**Teacher**: **Grade Level:** 3rd-6th

**Time:** 1 hour **Author:** Michelle Coe

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| **Next Generation Science Standards** | **3-LS1-1**. Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.**MS-ETS1-4**. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved. |
| **Enduring Understandings:** | **PS4.C** Information technologies and instrumentation can be used to help scientists and citizen scientists track phenological events in plants and animals.  |
| **Content Objective:** | Students will use computers and ipads (if available) to explore the life cycles, structures, and native habitats of their Nature’s Notebook plants. Students will work in teams to begin compiling this information in their journals. |

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| **Vocabulary** | **Materials** |
| DataLife CyclePhenophasesNativeClimateHabitatEdible | Science JournalsSite-specific Field Guides, printed, laminatedNN Data Sheets Computers & iPads (if available)Books (if available) |

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| **Seasonality**: This lesson will work well at the beginning of the year so that students can begin developing a better understanding of their specific NN plant species as soon as possible.  |
| MonsoonJuly-Sept. | AutumnOct.-Nov. | WinterDec.-Feb. | SpringMar.-Apr. | Dry SummerMay-June |

**Engage:** Challenge student-pairs to go outside and find one plant that has a fruit, flower, and flower bud all represented on it at the same time. Remind students to just look; have them prepare to share with the class what they found.

**Explore**: Guiding Question: *Why* we see different phenology displays, or phenophases (i.e., flowers, buds, fruits, and seeds) at different times of the year? Prompt students to think beyond the plant and tie into weather, climate, pollinators, and some of the other biotic organisms that may share a mutualistic relationship with the plant. Record answers on a storyboard.

**Explain**: Today we will be using technology to research facts about our plants. It is very important that we understand *why* certain phenophases are happening to the plants we are studying, so that the citizen science information we are providing NN scientists is as accurate as possible. What are a few questions we may already have about our Nature’s Notebook plants that we have been recording data for? Give students time to each come up with at least one question about the plant they have been observing. Have students record this question in their scientific journal. Encourage student groups to work together but make sure that each person records one question in their science journals.

Questions may include: What does it mean for a plant to be native to a certain place in the world? How does this relate to its habitat, or the place each plant and animal lives?Why are some plants important to us? Do we eat them, use them during ceremonies, or use them for medicine? Which plants? How do we use them?

Share some of these questions with the class and think through some of the prompts mentioned. Can some of these same questions be asked for another group’s plant?

**Elaborate:** Place students into their working science teams and give each group a computer, any relevant books, and an iPad. Have each team research the questions they wrote down in their journals. (*Teacher note: set a timer every 6 minutes so that everyone gets a turn with each technology source.)* Make sure the students are recording what they find in their science journals and are keeping logs of which sites they visit.

While groups are researching their individual plants, allow one group at a time to go outside and record their NN data for the week.

**Websites Helpful for Student Research:**

Horticultureunlimited.com

Desertusa.com/flora.html

Plants.usda.gov/java/nameSearch

Desertmuseum.org

**Evaluate:** Tell each student science team that they will be sharing one interesting fact they learned during their research today. Give each team 1-2 minutes to review their work and choose a speaker for the group. Go through each scientific team’s plant species and have students share and review the NN data collected that day. Ask students to compare and contrast data from the previous week, noting changes in the occurrence of fruits, flowers, buds, and more.