



**Introduction-** Phenophases are the annual life cycle stages which occur during a plant or animal's life for a year. Many of plants, animals, and even insects all depend on their inner time clocks so that they may all coexist in symbiotic relationships (1).

# Phenophases

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**Hypothesis-** I predict that all of the trees will bud out around the same time because they are in the same area.

**Method-** I measured and took photos of 3 different buds for almost 2 months on the FRC campus. The 3 trees I was measuring was a Ponderosa Pine, a White Alder, and a Cottonwood. The first couple of weeks there was not any major change to any of them.

**Table 1: Phenophase Measurements**

Ponderosa Pine	White Alder	Cottonwood
3/18 1.5cm tightly closed	3/18 1cm tightly closed	3/18 1cm tightly closed
4/14 1.5cm still closed	4/14 2.5cm starting to open	4/14 3cm opening
4/22 2.5cm closed but getting bigger	4/22 2.5cm opening & growing leaves	4/22 3cm opened and growing a leaf
4/29 3cm still growing	4/29 3cm growing more leaves	4/29 5cm growing more leaves
5/06 4.5cm getting close to opening	5/06 4.5cm has more leaves	5/06 6cm lots of new leaves

**Result-** By week 6 the White Alder and the Cottonwood had budded out and started growing leaves, as for the Ponderosa Pine there was not much of a change. By the last week there was a major change in all 3. The Ponderosa Pine still has not opened but has grown significantly, and the White Alder and Cottonwood have both budded out and grown lots of leaves, as shown in Table 1.

This table shows the measurements and dates recorded for all 3 phenophases. It also has a small explanation of the process the phenophases were going through at the given dates.

### Phenophase Photos

Figure 1a

Figure 1b

**Discussion-** I originally predicted that all 3 trees would bud out around the same time. My hypothesis was incorrect. 2 of the trees did bud out around the same time but the third tree did not.

**Future Research-** Next time I would take more notes in explaining the process better and I would also like to test them and see what happens in a longer time frame to see if climate change has any effect on it. I would also like to keep data on trees that are not in the same area to see if the location has any effect on the process.

### Reference

- (1) *Phenology definition*. NORTHEAST INDIGENOUS CLIMATE RESILIENCE NETWORK. (n.d.). <http://www.nicrn.org/phenology-definition.html>.

These figures show what the phenophases looked like at some point in their process. Figure 1a is the Ponderosa Pine the first week. Figure 1b is the Ponderosa Pine the last week. Figure 1c is the White Alder in the last week. And Figure 1d is the Cottonwood in the last week.



Figure 1c

Figure 1d