



British Hills

Biology: Lesson Plan



Aim to teach:

- the difference between the main types of germs
- how disease spreads
- key scientific terms when discussing microbiology and diseases

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Resources:

Learning:

Presentation slide
Learning Sheet – 1 per student

Outbreak game per group:

1x board incl. infected cards
1x counter
Epidemiologist cards-1 card per player
1x dice
1x game notes folder
Worksheet – 1 per student

Experiment:

Plastic cup for each student & markers
Tonic water
1x Black light
Recording sheet- 1 per student

1. Introduction to microbiology (20 min.)

- Explain what microbiology is and the transmission types using the presentation. Students have their learning sheets in front of them to refer to and write their own notes.
- Discuss differences between types of germs.

Note: The key terms are highlighted in orange on the PowerPoint.

Students may write on their learning sheet to refer back to throughout the lesson.

2. Discovering the spread of infection (40 min.)

Conduct the experiment - the transmitting of direct germs.

Label the plastic cups 1-20 with a marker. Half fill #5 with tonic water discretely and the rest with water.

- Students each receive a plastic cup.
- Explain to the students that one student is sick (has tonic water in their cup). The students walk around and greet three other people (or use a dialogue that you have given), after which they pour a little of their water into each other's cups. Have students record who they have interacted with on their worksheet.
- After 2 mins stop the interactions and have the students form a circle.



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- d. Notify class that cup #5 was infected (patient zero). The students have to now investigate who are infected based on clues (worksheet records).
- e. After the students have their idea of who is infected, place each cup in a dark area and shine the black light on it. If it glows, they are infected.
- f. Compare
- g. Discuss ways to reduce transmission of germs – discussion, group brainstorming, Q & A etc.

3. Outbreak game (30 min.)

- a. Referring to the experiment, talk about how outbreaks can occur where many people get sick. Introduce the role of an epidemiologist who researches the outbreak. This is what the students will be doing in this board game.

↳ Teacher Guide

The Object:

The object of the game is for players to understand the field of epidemiology. Your students' goal is to discover the following:

- Patient zero - who caused the initial outbreak of the illness?
- Pathogen - What toxic micro-organism caused the outbreak? - What are the symptoms?
- Location - Where did the infection occur?

In order to confirm their suspicions, players will visit the:

- Hospital to collect symptom data and initial patient interviews,
- Restaurant and Airport to investigate where the infection might of occurred,
- Test lab to get the blood test results of the patients, and the
- Medical files office to research what virus it may be.

They must then return to the Department of Public Health (starting square) with all their information and answer the questions found in their 'research report' (worksheet).

Obstacles: The students (epidemiologists) are at risk of being infected during the game. If all become infected to the point of hospitalisation, they are unable to complete the tasks and the game is over.



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The students work as a 'Virology unit' and move around the board as a collective whole using only one counter. To get infected all the player must do is pass the counter *through* an infected square. The student then picks up an infected card to reveal their symptoms and hours which they must tick off on their worksheet. Each player has 12 hours to use before hospitalisation. If hospitalisation is achieved then the player will need to turn their scientist card over.

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If all player cards become hospitalised, they can no longer obtain information and the epidemic wins.

The counter can go through buildings while travelling the board however you must roll an exact number in order to visit each building.

Alternatively, you can play an easier version where, if the player passes through an infected square they must turn their card over. They are out until a team mate or themselves rolls a '6' which will effectively heal them.

Extra teaching points:

- An **outbreak** is essentially the same thing as an epidemic, i.e., an increased frequency of a disease above the usual rate (endemic rate) in a given population or geographic area.
- It can be noted that **symptoms** can be a by-product of the sickness and not from the virus/pathogen itself. An example of this is dehydration (headaches etc.) from throwing up and diarrhea.