



## Dutch Elm Disease: A Threat to Longhouses and other Building Materials

### Organization:

**Title:** Dutch Elm Disease: A Threat to Longhouses and other Building Materials

**Summary:** Students learn about Dutch Elm disease and its impact on Elm trees and Haudenosaunee tools. Through a communicable disease lab students recognize the parallels between the transmission of Dutch elm disease and human diseases such as tuberculosis.

**Inquiry Question** Inquiry Question 3: What are some threats to the plant species used to construct these tools and technologies?

**Duration:** 1 class period

**Learning Environment:** Classroom, outdoor

**Season:** Summer, Spring, Fall

### Materials:

- Dutch Elm Disease.pdf
- Materials to run communicable disease lab: Saturated Baking Soda Solution (baking powder dissolved in water until no more can dissolve), Distilled H<sub>2</sub>O, Vinegar, Numbered clear plastic cup for each student, Stickers for vaccinated students, Phenolphthalein indicator solution, Substitution for Phenolphthalein indicator: Water from boiled red (purple) cabbage [To make the cabbage solution: Boil a half of a head of red (purple) cabbage in a large pot of *distilled* water. Using tap water will affect the pH of the solution and the results of the activity. Strain out the cabbage and keep the water. The water should turn purple. Refrigerate any portion that you do not use immediately. This can be kept refrigerated for a day or two. Frozen extract can be kept for months. WARNING: This is a very good indicator, and it is inexpensive, but it has a strong smell];
- Spread of Infectious Disease.pdf

### Curriculum Links:

Grade 7 Science and Technology: A1.1, A1.4, A1.5, A3.2, B2.1, B2.5

Grade 9 Science: A1.1, A1.5, A2.4, B2.4

### Meta Data:

**Content Type:** Activity

**Bundle:** Tools

**Theme:** Invasive Species

**Subject Area:** Biology, Chemistry, Health, History, Outdoor Education, Science, Social Studies

**Curriculum Focus:** 7, 9

- Teacher explains that the Haudenosaunee constructed many things locally from Elm trees. Tools include wooden spoons/ladles, dugout canoes, lacrosse equipment, longhouses etc.



- Using the **Dutch Elm Disease.pdf** teacher introduces students to the impact of Dutch elm disease on Elm trees and accordingly on Longhouses and other tools constructed with Elm.

### Communicable Disease Lab:

- In activity found in **Communicable Disease and Invasives.pdf** students are asked to draw a connection between Dutch elm disease and communicable diseases that impacts humans like Tuberculosis (TB). Dutch elm disease (DED) spreads much like human viruses. The beetles that invade trees are larger than human viruses, but transmission is similar in that they are both due to contact. Turtle Island is in the recovery phase of Dutch elm and is currently in the process of replanting the trees, even hybridizing elms to weather DED better in the future – but it is not out of the woods yet. DED is less prevalent now, but that's only because there are fewer elms, not because the beetles have moved on.
- Teacher begins by talking about the impact of TB historically, and today, in many Indigenous communities. Time permitted this could be extended into an inquiry project.
- The teacher explains to students that TB and other communicable diseases (like STIs) can spread rapidly. Often, a pathogen is transmitted before the carrier even knows they are infected. The purpose of the activity is to trace how quickly a disease can spread through the classroom.
- After the communicable disease lab, students think about why understanding how quickly diseases can spread is important in understanding the impact of an invasive species.
- It is important because just like communicable diseases found in humans, invasive species such as the fungi *Ophiostoma ulmi* carried by tiny elm bark beetles, spreads rapidly and in a manner that is difficult to control!