



uBEATS Teacher's Guide:

Climate and Health

This teacher guide is a supplementary text to support the use of the uBEATS “Climate and Health” module for grades 6-12.

To help students develop the knowledge necessary for an incredible future in health care, we created UNMC Building Excellence in Academics Through STEM (uBEATS), an online health science resource for Nebraska students.

UNMC uBEATS modules are short (15 minutes or less), interactive online health science modules to supplement curriculum taught in grades 6 – 12. These do not replace curriculum, but they are a supplement for teachers and students incorporating evidence-based information and UNMC expert guided material. Each module is chunked into sections with formative and summative assessments with immediate feedback provided.

Tips on how to utilize uBEATS modules:

- Internet access is required to view uBEATS modules.
- For those who have access to one-to-one technology, modules can be used in or outside of the classroom as a topic introduction, extension, or review. For classrooms without individual student devices, modules can be used in whole group instruction. Formative assessment questions can use the teacher's preferred call and response method and summative assessment questions can be displayed on the board and answered individually by students or printed and distributed to students after viewing the module.



Objectives

- Broadly understand the concept of Public Health, its distinguishing characteristics relative to the societal and environmental determinants of health.
- Identify the health impacts of climate change and effective responses on the part of specific health services in Nebraska.
- Explain the importance of working collaboratively and across disciplines on climate and health issues.

Introduction

In 2016, the U.S. Global Change Research Program produced an multisectoral assessment titled “The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment”. This report brought together numerous scientists, medical professionals, and public health experts to examine how climate change is already affecting human health and determine what changes may occur in the future. The report had representatives from multiple federal agencies, including the CDC, HHS, Defense Department, NOAA, NASA, EPA, and others. Based on their expert evaluations, it was determined that climate change is a significant threat to the health of the American people and that all Americans are vulnerable to the health impacts associated with climate change. The time to prepare our healthcare and public health professions for climate change is now.

Prior Knowledge

Before beginning this module, the teacher should understand the Next Generation Science Standards (NGSS) featuring [Three-Dimensional Learning](#).

Core Idea LS4.D: Biodiversity and Humans. [A Framework for K-12 Science Education](#)

Human beings are part of and depend on the natural world. Biodiversity—the multiplicity of genes, species, and ecosystems—provides humans with renewable resources, such as food, medicines, and clean water. Humans also benefit from “ecosystem services,” such as climate stabilization, decomposition of wastes, and pollination that are provided by healthy (i.e., diverse and resilient) ecosystems. The resources of biological communities can be used within sustainable limits, but in many



cases humans affect these ecosystems in ways—including habitat destruction, pollution of air and water, overexploitation of resources, introduction of invasive species, and climate change—that prevent the sustainable use of resources and lead to ecosystem degradation, species extinction, and the loss of valuable ecosystem services.

National Academies of Sciences, Engineering, and Medicine. 2012. A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas. Washington, DC: The National Academies Press. <https://doi.org/10.17226/13165>.

Science and Engineering Practices [NGSS](#)

Analyzing and Interpreting data

Crosscutting Concepts [NGSS](#)

Cause and Effect

Key Terms/Vocabulary

Climate, public health, societal determinants of health, environmental determinants of health, climate change, interventions, policy development, resilient communities, healthcare, supply-chain disruptions, population displacement, growing season, allergy, asthma, air pollution, health outcomes, cardiovascular disease, anxiety, depression, PTSD, mortality rate, traumatic injury, infectious disease, chronic respiratory issues, COPD, emphysema, heat exhaustion, heat stroke, droughts, infrastructure, ozone, temperature, precipitation, vector organisms, dengue fever, Zika virus, West Nile virus, Lyme disease, cholera, salmonella, campylobacter, solastalgia, ecoanxiety, ecological grief.

Science Standards

Nebraska's College and Career Ready Standards for Science 2024

[Nebraska Science Standards](#)

Weather and Climate: SC.HS.12

[Nebraska Health Science Standards](#)

HS.HS.7.2.a: Describe the fundamentals of health, wellness, and disease prevention

HS.HS.7.2.b: Explain physical, mental, social, and behavioral health and its impact on healthcare, disease, and prevention.

Next Generation Science Standards (NGSS) Core Idea

LS4.D: Biodiversity and Humans - Humans depend on the living world for the resources and other benefits provided by biodiversity. But human activity is also having adverse impacts on biodiversity through overpopulation, overexploitation, habitat destruction, pollution, introduction of invasive species, and climate change. Thus sustaining biodiversity so that ecosystem functioning and productivity are maintained is essential to supporting and enhancing life on Earth. Sustaining biodiversity also aids humanity by preserving landscapes of recreational or inspirational value.

National Health Science Standards (NCHSE)

3.1.3: Analyze the impact of emerging issues on healthcare delivery systems.

9.2.1: Discuss physical, mental, social, and behavioral development and its impact on healthcare.

Extensions of the lesson

To help students become more familiar with the Key Terms of this module, the teacher can use the vocabulary list for a classroom Word Wall, or integrate the vocabulary into classroom word games during review sessions.

Encourage students to check current events for the latest news involving the effects of climate change and global warming, including heat-related illness, extreme weather events, air pollution, allergies, infectious diseases, and mental health issues.

As student misconceptions become apparent, the teacher may need to reinforce these important concepts:

- Climate change and global warming are Public Health issues because of the many ways health is affected by these changes.
- Climate impacts our health both directly and indirectly. The direct impacts are the result of things such as extreme heat, changes in air pollution, and extreme weather. The indirect or delayed impacts can be more difficult to quantify or observe, but these impacts can be even more costly. Indirect impacts can include spreading disease, destroying food and water supplies, and disrupting well-being.
- The weather is extremely variable. Too much precipitation (leading to devastating floods) affects the health of people—and the healthcare system helping them—in different ways than too little precipitation (droughts) can damage the community. Climate change threatens to increase the severity at both ends of the spectrum.
- Excessive heat affects some populations more than others. What might be considered a

mere inconvenience or discomfort in some populations can threaten death to others.

Enrichment

Contact local county offices of Environmental Services and Emergency Management to ask about the impacts of climate change on health in your own community.

The World Health Organization (WHO) provides more information at [Climate Change and Health](#).

Listen to Clover Hogan's TED talk about ecoanxiety: [When Climate Change Feels Unstoppable](#).