Science Alignment Guide
Mason-Lake Tech Prep
Course: Allied Health Technology

*** *Note: If a standard is covered partially, then the part that is covered is underlined or identified in parentheses.*

High School Content Expectations							
Standard	Level of Coverage		Applied Concepts Linked to this Standard	Assessment Method		Assessment Correlation	Approximate Time Spend of on the Standard
	Partial	Complete		Performance Based	Written		
B2.2x Proteins Protein molecules are long, usually folded chains composed mostly of amino acids and are made of C, H, O, and N. Protein molecules assemble fats and carbohydrates; they function as enzymes, structural components, and hormones. The function of each protein molecule depends on its specific sequence of amino acids and the shape of the molecule.	x		Proteins are studied as part of a general overview of anatomy and physiology. Specific proteins are studied as part of the endocrine system, the cardiovascular system, and the digestive system.		x	Students demonstrate proficiency on worksheets and on tests.	Multiple weeks are spent studying anatomy and physiology. Proteins are scattered throughout the anatomy and physiology units.

B2.2f Explain the role of enzymes and other proteins in biochemical functions (e.g., the protein hemoglobin carries oxygen in some organisms, digestive enzymes, and hormones).	x (Only studied as part of human A&P)		Enzymes are studied as part of a general overview of anatomy and physiology. Specific enzymes are studied as part of the endocrine system, the cardiovascular system, and the digestive system.		x	Students demonstrate proficiency on worksheets and on tests.	Multiple weeks are spent studying anatomy and physiology. Enzymes are scattered throughout the anatomy and physiology units.
B2.4f Recognize and describe that both living and nonliving things are composed of compounds, which are themselves made up of elements joined by energy-containing bonds, such as those in ATP.	x		ATP is understood in terms of the role with mitochondria. Students study the cell and its relationship to compounds in the composition of living things.		x	Students demonstrate proficiency on worksheets and on tests.	Multiple weeks are spent studying anatomy and physiology. Compounds, elements, and ATP are scattered throughout the anatomy and physiology units.
B4.3g Explain that cellular differentiation results from gene expression and/or environmental influence (e.g., metamorphosis, nutrition).	x		Students recognize that differentiation can occur from genetics or environmental influences. This is stressed when discussing genetic and lifestyle risk factors for diseases. This is primarily expressed at a systems level rather than a cellular level.	x (With advanced students)	x	Students demonstrate proficiency on worksheets and on tests. Advanced students encounter this in scenario assessments.	Genetics and environmental risk factors are discussed in each of the 11 different organ systems.

B2.6a Explain that the regulatory and behavioral responses of an organism to external stimuli occur in order to maintain both short- and long-term equilibrium.	x (Limited to the human body's response to external stimuli)		Students are familiar with the human body's response to external stimuli in an attempt to maintain equilibrium as it relates to the different body systems.		x	Students demonstrate proficiency on worksheets and on tests.	Behavioral and regulatory responses are discussed in each of the 11 different organ systems.
B2.4h Describe the structures of viruses and bacteria.	x (Limited to the viruses and bacteria related to the human body system)		Students draw different microorganisms including bacteria (cocci, bacilli, spirilla) and viruses. Students identify their correct name. Students extend this concept to describe the effects of the viruses and bacteria on the human body.	x	x	Students demonstrate proficiency on worksheets, in drawings, and on tests. In the lab, students perform skills such as hand-washing, isolation procedures, and sterile techniques to prevent the spread of bacteria and viruses.	Included in infection control unit. The unit lasts about 2 weeks, but the primary focus of this concept is approximately 1 day.
B2.5i Relate cell parts/organelles to their function.		x	Students draw cells and label the parts of the cell. Students describe the functions of the parts of the cell.	x	x	Students demonstrate proficiency on worksheets, in drawings, and on tests.	Approximately 1-2 days.

B2.1x Cell Differentiation Following fertilization, cell division produces a small cluster of cells that then differentiate by appearance and function to form the basic tissues of an embryo.	x (Lightly covered, not at great depth)		In the study of cell reproduction, students recognize the process of meiosis. This concept is touched on further in the reproductive system unit.		x	Students demonstrate proficiency on worksheets.	Approximately 1 day.
B2.3g Compare the structure and function of a human body system or subsystem to a nonliving system (e.g., human joints to hinges, enzyme and substrate to interlocking puzzle pieces).	x (Not all sub-systems have an analogy)		Students understand analogies between human body systems and inanimate objects. Some references include: human joints and hinges, the heart and a toilet flushing, joint fluid and WD-40, muscle bundle fibers and spaghetti.	x		Students are encouraged to come up with analogies in the classroom setting.	Analogies are spread throughout the A&P units.
B2.3C Explain how stability is challenged by changing physical, chemical, and environmental conditions as well as the presence of disease agents.	x (For human body systems only)		Students understand how the uses of isotonic, hypertonic, and hypotonic solutions affect cells. Students understand how pollutants and extreme temperature changes affect the body. Students describe the effects of exogenous and endogenous diseases on body systems.		x	Students demonstrate proficiency on worksheets and on tests. (This concept may also be assessed during clinicals depending on the situation.)	These topics are discussed in each of the 11 different organ systems.

B2.3e Describe how human body systems maintain relatively constant internal conditions (temperature, acidity, and blood sugar).	x		Students describe how the human body system maintains constant internal conditions.	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	These concepts are encountered and stressed throughout the year.
B2.3x **Homeostasis** The internal environment of living things must remain relatively constant. Many systems work together to maintain homeostasis. When homeostasis is lost, death occurs.		x	The focus of this class is for students to understand and use homeostasis to maintain life. Students perform multiple tasks to take measurements that check for homeostasis.	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	These concepts are encountered and stressed throughout the year.
B2.3d Identify the general functions of the major systems of the human body (digestion, respiration, reproduction, circulation, excretion, protection from disease, and movement, control, and coordination) and describe ways that these systems interact with each other.		x	Students describe the major systems of the human body and understand how they interact with each other. Students perform multiple tasks to assess the functions of various body system functioning. Some examples include: temperature, pulse, respiration, blood pressure, fluid intake and output measurements, height, and weight.	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	These topics are discussed in each of the 11 different organ systems.

B2.3A Describe how cells function in a narrow range of physical conditions, such as temperature and pH (acidity), to perform life functions.		x	Students know the ranges that are appropriate for normal body functioning. This includes temperature and pH levels.	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	This concept is encountered throughout the course of the year.
B2.3B Describe how the maintenance of a relatively stable internal environment is required for the continuation of life.		x	Students recognize that the body functions best in a stable internal environment. This concept is a building block for the class.	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	This concept is encountered throughout the course of the year.
B2.3f Explain how human organ systems help maintain human health.		x	Students explain how the basic systems function together to maintain health. Students learn individually about each system and the levels of complexity from cells to organ systems.	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	These topics are discussed in each of the 11 different organ systems.

ACT Standards

Identified standards are embeded in the following ACT science topics: Body Systems, Cell Structure and Process, and Homeostasis

Select a single piece of data (numerical or non-numerical) from a simple data presentation (e.g., a table or graph with two or three variables; a food web diagram) (Range 13 – 15)		x	Students select data from the length and weight percentile charts. Students make predictions from these charts to determine the length and weight of the infants as they age. Students read charts for respiration, pulse, and temperature.	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	Students encounter these concepts throughout the year.
Identify basic features of a table, graph, or diagram (Range 13 – 15)		x	Students recognize that the x-axis typically represents time and the y-axis typically represents a medical measurement. Students know how to read appropriate units and scales from the graphs. Students extrapolate data based on trends in the graphs to determine patient status.	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	Students encounter these concepts throughout the year.

Select two or more pieces of data from a simple data presentation (Range 16 – 19)		x	Students select data from the length and weight percentile charts. Students make predictions from these charts to determine the length and weight of the infants as they age. Students read charts for respiration, pulse, and temperature.	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	Students encounter these concepts throughout the year.
Understand basic scientific terminology (Range 16 – 19)		x	Students understand scientific terminology as it relates to the medical field. Students encounter anatomy terminology as well as general scientific vocabulary.	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	Students encounter these concepts throughout the year.
Find basic information in a brief body of text (Range 16 – 19)		x	Students read their textbook, charts at the hospital, and journal & newspaper articles.	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	Students encounter these concepts throughout the year.
Determine how the value of one variable changes as the value of another variable changes in a simple data presentation (Range 16 – 19)		x	While reading graphs, students determine how changing one variable has an impact on another variable. While using equations (Alice's Areas) students determine how changes in one variable may effect changes in another.	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	Students encounter these concepts throughout the year.

Select data from a complex data presentation (e.g., a table or graph with more than three variables; a phase diagram) (Range 20 – 23)		x	Students read and interpret information from a vital sign graphic chart. (This chart compares temperature, pulse, respiration, blood pressure, fluid intake, urinary output, defecation, and weight.)	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	Approximately 1 week in the classroom and during their clinical experience.
Compare or combine data from a simple data presentation (e.g., order or sum data from a table) (Range 20 – 23)		x	Students order and sum data during their income analysis activity. Students add up totals for intake and output.	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	Approximately 1 week in the classroom and during their clinical experience.
Translate information into a table, graph, or diagram (Range 20 – 23)		x	Students put information into vital sign graphic charts and input & output charts. Students translate information into charts and/or graphs during the "Where Does It All Go?" lesson.	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	Students encounter these concepts throughout the year.
Select a simple hypothesis, prediction, or conclusion that is supported by a data presentation or a model (Range 20 – 23)		x	Students make predictions based on data from the infant growth chart. Students make hypotheses and conclusions based on vital sign information.	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	Students encounter these concepts throughout the year.

Identify key issues or assumptions in a model (Range 20 – 23)	x (As it relates to the human body)		Students look at models of the human body and determine key issues related to health. Students use x-rays to look for key issues or assumptions in the skeletal system. During clinicals, students look for key features to make observations and draw conclusions on the human body.	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	Students encounter these concepts throughout the year.
Compare or combine data from two or more simple data presentations (e.g., categorize data from a table using a scale from another table) (Range 24 – 27)		x	Students use conversion charts, total intake amounts, and chart the information on the intake and output record.	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	Approximately 2 days in the classroom and then during the clinical rotation.
Compare or combine data from a complex data presentation (Range 24 – 27)		x	Students read and interpret information from a vital sign graphic chart. (This chart compares temperature, pulse, respiration, blood pressure, fluid intake, urinary output, defecation, and weight.)	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	Approximately 1 week in the classroom and during their clinical experience.

Interpolate between data points in a table or graph (Range 24 – 27)		x	Students use interpolation when using a growth chart and when using the I&O conversion chart.	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	Approximately 4 days and possibly during their clinical experience.
Determine how the value of one variable changes as the value of another variable changes in a complex data presentation (Range 24 – 27)		x	Students determine how variables change in complex data presentations; such as growth charts and vital sign charts.	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	Approximately 4 days and possibly during their clinical experience.
Identify and/or use a simple (e.g., linear) mathematical relationship between data (Range 24 – 27)		x	Students measure a pulse for a shortened time frame and then convert the result to reflect the number of beats in one minute. While converting weight and height, students use linear proportions.	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	Throughout the year.
Analyze given information when presented with new, simple information (Range 24 – 27)		x	As students collect additional vital sign information over time, they analyze and draw conclusions on a patient's status.	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	Throughout the year.

Select a simple hypothesis, prediction, or conclusion that is supported by two or more data presentations or models (Range 24 – 27)	x (As it relates to the human body)		Students look at models of the human body and determine key issues related to health. During clinicals, students look for key features to make observations and draw conclusions on the human body.	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	Students encounter these concepts throughout the year.
Determine whether given information supports or contradicts a simple hypothesis or conclusion, and why (Range 24 – 27)	x (As it relates to the human body)		Students use initial information to arrive at a hypothesis. Upon further review of more information and review of additional symptoms, students determine if their hypothesis was correct.	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	Students encounter these concepts throughout the year.
Identify strengths and weaknesses in one or more models (Range 24 – 27)	x (As it relates to the human body)		While studying body systems, students recognize that certain models may only reflect certain body systems. (e.g., The skeleton may only model the skeletal system and not the interactions between systems.) Students recognize that manufactured models may closely resemble, but may not perfectly reflect, an actual human body.	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	Students encounter these concepts throughout the year.

Identify similarities and differences between models (Range 24 – 27)	x (As it relates to the human body)		Students recognize that manufactured models may closely resemble, but may not perfectly reflect, an actual human body. Students recognize that human bodies are similar in structure, but not all human bodies are exactly the same. Depending on genetics, lifestyle, and environment different people may have different physical characteristics or physiological responses in regards to health and diseases.	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	Students encounter these concepts throughout the year.
Compare or combine data from a simple data presentation with data from a complex data presentation (Range 28 – 32)		x	Students read and interpret information from a vital sign graphic chart. (This chart compares temperature, pulse, respiration, blood pressure, fluid intake, urinary output, defecation, and weight.) The information from this chart is compared to vital sign information in narrative form.	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	Approximately 1 week in the classroom and during their clinical experience.

Identify and/or use a complex (e.g., nonlinear) mathematical relationship between data (Range 28 – 32)	x (For limited non-linear functions)		Growth charts for weight, length, and head circumference are non-linear over time. Students use these charts for interpolation and extrapolation.	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	Approximately 1 day in the classroom and then possibly during the clinical rotation.
Extrapolate from data points in a table or graph (Range 28 – 32)		x	Students use extrapolation when using a growth chart and when using the I&O conversion chart.	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	Approximately 4 days and possibly during their clinical experience.
Select a complex hypothesis, prediction, or conclusion that is supported by a data presentation or model (Range 28 – 32)	x (As it relates to the human body)		Students look at models of the human body and determine hypotheses related to health based on multiple patient signs and symptoms. During clinicals, students look for key features to make observations and draw conclusions on the human body.	x	x	Students demonstrate proficiency in lab, during clinicals, and on tests.	Students encounter these concepts throughout the year.
Use new information to make a prediction based on a model (Range 28 – 32)		x	As students collect additional vital sign information over time, they analyze and draw conclusions on a patient's status.	x	x	Students demonstrate proficiency on worksheets, in lab, during clinicals, and on tests.	Throughout the year.

Compare or combine data from two or more complex data presentations (Range 33 – 36)	x (As it relates to the human body)		Students look at multiple forms of data through objective and subjective methods to determine hypotheses related to health. Students combine the data from all these sources to draw conclusions about a patient's health.	x	x	Students demonstrate proficiency in lab, during clinicals, and on tests.	Students encounter these concepts throughout the year.
Select a complex hypothesis, prediction, or conclusion that is supported by two or more data presentations or models (Range 33 – 36)	x (As it relates to the human body)		Students look at multiple forms of data through objective and subjective methods to determine hypotheses related to health. Students combine the data from all these sources to draw conclusions about a patient's health and predict patient treatment and possible outcomes.	x	x	Students demonstrate proficiency in lab, during clinicals, and on tests.	Students encounter these concepts throughout the year.

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