

Bioterrorism

A WebQuest for grades 9-12 (Biology)

Designed by

Brighton Oothoudt
bri010@earthlink.net

INTRODUCTION:

Bioterrorism are terrorist attacks that use biological agents instead of nuclear weapons and bombs. There are many dangerous viruses and bacteria that can be released into the city that can lead to disease and even death. We do not have a cure or vaccine for many of these infectious biological agents.

TASK:

You are a part of a team that has been working locally for the Center for Disease Control (CDC) near Jonesville, California (population 425,000). Jonesville has just been warned of a possible bioterrorist attack in their city and the CDC has decided to move your team in to assess the situation. Your team will present recommendations to a city council to prepare for the bioterrorist attack.

Your group will be assigned a biological agent to research. Then, within your group, decide who is going to assume the following roles. Use the questions appearing under each role to assist you in your research. While you are responsible for completing the work in your role in the group, you will also be responsible for drawing up recommendations, along with the other members of your team, on how to combat this serious issue.

MICROBIOLOGIST

- What type of agent is threatening your community?
- Is it a viral or bacterial agent?
- What is the agent's life cycle?
- How does it infect an individual?
- Is it air-borne, food-borne, or water-borne?
- What is the incubation time before a person is contagious?
- How contagious is the disease/agent?
- Why is the agent so dangerous?
- What does the contagion look like?

CARTOGRAPHER

- What is the rate of infection?
- After infection, how long does it take before a person is contagious?
- What is the city's population?
- Is the city urban and densely populated or is it rural and isolated?
- How long would it take before the entire city became populated?
- What are the calculations you used to arrive at this number?

PHYSICIAN

- What are the symptoms of the disease?
- What do the symptoms look like?
- How does the infection lead to the disease?
- What happens to the body as the disease progresses?
- In what ways can the disease be treated, if any?

ADMINISTRATION

- How can the city become prepared for the attack?
- What kinds of "bioterrorist attack kits" can be made?
- What are possible evacuation routes, if applicable, from the city before the attack?
- Do you need a map of the city?
- What are possible quarantine procedures after the attack?
- How can the city safeguard food or water from any kind of attack or contamination?

Even though each person is responsible for researching a particular aspect or role and his/her own report, you must work together to produce a coherent and organized presentation for the city council meeting.

PROCESS:

The end product of this webquest will be a presentation at a city council meeting recommending what to do in case of a bioterrorist attack. Each "CDC team member" of the team will be responsible for his/her section of research and one-page report while the recommendation will be arrived at through the cooperative efforts of the entire group that you are working with.

1. First, as a group decide on a biological agent (Smallpox, Anthrax, West Nile Virus, Ebola, or a current threat as described by the CDC). Then check with the teacher to see if that biological agent is okay to use in your webquest. Get together with the other members of your group and decide who will assume the

- responsibilities of each of the four roles. Do some "brainstorming" on what ideas may be included in your presentation. Develop a plan of action to determine the organization, contents, and "look" of your presentation.
2. Using the sites listed in the Resource section, begin to research your project. Locate the information necessary to answer the questions listed under your role in the Task section. As you will be creating a presentation, find some pictures that you can use to help illustrate your section, if applicable.
 3. Take notes as you do your research. Bookmark any sites that you find useful so that you can refer to them again quickly if necessary. Keep in mind the rules defining plagiarism. Plagiarism occurs when you steal or use the ideas or writings of another and present these writings or ideas as your own. Use quotes when necessary and don't forget to identify where you got your information from whether it is a website, books, magazines, etc. You will be expected to include your resources in the report as well as at the end of your presentation.
 4. After you have completed your research, begin writing the rough draft of your report. Make sure that you introduce your section so that the reader understands the purpose of your report. As you write, assume the person reading your paper has no knowledge of what you are writing about.
 5. Once each member has completed his/her section, meet with your group to share your reports. This is a great time that you can ask the other members of your group for advice on revising your writing. Write your final draft.
 6. As a group organize a presentation for the city council meeting. Use the ideas from the reports and all the research you have gathered. Keep in mind the questions outlined in each role. Also the following are three main questions that need to be addressed in the presentation at the city council meeting:
 - Why is your contagion considered to be a serious and global issue?
 - What is the rate of infection and how long will it take for the entire city to become infected?
 - How might the city protect itself from an attack? What are some preventive measures that can be taken?

WEB RESOURCES

* CDC- Public Health Emergency Preparedness and Response
<http://www.bt.cdc.gov/>

* US Food and Drug Administration – Counterterrorism
<http://www.fda.gov/oc/opacom/hottopics/bioterrorism.html>

* West Nile Virus
<http://www.westnilefever.com/index.html>

* World Health Organization – Smallpox
<http://www.who.int/csr/disease/smallpox/en/>

* Hidden Worlds Collide
http://www.sciencenews.org/sn_arc97/2_8_97/bob1.htm

* Emerging Infectious Diseases
<http://www.cdc.gov/ncidod/diseases/eid/index.htm>

* Anthrax
<http://www.sunspot.net/news/health/sns-ny-anthraxgallery.htmlstory>

* ScienceNet
<http://www.sciencenet.org.uk/index.html>

* Special Pathogens Branch
<http://www.cdc.gov/ncidod/dvrd/spb/index.htm>

EVALUATION

Bioterrorism Rubric

	Beginning 1	Developing 2	Accomplished 3	Exemplary 4	Score
Role	Does not answer any of the questions assigned to the role in the WebQuest.	Answers some of the questions assigned to the role in the WebQuest.	Answers most of the questions assigned to the role in the WebQuest.	Answers all of the questions of the vector or biological agent.	
Report	No information given as to the purpose of the report.	Some information given as to the purpose of the report.	Adequate information given so that reader is aware of the purpose of the report.	Introduction shows that the writer is very aware of the reader.	
Grammar and Syntax of Report	Very frequent grammar and spelling errors makes the writing impossible to understand.	Frequent grammar and spelling errors which make the writing difficult to understand.	Grammar and spelling errors do not detract from understanding the writing.	Grammar and spelling errors are infrequent, and writing is clear.	
Presentation (Visual)	Only one role is represented with visual aids.	Only two roles provide visual aids.	Only three roles provide visual aids.	Each role provides visual aides to enhance the presentation.	
Presentation (Context)	There was no attempt to address the questions at all.	There was an attempt made to address the questions.	Addresses the questions as stated in the process accurately.	Addresses the questions as stated in the process thoroughly and accurately.	
Research & Gather Information	Does not collect any information that relates to the topic.	Collects very little information--some relates to the topic.	Collects some basic information--most relates to the topic.	Collects a great deal of information--all relates to the topic.	

CONCLUSION

After having researched, written your report, and presented on your biological agent and bioterrorism, you should have a much clearer idea of the problems caused by such an event. Perhaps now you understand how easily a disease can spread and the importance of studying microbiology and the human body.

TEACHER EXTRAS

Before you start the webquest, jigsaw (<http://www.jigsaw.org/index.html>) with articles or papers regarding bioterrorism and infectious diseases. This will introduce the idea and spark interest about the topic without giving away too much information. The jigsaw will also build literacy skills and communicative skills among the students.

Glo Germ (<http://www.glogerm.com/>) is also great for the demonstration of contamination/transmission of germs. It can be used along with a lesson on the spread of the Black Plague (<http://www.mrdowling.com/703-plague.html>). For instance you could use a map (<http://www.mrdowling.com/703plaguemap.jpg>) of the infected areas of Europe to demonstrate global spread of disease. Start the students on an activity and contaminate paper or other tools used during the activity with Glo Germ and then use a black light to see where the powder has spread at the end of the activity. The powder is nearly undetectable.