



2014 Healthcare and Clinical Services

Mississippi Department of Education

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The Research and Curriculum Unit (RCU), located in Starkville, MS, as part of Mississippi State University, was established to foster educational enhancements and innovations. In keeping with the land grant mission of Mississippi State University, the RCU is dedicated to improving the quality of life for Mississippians. The RCU enhances intellectual and professional development of Mississippi students and educators while applying knowledge and educational research to the lives of the people of the state. The RCU works within the contexts of curriculum development and revision, research, assessment, professional development, and industrial training.

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Pam Hindman, Program Coordinator, Office of Career and Technical Education and Workforce Development, Mississippi Department of Education, Jackson, MS phindman@mde.k12.ms.us

Standards

Standards are superscripted in each unit and referenced in the appendices. Standards in the Healthcare and Clinical Services Curriculum Framework and Supporting Materials are based on the following:

National Healthcare Skill Standards

The National Healthcare Skill Standards were developed by the National Consortium on Health Science Education (formerly the National Consortium on Health Science and Technology Education) and WestEd Regional Educational Laboratory West in partnership with educators and health care employers. The standards were developed to inform current and future health care workers, employers, and educators as to what skills and knowledge workers need to succeed.

Common Core State Standards Initiative

The Common Core State Standards provide a consistent, clear understanding of what students are expected to learn, so teachers and parents know what they need to do to help them. The standards are designed to be robust and relevant to the real world, reflecting the knowledge and skills that our young people need for success in college and careers. With American students fully prepared for the future, our communities will be best positioned to compete successfully in the global economy. Copyright 2010. National Governors Association Center for Best Practices and Council of Chief State School Officers. All rights reserved. States and territories of the United States as well as the District of Columbia that have adopted the Common Core State Standards in whole are exempt from this provision, and no attribution to the National Governors Association Center for Best Practices and Council of Chief State School Officers is required. Reprinted from <http://www.corestandards.org/>.

National Educational Technology Standards for Students

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21st Century Skills and Information and Communication Technologies Literacy Standards

In defining 21st-century learning, the Partnership for 21st Century Skills has embraced five content and skill areas that represent the essential knowledge for the 21st century: global awareness; civic engagement; financial, economic, and business literacy; learning skills that encompass problem-solving, critical-thinking, and self-directional skills; and information and communication technology (ICT) literacy.

Preface

Secondary career and technical education programs in Mississippi face many challenges resulting from sweeping educational reforms at the national and state levels. Schools and teachers are increasingly being held accountable for providing true learning activities to every student in the classroom. This accountability is measured through increased requirements for mastery and attainment of competency as documented through both formative and summative assessments.

The courses in this document reflect the statutory requirements as found in Section 37-3-49, *Mississippi Code of 1972*, as amended (Section 37-3-46). In addition, this curriculum reflects guidelines imposed by federal and state mandates (Laws, 1988, Ch. 487, §14; Laws, 1991, Ch. 423, §1; Laws, 1992, Ch. 519, §4 eff. from and after July 1, 1992; Carl D. Perkins Vocational Education Act IV, 2007; and No Child Left Behind Act of 2001).

Executive Summary

Pathway Description

Healthcare and Clinical Services (HCCS) is a pathway of courses for students in the Health Sciences career cluster. The HCCS pathway includes classroom and hands-on experiences that will provide students with an overview of the health-care field, as outlined according to the Health Science Cluster in the National Career Clusters Framework and the National Consortium on Health Science Education (NCHSE), as well as begin to prepare students for careers in occupations predicted to have a high number of available jobs in the next 10 years, including careers in nursing services (registered nurse, nurse aide, practical nurse, home health aide), therapeutic services (sports medicine, athletic trainer, dietitian, respiratory therapist), diagnostic services (radiologist, phlebotomist, radiologic tech, sonographer, CT technician, medical lab technician), health informatics (health information technician, medical coder), veterinary services, medical services (optometrist, medical assistant), emergency services, rehabilitative services (physical therapist, occupational therapist, speech therapist) counselors, pharmacists, mental health services (psychologists).

Scheduling and operating more than one course in the same classroom/laboratory with the same teacher is not recommended. In order to enable the teacher to instruct students in skills on a one-on-one basis, the recommended class size is 12-15 students for the first two credits. For students taking the last two credits who are job shadowing, the recommended class size is 10 - 12 students. Please be aware that health care facilities often require a 10 to one student/teacher ratio in order to participate in job shadowing. Having a class that is too large decreases the quality experience that Healthcare and Clinical Services is meant to be for the student.

This program includes a minimum of 100 hours of clinical-type experience to be obtained by the program's completion. It is recommended to spread these hours out among the length of the program. This clinical-type experience can include: tours of health-care facilities, guest speakers, participation in health fairs or community service, laboratory practice, demonstration in the classroom, and observation or job shadowing experiences in medical facilities.

Industry Certification

By implementing the standards set forth in the Healthcare and Clinical Services pathway, students who successfully master the curriculum should have the necessary skills to take the National Health Science Assessment, which is based on industry-validated performance indicators. In addition, students whose programs meet additional criteria and approval by their respective agencies are prepared to complete the requirements and take the certification test to become a certified nurse aide through a certified nurse aide registry-approved site.

Assessment

The latest assessment blueprint for the curriculum can be found at <http://www.rcu.msstate.edu/Curriculum/CurriculumDownload.aspx>

Student Prerequisites

In order for students to be able to experience success in the Healthcare and Clinical Services pathway, the following prerequisites are suggested:

1. Completion of the Health Sciences (Core)
2. C or higher in English (the previous year)
3. C or higher in math (last course taken, or the instructor can specify the math)
4. Instructor approval and a TABE Reading Score of eighth grade or higher
5. C or higher in biology (or the last course taken as approved by instructor)

or

1. TABE Reading Score of eighth grade or higher
2. Instructor approval

or

1. Instructor approval

Academic Credit

The latest academic credit information can be found

at <https://www.rcu.msstate.edu/MDE/PathwaystoSuccess.aspx>. Once there, click the “*Counselor Resources*” Tab, then click “*Curriculum Enhancement List.*” Check this site often as it is updated frequently.

Teacher Licensure

The latest teacher licensure information can be found at <http://www.mde.k12.ms.us/educator-licensure>.

Professional Learning

If you have specific questions about the content of any of training sessions provided, please contact the Research and Curriculum Unit at 662.325.2510 and ask for an instructional design specialist.

Course Outlines

Option 1—Two One-Carnegie-Unit Courses

This curriculum consists of two one-credit courses, which should be completed in the following sequence:

1. **Healthcare and Clinical Services I—Course Code: 995104**
2. **Healthcare and Clinical Services II—Course Code: 995105**

Course Description: Healthcare and Clinical Services I

The Health Specialties course helps the student establish an understanding of specialty areas within the health care field. Students will be exposed to the theory and application related to careers within health care. This course covers topics such as emergency services, technical skills, and human growth and development. Also covered in this course are rehabilitative services, safety, and employability.

Course Description: Healthcare and Clinical Services II

The Direct Care course will allow students to investigate direct care as a career choice. Students will have the opportunity to discover information about pharmacological and diagnostic services and therapeutic services. This course covers medical and nursing services as well as information technology and health informatics.

Course Name: Healthcare and Clinical Services I — Course Code: 995104

Unit	Unit Name	Hours
1	Course Orientation, Safety Review, Clinical Policies, and Employability	25
2	Emergency Services and Technical Skills	60
3	Human Growth and Development	25
4	Rehabilitative Services	30
Total		140

Course Name: Healthcare and Clinical Services II— Course Code: 995105

Unit	Unit Name	Hours
5	Medical and Nursing Services	50
6	Therapeutic Services	30
7	Pharmacological and Diagnostic Services	40
8	Information Technology, and Health Informatics	20
Total		140

Option 2—One Two-Carnegie-Unit Courses

This curriculum consists of one two-credit course, which should be completed in the following sequence:

Healthcare and Clinical Services— Course Code: 995101

Course Description: Healthcare and Clinical Services

The Healthcare and Clinical Services course helps the student establish insight in the healthcare field. Students will be exposed to the theory and applied tasks related to careers within health care. This course covers topics such as human growth and development, health informatics, information technology, and therapeutic and rehabilitative services. Other topics include medical and emergency services, mental health, and pharmacological and nursing services.

Course Name: Healthcare and Clinical Services — Course Code: 995101

Unit	Unit Name	Hours
1	Course Orientation, Safety Review, Clinical Policies, and Employability	25
2	Emergency Services and Technical Skills	60
3	Human Growth and Development	25
4	Rehabilitative Services	30
5	Medical and Nursing Services	50
6	Therapeutic Services	30
7	Pharmacological and Diagnostic Services	40
8	Information Technology, and Health Informatics	20
Total		280

Research Synopsis

Introduction

The Healthcare and Clinical Services pathway covers the broad field of occupations related to health care and medicine. Health care is the largest and fastest growing industry in the United States. The health care field alone will generate more new jobs in the coming years than any other industry, largely in response to rapid growth in the elderly population. In fact, ten of the 20 fastest growing occupations are related to health care. Employment in home-health care and nursing and residential care should increase rapidly as life expectancies rise and families need assistance caring for their elderly family members, thus relying more on long-term care facilities. New technologies will continue to enable earlier diagnoses of many diseases, which often increases the ability to treat conditions that were previously terminal. Industry growth will also occur as a result of the shift from inpatient to less expensive outpatient and home-health care because of improvements in diagnostic tests and surgical procedures, along with patients' desires to be treated at home. Rapid growth is expected for workers in occupations concentrated outside the inpatient hospital sector, such as pharmacy technicians and personal and home-care aides. Traditional inpatient hospital positions are no longer the only option for many future health care workers.

The Healthcare and Clinical Services Career pathway will target careers at the professional and technical levels in health care. Students enrolled in these courses should be well prepared to pursue degrees at the community college and 4-year-college level.

Needs of the Future Workforce

Description	Current Jobs (2012)	Projected Jobs (2020)	Change (Number)	Change (Percent)	Median Hourly Earning
Anesthesiologists	160	165	5	3.00	\$76
Dentists (General)	784	957	173	22.00	\$78
Dietician Technicians	166	194	28	17.00	\$9
Dieticians/Nutritionists	384	433	49	13.00	\$26
Emergency Medical Technicians and Paramedics	1,595	1,778	183	11.00	\$15
Health Diagnosing and Treating Practitioners	178	221	436	24.00	\$28
Home Health Aides	4,701	7,359	2,658	57.00	\$9
Licensed Practical Nurses	752,300	920,800	168,500	22.00	\$19
Medical and Clinical Laboratory Technicians	1,489	1,771	282	19.00	\$17
Nursing Aides, Orderlies, and Attendants	15,090	18,423	3,333	22.00	\$9
Obstetricians and Gynecologists	220	227	7	3.00	\$26
Occupational Therapists	961	1,290	329	34.00	\$34
Optometrists	245	338	93	38.00	\$46
Orthodontists	51	62	11	22.00	\$26
Orthotists and Prosthetists	18	25	7	39.00	\$41
Pharmacists	591	688	97	16.00	\$53
Physical Therapists	1,442	1,976	534	37.00	\$35
Physical Therapy Assistant	553	761	208	38.00	\$18
Podiatrists	80	90	10	13.00	\$25
Recreational Therapists	292	645	53	18.00	\$15
Registered Nurses	2,737,400	3,449,300	711,900	26.00	\$31
Respiratory Therapists	1,195	1,479	284	24.00	\$22
Surgeons	350	361	11	3.00	\$26

Source: U.S. Department of Labor, Bureau of Labor Statistics, 2011

Perkins IV Requirements

The Healthcare and Clinical Services curriculum meets Perkins IV requirements of high-skill, high-wage, and/or high-demand occupations by introducing students to and preparing them for occupations in health care fields. It also offers students a program of study, including secondary, postsecondary, and Institutions of Higher Learning (IHL) courses, that will further prepare them for health care careers. Additionally, this curriculum is integrated with academic

Common Core Standards. Lastly, the curriculum focuses on ongoing and meaningful professional development for teachers as well as relationships with industry.

Curriculum Content

Summary of Standards

The standards to be included in the Healthcare and Clinical Services curriculum are the Common Core Standards for Mathematics, Common Core Standards for English/Language Arts, 21st Century Skills, and the National Educational Technology Standards (NETS) for Students. Combining these standards to create this document will result in highly skilled, well-rounded students who are prepared to enter a postsecondary academic or career and technical program. They will also be prepared to compete academically at a national level, as the Common Core Standards are designed to prepare students for success in community colleges, institutes of higher learning, and the workforce.

Academic Infusion

The Healthcare and Clinical Services curriculum is aligned to the Mississippi Academic Science Standards for Human Anatomy and Physiology. The content of the courses has been aligned to the Human Anatomy and Physiology Framework.

Transition to Postsecondary Education

The latest articulation information for Secondary to Postsecondary can be found at the Mississippi Community College Board (MCCB) website <http://www.mccb.edu/>

Best Practices

Innovative Instructional Technologies

Recognizing that today's students are digital learners, the classroom should be equipped with tools that will teach them in the way they need to learn. The Healthcare and Clinical

Services teacher's goal should be to include teaching strategies that incorporate current technology. It is suggested that each classroom house a set of desktop computers for students and one laptop for the teacher. To make use of the latest online communication tools such as wikis, blogs, and podcasts, the classroom teacher is encouraged to use a learning management system (LMS), such as the Healthcare and Clinical Services teacher learning management system that introduces students to education in an online environment and places the responsibility of learning with the student.

Differentiated Instruction

Students learn in a variety of ways. Some are visual learners, needing only to read information and study it to succeed. Others are auditory learners, thriving best when information is read aloud to them. Still others are tactile learners, needing to participate actively in their learning experiences. Add the student's background, emotional health, and circumstances, and a very unique learner emerges. By providing various teaching and assessment strategies, students with various learning styles can succeed.

Career and Technical Education Student Organizations

Teachers should investigate opportunities to sponsor a student organization. Health Occupations Students of America (HOSA) is the student organization for Healthcare and Clinical Services. HOSA provides a unique program of leadership development, motivation, and recognition exclusively for secondary, postsecondary, adult, and collegiate students enrolled in health occupations education programs.

Cooperative Learning

Cooperative learning can help students understand topics when independent learning cannot. Therefore, you will see several opportunities in the Healthcare and Clinical Services curriculum for group work. To function in today's workforce, especially within the health care

system, students need to be able to work collaboratively with others and solve problems without excessive conflict. The Healthcare and Clinical Services curriculum provides opportunities for students to work together and help one another to complete complex tasks.

Conclusions

Healthcare and Clinical Services is one of Mississippi's most comprehensive health curricula. Students that complete these programs are well equipped for a variety of endeavors. Instructors are urged to encourage these students to pursue educational opportunities at community colleges and universities in Mississippi.

Professional Organizations

Association for Career and Technical Education

<https://www.acteonline.org>

Mississippi ACTE <http://www.mississippiacte.com/>

American Association of Medical Transcriptionists

4230 Kiernan Avenue
Suite 130
Modesto, CA 95356
800.982.2182 (toll free)
209.527.9620 (direct)
209.527.9633 (fax)
www.ahdionline.org
ahdi@ahdionline.org

American Association for Respiratory Care

9425 N. MacArthur Blvd.
Suite 100
Irving, TX 75063-4706
972.243.2272
www.aarc.org

American Dental Assistants Association

35 East Wacker Drive
Suite 1730
Chicago, IL 60601-2211
312.541.1550
312.541.1496 (fax)
www.dentalassistant.org

American Dental Association

211 East Chicago Ave.
Chicago, IL 60611-2678
312.440.2500
www.ada.org

American Health Care Association

1201 L Street, N.W.
Washington, DC 20005
202.842.4444
202.842.3860 (fax)
www.ahca.org

American Hospital Association

One North Franklin
Chicago, Illinois 60606-3421
312.422-3000
www.aha.org

American Medical Association

515 N. State Street
Chicago, IL 60610
800.621.8335
www.ama-assn.org

American Red Cross National Headquarters

2025 E Street NW
Washington, DC 20006
800.REDCROSS (toll free)
800.257-7575 (Español)
www.redcross.org

American Society of Radiologic Technologists

15000 Central Ave. SE
Albuquerque, NM 87123-3909
800.444.2778, Press 5 (toll free)
505.298.4500, Press 5 (direct)
(505) 298-5063 (fax)
www.asrt.org

Hospital Corporation of America

One Park Plaza
Nashville, TN 37203
615.344.9551
www.hcahealthcare.com

**National Association of Emergency
Medical Technicians**

P.O. Box 1400
Clinton, MS 39060-1400
Physical Address
132-A East Northside Dr.
Clinton, MS 39056
1-800-34-NAEMT (toll free)
601.924.7744 (direct)
601.924.7325 (fax)
info@naemt.org
www.naemt.org

National Athletic Trainer's Association

2952 Stemmons Freeway #200
Dallas, TX 75247
214.637.6282
214.637-2206 (fax)
www.nata.org

**LifeWorks: Explore Health and Medical
Science Careers Early**

<http://science.education.nih.gov/lifeworks>

National Health Council

1730 M Street, NW
Suite 500
Washington, DC 20036
202.785.3910
202.785.5923 (fax)
www.nationalhealthcouncil.org

Nurses for a Healthier Tomorrow

www.nursesource.org

Nursing Spectrum

www.nurse.com

Ovarian Cancer National Alliance

910 17th Street, N.W.
Suite 1190
Washington, D.C. 20006
202.331.1332
202.331.2292 (fax)
ocna@ovariancancer.org
www.ovariancancer.org

Society of Nuclear Medicine

1850 Samuel Morse Drive
Reston, Virginia 20190
703.708.9000
www.snm.org

St. Jude Children's Research Hospital

332 N. Lauderdale
Memphis, TN 38105
901.495.3300
www.stjude.org

Le Bonheur Children's Medical Center

50 N. Dunlap Street
Memphis, TN 38103
901.287.KIDS (5437)
info@lebonheur.org

Mississippi Nurses Association

31 Woodgreen Place
Madison, MS 39110
601.898.0670
601.898.0190 (fax)
<http://www.msurses.org/>

American Heart Association

440 E. Pass Road Gulfport, MS, 39507
609 Corinne Street Hattiesburg, MS, 39401
4830 McWillie Circle Jackson, MS, 39206
www.americanheart.org

**The Center for Health and Health Care in
Schools**

202.466.3396
chhcs@gwu.edu
www.healthinschools.org

American Cancer Society

800.ACS.2345 (toll free)
www.cancer.org

The Diabetes Foundation of Mississippi

16 Northtown Drive
Suite 100

Jackson, MS 39211

601.957.7878

601.957.9555 (fax)

www.msdiabetes.org

**Mississippi Office of Healthy Schools —
A Division of Mississippi Department of
Education**

Central High School
359 Northwest Street

P.O. Box 771

Jackson, MS 39205-0771

www.healthyschoolsms.org

www.rxlist.com

www.PDR.net

**American Health Information
Management Association – AHIMA**

233 N. Michigan Ave, 21st Floor

Chicago, IL 60601-5800

312.233.1100

www.ahima.org

American Lung Association of Mississippi

P.O. Box 2178

Ridgeland, MS 39158

731 Pear Orchard Road

Suite 18

Ridgeland, MS 39157

800.586.4872 (toll free)

601.206.5810 (direct)

601.206.5813 (fax)

www.alams.org

American Nurses Association

8515 Georgia Ave, Suite 400

Silver Springs, MD 20910

800.274.4ANA

www.nursingworld.org

**American Speech-Language-Hearing
Association**

2200 Research Boulevard

Rockville, MD 20850-3289

800.638.8255

www.asha.org

American School Health Association

7263 State Route 43

P.O. Box 708

Kent, Ohio 44240

330.678.1601

330.678.4526 (fax)

asha@ashaweb.org

www.ashaweb.org

National School Boards Association

1680 Duke Street

Alexandria, VA 22314

703.838.6722

703.683.7590 (fax)

info@nsba.org

www.nsba.org

**Association for Professionals in Infection
Control and Epidemiology**

1275 K St., NW, Suite 1000

Washington, D.C. 20005-4006

202.789.1890

202.789.1899 (fax)

www.apic.org

**The American Assembly for Men in
Nursing**

AAMN 6700 Oporto-Madrid Blvd.

Birmingham, AL 35206

(205) 956-0146 (phone)

www.aamn.org

Association of Allied Health Programs

4400 Jenifer Street, NW Suite 333

Washington, D.C. 20015

(202) 237-6481 (phone)

(202) 237-6485 (fax)

www.asahp.org

Health Professions Network

1850 Samuel Morse Drive

Reston, VA 20190-5316

(703) 708-9000 (phone)
(703) 708-9015 (fax)
membership@healthpronet.org
www.healthpronet.org

**American Health Information
Management Association-AHIMA**
233 N. Michigan Avenue, 21st Floor
Chicago, IL 60601-5800
(312) 233-1100
www.ahima.org

Using this Document

Suggested Time on Task

An estimated number of clock hours of instruction that should be required to teach the competencies and objectives of the unit. A minimum of 140 hours of instruction is required for each Carnegie unit credit. The curriculum framework should account for approximately 75–80% of the time in the course.

Competencies and Suggested Objectives

A competency represents a general concept or performance that students are expected to master as a requirement for satisfactorily completing a unit. Students will be expected to receive instruction on all competencies. The suggested objectives represent the enabling and supporting knowledge and performances that will indicate mastery of the competency at the course level.

Integrated Academic Topics, 21st-Century Skills and Information and Communication Technology Literacy Standards, ACT College Readiness Standards, and Technology Standards for Students

This section identifies related academic topics as required in the Subject Area Testing Program (SATP) in Algebra I, Biology I, English II, and U.S. History from 1877, which are integrated into the content of the unit. Research-based teaching strategies also incorporate ACT College Readiness standards. This section also identifies the 21st-Century Skills and Information and Communication Technology Literacy skills. In addition, national technology standards for students associated with the competencies and suggested objectives for the unit are also identified.

References

A list of suggested references is provided for each unit. The list includes some of the primary instructional resources that may be used to teach the competencies and suggested objectives. Again, these resources are suggested, and the list may be modified or enhanced based on needs and abilities of students and on available resources.

Unit 1: Course Orientation, Safety Review, Clinical Policies, and Employability

Competencies and Suggested Objectives	
1. Describe the purpose of the course, review safety skills, and explain clinical policies. ^{DOK 1}	
a. Identify student and course expectations.	
b. Explore health science professional organizations (HOSA).	
c. Explore leadership skills and parliamentary procedures with professional organizations.	
2. Identify the personal traits of the health care professional. ^{DOK 1, HCFS 4}	
a. Classify the personal traits and attitudes desirable in a member of the health care team.	
b. Summarize professional standards as they apply to hygiene, dress, language, confidentiality, and behavior.	
3. Demonstrate basic employability skills. ^{DOK 2, HCFS 4}	
a. Apply the basic employability skills, such as interview skills, completing a job application, creating a résumé, and writing cover letters.	
4. Recognize the components for career decision-making. ^{DOK 1, HCFS 4}	
a. Discuss levels of education, credentialing requirements, and employment trends in health care.	
b. Compare careers within the health science career pathways (diagnostic services, therapeutic services, health informatics, support services, or biotechnology research and development).	

Scenarios

Unit 1

1) Students will be assigned to find a job announcement for which they would be interested in applying. They will compose a cover letter and résumé to submit to a potential employer and complete an application. Have other students (or teachers) act as an interviewer (or interview team) and have the “applicant” participate in a mock interview in which they are rated on their general characteristics (e.g. appearance and eye contact) and interviewing skills. HOSA’s guidelines and rubrics for the Job Seeking Skills event can be used for assessment and additional resources.

Attachments for Scenarios:

The Job Seeking Skills guidelines and rubrics can be found at: <http://www.hosa.org/>

Unit 2: Emergency Services and Technical Skills

Competencies and Suggested Objectives	
1.	Describe the field of emergency services. ^{DOK 1} <ol style="list-style-type: none">Identify the following emergency careers and describe their respective educational requirements, including licensure/certification, and job responsibilities: emergency/trauma physician, flight nurse, paramedic, emergency medical technician (EMT), emergency medical responder (EMR) (first responder), and community emergency response team (CERT).Describe emergency procedures: patient assessment, airway management, oxygen therapy, automated external defibrillator use, immobilization skills, patient transfers, treating shock, and triage.Review body systems as needed.
2.	Demonstrate procedures for measuring and recording vital signs, including normal ranges. ^{CNA, DOK 1, HCFS 10} <ol style="list-style-type: none">Measure and record oral, rectal, axillary, and tympanic temperatures accurately.Measure and record apical and radial pulse to an accuracy of +/- 2 beats per minute.Measure and record respirations to an accuracy of +/- 2 of instructor's count.Measure and record blood pressure to an accuracy of +/- 2 millimeters of actual reading.
3.	Perform skills obtained in training or certification for Basic Life Support for Health Care Providers. ^{DOK 2, HCFS 10} <ol style="list-style-type: none">Demonstrate the procedure for administering cardiopulmonary resuscitation (CPR) to infants, children, and adults.Demonstrate the procedure for administering CPR using an automated external defibrillator (AED) for infants, children, and adults.Demonstrate the procedure for removal of a foreign-body airway obstruction for infants, children, and adults.
4.	Demonstrate the necessary skills to provide first aid treatment. ^{DOK 2, HCFS 10} <ol style="list-style-type: none">Describe the basic principles of first aid.Demonstrate the procedure for treating external bleeding and the application of dressings and bandages.Demonstrate the procedure for treating shock.Demonstrate the procedure for treating muscle, bone, and joint injuries.Demonstrate the procedure for treating injuries that result from exposure to extreme heat and cold.Demonstrate the procedure for treating burns.Demonstrate the procedure for treating poisoning.Demonstrate the procedure for treating sudden illnesses including heart attack, stroke, fainting, convulsions, and diabetic reactions.

- i. Demonstrate the procedure for providing first aid care for injuries to the eyes, ears, head/skull, nose, chest, abdomen, and genital organs.

Scenarios

Unit 2

1) A man is holding a ladder steady for another man to work on the edge of the roof of a building. Man # 1 suddenly collapses clutching his chest and falls to the ground. He is unresponsive. Man #2 falls from the ladder fracturing his right wrist and forearm. Have two students act as rescuers. Use first aid, CPR/AED as needed to treat the victims. Set a time limit of 15 minutes. Tell the students to follow the guidelines they have learned concerning the principles of first aid. Have the other students observe the responses and make notes about anything not done properly, making sure to note how much time it takes the students to respond to the emergency situation. The rubrics in the HOSA First Aid/CPR event can be used to evaluate the students' performance.

2) Have students perform skits demonstrating a situation to which an emergency medical worker would respond. Students in the audience can peer review to assess whether the proper sequence and protocol is followed as well as whether or not the skills were performed accurately. HOSA's Emergency Medical Technician rubrics and procedures can be referenced.

3) Have the students assess one another's temperature, pulse (radial & apical), respiration, and blood pressure. They should progress through the named procedures smoothly and without interruption. Have the students convert the temperature readings from Fahrenheit to Celsius and a given temperature value from Celsius to Fahrenheit. Students should be able to recognize any value outside of the normal range. Use the rubric found in HOSA's Nursing Assisting Health Professions Event to assess student performance.

Attachments for Scenarios

The HOSA First Aid/CPR rubric can be found at:

<http://www.hosa.org>

The HOSA Emergency Medical Technician rubrics and procedures can be found at:

<http://www.hosa.org>

The HOSA Nursing Assisting Health Professions rubrics and procedures can be found at:

<http://www.hosa.org>

Unit 3: Human Growth and Development

Competencies and Suggested Objectives
1. Discuss the stages of growth and development across the lifespan. ^{DOK 1} <ol style="list-style-type: none">Describe Erikson's stages of psychosocial development.Describe the seven life stages (infancy through late adulthood) and the four main types of growth and development that occur (physical, mental, emotional, social) as individuals pass through these stages. (Eating disorders, chemical abuse and suicide associated with adolescents and Alzheimer's in late adulthood)Describe Maslow's Hierarchy of Human Needs.
2. Explain the concepts related to death and dying. ^{DOK 1} <ol style="list-style-type: none">Describe the five stages of grief.Describe hospice care.

Scenarios

Unit 3

Using PhotoStory, Microsoft PowerPoint, or similar software, students will create a narrated/annotated presentation using pictures of themselves (or family members, where applicable) to illustrate the varying stages of life. The presentation should include information about the physical and emotional characteristics of someone at the respective stages of life.

Attachments for Scenarios

None

Unit 4: Rehabilitative Services

Sports Medicine and Rehabilitation Services

Competencies and Suggested Objectives

1. Explore the field of sports medicine. ^{DOK 1}
 - a. Identify the following sports medicine careers and describe their respective educational requirements, including licensure/certification, and job responsibilities: Sports medicine physician, sports physical therapist, exercise physiologist, certified strength and conditioning specialist, certified athletic trainer, certified personal trainer, and sports medicine technician.
 - b. Describe the following basic sports medicine concepts and procedures: Basic physical assessment, injury assessment, body mass index (BMI) calculation, body fat percentage, and injury and preventative treatment modalities.
 - c. Review body systems as needed.
2. Explore the field of rehabilitative services. ^{CNA, DOK 2}
 - a. Identify the following rehabilitation careers and describe their respective educational requirements, including licensure/certification, and job responsibilities: Physical therapist, physical therapy assistant, physical therapy aide, occupational therapist, occupational therapy assistant, occupational therapy aide, speech language pathologist, audiologist, recreational therapist, music therapist, and art therapist.
 - b. Describe basic rehabilitative concepts and procedures: Range of motion exercises, assisting patient with ambulation, teaching patients to use assistive devices, application of heat and cold, and audiometer testing.
 - c. Demonstrate passive range of motion (PROM) for one knee, one ankle, and one shoulder.
 - d. Review body systems as needed.

Scenarios

Unit 4

1) Have the students take turns posing as a patient. Have patient lie in supine position on top of the bed. Student should take each extremity through the full range of motion (e.g., fingers to shoulder or toes to hip), describing each movement as it is performed. Then, the examining student should pretend that the patient has an affected or weak extremity and position the patient in a bed to support the affected extremity while maintaining the patient's correct spinal alignment. Use HOSA's Physical Therapy Assisting Rubric to assess student performance.

2) With the students acting as an art, music, or recreational therapist, ask them to plan a week of activities for patients in a children's hospital. Be sure to consider the limitations some patients may have due to their illnesses or injuries.

Attachments for Scenarios

The HOSA Physical Therapy Assisting rubric and guidelines can be found at:
<http://www.hosa.org>

Unit 5: Medical and Nursing Services

Competencies and Suggested Objectives

1. Explore the field of medical and nursing services. DOK 1 CNA
- Identify the following medical careers and describe their respective educational requirements, including licensure/certification, and job responsibilities: physician/medical doctor (MD), physician/doctor of osteopathic (DO), optometrist, podiatrist, surgical technologist, physician assistant, and medical assistant.
 - Identify the following nursing careers and describe their respective educational requirements, including licensure/certification, and job responsibilities: nurse practitioner, nurse anesthetist, registered nurse, licensed practical nurse, nurse midwife, and certified nursing assistant.
List of medical and nursing specialties: anesthesiology, cardiology, dermatology, emergency, endocrinology, family practice, gastroenterology, gerontology, gynecology, internal medicine, neonatology, neurology, obstetrical practice, ophthalmology, orthopedist, otolaryngology, pathology, pediatrics, physical medicine, plastic surgeon, proctology, psychiatry, radiology, sports medicine, surgery, urology.
 - Describe the following medical and nursing concepts and procedures:
 - Three main types of physical examinations: EENT, GYN, General (complete physical)
 - Main techniques used during physical exams: Observation, Palpation, Percussion & Auscultation.
 - Equipment used in physical exams: cervical spatula (ayer blade), laryngeal mirror, ophthalmoscope, otoscope, percussion (reflex) hammer, sigmoidoscope, speculum, sphygmomanometer, stethoscope, tongue blade/depressor, tuning fork.
 - Procedures:
 - taking height and weight measurements
 - vision screening
 - assisting with minor surgery & suture removal
 - recording electrocardiogram
 - writing and interpreting physician's orders
 - admitting/transferring/discharging a patient
 - interpreting physician's orders,
 - positioning a patient for an exam.
 - post mortem care
 - measuring patient's intake and output
 - List of Positions: supine, prone, lateral, fowler's (all 3 positions), lithotomy, and trendelenburg.

d. Review body systems as needed.

2. Review the skills required to become a certified nursing assistant (CNA) including physical care skills, psychosocial care skills, nurse aide skills, and activities of daily living (ADL) skills. ^{CNA, DOK 2}

Perform required ADL skills:

- i. Wash hands.
- ii. Apply one knee-high, elastic stocking.
- iii. Assist to ambulate using transfer belt.
- iv. Assist with use of bedpan.
- v. Clean upper or lower denture.
- vi. Count and record radial pulse.
- vii. Count and record respirations.
- viii. Donning and removing Personal Protective Equipment (gown and gloves).
- ix. Dress client with affected (weak) right arm.
- x. Feed client who cannot feed self.
- xi. Give modified bed bath (face, one arm, hand, and underarm).
- xii. Make an occupied bed (patient/client does not need assistance to turn).
- xiii. Measure and record blood pressure.
- xiv. Measure and record urinary output.
- xv. Measure and record weight of ambulatory client.
- xvi. Perform passive range of motion (PROM) for one knee and one ankle.
- xvii. Perform PROM for one shoulder.
- xviii. Position on side.
- xix. Provide catheter care for a female patient.
- xx. Provide fingernail care on one hand.
- xxi. Provide foot care on one foot.
- xxii. Provide mouth care.
- xxiii. Provide perineal care (peri-care) for a female patient.
- xxiv. Transfer from bed to wheelchair using transfer belt.

Scenarios

Unit 7

1) Have students work in pairs and demonstrate how to make an occupied bed, with one student playing the role of the patient and the other the health care professional. Have the students switch roles and repeat. The HOSA rubrics and procedures for the Nursing Assisting health professions event can be used for assessment.

Attachments for Scenarios

HOSA – Nursing Assisting Rubrics and Procedures:

<http://www.hosa.org/natorg/sectb/cat-ii/na.pdf>

Mississippi Board of Nursing:

<http://www.msbn.ms.gov/Pages/Home.aspx>

Unit 6: Therapeutic Services

Dietetics, Respiratory Therapy, and Mental Health

Competencies and Suggested Objectives	
1. Explore the field of nutrition and dietetic services. ^{DOK 1}	<ol style="list-style-type: none">a. Identify nutrition and dietetic careers and describe their respective educational requirements, including licensure/certification, and job responsibilities to include the following: registered dietitian, registered dietetic technician, certified dietary manager, nutritionist, and dietetic aide.b. Discuss basic nutrition requirements.c. Describe basic therapeutic diets, their nutritional requirements, and examples of medical conditions for which these diets are prescribed.d. Describe the following basic concepts and procedures: positioning a patient for eating, completing a menu requisition, calculating daily caloric intake, and determining body mass index (BMI).e. Review associated body systems as needed.
2. Explore the field of respiratory care. ^{DOK 1}	<ol style="list-style-type: none">a. Identify the following respiratory careers and describe their respective educational requirements, including licensure/certification, and job responsibilities: certified respiratory therapist, registered respiratory therapist, and pulmonary function technologist.b. Describe the following basic respiratory tests, concepts and procedures: electrocardiogram, pulmonary function tests, oxygen saturation, arterial blood gases, oxygen therapy, incentive spirometry, medicated aerosol therapy, and hyperinflation therapy.c. Review body systems as needed.
3. Explore the field of mental health services. ^{DOK 1}	<ol style="list-style-type: none">a. Identify the following mental health careers and describe their respective educational requirements, including licensure/certification, and job responsibilities: psychiatrist, psychologist, counselor, social worker, mental health technician, and mental health aide.b. Describe the following basic mental health concepts procedures: therapeutic communication, physical restraints, chemical restraints, reality orientation, behavior, psychosis, psychoneurosis, phobia, bipolar, suicide prevention, and forms of therapy.c. Review body systems as needed.

Scenarios

Unit 6

- 1) Assign students a patient, providing them with details about the patient's condition and history. Have the student plan a one-week menu for that patient based on their caloric needs and any prescribed diets or dietary limitations.
- 2) Have the students determine the total number of calories they need each day. Students who are overweight should determine how many fewer calories they need to consume each week in order to lose 1-2 pounds per week. Students who are underweight should determine how many more calories they need to consume each week in order to gain 1-2 pounds per week. Next, have students determine the type and duration of exercise they do each week and how many calories are burned during each activity. Have students adjust their calculated caloric intake goals to account for the number of calories they burn through exercise. Finally, have students keep a food and exercise journal (for a predetermined amount of time) to see how closely they adhere to their calculations.
- 3) Create patient scenarios describing the weight, health, dietary restrictions, activity level, and desired outcomes and distribute scenarios to the students. Have the students prescribe a diet and/or fitness plan for their patients to help them reach the desired results. (Alternative option: Allow the students to determine the desired results as well as prescribe the diet/fitness plan for their assigned patient scenarios based on the other information.)
- 4) Working in groups, students will complete research to determine services and support available to assist those with mental health issues, including the cost to the recipient of services. Each group should then compile and format the information in a brochure or other form of collateral that can be distributed to homeless shelters, local health facilities, or offices where care may be provided.

Attachments for Scenarios

None

Unit 7: Pharmacological and Diagnostic Services

Pharmacological, Medical Imaging, and Laboratory Services

Competencies and Suggested Objectives

1. Explore the field of pharmacological services. ^{DOK 1}
 - a. Identify the following pharmacological careers and describe their respective educational requirements, including licensure/certification, and job responsibilities: pharmacist and pharmacy technician.
 - b. Describe pharmacological concepts and procedures: reviewing prescriptions and medical orders, using a drug reference, components of prescriptions, filling prescriptions, patient teaching, drug administration methods, and common drug classifications with their actions.

Drug Administration Methods:

- buccal
- inhalation
- internal
- inunction (topically)
- oral
- parenteral
- sublingual

Drug Classifications:

- analgesic
 - anesthetic
 - antacid and acid reducer
 - antibiotic
 - anticholinergic
 - anticoagulant
 - anticonvulsive
 - antidepressant
 - antidiarrheal
 - antiemetic
 - antihistamine
 - antihypertensive
 - anti-inflammatory agent
 - antineoplastic agent
 - antipyretic
 - antitussive
 - bronchodilator
 - central nervous system depressant
 - central nervous system stimulant
 - coagulant
 - decongestant
 - desensitization agent
 - diuretic
 - emetic
 - hormones and hypoglycemic
 - hypnotic
 - laxative
 - sedative
 - sulfonamide
 - vaccines and immunizations
 - vasodilator
 - vitamins and minerals
- c. Apply mathematical computations related to health care procedures: convert metric measurements, convert household measurements, perform drug dosage calculations, analyze diagrams, charts, graphs, and tables to interpret health care results, record time using the 24-hour clock.

d. Review body systems as needed.
2. Explore the field of medical imaging services. ^{DOK 1} a. Identify the following medical imaging careers and describe their respective educational requirements, including licensure/certification, and job responsibilities: diagnostic radiologist, radiologic technologist, nuclear medicine technologist, radiation therapist, cardiovascular technologist, mammographer, sonographer, computed tomography technologist, and magnetic resonance technologist. b. Describe the following medical imaging concepts and procedures: angiography, echocardiography, fluoroscopy, magnetic resonance imagery, mammography, nuclear medicine, radiography, sonography, tomography, and x-ray. c. Demonstrate basic radiological positioning: posterior-anterior, anterior-posterior, lateral and oblique. d. Review associated body systems as needed.
3. Explore the field of medical laboratory services. ^{DOK 1} a. Identify the following laboratory careers and describe their respective educational requirements, including licensure/certification, and job responsibilities: pathologist, medical laboratory scientist, medical laboratory technician, medical laboratory assistant, cytotechnologist, histotechnologist, histotechnician, and phlebotomy technician. b. Describe the following basic medical laboratory concepts and diagnostic tests and their respective normal values: hematocrit, hemoglobin, white blood cell count, sodium, potassium, creatinine, low density lipoprotein, high density lipoprotein, and glucose. c. Describe methods of collecting specimens of blood, emesis, sputum, stool, and urine. d. Review associated body systems as needed.

Scenarios

Unit 5

1) Divide the class into groups of four to five students. Provide examples of lab slips to each group. Assign each group a specific test, or series of tests, and have them create lab slips with all of the correct information. Exchange the slips with other groups for evaluation.

2) Divide the students into pairs. Have the pairs of students role-play a pharmacist/pharmacy technician and a client. The client is given a diagnosis and a drug has been prescribed for the diagnosis. Have the pharmacist/pharmacy technician provide education about the drug to the client. Have the client ask pertinent questions.

Attachments for Scenarios

None

Unit 8: Information Technology and Health Informatics

Competencies and Suggested Objectives	
1. Describe basic health information concepts and literacy skills. ^{DOK 1, HCFS 11}	<ol style="list-style-type: none">a. Identify methods and types of data collected in health care.b. Use health record data collection tools (e.g., input screens, document templates).c. Differentiate between the types and content of health records (e.g., patient, pharmacy, and laboratory).d. Ensure that documentation in the health record reflects timeliness, completeness, and accuracy.e. Adhere to information systems policies and procedures as required by national, state, local, and organizational levels.
2. Discuss concepts related to privacy and confidentiality of health information. ^{DOK 1, HCFS 11}	<ol style="list-style-type: none">a. Apply privacy and confidentiality policies and procedures.b. Identify legal and regulatory requirements related to the use of personal health information.c. Identify and apply policies and procedures for access and disclosure of personal health information.d. Describe the consequences of inappropriate use of health data in terms of disciplinary action.e. Describe appropriate methods to correct inaccurate information/errors personally entered into an electronic medical record (EMR).
3. Explore the field of health informatics. ^{DOK 1}	<ol style="list-style-type: none">a. Identify the following health informatics careers and describe their respective educational requirements, including licensure/certification, and job responsibilities: health care receptionist, health information technician, health information coder/medical coder, medical transcriptionist, administrative medical assistant, medical office manager, and medical billing.b. Describe health informatics concepts and procedures: completing insurance forms, assembling a client record, diagnostic coding, procedural coding, proper telephone techniques, and office management.

Scenarios

Unit 8

- 1) Have the students acting as the information technology director of any kind of health care facility, and compose an acceptable use policy for the employees to sign to indicate their commitment to the safe, effective, and ethical use of the technologies in the facility.
- 2) Have the students role play proper telephone techniques. The teacher (or another student) will play the role of the caller and will be given a scenario to act out such as needing to make an appointment, refill a prescription, or to speak to a nurse. The answering student will implement proper telephone etiquette and protocol and will be assessed using the HOSA telephone techniques rubric in the medical assisting procedure event.

Attachments for Scenarios

The HOSA Job Seeking Skills Rubrics and Procedures can be found here:

<http://www.hosa.org>

Student Competency Profile

Student's Name: _____

This record is intended to serve as a method of noting student achievement of the competencies in each unit. It can be duplicated for each student, and it can serve as a cumulative record of competencies achieved in the course.

In the blank before each competency, place the date on which the student mastered the competency.

Unit 1: Course Orientation, Safety Review, Clinical Policies, and Employability		
	1.	Describe the purpose of the course, review safety skills, and explain clinical policies.
	2.	Identify the personal traits of the health care professional.
	3.	Demonstrate basic employability skills.
	4.	Recognize and the components for career decision-making.
Unit 2: Emergency Services and Technical Skills		
	1.	Describe the field of emergency services.
	2.	Demonstrate procedures for measuring and recording vital signs, including normal ranges.
	3.	Perform skills obtained in training or certification for Basic Life Support for Health Care Providers.
	4.	Demonstrate the necessary skills to provide first aid treatment.
Unit 3: Human Growth and Development		
	1.	Discuss the stages of growth and development across the lifespan.
	2.	Explain the concepts related to death and dying.
Unit 4: Rehabilitative Services		
	1.	Explore the field of sports medicine.
	2.	Explore the field of rehabilitative services.
Unit 5: Pharmacological and Diagnostic Services		
	1.	Explore the field of pharmacological services.
	2.	Explore the field of medical imaging services.
	3.	Explore the field of medical laboratory services.
Unit 6: Therapeutic Services		
	1.	Explore the field of nutrition and dietetic services.
	2.	Explore the field of respiratory care.
	3.	Explore the field of mental health services.

Unit 7: Medical and Nursing Services		
	1.	Explore the field of medical and nursing services.
	2.	Review the skills required to become a certified nursing assistant (CNA) including physical care skills, psychosocial care skills, nurse aide skills, and activities of daily living (ADL) skills.
Unit 8: Information Technology and Health Informatics		
	1.	Describe basic health information concepts and literacy skills.
	2.	Discuss concepts related to privacy and confidentiality of health information.
	3.	Explore the field of health informatics.

Appendix A: Unit References

All of the Healthcare and Clinical Services units use the same resources. Suggested resources are listed below.

Badasch, S., Chesebro, D. (2008). *Health science fundamentals: Exploring career pathways* (7th ed.). Upper Saddle River, NY: Prentice Hall.

Booth, K.A. (2004). *Health care science technology: Career foundations*. New York, NY: Glencoe/McGraw Hill.

DCM Instructional Systems (2013). Dean Vaughn Total Retention System™ series of educational programs for Healthcare. Retrieved from: <https://www.dcminstructionalsystems.com>

Ehrlich, A., Schroeder, C. L. (2009). *Introduction to Medical Terminology* (2nd ed). Clifton Park, NY: Delmar Cengage Learning.

Gerdin, J. (2011). *Health careers today* (5th ed.). St. Louis, MO: Mosby Elsevier.

Health Sciences Instructional Supplements (n.d.). National Consortium for Health Science Education. Retrieved from www.healthscienceconsortium.org

National Governors Association Center for Best Practices, Council of Chief State School Officers (2010). Common core state standards initiative. Retrieved from: <http://www.corestandards.org>

National Educational Technology Standards for Students: Connecting Curriculum and Technology (2007). Advancing digital age teaching. Retrieved from: <http://www.iste.org/standards/nets-for-teachers>

Partnership for 21st Century Skills (2010). 21st century skills standards. Retrieved from: <http://www.p21.org>

Practice Fusion, Inc. (2013). The largest physician-patient platform. Retrieved from: <http://practicefusion.com>

Simmers, L., Simmers-Nartker, K., & Simmers-Kobelak, S. (2009). *Diversified health occupations* (7th ed.). Clifton Park, NY: Delmar Cengage.

Scott, A. S., Fong, E. (2008). *Body structures and functions* (12th ed.). Clifton Park, NY: Cengage Learning.

Appendix B: Certified Nursing Assistant (CNA) Skills

Crosswalk for Healthcare and Clinical Services									
		Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8
a. i.				X					
a. ii.			X	X	X			X	
a. iii.									
b. i.		X				X			
b. ii.						X			X
c.				X					
d. i.									
d. ii.									
d. iii.					X				X
d. iv.									
d. v.									
d.vi.								X	
d. vii.								X	
d. viii.									
d. ix.									
d. x.									
d. xi.									X
d. xii.									X
d. xiii.								X	
d. xiv.									
d. xv.								X	
d. xvi.				X					
d. xvii.				X					
d. xviii.									
d. xix.									X
d. xx.									
d. xxi.									
d. xxii.									
d. xxiii.									
d. xxiv.									X

The following are skills required to become a certified nursing assistant (CNA).^{DOK 2}

- a. Explain the following categories of physical care skills:
 - i. Activities of daily living (ADL): hygiene, dressing and grooming, nutrition and hydration, elimination, and rest/sleep/comfort.

- ii. Basic nursing: infection control, safety/emergency procedures, therapeutic/technical procedures, data collection and reporting.
- iii. Restorative: injury prevention and self-care/independence.
- b. Identify and explain the following categories of psychosocial care skills:
 - i. Emotional and mental health needs.
 - ii. Spiritual and cultural needs.
- c. Describe the role of the nurse aide as it relates to communication, client rights, legal and ethical behavior, and as a member of the health care team.
- d. Perform required ADL skills:
 - i. Wash hands.
 - ii. Apply one knee-high, elastic stocking.
 - iii. Assist to ambulate using transfer belt.
 - iv. Assist with use of bedpan.
 - v. Clean upper or lower denture.
 - vi. Count and record radial pulse.
 - vii. Count and record respirations.
 - viii. Donning and removing Personal Protective Equipment (gown and gloves).
 - ix. Dress client with affected (weak) right arm.
 - x. Feed client who cannot feed self.
 - xi. Give modified bed bath (face, one arm, hand, and underarm).
 - xii. Make an occupied bed (patient/client does not need assistance to turn).
 - xiii. Measure and record blood pressure.
 - xiv. Measure and record urinary output.
 - xv. Measure and record weight of ambulatory client.
 - xvi. Perform passive range of motion (PROM) for one knee and one ankle.
 - xvii. Perform PROM for one shoulder.
 - xviii. Position on side.
 - xix. Provide catheter care for a female patient.
 - xx. Provide fingernail care on one hand.
 - xxi. Provide foot care on one foot.
 - xxii. Provide mouth care.
 - xxiii. Provide perineal care (peri-care) for a female patient.
 - xxiv. Transfer from bed to wheelchair using transfer belt.

Appendix C: Industry Standards

National Healthcare Foundation Standards

Crosswalk for Healthcare and Clinical Services									
		Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8
NHFS 1.1				X	X	X	X	X	
NHFS 1.2				X	X	X	X	X	
NHFS 1.3			X	X	X	X	X	X	X
NHFS 2.1		X	X	X	X	X	X	X	X
NHFS 2.2		X	X	X	X	X	X	X	X
NHFS 2.3		X	X	X	X	X	X	X	X
NHFS 3.1		X	X						X
NHFS 4.1		X							
NHFS 4.2		X							
NHFS 4.3		X							
NHFS 4.4		X							
NHFS 5.1									X
NHFS 5.2									X
NHFS 6.1		X							
NHFS 6.2		X							
NHFS 7.1		X							
NHFS 7.2		X							
NHFS 7.3		X							
NHFS 7.4		X							
NHFS 7.5		X							
NHFS 8.1		X	X	X	X	X	X	X	X
NHFS 8.2		X	X	X	X	X	X	X	X
NHFS 9.1					X	X	X	X	X
NHFS 10.1									X
NHFS 11.1									X
NHFS 11.2									X
NHFS 11.3									X

Foundation Standard 1: Academic Foundation

Health care professionals will know the academic subject matter required for proficiency within their area. They will use this knowledge as needed in their role. The following accountability criteria are considered essential for students in a health science program of study.

Accountability Criteria

1.1 Human Structure and Function

- 1.11 Classify the basic structural and functional organization of the human body (tissue, organ, and system).
- 1.12 Recognize body planes, directional terms, quadrants, and cavities.
- 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).
- 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 health care procedures (metric and household, conversions and measurements).
- 1.32 Analyze diagrams, charts, graphs, and tables to interpret health care results.
- 1.33 Record time using the 24-hour clock.

Foundation Standard 2: Communications

Health care professionals will know the various methods of giving and obtaining information. They will communicate effectively, both orally and in writing.

Accountability Criteria

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.
- 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.
- 2.22 Use medical abbreviations to communicate information.

2.3 Written Communication Skills

- 2.31 Recognize elements of written and electronic communication (spelling, grammar, and formatting).

Foundation Standard 3: Systems

Health care professionals will understand how their role fits into their department, their organization and the overall health care environment. They will identify how key systems affect services they perform and quality of care.

Accountability Criteria

3.1 Health Care Delivery Systems

- 3.11 Understand the health care delivery system (public, private, government, and non-profit).
- 3.12 Explain the factors influencing health care delivery systems.
- 3.13 Describe the responsibilities of consumers within the health care system.
- 3.14 Explain the impact of emerging issues such as technology, epidemiology, bioethics, and socioeconomics on health care delivery systems.
- 3.15 Discuss common methods of payment for health care.

Foundation Standard 4: Employability Skills

Health care professionals will understand how employability skills enhance their employment opportunities and job satisfaction. They will demonstrate key employability skills and will maintain and upgrade skills, as needed.

Accountability Criteria

4.1 Personal Traits of the Health Care Professional

- 4.11 Classify the personal traits and attitudes desirable in a member of the health care 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 health care.

4.3 Career Decision-making

- 4.31 Discuss levels of education, credentialing requirements, and employment trends in health care.
- 4.32 Compare careers within the health science career pathways (diagnostic services, therapeutic services, health informatics, support services, or biotechnology research and development).

4.4 Employability Preparation

- 4.41 Develop components of a personal portfolio
- 4.42 Demonstrate the process for obtaining employment

Foundation Standard 5: Legal Responsibilities

Health care professionals will understand the legal responsibilities, limitations, and implications of their actions within the health care delivery setting. They will perform their duties according to regulations, policies, laws and legislated rights of clients.

Accountability Criteria

5.1 Legal Implications

- 5.11 Analyze legal responsibilities.
- 5.12 Apply procedures for accurate documentation and record keeping.

5.2 Legal Practices

- 5.21 Apply standards for Health Insurance Portability and Accountability Act (HIPAA).
- 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.

Foundation Standard 6: Ethics

Health care professionals will understand accepted ethical practices with respect to cultural, social, and ethnic differences within the health care environment. They will perform quality health care delivery.

Accountability Criteria

6.1 Ethical Boundaries

- 6.11 Differentiate between ethical and legal issues impacting health care.

6.12 Recognize ethical issues and their implications related to health care.

6.2 Ethical Practice

6.21 Apply procedures for reporting activities and behaviors that affect the health, safety, and welfare of others.

6.3 Cultural, Social, and Ethnic Diversity

6.31 Understand religious and cultural values as they impact health care.

6.32 Demonstrate respectful and empathetic treatment of ALL patients/clients (customer service).

Foundation Standard 7: Safety Practices

Health care professionals will understand the existing and potential hazards to clients, co-workers, and self. They will prevent injury or illness through safe work practices and follow health and safety policies and procedures.

Accountability Criteria

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 Occupational Safety and Health Administration (OSHA) and Centers for Disease Control (CDC) regulations.

7.22 Apply principles of body mechanics.

7.3 Environmental Safety

7.31 Apply safety techniques in the work environment.

7.4 Common Safety Hazards

7.41 Comply with safety signs, symbols, and labels.

7.42 Understand implications of hazardous materials.

7.5 Emergency Procedures and Protocols

7.51 Practice fire safety in a health care setting.

7.52 Apply principles of basic emergency response in natural disasters and other emergencies.

Foundation Standard 8: Teamwork

Health care professionals will understand the roles and responsibilities of individual members as part of the health care team, including their ability to promote the delivery of quality health care. They will interact effectively and sensitively with all members of the health care team.

Accountability Criteria

8.1 Health Care 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.

Foundation Standard 9: Health Maintenance Practices

Health care professionals will understand the fundamentals of wellness and the prevention of disease processes. They will practice preventive health behaviors among the clients.

Accountability Criteria

9.1 Healthy Behaviors

- 9.11 Apply behaviors that promote health and wellness.
- 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.

Foundation Standard 10: Technical Skills

Health care professionals will apply technical skills required for all career specialties. They will demonstrate skills and knowledge as appropriate.

Accountability Criteria

10.1 Technical Skills

- 10.11 Apply procedures for measuring and recording vital signs including the normal ranges.
- 10.12 Apply skills to obtain training or certification in cardiopulmonary resuscitation (CPR), automated external defibrillator (AED), foreign body airway obstruction (FBAO) and first aid.

Foundation Standard 11: Information Technology Applications

Health care professionals will use information technology applications required within all career specialties. They will demonstrate use as appropriate to health care applications.

Accountability Criteria

11.1 Health Information Literacy and Skills

- 11.11 Identify methods and types of data collected in health care.
- 11.12 Use health record data collection tools (such as input screens, document templates).
- 11.13 Differentiate between types and content of health records (patient, pharmacy, and laboratory).
- 11.14 Ensure that documentation in the health record reflects timeliness, completeness, and accuracy.
- 11.15 Adhere to information systems policies and procedures as required by national, state, local, and organizational levels.

11.2 Privacy and Confidentiality of Health Information

- 11.21 Apply the fundamentals of privacy and confidentiality policies and procedures.
- 11.22 Identify legal and regulatory requirements related to the use of personal health information.
- 11.23 Identify and apply policies and procedures for access and disclosure of personal health information.
- 11.24 Describe the consequences of inappropriate use of health data in terms of disciplinary action.

11.25 Describe appropriate methods to correct inaccurate information/errors personally entered into an electronic medical record (EMR).

11.3 Basic Computer Literacy Skills

11.31 Apply basic computer concepts and terminology in order to use computers and other mobile devices.

11.32 Demonstrate basic computer operating procedures.

11.33 Demonstrate use of file organization and information storage.

11.34 Use basic word processing, spreadsheet, and database applications.

11.35 Evaluate the validity of web-based resources.

11.36 Demonstrate use of appropriate email and social media usage.

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at http://www.healthscienceconsortium.org/healthcare_standards.php.

Appendix D: 21st Century Skills¹

21 st Century Crosswalk for Healthcare and Clinical Services									
		Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8
CS1		X							
CS2		X							
CS3									
CS4		X	X	X	X	X	X	X	X
CS5		X							
CS6									
CS7									
CS8									X
CS9									X
CS10									
CS11									X
CS12		X							
CS13		X							
CS14		X							
CS15		X							
CS16		X							

CSS1-21st Century Themes

CS1 Global Awareness

1. Using 21st century skills to understand and address global issues
2. Learning from and working collaboratively with individuals representing diverse cultures, religions, and lifestyles in a spirit of mutual respect and open dialogue in personal, work, and community contexts
3. Understanding other nations and cultures, including the use of non-English languages

CS2 Financial, Economic, Business, and Entrepreneurial Literacy

1. Knowing how to make appropriate personal economic choices
2. Understanding the role of the economy in society
3. Using entrepreneurial skills to enhance workplace productivity and career options

CS3 Civic Literacy

1. Participating effectively in civic life through knowing how to stay informed and understanding governmental processes
2. Exercising the rights and obligations of citizenship at local, state, national, and global levels
3. Understanding the local and global implications of civic decisions

CS4 Health Literacy

1. Obtaining, interpreting, and understanding basic health information and services and using such information and services in ways that enhance health

¹ *21st century skills*. (n.d.). Washington, DC: Partnership for 21st Century Skills.

2. Understanding preventive physical and mental health measures, including proper diet, nutrition, exercise, risk avoidance, and stress reduction
3. Using available information to make appropriate health-related decisions
4. Establishing and monitoring personal and family health goals
5. Understanding national and international public health and safety issues

CS5 Environmental Literacy

1. Demonstrate knowledge and understanding of the environment and the circumstances and conditions affecting it, particularly as relates to air, climate, land, food, energy, water, and ecosystems.
2. Demonstrate knowledge and understanding of society's impact on the natural world (e.g., population growth, population development, resource consumption rate).
3. Investigate and analyze environmental issues, and make accurate conclusions about effective solutions.
4. Take individual and collective action toward addressing environmental challenges (e.g., participating in global actions, designing solutions that inspire action on environmental issues).

CSS2-Learning and Innovation Skills

CS6 Creativity and Innovation

1. Think Creatively
2. Work Creatively with Others
3. Implement Innovations

CS7 Critical Thinking and Problem Solving

1. Reason Effectively
2. Use Systems Thinking
3. Make Judgments and Decisions
4. Solve Problems

CS8 Communication and Collaboration

1. Communicate Clearly
2. Collaborate with Others

CSS3-Information, Media and Technology Skills

CS9 Information Literacy

1. Access and Evaluate Information
2. Use and Manage Information

CS10 Media Literacy

1. Analyze Media
2. Create Media Products

CS11 ICT Literacy

1. Apply Technology Effectively

CSS4-Life and Career Skills

CS12 Flexibility and Adaptability

1. Adapt to change
2. Be Flexible

CS13 Initiative and Self-Direction

1. Manage Goals and Time
2. Work Independently
3. Be Self-directed Learners

CS14 Social and Cross-Cultural Skills

1. Interact Effectively with others
2. Work Effectively in Diverse Teams

CS15 Productivity and Accountability

1. Manage Projects
2. Produce Results

CS16 Leadership and Responsibility

1. Guide and Lead Others
2. Be Responsible to Others

Appendix E: Common Core Standards

	Units	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8
Common Core Standards									
RL.11.1.									
RL.11.2.									
RL.11.3.									
RL.11.4.									
RL.11.5.									
RL.11.6.									
RL.11.7.									
RL.11.8.									
RL.11.9.									
RL.11.10.									
RI.11.1.									
RI.11.2.									
RI.11.3.									
RI.11.4.									
RI.11.5.									
RI.11.6.									
RI.11.7.									
RI.11.8.									
RI.11.9.									
RI.11.10.									
W.11.1.									
W.11.2.									
W.11.3.									
W.11.4.									
W.11.5.									
W.11.6.									
W.11.7.									X
W.11.8.									X
W.11.9.									
W.11.10.									
SL.11.1.									X
SL.11.2.									
SL.11.3.									
SL.11.4.									
SL.11.5.									
SL.11.6.									
L.11.1.		X							X
L.11.2.									
L.11.3.		X							X
L.11.4.									
L.11.5.									
L.11.6.									
RH.11.1.									
RH.11.2.									
RH.11.3.									
RH.11.4.									
RH.11.5.									
RH.11.6.									
RH.11.7.									
RH.11.8.									
RH.11.9.									
RH.11.10.									

RST.11.1.									
RST.11.2.									
RST.11.3.		X					X	X	
RST.11.4.		X					X	X	
RST.11.5.									
RST.11.6.									
RST.11.7.									X
RST.11.8.									X
RST.11.9.									X
RST.11.10.									X
WHST.11.1.									
WHST.11.2.									
WHST.11.3.									
WHST.11.4.									
WHST.11.5.									
WHST.11.6.									
WHST.11.7.									
WHST.11.8.									
WHST.11.9.									
WHST.11.10.									

Reading Standards for Literature (11-12)

College and Career Readiness Anchor Standards for *Reading Literature*

Key Ideas and Details

RL.11.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.

RL.11.2. Determine two or more themes or central ideas of a text and analyze their development over the course of the text, including how they interact and build on one another to produce a complex account; provide an objective summary of the text.

RL.11.3. Analyze the impact of the author’s choices regarding how to develop and relate elements of a story or drama (e.g., where a story is set, how the action is ordered, how the characters are introduced and developed).

Craft and Structure

RL.11.4. Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the impact of specific word choices on meaning and tone, including words with multiple meanings or language that is particularly fresh, engaging, or beautiful. (Include Shakespeare as well as other authors.)

RL.11.5. Analyze how an author’s choices concerning how to structure specific parts of a text (e.g., the choice of where to begin or end a story, the choice to provide a comedic or

tragic resolution) contribute to its overall structure and meaning as well as its aesthetic impact.

RL.11.6. Analyze a case in which grasping point of view requires distinguishing what is directly stated in a text from what is really meant (e.g., satire, sarcasm, irony, or understatement).

Integration of Knowledge and Ideas

RL.11.7. Analyze multiple interpretations of a story, drama, or poem (e.g., recorded or live production of a play or recorded novel or poetry), evaluating how each version interprets the source text. (Include at least one play by Shakespeare and one play by an American dramatist.)

RL.11.8. (Not applicable to literature)

RL.11.9. Demonstrate knowledge of eighteenth-, nineteenth- and early-twentieth-century foundational works of American literature, including how two or more texts from the same period treat similar themes or topics.

Range of Reading and Level of Text Complexity

RL.11.10. By the end of grade 11, read and comprehend literature, including stories, dramas, and poems, in the grades 11–CCR text complexity band proficiently, with scaffolding as needed at the high end of the range.

By the end of grade 12, read and comprehend literature, including stories, dramas, and poems, at the high end of the grades 11–CCR text complexity band independently and proficiently.

Reading Standards for Informational Text (11-12)

College and Career Readiness Anchor Standards for *Informational Text*

Key Ideas and Details

RI.11.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.

RI.11.2. Determine two or more central ideas of a text and analyze their development over the course of the text, including how they interact and build on one another to provide a complex analysis; provide an objective summary of the text.

RI.11.3. Analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop over the course of the text.

Craft and Structure

RI.11.4. Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text (e.g., how Madison defines faction in Federalist No. 10).

RI.11.5. Analyze and evaluate the effectiveness of the structure an author uses in his or her exposition or argument, including whether the structure makes points clear, convincing, and engaging.

RI.11.6. Determine an author's point of view or purpose in a text in which the rhetoric is particularly effective, analyzing how style and content contribute to the power, persuasiveness, or beauty of the text.

Integration of Knowledge and Ideas

RI.11.7. Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.

RI.11.8. Delineate and evaluate the reasoning in seminal U.S. texts, including the application of constitutional principles and use of legal reasoning (e.g., in U.S. Supreme Court majority opinions and dissents) and the premises, purposes, and arguments in works of public advocacy (e.g., The Federalist, presidential addresses).

RI.11.9. Analyze seventeenth-, eighteenth-, and nineteenth-century foundational U.S. documents of historical and literary significance (including the Declaration of Independence, the Preamble to the Constitution, the Bill of Rights, and Lincoln's Second Inaugural Address) for their themes, purposes, and rhetorical features.

Range of Reading and Level of Text Complexity

RI.11.10. By the end of grade 11, read and comprehend literary nonfiction in the grades 11–CCR text complexity band proficiently, with scaffolding as needed at the high end of the range.

By the end of grade 12, read and comprehend literary nonfiction at the high end of the grades 11–CCR text complexity band independently and proficiently.

College and Career Readiness Anchor Standards for *Writing*

Text Types and Purposes

W.11.1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

- a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences claim(s), counterclaims, reasons, and evidence.
- b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience's knowledge level, concerns, values, and possible biases.
- c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.
- d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.
- e. Provide a concluding statement or section that follows from and supports the argument presented.

W.11.2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.

- a. Introduce a topic; organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.
- b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.
- c. Use appropriate and varied transitions and syntax to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.
- d. Use precise language, domain-specific vocabulary, and techniques such as metaphor, simile, and analogy to manage the complexity of the topic.
- e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.

f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic).

W.11.3. Write narratives to develop real or imagined experiences or events using effective techniques, well-chosen details, and well-structured event sequences.

a. Engage and orient the reader by setting out a problem, situation, or observation and its significance, establishing one or multiple point(s) of view, and introducing a narrator and/or characters; create a smooth progression of experiences or events.

b. Use narrative techniques, such as dialogue, pacing, description, reflection, and multiple plot lines, to develop experiences, events, and/or characters

c. Use a variety of techniques to sequence events so that they build on one another to create a coherent whole and build toward a particular tone and outcome (e.g., a sense of mystery, suspense, growth, or resolution).

d. Use precise words and phrases, telling details, and sensory language to convey a vivid picture of the experiences, events, setting, and/or characters.

e. Provide a conclusion that follows from and reflects on what is experienced, observed, or resolved over the course of the narrative.

Production and Distribution of Writing

W.11.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)

W.11.5. 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. (Editing for conventions should demonstrate command of Language standards 1–3 up to and including grades 11–12 on page 54.)

W.11.6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.

Research to Build and Present Knowledge

W.11.7. 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.

W.11.8. 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 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.

W.11.9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

a. Apply grades 11–12 Reading standards to literature (e.g., “Demonstrate knowledge of eighteenth-, nineteenth- and early-twentieth-century foundational works of American literature, including how two or more texts from the same period treat similar themes or topics”).

b. Apply grades 11–12 Reading standards to literary nonfiction (e.g., “Delineate and evaluate the reasoning in seminal U.S. texts, including the application of constitutional principles and use of legal reasoning [e.g., in U.S. Supreme Court Case majority opinions and dissents] and the premises, purposes, and arguments in works of public advocacy [e.g., The Federalist, presidential addresses]”).

Range of Writing

W.11.10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

College and Career Readiness Anchor Standards for *Speaking and Listening*

Comprehension and Collaboration

SL.11.1. Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others’ ideas and expressing their own clearly and persuasively.

a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.

b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.

c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.

d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.

SL.11.2. Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data.

SL.11.3. Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used.

Presentation of Knowledge and Ideas

SL.11.4. Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.

SL.11.5. 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.

SL.11.6. Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate. (See grades 11–12 Language standards 1 and 3 for specific expectations.)

College and Career Readiness Anchor Standards for *Language*

Conventions of Standard English

L.11.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

a. Apply the understanding that usage is a matter of convention, can change over time, and is sometimes contested.

b. Resolve issues of complex or contested usage, consulting references (e.g., Merriam-Webster's Dictionary of English Usage, Garner's Modern American Usage) as needed.

L.11.2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

- a. Observe hyphenation conventions.
- b. Spell correctly.

Knowledge of Language

L.11.3. Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.

- a. Vary syntax for effect, consulting references (e.g., Tufte’s Artful Sentences) for guidance as needed; apply an understanding of syntax to the study of complex texts when reading.

Vocabulary Acquisition and Use

L.11.4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies.

- a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word’s position or function in a sentence) as a clue to the meaning of a word or phrase.
- b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable).
- c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage.
- d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).

L.11.5. Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.

- a. Interpret figures of speech (e.g., hyperbole, paradox) in context and analyze their role in the text.
- b. Analyze nuances in the meaning of words with similar denotations.

L.11.6. Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career

readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Reading Standards for Literacy in History/Social Studies (11-12)

Key Ideas and Details

RH.11.1 Cite specific textual evidence to support analysis of primary and secondary sources, connecting insights gained from specific details to an understanding of the text as a whole.

RH.11.2. Determine the central ideas or information of a primary or secondary source; provide an accurate summary that makes clear the relationships among the key details and ideas

RH.11.3. Evaluate various explanations for actions or events and determine which explanation best accords with textual evidence, acknowledging where the text leaves matters uncertain

Craft and Structure

RH.11.4. Determine the meaning of words and phrases as they are used in a text, including analyzing how an author uses and refines the meaning of a key term over the course of a text (e.g., how Madison defines faction in Federalist No. 10).

RH.11.5. Analyze in detail how a complex primary source is structured, including how key sentences, paragraphs, and larger portions of the text contribute to the whole.

RH.11.6. Evaluate authors' differing points of view on the same historical event or issue by assessing the authors' claims, reasoning, and evidence.

Integration of Knowledge and Ideas

RH.11.7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, as well as in words) in order to address a question or solve a problem.

RH.11.8. Evaluate an author's premises, claims, and evidence by corroborating or challenging them with other information.

RH.11.9. Integrate information from diverse sources, both primary and secondary, into a coherent understanding of an idea or event, noting discrepancies among sources.

Range of Reading and Level of Text Complexity

RH.11.10. By the end of grade 12, read and comprehend history/social studies texts in the grades 11–CCR text complexity band independently and proficiently.

Reading Standards for Literacy in Science and Technical Subjects (11-12)

Key Ideas and Details

RST.11.1. 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.

RST.11.2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

RST.11.3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

Craft and Structure

RST.11.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.

RST.11.5. Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.

RST.11.6. Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.

Integration of Knowledge and Ideas

RST.11.7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

RST.11.8. Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.

RST.11.9. Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

Range of Reading and Level of Text Complexity

RST.11.10. By the end of grade 12, read and comprehend science/technical texts in the grades 11–CCR text complexity band independently and proficiently.

Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects (11-12)

Text Types and Purposes

WHST.11.1. Write arguments focused on discipline-specific content.

- a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.
- b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience’s knowledge level, concerns, values, and possible biases.
- c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.
- d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.
- e. Provide a concluding statement or section that follows from or supports the argument presented.

WHST.11.2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

- a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.

b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.

c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.

d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.

e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).

WHST.11.3. (Not applicable as a separate requirement)

Production and Distribution of Writing

WHST.11.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

WHST.11.5. 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.

WHST.11.6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.

Research to Build and Present Knowledge

WHST.11.7. 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.

WHST.11.8. 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.

WHST.11.9. Draw evidence from informational texts to support analysis, reflection, and research.

Range of Writing

WHST.11.10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

Common Core Crosswalk for Mathematics (11-12)

	Units	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8
Common Core Standards									
N-RN.1.									
N-RN.2.									
N-RN.3.									
N-Q.1.			X						
N-Q.2.			X						
N-Q.3.			X						
N-CN.1.									
N-CN.2.									
N-CN.3.									
N-CN.4.									
N-CN.5.									
N-CN.6.									
N-CN.7.									
N-CN.8.									
N-CN.9.									
N-VM.1.									
N-VM.2.									
N-VM.3.									
N-VM.4.									
N-VM.5.									
N-VM.6.									
N-VM.7.									
N-VM.8.									
N-VM.9.									
N-VM.10.									
N-VM.11.									
N-VM.12.									
A-SSE.1.									
A-SSE.2.									
A-SSE.3.									
A-SSE.4.									
A-APR.1.									
A-APR.2.									
A-APR.3.									
A-APR.4.									
A-APR.5.									
A-APR.6.									
A-APR.7.									
A-CED.1.									
A-CED.2.									
A-CED.3.									
A-CED.4.									
A-REI.1.									
A-REI.2.									
A-REI.3.									
A-REI.4.									
A-REI.5.									
A-REI.6.									
A-REI.7.									
A-REI.8.									
A-REI.9.									
A-REI.10.									
A-REI.11.									
A-REI.12.									
F-IF.1.									
F-IF.2.									
F-BF.3.									

F-BF.4.									
F-LE.1.									
F-LE.2.									
F-LE.3.									
F-LE.4.									
F-LE.5.									
F-TF.1.									
F-TF.2.									
F-TF.3.									
F-TF.4.									
F-TF.5.									
F-TF.6.									
F-TF.7.									
F-TF.8.									
F-TF.9.									
G-CO.1.									
G-CO.2.									
G-CO.3.									
G-CO.4.									
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G-CO.6.									
G-CO.7.									
G-CO.8.									
G-CO.9.									
G-CO.10.									
G-CO.11.									
G-CO.12.									
G-CO.13.									
G-SRT.1.									
G-SRT.2.									
G-SRT.3.									
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G-SRT.6.									
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G-SRT.8.									
G-SRT.9.									
G-SRT.10.									
G-SRT.11.									
G-C.1.									
G-C.2.									
G-C.3.									
G-C.4.									
G-C.5.									
G-GPE.1.									
G-GPE.2.									
G-GPE.3.									
G-GPE.4.									
G-GPE.5.									
G-GPE.6.									
G-GPE.7.									
G-GMD.1.									
G-GMD.2.									
G-GMD.3.									
G-GMD.4.									
G-MG.1.									
G-MG.2.									
G-MG.3.									
S-ID.1.									
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S-IC.6.									
S-CP.1.									
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Mathematics (High School)

Number and Quantity

The Real Number System

N-RN.1. Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents.

N-RN.2. Rewrite expressions involving radicals and rational exponents using the properties of exponents.

N-RN.3. Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.

Quantities

N-Q.1. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

N-Q.2. Define appropriate quantities for the purpose of descriptive modeling.

N-Q.3. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

The Complex Number System

N-CN.1. Know there is a complex number i such that $i^2 = -1$, and every complex number has the form $a + bi$ with a and b real.

N-CN.2. Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.

N-CN.3. (+) Find the conjugate of a complex number; use conjugates to find moduli and quotients of complex numbers.

N-CN.4. (+) Represent complex numbers on the complex plane in rectangular and polar form (including real and imaginary numbers), and explain why the rectangular and polar forms of a given complex number represent the same number.

N-CN.5. (+) Represent addition, subtraction, multiplication, and conjugation of complex numbers geometrically on the complex plane; use properties of this representation for computation. For example, $(-1 + \sqrt{3}i)^3 = 8$ because $(-1 + \sqrt{3}i)$ has modulus 2 and argument 120° .

N-CN.6. (+) Calculate the distance between numbers in the complex plane as the modulus of the difference, and the midpoint of a segment as the average of the numbers at its endpoints.

N-CN.7. Solve quadratic equations with real coefficients that have complex solutions.

N-CN.8. (+) Extend polynomial identities to the complex numbers. For example, rewrite $x^2 + 4$ as $(x + 2i)(x - 2i)$.

N-CN.9. (+) Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.

Vector and Matrix Quantities

N-VM.1. (+) Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes (e.g., v , $|v|$, $\|v\|$, v).

N-VM.2. (+) Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point.

N-VM.3. (+) Solve problems involving velocity and other quantities that can be represented by vectors.

N-VM.4. (+) Add and subtract vectors

N-VM.4.a. Add vectors end-to-end, component-wise, and by the parallelogram rule. Understand that the magnitude of a sum of two vectors is typically not the sum of the magnitudes.

N-VM.4.b. Given two vectors in magnitude and direction form, determine the magnitude and direction of their sum.

N-VM.4.c. Understand vector subtraction $v - w$ as $v + (-w)$, where $-w$ is the additive inverse of w , with the same magnitude as w and pointing in the opposite direction. Represent vector subtraction graphically by connecting the tips in the appropriate order, and perform vector subtraction component-wise.

N-VM.5. (+) Multiply a vector by a scalar.

N-VM.5.a. Represent scalar multiplication graphically by scaling vectors and possibly reversing their direction; perform scalar multiplication component-wise, e.g., as $c(v_x, v_y) = (cv_x, cv_y)$.

N-VM.5.b. Compute the magnitude of a scalar multiple cv using $\|cv\| = |c|v\|$. Compute the direction of cv knowing that when $|c|v \neq 0$, the direction of cv is either along v (for $c > 0$) or against v (for $c < 0$).

N-VM.6. (+) Use matrices to represent and manipulate data, e.g., to represent payoffs or incidence relationships in a network.

N-VM.7. (+) Multiply matrices by scalars to produce new matrices, e.g., as when all of the payoffs in a game are doubled.

N-VM.8. (+) Add, subtract, and multiply matrices of appropriate dimensions.

N-VM.9. (+) Understand that, unlike multiplication of numbers, matrix multiplication for square matrices is not a commutative operation, but still satisfies the associative and distributive properties

N-VM.10. (+) Understand that the zero and identity matrices play a role in matrix addition and multiplication similar to the role of 0 and 1 in the real numbers. The determinant of a square matrix is nonzero if and only if the matrix has a multiplicative inverse.

N-VM.11. (+) Multiply a vector (regarded as a matrix with one column) by a matrix of suitable dimensions to produce another vector. Work with matrices as transformations of vectors.

N-VM.12. (+) Work with 2×2 matrices as transformations of the plane, and interpret the absolute value of the determinant in terms of area.

Algebra

Seeing structure in expressions

A-SSE.1. Interpret expressions that represent a quantity in terms of its context.

A-SSE.1.a. Interpret parts of an expression, such as terms, factors, and coefficients.

A-SSE.1.b. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P .

A-SSE.2. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.

A-SSE.3. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.

A-SSE.3.a. Factor a quadratic expression to reveal the zeros of the function it defines.

A-SSE.3.b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.

A-SSE.3.c. Use the properties of exponents to transform expressions for exponential functions.

A-SSE.4. Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. For example, calculate mortgage payments.

Arithmetic with Polynomials and Rational Expressions

A-APR.1. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials

A-APR.2. Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number a , the remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.

A-APR.3. Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.

A-APR.4. Prove polynomial identities and use them to describe numerical relationships.

A-APR.5. (+) Know and apply the Binomial Theorem for the expansion of $(x + y)^n$ in powers of x and y for a positive integer n , where x and y are any numbers, with coefficients determined for example by Pascal's Triangle.

A-APR.6. Rewrite simple rational expressions in different forms; write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$, using inspection, long division, or, for the more complicated examples, a computer algebra system.

A-APR.7. (+) Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.

Creating Equations

A-CED.1. Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.

A-CED.2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

A-CED.3. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.

A-CED.4. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law $V = IR$ to highlight resistance R .

Reasoning with Equations and Inequalities

A-REI.1. Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

A-REI.2. Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.

A-REI.3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

A-REI.4. Solve quadratic equations in one variable.

A-REI.4.a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form.

A-REI.4.b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b .

A-REI.5. Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.

A-REI.6. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.

A-REI.7. Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line $y = -3x$ and the circle $x^2 + y^2 = 3$.

A-REI.8. (+) Represent a system of linear equations as a single matrix equation in a vector variable.

A-REI.9. (+) Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension 3×3 or greater).

A-REI.10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

A-REI.11. Explain why the x -coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.

A-REI.12. Graph the solutions to a linear inequality in two variables as a half plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.

Functions

Interpreting Functions

F-IF.1. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x . The graph of f is the graph of the equation $y = f(x)$.

F-IF.2. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

F-IF.3. Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by $f(0) = f(1) = 1$, $f(n+1) = f(n) + f(n-1)$ for $n \geq 1$.

F-IF.4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.

F-IF.5. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function $h(n)$ gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.

F-IF.6. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.

F-IF.7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.

F-IF.7.a. Graph linear and quadratic functions and show intercepts, maxima, and minima.

F-IF.7.b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.

F-IF.7.c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.

F-IF.7.d. (+) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.

F-IF.7.e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.

F-IF.8. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.

F-IF.8.a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.

F-IF.8.b. Use the properties of exponents to interpret expressions for exponential functions.

F-IF.9. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.

Building Functions

F-BF.1. Write a function that describes a relationship between two quantities.

F-BF.1.a. Determine an explicit expression, a recursive process, or steps for calculation from a context.

F-BF.1.b. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.

F-BF.1.c. (+) Compose functions. For example, if $T(y)$ is the temperature in the atmosphere as a function of height, and $h(t)$ is the height of a weather balloon as a function of time, then $T(h(t))$ is the temperature at the location of the weather balloon as a function of time.

F-BF.2. Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.

F-BF.3. Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.

F-BF.4. Find inverse functions.

F-BF.4.a. Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse.

F-BF.4.b. (+) Verify by composition that one function is the inverse of another.

F-BF.4.c. (+) Read values of an inverse function from a graph or a table, given that the function has an inverse.

F-BF.4.d. (+) Produce an invertible function from a non-invertible function by restricting the domain.

F-BF.5. (+) Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.

Linear, Quadratic, and Exponential Models

F-LE.1. Distinguish between situations that can be modeled with linear functions and with exponential functions.

F-LE.1.a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.

F-LE.1.b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.

F-LE.1.c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another

F-LE.2. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).

F-LE.3. Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.

F-LE.4. For exponential models, express as a logarithm the solution to $ab^ct = d$ where a , c , and d are numbers and the base b is 2, 10, or e ; evaluate the logarithm using technology.

F-LE.5. Interpret the parameters in a linear or exponential function in terms of a context.

Trigonometric Functions

F-TF.1. Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.

F-TF.2. Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.

F-TF.3. (+) Use special triangles to determine geometrically the values of sine, cosine, tangent for $\pi/3$, $\pi/4$ and $\pi/6$, and use the unit circle to express the values of sine, cosine, and tangent for $\pi-x$, $\pi+x$, and $2\pi-x$ in terms of their values for x , where x is any real number.

F-TF.4. (+) Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions.

F-TF.5. Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.

F-TF.6. (+) Understand that restricting a trigonometric function to a domain on which it is always increasing or always decreasing allows its inverse to be constructed.

F-TF.7. (+) Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context.

F-TF.8. Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to find $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ given $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ and the quadrant of the angle.

F-TF.9. (+) Prove the addition and subtraction formulas for sine, cosine, and tangent and use them to solve problems.

Geometry

Congruence

G-CO.1. Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.

G-CO.2. Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).

G-CO.3. Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.

G-CO.4. Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.

G-CO.5. Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.

G-CO.6. Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.

G-CO.7. Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.

G-CO.8. Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.

G-CO.9. Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.

G-CO.10. Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180° ; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.

G-CO.11. Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.

G-CO.12. Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, or dynamic geometric software). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.

G-CO.13. Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.

Similarity, Right Triangles, and Trigonometry

G-SRT.1. Verify experimentally the properties of dilations given by a center and a scale factor:

G-SRT.1.a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.

G-SRT.1.b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.

G-SRT.2. Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.

G-SRT.3. Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.

G-SRT.4. Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.

G-SRT.5. Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.

G-SRT.6. Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.

G-SRT.7. Explain and use the relationship between the sine and cosine of complementary angles.

G-SRT.8. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

G-SRT.9. (+) Derive the formula $A = \frac{1}{2} ab \sin(C)$ for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.

G-SRT.10. (+) Prove the Laws of Sines and Cosines and use them to solve problems.

G-SRT.11. (+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).

Circles

G-C.1. Prove that all circles are similar.

G-C.2. Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.

G-C.3. Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.

G-C.4. (+) Construct a tangent line from a point outside a given circle to the circle.

G-C.5. Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.

Expressing Geometric Properties with Equations

G-GPE.1. Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.

G-GPE.2. Derive the equation of a parabola given a focus and directrix.

G-GPE.3. (+) Derive the equations of ellipses and hyperbolas given the foci, using the fact that the sum or difference of distances from the foci is constant.

G-GPE.4. Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point $(1, \sqrt{3})$ lies on the circle centered at the origin and containing the point $(0, 2)$.

G-GPE.5. Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).

G-GPE.6. Find the point on a directed line segment between two given points that partitions the segment in a given ratio.

G-GPE.7. Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.

Geometric Measurement and Dimension

G-GMD.1. Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.

G-GMD.2. (+) Give an informal argument using Cavalieri's principle for the formulas for the volume of a sphere and other solid figures.

G-GMD.3. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.

G-GMD.4. Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.

Modeling with Geometry

G-MG.1. Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).

G-MG.2. Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).

G-MG.3. Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).

Statistics and Probability

Interpreting Categorical and Quantitative Data

S-ID.1. Represent data with plots on the real number line (dot plots, histograms, and box plots).

S-ID.2. Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.

S-ID.3. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).

S-ID.4. Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate.

Use calculators, spreadsheets, and tables to estimate areas under the normal curve.

S-ID.5. Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.

S-ID.6. Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.

S-ID.6.a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.

S-ID.6.b. Informally assess the fit of a function by plotting and analyzing residuals.

S-ID.6.c. Fit a linear function for a scatter plot that suggests a linear association.

S-ID.7. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.

S-ID.8. Compute (using technology) and interpret the correlation coefficient of a linear fit.

S-ID.9. Distinguish between correlation and causation.

Making Inferences and Justifying Conclusions

S-IC.1. Understand statistics as a process for making inferences about population parameters based on a random sample from that population.

S-IC.2. Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?

S-IC.3. Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.

S-IC.4. Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.

S-IC.5. Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.

S-IC.6. Evaluate reports based on data.

Conditional Probability and the Rules of Probability

S-CP.1. Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events (“or,” “and,” “not”).

S-CP.2. Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.

S-CP.3. Understand the conditional probability of A given B as $P(A \text{ and } B)/P(B)$, and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.

S-CP.4. Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. For example, collect data from a random sample of students in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.

S-CP.5. Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.

S-CP.6. Find the conditional probability of A given B as the fraction of B’s outcomes that also belong to A, and interpret the answer in terms of the model.

S-CP.7. Apply the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, and interpret the answer in terms of the model.

S-CP.8. (+) Apply the general Multiplication Rule in a uniform probability model, $P(A \text{ and } B) = P(A)P(B|A) = P(B)P(A|B)$, and interpret the answer in terms of the model.

S-CP.9. (+) Use permutations and combinations to compute probabilities of compound events and solve problems.

Using Probability to Make Decisions

S-MD.1. (+) Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space; graph the corresponding probability distribution using the same graphical displays as for data distributions.

S-MD.2. (+) Calculate the expected value of a random variable; interpret it as the mean of the probability distribution.

S-MD.3. (+) Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value. For example, find the theoretical probability distribution for the number of correct answers obtained by guessing on all five questions of a multiple-choice test where each question has four choices, and find the expected grade under various grading schemes.

S-MD.4. (+) Develop a probability distribution for a random variable defined for a sample space in which probabilities are assigned empirically; find the expected value. For example, find a current data distribution on the number of TV sets per household in the United States, and calculate the expected number of sets per household. How many TV sets would you expect to find in 100 randomly selected households?

S-MD.5. (+) Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values.

S-MD.5.a. Find the expected payoff for a game of chance. For example, find the expected winnings from a state lottery ticket or a game at a fast-food restaurant.

S-MD.5.b. Evaluate and compare strategies on the basis of expected values. For example, compare a high-deductible versus a low-deductible automobile insurance policy using various, but reasonable, chances of having a minor or a major accident.

S-MD.6. (+) Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).

S-MD.7. (+) Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).

Appendix F: National Educational Technology Standards for Students (NETS-S)

NETS Crosswalk for Healthcare and Clinical Services									
		Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8
NETS Standards									
T1									
T2		X	X						X
T3									X
T4									X
T5									X
T6									X

- T1** Creativity and Innovation
- T2** Communication and Collaboration
- T3** Research and Information Fluency
- T4** Critical Thinking, Problem Solving, and Decision Making
- T5** Digital Citizenship
- T6** Technology Operations and Concepts

T1 Creativity and Innovation

Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology. Students do the following:

- a. Apply existing knowledge to generate new ideas, products, or processes.
- b. Create original works as a means of personal or group expression.
- c. Use models and simulations to explore complex systems and issues.
- d. Identify trends and forecast possibilities.

T2 Communication and Collaboration

Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others. Students do the following:

- a. Interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media.
- b. Communicate information and ideas effectively to multiple audiences using a variety of media and formats.
- c. Develop cultural understanding and global awareness by engaging with learners of other cultures.
- d. Contribute to project teams to produce original works or solve problems.

T3 Research and Information Fluency

Students apply digital tools to gather, evaluate, and use information. Students do the following:

- a. Plan strategies to guide inquiry.
- b. Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.
- c. Evaluate and select information sources and digital tools based on the appropriateness to specific tasks.
- d. Process data and report results.

T4 Critical Thinking, Problem Solving, and Decision Making

Students use critical-thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.

Students do the following:

- a. Identify and define authentic problems and significant questions for investigation.
- b. Plan and manage activities to develop a solution or complete a project.
- c. Collect and analyze data to identify solutions and/or make informed decisions.
- d. Use multiple processes and diverse perspectives to explore alternative solutions.

T5 Digital Citizenship

Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior. Students do the following:

- a. Advocate and practice safe, legal, and responsible use of information and technology.
- b. Exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity.
- c. Demonstrate personal responsibility for lifelong learning.
- d. Exhibit leadership for digital citizenship.

T6 Technology Operations and Concepts

Students demonstrate a sound understanding of technology concepts, systems, and operations. Students do the following:

- a. Understand and use technology systems.
- b. Select and use applications effectively and productively.
- c. Troubleshoot systems and applications.
- d. Transfer current knowledge to learning of new technologies.

