
- 4. Explain to students that an important part of science is sharing your findings with others. Discuss the value of sharing scientific information (so that others may learn from the work and to expand everyone's understanding of the subject). Scientists typically publish their work in scientific journals. Students will prepare a final presentation of their investigation to share with others, both in class and by posting online on the *DBG Journal of Student Findings*.
- 5. Give students time to prepare a final presentation display of their investigation. Using the information from their investigation, they may choose to create a poster, draw pictures, and/or include photographs taken during their investigation or acquired from the internet. Write a song, poem, skit or story reflecting their experience. Encourage student creativity in the display of their work. (Note: For more ideas on art projects that tie into Garden themes, go to the *Additional Resources* section of the Digital Learning website.)
- 6. Have students share their displays and compare their findings with the rest of the class.

POST YOUR FINDINGS ON THE INTERNET!

Students may share their findings online by visiting the *DBG Journal of Student Findings* at *http://www.dbg.org/index.php/digital/students/journal*. Here, students can submit investigation findings or original art inspired by their *Inquiry in the Garden*.



TEACHER'S GUIDE FOR FIRST GRADE-NOURY IN THE GARDEN - STAGE 2 Alternate Field Investigation

RELATED ADE STANDARDS:

LANGUAGE ARTS STRAND 4: VIEWING AND PRESENTING

| CONCEPT | PERFORMANCE OBJECTIVE |
|--|--|
| S4: Viewing and Presenting – Students use a variety of visual media and resources to gather, evaluate and synthesize information and to communicate with others. | VP–F3. Access, view and respond to visual forms such as computer programs, videos, artifacts, drawings, pictures and collages. |

SCIENCE STRAND 1: INQUIRY PROCESS

| CONCEPT | PERFORMANCE OBJECTIVE |
|---|--|
| C1: Observations, Questions, and Hypotheses – Observe, ask questions, and make predictions. | PO 1. Compare common objects using multiple senses. PO 2. Ask questions based on experiences with objects, organisms, and events in the environment. (See M01–S2C1–01) PO 3. Predict results of an investigation based on life, physical, and Earth and space sciences (e.g., animal life cycles, physical properties, Earth materials). |
| C2: Scientific Testing (Investigating and Modeling) | PO2. Participate in guided investigations in life, physical, and Earth and space sciences. |
| C4: Communication | PO 1. Communicate the results of an investigation using pictures, graphs, models, and/or words. PO 2. Communicate with other groups to describe the results of an investigation. |

continued...10.



TEACHER'S GUIDE FOR FIRST GRADE-INQUIRY IN THE GARDEN - STAGE 2 Alternate Field Investigation

RELATED ADE STANDARDS:

SCIENCE STRAND 4: LIFE SCIENCE

| CONCEPT | PERFORMANCE OBJECTIVE |
|---|--|
| C3: Organisms and Environments –Understand the relationships among various organisms and their environment. | PO 1. Identify some plants and animals that exist in the local environment. PO 3. Describe how plants and animals within a habitat are dependent on each other. |

EDUCATIONAL TECHNOLOGY STRAND 2: COMMUNICATION AND COLLABORATION

| CONCEPT | PERFORMANCE OBJECTIVE |
|---|---|
| C1: Effective Communications and Digital Interactions | PO 1. Communicate with others as a whole class using digital tools. |
| C3: Global Connections | PO1. Participate as a class in communication at a distance. |