uBEATS Teacher's Guide:

Resiliency Training - Part 1

This teacher guide is a supplementary text to support the use of the uBEATS "Resiliency Training – Part 1" 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 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

1. Differentiate between the various forms of stress.
2. Summarize the impact of stress on the human body.
3. Explain the role of emotions in human physiology.

Introduction

Resilience training is a deliberate effort to equip ourselves with the tools and mindset to face adversity head-on. It involves cultivating the ability to bounce back from setbacks, embrace change, and thrive amidst life's challenges. Resilience is defined as the ability to adapt to life's misfortunes and setbacks. Resilience is like the flexible branch of a tree that bends with the wind but remains unbroken. It's the capacity to navigate life's unpredictable twists and turns, emerging stronger and more empowered on the other side.

This module is the first in a 3-part series of modules on Resiliency Training that aims to provide a comprehensive understanding of the multifaceted nature of stress and its intricate effects on the human body. In this module, we will delve into the differentiation of stress forms, the profound impact of stress on physiological well-being, and the pivotal role emotions play in influencing human physiology.

Prior Knowledge

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

Dimension 3: Disciplinary Core Ideas—Life Sciences. A Framework for K-12 Science Education

In complex animals, the brain is divided into several distinct regions and circuits, each of which primarily serves dedicated functions, such as visual perception, auditory perception, interpretation of perceptual information, guidance of motor movement, and decision making about actions to take in the event of certain inputs. In addition, some circuits give rise to emotions and memories that motivate organisms to seek rewards, avoid punishments, develop fears, or form attachments to members of their own species and, in some cases, to individuals of other species (e.g., mixed herds of mammals, mixed flocks of birds). The integrated functioning of all parts of the brain is important for successful interpretation of inputs and generation of behaviors in response to them.

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

1. Asking questions (for science) and defining problems (for engineering)

6. Constructing explanations (for science) and designing solutions (for engineering)

Crosscutting Concepts NGSS

1. Patterns

2. Cause and Effect

7. Stability and Change

Key Terms/Vocabulary

Stress, resilience, stressors, eustress, distress, traumatic stress, acute stress, chronic stress, autonomic nervous system, fight-or-flight response, nervous system, cerebral cortex, amygdala, hypothalamus, endocrine system, homeostasis, hormones, pituitary gland, sympathetic nervous system, parasympathetic nervous system, freeze response, Hypothalamic-Pituitary-Adrenal Axis (HPA), neuroendocrine system, corticotropin-releasing hormone (CRH), adrenocorticotropic hormone (ACTH), adrenal glands, cortisol, adrenaline, dehydroepiandrosterone (DHEA), Depletion-to-Renewal Grid, physiology of stress.

Science Standards

Nebraska's College and Career Ready Standards for Science 2024 **Nebraska Science Standards**

- SC.HSP.6.5. Gather, analyze, and communicate evidence of the relationship between the structures and physiological processes of the nervous system.

National Consortium for Health Science Education **NCHSE**

- Foundation Standard 1: Academic Foundation
    - 1.1.2.g. Identify basic structures and describe functions of the human nervous system.
    - 1.1.2.h. Identify basic structures and describe functions of the human endocrine system.
- Foundation Standard 9: Health Maintenance Practices
    - 9.1.1. Promote self-care behaviors of health and wellness
        - Stress management

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 review sessions.

Encourage students to check current events for the latest news involving stress, anxiety, or mental health maintenance.

Advise students to reflect privately on their own personal experiences within the "Depletion to Renewal Grid" which is explained in this module's 4th section: Depleting and Renewing Emotions.

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

- Stress can be positive or negative. When positive stress provides motivation and helps a person cope with life situations, it is a good thing. But when stress is prolonged, it can lead to a range of physical and mental health issues.
- Stress can be classified into various types based on different criteria, such as its duration, source, or impact.
    - Eustress (positive)
    - Distress (negative)
    - Traumatic stress (triggered by sudden, traumatic events)
    - Acute stress (short-term, arising from immediate situations or events)
    - Chronic stress (prolonged, persists over an extended period)
- The autonomic (auto-nomic) nervous system is a network of nerves that controls your automatic bodily functions such as breathing and your heartbeat. It is divided into the sympathetic and parasympathetic nervous systems.
    - The sympathetic nervous system controls the "fight-or-flight" response which is activated during dangerous or stressful situations.
    - The parasympathetic nervous system controls the body in times of rest.
- The endocrine system works with the nervous system to produce hormones that manage the stress response. For example:
    - Cortisol can trigger a "fight-or-flight" response that can help get you out of danger.
    - DHEA (de-hydro-epi-andro-sterone) counteracts the effects of cortisol and calms you back down.

Enrichment

Study the basics of the nervous system's interactions with the endocrine system to maintain a healthy balance of homeostasis within the body. For example, read the article How Does the Nervous System Work with the Endocrine System?

Explore the website of the Mayo Clinic to learn more about managing stress. For example, see the article Chronic Stress Puts Your Health at Risk.

Learn about the effects that emotions have on the body by reading this article from Psychology Today. Do Feelings Influence Physical Health?

Search for classroom activities on stress management, such as Edutopia's Stress Reduction Activities for Students.