ND EPSCoR Life Cycle of a Lytic Bacteriophage Lesson Plan – High School

# Overview

## Lesson Title: Life Cycle of Lytic Bacteriophage

## Lesson Overview:

**This lesson is designed around the life cycle of a lytic bacteriophage. Students are provided with thought provoking questions and meaningful activities to help students take ownership in their learning.**

## Topic(s): Microbiology- Lytic Bacteriophages

**Grade or Grade Band: 9-12**

## Lesson Objectives:

## Students will apply their knowledge of what makes an organism living or non.

## Students will evaluate and construct the life cycle of a lytic bacteriophage.

**Next Generation Science Standards/ North Dakota Standards/CCSS :**

**CCSS:**

[**RST.9-10.4**](https://www.teacherspayteachers.com/Browse/Core-Standard/RST.9-10.4)

**NGSS:**

[**MS-LS1-2**](https://www.teacherspayteachers.com/Browse/Search:bacteriophage/Page:3)

**Time Needed (estimate): 120-180 Minutes**

**Lesson Author: Corey Morin**

**Scientist/K12 Collaborator & University:**

**Scientist Bio/Research:**

# Preparation/Materials

**Background knowledge students must have to be successful:**

Students should have a background knowledge of what DNA means/contains and how viruses work/replicate.

## Differentiation and accommodation to support learning for all students:

## Responses can be orally given.

## Students can be given extra time and alternate settings to complete tasks.

## Groups can be allowed for students who need extra help.

## Visual aides are included in the presentation along with auditory learning.

**Essential terminology:**

virus model patterns nature microorganism COVID-19 DNA

geometry RNA organism synthesis proteins replication

**Resources:**

**Websites:**

[**https://www.britannica.com/video/72951/cycle-infection-results-host-cell-death-release**](https://www.britannica.com/video/72951/cycle-infection-results-host-cell-death-release)

**Materials needed:**

Twizzlers (Pull and Peel)- multiple colors

Pipe Cleaners

Internet access

Pencils

Paper

Sticky notes

Gum Drops

Play Dough- multiple colors

Straws

Toothpicks

Markers

# Procedure/Activities

## Lesson sequence:

## Engage: (Power Point) 30 Minutes

## Go over—

## 1.) Viruses: living or non?

## 2.) What is a Virus?

## 3.) Three ways to control viruses

## 4.) Virus structure and types

## 5.) Bacteriophages

## 6.) Lytic VS Lysogenic Cycles

## 7.) 7 phases of the lytic cycle

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## Explore: (Research- Activity 1) 30-60 Minutes

## Students engage in researching thought provoking questions involving viruses and the life cycle of a lytic bacteriophage.

## Explain: (Model and Label Viruses) 60-90 Minutes

## Students will show and explain the life cycle of a bacteriophage.

## Extensions for learning more about this topic:

## <https://www.pbs.org/wgbh/nova/labs/lab/rna/3/1/>

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## *[https://www.lkstevens.wednet.edu › lib › Domain](https://www.lkstevens.wednet.edu/cms/lib/WA01001468/Centricity/Domain/865/virus%20powerpoint.ppt)*

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## *<https://www.cdc.gov › infectioncontrol › ppt>*

## <https://www.exploratorium.edu/snacks/viral-packaging>

## Evaluation of learning (formative or summative task):

Formative- Questions asked throughout presentation and activity. Observation of participation monitored throughout lesson. Feedback can be given to students throughout.

Summative- Review the materials from Activity 1 and 2 to do a summative assessment.

# Additional Lesson Resources / Materials

## Adapted from:/ References:

## <https://www.slideshare.net/HarinathaReddyA/bacteriophage-and-replication>

## <https://www.slideshare.net/AfraFathima5/lytic-lysogenic-cycle>

## <https://bio.libretexts.org/Bookshelves/Introductory_and_General_Biology/Book%3A_General_Biology_(Boundless)/21%3A_Viruses/21.02%3A_Virus_Infections_and_Hosts/21.2B%3A_The_Lytic_and_Lysogenic_Cycles_of_Bacteriophages>

## <https://preview-2.teacherspayteachers.com/8/8215/8215266/b6deb14824e20174bf86aff608dfd3d9?preview-token=exp=1660749556~hmac=8cb8804d884a53e2127a59bf5ec1a9db37331654cf5dbbd572a62ee7d570566f&file_name=demoMiddleSchoolBiologyCellandVirusStructuresColorandLabelActivities8215266.jpg>

## <https://www.anderson5.net/cms/lib/SC01001931/Centricity/Domain/1901/19_Lecture_Presentation.ppt>