

# LESSON PLAN

Template for the submission of local exemplars  
representative of instruction on a flexible instructional day

PDE review shall verify completeness of submission only, not quality or compliance.

LOCAL EDUCATION AGENCY (LEA) NAME Clairton City School District

English Language Arts  Math  Social Studies  **Science**  K-8  **9-12**

STANDARD(S) ADDRESSED (include alpha numeric and standard descriptor)

BIO.B.3.1.1 Explain how natural selection can impact allele frequencies of a population.  
BIO.B.3.1.2 Describe the factors that can contribute to the development of new species (e.g., isolating mechanisms, genetic drift, founder effect, migration).  
BIO.B.3.1.3 Explain how genetic mutations may result in genotypic and phenotypic variations within a population.

LESSON TITLE

**Evolution and Medicine – 9<sup>th</sup> Grade Biology**

LESSON GOALS (planned instructional outcomes)

By the end of the lesson, students will learn the relevancy of the concept of evolution within the medical field, how evolution impacts the design of medicine to fight pathogens, and the role evolution plays in hereditary diseases.

ACTIVITIES (Step-by-step directions for active student participation in support of planned instructional outcome. If instruction is to be delivered via the Internet, please include alternative pathways for lesson completion for those without Internet access.)

- Students start the lesson by watching the “Lesson Introduction” video created by the teacher. The video introduces the goals and objectives for the lesson as well as a tutorial on how to navigate the resources. The entire assessment will also be explained within the video. I brief segment will show how to starting typing their summaries for each topic. In the video it will be explained that if students need to review the concepts of evolution mechanisms, they are to watched a separate attached video of a previous assignment / lecture style explanation of the concepts.
- The video will explain how today’s assignment will help build background knowledge for their assignment on the following day where they will be learning how the evolution of illness relates to the current coronavirus crisis.
- The lesson starts with students accessing the provided link to Berkley.edu’s website that explains the theory evolution through various lenses. They will be focusing specifically on the medical field.
- Students will research the first concept: relevance of evolution in medicine.
- Students will research the second concept: the escape of the pathogens: an evolutionary arms race.
- Students will research the third concept: antibiotic resistance: delaying the inevitable.
- Students will research the fourth concept: HIV: the ultimate evolver.
- Students will research the fifth (and final) concept: Huntington’s Chorea: Evolution and Genetic Disease.
- After researching each topic, students will be required to write a five sentence summary for concepts 2-4. Even though some of the concepts are lengthy, students will be given the choice on what particular aspects within their summaries.
- Students without internet access will be given a print out version of the website so that they are able to access the same information as students completing the assignment online.

RESOURCES (materials and/or tools required to complete the activities)

- McGraw Hill Glencoe Biology – Chapter 15 Evolution - Section 3 Shaping Evolutionary Theory
- Teacher created video of the text book reading that narrates the book and provides added context
- Online resource: Understanding Evolution – Berkley.edu -  
[https://evolution.berkeley.edu/evolibrary/article/medicine\\_01](https://evolution.berkeley.edu/evolibrary/article/medicine_01)

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**OPPORTUNITIES FOR ACCOMMODATIONS AND MODIFICATIONS** (*options for adaptations, alternatives, and/or assistive measures within the lesson for English Learners and students with IEPs*)

Accommodations to the assignment are made by altering the sentence requirement for the summaries as well as the content discussed. Advanced students are encouraged to access the provided links on the Berkley.edu website to enhance their knowledge of each concept; these students will include extra sentences in their summaries to accommodate the extra reading they will be completing on the topic. Students who have difficulty with these types of assessments will have a teacher created tutorial video that shows step by step how to complete the assignment. In the tutorial video, I will show students how to start each concepts' summary.

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**ASSESSMENT(S)** (*evidence of learning*)

Students will create a summary essay using Google Docs for their lesson assessment. Students will be required to summarize four sections of the website and information that they researched. Students are required to utilize at least one vocabulary term from Chapter 15 Section 3 of their biology text book while crafting their summaries. The requirements for each paragraph is listed below.

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Students are required to write a one paragraph summary (five sentences) for EACH of the concepts below:

- (1) viruses and how they relate to evolution
- (2) evolution and antibiotic resistance
- (3) the evolution of HIV
- (4) the evolution of Huntington's disease and genetic disorders

The assignment will graded using a four point scale for each paragraph

- 1 = Student attempts to summarize the researched content. Did not meet length requirement and did not present accurate information.
- 2 = Student attempts to summarize the research content. Student provided accurate information appropriate to the topic, but they did not meet the length requirement.
- 3 = Student appropriately summarized research content, met the length requirement, and included accurate information from the source.
- 4 = Student appropriately summarized research content while correctly utilizing vocabulary terms (relating to evolution) learned in class, met the length requirement, and included accurate information from the source.

Chapter 15 Section 3 Vocabulary Terms:

Hardy-Weinberg Principle, genetic drift, founder effect, bottleneck, stabilizing selection, directional selection, disruptive selection, sexual selection, prezygotic isolating mechanism, postzygotic isolating mechanism, allopatric speciation, sympatric speciation, adaptive radiation, gradualism, and punctuated equilibrium.

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