**Monitor My Maple**

Phenology: Nature’s Calendar

**Lesson Designer:** Emlyn Crocker

**Grade Level / Subject:** 7th-8th grade science

**Standards addressed:** MS-LS2-1 Ecosystems: Cause & Effect Relationship; MS-LS2-4 Ecosystems: Impact of Change on Populations; MS- SL1 Comprehension and Collaboration

**Resources:**

* Phenology Relay Race cards
* Two sheets of construction paper and a marker
* MMM Autumn datasheet

Link: [www.natureupnorth.org/sites/default/files/fall\_maple\_monitoring\_data\_sheet\_1.pdf](http://www.natureupnorth.org/sites/default/files/fall_maple_monitoring_data_sheet_1.pdf)

**Total time:** 45 min

**Location:** Classroom, gym or outside (relay race)

Lesson Goals (KUD)

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| By the end of the lesson students will: |
| **Know**(Key terms, facts, names, etc.) | **Understand**(Big ideas, essential questions) | **Do**(Skills, performances (action verbs) |
| -definition of phenology-environmental factors like day length and temperature drive seasons-autumn maple phenology signs | -seasonal patterns are predictable-Each phenologic event is connected to a season  | -Phenology photo relay race-Answer questions about phenology -Read MMM datasheet and ask questions |

Planning pre-assessment

Lead up to this lesson by talking often about seasonal change. Ask students what seasonal change is coming in the next few months. Gage students understanding of/ familiarity with seasonal change.

Introduction/Expectation Setting

**Hook:** Ask the class “What changes are you excited for this time of year? What day will all the leaves have fallen from the trees?”. Introduce phenology.

**Goals:** Students will understand definition of phenology and purpose behind studying it, and will brainstorm fall maple phenology signs.
**Expectations:** Students are interactive and excited to discuss changes. All students participate in class discussion.

Lesson Body

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| **Time** | **Teacher Does** | **Student Does** | **KUD Addressed/KUD Assessed** | **UbD, HPL theory/concept supporting strategy or choice** |
| 5 min | Hook questions | Respond to questions, discuss fall color change | Answer questions about phenology (D) | Draw on prior knowledge to build understanding (HPL) |
| 5 min | Introduce concept of phenology; write on a whiteboard | Repeat definition, take notes | -definition of phenology (K) |  |
| 15 min | Phenology Relay Race: Take students to the gym or outside for the race (rules attached to lesson).Review results aloud with students; correct if necessary (use teacher cheat sheet).Debrief Question: Could any photos be placed in either pile correctly? Why? What cards would you choose to add to either group, if you could? | One at a time (per team) students run to the pile of photo cards, return to team and decide phenology yes or no, place in correct pile, and tag next team memberStudents participate in discussion, think critically about local phenology/ seasonal change.  | environmental factors like day length and temperature drive seasons (K)-seasonal patterns are predictable-Phenology photo relay race (D)-Each phenologic event is connected to a season (U)-Answer questions about phenology (D) | Prior knowledge (HPL)Student-friendly and interactive.  |
| 5 min | Transition to discussion on maple phenology. Review list created in Lesson 1 of what students already know about maples. Prompt class discussion with the question, “what changes do you expect to see on trees in the fall? | Students review existing knowledge of maples, thing critically about current maple phenology that they expect to see on their 1st observation. | -Answer questions about phenology (D) | Prior knowledge (HPL) |
| 15 min | Pass out MMM datasheets; tell students their tree teams. Talk through datasheet (if time allows).  | Take turns reading datasheets aloud; ask questions | Read MMM datasheet and ask questions (D) | Establish goals and expectations in backwards design (UbD) |

Closure

Review definition of phenology. Prompt students with the question, “what example of maple phenology are you most excited to study with your tree team this fall?”

Assessment

The assessment in this lesson is the formative relay race activity and informal discussions. Students are learning new material, and will show understanding as they perform the activities. The relay race is visual (pictures) and lets each student have a turn while also working in a team. It’s student friendly because it’s active, helping to make it fun and exciting for students to learn new materials and stay engaged. Example relay race cards enclosed.