UF-CPET SSI Lesson Plan

Name: Immune system and Communicable Diseases
Lesson Title: Emerging Pathogens
SSI Topic: Pathogens, Antibodies, and Vaccines

Lesson Length (class periods): 2 days/1 block
Grade Level(s): 9-12

Appropriateness for High School Students
Teaching strategies used: Inquiry-Based Learning - Critical thinking – Peer Teaching

Background

Florida State Standards (NGSSS)
SC.912.L.14.6
SC.912.L.14.52

Performance Objectives
a. Explain the basic functions of the human immune system, including specific and non-specific immune response, vaccines, and antibodies.
b. Explain the significance of genetic factors, environmental factors, and pathogenic agents to health from the perspectives of both individual and public health.
c. Analyze how heredity and family history can impact personal health.
d. Analyze strategies for prevention, detection, and treatment of communicable diseases.

Materials List and Student Handouts
• Pathogens, antibodies, and Vaccines Kit
• Handouts: Lab worksheet and Journal articles

ENGAGE

Overview:

Students will use prior knowledge about diseases and their causes.

<table>
<thead>
<tr>
<th>Activities (Teacher or Student Actions)</th>
<th>Probing Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students conduct a “survey” of different diseases they know about or suffered from</td>
<td>1. What are the diseases that you know about or have been suffered or suffering from? 2. Circle diseases caused by a pathogen.</td>
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</tbody>
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Probing Questions:
- Design questions that guide student explorations, evaluate student understanding, and facilitate student interaction and group collaboration.

### EXPLORER

**Overview:**

**Students will watch a short video: Pathogens (Discovery education)**

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| • Students distinguish pathogenic and non-pathogenic diseases.  
  • Students identify the different types of pathogens. | • What is the difference between a pathogenic and a non-pathogenic disease?  
  • What are the different types of pathogens mentioned in the video? |

### EXPLAIN

**Overview**

**Students will conduct the inquiry-based activity.**

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| 1. Modeling pathogens and antibodies  
  • Compare and contrast 3 types of bacterial infection.  
  • Use the model to describe the function of antigen.  
  • Use the antibodies model to explain how body responds to antigens.  
  • Explain the effect of vaccination on the immune system.  
  • Create and use graphs to compare and contrast primary immune response to secondary immune response. | 1. How do bacteria affect our cells?  
  2. Explain how our immune system responds to bacterial infection. |
## ELABORATE

**Overview**

Students will read the article using the strategy “Read and say something”

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<tr>
<td>1. Summarize general information</td>
<td>1. What is this article about?</td>
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<tr>
<td>2. Illness, cause and symptoms</td>
<td>2. What type of disease in mentioned in the article?</td>
</tr>
<tr>
<td>3. Sources of infection and risk factors</td>
<td>3. What are the cause and symptoms of the disease?</td>
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<tr>
<td>4. Diagnostics and detection</td>
<td>4. How can the disease be diagnosed and detected?</td>
</tr>
<tr>
<td>5. Treatment</td>
<td>5. How can the population prevent future outbreak?</td>
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<tr>
<td>6. Prevention and control</td>
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## EVALUATE

**Overview**

After conducting a research on bacterial meningitis, students will write a persuasive letter to parents encouraging them to have their children vaccinated with the meningitis vaccine.

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<tr>
<td>1. Conduct Internet research.</td>
<td>1. Why is important for people to get vaccinated?</td>
</tr>
<tr>
<td>2. Write a persuasive letter.</td>
<td>2. What arguments you used in order to convince parents to get their kids vaccinated with the meningitis vaccine?</td>
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