

Alternate Field Investigation



Saguaro

ACTIVITY OVERVIEW

In this investigation, students venture outside for a teacher–led, plant and animal life cycles 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 Desert Detectives, 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 life cycles discovery walk is for students to see real—life examples of life cycle stages in nature. 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 life cycles discovery walk. It is recommended that at least three specific places or "stops" be identified along the route that would serve as focal areas to present the introduction, life cycles of plants, and life cycles of animals teaching points. However, teachers should feel free to use more stops if necessary to take into account the inherent teaching opportunities offered by their unique schoolyard.



Alternate Field Investigation



Agave

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. If necessary, more stops may be used to convey all the points. Following each discussion, conduct one or more of the suggested activities. 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*.

Life Cycles Discovery Walk

General Teaching Points

- All plants and animals have a life cycle.
- Life cycles have distinctly different, recognizable stages.
- The life cycle describes the different stages of life including birth (live or as an egg), childhood, adulthood, and reproduction (a new birth).
- It is called the life "cycle" because it has no beginning and no end (cycle = circle).
- It is also called a cycle because it repeats itself.
- Although death is part of the life cycle, it is the reproductive stage that keeps the cycle going.
- Even in death, the cycle of life continues as living things decompose and return to the earth as soil.
- Some plants and animals have very unique life cycles.



Alternate Field Investigation



Mesquite seeds

GENERAL PROCEDURES

Introductory Stop

Description

The life cycle introductory stop is best located in an area that provides the best overview of the schoolyard. It would be ideal if a variety of plants were visible from this stop, both up close and in the distance. If there is room, it would be good for students to sit on the ground for the discussion and activities.

Teaching Points

- All plants and animals have a life cycle.
- An organism's life cycle has distinctly different, recognizable stages.
- The life cycle describes the different stages of life including birth (live or as an egg), childhood, adulthood, and reproduction (a new birth).
- It is called the life "cycle" because it has no beginning and no end (cycle = circle).
- It is also called a cycle because it repeats itself.
- In nature, we can see examples all around us of plants and animals in different stages of their life cycles.
- Humans too, have a life cycle.

Discussion and Activity Suggestions

At the life cycle introductory stop, first conduct a review of the life cycle and its different stages. Follow the review with an inquiry using the teaching points as a guide. Questions to guide the discussion and prepare students for the rest of the walk could include the following:

What are some stages of the cycle of life?

What is the life cycle of humans?

What might we see that would suggest a plant or animal's life cycle?

How many different stages of plants or animals do you think we might see?

What might be a sign of the life cycle stage of birth? (bird's nest, insect egg case, flowers or seeds of a plant, animal burrow)

What are signs of childhood (or early life) – (baby birds in a nest, caterpillars or other larvae, young children, young plants (seedlings or sprouts)



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Mesquite seedling

GENERAL PROCEDURES

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

Have students...

- Sit quietly for 3 minutes and see how many different examples they can find of plant and animal life cycles.
- Point out different plants or animals they see and state what stage of their life cycle they're in.
- Play a game similar to "I Spy" in which one student gives a clue such as "I spy an orange insect in its adult stage." or "I spy a small plant in its reproductive stage (with flowers)." The other students should try to locate the plant or animal in question.
- Choose a plant or animal in the area and act out its life stages, like "charades." The rest of the class should try to guess the plant or animal.

Life Cycles of Plants Stop

Description

The life cycles of plants stop is best located near a tree or bush that shows signs of its reproductive cycle (such as obvious flowers, fruits, seeds, or old seed pods on the ground below it). If your schoolyard has any agave or cactus, it would be good to have those in sight of this stop. A dead and/or fallen plant would also be a good focal point for the discussion about decomposition.

Teaching Points

- All plants have a life cycle.
- The stages of a plant's life cycle typically include seed, sprout, young plant, and adult plant (in its reproductive stage).
- Some plants can reproduce without seeds. They sprout young plants called "pups." This is called vegetative reproduction.
- Some agaves and cactus are able to reproduce without seeds.
- When plants die and decompose, they continue in the life cycle by returning to the earth and becoming soil.



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Mesquite tree

GENERAL PROCEDURES

Discussion and Activity Suggestions

At the life cycles of 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:

How many different stages of this plant's life cycle can we see here?

What stage of life is this plant in right now?

What stage of life do these flowers (or seeds, or seed pods) represent?

What are the other life cycle stages of this plant that we don't see here?

Does the season (time of year) have anything to do with the cycle of life? If so, in what way?

What might be another way that a plant such as this agave/cactus could reproduce?

What happens when plants die? How do they continue in the life cycle?

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

Have students...

- Sit quietly for 3 minutes and see how many different examples they can find of plant life cycles.
- Find an example of a plant in each stage of the life cycle (seed, seedling, adult plant, reproductive stage)
- See how many different plants they can find that are in their reproductive stage (have flowers, fruit, or seed pods)
- Find examples of vegetative reproduction through a plant's roots (a plant sending out a shoot underground that becomes another plant [e.g., grass, creosote, etc.])
- Find examples of a decomposing plant.
- Collect and study the soil under a bushy plant. Use a hand lens or other magnifying device to see the various particles in the soil. Look for decomposed plant parts.
- Choose a particular plant and draw its life cycle.



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Mesquite tree with pods

GENERAL PROCEDURES

Life Cycles of Animals Stop

Description

The life cycles of animals stop may be anywhere in the schoolyard where there are obvious signs of animals. Remember, insects are animals, too! Good places for this stop could include: near a tree with bird's nest, a place with animal burrows in the ground, or a plant in bloom attracting pollinators. Although a specific location should be chosen to convey the teaching points and conduct the activities, be prepared to stop when an insect, bird, or other animal is seen elsewhere on your route to take advantage of the "teachable moment."

Teaching Points

- All animals have a life cycle.
- The stages of an animal's life cycle include birth (live or as an egg), childhood, adulthood, and reproduction (a new birth).
- A bird's life cycle includes egg, chick, adult, and egg again (when the adult reproduces).
- Many animals find or build a shelter in which to bear young.
- Some insects go through a "metamorphosis" stage in which they undergo a dramatic change in their form.
- An example of an insect's metamorphosis stage is a cocoon or pupa.
- Many insects in their young stage (such as caterpillars) are called larva.
- Animals typically reproduce in their adult stage and bear young which continue the life cycle.
- Animals often rely on plants for food or shelter during various stages of their life cycles.



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Saguaro

GENERAL PROCEDURES

Discussion and Activity Suggestions

At the life cycles of animals 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:

Why do birds build nests? What stage of their life cycle might a nest represent?

Why do some animals dig burrows (holes)? What stages of an animal's life cycle might a burrow represent?

What are some animals that use burrows in which to have their young?

At what stage in a butterfly's life cycle does it fly?

What does a young butterfly look like? What is that stage called?

What are some ways that animals use (or interact with) plants during their life cycle?

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

Have students...

- See how many different animal burrows they can find and state what life cycle stage the holes represent.
- See how many different signs of insects they can find and state what life cycle stage is represented.
- Draw a picture of a chosen animal's life cycle.
- Play a game like "Pictionary" in which they draw an animal and have other students guess the animal and/or its life cycle stage.
- Choose an animal in the area and act out its life cycle stages, like "charades." The rest of the class should try to guess the animal.
- Sit quietly for 5 minutes and observe animals. Discuss the different animals and life cycle stages seen.



Alternate Field Investigation



Agave

CONCLUDING ACTIVITY

Procedures

- 1. Back in the classroom review and discuss the students' experiences during their *Introductory Activity* (Stage 1).
- 2. Review main concepts and terms and how they applied to the *Life Cycles Discovery Walk* (the investigation). They should then consider the discoveries they made during the investigation and review their findings. What did students discover during their investigation? Each student should also come up with a new question that they would like to know the answer to based on what they learned during the *Discovery Walk*.
- 3. 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*.
- 4. Give students time to prepare a final presentation display of their investigation (*Discovery Walk*). 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.)
- 5. 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 SECOND GRADE-INQUIRY IN THE GARDEN - STAGE 2 Alternate Field Investigation

RELATED ADE STANDARDS:

LANGUAGE ARTS STRAND 3: LISTENING AND SPEAKING

| CONCEPT | PERFORMANCE OBJECTIVE |
|---|--|
| C3: Students effectively listen and speak in situations that serve different purposes and involve a variety of audiences. | LS-F1. Use effective vocabulary and logical organization to relate or summarize ideas, events and other information. |

BEGINNING THEATER STRAND 1: CREATE

| CONCEPT | PERFORMANCE OBJECTIVE |
|------------|--|
| C2: Acting | PO 101. Imagine and describe characters, their relationships, what they want and why (e.g., through variations of movement and gesture, vocal pitch, volume, and tempo). |

BEGINNING VISUAL ARTS STRAND 2: RELATE

| CONCEPT | PERFORMANCE OBJECTIVE |
|--------------------------|--|
| C4: Meanings or Purposes | PO 101. Interpret meanings and/or purposes of an artwork using subject matter and symbols. |



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

RELATED ADE STANDARDS:

SCIENCE STRAND 1: INQUIRY PROCESS

| CONCEPT | PERFORMANCE OBJECTIVE |
|--|---|
| C1: Observations, Questions, and Hypotheses | PO 1. Formulate relevant questions about the properties of objects, organisms, and events in the environment. |
| C2:Scientific Testing (Investigating and Modeling) | PO 2. Participate in guided investigations in life, physical, and Earth and space sciences. |
| C3: Analysis and Conclusions | PO 4. Generate questions for possible future investigations based on the conclusions of the investigation. |
| C4: Communication | PO1. Communicate the results and conclusions of an investigation. PO2. Communicate with other groups to describe the results of an investigation. |

SCIENCE STRAND 2: HISTORY AND NATURE OF SCIENCE

| CONCEPT | PERFORMANCE OBJECTIVE |
|------------------------------------|--|
| C2: Nature of Scientific Knowledge | PO 1. Identify components of familiar systems (e.g., organs of the digestive system, bicycle). |

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

RELATED ADE STANDARDS:

SCIENCE STRAND 4: LIFE SCIENCE

| CONCEPT | PERFORMANCE OBJECTIVE |
|---------|---|
| | PO 1. Describe the life cycles of various insects. PO 2. Describe the life cycles of various mammals. PO 3. Compare the life cycles of various organisms. |

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 or small group using digital tools. PO 2. Identify and demonstrate safe and appropriate behavior when using digital environments to communicate with others. |