

Kindergarten - Lesson K1.5

How Does a Coat Keep You Warm in Cold Weather?

Teacher Background

In Lesson 1.5, students think about and discuss how their winter coat keeps them warm in cold weather.

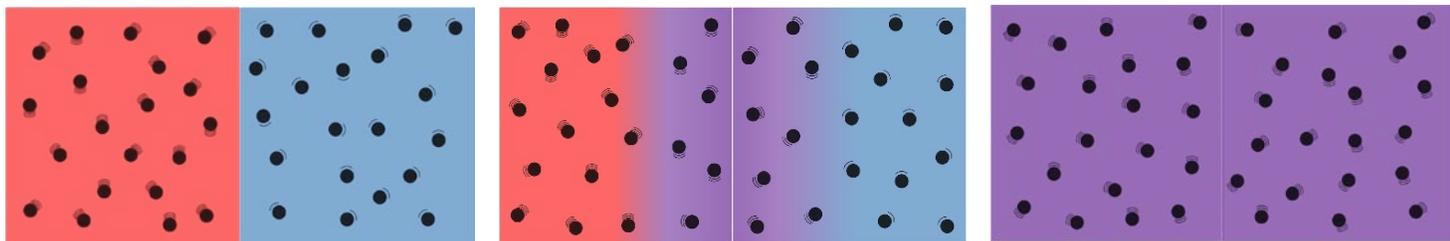
Using Models for Understanding

As in previous lessons, students continue to see and use models to better understand the phenomena they are investigating. In this lesson, a small cup with warm water is used to *represent* a person and a larger container of cold water is used to *represent* cold weather. Creating and using models to better understand a system or phenomenon is a skill that students can begin early and refine as they get older.

The animation is another type of model. In the animation, red arrows are used to represent heat moving from the warmth of the body to the colder air. Heat or thermal energy always moves from an area of higher temperature to an area of lower temperature.

Heat Transfer

Another model is often used to show heat transfer by the process of conduction. In this model, dots or spheres are used to represent the atoms or molecules in a warm and cold object. The molecules in the warm object move faster than molecules in the colder one. This means that when the two objects come into contact, the faster-moving molecules of the warmer object transfer energy to the slower moving molecules of the colder object. This is the transfer of energy by direct contact or conduction. This transfer causes the faster moving molecules to slow down and the slower-moving molecules to speed up until the objects come to the same temperature.



Heat Transfer by Conduction

The consequences of heat transfer are not always easy to understand and accept in practice. For instance, if you touch a piece of metal it often feels cold even though it is at room temperature. The reason it feels cold is that when you touch it with your relatively warmer hand, energy moves from your hand to the metal. The transfer of energy *from* your hand makes the molecules in your skin move more slowly, and your hand feels colder.

This principle of heat transfer is directly related to why coats keep us warm in the winter. Without a coat, your body is in more direct contact with air at a low temperature. The faster-moving molecules in your skin transfer energy to the slower-moving molecules of the relatively colder air which makes you feel cold.