

## PROJECT OVERVIEW

<b>Name of Project:</b>	<b>Infectious Diseases</b>	<b>Duration: 3 weeks</b>				
<b>Subject/Course:</b> <i>Biology</i>	<b>Teacher(s):</b> Kara Kits	<b>Grade Level:</b> 10 <sup>th</sup>				
<b>Other subject areas to be included, if any:</b>						
<b>Project Idea</b> Summary of the issue, challenge, investigation, scenario, or problem:	Students will create a Public Service Announcement for the CDC regarding a “mystery” pathogen that may be a threat. They will complete several guided research activities relating to viruses and bacteria. In addition, they will use scientific processes to collect and identify possible microorganisms.					
<b>Driving Question</b>	How can we stop the spread of infectious disease?					
<b>Content and Skills Standards</b> to be addressed:	<p>B1.1C Conduct scientific investigations using appropriate tools and techniques (e.g., selecting an instrument that measures the desired quantity—length, volume, weight, time interval, temperature—with the appropriate level of precision).</p> <p>B1.1h Design and conduct a systematic scientific investigation that tests a hypothesis. Draw conclusions from data presented in charts or tables.</p> <p>B1.2C Develop an understanding of a scientific concept by accessing information from multiple sources. Evaluate the scientific accuracy and significance of the information.</p> <p>L2.p1A Distinguish between living and nonliving systems.</p> <p>B2.3f Explain how human organ systems help maintain human health.</p> <p>B2.4h Describe the structures of viruses and bacteria.</p> <p>B2.4i Recognize that while viruses lack cellular structure, they have the genetic material to invade living cells.</p> <p>B2.r6c Recognize and explain that communication and/or interaction are required between cells to coordinate their diverse activities.</p> <p>B2.r6e Analyze the body’s response to medical interventions such as organ transplants, medicines, and inoculations.</p> <p>L3.p2D Explain how two organisms can be mutually beneficial and how that can lead to interdependency.</p> <p>B3.r5g Diagram and describe the stages of the life cycle for a human disease-causing organism.</p>					
		T+A	E		T+A	E
<b>21<sup>st</sup> Century Skills</b> to be explicitly <i>taught and assessed</i> (T+A) or that will be <i>encouraged</i> (E) by project work, but not taught or assessed:	<b>Collaboration</b>	X		Other:		
	<b>Presentation</b>	X				
	<b>Critical Thinking</b>	X				

			Presentation Audience:	
Culminating Products and Performances	Group:	Students will work with classmates to: <ol style="list-style-type: none"> <li>1. Design and carry out a scientific investigation on bacteria and bacterial growth</li> <li>2. Collect and record information regarding infectious diseases (viral &amp; bacterial)</li> <li>3. Interview a local health/medical practitioner</li> <li>4. Create a PSA focusing on infectious disease prevention</li> <li>5. Publish their PSA on the web—either submission to “competition” site (i.e. <a href="http://www.ivieawards.org/categories/psa/psa.html">http://www.ivieawards.org/categories/psa/psa.html</a>) or publishing on YouTube or other sites</li> </ol>	Class:	X
			School:	
	Individual:	Each student will be expected to: <ol style="list-style-type: none"> <li>1. Complete the guided research on infectious diseases (viral &amp; bacterial)</li> <li>2. Keep an individual “lab notebook” of infectious disease information</li> <li>3. Create a “Bacterial/Virus Wanted Poster”</li> <li>4. Complete the Unit Test</li> </ol>	Community:	X
			Experts:	X
Web:			X	
			Other:	

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Entry event to launch inquiry, engage students:	<ul style="list-style-type: none"> <li>• Show students a “gross” video/pictures/story that relates to what is “clean” and “dirty.” (e.g. a person kissing their dog, eating food off the floor, picking his nose)</li> <li>• Play a short “What would you do for money?” game that involves questions about licking the floor, trading gum, licking their shoe, doorknob, etc.</li> <li>• Show a video of a news story about bacteria on cell phones.</li> </ul> Group Discussion Question: <ul style="list-style-type: none"> <li>• What is “dirty”?</li> <li>• What makes us sick?</li> <li>• Where (on what items in our everyday lives) are bacteria and viruses most concentrated?</li> <li>• How can we prevent illness?</li> </ul>				
Assessments	Formative Assessments	Reading assignment quiz (on Moodle)	X	Interview Reflections	X
		Infectious Disease Webquest	X	Bacteria Lab Report	X

	(During Project)	Lecture Notes Checks	X	Your Magic Doctor Discussion Questions	X
	Summative Assessments (End of Project)	Group PSA presentation with rubric	X	Peer Evaluation (use rubric)	X
		Unit Test (Multiple Choice/Short Answer/Essay Test)	X	Self-Evaluation (use rubric)	X
Resources Needed	On-site people, facilities:	Computers (student laptops), video cameras, cables, projectors			
	Equipment:	Bacteria Lab equipment,			
	Materials:	Movie segments from United Streaming & YouTube; audio segments from NPR; <i>Your Magic Doctor</i> video; petri dishes, swabs, tape, incubator, markers; Textbook; handouts for notes and activities			
	Community resources:	List of cooperative medical/health professionals for students to interview (for first time using PBL Lesson, have guest speaker...sort of like a group interview)			
Reflection Methods	(Individual, Group, and/or Whole Class)	Reflection Journal	X		
		Whole-Class Discussion	X		
		Survey	X		

## PROJECT TEACHING AND LEARNING GUIDE

<b>Project: Infectious Diseases</b>	<b>Course/Semester: Biology/2<sup>nd</sup> Semester</b>
<b>Knowledge and Skills Needed by Students</b> to successfully complete culminating products and performances, and do well on summative assessments	<b>Scaffolding / Materials / Lessons to be Provided</b> by the project teacher, other teachers, experts, mentors, community members
What are viruses & bacteria?	→ Class discussion following entry event; Guest speaker
How do scientists identify viruses and bacteria?	→ Lesson on virus and bacteria identification; Virus & Bacteria Wanted Poster; Guest speaker
Where do we find viruses and bacteria?	→ Lesson on survival needs of viruses and bacteria; Bacteria Lab; Guest speaker
What are some ways that are used to control viruses and bacteria?	→ Lesson on virus and bacteria control; Infectious Disease Webquest Part 1; Guest speaker
How can people avoid being infected with harmful viruses and bacteria?	→ Interview with medical/health professional; class discussion following "Your Magic Doctor" video; Guest speaker
What are beneficial flora that are found in humans? How can they be used and identified?	→ Infectious Disease Webquest Part 2: "Community of Thousands" NPR radio show with guiding questions; Guest speaker
How does your immune system work? How does it respond to "foreign invaders"?	→ Your Magic Doctor video and discussion questions; review lesson on immune system; Guest speaker
What is a PSA? How are PSAs used? What do PSAs for health related issues look like?	→ Lesson on and introduction to PSAs; view several examples of PSAs

# PROJECT CALENDAR

Project: Infectious Diseases

Start Date: January 24, 2011

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
<b>PROJECT WEEK ONE</b>				
<p>Entry Event</p> <p>Small group work on designing Bacteria Lab</p> <p>Work time for Reading assignment (reading assignment quiz on Moodle)</p>	<p>Small group work on collecting samples for Bacteria Lab</p> <p>Lesson on virus and bacteria survival needs</p>	<p>Lesson on virus and bacteria identification</p> <p>Infectious Disease Webquest Part I</p>	<p>Lesson on virus and bacteria control</p> <p>Infectious Disease Webquest Part II</p>	<p>Small group work on Bacteria Lab</p> <p>Work on Virus &amp; Bacteria Wanted Posters</p>
<b>PROJECT WEEK TWO</b>				
<p>Lesson on immune system</p> <p><i>Your Magic Doctor</i> video followed by class discussion</p>	<p>Group "tour" activity of the Bacteria Wanted Posters</p>	<p>Lesson on and Introduction to PSA's</p> <p>Group discussion regarding PSAs and brainstorm questions for guest speaker (post on Google Docs)</p>	<p>Unit Test</p>	<p>Guest speaker about infectious diseases (local infectious disease expert— physician, nurse, lab tech, etc...)</p>
<b>PROJECT WEEK THREE</b>				
<p>Small group work on PSA (research)</p>	<p>Small group work on PSA (research, rough draft)</p>	<p>Wrap up small group work on PSA (recording &amp; publishing)</p>	<p>Group share time of PSAs</p>	<p>Self and peer evaluations</p> <p>Class debriefing and processing</p>