

Kindergarten - Lesson K1.6

Building a Structure for Shade

Teacher Background

In Lesson 1.6, students design and build a structure to reduce the warming effect of the sun. This lesson is intended to introduce students to the engineering design process at a very basic level. The engineering design is often described as a series of steps or as a cycle:

1. Define the problem

First, a problem is identified: A device or structure is needed to block the sun to make an area that is shaded and cooler. To better understand the problem, students look at shade structures and go outside to experience the temperature difference between sun and shade.

2. Develop possible solutions

Next, a prototype is designed, sketched, built, and tested to see how well it solves the problem: Students draw and then build the first version of their device. Students help devise a test to see if the shaded area is actually cooler than a sunny area nearby.

They might try to see if it feels cooler or they could use two thermometers.

3. Optimize the design solution

After testing their structure, the design can be modified to work better:

Students might see a need to modify certain parts or make major changes to their structures and then test them again. For a shade-making structure with a paper top, students may realize they need a bigger piece of paper, that the paper should be angled in a different way, or that it needs to be supported differently.

Note: Students will likely need a fair amount of help in drawing a basic design for their structure, and in building and testing it. Student's designs and structures should be considered successful if they cast a shadow effectively on the ground. Given the time the structures can stay in place and the conditions outside, you and the students may or may not observe a cooling effect from the area of shade.

