

Theme 7 - Infection

Outcomes	Content	Activities/Resources	Assessment
<p>1. Compare and contrast infectious diseases and noninfectious diseases.</p> <p>Target Standards 4.R.RS.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical contexts relevant to reading comprehension</p> <p>4.S.CC.1 Engage effectively in a range of collaborative discussions a. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.</p> <p>4.S.PK.1 Present claims and findings, sequencing ideas logically and using pertinent descriptions,</p>	<p>What is the difference between an infectious and noninfectious disease?</p>	<p><u>Disease Sorting</u> Activity 1 This activity is intended to determine prior understanding of diseases. Divide the class into small groups and give them the Randomized List of Diseases. Have them sort the list into infectious and noninfectious diseases and ask them to discuss their reasoning with the class or small groups.</p> <p><u>Ebola, Measles, COVID-19</u> Activity 2: Reading 3 Students independently read the articles about Ebola, Measles and COVID19. As they are reading, have them take notes on each disease, with the goal of being able to compare and contrast these diseases. They should refer to the chart and their notes, and write their compare/contrast in complete sentences. (ELL Support: Text readability is approximately 10th grade, so this activity may be adjusted for pair work, or could be eliminated depending on the student group.)</p> <p>Discuss the following questions as a class:</p> <ul style="list-style-type: none"> • What are the characteristics that make something alive? What functions or processes must an object be able to carry out in order 	<p>Accurate sorted list from Activity 1</p> <p>Completed compare/contrast sentences from Activity 2</p> <p>After students view the video, they will create a Venn Diagram to demonstrate how viruses and bacteria are similar and different</p>

<p>facts and details</p> <p>4.W.PD.1 Develop and organize clear and coherent writing in a style that is appropriate to task, purpose, and audience.</p>		<p>to be considered alive?</p> <ul style="list-style-type: none"> Given these characteristics of life, are viruses alive? Consider which characteristics a virus has, which it potentially has, and which it does not and cannot have. Thus far in the activity, the words “living” and “alive” have been used interchangeably. Are they truly synonymous, or is there a distinction that can be made between the two terms? <p>Watch the video “Bacteria vs Viruses: What’s the Difference?” ELL support: Turn on subtitles/closed captions while playing videos.</p>	
<p>2. Identify ways to prevent infection and control the spread of viruses.</p> <p>Target Standards 4.R.RS.3 Follow precisely a multi-step procedure when carrying out experiments, taking measurements, or performing technical tasks.</p> <p>4.R.FW.3 Apply environmental reading to life skills b. Use informational texts, internet web sites, and/or</p>	<p>How can you prevent the transmission of viruses?</p>	<p>Infection Control CDC Review the CDC website for a variety of information on how to prevent infection.</p> <p>Handout: Chain of Infection Discuss as a class this diagram that shows what is needed for an infection to spread and how to stop the process. Review the vocabulary as needed. For additional review, have each student “play” the role of one of the chain links - place students in a circle and have them “act out” the chain of infection, explaining aloud each role.</p> <p>Lesson Plan: How Does Disease Spread? <i>(Lesson takes approximately 1 hour - can be adjusted based on needs of</i></p>	<p>Completed chain of infection and list of potential prevention strategies for the fictional virus in the lesson plan.</p>

<p>technical materials to review and apply information sources for occupational tasks.</p> <p>4.S.CC.7 Predict potential outcomes and/or solutions based on oral information regarding trends.</p>		<p><i>the class</i>) Students will understand the chain of infection through a fictional situation. After assessing the spread of the virus, they will design strategies to reduce the spread. This activity can be done in small groups.</p>	<p>Knowledge Check: Chain of Infection in lesson plan, pages 9-10</p>
<p>3. Explain the features and functions of the lymphatic system.</p> <p>Target Standards 4.R.RS.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually.</p> <p>4.R.RS.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical contexts.</p>	<p>What are the parts of the lymphatic system and how does it function?</p>	<p>Activity: The Lymphatic System Ask students, ‘Why do doctors feel your neck? What are they looking for?’</p> <p>Watch the video Lymph & lymphatic system (video) Khan Academy. Discuss the video as a class. ELL support: Turn on subtitles/closed captions while playing videos.</p> <p>https://sciencenotes.org/human-anatomy-worksheets-and-study-guides/ Choose one of the free Science Notes worksheets to print and ask students to label it accurately. Review terminology together as needed.</p> <p>Activity: Our Cells Ourselves Part 1 of this lesson students play a game called Defend Your Body to learn about the lymphatic system’s functions and purpose. Adjust/condense this lesson and game as appropriate.</p>	<p>Completed labeling of one of the lymphatic system from the free worksheet site.</p> <p>Optional: Students complete the Anatomy of a Lymph Node graphic.</p>

<p>4. Understand what vaccines are and the reasons for them.</p> <p>Target Standards</p> <p>4.R.RS.1 Cite specific textual evidence to support analysis of science and technical texts.</p> <p>4.R.RS.3 Follow precisely a multi-step procedure when carrying out experiments, taking measurements, or performing technical tasks <i>(if students do the paper pathogen activity)</i></p> <p>4.R.RS.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in scientific or technical contexts...</p> <p>4.S.CC.1 Engage effectively in a range of collaborative discussions...</p>	<p>What are vaccines and why are they important?</p> <p>What is the scientific process for developing a vaccine?</p>	<p>To begin, have a whole class discussion about the impact of COVID-19. Prompt students to think about how science and vaccines can impact situations like COVID-19.</p> <p>Distribute the Spike Protein Student Magazine to students. Use the Spike Protein Teaching Guide for a variety of activities using this magazine, including reading comprehension, vocabulary review, and tactile paper pathogen creation. The lesson purpose is to understand the journey of a vaccine. The activity at the end of the teaching guide titled “Model mRNA Vaccine Science” requires students to integrate information from their classroom activity with supporting evidence from the magazine.</p> <p>ELL Support: Provide the Spike Protein Vocabulary List and review with students.</p> <p>Review the vaccine schedules for children and adults, focusing on Table 1 from both documents. Lead students to reflect on their experience with maintaining a vaccine schedule either for themselves or their children. (You may want to include cultural practices and religious beliefs as part of this conversation.)</p> <p>Extension: Provide a sample vaccination record from a doctor’s office (remove identifying information) and have students compare it to the schedule charts above.</p>	<p>Completed “Model mRNA Vaccine Science” handout from the Spike Protein Teaching Guide.</p> <p>Extension: After completing the handout, the students could design their own visual representation of the journey of a vaccine, by creating a diagram, a slide show, or other media presentation.</p>
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<p>5. Understand the use of antibiotics for bacterial infection and potential issues with using antibiotics.</p> <p>Target Standards 4.S.CC.1c Pose and respond to specific questions with elaboration and detail by making comments that contribute to the topic, text, or issue under discussion.</p> <p>4.S.CC.1f Review the key ideas expressed and demonstrate understanding of multiple perspectives through reflection and paraphrasing.</p> <p>4.W.RB.2 Gather relevant information from multiple print and digital sources;... quote or paraphrase the data and conclusions of others while avoiding plagiarism...to produce a completed professional document.</p>	<p>What is the purpose of an antibiotic?</p> <p>What are some potential problems that the use of antibiotics can cause?</p>	<p>Review the difference between types of disease by showing the video “Infectious and Non-Infectious Diseases.” https://www.youtube.com/watch?v=tBC4CGXnV5E ELL support: Turn on subtitles/closed captions while playing videos. Discuss as a class how various illnesses are treated. A group activity may include handing out a card with an illness and having the group discuss what they know about possible treatment options.</p> <p>Activity: Antibiotics There is a useful series of resources on diseases called <i>Pathways</i> - https://nigms.nih.gov/education/pathways/Pages/Home.aspx#basic-science-careers. The unit “SUPERBUGS” includes lessons on understanding antibiotics and their uses. At a minimum, students read the article “Stop the Spread of Superbugs.” The class can discuss the purpose of antibiotics and some issues that stem from the use of antibiotics. (Use the Superbug Teaching Guide page 2, sections 4 & 5 to guide the discussion.) ELL Support: Provide the Superbugs Vocabulary handout as an additional resource, as needed.</p> <p>Distribute or display page 3 of the Superbug Teaching Guide, “Why Did the Medicine Fail?” Students read each scenario and hypothesize what might have</p>	<p>Students are assigned to read the article “What to Know About Antibiotics.” They then create a summary of either the purpose of antibiotics OR the potential problems with the use of antibiotics. Students can draw on any of the resources used during this lesson to produce their summary.</p>
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		<p>happened. Discuss their hypotheses and the 3 comprehension questions as a class or in small groups. (Answers on page 2, section 6.)</p>	
<p>6. Read and interpret graphs and charts related to infection.</p> <p>Target Standards 4.R.RS.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually</p> <p>3.EE.1 Write and evaluate numerical expressions involving whole-number exponents.</p> <p>4.R.RS.3 Follow precisely a multi-step procedure when carrying out experiments, taking measurements, or performing technical Tasks</p> <p>4.R.CI.1c predict probable outcomes from knowledge of events obtained from a reading selection.</p>	<p>What is exponential growth?</p> <p>What are exponents?</p>	<p>Activity: Exponential Growth There is a lot of information covered in the New York Times' lesson, "The Math of Ending the Pandemic: Exponential Growth and Decay." (The answer key is found here.) Teach the whole lesson or select the parts most relevant for your class. At a minimum, complete the following:</p> <ul style="list-style-type: none"> • Have students examine the tree diagram that shows the train of transmission and discuss their observations. • Review the concept of exponents and complete the table created to show exponential growth. Once the table is created, graph the results. Do the same with Exponential Decay. <p>After working with the NYT lesson, complete the Activity: Infectious Disease Protocol. After, use questions 6-15 as class discussion OR for students to complete independently as homework.</p>	<p>Completed assigned questions from the lesson Exponential Growth and Decay for students to respond to in writing, depending on the class discussion.</p> <p>Completed discussion or written answers to questions 6-15 from the Infectious Disease Protocol activity.</p>

<p>7. Understand the causes and effects of an infectious disease outbreak.</p> <p>Target Standards</p> <p>4.R.CI.6 Integrate information from texts, charts, and graphs to draw a conclusion.</p> <p>4.R.RS.11 Transcribe and interpret information, data, and observations to apply information learned from reading to actual practice.</p>	<p>What causes a pandemic to start? What are the effects of COVID?</p>	<p>Activity: What Exactly is a Pandemic? In Part 1 of this activity, students will learn about the differences between an endemic, epidemic, and pandemic through an evaluation of disease patterns.</p>	<p>Within Part 1 of the lesson plan, there are 8 Level of Disease Event Cards that students will use to classify each event as an endemic, epidemic, or pandemic. Their completed classification can be used as an assessment.</p>
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