

GRADES K-6th

BudBurst Museum Facilitator Guide

Big Picture Concept

Plant lifecycles, plant parts

Program Description

Join citizens all over the U.S. in collecting plant lifecycle (phenology) data and contributing to an ongoing scientific research project that explores the effects of climate change on the plant lifecycle. Students will identify and observe and collect data on native U.S. plants at different stages in their lifecycle, budding, first bloom, full bloom, and die-off. Once data has been collected, students will return to the classroom, analyze their data, and enter the results on the budburst.org website to be included in the national data collection effort.

Suggested Time: 35 min

Materials:

- Student data collection forms (download from website) or notebooks to record data
- Plant Identification Cards (you can print out the relevant plant ID pages from the budburst website) One set for each student group or chaperone
- Pencils
- Magnifying glasses (optional)

Before you Begin:

- Decide which plants you will have students identify and locate those plants in your available space.
- Print out plant identification sheets.

I. Introduction/Welcome

Welcome

- Welcome students, teacher(s), and chaperones. This is a good time to address the chaperones and assign each of them to a group of children. The chaperones will be responsible for helping to guide the children in their groups through their activities at the Garden. Briefly introduce the garden and go over any museum rules.

Introduction

K-2nd Grade

- Introduce yourself and briefly explain what they will do today: explore and observe. *"Today you are a scientist"*. Say, what do scientists do? Encourage students to give you answers, you'll hear things like, they do research, experiment, and study. Emphasize that one of the main things scientists do is make observations.

3rd – 6th grade:

- Introduce yourself and briefly explain what they will do today: explore and observe. *"Today you are a botanist"* say, does anyone know what botanists do? Encourage students to give you answers. Emphasize that one of the main things botanists do is make observations.

II. BudBurst Plant Search (35 minutes)

Location: The outside area where you have identified BudBurst plants.

Big Picture Concept: Plants are composed of different parts with different functions. Plants go through a life cycle that includes seed to seedling to secondary plant growth to flowering to fruiting.

Scientists make observations so today you will need to look for some specific plant parts and record what you observe.

K –2nd grade:

- Begin by asking the students if they know the parts of a plant (seed, roots, stem, leaves, flowers, fruit). If they are older ask them if they know the life cycle of a plant. You might have to prompt them by asking where we get new plants.
- In this way you can talk them through the cycle of seed to seedling to plant growth to flowering to pollination to fruiting to seed dispersal. Draw this on the portable dry erase board.
- Ask them when plants start growing outside (spring) and why they start when they do (increased warmth and/or daylight hours). Ask them whether plants everywhere start growing at the same time. You might need to draw a comparison between Hawaii or Florida and Chicago.

- You might want to include in the discussion that anything with a seed is a fruit. Cucumbers, pumpkins, apples, green beans, pears, and tomatoes are all fruits (to name a few).
- Tell students that today they are going to look for a plant that has buds, leaves, flowers, and fruits.

3rd – 6th grade:

- Ask the students how we grow new plants or how do we propagate plants? Seeds are one way to produce more plants. Ask them to talk through the life cycle of a plant as you draw it on the portable dry erase board.
- Once they've done this ask them why plants are important to us. Plants are important because they provide us with food, medicine, and natural beauty. They help to control loss of land due to erosion, provide habitats for other animals, and provide us with oxygen to breathe.
- We talked about plants providing us with food. How do they do that? They turn light energy from the sun into food energy through the process called photosynthesis (photo=light and synthesis=to make).
- Tell students that there is a whole area of science that studies the plant life cycle and the specific events like budding, leafing, blooming, die-off, called **Phenology**. Ask students whether it matters when plants bloom? What would happen if apple trees bloomed in the fall? Would we get apples? Why not. (pollinators, climate)
- Ask students why plants start growing in the spring (rather than winter) and why they start when they do (increased warmth and/or daylight hours). Ask them whether plants everywhere start growing at the same time. You might need to draw a comparison between Florida and Chicago or ask if it is spring everywhere when it is spring in Chicago.
- Tell students that because plants are sensitive to climate, scientists can use the timing of life-cycle (phenological) events to understand how the climate is changing.
- Tell students that today they will help scientists understand climate change by collecting data about plant phenology that they can bring back to the classroom and give to scientists to use by entering it into a website. Students all over the country are collecting this data to contribute to a real scientific investigation.

Plant Life Cycle Search

- Tell them that they will be exploring the outside Garden today each student should have paper and pencil to record their observations.

K-2nd grade

- Have them sketch seeds, stems, leaves, and flowers. It also provides space to sketch the plant life cycle (they may need your drawing as a guide, so you may want to have them do this before they explore).

3rd – 6th graders

- Have them enter data on the phenological stage of 5 specific BudBurst plants (that are present at your location) and it is their job to 1) find the plants in the garden and 2) write down what stage the plant is in its lifecycle.

NOTE: To enter the data on the website when they get back to school **students must have the latitude and longitude of their data collection site.** If you have access to a GPS unit, you may use that in the activity, particularly with the older students. If you do not have a GPS unit, make sure the students and/or teacher has the address of your institution (or closest street address) and they have the GPS Coordinate Instruction Sheet.

- Distribute plant ID cards to each teacher and chaperone
- Distribute magnifying glasses to each scientist. **Put the chaperones and teachers in charge of returning the magnifying glasses to you when the activity is over.** Remind them that they can use their magnifying glasses to make their observations. They are welcome to touch the plants gently but tell them that they are not allowed to pick any plants. Remind them also to stay on the paths and be careful not to step on any plants.
- Ask the scientists to search the garden for specific plant parts (and a plant's life cycle for 3rd-6th graders) and sketch and record their observations in their guide.
- After they have finished making observations ask them to return the magnifying glasses to the station

- Remind the scientists and teachers that they can contribute to a real scientific research project by taking their data back to the classroom and entering it into the www.budburst.org website.
- Distribute follow-up activity plans to teachers or refer teachers to BudBurst website for additional activities.

GPS Coordinate Instruction Sheet

First, identify the latitude and longitude of your location:

<http://www.multimap.com>

- Find the full address of the location you need coordinates for including street address and zip code.
- Where it says country in the top left corner it should say United States. Type in the street address, town, state and zip code and click 'find' it will then display a map of that location.
- The red circle is over address you entered into the search engine. You will also notice it has zoomed in on the location.
- If the location is not exactly where you want, you can use the arrows on the sides of the map to navigate to the specific location.
- Double click on it to center the map around that point. Notice that the red circle stays in the same place. To re-center the red circle, scroll down and under the map, you will see Map Information, including X and Y coordinates, latitude/longitude, and a URL address.
- Click on the link and the red circle will move to your selected location.
- Now look back under the map and you will see the new Map Information, including X and Y coordinates, latitude/longitude, and a URL address.
- Copy the latitude/longitude coordinates displayed within the parenthesis. These are the decimal degree coordinates needed to enter your BudBurst data online at www.budburst.org!

Now you are ready to enter your BudBurst data!

www.budburst.org