

Supplies

Most shelter materials are inexpensive, reusable, improvised, or commonly available around schools.

Sticks, Poles, and Stakes



Sticks, at least three per student



Poles, around 8 feet long, and at least 3 per group



Tent stakes, at least three per group

Natural Features



Trees



Post



Dirt

Many shelter designs rely on natural or built anchor points—such as trees, posts, fences, or playground structures—to support ridgelines and structural tension.

Ropes and Cordage



Rope, at least twelve foot lengths



Paracord, at least five foot lengths

Tarps



10' x 10'

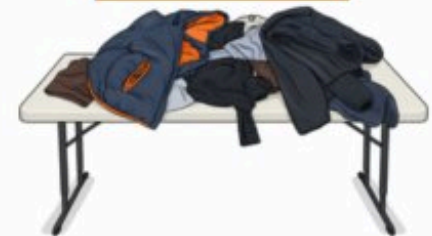


18" x 18"

Tarps are versatile, lightweight, and inexpensive materials for shelter construction. If students learn how to build shelters with tarps, they can easily transfer those skills to natural or improvised materials.

Extra Coats

LOST AND FOUND



Students often forget coats. Extra coats from the school's lost and found can help keep students warm during outdoor activities.

Lesson 3: Lean-To Shelter

Summary

Temperature is not just a number on a thermometer—it is affected by environmental factors such as wind and sunlight. Wind chill can make the air feel significantly colder, while direct sunlight can increase heat exposure. Because of this, managing wind and shade is essential for maintaining comfort.

In this lesson, students learn how a lean-to shelter can be used to block wind and provide shade. Using a ridgeline and tarp, students build a simple lean-to and evaluate how its design reduces exposure to wind and sun.



Standards and Objectives

Content Standards

Heat Transfer. Science standards for grades 6 to 10 include thermal energy transfer, including convection.

Data and Tables. Math standards for grades 6 to 10 require students to be able to read, interpret, and analyze data presented in tables, and use the information in the table to answer mathematical or contextual questions.

Lesson Objectives

1. Students can tie a bowline.
2. Students can explain “wind chill” and “temperature in the shade.”
3. Students can build a lean-to shelter out of a tarp and cord.

Social & Emotional Objectives

Improvisation and Flexibility: “Making do” with limited time and resources helps students manage frustration and adapt to challenges. Shelter building reinforces persistence, problem-solving, and resourcefulness.

Supplies

Per Student

For the bowline knot

- Five-foot length of paracord

Per Group

For the lean-to shelter

- Ridgeline material: Rope or a pole
- A 10'x10' tarp
- Two tent stakes

Per Class

- Outdoor space with sturdy features to attach or support a shelter (fence, trees, wall, etc.)