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| **TEXAS CTE LESSON PLAN**[www.txcte.org](http://www.txcte.org) |
| **Lesson Identification and TEKS Addressed** |
| **Career Cluster** | Health Science |
| **Course Name** | Principles of Health Science |
| **Lesson/Unit Title** | Cycle of Infection |
| **TEKS Student Expectations** | **130.222.(c) Knowledge and Skills**(10) The student recognizes the rights and choices of the individual. (B) The student is expected to identify wellness strategies for the prevention of disease(11) The student recognizes the importance of maintaining a safe environment and eliminating hazardous situations. (B) The student is expected to identify industry safety standards such as standard precautions, fire prevention and safety practices, and appropriate actions to emergency situations(C) The student is expected to relate safety practices in the health science industry |
| **Basic Direct Teach Lesson**(Includes Special Education Modifications/Accommodations and one English Language Proficiency Standards (ELPS) Strategy) |
| **Instructional Objectives** | Upon completion of this lesson, the student will be able to:* Identify the cycle of the infectious process
* Investigate ways to protect themselves and patients from infection
* Research common human pathogens
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| **Rationale** | Infection control is an increasingly important aspect of health care for both the client and the health care professional. |
| **Duration of Lesson** | 3 – 6 hours |
| **Word Wall/Key Vocabulary***(ELPS c1a,c,f; c2b; c3a,b,d; c4c; c5b) PDAS II(5)* |  |
| **Materials/Specialized Equipment Needed** | * Art supplies.
* Internet accessibility
* Library resources
* Rubrics
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| **Anticipatory Set**(May include pre-assessment for prior knowledge) | Sara plays goalie for the varsity soccer team at Central High. During last Friday’s game Sara made several big saves, but her body took a beating resulting in several small cuts and bruises. A couple of days later, Sara notices small red bumps that resemble pimples, boils or spider bite. She tried using triple antibiotic ointment but the next day they were bigger and more painful. Sara decides she should show her mom who takes her to the urgent care center where the doctor informs her that she has methicillin-resistant Staphylococcus aureus or MRSA. Both Sara and her mom have heard of the infection and know that it is not to be taken lightly. What they cannot figure out is how Sara, who is generally so healthy, contracted the organism. Sara also worries if she has exposed all her friends and team mates.How are diseases transmitted from person to person? |
| **Direct Instruction \*** | 1. Infections and diseases are classified as one of the following:
	1. Endogenous- means it originates within. Includes: metabolic disorders, congenital abnormalities, tumors, and infections caused by microorganisms within the body.
	2. Exogenous- means it originates outside the body - Includes: pathogenic organisms that invade the body, radiation, chemical agents, trauma, electric shock and temperature extremes.
	3. Nosocomial- means the infection is one that is acquired by an individual in a health care facility which is transmitted by health care workers to the patient.
	4. Opportunistic- means the infections are those that occur when the body’s defenses are weak.
2. Infections are also classified as Aerobic or Anaerobic:
	1. Aerobic- means the organism requires oxygen to live.
	2. Anaerobic- means it lives and reproduces in the absences of oxygen.
3. Infection cycle is well defined:
	1. Infective agent: Common pathogens include bacteria, viruses, funguses, rickettsiae, protozoa.
	2. Reservoir
		1. Place where causative agent can live.
		2. Common reservoirs include human body, animals, environment, and fomites or objects contaminated with infectious material that contains the pathogens.
	3. Portal of exit
		1. Way for causative agent to escape from the reservoir.
		2. Pathogens can leave the body through urine, feces, saliva, blood, tears, mucous discharge, sexual secretions, and draining wounds.
	4. Means of transmission
		1. Pathogen must be transmitted to another reservoir or host where it can live.
		2. Pathogen can be transmitted in different ways:
			1. Direct Contact
				1. Person-to-person spread by physical contact.
				2. Contact with the body secretions containing pathogen.
			2. Indirect contact
				1. Pathogen is transmitted from contaminated substances (i.e. food, air, soil, insects, feces, clothing, instruments, and equipment).
				2. Touching contaminated equipment.
				3. Breathing in droplets carrying airborne pathogens.
				4. Receiving the bite of an insect carrying pathogen.
	5. Portal of entry
		1. Way to enter a new reservoir or host
		2. Means of entry
			1. Breaks in the skin or mucous membrane
			2. Respiratory tract
			3. Digestive tract
			4. Genitourinary tract
			5. Circulatory system
	6. Susceptible host
		1. Individual who can contract the disease
		2. Humans may fight off causative agents and do not contract disease if:
			1. Defense mechanisms of body are intact.
			2. Immune system functioning.
		3. Human becomes susceptible host in some instances
			1. Large numbers of the pathogen invade the body.
			2. Body defenses are weak.
4. The cycle of infection can be broken at any link of the chain
	1. The infectious agent can be neutralized or destroyed by Treatment.
	2. The reservoir host must maintain personal hygiene.
	3. The portal of exit is closed using proper attire (gowns, gloves, other clothing), control of body secretions, and proper handwashing.
	4. The route of transmission is minimized through proper handwashing, disinfection and sterilization and proper disposal of contaminated materials.
	5. The portal of entry is blocked by asepsis, disinfection, and sterilization procedures.
	6. Host susceptibility is broken when the health and wellness of an individual is maintained.
5. Microorganisms and Disease
	1. Microorganism: an organism that is too small to be seen by the human eye.
		1. Fungi: simple plants such as molds and yeasts, some of which cause disease.
		2. Protozoa: the only group of microorganisms classified as an animal.
		3. Virus: microorganisms that are so small they cannot be seen with an ordinary light microscope. They are not destroyed by antibiotics.
		4. Bacteria: microorganisms first seen under the microscope by Antoni van Leeuwenhoek in 1693. The classification is determined by the shape of the bacteria and whether it grows with or without oxygen. Only a few bacteria, such as staphylococcus and streptococcus cause disease.
			1. Aerobic bacteria: live and multiply in the presence of oxygen.
			2. Anaerobic bacteria: live and multiply without oxygen
			3. Cocci: round bacteria
				1. Staphylococci: round bacteria in clusters like grapes; cause boils, impetigo, and osteomyelitis
				2. Streptococci: round bacteria arranged in chains; cause rheumatic fever, streptococcal pneumonia, and scarlet fever.
				3. Diplococci: round bacteria arranged in pairs; cause gonorrhea and meningitis.
			4. Bacilla: rod shaped bacteria.
			5. Spirilla: shaped like spirals.
		5. Rickettsiae: smaller than bacteria, barely visible under light microscope; cause typhus, Rocky Mountain spotted fever.
	2. Pathogen: a disease-causing microorganism.
6. Asepsis is the absence of infection.
	1. Medical asepsis: practices and techniques that are designed to protect individuals from the spread of disease.
		1. Antiseptic: substances that inhibit the growth of bacteria. Some of these substances can be used on the skin.
		2. Disinfectant: substances or practices that cannot be used on the skin. This includes chemicals and boiling.
		3. Sterile: absence of all microorganisms.
	2. Surgical asepsis: the use of sterile technique to handle equipment, maintain sterile fields, change dressings and dispose of contaminated materials without introducing harmful microorganisms.
7. Epidemiology: tracing the occurrence of health-related events in society.
	1. Epidemiologist is a person who specializes in the study of outbreaks of diseases within a population group.
		1. Endemic: refers to the ongoing presence of a disease within a population, group, or area. For example, the common cold is always present within a population.
		2. Epidemic: is a sudden and widespread outbreak of a disease within a population, group or area. For example, a sudden wide spread outbreak of measles is an epidemic.
		3. Pandemic: refers to an outbreak of a disease occurring over a large geographic area, possibly worldwide. For example, AIDS is pandemic.

*Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*NONE |
| **Guided Practice \*** | Research and investigate common human pathogens in small groups.*Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*NONE |
| **Independent Practice/Laboratory Experience/Differentiated Activities \*** | Create mobiles of various microorganisms. (Each should have identifying information telling about the microbe, what disease(s) it causes, epidemiology, treatment, and treatment success rate).Design a multimedia project that identifies a microorganism and its passage through the chain of infection.*Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*NONE |
| **Lesson Closure** |  |
| **Summative/End of Lesson Assessment \***  | Multi-media Project Oral presentation of Infectious Disease Outbreak*Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:** For reinforcement, students will draw a poster showing the chain of infection and identify strategies to break the chain.
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| **References/Resources/****Teacher Preparation** |  |
| **Additional Required Components** |
| **English Language Proficiency Standards (ELPS) Strategies** |  |
| **College and Career Readiness Connection[[1]](#footnote-1)** |  |
| **Recommended Strategies** |
| **Reading Strategies** |  |
| **Quotes** |  |
| **Multimedia/Visual Strategy****Presentation Slides + One Additional Technology Connection** |  |
| **Graphic Organizers/Handout** |  |
| **Writing Strategies****Journal Entries + 1 Additional Writing Strategy** |  |
| **Communication****90 Second Speech Topics** |  |
| **Other Essential Lesson Components** |
| **Enrichment Activity**(e.g., homework assignment) | For enrichment, students will research an infectious outbreak (such as the Ebola virus) that may be a threat to world health and present that information to the class. |
| **Family/Community Connection** |  |
| **CTSO connection(s)** | HOSA, SkillsUSA |
| **Service Learning Projects** |  |
| **Lesson Notes** |  |

1. Visit the Texas College and Career Readiness Standards at <http://www.thecb.state.tx.us/collegereadiness/CRS.pdf>, Texas Higher Education Coordinating Board (THECB), 2009. [↑](#footnote-ref-1)