Science & History

Inuit Clothing: Life on Top of the World

Anyone who has ever experienced the stinging cold of sub-zero weather knows this fact well: The trick to winter survival is to prevent your body's thermal energy from being lost to the environment. For the Inuit people of Greenland and the northernmost parts of North America, surviving in bitterly cold weather for a large part of the year is a way of life.

Insulating with Clothing

With its frigid, sub-zero temperatures and its icy, snow-covered landscape, the Arctic is one of the harshest places on Earth. Perhaps more than anything else, Inuit clothing and the way it is worn allows its wearers to survive comfortably in the far north.

Although technology and other cultural influences have changed the basic way of life of the Inuit, many of their historical practices still exist. This is particularly true in their clothing. Traditionally, skins and furs from seal, caribou, fox, and polar bear were used to fashion all articles of clothing, including coats, hats, mittens, shirts, boots, pants, and socks.

In cold winter weather, the Inuit wear two suits of clothing. The inner layer of clothing is worn with the fur against the skin, and the outer layer is worn with the fur facing out. The use of fur and two layers of clothing illustrates a knowledge of how to conserve thermal energy and stay warm in cold weather. Animal fur is excellent for preventing thermal energy loss. It acts as an insulator, which is a material that prevents heat transfer. The long, thick hairs trap pockets of air that are warmed when placed close to the body. Also, the hairs themselves are hollow, so the air inside them is another barrier to the flow of heat away from the body. An additional layer of insulation is also formed between the two layers of clothing.

Science Journal

Write a short story or a non-fiction piece about either the coldest or warmest weather you've experienced in your life. Describe the temperature and other environmental conditions you observed. How were you able to adapt to the weather conditions? Explain how your clothing choices allowed you to remain comfortable.

Chapter 5

Review

Summary

5-1: Energy and Work

1. Energy is the ability to cause change. Energy may be in the form of motion (kinetic energy) or it may be stored (potential energy).
2. Energy exists in many different forms, and it can change from one form to other forms with no loss of total energy.
3. Work is the transfer of energy through motion. Work is done only when force produces motion in the direction of the force.

5-2: Temperature and Heat

1. All matter is made up of tiny particles that are in constant motion. This motion is not related to or dependent on the motion of the object.
2. Heat and temperature are related, but they are not the same. The temperature of a material is a measure of the average kinetic energy of the particles that make up the material. Heat is the energy that flows from a warmer to a cooler material.
3. The thermal energy of a material is the total energy—both kinetic and potential—of the particles that make up the material.

5-3: Science and Society: Thermal Pollution: Waste You Can't See

1. When waste heat finds its way into rivers, lakes, and oceans, it can damage or destroy the plants and animals living there.
2. Government and industry continue to debate whether the benefits of regulating thermal pollution are worth the costs to society.

5-4: Measuring Thermal Energy

1. Different materials have different heat capacities, or specific heats.
2. The specific heat of a material can be used to calculate changes in the thermal energy of the material.

Key Science Words

a. energy
b. heat
c. kinetic energy
d. law of conservation of energy
e. mechanical energy
f. potential energy
g. specific heat
h. temperature
i. thermal energy
j. thermal pollution
k. work

Reviewing Vocabulary

Match each phrase with the correct term from the list of Key Science Words.

1. the ability to cause change
2. energy of motion
3. Under normal conditions, energy cannot be created or destroyed.
4. energy required to raise the temperature of 1 kg of a material 1 K
5. total energy of the particles in a material
6. the transfer of energy through motion
7. transfer of energy from warmer to cooler materials
8. stored energy
9. measure of the average kinetic energy of the particles in a material
10. the total amount of kinetic and potential energy of an object