

Infections and Abnormalities	Grade 10 - Tissues, Organs & Systems
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<h2 style="margin: 0;">Lesson Plan</h2>	Assessment	Assessment OF, culminating
	Cross-curricular	Physical Education, Chemistry (Acids/Bases)

<p>Big Ideas</p> <ul style="list-style-type: none"> ● Evaluate the importance of medical and other technological developments related to systems biology, and analyse their societal and ethical implications; ● Investigate cell division, cell specialization, organs, and systems in animals and plants, using research and inquiry skills, including various laboratory techniques; <p>Learning Goals</p> <ul style="list-style-type: none"> ● Understand the frequency that diseases, and abnormalities can be spread. ● Be able to use scientific vocabulary such as, but not limited to, diffusion, red blood cells, and absorption, to describe biological processes. ● Investigate and explain in scientific and everyday terms, how an abnormality or disease exists in the body and the systems that it disrupts. 	<p>Specific Expectations</p> <p>1.3 describe public health strategies related to systems biology (AIDS education), and assess their impact on society.</p> <p>2.7 use a research process to investigate a disease or abnormality related to tissues, organs, or systems of humans or plants.</p> <p>2.1 use appropriate terminology related to cells, tissues, organs, and systems of living things.</p>
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Description

In this lesson, students will take part in an interactive simulation to demonstrate the frequency of the spread of infection (ie. AIDS, Sexually Transmitted Diseases, etc). They will then choose an abnormality (ie. cancer), disease or virus to further explore. Lastly, each student (or small groups of students) will research their topic to create a public health announcement educating the public about their findings in a “marketplace” setting.

Materials

NaOH (sodium hydroxide solution)
Phenolphthalein solution
clean test tubes
dropper
Handouts
access to internet and computers

Safety Notes

NaOH is a strong base and corrosive. Care should be taken when handling it. Gloves, lab coat, close toed shoes, goggles and tied back hair is advised.

Introduction

Students will take part in an interactive simulation to demonstrate the rate that transmitted diseases can spread.

Part A:

Give each student a test tube half full with water. Fill only one test tube halfway with phenolphthalein solution instead of water but do not tell the students which one it is. Ask them to pretend that they are at a social gathering and sharing drinks (depending on your students, you could also relate it to sexually transmitted diseases). Students will “share” drinks by choosing a partner, pouring a little of their solution into their partner’s test tube and having the partner do the same to their test tube. They will then move onto another partner until the teacher asks them to stop. (Depending on the size of the class, the teacher will want to give them at least 2-5 minutes to do this.)

Part B:

After the teacher asks them to stop, he/she will walk around with the NaOH (please see safety notes for handling NaOH) and carefully put a drop of NaOH into each test tube. Some of the students test tubes will turn pink (this is because the phenolphthalein solution is an indicator that turns liquid pink in the presence of a base). The pink signifies the disease. Have a class discussion around the fact that the “social” began with only one infected test tube but now there are much more. Points to discuss are:

- the number of test tubes or people infected in the amount of time that it took them to “share” and what does this signify in the real world;
- Do all diseases or abnormalities spread this way and why or why not. Which ones do and don’t;
- Based on the disease and abnormalities that we discussed, why is it important that everyone around us know this information as well?

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- What other wonderings do the students have?
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Action

Part A:

Lead students into discussing:

- why it is important to educate others about the risks, prevention and how to take care of, diseases, viruses and abnormalities;
- effective ways of making the public aware.

Part B:

Students will choose and research a common/current disease, virus or abnormality. They will fill out the handout and checklist provided ensuring that they include all the relevant points. They will then create a public health announcement (ie. billboard, online presentation, etc) for a marketplace type venue. Students will also be responsible for doing a short presentation to the “public” (ie. students and teachers from other classes passing by) to help educate them about their topic. Attendees will be given a short peer review to fill out, which can be counted towards the learning skills portion of their report card.

Consolidation/Extension

- Each group of students and teacher will have a mini conference and teacher will assess the student groups with the checklist provided.
 - Group discussion should take place around the experience of this type of activity and whether students enjoyed it and how they would like to alter it to make it better.
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Resources

Rubrics adapted from:

<http://www.dailyteachingtools.com/cooperative-learning-evaluate.html#3>