

**SCIENCE PROJECT BASED LEARNING UNIT  
– PATHOGENS, VIRUSES, & BACTERIA**

**GRADE: 3-12**

<b>PBL Scenario Plan</b>
<p><b>S – What is the Situation?</b></p> <p>A Criminal (Coronavirus/Escherichia Coli) is loose in the community and the police force is searching for the “wanted” criminal.</p>
<p><b>C – What is the Challenge?</b></p> <p>You will create a “Wanted” poster to help community members identify the culprit. The “Wanted” poster should include important information specific to your “criminal”. You will create a Sheriff Department TV announcement (including your Wanted Poster) to help alert the community members to be on the look out for your specific “criminal”.</p>
<p><b>R – What Role(s) does the student assume?</b></p> <p>Sheriff Department Investigator</p>
<p><b>A – Who is the Audience?</b></p> <p>Students/Community Members</p>
<p><b>P – What is the Product or Performance?</b></p> <p>Wanted Poster, Sheriff Department TV announcement</p>

## Unit Plan

LS1.A: Structure and Function

LS1.B: Growth and Development of Organisms

LS1.C: Organization for Matter and Energy Flow in Organisms

LS3.A: Inheritance of Traits

LS3.B: Variation of Traits

- Relating ways chance, mutagens, and genetic engineering increase diversity. Examples: insertion, deletion, translocation, inversion, recombinant DNA.
- Identifying ways in which organisms from the Eubacteria and Archaeobacteria kingdoms are beneficial and harmful. Examples: beneficial--decomposers; harmful—diseases.
- Justifying the grouping of viruses in a category separate from living things.
- Contrasting autotrophs and heterotrophs.
- Describing the niche of decomposers.

Outcomes: Be able to tell the difference between a bacteria and a virus. Be able to tell the different between Coronavirus and Escherichia Coli

Essential Question: If you are sick and you go to the doctor, why would it be important to know the difference between an illness caused from a Escherichia Coli and an illness caused from a Coronavirus?

Unit Questions: Why is Coronavirus not considered a living organism? Can all Escherichia Coli be easily killed with antibiotics? How do Coronavirus and Escherichia Coli obtain energy?

Content Questions: (Align with content standards and learning objectives and support the Essential and Unit Questions)

- Illustrate and construct the three-dimensional structure of a Coronavirus and identify the parts of Coronavirus?
- Describe and the reproduction cycle of both the Coronavirus and Escherichia Coli?
- Analyze the various shapes of bacteria and viruses?
- Distinguish the different among photosynthesizers, chemoautotrophs, and heterotrophs, and research about 2 to 3 other types of bacteria/viruses that fall under each category.

Day 1	Day 2	Day 3	Day 4	Day 5
PBL Overview Research: Virus/Bacteria, Coronavirus/ Escherichia Coli	Research: Virus/Bacteria, Coronavirus/ Escherichia Coli	PAGES tutorial and practice	Create PAGES “Wanted” Poster	Create/Edit iMovie
Day 6	Day 7	Day 8	Day 9	Day 10
Create/Edit iMovie	Create/Edit iMovie	Presentations		

## Virus/Bacteria PBL Project Student Directions/Information Sheet

### **S – What is the Situation?**

A Criminal (Coronavirus/Escherichia Coli Bacteria) is loose in the community and the police force is searching for the “wanted” criminal.

### **C – What is the Challenge?**

You will create a “Wanted” poster to help community members identify the culprit. The “Wanted” poster should include important information specific to your “criminal”. You will create a Sheriff Department TV announcement (including your Wanted Poster) to help alert the community members to be on the lookout for your specific “criminal”.

### **R – What Role(s) does the student assume?**

Sheriff Department Investigator

### **A – Who is the Audience?**

Students/Community Members

### **P – What is the Product or Performance?**

Wanted Poster, Sheriff Department TV announcement

**GRADING: (200 total points)**

**Research Graphic Organizer – 50 points possible**

**Wanted Poster – 50 points possible**

**Imovie Participation (based from your role) – 50 points possible**

**Imovie Presentation – 50 points possible**

# Research Graphic Organizer

<b>Photo or Illustration</b>	<b>Description</b>
<p data-bbox="391 373 581 401">Shape and parts</p>	<p data-bbox="834 373 1382 443">Description of pathogen is clear and complete. Includes name.</p>

**Transmission**

Describes how the pathogen infects its host in detail.

**Who does it victimize?**

Tells where the pathogen strikes and on whom it strikes, with detail.

Name: \_\_\_\_\_

Date \_\_\_\_\_

### Wanted Poster Rubric

Requirements	YES	NO	POINTS
Scientific name of pathogen			
Common name of pathogen			
Who does it victimize?			
Symptoms			
Treatments/Prevention			
1 interesting fact			
1 picture of pathogen			
1 picture of infected person			
All text is clear and consistent			
Uploaded and Shared on Googledocs			
Design is professional			

Total points \_\_\_\_\_ /50

Name: \_\_\_\_\_

Date \_\_\_\_\_

### TV Announcement Rubric

Requirements	Yes	No	Points
Length of iMovie is 2:00 – 2:30 minutes long			
Includes pictures of pathogens and infected people			
Includes a description of the pathogen			
Includes an explanation of transmission			
Who does the pathogen victimize?			
Where is the pathogen located?			
What are the symptoms?			
Includes a description of the degree of damage			
Includes treatments			
Explains the pathogen's reproduction process			
Includes at least 1 interesting fact			
Includes video footage			
At least 1 still picture			
At least 1 transition			
Includes text			

Includes sound and/or voice over			
Sound volume is appropriate			
Content is appropriate and related to assignment			
Uploaded and shared on Googledocs			

Total: \_\_\_\_\_/50