

Utah	Human Anatomy Standards	Human Anatomy & Physiology 12e Page Reference
Standard HUMA.1.1	Develop and use models to demonstrate the orientation of anatomical structures and regions of the human body. Emphasize how size, orientation, and location within the human body supports the function of the anatomical structures.	Ch. 1 , especially 1.2 and 1.5; Chs. 5–27 provide anatomical models for each body system
Standard HUMA.1.2	Obtain, evaluate, and communicate information about how the scale, proportion, and quantity of different body structures affects their functions within the human body. Emphasize the roles of cells, tissues, organs, and organ systems.	1.2 levels of organization from atoms to organism; Ch. 3 cells; Ch. 4 tissues; Chs. 5–27 connect cells, tissues, organs, and organ systems to their functions
Standard HUMA.2.1	Construct an explanation about the relationship between the structures of the integumentary system and their role in protection, eliminating waste products, and regulating body temperature.	Ch. 5 , especially 5.1–5.3 and 5.7–5.9
Standard HUMA.2.2	Develop and use models to relate the structure of the skeletal system to its functional role in movement, protection, and support.	Ch. 6 Bones and Skeletal Tissues; Ch. 7 The Skeleton; Ch. 8 Joints; 10.4 Muscles acting with bones form lever systems
Standard HUMA.2.3	Plan and carry out an investigation to determine the cause and effect relationship between structures of the muscular system and their role in movement and support.	Ch. 9 and Ch. 10 provide content for investigating how muscular structures produce movement and support.
Standard HUMA.2.4	Engage in argument from evidence about how the integumentary, skeletal, and muscular systems make support, protection, and movement possible. Emphasize the homeostatic mechanisms, as well as the effects of and responses to nutrition, aging, diseases, and disorders.	Ch. 5.8–5.9 (skin as a protective barrier; skin cancer and burns); Ch. 6.2, 6.6–6.8 (bone support, remodeling, repair, and disorders); Ch. 9.6–9.9 (muscle energy use, exercise, and adaptation); Ch. 10.1–10.5 (muscles working with bones to produce movement)
Standard HUMA.3.1	Plan and carry out an investigation to determine how the structures of the nervous system support the function of information processing (detection, interpretation, and response) within the body.	11.4–11.10, 13.1–13.2 and 13.8–13.9 describe the physiology of the nervous system

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Standard HUMA.3.2	Analyze and interpret data to explain how the hormones of the endocrine system regulate physical and chemical processes to maintain a stable internal environment, support general health, and promote growth and development throughout the lifespan. Emphasize both positive and negative feedback mechanisms. Examples of feedback mechanisms could be heart rate, blood sugar, childbirth, temperature, and growth.	Ch. 16; 24.9–24.11 hormones regulating food intake, metabolism, and temperature; 28.6 childbirth as a positive-feedback example
Standard HUMA.3.3	Construct an explanation about how the cause and effect relationship of the endocrine and nervous systems makes information processing (detection, interpretation and response) possible. Emphasize homeostatic mechanisms and their effects and responses to nutrition, aging, diseases, and disorders.	1.4 homeostasis and negative feedback; Chs. 11–15 nervous system detection, interpretation, and response; Ch. 16 endocrine signaling and feedback
Standard HUMA.4.1	Analyze and interpret data to identify patterns that explain how the cardiovascular and respiratory systems obtain oxygen, transport nutrients, and remove waste.	17.3 how blood obtains and transports oxygen, nutrients, and carbon dioxide waste; Ch. 18–19 heart and blood vessels; Ch. 22 respiratory system
Standard HUMA.4.2	Obtain, evaluate, and communicate information about the relationship between the structure and function of the digestive and urinary systems as they utilize matter to derive energy and eliminate waste.	Ch. 23 The Digestive System; Ch. 25 The Urinary System

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Standard HUMA.4.3	Ask questions to construct an explanation about the interdependence of the cardiovascular, respiratory, urinary, and digestive systems. Emphasize homeostatic mechanisms, as well as the effects of and responses to nutrition, aging, diseases, and disorders.	19.8 regulation of blood pressure (cardiovascular homeostasis interdependent with the urinary system); 22.8 regulation of breathing (coordination of the respiratory and cardiovascular systems); 23.11 digestion and nutrient absorption (digestive and cardiovascular interactions); 25.3–25.9 urine formation and regulation of body fluids (urinary regulation of blood volume and composition); 26.1–26.6 regulation of water, electrolytes, and acid-base balance
Standard HUMA.4.4	Use mathematics and computational thinking to design a device which measures the exchange of matter and energy used by the cardiovascular, respiratory, digestive, and urinary systems to determine health of those systems and to prevent potential health issues. Define the problem, identify criteria and constraints, develop possible solutions using models, analyze data to make improvements from iteratively testing solutions, and optimize a solution. Examples of measurements could include caloric input to the digestive system, respiratory gas output, respiratory rates, respiratory volumes, digestive rates, heat lost by urine output, blood pressure, and heart rate.	Relevant measurement content: 18.6–18.7 cardiac cycle, heart rate, stroke volume, and cardiac output; 19.6–19.8 blood flow and blood pressure; 22.4–22.5 breathing mechanics and pulmonary volumes, capacities, and flow rates; 23.10–23.11 digestion and nutrient processing; 24.1–24.11 energy intake, metabolism, and heat balance; 25.7–25.9 urine concentration, volume, and elimination

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Standard HUMA.5.1	Obtain, evaluate, and communicate information about how the structures of the male and female reproductive system provide a stable yet changing environment to allow for the production of egg and sperm, fertilization, implantation, and the development of human fetus. Emphasize the role of hormones in the male and female reproductive process.	Ch. 27 The Reproductive System; Ch. 28 Pregnancy and Human Development
Standard HUMA.5.2	Develop and use models to describe the stability and change in the stages of human embryology and gestation, including fertilization and embryo and embryo and fetal development. Emphasize the embryological changes through the different stages of development.	Ch. 28 Pregnancy and Human Development
Standard HUMA.5.3	Ask questions about how the reproductive system uses matter and energy to make growth and development possible. Emphasize homeostatic mechanisms, as well as the effects of and responses to nutrition, aging, diseases, and disorders.	Ch. 24 nutrients, metabolism, energy storage/release, and energy balance; Ch. 27 The Reproductive System; Ch. 28 Pregnancy and Human Development