



Pacifica's Mobile Nature & Horticulture Center

"Cycles" Second and Third Grade Program Outline

Introduction: All of life is enmeshed in cycles, small and large. The students will explore this with a Moebius strip and a large spinning circle (with a variety of cycles: water, plants, mammals, insects, frogs, seasons, etc.) that students can spin. How cycles inter-relate with each other and with our lives will be discussed.

NATURE CENTER STATION OBJECTIVES:

1. To examine the life cycles of butterflies and frogs.
2. To explore the cycle of water and discuss its importance in our lives.
3. To determine the land to water ratio.
4. To determine the total water to drinkable water ratio.

ACTIVITIES:

YELLOW:

1. Students will design and construct a spinner of these cycles: butterflies, frogs, and water.

BLUE:

2. Students will help to manipulate models of a water cycle to understand the cycles and their importance to life.

HORTICULTURE CENTER STATION OBJECTIVES:

1. To examine the rotation of the earth, night and day, and the seasons.
2. To identify the characteristics of worms.
3. To discuss the life cycles of plants.
4. To compare pictures and drawings of plants at different times in the life cycle.
5. To discuss the importance of decomposers.

Pacifica's Mobile Nature and Horticultural Center Curriculum

6. To plant seeds for school and/or home vegetable garden.

ACTIVITIES:

RED:

1. Students will observe worms and what roles they play.*

* Note: Information for simple follow-up experiments (at the bottom of the activity sheet) is included in the "post-visit" section).

GREEN:

1. Students will plant vegetable seeds and discuss the various cycles of plants.*
2. Students will examine the seasons with a tilted globe and "sun".

*Note: Use of the planting station in the mobile classroom will be used for these experiments.

Connections to the Certificate of Initial Mastery (CIM) Standards:
Nature Center Objectives –

Unifying Concepts and Processes: Understand and apply major concepts and processes common to all sciences.

Common Curriculum Goal: Apply foundation concepts of change, cycle, cause, and effect, energy and matter, evolution, perception, and fundamental entities.

Content Standards: Use concepts and processes of – change, constancy, and measurement.

Leads to or meets the Benchmark at Grade 3:

1. Student will be able to identify examples of change.
2. Student will be able to arrange parts of a cycle.
3. Student will be able to recognize and diagram the parts of a system.
4. Students will be able to compare objects, drawings, and constructions to the real things they represent.

Horticulture Center Objectives –

Unifying Concepts and Processes: Understand and apply major concepts and processes common to all sciences.

Common Curriculum Goal: Apply foundation concepts of change, cycle, cause, and effect, energy and matter, evolution, perception, and fundamental entities.

Content Standards: Use concepts and processes of – change, constancy, and measurement.

Leads to or meets the Benchmark at Grade 3:

1. Student will be able to identify examples of change.
2. Student will be able to arrange parts of a cycle.
3. Student will be able to recognize and diagram the parts of a system.
4. Student will be able to identify examples of change over time.
5. Students will be able to compare objects, drawings, and constructions to the real things they represent.

Life Science: Understand structures, functions, and interactions of living organisms and the environment.

Common Curriculum Goal: HEREDITY – Understand the transmission of traits in living things.

Content Standards: Describe the transmission of traits in living things.

Leads to or meets the Benchmark at Grade 3:

1. Describe how related plants and animals have similar characteristics.

These benchmark standards can be used for both the Nature Center and Horticulture Center Objectives.

Scientific Inquiry: Use interrelated processes to pose questions and investigate the physical and living world.

Common Curriculum Goal: Formulate and express scientific questions and hypotheses to be investigated.

Content Standards: Formulate and express scientific questions and hypotheses to be investigated.

Leads to or meets Benchmark at Grade 3:

1. Ask questions about objects, organisms, and events that are based on observations and can be explored through simple investigations.

Scientific Inquiry: Use interrelated processes to pose questions and investigate the physical and living world.

Common Curriculum Goal: Design scientific investigations to address and explain questions and hypotheses.

Content Standards: Design scientific investigations to address and explain questions and hypotheses.

Leads to or meets Benchmark at Grade 3:

1. Plan a simple investigation.

Scientific Inquiry: Use interrelated processes to pose questions and investigate the physical and living world.

Common Curriculum Goal: Conduct procedures to collect, organize, and display scientific data.

Content Standards: Conduct procedures to collect, organize, and display scientific data.

Leads to or meets Benchmark at Grade 3:

1. Collect data from an investigation.

Scientific Inquiry: Use interrelated processes to pose questions and investigate the physical and living world.

Common Curriculum Goal: Analyze scientific information to develop and present conclusions.

Content Standards: Analyze scientific information to develop and present conclusions. .

Leads to or meets Benchmark at Grade 3:

1. Use the data collected from an investigation to explain the results.

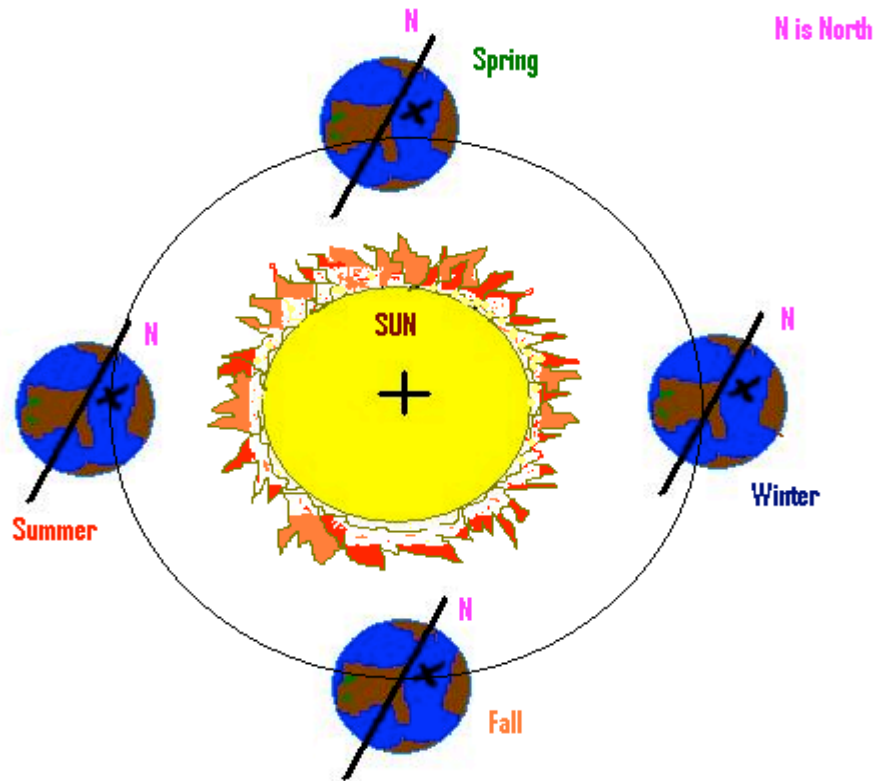
Background Information: It is included in the front pocket of each grade level folder.

Post-Visit Activities:

1. Complete the activities begun in the "Caterpillar":
 - a. The simple worm experiments using light sensitivity, preference for wet/dry, etc.; as variables (information is in the back pocket of the notebook).
 - b. Review the plant cycle and water cycle follow-up assignment sheets.
 - c. Continue to care for the vegetable seeds planted in pots:
 - i. Send them home for the students to care for the plants.
 - ii. Create and maintain a school or classroom garden.
2. There is information about several possible post-visit activities are in the back pocket of each grade level's folder.

Seasons Activity

SEASONS: SPRING, SUMMER, AUTUMN, WINTER . . . WHY?



Circle One: The sun circles around the earth The earth circles around the sun

Our pretend sun is a light bulb. Is you hand warmer or cooler as it gets closer to the light?

Measure how far the pretend sun's rays need to travel to reach Oregon in each season.

	Measurement	Write long in the longest and short in the shortest	Weather in that season		
			COLD	MEDIUM	HOT
SPRING			COLD	MEDIUM	HOT
SUMMER			COLD	MEDIUM	HOT
FALL (AUTUMN)			COLD	MEDIUM	HOT
WINTER			COLD	MEDIUM	HOT

ARE THE SUN'S RAYS WARMEST WHEN THEY ARE: (Circle One)

SHORTER AND MORE DIRECT

LONGER AND MORE SPREAD OUT

WHY DO PLANTS GROW MOST IN SUMMER? _____

STATION GREEN ACTIVITY SHEET

Worm Activity

WORMS!

Instructions: Draw a picture of your worm.

HOW DOES IT FEEL? _____ HOW LONG IS IT? _____

HOW DOES IT MOVE? _____

CAN YOU FIND ITS MOUTH? _____ "FEET" _____ (Look at the chart to see where they are).

WHAT DO WORMS AND OTHER DECOMPOSERS DO IN A GARDEN AND IN THE FOREST? _____

Chart:



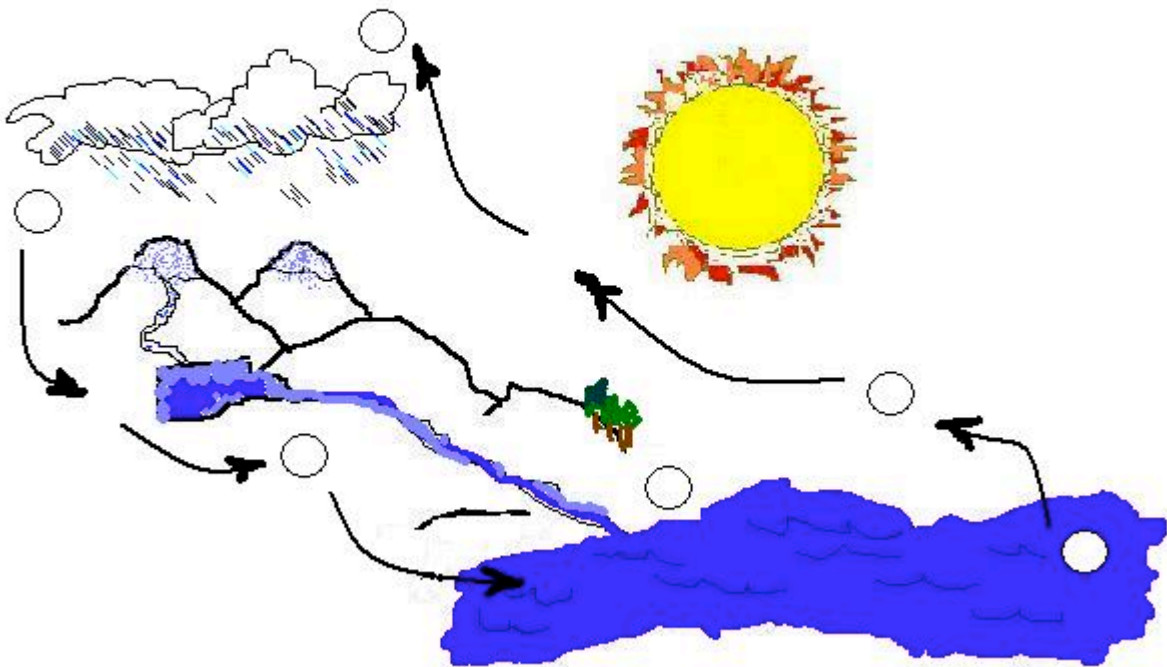
STATION RED ACTIVITY SHEET

Water Cycle Activity

The water we drink could be the same water a dinosaur drank because our precious water goes around and round in a never-ending cycle . . . if we protect it.

Pretend you are a raindrop. Draw a line from each of the words below to name a step in the water cycle you'll travel to get back home including some of the side trips you might take.

Clouds Precipitation (rain & snow) Evaporation Ocean River Wetland



How much of the earth is covered in water? (circle one)



How much of that water is drinkable? (Circle one)



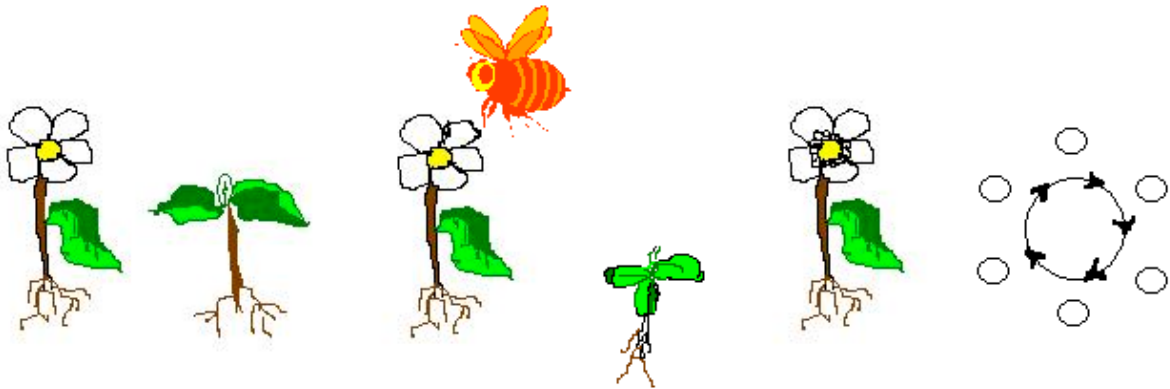
How can we help to protect our water?

STATION BLUE FOLLOW-UP ACTIVITY SHEET

Pacifica: A Garden in the Siskiyou
P.O. Box One
Williams, OR 97544
Ph. (541) 846-1100 Fax. (541) 846-1101
www.pacificagarden.org

Plant Life Cycles

Put the following steps in a plant's life in order by drawing a line to their place in the cycle.



Plant Life Cycles; they are not all the same:



WOODY plants live for many years. Some lose their leaves in autumn (deciduous), some don't (evergreens).



PERENNIAL plants live for several years. They die back in winter but come up again in spring.



A daisy lives for several years: IS IT A

PERENNIAL or an **ANNUAL** ?

(Circle one)

STATION GREEN FOLLOW-UP ACTIVITY SHEET
Plant Life Cycles
(con't)



Beans

A bean lives for one year: IS IT A

WOODY or an ANNUAL ?

(Circle one)



Oak Tree

An oak tree can live for hundreds of years: IS IT A

WOODY or a PERENNIAL ?

(Circle one)

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STATION GREEN FOLLOW-UP ACTIVITY SHEET

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Appendix A

Post Activities

These activities are suggested to complete the visit of the mobile greenhouse and nature center – “The Caterpillar” to your school

Post-Visit Activities:

1. Complete the activities begun in the “Caterpillar”:
 - a. The simple worm experiments using light sensitivity, preference for wet/dry, etc.; as variables (information is in the back pocket of the notebook).
 - b. Review the plant cycle and water cycle follow-up assignment sheets.
 - c. Continue to care for the vegetable seeds planted in pots:
 - i. Send them home for the students to care for the plants.
 - ii. Create and maintain a school or classroom garden.
2. There is information about several possible post-visit activities are in the back pocket of each grade level's folder.

**Appendix B
Change
Resources**

Background Material:

1. There is additional information on plants, life cycles, and worms included in the front pocket of your grade level folder.

Additional Resources:

Books:

1. **A Seed Grows: My first look at a Plant's Life Cycle; Pamela Hickman; Kids Can Press, LTD., 1997. ISBN: 1550742000.**
2. **Planets in Transit: Life Cycles for Living (The Planet Series); Robert Hand and Charles A Jayne; Schiffer Publishing, LTD., 1980. ISBN: 0914918249.**
3. **Pumpkin Cycle: The Story of a Garden; George Levenson and Schmuel Thaler; Tricycle Press, 1999. ISBN: 1582460043.**
4. **From Tadpole to Frog; Jan Kottke; Children's Press, 2000. ISBN: 0516235117**
5. **Tree is a Plant; Clyde Robert, Robert Bulla, and Stacey Schuett; Harper Collins Children's Books, 2001. ISBN: 0064451968.**
6. **Cycles of Life: Exploring Biology; Cecie Starr and Gerald L. (Ed) Kellogg; Thomson Learning, 1999. ISBN: 0534372724.**

Websites:

1. U.S. Environmental Protection Agency: www.epa.gov/kids/
2. The Global Habitat Project Green Screen: www.greenscreen.org
3. Project Learning Tree: www.plt.org

Appendix C

Glossary

Decomposers: An important step in many cycles, which connects the beginning with the end by breaking down dead plants and animals into material that is used again.

Worms and Worm parts:

Setae – bristles on the underside (made of chitin, like fingernails) which help worms dig a burrow and cling to their burrow when predators try to pull them out.

Clitellum – a long swollen segment located about 1/3 of the way from the front, which indicates a worm is old enough to mate and lay eggs.

Rotation: Going around the earth, facing the sun, rotates once a day, bringing night and day. The earth rotates around the sun once a year, bringing the seasons.

Butterfly Cycle: A complete metamorphosis; incomplete is equal to an egg, nymph, and adult. Stages – 1) Egg, 2) larva (caterpillar), 3) pupa (chrysalis), 4) adult (butterfly).

Frog Cycle: Stages – 1) Egg (in water), 2) tadpole (in water), and 3) grow legs and becomes a frog (on land and water).

Plant Cycles: Stages – 1) Seed, 2) root, 3) leaves, 4) flowers, 5) pollination, 6) new seed formed, 7) plant dies – after a variety of periods 8) decomposers break down leaves to make new soil for seeds.

Annual plants: They live only one year, produce seed to reproduce and then die.

Perennials: They live more than two years, die back to the ground in winter.

Woodies: They live a long life (length varies); have a woody structure above ground all year; can be deciduous (lose their leaves in fall) or evergreen.

Photosynthesis: Plants use sun, chlorophyll, water to make food (glucose), oxygen and water.

Water Cycle:

- 1) **Evaporation** – to change from liquid to vapor; in warm temperatures air can hold more water particles.
- 2) **Condensation** – to change from vapor to liquid; in cold temperatures air can't hold as much water.
- 3) **Clouds** – a mass of condensed water or ice droplets.

- 4) Precipitation – rain and snow.**
- 5) Transpiration – plants release oxygen and water in the air.**