

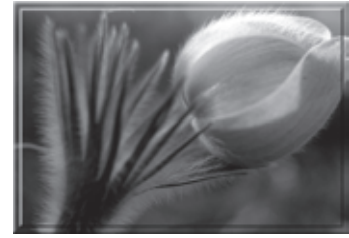
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key
ACTIVITIES



overview:

The students discuss signs of spring's arrival and are introduced to the Plantwatch program. Use Activity 1 in conjunction with Activity 2 to introduce your students to the concept of phenology and Plantwatch.

activity **one**



LORNA ALLEN

Signs of Spring

skills

Inferring, communicating

materials

1. Illustrations of the plants.
(see website <www.devonian.ualberta.ca/pwatch> and select The Plants)
2. Letter to students from the national Plantwatch research scientist, Elisabeth Beaubien. (page 2-3)

preparation

1. Read Introduction to Plantwatch.
2. Assemble the illustrations and letter to students.
(page 2-3)

focus

What outdoor signs suggest that spring is coming?

explore/investigate

1. Discuss the signs of spring known by the students.
2. Introduce the Plantwatch program to the students.
3. Review the illustrations.
4. Question: Do you think any of these plants or shrubs might be found in our community? Select a species to observe.
5. Have the students ask their families and neighbours if they know where this species can be found locally.
6. Give the letter from Elisabeth Beaubien to the students and ask them to share it with their families.

suggested connections

Key Activity 2, Predicting Seasonal Occurrences (page 2-4)

Science Activity 5, Developing a Phenology Calendar
(Connections - Science, page 3-19)

Language Arts Activity 2, Celebrating Spring
(Connections - Language Arts, page 3-49)



ELISABETH BEAUBIEN



Devonian Botanic Garden

University of Alberta, Edmonton, Alberta, Canada, T6G 2E1 • Phone: (780) 987 - 3054 • Fax: (780) 987 - 4141

Dear Student,

I would like to introduce myself and the Plantwatch program to you.

My name is Elisabeth Beaubien. I've been keen on plants and animals since I was young, so it was a simple choice for me to study biology and then botany. My main jobs have been as a naturalist and environmental educator. I launched Plantwatch in 1995 and now there are coordinators in most provinces and territories!

If you enjoy being outdoors, using a computer, and want to help society understand the effects of climate change, this program is for you! There is lots of fun to be had, tracking plant changes and writing down what you see. It is amazing to see the differences from year to year, and from place to place! While participating in Plantwatch, you will be acting as the “eyes of science” by observing the flowering of one or more of the following plants:

Common purple lilac (*Syringa vulgaris*); cultivated shrub, common in gardens

Dandelion (*Taraxacum officinale*); introduced herb, common in lawns, disturbed areas

Aspen poplar (*Populus tremuloides*); tree, across Canada

Larch, tamarack (*Larix laricina*); tree, across Canada

Prairie crocus (*Anemone patens*); herb, prairie and northern North America

Bearberry (*Arctostaphylos uva-ursi*); low shrub, across Canada

Saskatoon, serviceberry (*Amelanchier* spp.); tall shrub, across North America

Western trillium (*Trillium ovatum*); herb, northwestern North America

White trillium (*Trillium grandiflorum*); herb, eastern deciduous forest

Bunchberry, crackerberry (*Cornus canadensis*); herb, boreal zone

Labrador tea (*Rhododendron groenlandicum*, formerly *Ledum groenlandicum*); shrub, boreal

Purple saxifrage (*Saxifraga oppositifolia*); herb, arctic-alpine

White dryad, white mountain avens (*Dryas octopetala/integrifolia*); mat-forming low shrub, arctic and alpine tundra

(More species will be added in the coming year.)

On the Internet data form, your class will report the calendar dates when your plants start to bloom and are in full bloom. Every week we put the flowering dates received from all the Plantwatch observers on Internet maps, and post observers' names, locations and dates in Internet tables. Your regional coordinator will be delighted to see your reports!

This information is useful for many reasons. Because plants flower in response to warmth, flowering dates can help us track the results of a warm or cold spring. It will help us learn more about weather's variability and changes in climate. *Did you know that plants have been flowering earlier in recent decades in western Canada?* We can also use your plant observations to provide farmers with advice about good times to plant their crops, to fertilize and to control pests. Foresters can use the information to correctly time seed-collection trips, or to manage insects. In the field of human health, pollen warnings can help those with allergies prepare in advance.

Thank you for joining the Plantwatch team! Your help and participation are greatly appreciated.

Cheers,

Elisabeth Beaubien,

Research Associate, Phenology
National Coordinator, Canada Plantwatch

overview:

Students are introduced to seasonal change and the concept of phenology by surveying others about the signs of spring and making their own predictions.

Use this activity in the fall or late winter to introduce phenology to your students and get them thinking about seasonal change.

activity two



Predicting Seasonal Occurrences

skills

Predicting, communicating

materials

Survey questions, survey sheets and pencils.

preparation

Prepare survey sheets.

Read Science Activity 5, *Developing a Phenology Calendar* (Connections - Science, page 3-19)

focus

Introduction to phenology

suggested connections

Language Arts Activity 2, Celebrating Spring (Connections - Language Arts, page 3-49)

Science Activity 2, Weather (Connections - Science, page 3-7)

explore/investigate

- A. Choose several local signs of spring that can be easily observed, and have the students predict when those events will occur. These signs may involve the arrival of migratory birds, changes in weather, the appearance of leaves and flowers, or changes in human behaviour (changes in clothing, seasonal sports, farming practices, etc.) For example, some migratory birds may be easily identified (e.g., Canada geese, mallard ducks, common loons, swallows, robins), and students can be asked to predict when the first spring migrants will be sighted. When will the last snow on the school grounds melt? When will baseball season begin? When will farmers plant the first spring crops? When will ice on lakes and rivers disappear?

Record the students' predictions on a calendar and encourage the students to report any sightings or observations of the predicted events.

- B. Have the students conduct a survey of their parents, grandparents or other students to learn about local signs of spring (see the survey on the following page).

Signs of Spring Survey Questionnaire

Purpose: To find out how local people identify the arrival of spring and to discover when local people expect seasonal events will occur.

1. Please complete this sentence as many times as you wish.
"I know that winter is over when ..."
2. Please complete this sentence as many times as you wish.
"I know that spring is here when ..."
3. What are the signs of spring here in April?
4. What are the signs of spring here in May?
5. What things do you do in the spring, and how do you know when to do them?

Have students share the results of their survey with the class. In discussing the results of the survey, be sure to point out how some events can be predicted with great accuracy (e.g., the spring equinox, the next full moon, the last day of school before summer vacation). The timing of other events (e.g., bird migrations, frog calling, flowering dates, planting times) may vary from year to year, often depending on the weather. Weather conditions include such things as air temperature, precipitation and wind.

explore/investigate continued

- C. Climate is the general pattern of weather in a region, based on a minimum of 30 years of records. Because seasonal weather patterns tend to be similar over a long period of time, we are able to predict, with some accuracy, when certain changes in nature will take place in different locations.

You may wish to invite a local naturalist to talk with the class about how people are able to make predictions about when certain signs of spring will appear. Have him/her introduce students to local sources of information on bird migrations and bloom times. Contact your local naturalists' club for names of resource people. As well, look for First Nations Peoples' calendars –these often make reference to the seasonal changes in plants and animals that occur at different times of year.

Phenology is the study of the seasonal timing of life cycle events in plants and animals. Historical phenology records can provide evidence of the effects of climate changes over time.

overview:

Students go outdoors to identify and mark the plants they will observe for Plantwatch. Students make qualitative observations by describing, in words or pictures, the plants and their habitats. If a woody plant is chosen for this Plantwatch study, students can bring a branch into the warm classroom in late winter, to observe the buds developing indoors.

activity three



HALLE FLYGARE

Locating and Tagging the Plants

skills

Observing, identifying plants, sketching and map-making

materials

Plantwatch species information (see website <www.devonian.ualberta.ca/pwatch>)

Make your own tags to label the trees and shrubs, or ask a nursery for flexible plastic tags. Embossable aluminum tags work very well.

Permanent markers (for plastic tags)

Student logbooks or Observation Sheets (download Observation Sheet.pdf)

Plantwatch data forms (download Data Form.pdf)

preparation

Determine which species can be found in your area and select a species to report on.

Read Background Information on your chosen plant. (see website <www.devonian.ualberta.ca/pwatch>)

focus

Where can we find these plants?

suggested connections

Science Activity 1, Plants and Ecology: All My Relations (Connections - Science, page 3-5)

Language Arts Activity 1, Descriptions (Connections - Language Arts, page 3-47)

explore/investigate

1. Take the students on a walk to locate Plantwatch plants in the area of the school. You may want to ask a local naturalist or gardener to help with identifying the species. Tag up to 5 individuals of your selected woody plant species (trees or shrubs) or mark up to 5 patches of your selected smaller plant. Make a sketch map of the area showing your tagged plant locations.
2. Assign a group of students to each tagged woody plant or patch of plants. These students will be responsible for checking on their plants at least every 2 to 3 days when the time for flowering nears, and reporting any changes they observe to the class.
3. Have your students write descriptions of the plants' habitats and/or make sketches of the plant (e.g. sketch flower buds every few days as they grow larger) in their logbooks or on their observation sheets.
4. You may wish to clip a few short branches of your selected shrub or tree for observation in the classroom. Clip branches when the plant is dormant (i.e., before the leaves/flowers appear, January to April). Place the clipped branches in water in the classroom. Change the water and cut off a small portion of the wet end of a branch weekly. Students can observe the early development of leaves and flowers. For example, aspen poplar will flower quickly; saskatoon may take a few weeks to flower; and lilac will probably just produce leaves and flower buds before withering.

background information

When to Observe

Lilac generally starts to bloom in May in most of Canada, but keep a sharp eye on your bush starting at the end of April. Here's one example of relative timing: in central Alberta, lilac flowering generally starts a few days after full bloom of saskatoon.

Dandelion appears in April or May (make sure you observe well away from warm building walls, so that your date reflects the average time for dandelion in that area)

Aspen poplar can expand its catkins and release pollen very soon after snowmelt, if the weather is warm! Start watching catkins in very early spring.

Larch has small male and female cones that develop very early: watch for pollen shed and then needles emerging.

Prairie crocus buds poke through the ground in early spring. Visits to locations where crocus plants grow should be scheduled soon after the snow disappears. The time from first flowering to full flowering usually lasts 7-10 days, depending on the weather (faster flowering in hot weather, slower in cold weather).

Bearberry is one of the earliest flowers: look under leaves to see these small white and pink bells.

Saskatoon usually flowers in May (later in the north).

Western trillium and **white trillium** are some of the first forest wildflowers to bloom.

Bunchberry flowers after all the above flowers: in May or June.

Labrador tea usually flowers in late May or June.

Purple saxifrage is a "harbinger of spring" in the north and in the mountains, flowering soon after the snow melts.

White dryad starts flowering shortly after purple saxifrage.

Where to Observe

1. Plantwatch needs flowering dates of plants that are somewhat "average" in bloom time for your area. If your chosen plant flowers much earlier or later than others in the area, simply note this under the "Comments" section of the Plantwatch Data Form and tag a different plant (or group of plants) next year.
2. For the native plants, (i.e., any Plantwatch species except lilac and dandelion) select a natural setting away from buildings and other heat sources. For lilac, if possible, select a plant in the open, preferably away from any wall (with closest branch tips at least 2 m [6 ft.] away). For dandelion, select a patch on a flat area, if possible, and at least 10 m from a south or west-facing wall or fence.

Please note the details of your plants' habitats on the Plantwatch Data Form (download [Data Form.pdf](#)) to help Plantwatch assess the possible effects of location on your flowering dates.

3. It is important, where possible, to observe plants growing in a relatively flat area. Why? Plants on hills will get more or less sun depending on which way their slope faces. Plants on east- and south-facing slopes receive more warmth from the sun and flower earlier than the same species on colder north-facing slopes. If you are limited to watching plants on slopes or hillsides, please note which way your slope faces, using a compass, on the Plantwatch Data Form.

How to Tag

Larger woody plants: e.g. lilac, aspen poplar, larch or saskatoon: Say, for example, your class has selected the lilac as a species to observe. Locate **up to five** plants per class to observe, and assign a number to each plant. When you report flowering on the Plantwatch Data Form, put this number in the *Plant Number* section.

Make your own tags by cutting up plastic yogurt/dairy containers, or by using masking tape, or find tags at a plant nursery or forestry supply store. Mark the tag with a plant number (see box below). Wrap the tag around a solid branch of your tree or shrub (at least 2-3 cm or 1 in. diameter).

Try to put the tag on a branch where students can find it easily even when the bush has leaves. If plant or label vandalism is a potential problem, you may wish to select plants away from public view, or place the tag so it is not visible from a main trail or public area.

Permanent Markings on Labels

Because even permanent pen markings can fade after two months' exposure to spring sunshine, consider a more permanent marking method. Find a plastic label-maker to add your plant's number and name to the plastic tag. Nurseries or forestry supply stores often sell embossable aluminum tags for shrubs or trees.

Be sure to make and keep a sketched map of plant locations and numbers in case your label is removed, and to help relocate the plant the next spring. It is best to leave the label on a tree or shrub, and to observe the same plant in subsequent years.

Tagging Smaller plants:

For prairie crocus, white or western trillium, Labrador

tea, dandelion, bearberry, bunchberry, purple saxifrage and dryad: Search for a good patch of plants, i.e. in spring, one that has buds or flowers; or in summer, fall, or winter, one that has evidence of present or past fruit (empty flower stem, berries, seeds, capsules from the previous year). If the plants are very abundant, select a square patch of 1 m x 1 m (3 ft. x 3 ft.). Mark the corners of the patch using small rocks or sticks. Adding a yellow plastic tent peg, or a metal tent peg with orange flagging tape tied on, will make it simple to relocate your site. Make sure the patch has a number — use a plastic or aluminum label.

Saskatoon flowers



ELISABETH BEAUBIEN

How Many to Mark or Tag

Reporting on **one** shrub or patch is fine, and more is even better! Please report on a **maximum** per class of

- five woody plants of one of the larger plants (e.g., lilac, aspen poplar, larch or saskatoon), **or**
- five patches of one of the smaller plants (e.g., dandelion, prairie crocus, bearberry, trillium, bunchberry, Labrador tea, dryad or saxifrage).

Put the number on the tag for that plant or patch.

Create a school Plantwatch garden using the species that naturally occur in your area. Then students can easily observe the plants at all stages of their life cycle! There are a few ethical issues to consider, however, when obtaining native plants. These plants should be grown from locally-collected seed, or purchased from a reputable nursery that propagates the plants and does not simply dig up plants in the wild and sell them. For more information, see the ethical guidelines.