



Life Cycle Wheels: Recording Nature's Calendar

Overview

Schoolyard Activity

Students record the changes of a natural subject through the school year.

Research Activity

Students research a local bird, complete & present their life cycle wheel about their bird.

Recommended Ages

Schoolyard activity

Grades 3 and up

Research activity

Grades 4 and up

Activity Time

Schoolyard Activity

Outside observation once every month for 40-50 minutes over the school year.

Research Activity

Inside research during 5 class periods.

Materials

Schoolyard Activity

- > Copies of the life cycle wheel, worksheet, rubric
- > Examples of completed wheels, provided
- > Coloring pencils, pencils, Clip boards
- > Sit-upons
- > Binoculars/magnifying glasses(optional)

Research Activity

- > Computers
- > Copies of wheels and rubrics
- > Pencils, coloring pencils

Introduction

The annual life cycle of our birds is linked with the seasonal changes in the habitats they depend on. The migration of birds in the spring is timed with the hatching of insects in the vast temperate forests of North America. The timing of insects is linked with the rebirth of plant life after winter. The rebirth of plant life is linked to increasing sunlight and warmth that comes with spring. Nature's calendar is beautiful to observe. When the mountain ash are full of berries, I know the cedar waxwings will soon invade my yard. What life cycle connections have you noticed in your area?

Life Cycle Wheels: Keeping a Record

The reoccurrence of plant and animal life cycles in relation to seasons and climate is called phenology. Consider it nature's calendar; it is important for all plants and animals. For people, the regular timing of nature's cycles is important for many reasons such as our health (think allergies, flu shots, and poison ivy), agriculture (planting, harvesting), recreation (ice skating vs. swimming), and monitoring weather events (hurricane season). Life cycle wheels are a unique way to keep a record in a non-linear fashion, revealing patterns and giving us a true sense of the cyclic nature of our world.

Phenology & Climate Change

The warmer temperatures that are the result of climate change are causing many plants to flower earlier and insects to emerge sooner. While non-migratory birds may be able to adjust their activities to take advantage of changes in the availability of food resources, migratory birds must alter the timing of their long-distance journeys. If birds that winter in Mexico,

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Phenology & Climate Change, Cont'd.

the Caribbean, and Central and South America do not change the timing of their departure to breeding sites in the United States and Canada, they may miss the insects and other foods on which they depend to help them migrate and to nest and raise young. Scientists call this phenomenon “mis-timing”. Already, researchers have learned that some bird species may need up to 35 years to shift the timing of their migrations, and that migratory species require more time.

How to Use the Wheel: 2 activity options

1. **Schoolyard Monthly Observations:** Students enter monthly observations of the same subject through the school year. The theme of the wheel is recorded in words or pictures at the center. Will your wheel reflect the annual cycle of a Canada goose, an oak tree, or a pond? Next, the larger middle section is divided to record your observations for each month. Consider making your observation about the same time each month. Finally, the outer most ring can be used to record more details such as the weather, seasons, etc. For examples of additional life cycle wheels visit: www.partnersinplace.com.

2. **Local Bird Research Project:** In this activity, students choose a bird to research from a list that you have prepared. Then follow the directions to fill in the wheel.

Preparation

Order copies.

The wheel is 11” by 11” so you may need to take it to a copy center to print. You can also order copies through Environment for the Americas at <http://www.environmentamericas.org/product/bird-life-cycle-wheel/>, (\$1 per copy or \$11.95 for 30 copies).

Print the two examples included with this activity.

These will serve as good examples to help your students understand how the wheel works.

Schoolyard Observation Considerations -

1. Choose the area where students will make their observations. What can they observe in this area? Make a list for step 2 of the activity. If you think your students will have a hard time choosing something to observe, you may want to let them choose from your list. When choosing an area also keep in mind how easily you be able to check-in with students. Are they close or far apart?
2. Make sure the observation areas are safe and free of poison ivy, red ants, etc.
3. Schedule your outside sessions in your classroom planning calender.
4. Gather Materials: clip boards, copies of the observation worksheet, pencils and colored pencils, and consider providing sit-upons, like carpet squares, to make students comfortable while observing.

Research Project Considerations

1. Identify and reserve a block of time when your class can use the computers.
2. Prior to the unit, ensure that student’s are able to access the web site: www.allaboutbirds.com.
3. Go to Birdzilla.com to access a list of the common bird species of your state for your students to research: <http://www.birdzilla.com/state-based-information/3307.html> We highly recommend that your students learn about common birds in your area. Other resources for research will be listed at the end of this activity.

Preparation Continued

Vocabulary.

1. **Life Cycle:** The changes in growth and development of a living organism over its lifetime.
2. **Phenology:** The study of reoccurring events in plant and animal life cycles in relation to seasons and climate such as when birds nest & migrate, flowers bloom, leaves turn colors, etc.
3. **Life Cycle Wheel:** A way to record phenology events in a circular form; it may also be called a phenology wheel. Life cycle wheels are a unique way to look at the order of events. Rather than recording and viewing events using a traditional time line or calendar, the shape of the wheel illustrates events in a circle, allowing us to more readily see patterns. The wheel can be used to record many cycles in nature: phases of the moon, seasons, bird migration and more.

Schoolyard Observation Directions

1. Introduce the new activity.

Explain to students that they are starting a new activity on life cycles. Explain the new term and that for one class period each month they will be observing the same subject and recording the changes on a life cycle wheel. Ask students, "How do we usually record events or show things that happen?" If they are not sure, prompt them with showing them a calendar and time line. Ask them, "What do we record on time lines and calendars?" Show them the wheel and explain that this is another way to record events. The wheel works the same way except we are going to record changes in nature. (See the definition above for further details on the wheel).

Morning Meeting Activity(Optional): Birthday life cycle Wheel

Introduce the life cycle wheel. Explain, "We are going to record our birthdays on the wheel but in relation to nature's calendar. You will each think about what is happening in nature when it is your birthday and give the class clues. Then we will try to guess your birthday month. For example, my birthday happens when I can see my breath, the trees are bare, the ground is white and bears are asleep. When the correct guess is made, write the person's name in the correct month on the wheel. In the center, you can put a picture of the class or write the class name (Mrs. Smith's 3rd grade class). Students may need prompting to think of natural events, instead of holidays or recreational activities.

2. How to use the wheel: Show students a blank wheel.

1. Begin your explanation at the center of the circle. Tell students that the center circle is the place to draw or write the subject they are observing. It can be a specific bird, a tree, or a larger area like the schoolyard or school garden. With students, make a list of subjects they could observe in the schoolyard. Use the list you prepared to get them started with ideas and/or to add to the class list.
2. Move to the next ring of months that are divided into pie shapes; this is where you will record your observations with pictures and/or words each month. The best observations of what is blooming, buzzing, and singing that time of year come from using your senses: sight, sound, smell, and touch. Do you hear the buzz of hummingbird wings? Do you smell fragrant flowers? Are the mosquitoes or black flies biting? What colors do you see?
3. Next, point to the outermost ring and how it can be used to show more details about habitat, weather, the seasons, or details you can fit in the middle circle.

Schoolyard Observation Directions Continued

3. Model using the wheel.

Students can do their best when they can see a new task modeled by their teacher. Modelling sets expectations for what you want students to do for their academic work and behavior. Modelling is especially important the first couple times you do this activity, but it is always good to review expectations each time. You can also consider asking a student volunteer to model before subsequent lessons.

1. Take a carpet square (or whatever sit-upon you are using) and pretend to find a place to sit for your observation in the classroom. Place the carpet gently down and sit, pretending to observe quietly. Ask students what they noticed you did and are doing, or you can simply state “Notice how I gently placed the carpet on the ground and sat down. I am sitting by myself, quietly--listening and watching.” You may even want to model investigating an imaginary subject (smelling the blossoms, feeling the leaves, etc) making sure to show that you are quiet and gentle.
2. Choose a subject that could be observed by students outside, for example a butterfly bush. Whatever your example follow a similar routine as this example using the butterfly bush. Draw a butterfly bush in the center and write the name. Point students to the month of September on the calendar. This is where they record their first observations today. Explain that you made observations yesterday, and I will use my notes to fill in my wheel. Show the students your notes on the worksheet:
I saw a ruby-throated humming bird. The blossoms are purple & smell sweet. There are bees and lots of butterflies, show them the sketch of some of the butterflies you made. The leaves are dark green and leathery. The sky is clear, blue, no clouds. It's about 70 degrees.

Now demonstrate how you will transfer your notes to your wheel. You could choose to write the details or draw what you observed in the pie shape area for September. In the outermost ring, color the area for the sky and record weather notes, or observation details you couldn't fit in the middle circle.

3. Choosing the subject and first observation.

Review the list of possible observation subjects the students came up with at the beginning of the lesson. Have each student choose a subject, and take a clipboard, pencil, worksheet, and carpet square. Remember to tell them where to go if you have a designated area. Also, tell them how long they have to observe and to listen for the bell (or whatever you use) that signals time to stop and meet at a point of your choosing.

First Observation Note: Because the first visit may take longer with explaining and finding their place, considering focusing on allowing students to find their place and their subject, followed by returning to the classroom to fill in the center of the circle. The next day, or later in the week they could return to their spot to make their first observation.

4. Filling in their wheel.

Upon returning to the classroom, allow students time to fill in their wheel using their notes.

5. Wrap-up

Wrap-up by letting student share what they observed. Also, restate that they will be doing this activity once a month following the same pattern.

Research Project Instructions

1. Introduce the activity.

Explain to students that they will be learning about birds that live in our area. They will get to choose a bird from a list of local birds that you have prepared. Students will have two computer sessions for their research and two class sessions for preparing a life cycle wheel about a year in the life of their bird. The final session will be a presentation of their bird life cycle wheel. Refer to the rubric for the research project to provide the details that students need to include in their wheel. The rubric also doubles as a check list.

What is a life cycle, phenology and the life cycle wheel? To introduce this to your students, please refer to the detailed instructions provided in the schoolyard observation option.

2 Presentations.

1. Model for students your expectations for presentations by presenting a wheel you have made. Before you begin, ask students to carefully observe what you do. When you are done ask for questions and comments. After your presentation, ask students what they noticed about how you presented: what was my voice like? What did I do with my hands and eyes? How did I use the wheel to tell about my bird? Make a list of what the students noticed on the board. Add anything they may have missed that you think is important. Next talk about the questions and comments. If any questions or comments are stated in a negative way, ask students how the comment can be rephrased to be positive. For example, "A hawk's beak doesn't look like that." Rephrase, "I wish the hawk's beak was _____. " or focus on what you do like such as "I like the color of your hawk." Emphasize that all presenters deserve respect for their work and effort.
2. Review the presentation rubric either before you model, or after you modeled and had the class discussion.
3. After the presentations are done, post the students work in the hallway for others to enjoy.

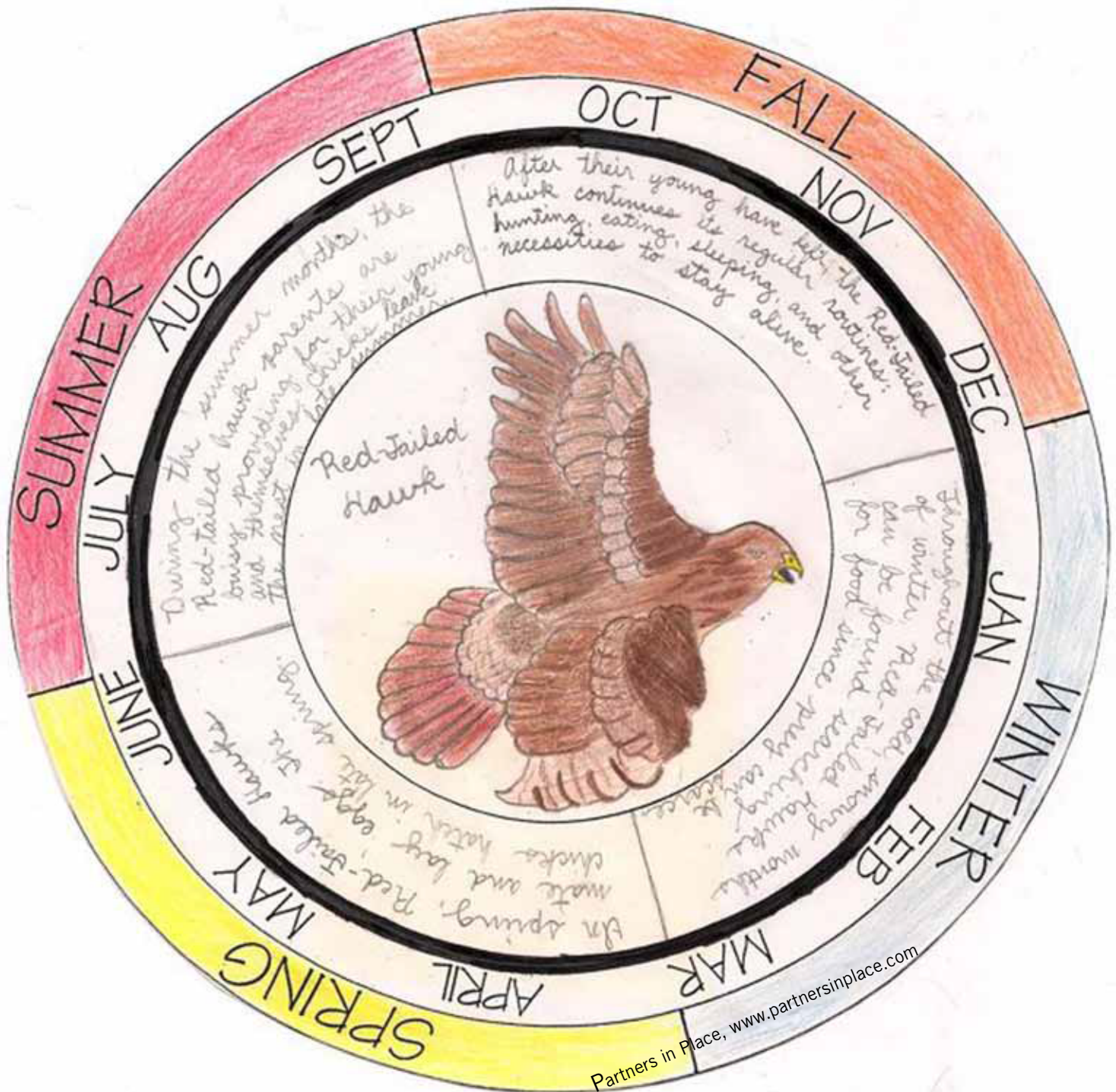
Sample Life Cycle Wheels

Sample wheels are provided by Partners in Place. See their web site for more ideas, www.partnersinplace.com.



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Life Cycle Wheel Rubric

Use this rubric to help inform your students of your expectations for the life cycle wheel activity. Use the additional row to add more requirements.

My Wheel	Center Circle	Middle Circle	Outer Circle
My wheel is readable.	I have clearly written my subject, and made a drawing.	My classmate can read my observation details. My details are written in complete sentences, with correct capitals and punctuation.	I have clearly written and/or drawn additional details.
I have details about my subject.	<ul style="list-style-type: none"> The name of my subject is spelled correctly. The drawing is accurate in terms of colors and features. 	Details about my subject include: <ul style="list-style-type: none"> How my subject looks or how it has changed. Other plants or animals interacting with my subject. Habitat details or changes. 	The extra details I have recorded tell more about what is happening around my subject such as weather, seasons, what's in bloom or buzzing.

Presentation Rubrics

My Presentation	Presenter	Apprentice Presenter	Novice Presenter
Eye Contact and Posture	I stand straight. I establish eye contact with the audience. I am relaxed and confident	I stand up straight and have eye contact with the audience some of the time.	My posture is not straight. I do not look at the audience.
Voice	I speak clearly and do not mispronounce any words. My voice is loud enough that everyone can hear me.	I speak clearly most of the time, and I may mispronounce one or two words. My voice is loud some of the time.	I do not speak clearly and have trouble pronouncing some words. My voice is soft and I am asked to speak up.
Preparedness	I have rehearsed and am prepared for questions.	I am prepared but needed to rehearse more.	I did not rehearse.
Prop	I point to the part of the wheel that I am speaking about. I go back and forth between the wheel and looking at the audience.	I point to the wheel as I speak but it may not always be at the right part. I may look at the wheel more than the audience.	I hold the wheel but do not point to it. I talk to the wheel, not to the audience.

My Research	<p>_____ I have recorded the references for my research on the back of the wheel.</p> <p>_____ I followed the bibliography format my teacher gave me.</p> <p>_____ I have included the following details about my subject:</p> <p>_____ Habitat in winter and summer, migration and route if known.</p> <p>_____ Eating habits throughout the year.</p> <p>_____ Nesting</p> <p>_____ Young</p> <p>_____ Migration</p> <p>_____ Other details of interest to me</p>
My Participation	<p>_____ I gave my full attention to the presenter.</p> <p>_____ my eyes are on the presenter.</p> <p>_____ my ears are listening.</p> <p>_____ nothing is in my hands</p> <p>_____ I ask thoughtful questions related to the presenter's topic.</p> <p>_____ I make positive comments to the presenter.</p>

Schoolyard Observation Worksheet

My Name:		My Observation Subject:	
Date:			
Weather:			
What I See	What I Smell	What I Hear	What I Feel
I			