### Unit 1: Introduction to Body, Skin and Skeletal Systems

## **Big Ideas:**

- Human anatomy and physiology are complementary sciences that allow one to study, classify, and understand body structures and functions.
- The body is composed of chemicals that underlie and provide for all bodily functions.
- Cells carry out all the chemical activities needed to sustain life. Tissues provide for a division of labor among cells.
- Body membranes line or cover, protect, and lubricate body surfaces. As the outermost boundary of the body, the skin protects against injuries of many types.

## **Essential Questions:**

- 1. What is anatomy?
- 2. What is physiology?
- 3. How are anatomy and physiology related?
- 4. What does the body need to survive?
- 5. How do the skin and its components make up a complex set of organs that protects and interacts with other body systems?
- 6. Why can't humans survive without oxygen? Specifically, why can't we depend on fermentation instead of cellular respiration?

# NGSS Priority Standards:

**HS-LS1-1** Construct an explanation based on evidence for how the structure of DNA determine the structure of proteins which carry out the essential functions of life through systems of specialized cells.

**HS-LS1-2** Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS-LS1-3 Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

HS-LS1-4 Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.

**HS-LS1-6** Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.

**HS-LS1-7** Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy.

**HS-LS3-1** Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.

**HS-PS1-2** Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.

## Alaska Math and ELA

**RST.11-12.1** Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. (HS-LS1-1),(HS-LS1-6)

**WHST.9-12.2** Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. (HS-LS1-1),(HS-LS1-6)

**WHST.9-12.5** Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. (HS-LS1-6)

**WHST.9-12.7** Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. (HS-LS1-3)

**WHST.11-12.8** Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. (HS-LS1-3)

WHST.9-12.9 Draw evidence from informational texts to support analysis, reflection, and research. (HS-LS1-1),(HS-LS1-6)

**SL.11-12.5** Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. (HS-LS1-2),(HS-LS1-4),(HS-LS1-5),(HS-LS1-7)

### Mathematics -

MP.4 Model with mathematics. (HS-LS1-4)

**HSF-IF.C.7** Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. (HS-LS1-4)

HSF-BF.A.1 Write a function that describes a relationship between two quantities (HS-LS1-1),

Recommended Activities and Labs

- Full body tracing labeled with body regions, body landmarks, and directional terminology
- Body buffer lab
- Transport lab (diffusion and osmosis) with dialysis tubing Histology atlas
- Skin cancer activity
- Long bone (NASA) lab