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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** | World Health Research  |
| **Lesson/Unit Title** | Global Infectious Diseases |
| **TEKS Student Expectations** | **130.226. (c) Knowledge and Skills**(2) The student explores and discusses current major human health problems in the world.(F) The student is expected to identify and describe the challenges in global health that can have the greatest impact on health in developing nations(3) The student explains who pays for health care in the world today. (A) The student is expected to compare the availability of health care in developing and developed countries(4) The student describes the engineering technologies developed to address clinical needs. (A) The student is expected to describe technologies that support the prevention and treatment of infectious diseases |
| **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:* Explain why infectious diseases are still one of the leading causes of death worldwide despite available technology and treatments
* Differentiate between emerging and reemerging diseases, and give examples of each
* Analyze at least ten of the world’s most common infectious diseases
* Examine available technology to combat infectious diseases in developing countries
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| **Rationale** | Despite safe and effective medical interventions, infectious diseases are the major cause of death, disability, and socioeconomic disruption for millions of people. An inquiry into the world’s most deadly infectious diseases is necessary to raise awareness of their broad and borderless impact**.** |
| **Duration of Lesson** |  |
| **Word Wall/Key Vocabulary***(ELPS c1a, c, f; c2b; c3a, b, d; c4c; c5b) PDAS II (5)* |  |
| **Materials/Specialized Equipment Needed** | * Part I: *Track That Disease!*
* Part II: *Track That Disease!*
* map of the world template, for the Global Wall Map project
* Disease Cards
* *Track That Disease!* Evaluation/Presentation Rubric
* Enrichment handouts from The Global Health Council
	+ *Understanding Infectious Diseases*
	+ *Infectious Disease Expenditures*
	+ *Infectious Disease Interventions*
	+ *Overcoming Neglected Tropical Diseases*
* Butcher paper
* Scissors
* stick glue
* markers
* Class computers (for the investigation phase of the project)
* PBS DVD: The Heroes -<http://www.pbs.org/wgbh/rxforsurvival/series/about/special.html>
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| **Anticipatory Set**(May include pre-assessment for prior knowledge) | Discuss the following:“In the year of 1657 I discovered very small living creatures in rain water. No more pleasant sight has met my eye than this of so many thousands of living creatures in one small drop of water...”–stated by Anton Leeuwenhoek after discovering he could see ‘wee animacules’ (bacteria) with the microscopic lens he developed |
| **Direct Instruction \*** | Open lecture with *A Global Health Challenge: A Tale of Two Girls* Flash movie (requires Flash player). This short feature story contrasts the lives of two baby girls: one born in a developed country, Japan; and the other in a developing country, Sierra Leone. <http://www.who.int/features/2003/11/en/index.html>1. The impact of global infectious diseases
	1. Over 9.5 million people die each year due to infectious diseases
	2. Nearly all live in developing countries
	3. Children are particularly vulnerable
		1. Pneumonia, diarrhea, and malaria are the leading causes of death in children under age 5
		2. Infectious disease in adults may lead to disability, decreased productivity, and death
	4. Each year between 1.3 and 3 million people die of malaria and 1.7 million die from tuberculosis (TB)
		1. Together these diseases cause more deaths than HIV/AIDS
2. Co-infection
	1. People infected with one infectious disease become more susceptible to other diseases
	2. Examples: HIV/AIDS co-infection with tuberculosis or malaria
3. Infectious diseases remain among the leading causes of death worldwide for three reasons:
	1. Emergence of new infectious diseases
	2. Reemergence of old infectious diseases
	3. Persistence of stubborn infectious diseases
4. Emerging diseases include
	1. Outbreaks of previously unknown diseases
	2. Examples of emerging diseases
		1. Ebola virus – first outbreaks in 1976; discovery of the virus in 1977
		2. HIV/AIDS – the virus was first isolated in 1983
		3. Hepatitis C – first identified in 1989; now known to be the most common cause of post-transfusion hepatitis worldwide
5. Reemerging diseases include
	1. Known diseases that have reappeared after a significant decline in incidence
	2. Old infectious diseases that have undergone natural genetic variations, recombination, and adaptations to which the immune system has not been previously exposed
	3. Examples of re-emerging diseases
		1. Pertussis (whooping cough) – a vaccine in the late 1940s largely eradicated this condition; now reemerging because adult immunizations to this disease have worn off and many children today are not fully immunized
		2. Tuberculosis (TB) – an ancient bacterial disease that remains one of the major causes of disability and death worldwide; the discovery and use of antibiotics took TB out of the spotlight; however, the bacteria have mutated, and in 2006, 9.2 million new cases of TB reemerged
		3. West Nile virus – heavy rains followed by flooding and higher temperatures have contributed to the reemergence of this mosquito-transmitted disease
6. Continued infectious disease evolution and emergence due to
	1. Demographics, trade (food, animals, plants), travel, and land use
		1. Rapid urbanization brings people into closer proximity, resulting in more frequent contact with disease vectors and novel pathogens
		2. Increasing trade in exotic animals for pets and as food sources has given opportunity for pathogens to jump from animal reservoirs to humans
		3. Traveling by jet nowadays allows pathogens to infect people from one country or continent within short periods of time
		4. Changes in the landscape such as
			1. Developing irrigated agriculture that can create breeding grounds for mosquitoes
			2. Urbanized areas where there is inadequate storm drainage and sewage systems that can facilitate the spread of waterborne pathogens
			3. Deforestation that transforms natural areas and can lead to the extinction of predators that favor some disease vectors
7. Infectious Disease Expenditures
	1. Foundations and public and/or private partnerships play a key role in funding for research into infectious diseases
		1. Pharmaceutical companies partner with governments and nongovernmental organizations to provide drugs and materials at no or low cost, particularly for neglected diseases in resource poor countries
		2. The Bill and Melinda Gates Foundation contributed more than $1.87 billion in grants to combat infectious diseases
			1. The foundation provides support for vaccine research and has pledged to triple its funding for TB by 2015
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| **Guided Practice \*** | Complete the activity, *Track that Disease!* parts I & II and participate in a group presentation. |
| **Independent Practice/Laboratory Experience/Differentiated Activities \*** |  |
| **Lesson Closure** |  |
| **Summative/End of Lesson Assessment \*** | *Track That Disease!* Evaluation/Presentation RubricFor reinforcement, the students define key terms from the lesson.  |
| **References/Resources/****Teacher Preparation** | * World Health Organization (WHO)
* Global Health Council
* National Institute of Allergy and Infectious Diseases
* ActionBioscience.org
* Environmental Knowledge for Change
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| **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, the students will view and report on the PBS documentary DVD *The Heroes: Extraordinary Individuals Battling the World’s Most* *Dangerous Diseases*. (2 hrs.)<http://www.pbs.org/wgbh/rxforsurvival/series/about/special.html> |
| **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)