

## Needle Ice



Needle ice is a needle-shaped column of ice formed by groundwater. Needle ice forms when the temperature of the soil is above 0 °C and the surface temperature of the air is below 0 °C. Liquid water underground rises to the surface by capillary action, and then freezes and contributes to a growing needle-like ice column. Needle ice requires a flowing form of water underneath the surface, and it must come into contact with air that is below freezing. This phenomenon usually occurs at

night when temperatures are at their lowest point. The ice needles are typically a few centimeters long. While growing, they may lift or push away small soil particles. On sloped surfaces, needle ice may be a factor contributing to soil creep and contribute to erosion or disrupt the growth of seedlings. Because of this, the phenomenon can be used to explore how the freezing and thawing of water contributes to changing landscapes.

### Additional Resources:

Illinois State University [Needle Ice](#)

### Performance Standards

2 <sup>nd</sup> Grade	4 <sup>th</sup> Grade	Middle School	High School
2-ESS-2.1. Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.	4-ESS-2.1. Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.	MS-ESS-2.2. Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.	HS-ESS-2.2. Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems. HS-ESS-2.5. Plan and conduct an investigation of how the chemical and physical properties of water contribute to the mechanical and chemical mechanisms that affect Earth materials and surface processes.



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