Unit 4 - Medicines, Devices, and Technology

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Title Section

Department of Curriculum and Instruction

Belleville Public Schools

Curriculum Guide

Medical Academy Field Experience, 12th Grade

Medicines, Devices, and Technology

Belleville Board of Education

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Unit Overview

Medicines, devices, and technology encompass the medical devices (supplies and equipment), pharmaceuticals, and other health care-specific technology unique to health care delivery. Also important in the delivery system's supply chain are the goods and services typically needed by all industries, including structures such as offices and buildings, information technology tools, paper and other supplies, and consulting and other business services. Such expenditures represent about 20% of the national health expenditure.

Enduring Understanding

Enduring understandings:

Medical devices, medicines, and technology comprise an important and costly sector of the U.S. health care delivery system, which is also important to the general economy.

As noted previously the U.S. pharmaceutical sector alone is about triple the size of China's, its nearest rival

and both the pharmaceutical and medical device manufactures make use of the U.S.'s extensive research and scientific base as well as capital markets.

The EU has a decentralized system, which requires coordination between the countries with approval and regulatory activities, while the United States has a centralized process, which is headed by the federal FDA.

The FDA premarketing approval process is extensive, although once a product is on the market, the FDA also has several postmarketing surveillance programs to identify adverse events that did not appear during the approval process. This can result in updates to drug labeling, recalls, or reevaluation of the original decision.

Essential Questions

Essential Questions:

1. How do the regulatory cycles compare between medical devices and drugs?
2. What is the role of patents and other intellectual property protections in the medical products markets?
3. What are some of the complications with drug pricing?

Exit Skills

By the end of this unit, students will understand:

The regulatory process of Pharmaceuticals

The regulatory process of medical devices

How the FDA secures safety

New Jersey Student Learning Standards (NJSLS-S)

HPE.2.1.12.C.1	Determine diseases and health conditions that may occur during one's lifespan and identify prevention and treatment strategies.
HPE.2.1.12.C.2	Develop strategies that will impact local, state, national, and international public health efforts to prevent and control diseases and health conditions.
HPE.2.2.12.E.1	Analyze a variety of health products and services based on cost, availability, accessibility, benefits, and accreditation.
HPE.2.2.12.E.2	Determine the effect of accessibility and affordability of healthcare on family, community, and global health.
HPE.2.2.12.E.CS1	Potential solutions to health issues are dependent on health literacy and available resources.
HPE.2.2.12.E.CS2	Affordability and accessibility of healthcare impacts the prevention, early detection, and treatment of health problems.
9-12.HS-LS2-7.ETS1.B.1	When evaluating solutions it is important to take into account a range of constraints including cost, safety, reliability and aesthetics and to consider social, cultural and environmental impacts.

Interdisciplinary Connections

LA.RST.11-12.1	Accurately cite strong and thorough evidence from the text to support analysis of science and technical texts, attending to precise details for explanations or descriptions.
LA.RST.11-12.2	Determine the central ideas, themes, or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
LA.WHST.11-12.8	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

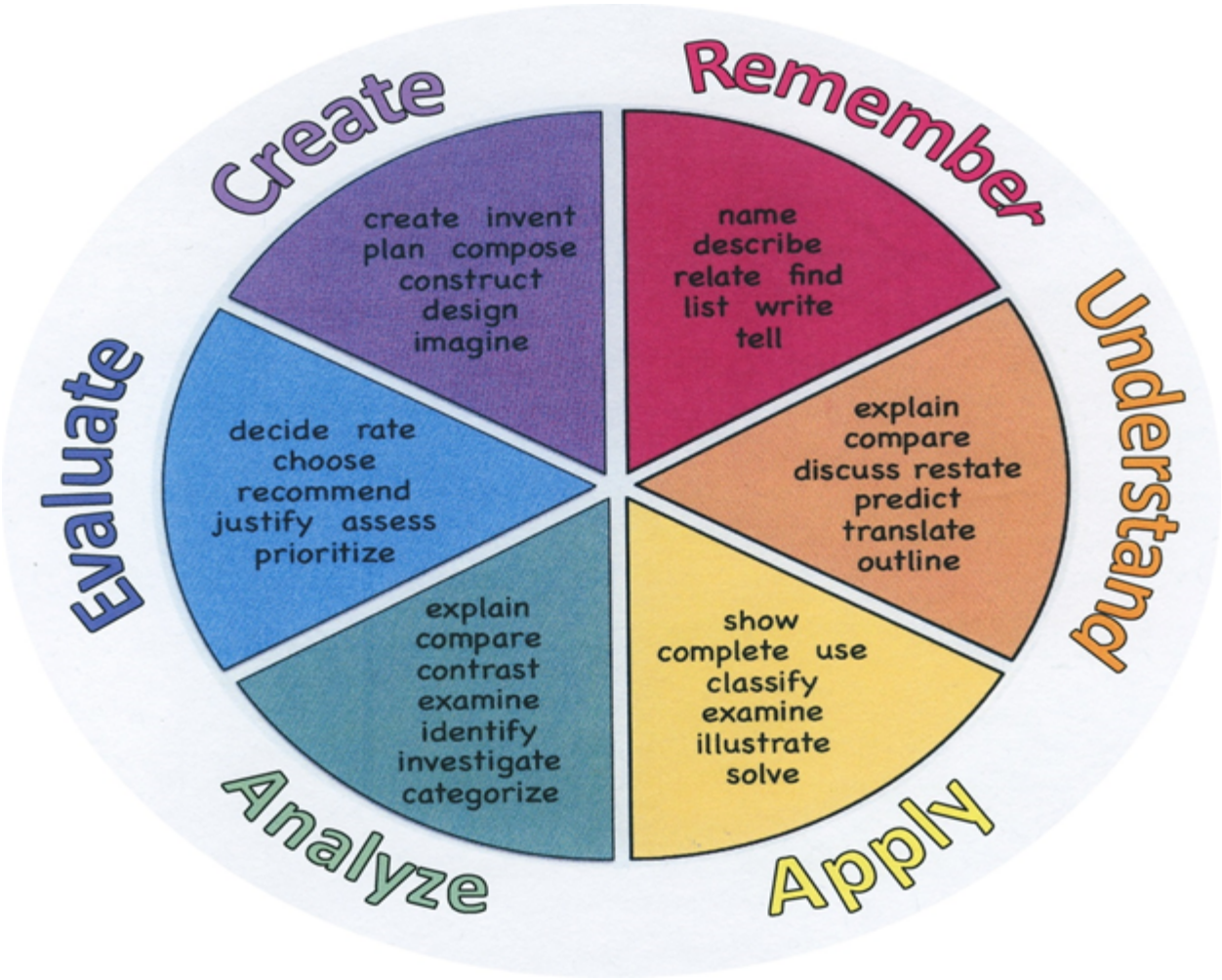
	to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.
LA.WHST.11-12.9	Draw evidence from informational texts to support analysis, reflection, and research.

Learning Objectives

After completing this chapter, students will be able to:

Describe the major categories of products and their users, purchasers, and deciders.
Describe the typical research, development, and regulatory cycles of each category.
Describe the makeup of the firms working in each market.

Remember	Understand	Apply	Analyze	Evaluate	Create
Choose	Classify	Choose	Categorize	Appraise	Combine
Describe	Defend	Dramatize	Classify	Judge	Compose
Define	Demonstrate	Explain	Compare	Criticize	Construct
Label	Distinguish	Generalize	Differentiate	Defend	Design
List	Explain	Judge	Distinguish	Compare	Develop
Locate	Express	Organize	Identify	Assess	Formulate
Match	Extend	Paint	Infer	Conclude	Hypothesize
Memorize	Give Examples	Prepare	Point out	Contrast	Invent
Name	Illustrate	Produce	Select	Critique	Make
Omit	Indicate	Select	Subdivide	Determine	Originate
Recite	Interrelate	Show	Survey	Grade	Organize
Select	Interpret	Sketch	Arrange	Justify	Plan
State	Infer	Solve	Breakdown	Measure	Produce
Count	Match	Use	Combine	Rank	Role Play
Draw	Paraphrase	Add	Detect	Rate	Drive
Outline	Represent	Calculate	Diagram	Support	Devise
Point	Restate	Change	Discriminate	Test	Generate
Quote	Rewrite	Classify	Illustrate		Integrate
Recall	Select	Complete	Outline		Prescribe
Recognize	Show	Compute	Point out		Propose
Repeat	Summarize	Discover	Separate		Reconstruct
Reproduce	Tell	Divide			Revise
	Translate	Examine			Rewrite
	Associate	Graph			Transform
	Compute	Interpolate			
	Convert	Manipulate			
	Discuss	Modify			
	Estimate	Operate			
	Extrapolate	Subtract			
	Generalize				
	Predict				



Suggested Activities & Best Practices

Guidelines for Suggested Activities:

- Read Chapter 4
- Define vocab words
- Complete Study Questions 1-3
- Presentation Medical Devices of your choosing
- Project on FDA and safety

Assessment Evidence - Checking for Understanding (CFU)

Chapter Test (Summative)

Quizzes (Summative)

Multimedia Report (Formative)

Questions Set (Formative)

Class Discussion (Alternate)

Internships (Alternate)

Physician Observations (Alternate)

Journal (Formative)

Think Pair Share (formative)

McGraw Hill Practice -on-line (alternate)

- Admit Tickets
- Anticipation Guide
- Common Benchmarks
- Compare & Contrast
- Create a Multimedia Poster
- DBQ's
- Define
- Describe
- Evaluate
- Evaluation rubrics
- Exit Tickets
- Explaining
- Fist- to-Five or Thumb-Ometer
- Illustration
- Journals
- KWL Chart

- Learning Center Activities
- Multimedia Reports
- Newspaper Headline
- Outline
- Question Stems
- Quickwrite
- Quizzes
- Red Light, Green Light
- Self- assessments
- Socratic Seminar
- Study Guide
- Surveys
- Teacher Observation Checklist
- Think, Pair, Share
- Think, Write, Pair, Share
- Top 10 List
- Unit review/Test prep
- Unit tests
- Web-Based Assessments
- Written Reports

Primary Resources & Materials

Jonas' Introduction to the U.S. Health Care System, 9th Edition

Springer Publishing Company CONNECT- ONLINE RESOURCES for textbook

Ancillary Resources

Anatomy Student's Review Workbook: Test and reinforce your anatomical knowledge by Ken Ashwell Ph.D.

Hospital Administrators

Physicians-Intern Conversations

Technology Infusion

ONLINE TEXTBOOK

SPRINGER PUBLISHING CONNECT ONLINE RESOURCES

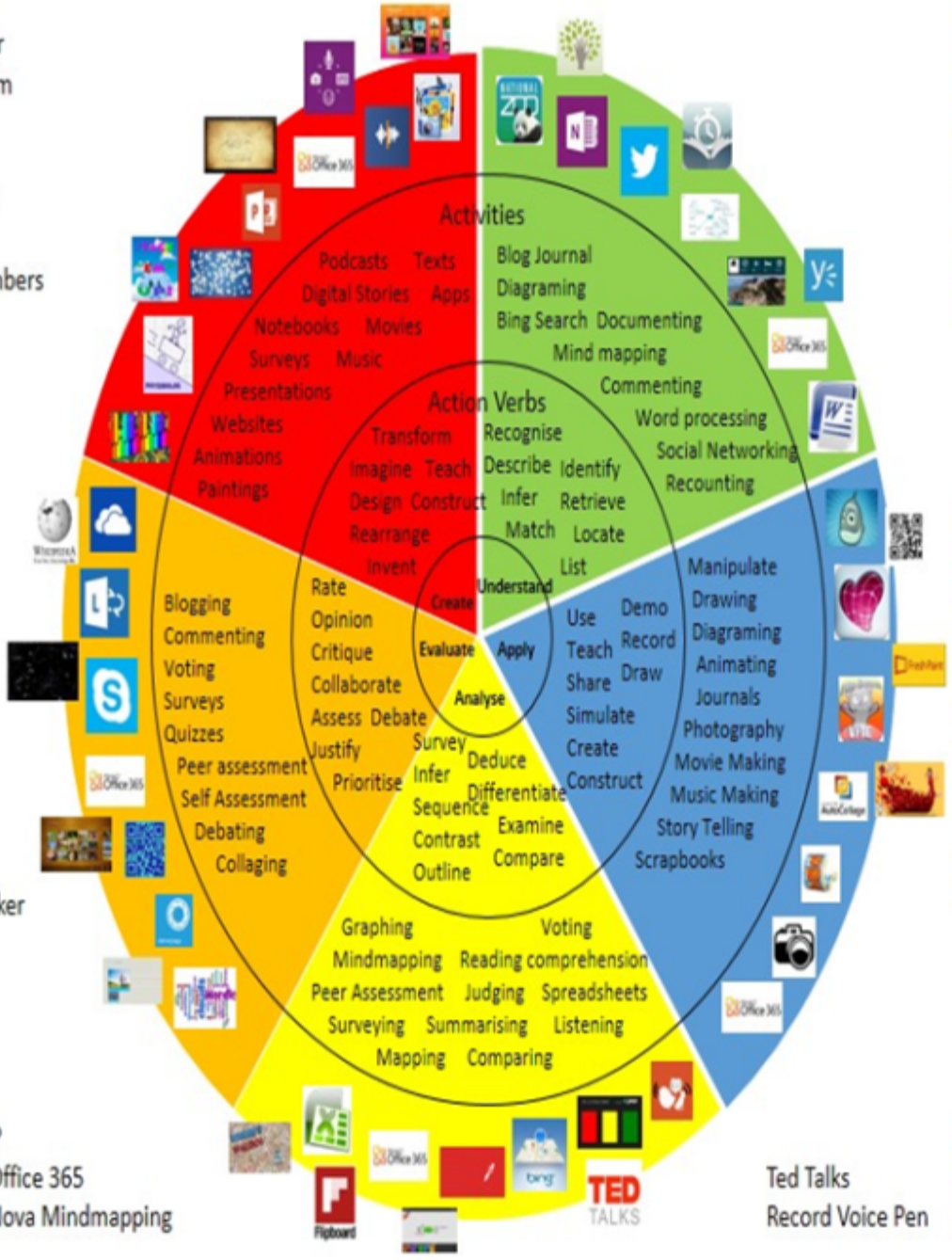
YOUTUBE

GOOGLE CLASSROOM PLATFORM TO SERVICE THE CLASS

Win 8.1 Apps/Tools Pedagogy Wheel

Podcasts
Photostory 3
Kid Story Builder
Music Maker Jam
Paint A Story
Office 365
MS PowerPoint
Stack 'Em Up
NqSquared Numbers
Physamajig
Xylophone 8

Wikipedia
Skydrive
Lync
SkyMap
Skype
Office 365
Puzzle Touch
Easy QR
Memorylage
Life Moments
Word Cloud Maker



Where's Waldo?
MS Excel Office 365
Flipboard Nova Mindmapping

Ted Talks
Record Voice Pen

Originally taken from http://www.coetail.com/vzimmer/files/2013/02/iPadagogy-Wheel.001.jpg
And adapted for Windows 8.1 devices by Charlotte Beckhurst @CharBeckhurst

Alignment to 21st Century Skills & Technology

CRP.K-12.CRP2.1	Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.
CRP.K-12.CRP10.1	Career-ready individuals take personal ownership of their own education and career goals, and they regularly act on a plan to attain these goals. They understand their own career interests, preferences, goals, and requirements. They have perspective regarding the pathways available to them and the time, effort, experience and other requirements to pursue each, including a path of entrepreneurship. They recognize the value of each step in the education and experiential process, and they recognize that nearly all career paths require ongoing education and experience. They seek counselors, mentors, and other experts to assist in the planning and execution of career and personal goals.
CAEP.9.2.12.C.1	Review career goals and determine steps necessary for attainment.
CAEP.9.2.12.C.2	Modify Personalized Student Learning Plans to support declared career goals.
TECH.8.1.12	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.12.A.3	Collaborate in online courses, learning communities, social networks or virtual worlds to discuss a resolution to a problem or issue.
TECH.8.1.12.C.CS1	Interact, collaborate, and publish with peers, experts, or others by employing a variety of digital environments and media.

21st Century Skills/Interdisciplinary Themes

Upon completion of this section, please remove all remaining descriptions, notes, outlines, examples and/or illustrations that are not needed or used.

Please list only the **21st Century/Interdisciplinary Themes** that will be incorporated into this unit.

- Communication and Collaboration
- Creativity and Innovation
- Critical thinking and Problem Solving
- ICT (Information, Communications and Technology) Literacy
- Information Literacy
- Life and Career Skills
- Media Literacy

21st Century Skills

Upon completion of this section, please remove all remaining descriptions, notes, outlines, examples and/or illustrations that are not needed or used.

Please list only the **21st Century Skills** that will be incorporated into this unit.

- Civic Literacy
- Environmental Literacy
- Financial, Economic, Business and Entrepreneurial Literacy
- Global Awareness
- Health Literacy

Differentiation

Small group instruction

Multi sensory approaches

leveled rubrics

flexible grouping

Extra time to complete assignments

Differentiations:

- Small group instruction
- Small group assignments
- Extra time to complete assignments
- Pairing oral instruction with visuals
- Repeat directions
- Use manipulatives

- Center-based instruction
- Token economy
- Study guides
- Teacher reads assessments allowed
- Scheduled breaks
- Rephrase written directions
- Multisensory approaches
- Additional time
- Preview vocabulary
- Preview content & concepts
- Story guides
- Behavior management plan
- Highlight text
- Student(s) work with assigned partner
- Visual presentation
- Assistive technology
- Auditory presentations
- Large print edition
- Dictation to scribe
- Small group setting

Hi-Prep Differentiations:

- Alternative formative and summative assessments
- Choice boards
- Games and tournaments
- Group investigations
- Guided Reading
- Independent research and projects
- Interest groups
- Learning contracts
- Leveled rubrics
- Literature circles
- Multiple intelligence options
- Multiple texts
- Personal agendas
- Project-based learning
- Problem-based learning
- Stations/centers
- Think-Tac-Toes
- Tiered activities/assignments
- Tiered products
- Varying organizers for instructions

Lo-Prep Differentiations

- Choice of books or activities
- Cubing activities
- Exploration by interest
- Flexible grouping
- Goal setting with students
- Jigsaw
- Mini workshops to re-teach or extend skills

- Open-ended activities
- Think-Pair-Share
- Reading buddies
- Varied journal prompts
- Varied supplemental materials

Special Education Learning (IEP's & 504's)

Sit student with partner to complete LEARNING OUTCOME questions throughout the chapters.

Increase visuals in classroom

Graphic organizers using illustrations

Context Cues

Check and Recheck for understanding by asking open ended questions

Have students repeat instructions

- printed copy of board work/notes provided
- additional time for skill mastery
- assistive technology
- behavior management plan
- Center-Based Instruction
- check work frequently for understanding
- computer or electronic device utilizes
- extended time on tests/ quizzes

- have student repeat directions to check for understanding
- highlighted text visual presentation
- modified assignment format
- modified test content
- modified test format
- modified test length
- multi-sensory presentation
- multiple test sessions
- preferential seating
- preview of content, concepts, and vocabulary
- Provide modifications as dictated in the student's IEP/504 plan
- reduced/shortened reading assignments
- Reduced/shortened written assignments
- secure attention before giving instruction/directions
- shortened assignments
- student working with an assigned partner
- teacher initiated weekly assignment sheet
- Use open book, study guides, test prototypes

English Language Learning (ELL)

Google Translate allowed in room to read chapters

Sit student with bilingual partner of same language to complete LEARNING OUTCOME questions throughout the chapters.

Increase visuals in classroom

Graphic organizers using illustrations

Context Cues

Check and Recheck for understanding by asking open ended questions

Have students repeat instructions

Provide notes in native language when available

- teaching key aspects of a topic. Eliminate nonessential information
- using videos, illustrations, pictures, and drawings to explain or clarif
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning;
- allowing students to correct errors (looking for understanding)
- allowing the use of note cards or open-book during testing
- decreasing the amount of workpresented or required
- having peers take notes or providing a copy of the teacher's notes
- modifying tests to reflect selected objectives
- providing study guides
- reducing or omitting lengthy outside reading assignments
- reducing the number of answer choices on a multiple choice test
- tutoring by peers
- using computer word processing spell check and grammar check features
- using true/false, matching, or fill in the blank tests in lieu of essay tests

At Risk

Tutoring by Peers

Using videos, illustrations, pictures, and drawings to explain or clarify

Use in - class box of study cards

rewatch videos on youtube for enhanced understanding

- allowing students to correct errors (looking for understanding)
- teaching key aspects of a topic. Eliminate nonessential information
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning
- allowing students to select from given choices

- allowing the use of note cards or open-book during testing
- collaborating (general education teacher and specialist) to modify vocabulary, omit or modify items to reflect objectives for the student, eliminate sections of the test, and determine how the grade will be determined prior to giving the test.
- decreasing the amount of workpresented or required
- having peers take notes or providing a copy of the teacher's notes
- marking students' correct and acceptable work, not the mistakes
- modifying tests to reflect selected objectives
- providing study guides
- reducing or omitting lengthy outside reading assignments
- reducing the number of answer choices on a multiple choice test
- tutoring by peers
- using authentic assessments with real-life problem-solving
- using true/false, matching, or fill in the blank tests in lieu of essay tests
- using videos, illustrations, pictures, and drawings to explain or clarify

Talented and Gifted Learning (T&G)

Utilize project-based learning for greater depth of knowledge

Multi-disciplinary unit and/or project

Teacher-selected instructional strategies that are focused to provide challenge, engagement, and growth opportunities

- Above grade level placement option for qualified students
- Advanced problem-solving
- Allow students to work at a faster pace
- Cluster grouping
- Complete activities aligned with above grade level text using Benchmark results
- Create a blog or social media page about their unit
- Create a plan to solve an issue presented in the class or in a text
- Debate issues with research to support arguments
- Flexible skill grouping within a class or across grade level for rigor
- Higher order, critical & creative thinking skills, and discovery
- Multi-disciplinary unit and/or project
- Teacher-selected instructional strategies that are focused to provide challenge, engagement, and growth opportunities
- Utilize exploratory connections to higher-grade concepts

- Utilize project-based learning for greater depth of knowledge

Sample Lesson

Unit Name: Introduction to the US Health Care System

NJSLS:

Interdisciplinary Connection: Health and Physical Education, social studies, mass communications

Statement of Objective: SWBAT work to create a collaborative video on the 5 determinants of health care creating a solid foundation on this topic

Anticipatory Set/Do Now: Research the 5 determinants of healthcare-Genetic Inheritance, Physical Environment, Social Environment, Health Behavior, Health Care as a determinant

Learning Activity: work to create a collaborative video on the 5 determinants of health care

Student Assessment/CFU's: Watch videos (final products) and ask questions; class discussion

Materials: Online video tools, text book, healthcare resources

21st Century Themes and Skills:

Differentiation/Modifications:

Integration of Technology: Google, online text,

HPE.2.2.12.E.1	Analyze a variety of health products and services based on cost, availability, accessibility, benefits, and accreditation.
HPE.2.2.12.E.2	Determine the effect of accessibility and affordability of healthcare on family, community, and global health.
HPE.2.2.12.E.CS2	Affordability and accessibility of healthcare impacts the prevention, early detection, and treatment of health problems.