**Title of Project: Your Global Crisis: Policing a Microscopic Universe**

**Subject(s): Interdisciplinary, Science and Language Arts**

**Grade Level(s): Eighth Grade Gifted—Advanced Content**

**Abstract:**

Students will read *Hot Zone* by Richard Preston and then participate in a research*-*based, problem-solving disease outbreak simulation in which they will work together, in conjunction with guidance from the Centers for Disease Control, to formulate a plan of attack and a solution to the simulation. Students will incorporate interdisciplinary research along with technology to understand how a disease outbreak occurs, how the outbreak is managed, and how it can eventually be contained. While in the throes of research, students will collaborate with other online student communities as well as an online mentor to assist in guiding the research and to provide an authentic audience for students to work with. In this unit, students must:

* understand and apply both ISTE technology standards and ELA content standards for research and writing
* utilize 21st Century technology such as ePals, telementoring, blackboard, Inspiration software, voicethread, Prezis, and on-line journaling and webpage design during the course of this project to monitor, record, and communicate their research findings.
* research for specific pieces of information from the library, Cobb Virtual Library, and from specific internet sites
* have a general understanding of infectious diseases, esp. the difference between a virus and a bacteria.
* have a general understanding of cabinet positions in the US government and the areas of responsibility for each, esp. the Secretary of Commerce, the Secretary of Homeland Security, the Secretary of Defense, and the Secretary of Health and Human Services.
* connect with the CDC experts for information about the various biohazard levels.
* construct an emergency plan, based on chosen contagion, by synthesizing various types of research information into one document leading students from an authentic problem

**Learner Description/Environment:**

Students participating in this research activity will be gifted 8th grade students. Students will be doing a large majority of their research in the school environment using available technology.

Students will also participate in a field trip to the CDC “Global Health Odyssey Museum.” In this field trip, students will learn about CDC’s history, CDC’s current work in preventing disease and promoting health, and detailed information about various infectious diseases. Upon arrival to the Global Health Odyssey Museum, the group will be greeted and oriented to CDC on the Global Symphony platform. The Global Symphony is a media installation featuring three, three-minute stories that describe CDC’s contributions to the elimination of polio, an historic Legionnaires’ disease outbreak, and the battle to stem the rise of obesity in the United States. Following the orientation, students will be divided into two smaller groups. One group will tour the exhibit area while the other group watches a video about CDC. Approximately 40 minutes later the groups will trade places. Through the context of the history of CDC exhibit, students will learn about infectious and chronic diseases studied at CDC, the bacteria, viruses and risk behaviors that cause diseases, and prevention methods like immunization and healthy lifestyles. Following the guided tour and video presentation, students will have the opportunity to try on a Biosafety Level 4 lab suit and explore the exhibit area independently.

**Time Frame:**

This research unit will take approximately 9 weeks to complete.

**Learner Performances:**

Students participating in this research project should know and be able to:

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| * Read classic and contemporary works
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| * Read for varied purposes such as to be informed, to be entertained, to appreciate the writer’s craft, and to discover models for his/her own writing.
* Use multiple sources, including electronic texts, electronic data bases, electronic web-based projects, field experts, technology, and print resources, to locate and organize information.
* Summarize, record, and organize information from multiple sources by taking notes,

outlining ideas, and making charts.* Produce research projects and reports in effective formats for various audiences.
* Communicate with students globally about disease management through IECC and ePals
* Connect with mentors and experts in the field of disease management through CARE U.S.A. and international telementoring
* Present organized statements, reports, and speeches using visuals or media to support meaning.
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This research project touches all levels of Blooms Taxonomy from simple Knowledge and Comprehension skills up to Analysis, Evaluation, and Synthesizing of new ideas and ways to seek solution to real authentic problems. Students will also work with information found on [www.nationalgeographic.com](http://www.nationalgeographic.com) to predict future disease trends resulting from environmental and political influences like climate change and bioterrorism.

**Standards Assessed:**

**For the literature based component of this unit and the reading of Richard Preston’s *Hot Zone,* students will address the following standards:**

**ELA8R1 The student demonstrates comprehension and shows evidence of a**

**warranted and responsible explanation of a variety of literary and informational**

**texts.**

For **literary texts**, the student identifies the characteristics of various genres

and produces evidence of reading that:

* Identifies the difference between the concepts of theme in a literary work and

author’s purpose in an expository text.

* Compares and contrasts genre characteristics from two or more selections of

literature.

* Compares and contrasts motivations and reactions of literary characters from

different historical eras confronting similar situations or conflicts.

* Evaluates recurring or similar themes across a variety of selections, distinguishing

theme from topic.

* Evaluates the structural elements of the plot (e.g., subplots, climax), the plot’s

development, and the way in which conflicts are (or are not) addressed and resolved.

**For the research component of the unit, students will address the following standards:**

For **informational texts**, the student reads and comprehends in order to

develop understanding and expertise and produces evidence of reading that:

* Analyzes and evaluates common textual features (e.g., paragraphs, topic sentences,

concluding sentences, introduction, conclusion, footnotes, index, bibliography).

* Recognizes and traces the development of an author’s argument, point of view,

or perspective in text.

* Identifies messages and themes from books in all subject areas.
* Responds to a variety of texts in multiple modes of discourse.
* Relates messages and themes from one subject area to those in another area.
* Evaluates the merits of texts in the subject disciplines of Language Arts, Science, and Social Studies.
* Examines the author’s purpose in writing.
* Recognizes and uses the features of disciplinary texts (e.g., charts, graphs, photos,

maps, highlighted vocabulary).

The student produces a piece of **writing drawn from research** that:

* Poses relevant and tightly drawn questions about the topic.
* Engages the reader by establishing a context.
* Conveys clear and accurate perspectives on the subject.
* States a thesis.
* Records important ideas, concepts, and direct quotations from significant

information sources, and paraphrases and summarizes all perspectives on the

Topic, as appropriate.

* Uses a variety of primary and secondary sources and distinguishes the nature

and value of each.

* Organizes and displays information on charts, maps, and graphs.
* Provides a sense of closure to the writing.
* Documents resources (bibliography, footnotes, endnotes, etc.).

**For the Technology Components of this unit, students will address the following ISTE standards:**

* Creativity and Innovation: Student demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology. Students will:
	+ apply existing knowledge to generate new ideas, products, or processes.
	+ create original works as a means of personal or group expression.
	+ use models and simulations to explore complex systems and issues.
	+ identify trends and forecast possibilities.
* 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 will:
	+ interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media.
	+ communicate information and ideas effectively to multiple audiences using a variety of media and formats.
	+ develop cultural understanding and global awareness by engaging with learners of other cultures.
	+ contribute to project teams to produce original works or solve problems.
* Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information. Students will
	+ Plan strategies to guide inquiry
	+ locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media
	+ evaluate and select information sources and digital tools based on the appropriateness to specific tasks.
	+ process data and report results
* 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 will:
	+ identify and define authentic problems and significant questions for investigation.
	+ plan and manage activities to develop a solution or complete a project.
	+ collect and analyze data to identify solutions and/or make informed decisions.
	+ use multiple processes and diverse perspectives to explore alternative solutions

**The “hook” or Introduction**:

Below is the invitation and scenario that students will be given after having shown a clip from the movie “Outbreak.”

Invitation: Imagine what it would be like to know that the survival of the world rests in you and your team’s hands. How would you feel knowing that you had to risk your life to go to the “Hot Zone” of a biological disaster in the making? What would you do if you were faced with making choices that could endanger the lives of you and your teammates…even the lives of the entire world? Could you handle the pressure?

Scenario: You are a member of a very important team of physicians and government officials employed by the Centers for Disease Control and the U.S. Government’s Homeland Security. Your team specializes in the research and containment efforts of all kinds of infectious diseases. Additionally, the CDC is in need of updated information on disease outbreaks and containment efforts and wants to hire you and your team to investigate. You have received a phone call on the “red line” that an outbreak has occurred that needs your immediate attention. Several people have died, and many are sick. You and your team must now go to the site of the outbreak to assess damages, create an action plan for containment, and bring the outbreak to a successful close. What will you do? Can you succeed?

Audience: Students will work, in collaboration with the CDC Educational Department as well as with Paul Giannone, a personal friend who works at the CDC (for information about Paul, please click on this link: <http://www.cdc.gov/globalhealth/leadership/giannone.htm>). Paul works with the Global Disease Detection and Emergency Response Unit at the CDC, and is the “on-site” person when global disease outbreaks occur.

NOTE: I am in the process of working with Paul to arrange for him and his Unit to work with my students as they develop their research and share their outcomes with a wider audience. As of last Tuesday, December 6, 2011, Paul was notified and hand-delivered THIS Engaged Learning Project outline. We are in the process of working out ways in which his unit and my students can

engage in some professional collaboration. We plan to invite Paul and representatives from his unit at the CDC to come to Griffin for culminating presentations. We are also working on organizing a plan for students to use their research to support the efforts of Paul’s Unit. Specifics are still under development at this time.

This project is interesting to students because it is interdisciplinary in nature and it is quite novel. Kids will love the idea of connecting with experts in the field and taking a field trip to the CDC. Students also love the idea of an extended simulation in which they get to role play and adopt the parts of adult professionals.

**Process:**

The Unit goals and objective are listed in the standards outlined above and in the learner performances outlined above.

Some essential questions that students will answer during the course of their research will be as follows:

* What is the nature of disease, and how does it get transmitted?
* How does technology play a role in your research and interaction with others?
* What are the inherent challenges of working together in a group and how do you go about addressing these challenges?
* How is the idea of global interdependence reflected in disease research? In the experience you have had with people from the CDC, your on-line mentor, and your on-line students? How did they influence the way you addressed the demands of your job?
* How is interdependence played out in your groups as you play your roles? As students trying to get a project done?
* How difficult is it to work with various fields of expertise in ONE scenario? What were the difficulties and how did you overcome them?
* In what ways are leadership and cooperation important given this scenario/simulation?
* Where does the idea of ethics (feelings of right and wrong) come into the picture?
* How are constitutional rights affected during a major crisis of national proportions?
* How important is organization and planning?

**Teachers will do the following to introduce the unit:**

Prior to project roll out:

* Teacher will organize and initiate on-line connections to ePals and telementoring programs, making it possible for students to “run the show” once processes are initiated.
* Teacher will set up field trip to CDC, organize CDC Public Relations visit to the school, and connect students with CDC experts in the field.

Day of Project Roll Out:

* Divide students up into groups of 5-6 students. Assign them a color (blue, green, or red). Groups are divided according to the way a disease can be transmitted (airborne, bodily fluids, and vector transmission). Each group has a different scenario they must attend to.
* Hand out packet outlining the simulation/scenario that your students will be undertaking. (see attached)
* Read the Invitation and the scenario to students.
* Introduce the students to various technology media available to students throughout the research process using mini-lessons to convey how to navigate the various technology opportunities.

During Project:

* Teacher will lead mini-lessons on technology and research skills throughout the course of the project.
* Teacher will create Blackboard writing prompts for students to answer throughout the project (one HOTS question per week to be incorporated into research)
* Teacher will facilitate, guide, monitor, and assess students groups and will work with students to make sure that they are on-target with due dates and responsibilities.
* Teacher will help direct students and guide them to the resources they need to get their questions answered.

**Students will do the following:**

Week One:

* Read and understand the task at hand. During this week, students will view a couple of videos on Hanta and Ebola virus outbreaks and how they are handled.
* Become familiar with the various technologies that will be incorporated in the project through teacher-led mini-lessons. These mini-lessons are for technology responses the students will need to learn about right away and get started on immediately.
	+ Connecting with on-line ePals
	+ Connecting with on-line mentor
	+ Blackboard
	+ Weebly
	+ Inspiration
* After a couple mini-lessons on research skills, students will begin preliminary, general research about their chosen disease.

Week Two:

* Research continues on disease and outbreak management. Students research their disease, gathering various types of data from magazine and newspaper articles, journals, internet resources, etc.
* Attend CDC field trip
* Connect with on-line resources for research through Cobb Virtual Library.
* Continue to connect with on-line classrooms through ePals.
* Continue dialogue with on-line mentor through telementor program
* Teacher mini-lesson on use of Inspiration to track research processes.
* Students continue working with ePals and Telementors.
* Students continue to update Weebly website with new and insightful research and updates re: ePals and telementors.

Week Three:

* Research continues using CVL and other on-line resources provided by the teacher and discovered by students.
* Students will maintain website on an ongoing basis to reflect on their work.
* Students continue working with ePals and Telementors.
* Students continue to update Weebly website with new and insightful research and updates re: ePals and telementors.

Week Four:

* Students begin to utilize their research to start the process of reconstructing their individual emergency scenarios, and creating their emergency plans using Inspiration
* Students will also develop their Prezi presentation outlining the disease information and including pictures of disease.
* Students will maintain website on an ongoing basis to reflect on their work.
* Students continue working with ePals and Telementors.
* Students continue to update Weebly website with new and insightful research and updates re: ePals and telementors.

Week Five:

* Students will present their Prezis on their disease information.
* Students continue to develop an emergency plan which addresses the hazardous nature of an illness.
* Each group will post something significant to their voicethread account and other students will be required to respond. (teacher to assign groups)
* Allow students time to problem solve and to work on their specific scenarios during class time.
* Students will maintain website on an ongoing basis to reflect on their work.
* Students continue working with ePals and Telementors.
* Students continue to update Weebly website with new and insightful research and updates re: ePals and telementors.

Week Six:

* Students present their reconstruction piece as a group to discuss what happened, who was infected, how they went about controlling the outbreak and how outbreak was eliminated.
* Students work in class on PSA announcements using Narrated PowerPoint or videotaping.
* Students will maintain website on an ongoing basis to reflect on their work.
* Students continue working with ePals and Telementors.
* Students continue to update Weebly website with new and insightful research and updates re: ePals and telementors.

Week Seven:

* Students will work on any loose ends they have going.
* Students will seek feedback from telementors and ePals on emergency plans before presenting the final piece.
* Students will present PSA announcements.
* Students will work on finishing up final emergency plan incorporating global feedback as they revise.

Week Eight:

* Students will present emergency plans
* Students will work on reflections of project, identifying their strengths and weaknesses.
* Students will submit emergency plans to the CDC for final approval.

**Students will be assessed** throughout the process with a variety of methods:

* Checkpoint grades on journals
* Formative in-class mini-lesson activities
* Group interaction
* Blackboard participation
* Formative project assessments
* Summative project assessments
* Weekly group reports
* Weebly website (for the group) to document research process

Students are self-directed throughout the entire 8 weeks, with structure provided by the teacher. Groups work together to set goals and generate, with guidance from the teacher, weekly “to do” lists to accomplish final outcomes.

**Products**:

This unit produces a number of different products generated throughout the research process. Technology is integrated along the way (see below) to assist students in reaching their goals. Performance rubrics will be utilized to assess each product along the way. The products that will be created during the course of this unit are as follows:

* Journal (on-line or written, choice for student)—ongoing (individual grade)
* Prezi presentation to define the virus/bacteria and its mechanism of action. This presentation can be used to create a 3D depiction of virus or bacteria (individual grade)
* Reconstruction of disease outbreak outlined in Inspiration, given specific teacher-provided scenario (group grade)
* Voicethread presentation of research with global input into presentation communicated through use of ePals (group grade)
* Blackboard utilized to communicate to group members, to field questions for one another, and to answer teacher research-related prompts
* Emergency plan for disease management and containment (group grade)
* Video-taped or voice annotated PowerPoint PSA regarding disease prevention (group grade)
* Weebly website to be used for written recap of research process and outcomes, including the 5 predicted obstacles and solutions per student in each group, based on his/her particular topic. (individual [webpage per student]and group grade [overall website])

**Technology Resources/Management:**

As is obvious throughout this brief description, technology is integrated throughout the project from using Cobb Virtual Library with its on-line encyclopedias and databases to web-based projects using ePals and International Telementoring Program. Technology is also offered to assist students in coming up with meaningful products which reflect the research they have done (like voicethread, blackboard, prezi, weebly, PowerPoint, etc). Technology supports engaged learning by facilitating the interaction of students between one another and the world at large. It also enables students to reach for higher level thinking skills just by the nature of what they are doing with the technology in communicating their research process. The content is challenging, inviting students to engage in higher level thinking skills and activities. The tasks are

authentic, student-directed, and interdisciplinary. The student plays the explorer, the teacher (even to the teacher!), and the producer, while the teacher facilitates, guides and learns

alongside the students. Technology facilitates collaboration between students in the classroom (Blackboard) as well as students and experts in the world (ePals, telementoring). The assessments are all performance-based, seamless, and generative (through their reflections on weebly).

**Student Skill Development:**

Students will need to understand how to utilize ePals (<http://www.ePals.com>) and International Telementoring Program (<http://www.telementor.org>) . They will need to be familiar with how to use voicethread and Prezis. Teachers and students alike can access **tutorials** on the following websites ([www.voicethread.com](http://www.voicethread.com) and [www.prezi.com](http://www.prezi.com)). Students will also need to become familiar with Cobb Virtual library and the various resources available there, to include on-line encyclopedias and databases, as well as specific websites like [www.nationalgeorgraphic.com](http://www.nationalgeorgraphic.com) and [www.cdc.gov](http://www.cdc.gov). As a teacher who has implemented these technologies in the classroom already, I can say that stepping in and doing them is the best teacher. I always establish with my gifted kids up front that we are a learning TEAM, and that I am learning just as much as they are as we slog through the process together. I have found in my own experience that students enjoy teaching me things I didn’t know before, and I often give extra credit when they can stump me!!

**Adaptations for Special Needs:**

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| Differentiating the Product by: |
|  | * Product Differentiation is built into the unit project. Through the use of a choice matrix, students can choose their methods of communicating their research, based on their comfort levels.
* The group set up is ideal for mixed ability groupings. If there are students who struggle a little more than others, the mixed ability grouping can ensure that all
* students are successful. In the event a student has a disability, that student can be paired up with a stronger student in the group to assist.
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**Assessment:**

Assessments will include a series of formative and summative assessments outlined below:

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| Formative Assessments: |
|  | * Use of Black board to communicate with group members throughout the research project. (individual grade)
* Reconstruction product: Each group has been given a specific scenario that they must use their creative, higher level thinking to reconstruct using Inspiration Software.
* 5 predicted obstacles and solutions per student in each group, based on his/her particular topic, to be created on individual’s Weebly webpage of group’s Weebly website (individual grade)
* Prezi presentation of disease researched: what the virus/bacteria looks like under a microscope, the basic information about the disease, incubation period, symptoms of the disease, average length of illness, mortality rate.
* Voicethread journal updates for global ePals feedback.
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|  | Note: Feedback—teacher must be available to visit each of the groups to see how they are managing their assigned “crisis”. There are many “roadblocks” that are naturally inherent in a complex assignment like this. Teacher acts as afacilitator, empowering students to manage their own problems and opportunities for growth. |
| Summative Assessments: |
|  | * Emergency Plan (group project)—students will have to research specific area of expertise and discuss what job entails in body of emergency plan. Emergency plan reflects what the scenario (current reality) is, what they can do to manage the outbreak, and what needs to be done to contain it. Students must “tie up loose ends” of the people in their scenarios, as well.
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|  | * Journal to include the following (individual grade):
	+ Individual research
	+ Group updates
	+ *Hot Zone* reading reflections
	+ Updates in scenario/simulation
	+ Writing responses to journal topics given in class
* Videotaped or Narrated PowerPoint PSA (group grade)
* Overall written recap of research findings, with a focus on essential questions and the theme of interdependence on Weebly.com (group grade)

Note: Written feedback from teacher (by hand or on blackboard) re: journal entries is a very good way to hold students accountable for their work. The more comments are made, the more effort students seem to invest. |

**Supporting Materials**:

Here are some helpful websites for the successful consummation of this unit project:

[www.weebly.com](http://www.weebly.com)

[www.prezi.com](http://www.prezi.com)

[www.voicethread.com](http://www.voicethread.com)

[www.telementor.org](http://www.telementor.org)

[www.ePals.com](http://www.ePals.com)

[www.nationalgeographic.com](http://www.nationalgeographic.com)

[www.cdc.org](http://www.cdc.org)

[www.engenderhealth.com](http://www.engenderhealth.com)

[www.nih.gov](http://www.nih.gov)

The movie Outbreak is important to use as a “hook” for students.

In Cobb Virtual Library, the following resources are of particular help for this project:

<http://www.worldbookonline.com/student/home>

<http://find.galegroup.com/srcx/start.do?prodId=SRC-4&userGroupName=cobb90289>

<http://ic.galegroup.com/ic/scic/?userGroupName=cobb90289> Science in Context