

**PBL Unit Title:** Viruses Released

**Primary Subject Area:** Biology

**Interdisciplinary Areas also Covered:**

**Grade/Age Level:** 7<sup>th</sup> Grade

**Description of students' role and problem situation:** Students will perform various tasks. They will be experts in five fields of study to develop a procedure for this problem. They will have to determine the virus and possible treatment.

**Educational Objectives: (Indicate if unit is interdisciplinary, but only list the objectives from primary subject area)** Interdisciplinary  
Students must be able to identify cells and relate them to viruses and body systems.  
Students must be able to identify body system functions.

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**School Name:** Four Oaks Middle School

**School Location:** Four Oaks, North Carolina

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# WFOMS Special Report

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*Reporting by: Ashton Wood*

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I am Ashton Wood reporting live from Four Oaks Middle. It has been reported an unmarked box containing perfumes given out to students about three weeks ago in the student commons caused a disaster. The vender distributing the perfume was not authorized by our school to be on the premises. Many of the students who received the perfume immediately opened the package dispersing the perfume into the air. The perfume has been sucked into the air system and dispersed to the classrooms filled with students. According to e-mails recently received by our staff, the perfume sample was reported to be poisonous, carrying a deadly virus. I have been told that at this time the proper experts have been notified to contain the situation. Dialing 911 in most communities activated the local emergency response system; local law enforcement authorities should be notified. The local FBI field office and local and state public health authorities also have been notified however; all students are to remain in their classrooms until proper action can be taken for these measures. We will keep you informed of any further developments. Back to your regularly scheduled Program.

## *A Word from the Principal*

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You are a team of experts assembled to assist our school solve this problem. Not reported on the news reports issued is that three of our seventh grade students have been reported to have symptoms arising since the attack. At first, we thought these three students were suffering from the flu. They complained of feeling under-the-weather; feeling fever, nausea, vomiting, headache, and backache. Then, severe abdominal pain and disorientation set in, as small, round sores erupted all over the skin. We need your help to determine the virus that is affecting our school and how to deal with the issue at hand.

### Group 1 School Officials

You are members of the school office. It is your job to maintain control of the school and parents. We cannot allow any students to leave or parents to enter the school without causing hysteria, according to the county terrorist plan, the school must be quarantined. You may contact members of the media, law enforcement, or other sources to assist you. This is a pressing matter so you must complete your assignment in one day and give your results tomorrow.

### Group 2 CDC

You are members of the CDC needed to research the symptoms of these students and the situation to determine the disease we need to focus upon and its effects. Since, time is

short and very limited we have provided you with the information sources requested. You have two days to complete your task

#### Group 3 Medical Experts

Now that we have determined the disease we are dealing with and the effects of this virus if untreated, we need to know what body systems are affected and methods to treat the sick people affected from this outbreak. You need to provide the body systems affected and possible solutions for treatment of each system. Again time is limited and you are provided with support and equipment so you must report back in two days.

#### Group 5 FBI

You are members of the FBI your job is to keep this situation from occurring again. You must evaluate the situation, suggestions, and procedures from the four other groups and establish a guideline for future outbreaks. This outline is a suggestion so that people will know what to do in the event of another outbreak. Give possible solutions and reasoning as to why those solutions worked or will work in the event of a future outbreak. You have three days to complete and present.

## **Meet the Problem**

### **Goal:**

The students should be able to determine the virus released based on the symptoms, analyze the systems affected and its possible outcome, and develop suggestions for treatment and guidelines for prevention or future cases.

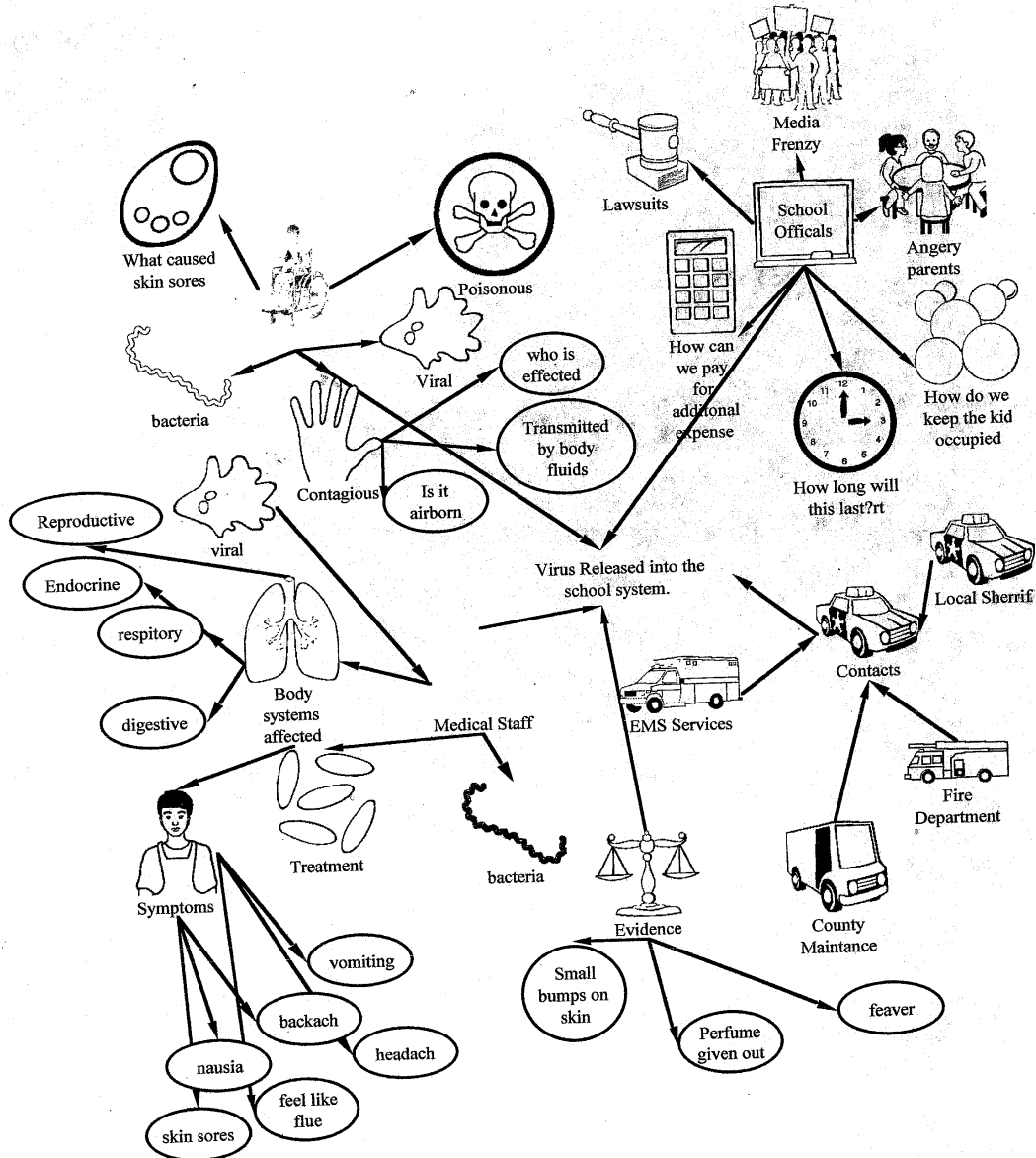
### **Role and Situation:**

The situation is that an airborne virus was released presenting three students in the seventh grade with small poxes. The students take on several roles. First as school officials acting to maintain peace. Second as the Center for Disease Control, determine the virus and advise the medical staff of its potential. Third would be the medical staff, which would research the systems affected and develop treatment. Finally the FBI would evaluate the action taken and develop a guideline for future outbreaks.

The teacher would be facilitator and coach

### **Materials:**

Internet and Internet sites linked to the CDC



<b>Know</b>	<b>Need to know</b>
Unmarked box containing perfumes were given out to students Who delivered the box UPS, FedEx, etc.	
Three weeks ago	What diseases have a three-week onset?
Our school did not authorize the vender distributing the perfume. What disease caused the skin to break out?	
Opened the package dispersing the scent into the air.	Is the perfume a virus or bacteria?
Media was not given all the information	Where these location during the opening of the perfume?
Professionals have been contacted.	What systems of the body are affected?
Some of the report not released to the public	Is this virus contagious?
News will keep the public updated on the reports.	Where are the exits?
Students are to remain in their classrooms.	How do we inform parents without creating a panic?
Parents will be irate and searching for information.	How do we keep parents out and students in?
The perfume has been sucked into the air system.	What markings were on the box?
It was then dispersed to the classrooms filled with students.	Where was their students present at school the day of the attack?
The students complained of feeling under the weather.	
Symptoms included nausea, vomiting, headache and backache	What kind of filtration system does the school have?
Professionals were contacted.	We need to track the location of the perfume.
Severe abdominal pain occurred later.	What vents lead to which rooms?
Disorientation sets in and small round sores erupt.	Is the virus an airborne virus?
Students are to remain in their classrooms	Can we contain mad parents?

## Sample Problem Statements

How can we as members of the medical staff present information at the meeting of experts concerning the recent release of perfume, possibly causing a potentially deadly outbreak at Four Oaks Middle?

- 1) Is it understandable?
- 2) Does it offer more than one viable option?
- 3) Does it describe what body systems are affected?
- 4) How are these systems affected?
- 5) How can we assist these people affected?
- 6) What treatment is available?
- 7) What treatment is required?
- 8) What solutions can we use to keep the patients comfortable?

How can we as members of the CDC assess the situation to determine the potential virus?

- 1) What are the complaints?
- 2) What is the duration or onset of the symptoms?
- 3) What are the symptoms?
- 4) What virus has the same symptoms with the same duration?
- 5) Is the virus contagious?

How can we as local law enforcement control the situation and maintain peace?

- 1) Do we need to block off the streets?
- 2) Can we contain the students?
- 3) How do we keep the students occupied?
- 4) How do we contain angry parents?

How do we as school board officials contain the backlash from this event?

- 1) Do we need to hire lowers?
- 2) Will we be sued?
- 3) Will the media broadcast all the events?
- 4) How will we pay for all the activity?
- 5) How will this look to the public?
- 6) What will the Black Survey show?

## Resource List

### Websites:

Center for Disease Control web page

<http://www.cdc.gov/>

<http://www.bt.cdc.gov/Agent/Smallpox/SmallpoxGen.asp>

Journals of the AMA web page

<http://jama.ama-assn.org/issues/v281n22/ffull/jst90000.html>

CNN war on Terror web page

<http://www.cnn.com/SPECIALS/2001/trade.center/biochem.weapons/>

### Guest Speakers:

Harnett County SWAT Team

Director of Emergency Services for Johnston County

School Board Member

Director of Education for Johnston Memorial Hospital

Emergency Medical Director for County Emergency Medical Services

### Books

Fenn A. Elizabeth (2001) Pox Americana: The great smallpox epidemic of 1775-82 . Hill & Wang, Incorporated

Allan Everett (1993) Surgeons, smallpox and the poor: A history of medicine and social conditions in nova scotia, 1749-1793 McGill-Queens University Press

### Brochure

Education Resource Information center (2001) How Can We Help Make Schools Safe for Children? (1st ed.) {Brochure}. Chester R. Robinson and James O. Fuller, ERIC Clearinghouse on Counseling and Student Services.



## Capstone Performance



You are members of the FBI; your job is to keep this situation from occurring again. You must first evaluate the situation, suggestions, and procedures from the four other groups. Determine their relevance to their professional group and if their suggestions and solutions are implement able. Then establish a guideline for future outbreaks, providing solutions based on the advice from the experts from the other groups. This outline is a suggestion so people will know what to do in the event of another outbreak and to prevent further outbreaks. Give possible solutions and reasoning as to why those solutions worked or will work in the event of a future outbreak. You have three days to complete and present. On the Fourth day each team will present their ideas to the other groups of FBI agents that will be assembled. You must persuade and sell your idea to the rest of the agents so your idea will be implemented. In your persuasion you must give a reason for why your topic should be chosen and support it with three basic detailed reasons. To turn in you must write a persuasive paper detailing your reasons and ideas.

(Set up)

The members of the FBI will have an expert from each group previously discussed: (1) Local government (2) School Official (3) Member of the CDC (4) Member of the Medical Staff. These four groups will make up the members of the FBI. This project has been preformed in stages; all groups participated as each expert. As we completed one area the groups were rearranged to give the students new members to work with during the process. The members are reassigned to new members and assigned an area of expertise. Each person is an expert in their area, and they must bring their knowledge and suggestions to the table for discussion to establish a set of standards for other terrorist attacks.

The audience will be the group members of the FBI (classmates) and the director of the FBI (me).

Students will write a persuasive paper, present their topic and attempt to persuade the other members of the FBI to adopt their proposal. They will use visual aids, proper attire, and research as support for their proposal. Each group only has 15min. To present. Other teams will be allowed to ask the groups questions on their topic. The group is expected to carry on a discussion with the other members in support of their proposal.

**(1) Teacher Assessment from Rubric**  
**(2) Peer Assessment**

**Participation Pie**

Divide the pie, give each member a color and label the color with that member's name. With the different colors illustrate how much each member of the group has participated in this task (do not include yourself). Write reasons why you divided each member as you did and give suggestions for ways you might improve effect ness of your group.

Reasons: \_\_\_\_\_  
 \_\_\_\_\_

**Ideas for me to improve:** \_\_\_\_\_  
 \_\_\_\_\_

<b>Individual reflection</b>	<b>Seldom</b>				<b>Always</b>
1) I listened to everyone's ideas first With out input.	1	2	3	4	5
2) I waited until the speaker was finished BefOr speaking	1	2	3	4	5
3) I made certain everyone understood the To The material we were studding.	1	2	3	4	5
4) I contributed to the discussion.	1	2	3	4	5
5) I took good notes and helped my TeaM mated with my notes.	1	2	3	4	5

**(3) Group Evaluation**

<b>Circle One</b>			
Our group	did not get Started in a Timely manor	got started fairly quickly	got started immediately
	Didn't stay On topic	Stayed somewhat on topic	worked together well on topic
	Did not Cooperate	worked together to to some extent	worked together very well tougher
	Only a few Contributed	Most everyone Contributed	Everyone Contributed
	Only a few Listened	Most everyone Listened	Everyone Listened
	Only a few Helped each other	Most everyone helped each other	Everyone helped each other

**One thing we could have done differently next time to improve how we worked together as a team:**  
 \_\_\_\_\_

**One thing we did as a team that really helped me during this problem:**  
 \_\_\_\_\_

# Rudimentary Rubric

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## Objective

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Seventh Grade Standard Course of Study

- 1) 2.03 Analyze human body systems:
  - Form to function.
  - Interrelationships.
- 2) 2.04 Relate disease to biological hazards:
  - Pollen.
  - Viruses.
  - Bacteria.
  - Parasites.
- 3) 4.01 Classify substances based on their properties:
  - Elements.
  - Compounds.
  - Mixtures.
- 4) 1.04 Evaluate human impact on the atmosphere.

## Interdisciplinary Characteristics

### 1) Information Skills Curriculum

Seventh grade students use oral language, written language, and media and technology for expressive, informational, argumentative, critical, and literary purposes. Students also explore the structure of language and study grammatical rules in order to speak and write effectively. While emphasis in seventh grade is placed on argument, students also:

- Express individual perspectives in response to personal, social, cultural, and historical issues.
- Interpret and synthesize information.
- Critically analyze print and non-print communication.
- Use effective sentence construction and edit for improvements in sentence formation, usage, mechanics, and spelling.
- Interpret and evaluate a wide range of literature.

**Strands:** Oral Language, Written Language, and Other Media/Technology

### Competency Goal 1

**The learner will use language to express individual perspectives in response to personal, social, cultural, and historical issues.**

- 1.01 Narrate an account such as a news story or historical episode which:
  - creates a coherent organizing structure appropriate to purpose, audience, and context.
  - orients the reader/listener to the scene, the people, and the events.
  - engages the reader/listener by establishing a context and creating a point of view.

1.02 Explore expressive materials that are read, heard, and viewed by:

- generating a learning log or journal.
- maintaining an annotated list of works read/viewed.
- creating an artistic interpretation that connects self and/or society to the selection.
- constructing and presenting book/media reviews.
- taking an active role in formal and informal book talks/discussions.

1.03 Interact in group settings by:

- responding appropriately to comments and questions.
- offering personal opinions confidently without dominating.
- giving appropriate reasons that support opinions.
- soliciting and respecting another person's opinion.

1.04 Reflect on learning experiences by:

- analyzing personal learning growth and changes in perspective.
- examining changes in self throughout the learning process.
- determining how personal circumstances and background shape interaction with text.

## **Competency Goal 2**

**The learner will synthesize and use information from a variety of sources.**

2.01 Respond to informational materials that are read, heard, and/or viewed by:

- summarizing information.
- determining the importance of information.
- making connections to related topics/information.
- monitoring comprehension.
- drawing inferences.
- generating questions.

2.02 Develop informational products and/or presentations that use and cite at least three print or non-print sources by:

- identifying and using appropriate primary and secondary sources.
- comparing, contrasting, and evaluating information from different sources about the same topic.
- evaluating information for extraneous details, inconsistencies, relevant facts, and organization.

## **Competency Goal 3**

**The learner will refine the understanding and use of**

## **argument.**

3.01 Analyze a variety of public documents that establish a position or point of view by:

- identifying the arguments and positions stated or implied and the evidence used to support them.
- recognizing bias, emotional factors, and semantic slanting.
- examining the effectiveness of style, tone, and use of language.

3.02 Use the problem-solution process by:

- analyzing problems and solutions within various texts and situations.
- utilizing the problem-solution process within various contexts/situations.
- constructing essays/presentations that respond to a given problem by proposing a solution that includes relevant details.

3.03 Create arguments that evaluate by:

- stating a firm judgment.
- justifying the judgment with logical, relevant reasons, clear examples, and supporting details.
- creating an organizing structure appropriate to purpose, audience, and context.

## **Competency Goal 4**

**The learner will refine critical thinking skills and create criteria to evaluate text and multimedia.**

4.01 Analyze the purpose of the author or creator by:

- examining any bias, apparent or hidden messages, emotional factors, or propaganda techniques.
- exploring and evaluating the underlying assumptions of the author/creator.

4.02 Develop (with assistance) and apply appropriate criteria to evaluate the quality of the communication by:

- using knowledge of language structure and literary or media techniques.
- drawing conclusions based on evidence, reasons, or relevant information.
- considering the implications, consequences, or impact of those conclusions.

4.03 Develop the stance of a critic by:

- considering and presenting alternative points of view or reasons.
- remaining fair-minded and open to other interpretations.

## **Competency Goal 5**

**The learner will respond to various literary genres using**

## **interpretive and evaluative processes.**

5.01 Increase fluency, comprehension, and insight through a meaningful and comprehensive reading program by:

- using effective reading strategies to match type of text.
- reading self-selected literature and other materials of individual interest.
- reading literature and other materials selected by the teacher.
- assuming an active role in teacher-student conferences.
- engaging in small group discussions.
- taking an active role in whole class seminars.
- analyzing the effects on texts of such literary devices as figurative language, dialogue, flashback, allusion, and irony.
- analyzing the effects of such elements as plot, theme, point of view, characterization, mood, and style.
- analyzing themes and central ideas in literature and other texts in relation to personal issues/experiences.

5.02 Study the characteristics of literary genres (fiction, nonfiction, drama, and poetry) through:

- reading a variety of literature and other text (e.g., mysteries, novels, science fiction, historical documents, newspapers, skits, lyric poems).
- analyzing what genre specific characteristics have on the meaning of the work.
- analyzing how the author's choice and use of a genre shapes the meaning of the literary work.
- analyzing what impact literary elements have on the meaning of the text such as the influence of setting on the problem and its resolution.

## **Competency Goal 6**

### **The learner will apply conventions of application of grammar and language usage.**

6.01 Model an understanding of conventional written and spoken expression by:

- using a variety of sentences correctly, punctuating them properly, and avoiding fragments and run-ons.
- using subject-verb agreement and verb tense that are appropriate for the meaning of the sentence.
- applying the parts of speech to clarify language usage.
- using pronouns correctly, including clear antecedents and correct case.
- using phrases and clauses correctly, including proper punctuation (e.g., prepositional phrases, appositives, dependent and independent clauses).
- determining the meaning of unfamiliar vocabulary words using

context clues, a dictionary, a glossary, a thesaurus, and/or structural analysis (roots, prefixes, suffixes) of words.

- extending vocabulary knowledge by learning and using new words.
- determining when and where dialects and standard/nonstandard English usage are appropriate.
- applying language conventions and usage during oral presentations.
- choosing language that is precise, engaging, and well suited to the topic and audience.
- experimenting with figurative language and speech patterns.

6.02 Continue to identify and edit errors in spoken and written English by:

- using common spelling rules, applying common spelling patterns, and developing and mastering an individualized list of words that are commonly misspelled.
- mastering proofreading symbols for editing.
- producing final drafts/presentations that demonstrate accurate spelling and the correct use of punctuation, capitalization, and format.
- listening to and monitoring self to correct errors.
- examining the effectiveness of style, tone, and use of language.

## **(2) Computer Skills**

### **Competency Goal 1**

**The learner will understand important issues of a technology-based society and will exhibit ethical behavior in the use of computer and other technologies.**

1.1 Demonstrate ethical behavior relating to security, privacy, passwords, and personal information. (SI)

1.2 Demonstrate an understanding of copyright by citing sources of copyrighted materials in papers, projects, and multimedia presentations. (SI)

1.3 Describe the impact of technology on the skills needed for the workplace.(SI)

*Grade Level Focus Areas*

- *Using ethical behavior in the use of technology resources*
- *Using appropriate spreadsheet functions to solve problems related to content areas*
- *Selecting and using technology tools to collect, analyze, and display data*
- *Using a variety of technological tools to develop projects in content areas*

**Competency Goal 2 The learner will demonstrate knowledge and skills in the use of computer and other technologies.**

## **Student Characteristics**

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- 1) Cooperation, team work
  - 2) Self-motivated
  - 3) Leadership qualities
  - 4) Able to collaborate and explain ideas
  - 5) The ability to make decisions and sort details.
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## Assessment Rubric

<b>Professionalism</b>	Elaborate dress ties, dresses or dress suit all members dressed appropriate attire	All members dressed appropriate attire	3/4 members dressed appropriate attire	1/2 members dressed appropriate attire	Normal attire	Inappropriate attire
<b>Visual Aids</b>	3 visual aids, neat and easy to follow	3 visual aids not neat or not easy to follow	2 visual aids neat and easy to follow	2 visual aids not neat or not easy to follow	2 visual aids not neat and not easy to follow	1 visual aid neat and easy to follow
<b>Organization</b>	Contains 2 graphic organizers neat ready to begin on time	Contains 2 graphic organizers missing one: neat ready to begin on time	Contains 2 graphic organizers missing both: neat ready to begin on time	Contains 1 graphic organizers neat ready to begin on time	Contains 1 graphic organizers missing one: neat ready to begin on time	Contains 1 graphic organizers missing both: neat ready to begin on time
<b>Performance</b>	Knowledgeable of the subject, Persuasive 3 supporting details participate in discussion used notes as reference no reading	Missing one; Knowledgeable of the subject, Persuasive 2 supporting details participate in discussion used notes as reference no reading	Missing two: Knowledgeable of the subject, participate in discussion used notes as reference no reading Persuasive but no details to support	Not Knowledgeable of the subject, participate in discussion used notes as reference no reading Not persuasive but attempts to provide details	Knowledgeable of the subject, participate in discussion readings notes Not persuasive and no details	Reads notes no discussion Unable to discuss material
<b>Time</b>	12-15min.	11-9min	8-5min	16-20 min	21-25min	Less than 5 More than 25min
<b>Solution Realistic</b>	Solution could be implemented in real life. Solution reflects prior groups ideas. Solution takes in account Budget and prior planning	Solution could be implemented in real life. Solution does not reflect prior groups ideas. Solution takes in account Budget and prior planning	Solution could be implemented in real life. Solution reflects prior groups ideas. Solution does not takes in account Budget and prior planning	Solution could not be implemented in real life. Solution reflects prior groups ideas. Solution takes in account Budget and prior planning	Solution could not be implemented in real life. Solution reflects prior groups ideas. Solution does not takes in account Budget and prior planning	Solution could not be implemented in real life. Solution does not reflect prior groups ideas. Solution does not takes in account Budget and prior planning
<b>Paper</b>	Persuasive 3 details and follows grammar rules detailed conclusion	Persuasive 2 details and follows most grammar rules detailed conclusion	Persuasive 1 details and follows most grammar rules detailed conclusion	Not persuasive but contains details and a good conclusion most grammar rules followed	Not persuasive contains little details but a good conclusion some grammar rules followed	5 sources 1 different sites

## Coaching Questions

### Meet the Problem:

C (1) Is there anything in the problem that is unfamiliar to you?

M (2) What type of problem solving strategies will you use to organize the problem?

EC (3) Could this problem happen in the real world?

### Know/Need to Know

C (1) What do you know based directly from the problem?

M (2) Where can you do to find information based on your knowledge of the problem and the material you need to research?

EC (3) What potential obstacles do you see in this problem?

### Problem Solving

C (1) What is the deadline for your group's problem?

M (2) Did you ask all the members in your group and consider their suggestions?

EC (3) what is the pro's and con's of all your group member's suggestions and how could you use them to establish a solution?

### Information Gathering

C (1) In the list provided where could you find resources?

M (2) How have your suggestions contributed to the group's knowledge of the problem?

EC (3) If you discussed your suggestions with an expert in your area what then? If you don't test your suggestions what then?

### Generating Solutions

C (1) What have you learned?

M (2) How did your group arrive at their solutions and what process did you take to arrive at that solution?

EC (3) Will your solution resolve all the issues concerning the release of the poison and treatment? If not what unresolved issues still remain?

25 points

20 points

15 points

10 points

5 points

## Alternative Solutions

### ----- Rudimentary Rubric

#### Solution One

The school will install all schools with a special high-powered, magnetic computerized, doorway system to unlock the door for someone to enter. The person entering the door will be provided with a badge that contains their ID code. When the person wants to enter a location they will have to scan their badge in front of a magnetic eye on the door. The door and the person's code recorded into the mainframe with the time of entrance will scan the code. If the person does not have a badge there will be an intercom that will have to call the office for approval to enter. By controlling the visitor you may control terrorist from entering the school.

<b>PRO</b>	<b>CON</b>
<b>The scanner will keep track of each person entering the door.</b>	<b>This will cost a lot of money.</b>
If a teacher goes into an area during the time they are suppose to be teaching it will record their badge.	Office staff will have to police the people coming into the school
All visitors will have to be approved before entering. This will cut down on unauthorized staff smoke breaks.	It may be used as big brother to police teachers.
If teacher leaves the school without permission it will be recorded.	Teachers may use each other's badges.

#### Consequences

If the power goes out all doors will remain locked and no one will be allowed to open the door.
If there is a fire drill all doors will be unlocked so anyone can enter without authorization

#### Solution Two

The air vent could have a particulate counter, when the ventilation system counts a certain number of particulates the system will shut down so viruses are not transmitted.

<b>PRO</b>	<b>CON</b>
<b>This will keep particulate from being transferred from one class to another.</b>	<b>This will cost a lot of money.</b>
The air in the classrooms will be cleaner.	When the vent is shut down who will come to reset the system?
This will help students with asthma breath better.	The particulate of a microorganism or a virus is much smaller than that of a dust particle. So what size particles will the particulate count?
The school can determine how clean their air is in the school at all times.	Who will set the number of particulates and will they match viruses?

## Consequences

If there is a strong wind that blows dust from the ball fields into the school the ventilation system will shut down, so there will be no circulation of airflow.
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If the vent system contains a particle counter and the counter reaches the maximum numbers the air condition will shut down even if the temperature is ninety degrees outside until someone comes to check the counter.
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Suggestion one was chosen to be the better suggestion because although it cost a lot of money the benefits out way the problems. In the second suggestion the air system-counting particles is a good idea, but microorganism come in different sizes. Viruses and bacteria that cause diseases are very small particles making it difficult to count the particulate material. Dust particles would clog the system and shut it down allowing the viruses and bacteria to pass through the ventilation system. However, the first solution will assist administration in policing the staff. It will control the visitors, because without permission they cannot enter campus. The scanning system will keep track of the teacher who leave their room while they are suppose to be teaching. The system will help keep unauthorized personal out of the school so they cannot pass out poisonous material.

## Rudimentary Rubric For Debriefing Session

### Review of Student Generated Material:

The students are members of the FBI and their job is to keep the situation from occurring again. The groups have traveled through each station of the assignment. First everyone was a member of the local government. The students were divided into groups of four. They each had to come up with their own solutions for the group. Then the groups were rearranged for the second group, so they are associated with all new members. The second group we worked on is the school officials. Again the students had to determine solutions to the problems addressed. The students were rearranged again for the third group the members of the CDC, and again for members of the medical staff to solve each problem with new ideas and members. Finally, the groups are rearranged for the last group the members of the FBI. Each person in the group is given a title of expertise. One person will be the school official, the local law enforcement, medical staff and the CDC. All of these professionals have been united to set up standards and guidelines for people to follow for further outbreaks. After three days of deliberating the student must write a paper, make visual aids so they can present their solution to the class. It is their job to sell their solution so the class will use their suggestion or parts of their suggestion for a final set of standards that will be summated to the Director of Home land security. All students will present so that it insures that all students' solutions will be shared with all students.

### Rating of Solution

After everyone has presented, the class will discuss + and delta of each groups project. The + is the positive aspects of the presentation and the solutions in the presentation the class would like to submit to the Director of Home Land Defense. The delta is things that could be improved upon. Not necessarily bad aspects but suggestions that need to be addressed so they can be improved. The groups will be asked to discuss each of the other group's solutions they presented. The teacher will ask group one what did you find positive or a suggestion we could use from group two's presentation? Group two what did you have a question about group three's presentation? Each group will rate each other in a round robin style with both positive and negative.

+	Delta
Providing each school with magnetic entrances to all door leading outside, and the staff with magnetic badges that open the door. Only people with the special badge can enter the school with out visiting the office.	Let everyone eat lunch and socialize out side so if the perfume is released it will go in to the air.
The air vent could have a particulate counter, when the ventilation system counts a certain number of particulates the system will shut down.	Frisk everyone before they can enter the building.
Have all deliverymen where be certified and provided with a special badge so when flashed across an electronic eye their code is recorded in the system.	Don't allow any student to wear a coat or bring a book bag to school. That way they could not carry in dangerous material.

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### **One Best Solution:**

Once every group has finished the + delta chart, we will as a class use the + side and some of the reevaluated suggestions from the delta side to formulate a class procedure and guideline that will be submitted to the Director of Homeland Defense.

### **Coaching By Teacher**

The teacher will provide the students the latest research, news articles, memos or websites with the latest news on the topic. As the student s goes through the process the teacher must ask probing questions to redirect students. For example that is a great idea but what do you do if that suggestion does not work? Have you thought about environmental factors and how your suggestion may affect it? During the + delta the teacher may have to redirect the students to give suggestions that could be changed or altered and not allow the delta side to become a complaint session. The groups should be deterred from criticizing other group's work. The delta is used as a helpful tool not a method to criticize other group's work.