

**Maine Department of Education
Career and Technical Education**

**Allied Health Occupations-CIP: 51.0000
National Consortium for Health Science Education Standards (NCHSE)**

**Intersections with
Maine College and Career Readiness Standards-Mathematics**

Duties, Skills, and Tasks- Health Occupations	Math Content Standards And The Eight Mathematical Practices (CCSS)	Demonstration of Proficiency (possible projects, evidence, performance assessment, etc.)	Maine Learning Results- Guiding Principles & Career and Education Development <i>(Optional)</i>
Foundation Standard 1: Academic Foundation			
1.1 Human Anatomy and Physiology			
1.11 Identify basic levels of organization of the human body. a. Chemical b. Cellular c. Tissue d. Organs e. Systems f. Organism	No Standards identified for Intersection.		
1.12 Identify body planes, directional terms, cavities, and quadrants. a. Body planes (sagittal, mid-sagittal, coronal/frontal, transverse/horizontal) b. Directional terms (superior, inferior, anterior/ ventral, posterior/dorsal, medial, lateral, proximal, distal, superficial, and deep) c. Cavities (dorsal, cranial, spinal, thoracic, abdominal, and pelvic) d. Quadrants (upper right, lower right, upper left, and lower left)	No Standards identified for Intersection.		
1.13 Analyze basic structures and	No Standards identified for		

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<p>functions of human body systems (skeletal, muscular, integumentary, cardiovascular, lymphatic, respiratory, nervous, special senses, endocrine, digestive, urinary, and reproductive).</p> <p>a. Body planes (sagittal, mid-sagittal, coronal/frontal, transverse/horizontal)</p> <p>b. Directional terms (superior, inferior, anterior/ventral, posterior/dorsal, medial, lateral, proximal, distal, superficial, and deep)</p> <p>c. Cavities (dorsal, cranial, spinal, thoracic, abdominal, and pelvic)</p> <p>d. Quadrants (upper right, lower right, upper left, and lower left)</p> <p>e. Skeletal (bone anatomy, axial and appendicular skeletal bones, functions of bones, ligaments, types of joints)</p> <p>f. Muscular (microscopic anatomy of muscle tissue, types of muscle, locations of skeletal muscles, functions of muscles, tendons, directional movements)</p> <p>g. Integumentary (layers, structures and functions of skin)</p> <p>h. Cardiovascular (components of blood, structures</p>	<p>Intersection.</p>		

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<p>and functions of blood components, structures and functions of the cardiovascular system, conduction system of the heart, cardiac cycle)</p> <p>i. Lymphatic (structures and functions of lymphatic system, movement of lymph fluid)</p> <p>j. Respiratory (structures and functions of respiratory system, physiology of respiration)</p> <p>k. Nervous (structures and functions of nervous tissue and system, organization of nervous system)</p> <p>l. Special senses (structures and functions of eye, ear, nose and tongue; identify senses for sight, hearing, smell, taste, touch)</p> <p>m. Endocrine (endocrine versus exocrine, structures and functions of endocrine system, hormones, regulation of hormones)</p> <p>n. Digestive (structures and functions of gastrointestinal tract, chemical and mechanical digestion, structures and functions of accessory organs)</p> <p>o. Urinary (structures and functions of urinary system, gross and microscopic anatomy, process of urine formation, urine composition, homeostatic balance)</p>			

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p. Reproductive (structures and functions of male and female reproductive systems, formation of gametes, hormone production and effects, menstrual cycle, and conception)			
1.2-Diseases and Disorders 1.21 Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers). a. Etiology b. Pathology c. Diagnosis d. Treatment e. Prevention 1.22 Discuss research related to emerging diseases and disorders (such as: autism, VRSA, PTSD, Listeria, seasonal flu). 1.23 Describe biomedical therapies as they relate to the prevention, pathology, and treatment of disease. a. Gene testing b. Gene therapy c. Human proteomics d. Cloning e. Stem cell research	No Standards identified for Intersection.		

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<p>1.31 Demonstrate competency in basic math skills and mathematical conversions as they relate to healthcare.</p> <p>a. Metric system (such as: centi, milli, kilo)</p> <p>b. Mathematical (average, ratios, fractions, percentages, addition, subtraction, multiplication, division)</p> <p>c. Conversions (height, weight/ mass, length, volume, temperature, household measurements)</p>	<p>Math.HSA-REI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.</p>	<p>Metric System Conversions (Medical Measurement)</p>	
<p>1.32 Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.</p>	<p>Math.HSS-ID.A.1 Represent data with plots on the real number line (dot plots, histograms, and box plots).</p> <p>Math.HSS-ID.B.6 Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.</p>	<p>Vital Signs Graphic Worksheet Pediatric Growth Chart</p>	
<p>1.33 Demonstrate use of the 24-hour clock/military time.</p>	<p>No Standards identified for Intersection.</p>		
Foundation Standard 2: Communications			
<p>2.1 Concepts of Effective Communication</p> <p>2.11 Model verbal and nonverbal communication.</p> <p>2.12 Identify common barriers to communication.</p> <p>a. Physical disabilities (aphasia, hearing loss, impaired vision)</p>	<p>No Standards identified for Intersection.</p>		

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b. Psychological barriers (attitudes, bias, prejudice, stereotyping) 2.13 Identify the differences between subjective and objective information. 2.14 Interpret elements of communication using basic sender-receiver-message-feedback model. 2.15 Practice speaking and active listening skills. 2.16 Modify communication to meet the needs of the patient/ client and be appropriate to the situation.			
2.2 Medical Terminology 2.21 Use common roots, prefixes, and suffixes to communicate information. 2.22 Interpret medical abbreviations to communicate information. a. Common abbreviations b. Joint Commission official "Do Not Use List.	No Standards identified for Intersection.		
2.3 Written Communication Skills 2.31 Utilize proper elements of written and electronic communication (spelling, grammar, and formatting). 2.32 Prepare examples of technical, informative, and creative writing.	No Standards identified for Intersection.		
Foundation Standard 3: Systems			
3.11 Compare healthcare delivery systems. a. Non-profit and for profit (such as: hospitals, ambulatory facilities, long-	→ 3.14 Math.HSA-REI.B.3 Solve linear equations and inequalities in one	Insurance and Reimbursement Calculations	

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<p>term care facilities, home health, medical and dental offices, mental health services)</p> <p>b. Government (such as: CDC, FDA, WHO, OSHA, Public Health systems/Health Departments, Veteran’s Administration)</p> <p>c. Non-profit (such as: March of Dimes, American Heart Association)</p> <p>3.12 Describe the responsibilities of consumers within the healthcare system (such as: self-advocacy, patient compliance, provider and consumer obligations).</p> <p>3.13 Assess the impact of emerging issues on healthcare delivery systems (such as: technology, epidemiology, bioethics, socioeconomics).</p> <p>3.14 Discuss healthcare economics and common methods of payment for healthcare.</p> <p>a. Private health insurance (such as: Blue Cross, Affordable Care Act - ACA)</p> <p>b. Managed care (such as: HMOs, PPOs, medical home)</p> <p>c. Government programs (Medicare, Medicaid, Tricare, and Workers’ Compensation)</p>	<p>variable, including equations with coefficients represented by letters.</p> <p>Math.HSA-SSE.A.1a Interpret parts of an expression, such as terms, factors, and coefficients.</p> <p>Math.HSA-SSE.A.1b Interpret complicated expressions by viewing one or more of their parts as a single entity.</p>		
<p>Foundation Standard 4: Employability Skills</p>			

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<p>4.1 Personal Traits of the Health Professional</p> <p>4.11 Identify personal traits and attitudes desirable in a member of the career ready healthcare team.</p> <ul style="list-style-type: none"> a. Acceptance of criticism b. Competence c. Dependability d. Discretion e. Empathy f. Enthusiasm g. Honesty h. Initiative i. Patience j. Responsibility k. Self-motivation l. Tact m. Team player n. Willingness to learn <p>4.12 Summarize professional standards as they apply to hygiene, dress, language, confidentiality and behavior.</p>	<p>No Standards identified for Intersection.</p>		
<p>4.2 Employability Skills</p> <p>4.21 Apply employability skills in healthcare.</p> <ul style="list-style-type: none"> a. Chain of command b. Correct grammar c. Decision making d. Flexible e. Initiative f. Integrity 	<p>No Standards identified for Intersection.</p>		

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g. Loyalty h. Positive attitude i. Professional characteristics j. Prompt and prepared k. Responsibility l. Scope of practice m. Teamwork n. Willing to learn			
4.3 Career Decision-making 4.31 Research levels of education, credentialing requirements, and employment trends in health professions. 4.32 Distinguish differences among careers within health science pathways (diagnostic services, therapeutic services, health informatics, support services, or biotechnology research and development).	No Standards identified for Intersection.		
4.4 Employability Preparation 4.41 Develop components of a personal portfolio. a. Letter of introduction b. Resume c. Sample Projects d. Writing Sample e. Work-based Learning Documentation f. Oral Report g. Service Learning/Community Service h. Credentials i. Technology Skills	No Standards identified for Intersection.		

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j. Leadership Examples 4.42 Identify strategies for pursuing employment (social media, personal networking, job sites, internships).			
Foundation Standard 5: Legal Responsibilities			
5.1 Legal Responsibilities and Implications 5.11 Analyze legal responsibilities and implications of criminal and civil law. a. Malpractice b. Negligence c. Assault d. Battery e. Invasion of privacy f. Abuse g. Libel h. Slander	No Standards identified for Intersection.		
5.2 Legal Practices 5.21 Apply standards for the safety, privacy and confidentiality of health information (HIPAA, privileged communication). 5.22 Describe advance directives. 5.23 Summarize the essential characteristics of a patient's basic rights within a healthcare setting. 5.24 Define informed consent. 5.25 Explain laws governing harassment and scope of practice.	No Standards identified for Intersection.		
Foundation Standard 6: Ethics			

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<p>6.1 Ethical Practice 6.11 Differentiate between ethical and legal issues impacting healthcare. 6.12 Identify ethical issues and their implications related to healthcare (such as: organ donation, <i>in vitro</i> fertilization, euthanasia, scope of practice, ethics committee). 6.13 Utilize procedures for reporting activities and behaviors that affect the health, safety, and welfare of others (such as: incident report).</p>	<p>No Standards identified for Intersection.</p>		
<p>6.2 Cultural, Social, and Ethnic Diversity 6.21 Discuss religious and cultural values as they impact healthcare (such as: ethnicity, race, religion, gender). 6.22 Demonstrate respectful and empathetic treatment of ALL patients/clients (such as: customer service, patient satisfaction, civility).</p>	<p>No Standards identified for Intersection.</p>		
<p>Foundation Standard 7: Safety Practices</p>			
<p>7.1 Infection Control 7.11 Explain principles of infection control. a. Chain of infection b. Mode of transmission (direct, indirect, vectors, common vehicle [air, food, water], healthcare-associated infections [nosocomial], opportunistic)</p>	<p>No Standards identified for Intersection.</p>		

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c. Microorganisms (non-pathogenic, pathogenic, aerobic, anaerobic) d. Classifications (bacteria, protozoa, fungi, viruses, parasites) 7.12 Differentiate methods of controlling the spread and growth of microorganisms. a. Aseptic control (antiseptics, disinfection, sterilization, sterile technique) b. Standard precautions c. Isolation precautions d. Blood borne pathogen precautions e. Vaccinations			
7.2 Personal Safety 7.21 Apply personal safety procedures based on Occupational Safety and Health Administration (OSHA) and Centers for Disease Control (CDC) regulations. 7.22 Demonstrate principles of body mechanics.	No Standards identified for Intersection.		
7.3 Environmental Safety 7.31 Apply safety techniques in the work environment. a. Ergonomics b. Safe operation of equipment c. Patient/client safety measures (check area for safety)	No Standards identified for Intersection.		
7.4 Common Safety Hazards 7.41 Observe all safety standards	No Standards identified for Intersection.		

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related to the Occupational Exposure to Hazardous Chemicals Standard (Safety Data Sheets (SDSs)). (www.osha.gov) 7.42 Comply with safety signs, symbols, and labels.			
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 (safe location, contact emergency personnel, follow facility protocols).	No Standards identified for Intersection.		
8.1 Healthcare Teams 8.11 Evaluate roles and responsibilities of team members. a. Examples of healthcare teams b. Responsibilities of team members c. Benefits of teamwork 8.12 Identify characteristics of effective teams. a. Active participation b. Commitment c. Common goals d. Cultural sensitivity e. Flexibility f. Open to feedback g. Positive attitude h. Reliability i. Trust j. Value individual contributions	No Standards identified for Intersection.		

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<p>8.2 Team Member Participation 8.21 Recognize methods for building positive team relationships (such as: mentorships and teambuilding). 8.22 Analyze attributes and attitudes of an effective leader.</p> <p>a. Characteristics (interpersonal skills, focused on results, positive) b. Types (autocratic, democratic, laissez faire) c. Roles (sets vision, leads change, manages accountability)</p> <p>8.23 Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).</p>	<p>No Standards identified for Intersection.</p>		
<p>Foundation Standard 9: Health Maintenance Practices</p>			
<p>9.1 Healthy Behaviors 9.11 Promote behaviors of health and wellness (such as: nutrition, weight control, exercise, sleep habits). 9.12 Describe strategies for prevention of disease.</p> <p>a. Routine physical exams b. Medical, dental, and mental health screenings c. Community health education outreach programs d. Immunizations e. Stress management f. Avoid risky behaviors</p>	<p>→9.11 Math.HSS-ID.A.1 Represent data with plots on the real number line (dot plots, histograms, and box plots).</p> <p>Math.HSS-ID.B.6 Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.</p>	<p>Interpreting graphs for nutritional standards and weight control. Evaluate graphs and provide educational data for disease prevention.</p>	

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9.13 Investigate complementary and alternative health practices as they relate to wellness and disease prevention (such as: Eastern medicine, holistic medicine, homeopathy, manipulative and natural therapies).			
*Foundation Standard 10: Technical Skills			
10.1 Technical Skills 10.11 Apply procedures for measuring and recording vital signs including the normal ranges (temperature, pulse, respirations, blood pressure, pain). 10.12 Obtain training or certification in cardiopulmonary resuscitation (CPR), automated external defibrillator (AED), foreign body airway obstruction (FBAO) and first aid. *Additional technical skills may be included in a program of study based on career specialties.	No Standards identified for Intersection.		
Foundation Standard 11: Information Technology Applications			
11.1 Key Principles of Health Information Systems 11.11 Identify types of data collected in Electronic Health Records/Electronic Medical Records (EHR or EMR) (such as: history and physical, medications, diagnostic tests, patient demographics). 11.12 Explore different types of health record data collection tools (such as: patient monitoring equipment,	No Standards identified for Intersection.		

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telemedicine, phone application, and medical wearable devices). 11.13 Identify the types and content of an EHR/EMR (such as: pharmacy, laboratory, radiology). 11.14 Create documentation in EHR/EMRs that reflect timeliness, completeness, and accuracy. 11.15 Adhere to information systems policies, procedures, and regulations as required by national, state, and local entities.			
11.2 Privacy and Confidentiality of Health Information 11.21 Apply fundamentals of privacy and confidentiality policies and procedures (HIPAA). 11.22 Identify legal and regulatory requirements related to the use of personal health information (such as: Health Information Technology Act— HITECH Act, American Recovery and Reinvestment Act—ARRA). 11.23 Identify common policies and procedures for proper access, disclosure and protection of personal health information (such as: passwords, administrative safeguards, database security). 11.24 Describe consequences of inappropriate use of health data in terms of disciplinary action.	No Standards identified for Intersection.		

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11.25 Understand the principle to correct inaccurate information/errors entered into an EHR/EMR (such as: adding, clarifying, and correcting information).			
11.3 Basic Computer Skills 11.31 Apply basic computer concepts and terminology necessary to use computers and other mobile devices. 11.32 Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings). 11.33 Demonstrate use of file organization and information storage. 11.34 Identify uses of basic word processing, spreadsheet, and database applications. 11.35 Evaluate validity of web-based resources. 11.36 Demonstrate appropriate usage of email and social media in a work environment (such as: work-related communications, personal texting on own time, appropriate language and content, use full language sentences).	No Standards identified for Intersection.		