2 How does disease spread?

CDC NERD Academy

Grade level 6–12

Suggested time 75 minutes

Overview

In this module, students learn how infectious diseases are spread. Using information on a fictional, novel emerging respiratory disease (NERD), students identify key components of a chain of infection, assess the spread of an infectious agent, and design evidence-based prevention strategies to reduce the spread of NERD.

Learning objectives

After this module, students should be able to

- Define chain of infection
- Distinguish between direct and indirect transmission
- Discuss how prevention strategies can focus on different links along the chain of infection to reduce the spread of disease
- Use a model to illustrate a possible chain of infection for NERD
- Create evidence-based prevention strategies to reduce the spread of NERD

STEM connections & standards

STEM connections: Science: microbiology; Engineering: design

Problem-based skills: Scientific design, implementing action plans, collaborative performance

Epidemiology and Public Health Science Core Competencies: HS-EPHS1: Epidemiologic Thinking and a Public Health Approach **https://www.cdc.gov/careerpaths/k12teacherroadmap/pdfs/ephs-competencies.pdf**

National Health Education Standards: Standard 1: Students will comprehend concepts related to health promotion and disease prevention to enhance health. Standard 2: Students will analyze the influence of family, peers, culture, media, technology, and other factors on health behaviors. Standard 7: Students will demonstrate the ability to practice health-enhancing behaviors and avoid or reduce health risks. Standard 8: Students will demonstrate the ability to advocate for personal, family, and community health. **https://www.cdc.gov/healthyschools/sher/standards/index.htm**

Next Generation Science Standards: Science & Engineering Practice(s): Asking Questions and Defining Problems; Developing and Using Models; Crosscutting Concept(s): Cause and Effect **http://www.nextgenscience.org/get-to-know**

Timeline

1 Introducing the content (30 minutes)

Students watch the "How does disease spread?" video (12:42 minutes) to learn about disease transmission, or how disease spreads. Teachers can assess student knowledge of the video content using the **Knowledge Check**. The class can further discuss the role of an infection prevention specialist using the **Career Spotlight**.

2 Activity (35 minutes)

Students use *think, pair, share,* and concept mapping to create a possible chain of infection for NERD and brainstorm strategies to reduce the spread of disease. Teachers can watch an activity demonstration video (2:40 minutes) that illustrates how to teach this activity in the classroom.

3 Class discussion (10 minutes)

As a class, students apply their knowledge to answer questions about how disease spreads.

Vocabulary

Chain of infection, direct transmission, indirect transmission, infectious agent, mode of transmission, portal of entry, portal of exit, prevention strategies, reservoir, respiratory disease, susceptible host.

See **Definitions.**

Materials

Handouts, scissors, tape and highlighter.

Meet Ivy, an infection prevention specialist

Learn more about an infection prevention specialist's role in the **Career Spotlight** and the "How does disease spread?" video.

Teacher preparation

- Preview videos.
- Make copies of handouts.
- Create a classroom version of the **Graphic Organizer: Chain of Infection** (e.g., re-create on whiteboard or large poster or prepare to project the image).

Videos

- "How does disease spread?" video (12:42 minutes) for students
- Activity demonstration video (2:40 minutes) for teachers

www.cdc.gov/scienceambassador/nerdacademy/disease-spread.html

Handouts

- **Knowledge Check: Chain of Infection** (one per student)
- **Career Spotlight: Infection Prevention Specialist** (one per student or one classroom copy)
- **NERD Factsheet** (one per student)
- **Graphic Organizer: NERD Chain of Infection** (one per student)
- **NERD Strategy Cards** (one sheet per group)

Introducing the content (30 minutes)

Say aloud

An agent that causes disease can be spread through a series of steps often referred to as a chain of infection. During this video, you will see how infection prevention specialists use information on the type of infectious agent, how it is spread, and common ways it exits and enters its hosts to create a chain of infection model. This information can then be used to identify appropriate prevention strategies to reduce the spread of the disease.

1. Show the "How does disease spread?" video (12:42 minutes) to students.
2. Hand out the **Knowledge Check: Chain of Infection**. Allow students 3–5 minutes to answer the questions. Then, review as a class using the **Knowledge Check: Answer Key** provided.
3. Hand out or display the **Career Spotlight**. Discuss the role of an infection prevention specialist.

Activity: Part 1 (15 minutes)

Say aloud

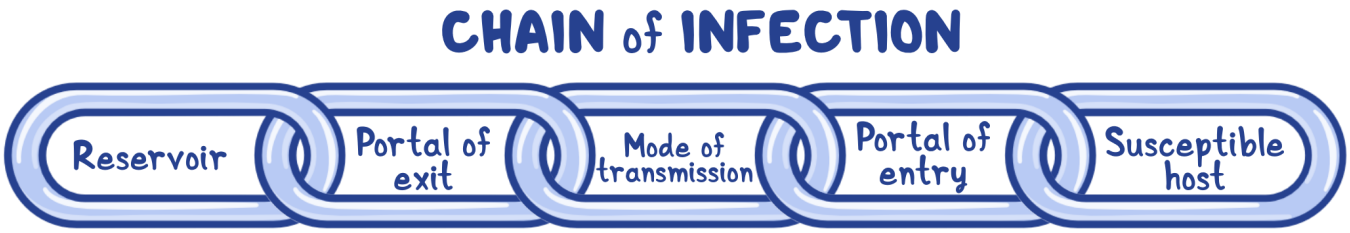
Now that you have seen how infection prevention specialists use a chain of infection model, you will use this information to identify a possible chain of infection for a novel emerging respiratory disease (NERD). You will begin by reading the NERD Factsheet. Factsheets communicate key information about infectious agents and disease to healthcare providers, state and local health departments, and the public. Using the NERD Factsheet, you will fill in a graphic organizer with key information about NERD.

1. Hand out the **NERD Factsheet** and **Graphic Organizer: NERD Chain of Infection**.

2. Have students read through the factsheet on their own, highlighting or annotating information about infectious agent, reservoir, portal of exit, portal of entry, mode of transmission, and susceptible host.

3. Divide students into groups of 2 or 3 to discuss and fill in their graphic organizer with information from the **NERD Factsheet**.

4. Display the classroom version of the graphic organizer. Ask for student volunteers to help complete this version. Use the **Graphic Organizer: Answer Key** to discuss what information should be placed into each section of the graphic organizer and why.



Activity: Part 2 (20 minutes)

Say aloud

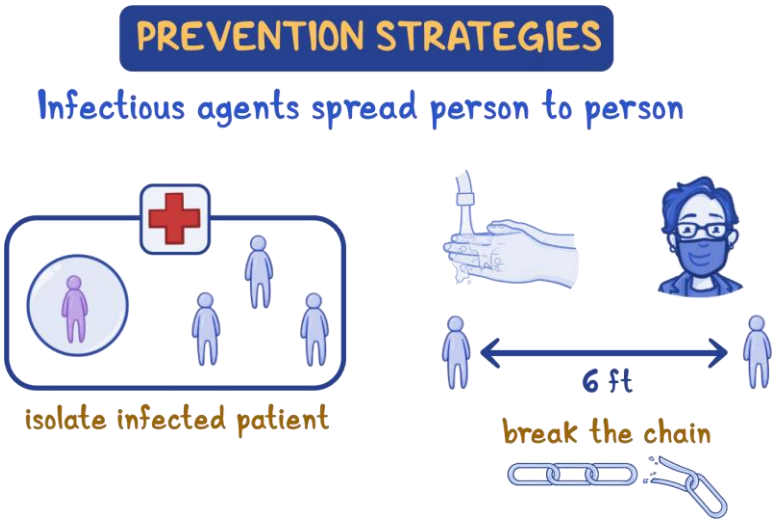
Now that you have a better understanding of a possible chain of infection for the NERD virus, your goal is to use this information to reduce the spread of disease. As a group, you will review the classroom version of the graphic organizer and think about current practices in your school. Consider how people interact with the school environment (e.g., desks, lockers, cafeteria) and each other and how NERD might spread based on these interactions. You will come up with prevention strategies that can reduce the spread of disease. Your strategies should try to break the chain of infection at different points (or links) in the chain.

1. Divide the class into groups of 3–5 students. Hand out the **NERD Strategy Cards** (one sheet per group). Allow groups 5 minutes to brainstorm a list of typical in-school interactions that may allow NERD to spread and realistic prevention strategies that may reduce the spread (Part 1). Encourage students to come up with as many as possible.

2. Instruct groups to select three of the prevention strategies to complete the strategy cards (Part 2). Remind them to choose strategies that break the chain of infection in different points (or links).

3. Ask for a volunteer from each group to present their strategies to the class. After each group presents, ask students to cut out the strategy cards and tape each card to the classroom version of the graphic organizer where the prevention strategy would break the chain of infection.

4. As a class, discuss the strategies using the **NERD Strategy Cards: Sample Answers** as a guide.



Class discussion (10 minutes)

- Why is it important to identify possible chains of infection for an infectious agent and disease?
- What types of prevention strategies are easy to put in place? Why might some prevention strategies be more effective or less effective than other prevention strategies? How might "layering" or using multiple prevention strategies at the same time reduce the spread of disease?
- How might the chain of infection and prevention strategies for NERD change if the infectious agent was foodborne instead of respiratory?

Definitions

Chain of infection: The process that occurs when an infectious agent leaves its source or reservoir through a portal of exit and uses a mode of transmission to reach the portal of entry of a susceptible host.

Direct transmission: The close and immediate transfer of an infectious agent from a source or reservoir to a susceptible host by direct contact (e.g., skin-to-skin contact, or kissing) or respiratory droplets (i.e., droplets that spread through coughing, sneezing, talking, or breathing).

Indirect transmission: The transfer of an infectious agent from a source or reservoir to a susceptible host through an extra step that may include suspended air particles (airborne), inanimate objects (vehicleborne), or living intermediaries (vectorborne).

Infectious agent: Organisms (e.g., bacteria, viruses, parasites, or fungi) that can cause disease or other poor health outcomes as a result of multiplying or undergoing development in a susceptible host.

Mode of transmission: The process by which an agent moves from its source or reservoir to a susceptible host, either directly or indirectly (e.g., respiratory droplets, airborne, direct contact, vehicleborne, or vectorborne).

Portal of entry: The pathway taken by an infectious agent to enter a host (e.g., nose, mouth, or break in skin).

Portal of exit: The pathway taken by an infectious agent to exit a host (e.g., nose, mouth, anus, or blood).

Prevention strategies: Actions that reduce the spread of disease.

Reservoir: The natural habitat (e.g., an animal, water, or soil) where an infectious agent lives, grows, and multiplies**.**

Respiratory disease: A disease that typically involves the lungs and airways within the nose and throat.

Susceptible host: A host (e.g., human, animal, or environment) that an infectious agent can enter and that is not resistant to that agent, which then may cause disease.

For more vocabulary, visit: **https://www.cdc.gov/scienceambassador/nerdacademy/glossary.html**

Extension ideas

- Have students complete a chain of infection model and determine prevention strategies for other infectious agents or diseases (e.g., *Escherichia coli* [bacterial infection], *Vibrio cholerae* [cholera], Mycobacterium tuberculosis [tuberculosis], *Cryptococcus gattii* [fungal infection], rabies virus [rabies]). Search for factsheets on **http://www.cdc.gov**.
- Have students read The Junior Disease Detectives: Operation Outbreak Graphic Novel available at **https://www.cdc.gov/flu/resource-center/freeresources/graphic-novel/index.html**. Complete a chain of infection for the novel influenza virus.

CDC Resources

COVID-19 (Coronavirus Disease): How COVID Spreads
https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/how-covid-spreads.html

COVID-19 Operational Considerations for Schools
https://www.cdc.gov/coronavirus/2019-ncov/global-covid-19/schools.html

Operational Strategy for K-12 Schools through Phased Prevention (Archived webpage is for historical purposes, last updated on May 15, 2021)
https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/schools.html

COVID-19 Vaccines: Key Things to Know
https://www.cdc.gov/coronavirus/2019-ncov/vaccines/keythingstoknow.html

Scientific Brief: SARS-CoV-2 and Potential Airborne Transmission
https://www.cdc.gov/coronavirus/2019-ncov/more/scientific-brief-sars-cov-2.html

Principles of Epidemiology, Lesson 1, Section 10: Chain of Infection
https://www.cdc.gov/csels/dsepd/ss1978/lesson1/section10.html

The Junior Disease Detectives: Operation Outbreak Graphic Novel
https://www.cdc.gov/flu/resource-center/freeresources/graphic-novel/index.html

The CDC NERD Academy curriculum was developed by the Centers for Disease Control and Prevention's (CDC's) Science Ambassador Fellowship (SAF) program with input from STEM teachers and public health experts. Support for the curriculum is made possible through a partnership between the CDC Foundation and CDC. Videos for the curriculum were developed and produced by Osmosis.

Disclaimer: NERD (novel emerging respiratory disease) is a fictional disease created for this curriculum. NERD etiology, data, events, and information presented in the CDC NERD Academy curriculum are loosely based on the understanding of COVID-19 prior to a vaccine becoming available. Some details have been generalized for educational purposes.

Knowledge Check: Chain of Infection

Directions: After watching the "How does disease spread?" video (12:42 minutes), answer the following questions.

1 A chain of infection is

a. the person-to-person transmission of an infectious agent.
b. a process that shows how an infectious agent moves from a source or reservoir to a susceptible host.
c. a strategy for protecting susceptible hosts from infection.
d. a series of actions that individuals can take to prevent disease.

2 For each example below, choose the link of the chain of infection that it represents.

Infectious agent	Source or Reservoir	Mode of Transmission	Susceptible Host

Fill in the blank	Example
	Influenza virus
	Drinking contaminated water
	Person with pneumonia
	Healthy elderly person
	Mosquitoes, fleas, and ticks
	Streptococci bacteria
	Rabid dog
	Infant or baby

3 Provide an example of a prevention strategy shown in the video. Explain how it broke the chain of infection.

(Over)

4 Identify if the following types of transmission are direct or indirect.

Direct (D)	Indirect (I)

Fill in the blank	Example
	Getting bitten by a mosquito
	Coughing (droplet spread)
	Eating a raw hamburger
	Touching a doorknob, then rubbing your eyes
	Kissing

Knowledge Check: Answer Key

Directions: After watching the "How does disease spread?" video (12:42 minutes), answer the following questions.

1 A chain of infection is

a. the person-to-person transmission of an infectious agent.
b. a process that shows how an infectious agent moves from a source or reservoir to a susceptible host. **(Correct answer)**
c. a strategy for protecting susceptible hosts from infection.
d. a series of actions that individuals can take to prevent disease.

2 For each example below, choose the link of the chain of infection that it represents.

Infectious agent	Source or reservoir	Mode of Transmission	Susceptible host

Fill in the blank	Example
Infectious agent	Influenza virus
Mode of transmission	Drinking contaminated water
Source or reservoir	Person with pneumonia
Susceptible host	Healthy elderly person
Mode of transmission	Mosquitoes, fleas, and ticks
Infectious agent	Streptococci bacteria
Source or reservoir	Rabid dog
Susceptible host	Infant or baby

3 Provide an example of a prevention strategy shown in the video. Explain how it broke the chain of infection.

Answer: Answers will vary. Examples could include treating or purifying water at the source or reservoir to destroy or remove an infectious agent that is waterborne, washing hands to remove an infectious agent and disrupt the spread at mode of transmission, or using a vaccine to create an immune response that decreased the susceptibility of the host.

4 Identify if the following types of transmissions transmission are direct or indirect.

Direct (D)	Indirect (I)

Fill in the blank	Example
Indirect	Getting bitten by a mosquito
Direct	Coughing (droplet spread)
Indirect	Eating a raw hamburger
Indirect	Touching a doorknob, then rubbing your eyes
Direct	Kissing

Career Spotlight

CDC NERD Academy

Infection Prevention Specialist

An infection prevention specialist helps develop ways to detect, prevent, and control the spread of disease in healthcare settings which helps keep patients and staff safe. They reduce the spread of disease by collecting and analyzing data on healthcare-associated infections, identifying outbreaks, and using appropriate prevention strategies to prevent and control further spread. Infection prevention specialists are like disease detectives for specific settings such as hospitals.

Meet Ivy, an infection prevention specialist

Who do they work with?

Infection prevention specialists collaborate with health care providers and different public health professionals, including epidemiologists, microbiologists, laboratory scientists, state and local public health officials, healthcare providers, health educators, and communication specialists.

Where do they work?

Infection prevention specialists work in different settings, including health care facilities, hospitals, clinics, and long-term–care facilities. They also work in local and state health departments, and federal and international public health agencies, including the Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO).

What skills do they use?

Infection prevention specialists have skills in problem solving, communication, leadership, and time management. They are flexible, collaborative, and adaptable in a fast-paced environment.

What qualifications do they need?

Most infection prevention specialists have a registered nurse (RN) license and certifications in infection prevention and control. Some have advanced degrees (MD, DO, or PhD) and certification or special training.

NERD Factsheet

CDC NERD Academy

NOVEL EMERGING RESPIRATORY DISEASE

What is NERD?

NERD is a fictional novel emerging respiratory disease caused by a virus that can spread from person to person. NERD symptoms can range from mild (or no symptoms) to severe illness and death.

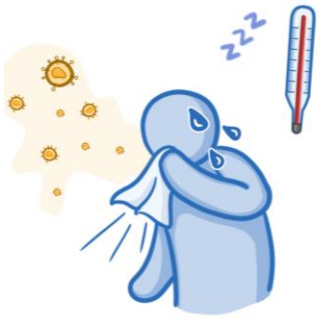
Who can get NERD?

- People of any age can get NERD, even healthy young adults and children.
- People who are older or have certain underlying medical conditions are at higher risk of getting very sick from NERD.
- Other groups may be at higher risk for getting NERD or having more severe illness.

What are the symptoms of NERD?

Symptoms may appear 2–14 days after exposure to the virus. People with these symptoms may have NERD:

- Fever or chills
- Cough
- Shortness of breath or difficulty breathing
- Fatigue
- Muscle or body aches
- Headache
- New loss of taste or smell
- Sore throat
- Congestion or runny nose
- Nausea or vomiting
- Diarrhea



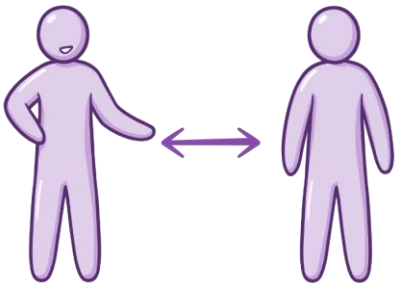
What do I do if I have symptoms?

- Stay home except to seek medical care. Separate yourself from other people.
- Get tested. If you test positive, tell your close contacts that they may have been exposed to NERD.
- You can be with others after at least 10 days since your symptoms first appeared and at least 24 hours with no fever.

Be aware of the signs of severe disease, including trouble breathing, pain or pressure in the chest, confusion, or trouble waking or staying awake. If someone is showing any of these signs, seek emergency medical care immediately.

How does NERD spread?

NERD **most commonly** spreads during direct, close contact:



- When people have direct contact with a person with NERD.
- When a person with NERD releases respiratory droplets when they cough, sneeze, sing, talk, or breathe, and these droplets are inhaled by another person who is physically near (within 6 feet).

NERD **sometimes** spreads through airborne transmission, especially indoors:

- When a person with NERD breathes heavily — such as when exercising, singing, or shouting — they can produce more respiratory droplets that can linger in the air for minutes to hours.

NERD is **less commonly** spread through contact with contaminated surfaces.

- When a person touches a surface or object with the virus on it and then touches their mouth, nose, or eyes.

What if I have been in close contact with someone with NERD?

Close contact is defined as being within 6 feet of a NERD-positive individual for a total of 15 minutes or more.

- Separate yourself from other people. A person infected with NERD can spread the virus starting 48 hours, or 2 days, before the person feels any symptoms or tests positive.
- Watch for symptoms until 14 days after exposure.
- If you do not have symptoms, you can be with others 14 days after your last contact with someone with NERD.
- If you have symptoms, you can be with others after at least 10 days since your symptoms first appeared and at least 24 hours with no fever.
- Get tested. If you test positive and have no symptoms, you can be with others after 10 days have passed since the date you had your positive test.

Three important ways to slow the spread

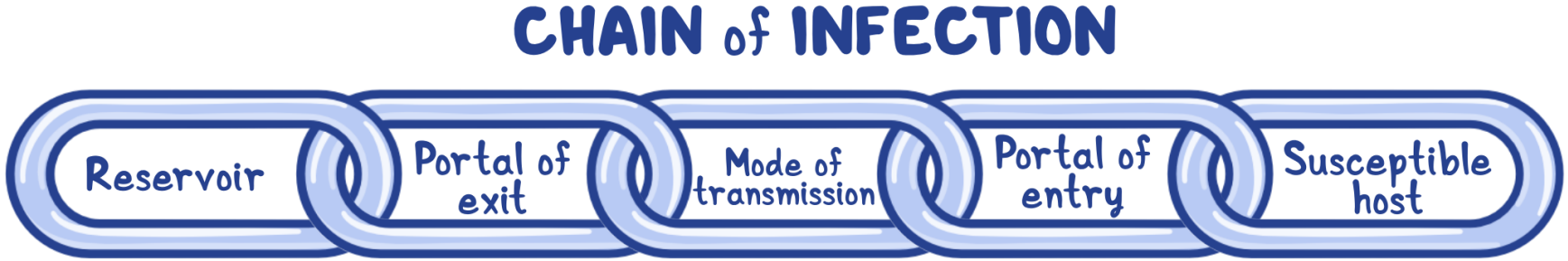
1. Wear a mask to protect yourself and others and stop the spread of NERD.
2. Stay at least 6 feet (about 2 arm lengths) from others who don't live with you.
3. Avoid crowds. The more people you are in contact with, the more likely you are to be exposed to NERD.

Graphic Organizer: NERD Chain of Infection

Directions: Below are the links in a chain of infection. For NERD, consider a chain of infection for person-to-person transmission. First, read the NERD Factsheet and highlight sections that may fit into the graphic organizer below. Then, answer the questions.

Infectious Agent: An infectious agent is an organism that can be transmitted and cause disease. Examples include bacteria, viruses, parasites, and fungi.

What is the infectious agent for NERD?



A reservoir is where an infectious agent lives, grows, and multiplies.	A portal of exit is where an infectious agent leaves the reservoir.	Mode of transmission is how an infectious agent is directly or indirectly spread.	A portal of entry is where an infectious agent enters a host.	A susceptible host is a host that an infectious agent can enter and cause disease.
Examples can include an animal, water, soil, or a human.	Examples can include a nose or a break in skin.	Examples can include respiratory droplets, airborne, direct contact, vehicle-borne, or vector-borne.	Examples can include a nose, a break in skin, eyes, or mouth.	Examples can include all humans, or certain groups of humans, such as children or older adults.
What is the reservoir of NERD?	**What are the portals of exit for NERD?**	**What are the modes of transmission for NERD?**	**What are the portals of entry for NERD?**	**Who is a susceptible host of NERD?**

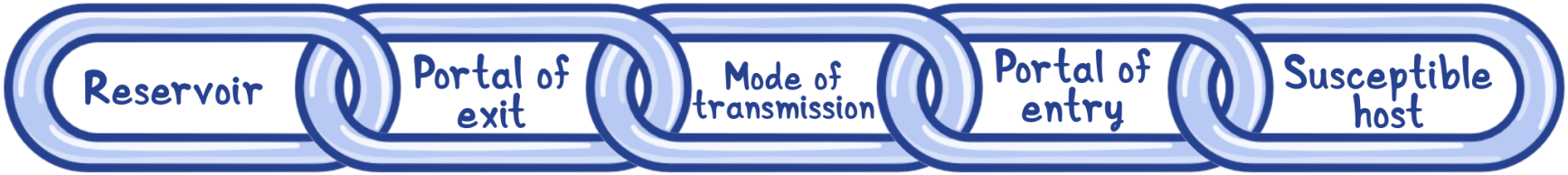
Graphic Organizer: Answer Key

Directions: Below are the links in a chain of infection. For NERD, consider a chain of infection for person-to-person transmission. First, read the NERD Factsheet and highlight sections that may fit into the graphic organizer below. Then, answer the questions.

Infectious Agent: An infectious agent is an organism that can be transmitted and cause disease. Examples include bacteria, viruses, parasites, and fungi.

What is the infectious agent for NERD? **Answer: Virus**

CHAIN of INFECTION



A reservoir is where an infectious agent lives, grows, and multiplies. Examples can include an animal, water, soil, or a human.	A portal of exit is where an infectious agent leaves the reservoir. Examples can include a nose or a break in skin.	Mode of transmission is how an infectious agent is directly or indirectly spread. Examples can include respiratory droplets, airborne, direct contact, vehicle-borne, or vector-borne.	A portal of entry is where an infectious agent enters a host. Examples can include a nose, a break in skin, eyes, or mouth.	A susceptible host is a host that an infectious agent can enter and cause disease. Examples can include all humans, or certain groups of humans, such as children or older adults.
What is the reservoir of NERD? **Answer:** Infected humans	**What are the portals of exit for NERD?** **Answer:** Nose, mouth	**What are the modes of transmission for NERD?** **Answer:** Direct: respiratory droplets; Indirect: vehicle-borne	**What are the portals of entry for NERD?** **Answer:** Mucous membranes (nose, mouth, or eyes)	**Who is a susceptible host of NERD?** **Answer:** All people, especially older adults and people with underlying medical conditions

NERD Strategy Cards

Part 1: Brainstorm

Directions: Review the NERD chain of infection.

Consider how people interact with the school environment (e.g., desks, lockers, or cafeteria) and each other, and how NERD might spread based on these interactions. List these interactions and, as a group, brainstorm corresponding prevention strategies that can be put into place to reduce the spread of disease.

Prevention Strategies should try to break the chain of infection at different links. Consider some of the possible links to break, such as destroying or removing the infectious agent, separating the reservoir from susceptible hosts, creating barriers to the portal of exit (reservoir) or portal of entry (susceptible host), disrupting the mode of transmission, or reducing the susceptibility of a host.

Keep track of your group's ideas below.

Interactions	Prevention Strategies

Interactions	Prevention Strategies

Part 2: Strategy Cards

Directions: From the list you brainstormed, select three prevention strategies that break the chain of infection at different links. Complete the 3 NERD Prevention Strategy cards together. Then, cut out the cards and determine who will be your spokesperson to present your strategies to the class. Have the spokesperson tape each card to the classroom version of the graphic organizer where the prevention strategy would break the chain of infection.

NERD Prevention Strategy #1

Strategy	
Chain link broken	
Explanation	

NERD Prevention Strategy #2

Strategy	
Chain link broken	
Explanation	

NERD Prevention Strategy #3

Strategy	
Chain link broken	
Explanation	

NERD Strategy Cards: Sample Answers

Part 1: Brainstorm

Directions: Review the NERD chain of infection.

Consider how people interact with the school environment (e.g., desks, lockers, or cafeteria) and each other, and how NERD might spread based on these interactions. List these interactions and, as a group, brainstorm corresponding prevention strategies that can be put into place to reduce the spread of disease.

Prevention Strategies should try to break the chain of infection at different links. Consider some of the possible links to break, such as destroying or removing the infectious agent, separating the reservoir from susceptible hosts, creating barriers to the portal of exit (reservoir) or portal of entry (susceptible host), disrupting the mode of transmission, or reducing the susceptibility of a host.

Keep track of your group's ideas below.

Answer: Answers will vary. Sample answers are provided.

Interactions	Prevention Strategies
Sharing & using frequently touched surfaces Sharing gym lockers; sharing desks; sharing objects (e.g., pens, pencils, or gym equipment); touching public surfaces (e.g., door handles, stair railings, sink handles, or drinking fountains)	Cleaning and disinfecting surfaces; reinforcing handwashing with soap and water; discouraging and limiting the use of shared objects
Contact between peers Shaking hands or giving high-fives or fist bumps, and other displays of affection	Reinforcing handwashing with soap and water, air high fiving or other no-contact ways of greeting each other, maintaining at least 6 feet of distance
Gathering with peers Sitting next to someone in the classroom or bus; meeting up with your friends in the hallway or stairway; participating in extracurricular programs and sports; attending indoor assemblies and sporting events; attending outdoor sporting events	Wearing masks consistently and correctly over the nose and mouth; reducing the number of people gathering together; maintaining at least 6 feet of distance between others when possible; moving events outdoors; improving ventilation by opening doors and windows

Interactions	Prevention Strategies
Gathering with adults Meeting with a teacher for afterschool help	Wearing masks consistently and correctly over the nose and mouth; maintaining at least 6 feet of distance; meeting over a virtual platform instead of in-person, encouraging teachers and staff to consider getting vaccinated
Eating lunch Eating requires you to remove your mask	Maintaining at least 6 feet of distance between others when possible; moving lunch outdoors if possible; improving ventilation by opening doors and windows

Part 2: Strategy Cards

Directions: From the list you brainstormed, select three prevention strategies that break the chain of infection at different links. Complete the 3 NERD Prevention Strategy cards together. Then, cut out the cards and determine who will be your spokesperson to present your strategies to the class. Have the spokesperson tape each card to the classroom version of the graphic organizer where the prevention strategy would break the chain of infection.

Answer: Answers will vary. Sample answers are provided.

NERD Prevention Strategy

Strategy	Maintaining at least 6 feet of distance (i.e., social or physical distancing)
Chain link broken	Reduces effectiveness of the mode of transmission
Explanation	Maintaining at least 6 feet of distance between others, especially when not wearing a mask, allows for respiratory droplets containing the NERD virus to fall to the ground. This can reduce the likelihood of respiratory droplets from being inhaled by a susceptible host. This reduces the spread of NERD by reducing direct, respiratory droplet transmission.

NERD Prevention Strategy

Strategy	Reinforcing handwashing with soap and water for at least 20 seconds
Chain link broken	Removes infectious agent
Explanation	Washing hands with soap and water can remove or destroy the NERD virus. This removes the infectious agent (i.e., NERD virus) from the chain of infection. This reduces the spread of NERD by reducing indirect, vehicle-borne transmission.

NERD Prevention Strategy

Strategy	Wearing masks consistently and correctly
Chain link broken	Blocks the portal of exit (of the reservoir) and the portal of entry (of the susceptible host)
Explanation	Wearing a mask consistently and correctly to cover your mouth and nose captures respiratory droplets and acts as a barrier to the portal of exit (of the reservoir) or portal of entry (of the susceptible host). This reduces the spread of NERD by reducing direct, respiratory droplet transmission and indirect, airborne and vehicle transmission.

NERD Prevention Strategy

Strategy	Cleaning and disinfecting surfaces
Chain link broken	Removes or destroys the infectious agent
Explanation	Cleaning and disinfecting frequently touched surfaces and shared objects can remove or destroy the infectious agent (i.e., the NERD virus) from the chain of infection. This reduces the spread of NERD by reducing indirect, vehicle-borne transmission.

NERD Prevention Strategy

Strategy	Improving indoor ventilation by opening doors and windows
Chain link broken	Reduces effectiveness of the mode of transmission
Explanation	Ventilation reduces the concentration of NERD virus in a room by increasing air flow, which moves particles in the air. This can reduce the likelihood of respiratory droplets from being inhaled by a susceptible host. This reduces the spread of NERD by reducing direct, respiratory droplet transmission and indirect, airborne transmission.

NERD Prevention Strategy

Strategy	Use of outdoor classroom space
Chain link broken	Reduces effectiveness of the mode of transmission
Explanation	Outdoor spaces can disperse NERD virus, reducing the likelihood of respiratory droplets from being inhaled by a susceptible host. This reduces the spread of NERD by reducing direct, respiratory droplet transmission and indirect, airborne transmission.

NERD Prevention Strategy

Strategy	Vaccinating teachers and staff
Chain link broken	Reduces the susceptibility of the host
Explanation	At the individual level, vaccination can protect teachers and staff by creating an antibody (immune system) response so their bodies will be ready to fight the virus if they are exposed to NERD. This reduces their risk for severe illness and the likelihood that they can pass it on to someone else. At the population level, vaccination reduces the number of susceptible people. This means the NERD virus is less likely to travel from person to person and the entire community is less likely to get the disease.