STEM Connections & Standards

CDC NERD Academy

This document provides an overview of the standards alignment for each CDC NERD Academy module. This information can also be found on the first page of each lesson plan.

Module 1: What exactly is a pandemic?

Justifying level of disease occurrence using evidence

STEM connections: Science: classification; Social science: timeline, mapping

Problem-based skills: Identifying trends, decision making, collaborative performance

Epidemiology and Public Health Science Core Competencies: HS-EPHS1: Epidemiologic Thinking and a Public Health Approach; HS-EPHS2: Public Health Surveillance

National Health Education Standards: Standard 1: Students will comprehend concepts related to health promotion and disease prevention to enhance health. Standard 5: Students will demonstrate the ability to use decision-making skills to enhance health.

Next Generation Science Standards: Science & Engineering Practice(s): Asking Questions and Defining Problems; Analyzing and Interpreting Data; Engaging in Argument from Evidence; Crosscutting Concept(s): Patterns

Module 2: How does disease spread?

Using disease transmission models to design prevention strategies

STEM connections: Science: microbiology; Engineering: design

Problem-based skills: Scientific design, implementing action plans, collaborative performance

Epidemiology and Public Health Science Core Competencies: HS-EPHS1: Epidemiologic Thinking and a Public Health Approach

National Health Education Standards: Standard 1: Students will comprehend concepts related to health promotion and disease prevention to enhance health. Standard 2: Students will analyze the influence of family, peers, culture, media, technology, and other factors on health behaviors. Standard 7: Students will demonstrate the ability to practice health-enhancing behaviors and avoid or reduce health risks. Standard 8: Students will demonstrate the ability to advocate for personal, family, and community health.

Next Generation Science Standards: Science & Engineering Practice(s): Asking Questions and Defining Problems, Developing and Using Models; Crosscutting Concept(s): Cause and Effect

Module 3: Who is at risk?

Using mathematics and computational thinking to evaluate risk of disease

STEM connections: Social Studies: Social determinants

Problem-based skills: Decision making, collaborative performance

Epidemiology and Public Health Science Core Competencies: HS-EPHS1: Epidemiologic Thinking and a Public Health Approach; HS-EPHS3: Analytic Epidemiology

National Health Education Standards: Standard 1: Students will comprehend concepts related to health promotion and disease prevention to enhance health. Standard 4: Students will demonstrate the ability to use interpersonal communication skills to enhance health and avoid or reduce health risks.

Next Generation Science Standards: Science & Engineering Practice(s): Using Mathematical and Computational Thinking, Constructing Explanations and Designing Solutions; Crosscutting Concept(s): Cause and Effect

Module 4: Where do public health data come from?

Planning and carrying out surveillance

STEM connections: Mathematics: graphing; Social Studies: U.S. geography

Problem-based skills: Scientific design, identifying trends, collaborative performance

Epidemiology and Public Science Health Core Competencies: HS-EPHS2: Public Health Surveillance

National Health Education Standards: Standard 2: Students will analyze the influence of family, peers, culture, media, technology, and other factors on health behaviors. Standard 3: Students will demonstrate the ability to access valid information, products, and services to enhance health.

Next Generation Science Standards: Science & Engineering Practice(s): Planning and Carrying out Investigations, Analyzing and Interpreting Data; Crosscutting Concept(s): System and System Models, Patterns

Module 5: How are public health data visualized?

Evaluating data to communicate information about disease spread

STEM connections: Science: microbiology, pathogens; Mathematics: graphing, interpreting patterns, analyzing data

Problem-based skills: Identifying trends, collaborative performance

Epidemiology and Public Health Science Core Competencies: HS-EPHS2: Public Health Surveillance

National Health Education Standards: Standard 5: Students will demonstrate the ability to use decision-making skills to enhance health.

Next Generation Science Standards: Science & Engineering Practice(s): Asking Questions and Defining Problems, Analyzing and Interpreting Data, Obtaining, Evaluating, and Communicating Information; Crosscutting Concept(s): Patterns

Module 6: Why do laboratory testing?

Analyzing and interpreting laboratory testing data

STEM connections: Chemistry: antigen testing; Math: fractions, percentages

Problem-based skills: Identifying trends, decision-making

Epidemiology and Public Health Science Core Competencies: HS-EPHS1: Epidemiologic Thinking and a Public Health Approach; HS-EPHS2: Public Health Surveillance

National Health Education Standards: Standard 3: Students will demonstrate the ability to access valid information, products, and services to enhance health.

Next Generation Science Standards: Science & Engineering Practice(s): Analyzing and Interpreting Data; Crosscutting Concept(s): Structure and Function

Module 7: Why is contact tracing so important?

Asking questions to define the scope of a public health problem

STEM connections: Science: microbiology; Mathematics: interpreting patterns

Problem-based skills: Identifying trends, decision making, implementing action plans, collaborative performance

Epidemiology and Public Health Science Core Competencies: HS-EPHS1: Epidemiologic Thinking and a Public Health Approach

National Health Education Standards: Standard 5: Students will demonstrate the ability to use decision-making skills to enhance health. Standard 7: Students will demonstrate the ability to practice health-enhancing behaviors and avoid or reduce health risks. Standard 8: Students will demonstrate the ability to advocate for personal, family, and community health.

Next Generation Science Standards: Science & Engineering Practice(s): Asking Questions and Defining Problems, Planning and Carrying Out Investigations, Obtaining, Evaluating, and Communicating Information, Constructing Explanations and Designing Solutions; Crosscutting Concept(s): Cause and Effect

Module 8: How is an outbreak investigated?

Constructing explanations for disease spread and designing solutions to control disease

STEM connections: Science: hypothesis generation, data analysis; English Language Arts: synthesizing information, communicating to an audience

Problem-based skills: Scientific design, decision-making, implementing action plans, collaborative performance

Epidemiology and Public Health Science Core Competencies: HS-EPHS1: Epidemiologic Thinking and a Public Health Approach; HS-EPHS2: Public Health Surveillance; HS-EPHS4: Prevention Effectiveness

National Health Education Standards: Standard 4: Students will demonstrate the ability to use interpersonal communication skills to enhance health and avoid or reduce health risks. Standard 8: Students will demonstrate the ability to advocate for personal, family, and community health.

Next Generation Science Standards: Science & Engineering Practices: Planning and Carrying Out Investigations, Obtaining, Evaluating and Communicating Information, Constructing Explanations and Designing Solutions; Crosscutting Concept(s): System and System Models; Patterns

Resources

- Epidemiology and Public Health Science Core Competencies (EPHS): **https://www.cdc.gov/careerpaths/k12teacherroadmap/pdfs/ephs-competencies.pdf**
- National Health Education Standards (NHES): **https://www.cdc.gov/healthyschools/sher/standards/index.htm**
- Next Generation Science Standards (NGSS): **http://www.nextgenscience.org/get-to-know**