



Don't Sweat It Scientists Study the Effect of DEET on Sweating



Natick, MA (Army Research Lab) -- Scientists study the effects of hot and cold environments on human physiology using a climatic chamber that can simulate tropical and arctic conditions. Sweating is necessary to keep the body from overheating when the temperature rises or during exercise. Experiments will determine if DEET (an insect repellent) interferes with sweating.

"The human body is incredibly adaptable to so many different circumstances."

Robert Kenefick, research psychologist

Framework

Middle School

Standards

- NSES - C.ii.5 ➤ The human organism's systems interact.
- NSES - C.iii.1 ➤ Organisms maintain stable internal conditions.
- NSES - C.iii.2 ➤ Regulation of an organism's internal environment involves sensing.
- STL - 2.V ➤ Controls are mechanisms in a system.
- STL - 15.1 ➤ Artificial ecosystems replicate aspects.

Content Illustrated

- Humans respond to increasing temperature by sweating.



Content



Life Science

- Normal body temperature is 37°C or 98.6°F.
- As you exercise and/or absorb heat from the environment, your core and skin temperatures increase. That information is registered by the part of the brain called the hypothalamus.
- Peripheral vasodilation is used to cool the body core by transferring heat to the skin.
- The hypothalamus also initiates sweating. When sweat evaporates off the skin, it cools the body.
- Sweat is 99 percent water. Dehydration can occur unless water is replaced after sweating.
- Scientists study how the human body adapts to different conditions.
- Before testing, soldiers must acclimatize to the extreme environment.

Physical Science

- Water requires heat to evaporate.

Technology

- Climatic chambers can simulate arctic and tropical climate conditions. They can produce wind, rain, and temperatures between -70°F to 165°F.
- Devices attached to the skin can measure the humidity and temperature of a specific area.

Math

- Temperature conversion from Fahrenheit to Celsius scale:
 $F = (9/5)C + 32$

Suggested Activities

To think about as you watch:

- What method is the scientist using to answer his or her questions about DEET and sweating?

Suggested Activities

- Develop your own question related to sweating. Discuss how you would create a scientific experiment, with controls and trials, to answer your question.

Keywords

acclimatize, arctic, climatic chamber, control trial, DEET, dehydration, evaporate, hypothalamus, simulate, peripheral vasodilation, scientific method, trial, tropic

- *Don't Sweat It* can be found online at www.ndep.us/Don't-Sweat-It. Visit www.ndep.us/LabTV for a list of process skills modeled in webisodes.