Standards Alignment: Common Core Mathematics / Health Science

Healthcare Standards	**Common Core Standards**	**Explanation or notes for alignment**	**Evidence of mastery Student should be able to:**
Standard 1: Academic Foundation			
1.1 **Human Structure and Function**			
1.11 Classify the basic structural and functional organization of the human body.			
1.12 Recognize body planes, directional terms, quadrants, and cavities.	4.G3 4.NF3 6.NS8	Body Symmetry; abdominal cavity regions.	Illustrate and identify body symmetry (part to whole relationships) through drawing of 4 quadrants and 9 regions in a fill in the blank worksheet. Identify the quadrants as to ¼, ½, ¾ (fractions). Assess the rule of nines in a burn victim. Apply understanding of abdominal quadrants and regions to abdominal pain assessment.
1.13 Analyze the basic structure and function of the human body.			

1.2 **Diseases and Disorders**			
1.21 Describe common diseases and disorders of each body system (prevention, pathology, diagnosis, and treatment).	4.MD6 N-Q1 N-Q2 N-Q3	Angle of injection for different types of injections; thickening liquids; raised bed angles; rates of oxygen flow; rates of flow determining nasal cannula vs mask usage; calculating blood sugar averages; calculating burn percentage; conversion of calories of different nutrients (e.g., Carbohydrates have 4 cal/gm).	Draw and identify 15, 30, 45 and 90 degree angles as used in various injections types. Apply understanding of angles to range of motion, bed positions. Determine rate of flow based on oxygen delivery device. Measure the correct amount of thickener to appropriate consistency of syrup, honey and pudding. Compare and contrast hyper, hypo and normal blood glucose levels. Apply understanding of blood glucose norms and when to report abnormal readings to supervisor. Using mathematical equations, average a monthly value of a patient's blood sugar. Use the rule of nines to calculate burn percentage. Convert calories to grams/nutrient.
1.22 Recognize emerging diseases and disorders.			
1.23 Investigate biomedical therapies as they relate to the prevention, pathology, and treatment of disease.			

1.3 Medical Mathematics			
1.31 Apply mathematical computations related to healthcare procedures (metric and household, conversions and measurements).	7.EE3 N-Q1, N-Q2, N-Q3	Ounces to ML or CC; ft to inches; lbs to kg; C to F; cc to tsp (crosses within system and across systems – English/Metric/Apothecary). Roman numerals.	Convert metric to English to Apothecary by using ratio and proportion and mathematical operations of addition, subtraction and multiplication and division Identify and use metric symbols. Identify and use Roman numerals. Use of mnemonic device for LCDM (Lovely Cats Don't Meow).
1.32 Analyze diagrams, charts, graphs, and tables to interpret healthcare results.	S-ID1 S-IC5 S-CP5 N-Q1 N-Q2	Intake/Output charts; height/weight charts; MyPlate U.S.D.A. food guidance system interpretation; design MyPlate guide for a given patient (age, weight, height); patient charting (by hand and electronic; develop and interpret); bath charting.	Correctly add intake and output charts/height and weight charts of assigned patients in nursing homes. Data analysis of weight loss of patient under watch. Create a personal chart of the MyPlate U.S.D.A. food guidance system, identify where intake is more or less and to make adjustments in numbers to meet the RDA. Investigate the relationship between fluid intake and output and their connection to hydration status. Analyze and interpret data on contribution of preventable causes of a specific disease (e.g., relationship of smoking to lung cancer; alcohol intake to fetal alcohol syndrome; STDs).

1.33 Record time using the 24-hour clock.	7.EE3 4.MD2	Elapsed time (medication administration; turning patient schedule; ted hose off schedule; respirations); converting to 24 hour clock (military time vs. meridian time); timing seizures.	Calculate elapsed time between procedures, e.g. turn every 2 hours, ted hose off at HS (hours sleep) and create a chart to use for each patient. Use the clock or a watch to check respirations by 15 sec, 30 sec and 60 sec and multiply value as needed. Illustrate the 24 hour military time and convert from it to meridian using a worksheet provided. Convert standard time to 24-hour clock time. Calculate elapsed time using a 24-hour clock.
Standard 2: Communications			
2.1 Concepts of Effective Communication			
2.11 Interpret verbal and nonverbal communication.			
2.12 Recognize barriers to communication.			
2.13 Report subjective and objective information.	S-IC3 S-MD7(+)	Recording vital signs – increases and decreases, conversions (deductive reasoning).	Recall normal values of vital signs and identify difference of normal and abnormal values by subtraction. Perform temperature conversions from Celsius to Fahrenheit or vice versa with decimals. Utilize pain assessment scale with a patient and report as needed. Correlate abnormal values of blood pressure with the probability and incidence of stroke or shock.

2.14 Recognize the elements of communication using a sender-receiver model.			
2.15 Apply speaking and active listening skills.			
2.2 Medical Terminology			
2.21 Use roots, prefixes, and suffixes to communicate information.		Mathematical prefixes.	Understand the mathematical prefixes and suffixes (e.g., centimeter).
2.22 Use medical abbreviations to communicate information.	N-Q1	Mathematical abbreviations – for measurements.	Chart data using appropriate medical abbreviations and symbols.
2.3 Written Communication Skills			
2.31 Recognize elements of written and electronic communication (spelling, grammar, and formatting).	N-Q1	Recognizing measurement words/language and write/format them appropriately.	Chart data using appropriate medical abbreviations and symbols.
Standard 3: Systems			
3.1 Healthcare Delivery System			
3.11 Understand the healthcare delivery system (public, private, government, and non-profit).	7.NS3 7.RP3	Insurance discussions – copays, deductibles public assistance programs (Medicare, Medicaid, private insurance).	Demonstrate understanding of healthcare payment systems/sources by application of premiums, deductibles, copays, coinsurance and compare various payment sources (e.g., private insurance vs Medicare vs Medicaid vs uninsured).
3.12 Explain the factors influencing healthcare delivery systems.	7.NS3 7.RP3	Insurance vs no insurance vs public assistance.	Explain how various insurance type or lack of healthcare insurance impacts the healthcare decisions a consumer makes for themselves or their family OR the level or type of healthcare available to a consumer.

3.13 Describe the responsibilities of consumers within the healthcare system.	7.NS3 7.RP3	Copays/ deductibles Responsibilities influencing the cost of healthcare.	Consumer Responsibilities survey – survey healthcare consumers regarding healthcare responsibilities such as wellness, financial/payment responsibility, proactive vs reactive healthcare consumer, selection and relationships with healthcare providers, and interpret numerical data collected (for example – National Consortium for Health Sciences Education, Foundation standard 3: Systems).
3.14 Explain the impact of emerging issues such as technology, epidemiology, bioethics, and socioeconomics on healthcare delivery systems.	7.NS3 7.RP3 S-MD5	Cause and incidence of disease; % of population w or w/o insurance; impact of malpractice insurance on costs.	Investigate malpractice insurance costs for various fields of healthcare. Investigate the costs (social, financial, emotional, family) of healthcare for a given terminal patient.
3.15 Discuss common methods of payment for healthcare.	7.NS3 7.RP3	Insurance discussions/comparisons.	Explain how various insurance type or lack of healthcare insurance impacts the healthcare decisions a consumer makes for themselves or their family OR the level or type of healthcare available to a consumer.
Standard 4: Employability Skills			
4.1 Personal Traits of Healthcare Profession			
4.11 Classify the personal traits and attitudes desirable in a member of the healthcare team.			
4.12 Summarize professional standards as they apply to hygiene, dress, language, confidentiality, and behavior.			

4.2 Employability Skills			
4.21 Apply employability skills in healthcare.	A-SSE3c A-SSE4 7.RP3	Create a budget for healthcare office/unit; estimate and order supplies.	Create budget for a given healthcare office or unit.
4.3 Career Decision-making			
4.31 Discuss levels of education, credentialing requirements, and employment trends in healthcare.	A-SSE3c A-SSE4 7.RP3	Employment trends – job outlook statistics (interpreting existing data; calculating % openings from local area). Calculating and comparing education costs.	Establish a plan for five years after high school graduation including education and living expenses. Compare education levels, income and occupational outlook for various healthcare occupations.
4.32 Compare careers within the health science career pathways (diagnostic services, therapeutic services, health informatics, support services, or biotechnology research and development).	A-SSE3c A-SSE4 7.RP3		
4.4 Employability Preparation			
4.41 Develop components of a personal portfolio.			
4.42 Demonstrate the process for obtaining employment.			
Standard 5: Legal Responsibilities			
5.1 Legal Implications			
5.11 Analyze legal responsibilities.			
5.12 Apply procedures for accurate documentation and record keeping.	N-Q.1		Chart data using appropriate medical abbreviations and symbols.

5.2 Legal Practices			
5.21 Apply standards for Health Insurance Portability and Accountability Act (HIPAA).	7.NS3	Cost of HIPAA violation (problem w/ specific example).	Recognize financial impact of HIPAA violation such as breach of confidentiality.
5.22 Describe advance directives.			
5.23 Summarize the Patient's Bill of Rights.			
5.24 Understand informed consent.			
5.25 Explain laws governing harassment, labor and scope of practice.			
Standard 6: Ethics			
6.1 Ethical Boundaries			
6.11 Differentiate between ethical and legal issues impacting healthcare.	7.NS3	Cost of HIPAA violation (problem w/ specific example).	Recognize financial impact of HIPAA violation such as breach of confidentiality. Calculate the damages awarded based on verdict of a healthcare lawsuit scenario (e.g., malpractice, wrongful death).
6.12 Recognize ethical issues and their implications related to healthcare.	S-MD7(+)	Probabilities of outcomes in making decisions regarding healthcare.	Using an ethics scenario (such as continuation of life support, accessibility to healthcare based on ability to pay, socioeconomic status, culture), research and debate multiple perspectives on the issue.

6.2 Ethical Practice			
6.21 Apply procedures for reporting activities and behaviors that affect the health, safety, and welfare of others.	S-CP6	Probabilities of having an incident of X if procedure Y is not followed. Infection if don't wash hands properly; pregnancy.	Research incidence of nosocomial infections related to hand washing. Research use of gait belts and patient falls in a clinical facility.
6.3 Cultural, Social, and Ethnic Diversity			
6.31 Understand religious and cultural values as they impact healthcare.			
6.32 Demonstrate respectful and empathetic treatment of ALL patients/clients (customer service).			
Standard 7: Safety Practices			
7.1 Infection Control			
7.11 Explain principles of infection control.			
7.12 Describe methods of controlling the spread and growth of microorganisms.			
7.2 Personal Safety			
7.21 Apply personal safety procedures based on OSHA and CDC regulations.			

7.22 Apply principles of body mechanics.	4.MD6 S-MD7	Using data to demonstrate reason for specific procedures (i.e., doing a lift a certain way because if you don't, you have X probability of having an injury). Angles to consider in transfer.	Identify and position the wheelchair and bed so they are at an angle safe and efficient for transfer. Make necessary adjustments for special conditions (e.g., transferring patient on the weak side vs. on the strong side). Compare rates of back injury between healthcare workers (e.g., CNA, RN, physicians, respiratory therapist, dieticians, housekeeping staff).
7.3 Environmental Safety			
7.31 Apply safety techniques in the work environment.	7.RP3	Calculation of bleach solution in accordance with label (mixture problems).	Use ratio, proportion and percent when mixing solutions properly (e.g., cleaning solutions, sterilization solutions).
7.4 Common Safety Hazards			
7.41 Comply with safety signs, symbols, and labels.	7.RP3	Calculation of bleach solution in accordance with label (mixture problems).	Use ratio, proportion and percent when mixing solutions properly (e.g., cleaning solutions, sterilization solutions) as stated on the label.
7.42 Understand implications of hazardous materials.			
7.5 Emergency Procedures and Protocols			
7.51 Practice fire safety in a healthcare setting.			
7.52 Apply principles of basic emergency response in natural disasters and other emergencies.			

Standard 8: Teamwork			
8.1 Healthcare Teams			
8.11 Understand roles and responsibilities of team members.			
8.12 Recognize characteristics of effective teams.			
8.2 Team Member Participation			
8.21 Recognize methods for building positive team relationships.			
8.22 Analyze attributes and attitudes of an effective leader.			
8.23 Apply effective techniques for managing team conflict.			
Standard 9: Health Maintenance Practices			
9.1 Healthy Behaviors			
9.11 Apply behaviors that promote health and wellness.	7.NS3 7.EE3 7.EE4	Caloric intake; BMI; reading and interpreting nutrition labels.	Read, interpret and apply to patient nutritional intake the information on a food nutrition label. Record a food log over a 24 hour period and compare numerically with recommended intake of calories and other nutritional requirements. Calculate recommended caloric intake for weight gain or weight loss based on self or given patient scenario. Calculate BMI based on self or given patient scenario; answer the question “how many pounds would you (or patient) need to lose to achieve a target BMI?”

9.12 Describe strategies for the prevention of diseases including health screenings and examinations.			
9.13 Discuss complementary (alternative) health practices as they relate to wellness and disease prevention.	7.NS3 7.EE3 7.EE4	Caloric intake; BMI; reading and interpreting nutrition labels.	Investigate impact of daily exercise on daily caloric expenditure to include basal metabolic rate and expenditure of calories based on given activity. Compare absorption of nutritional supplement versus absorption of nutritional intake (e.g., calcium supplement versus calcium in foods).
Foundation 10: Technical Skills			
10. 1 Technical Skills			
10.11 Apply procedures for measuring and recording vital signs including the normal ranges.	N-Q1 N-Q2 N-Q3 7.NS3 7.EE3 7.EE4	Liquid measurements; taking blood pressure; reading thermometers, spirometer; heart rate; comparisons to normal range.	Demonstrate measuring input and output, taking vital signs and compare to norms. Convert metric to English to Apothecary by using ratio and proportion and mathematical operations.
10.12 Apply skills to obtain training or certification in CPR, AED, FBAO and first aid.	7.RP3	Ratios – compressions per breath (CPR).	Apply proper compression to breath ratio when delivering CPR in simulation. Compare survival rates when using compression/breath CPR with compression only CPR. Determine the impact of an insufficient breath on tidal volume.

Foundation 11: Information Technology Applications			
11.1 Health Information Management			
11.11 Utilize current computer hardware and software.			
11.12 Identify records, files and technology applications common to healthcare.			
11.13 Enter data into computer files using reference tools to insure accuracy.			
11.2 Information Technology			
11.21 Communicate using technology to access and distribute data and other information.			
11.22 Maintain the security and confidentiality of electronic patient information adhering to workplace policies.			

Codes for Common Core Mathematics are:

4.G = Grade 4 Geometry

4.MD = Grade 4 Measurement and Data

4.NF = Grade 4 Numbers and Operations – Fractions

6.NS = Grade 6 The Number System

7.EE = Grade 7Expressions and Equations

7.NS = Grade 7 The Number System

7.RP = Grade 7 Ratios and Proportional Relationships

N-Q = Number and Quantity: Quantities

S-ID = Statistics and Probability: Interpreting Categorical and Quantitative Data

S-IC = Statistics and Probability: Making Inferences and Justifying Conclusions

S-CP = Statistics and Probability: Conditional Probability and the Rules of Probability

S-MD = Statistics and Probability: Using Probability to Make Decisions