

# SOLVE THE OUTBREAK



## Common Core Aligned Lesson Plan High School Level

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### Lesson Element:

The activities included in this lesson plan can be done within two 45 minute or one 90 minute class period.

#### 1. Common Core Learning Standards Addressed:

The activities included in this lesson plan address the following Common Core Learning Standards

- Planning and Carrying Out Investigations.
- Asking Questions and Defining Problems.
- Cause and Effect.
- Obtaining, Evaluating, and Communicating Information.
- Scientific Knowledge is Open to Revision in Light of New Evidence.

#### 2. Learning Targets:

After completing this lesson plan, students should be able to

- Understand how outbreak investigations are carried out.
- Know how to work through an outbreak investigation to solve a problem.
- Explore the steps used to answer science-based questions.
- Identify factors that can influence the quality of data.
- Explore the cause and effect of an outbreak on communities.

#### 3. Resources/Materials:

- CDC's Excite website: <http://www.cdc.gov/EXCITE/>
- Solve the Outbreak on -
  - Android tablets - <https://play.google.com/store/apps/details?id=gov.cdc.sto&hl=en>
  - Apple iPad - <https://itunes.apple.com/us/app/solve-the-outbreak/id592485067?mt=8>
  - CDC website - <http://www.cdc.gov/mobile/applications/sto/web-app.html>
- Additional Resource of Case Studies: <http://www.cdc.gov/eis/casestudies/casestudy-list.htm>
- MMWR reports: [http://www.cdc.gov/mmwr/mmwr\\_wk.html](http://www.cdc.gov/mmwr/mmwr_wk.html)
- Steps in an outbreak investigation <http://www.cdc.gov/opphss/csels/dsepd/ss1978/lesson6/section2.html>.
- Rent or Purchase the movie Contagion.
- Rent or Purchase the movie Outbreak.

#### 4. Activities/Tasks:

- Complete one the Solve the Outbreak scenarios - Deadlier than War, The Queens Killer, and/or Case of the Conference Blues.
- Watch the What is Epidemiology video: <http://www.cdc.gov/EXCITE/epidemiology.html>.

# SOLVE THE OUTBREAK



- Watch the “Global Disease Detectives” video: <http://www.cdc.gov/CDCTV/DiseaseDetectives/>.
- Discuss what happened in the scenario(s) with the classroom linking activities in the app with the steps in an outbreak investigation <http://www.cdc.gov/opphss/csels/dsepd/ss1978/lesson6/section2.html>.

Note: The suggested scenarios included in this lesson plan were selected based on their level of relevance to the selected Common Core Learning Standards listed in section 1. Each of the scenarios are listed as Level 3 within the matrix, meaning they provide direct application of the concepts highlighted by the common core learning standards.

## 5. Access for All:

- If students do not have a device compatible with the app, borrow one from the media center.
- Have students group together with individuals who have the necessary technology.
- Teacher can use projector technology to present the scenario to the entire class.
- Students can access the [Solve the Outbreak app on the CDC website](http://www.cdc.gov/mobile/applications/sto/web-app.html) in a computer lab setting.  
<<http://www.cdc.gov/mobile/applications/sto/web-app.html>>

## 6. Modifications/Accommodations:

- Read the Solve the Outbreak scenario to the student aloud.
- The app has been developed to work with all the accessibility features on Apple and Android mobile tablets (Android tablets 7 inches and above).
- There is also an accessible version on the CDC website <http://www.cdc.gov/mobile/applications/sto/508STO.html>.

## Lesson:

### 1. Assign students to independently search the meaning of epidemiology online.

- Ask students to share what they found online.
- Based on responses, explain what is epidemiology

### 2. Play the “What is Epidemiology” video: <http://www.cdc.gov/EXCITE/epidemiology.html>.

- Verbally assess student’s understanding of the video by asking probing questions regarding what defines the field of epidemiology and have the students provide 2-3 examples of when epidemiology could be used.

### 3. Explain the purpose of Disease Detectives in the Epidemic Intelligence Service and how these scientists use problem-solving skills to prevent the spread of disease.

### 4. Play the “Global Disease Detective” video: <http://www.cdc.gov/CDCTV/DiseaseDetectives/>

### 5. Introduce the Solve the Outbreak app to students and explain the importance of identifying a problem, and establishing a plan (that may need to be modified) in order to determine the cause of an outbreak. Review the Steps to Solving an Outbreak, explain that these are often done simultaneously, need not be in the order listed, that a single activity can address more than one step and that a single step may involve multiple activities.

# SOLVE THE OUTBREAK

6. Have students work in pairs to go through a scenario and answer the questions within the app.
  - Have students explore the “learn more” content link to read more about the process of conducting an outbreak investigation.
7. Provide a high level explanation of the scenario and work through a scenario as a class, asking students to identify what the problem is in the scenario, how the Disease Detective formulated questions to discover the cause of the outbreak, and the importance of establishing a plan to quickly solve the outbreak. Have students link various activities in the scenario with the steps of an outbreak investigation. If there are steps that are not clearly represented, ask students to propose what things might or could have been done that were not represented in the scenario. Ask students to reflect on the types and methods used to collect the data presented in the scenario and to speculate about factors that may have influenced the quality of the data. For example, difficulty in remembering past events often influences the quality of interview data while laboratory data may be influenced by improper collection, transport or storage of specimens as well as the sensitivity and specificity of the tests used to test the samples (i.e., some techniques are more accurate than others). Ask them how they might improve the quality of the data collection.
8. Discuss the importance of cause and effect in regards to the Disease Detective’s decision-making skills, as well as the cause and effect the various characters/victims have in spreading the disease.

## Homework Options:

1. Have students write a one page summary on an outbreak that CDC disease detectives have helped solved. You can view this information in the Learn section of the app under “Who are disease detectives?” and “What type of investigation do Disease Detectives solve?” Ask students to pick an investigation from the list and research it online.
2. Have student’s research careers in public health and write up 3-4 careers, including qualifications, daily activities, and organizations that hire individuals in these fields.