HISTORIC GERMANTOWN

SCIENCE *Sleuths*

Section 5 : GRUMBLETHORPE

LESSON OBJECTIVE

Students will learn how to discover patterns in disease transmission and occurrence

Key Terms

Epidemic

A widespread occurrence of an infectious disease in a community at a particular time

Pandemic

A widespread occurrence of an infectious disease over a whole country or the world at a particular time

Virus

Microscopic organisms that can infect hosts, like humans, plants or animals

Transmission

The act of transferring something from one spot to another

Test your knowledge

Multiple choice

1. Epidemiology is best described as the study of:

- a How to treat individual patients with diseases
- b The spread and causes of diseases in populations
- c How to develop new vaccines for specific diseases
- d The history of medical breakthroughs

2. A disease that spreads across multiple countries or even globally is considered:

- a An epidemic
- b An endemic
- c A pandemic
- d An outbreak

3. Which of the following is a factor that can influence the spread of disease?

- a Climate
- b Access to clean water and sanitation
- c Vaccination rates
- d All of the above

4. Which of these is a possible way a disease can spread?

- a Through the air
- b By touching contaminated objects
- c Through insect bites
- d All of the above

5. What do epidemiologists use to understand the source and spread of a disease?

- a Microscopes only
- b Data about people, places, and times
- c Only patient interviews
- d Only laboratory tests

Match the term with its definition

Epidemic	○	○	a widespread occurrence of an infectious disease over a whole country or the world at a particular time
Pandemic	○	○	microscopic organisms that can infect hosts, like humans, plants or animals
Virus	○	○	the act of transferring something from one spot to another
Transmission	○	○	a widespread occurrence of an infectious disease in a community at a particular time

Test your knowledge

Read the following scenario. Answer the corresponding question

At least 70 people attending a national conference in a city in Texas became ill with what appeared to be food poisoning. Three hospitals in the area treated and released 48 attendees who complained of nausea and vomiting; others with similar symptoms were hospitalized overnight. A health official noted that all of the patients had eaten brunch or lunch at the same hotel. The hotel's lunch menu included roast chicken, roast beef, and a vegetable pasta dish. Because some of the people who became ill were vegetarian, there was particular interest in determining whether the pasta dish might be contaminated. At the time of the report, health officials were still looking for the source of the outbreak. The hotel was cooperating in the investigation and had voluntarily halted food service for the time being.

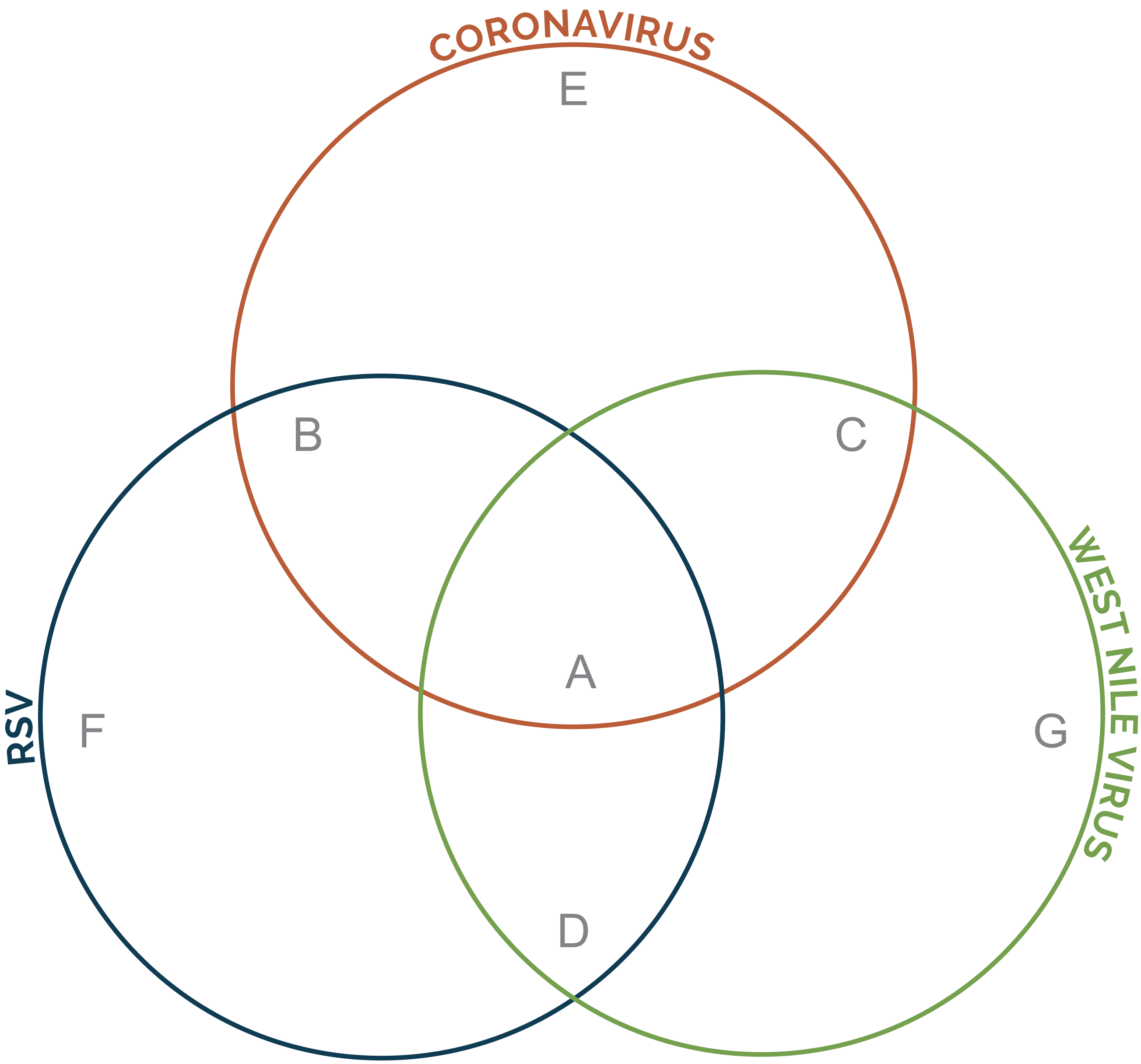
Explain why you might consider this problem important enough to investigate. Give at least three reasons for investigating

Test your knowledge *(continued)*

Content Overview

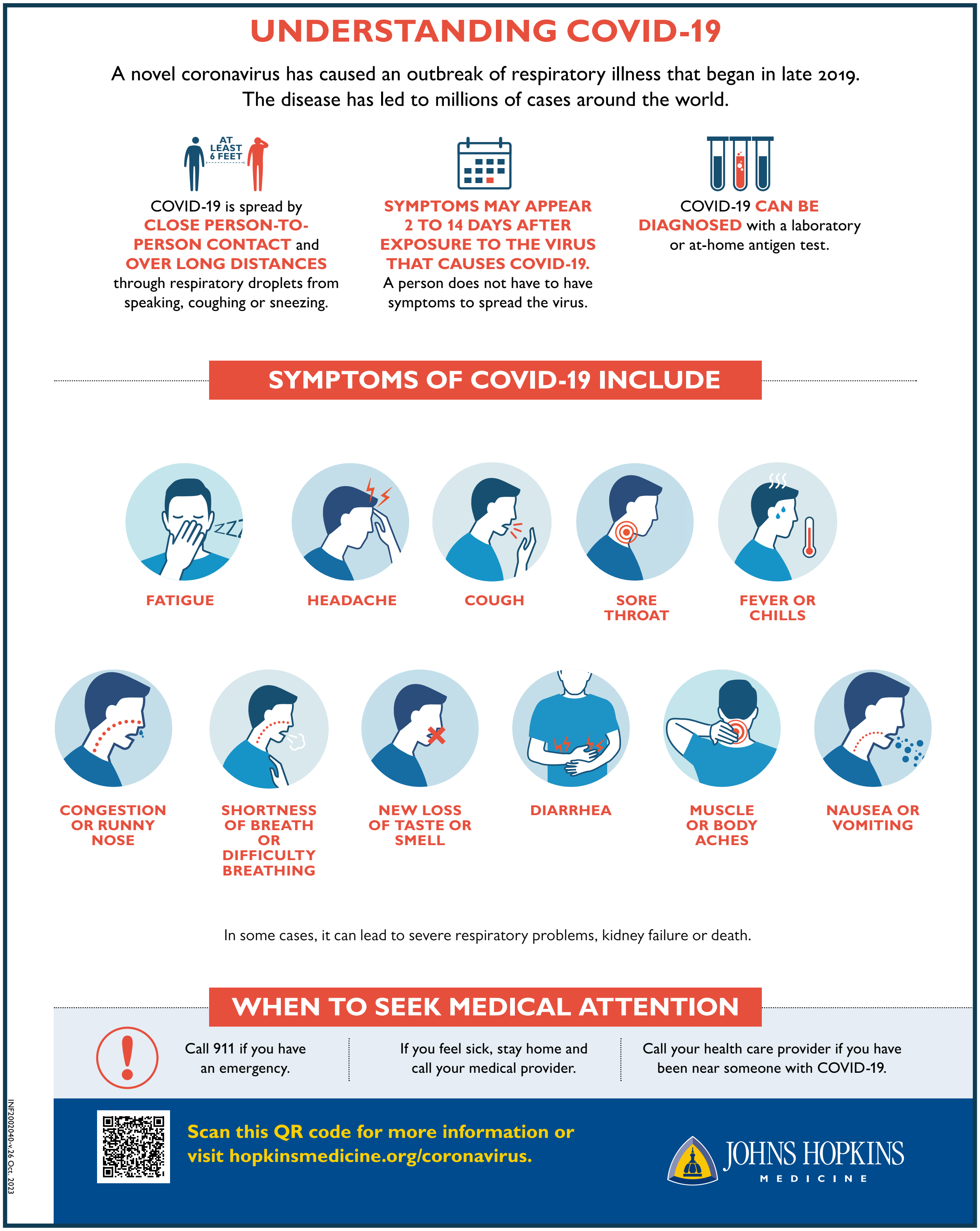
Analyze the infographics on the following pages that detail information about three common viruses. In the Venn Diagram below:

- *Write one similarity between all three viruses (A)*
- *One similarity between two of the viruses (B, C and D)*
- *One way that each virus is unique (E, F and G)*



Test your knowledge *(continued)*

Infographic 1: COVID-19 (Page 1 of 2)



Source: Johns Hopkins Medicine https://www.hopkinsmedicine.org/-/media/coronavirus/documents/inf2002040_at_coronavirus-infographic-v26.pdf

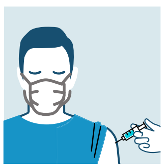
Test your knowledge (continued)

Infographic 1: COVID-19 (Page 2 of 2)

UNDERSTANDING COVID-19

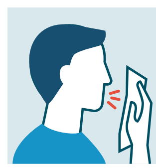
A novel coronavirus has caused an outbreak of respiratory illness that began in late 2019. The disease has led to millions of cases around the world.

THE BEST WAYS TO PROTECT YOURSELF



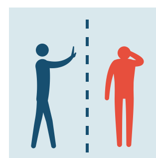
GET VACCINATED as soon as you can.

WEAR A FACE MASK when in public to help prevent the spread of the virus.

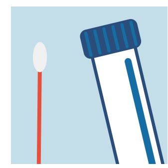


IF NOT WEARING A MASK cough or sneeze into a tissue or bent elbow. Throw the tissue in the trash.

WHEN WEARING A MASK you can cough or sneeze into the mask. Change mask as soon as possible.



PHYSICAL DISTANCING Stay at least 6 feet away from others.



TEST TO PREVENT SPREAD TO OTHERS Consider getting tested before joining indoor gatherings with others who are not in your household.

IF YOU FEEL SICK stay home and call your health care provider.

DO NOT TOUCH YOUR FACE without washing your hands first.

CLEAN AND DISINFECT frequently touched objects and surfaces.

HANDWASHING Frequently wash your hands with soap and water or use a hand sanitizer with at least 60% alcohol.

AVOID CROWDS AND POORLY VENTILATED SPACES. Avoid indoor spaces that do not offer fresh air.

WHEN TO SEEK MEDICAL ATTENTION

Call 911 if you have an emergency.

If you feel sick, stay home and call your medical provider.

Call your health care provider if you have been near someone with COVID-19.

Scan this QR code for more information or visit hopkinsmedicine.org/coronavirus.

JOHNS HOPKINS MEDICINE

INF2002040-v26 Oct. 2023

Source: Johns Hopkins Medicine https://www.hopkinsmedicine.org/-/media/coronavirus/documents/inf2002040_at_coronavirus-infographic-v26.pdf

Test your knowledge *(continued)*

Infographic 2: Resipiratory Syncytial Virus (RSV)

Respiratory Syncytial Virus (RSV)

What is RSV?

RSV is a common respiratory virus that often results in mild, cold-like symptoms, but can lead to serious illness. RSV infects the nose, throat, lungs, and breathing passages and is spread through contact with an infected person, or by touching contaminated surfaces and then touching your eyes, nose, or mouth. RSV typically circulates with other seasonal respiratory viruses, and it can be hard to tell the difference between RSV, COVID-19, and flu.

Nearly all children will have an RSV infection before their 2nd birthday but RSV can affect people of all ages. Most people infected are contagious for 3 to 8 days with mild symptoms, which may include:

- **Coughing**
- **Sneezing**
- **Runny nose**
- Fever

Help prevent RSV

There are actions you can take to help prevent RSV:

- **Wash your hands often—for at least 20 seconds using soap and water**
- **Clean frequently touched surfaces**
- **Avoid close contact with others who may be sick and stay home when you are sick**
- **Cover coughs and sneezes**
- **Talk with a healthcare professional about vaccines and monoclonal antibodies recommended for certain at-risk groups**

Certain groups are at a greater risk for RSV-related complications, including:

- **Premature infants and infants age 6 months and younger**
- **Individuals with chronic heart or lung disease**
- **Older adults (65+)**
- **Individuals with compromised immune systems**

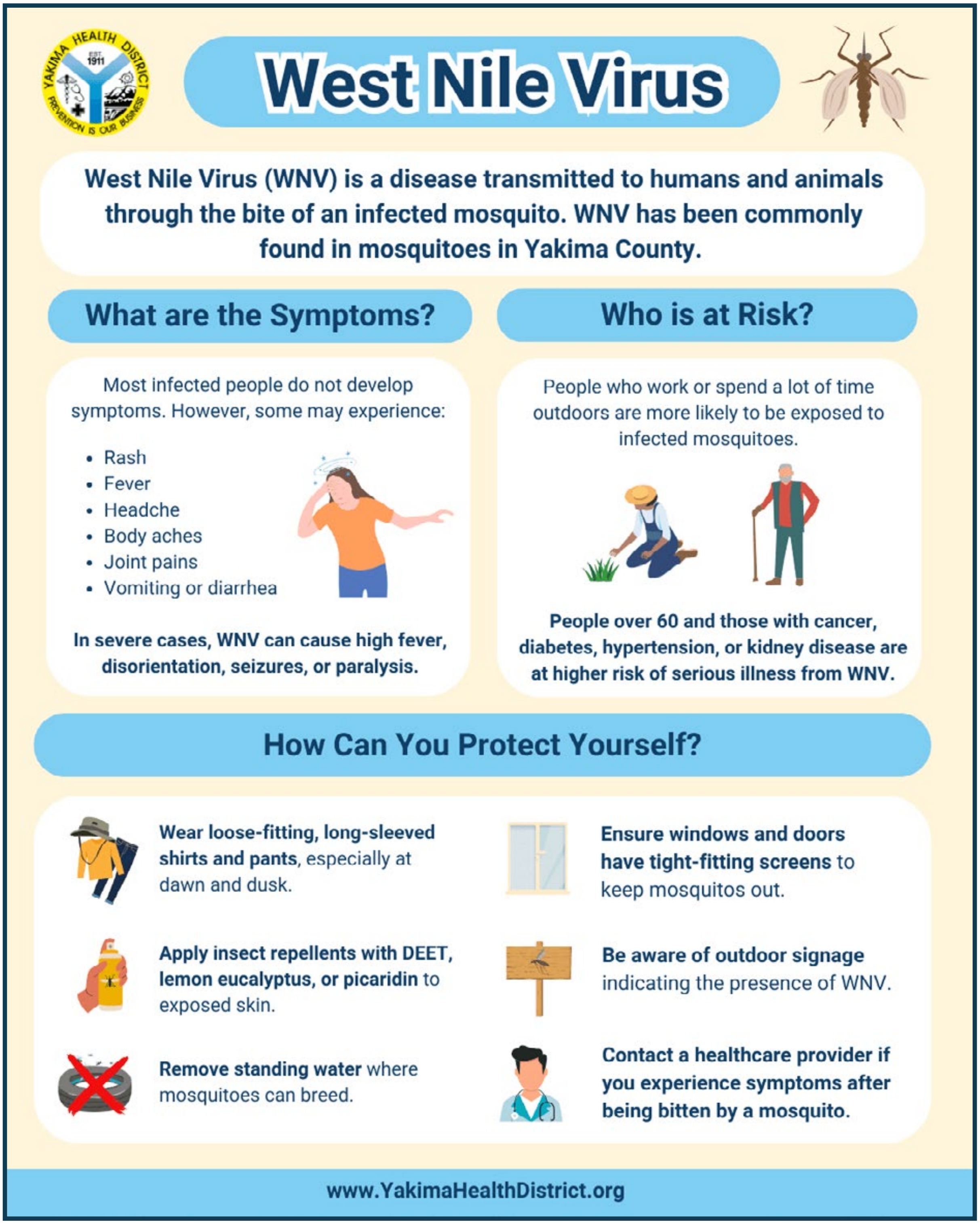
National Foundation for Infectious Diseases

Learn more at **www.nfid.org/rsv**

Source: National Foundation for Infectious Diseases https://www.nfid.org/resource/rsv-fact-sheet/

Test your knowledge *(continued)*

Infographic 3: West Nile Virus (WNV)



Source: Yakima Health District https://www.yakimacounty.us/DocumentCenter/View/38367/ENG-WNV-Flyer-8-7-24

Site History

German immigrant John Wister (Johannes Wüster, 1705-1789) built Grumblethorpe in 1744 as a summer home outside of Philadelphia. The property extended from Germantown Avenue to the Wingohocking creek and included a farm, gardens, and orchards with fruit trees to supplement John's wine importing business. This house provided a refuge for the family from the humid Philadelphia summers, and in 1793, the family stayed in Germantown through the winter to avoid the yellow fever epidemic.

A photo showing the Grumblethorpe barns in 1892

Did you know?

This house was occupied by the British and used as one of its headquarters during the Battle of Germantown in October 1777. John Wister was confined to his Market Street home in Philadelphia and John's son Daniel and his family had fled to a relative's house in what is now Lower Gwynedd. Daniel Wister's oldest daughter Sarah "Sally" Wister (1761-1804) started a diary documenting this disruptive period in her family's lives, written as a series of letters to her childhood friend Deborah Norris (later Deborah Norris Logan). Sally's 48-page diary is notable as one of the few, if any, written accounts of a teenage girl during the American Revolution.

What to know before you go *(continued)*

Did you know?

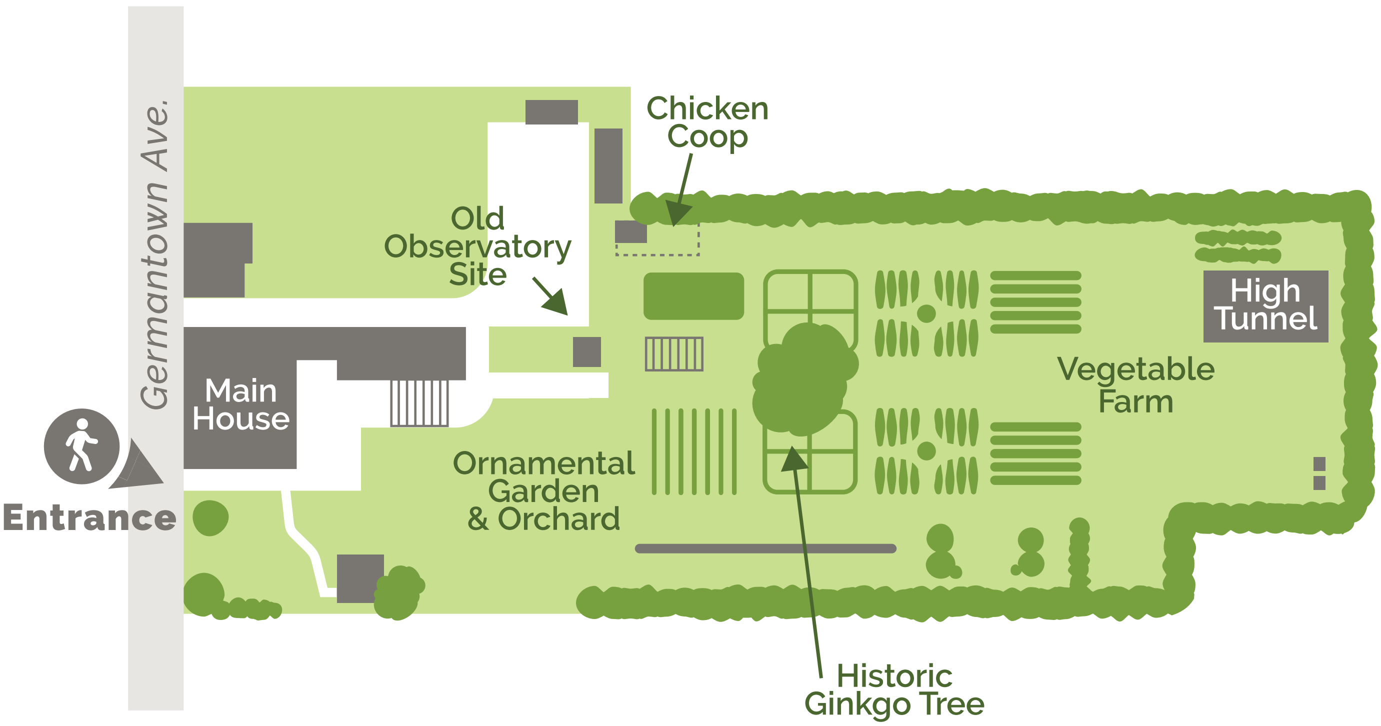
The family's impact can still be found on the Grumblethorpe property today in the historic flower and vegetable beds, the climbing Wisteria vines (named after the family), and the massive fruiting ginkgo tree that towers over the property. Dating to around 1845, this is believed to be one of the oldest female ginkgo trees in America.

In 1811, John's grandson Charles Jones Wister Sr., astronomer, horticulturalist, and inventor, made this Germantown house the permanent family home. He modernized the architecture, created additions, and built special buildings like the forge and observatory. It was Charles Sr. who gave the house its new name: *Grumblethorpe.* Charles was a citizen scientist and studied a wide range of scientific disciplines and was one of the founders of the Academy of Natural Sciences. Charles kept daily weather records for decades and his data was used by the local newspaper and the U.S. Coast Guard. Across multiple generations, the Wisters were passionate about horticulture, botany and farming.

Today, Grumblethorpe is managed by the Philadelphia Society for the Preservation of Landmarks to continue Grumblethorpe's legacy as a working urban farm and as an important teaching resource for the community.

A photo showing the observatory and ice house at Grumblethorpe

Can't wait to see you at
GRUMBLETHORPE!



www.philalandmarks.org/grumblethorpe

What have you learned?

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Briefly describe the initial steps that you would take in investigating this problem. Indicate the type of data needed to accomplish each step and give examples of sources of such data in a community.

Links to Useful Sites

[Intro to Epidemiology - YouTube]

[Epidemiology - What is it? (NIEHS)]

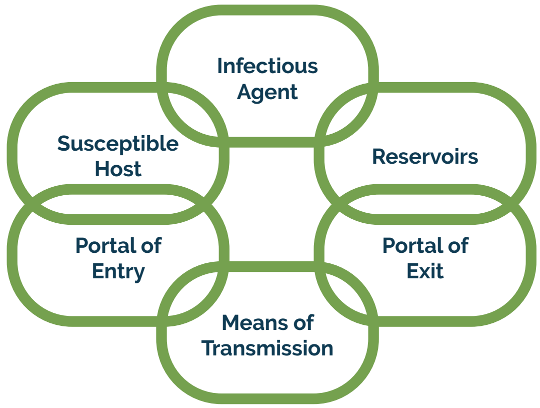
[CDC: Solve the Outbreak Game]

[PBS LearningMedia: Infectious & Communicable Diseases- Videos and Support Materials]

[TED-Ed: How do viruses jump from animals to humans? (YouTube)]

Infographic Creation

The Chain of Infection refers to the sequence of events that leads to the transmission and spread of an infectious disease. It consists of six key components:



Your group will be creating an infographic depicting one of the six components or "links" in the Chain of Infection. Infographics are visual representations of knowledge and information and are designed to make complex ideas and large amounts of data easy to understand. Consider the infographics from the pre-visit lesson about various diseases. Using reliable resources, research your assigned component and include the following information:

- Definition of component
- Identify at least three examples of the component
- Example of ways to break the chain at this stage
- Relevant terminology
- Simple, easy to understand images and language
- The final product should be informative, simple, and engaging.

STEM Careers

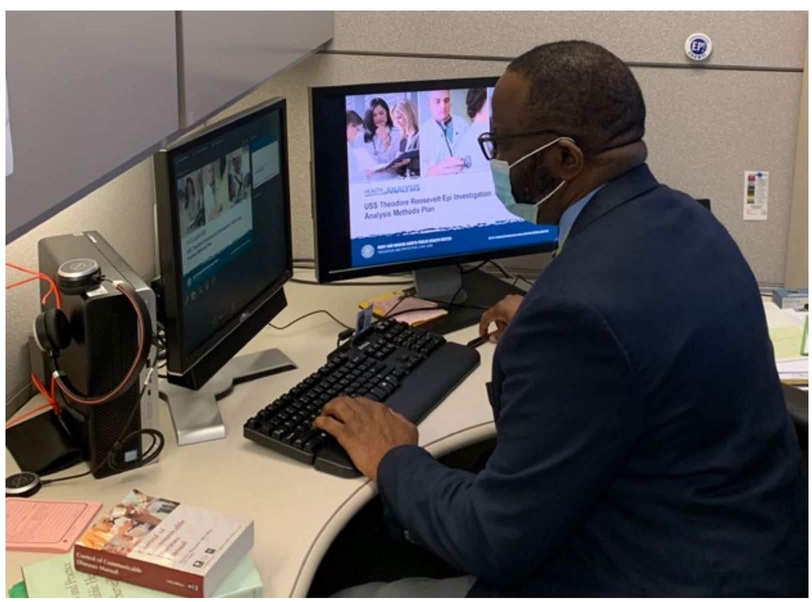
Did you know?

Did You Know that real-life stories of the Center for Disease Control and Prevention's Epidemic Intelligence Service have inspired cinematic accounts of a pandemic? The movie *Contagion* is a fictional account of a dangerous infectious disease occurring globally and the role epidemiologists play in containing the spread. [Source]

Epidemiologist

Epidemiologists are public health workers who investigate patterns and causes of disease and injury. They seek to reduce the risk and occurrence of negative health outcomes through research, community education and health policy. Some of their responsibilities are to:

- Design and conduct research studies to investigate disease outbreaks and trends
- Collect and analyze data from surveys, interviews, and medical records
- Identify risk factors and causal relationships
- Develop and evaluate public health interventions and prevention programs
- Communicate findings to policymakers, healthcare professionals, and the public
- Monitor and report on disease trends and outbreaks
- Advocate for evidence-based public health policies



Dr. Francis Obuseh, a senior Epidemiologist and Public Health Educator at the Navy and Marine Corps Public Health Center works on an epidemiologic data analysis plan.

Acknowledgements

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Cover images include a solar microscope, bone slide with mosquito specimen, and meteorological tablets from the collection of the Wyck Association; Isaac Norris' Thirty Year Pocket Almanac from 1677 from the Stenton Collection on deposit at The Library Company of Philadelphia; and Hexamer General Survey of Wingohocking Hosiery Mills, Shoemaker Lane and Wingohocking Creek, Germantown, Philadelphia, Philadelphia County, Pennsylvania. vol.10 Plate 943, from the Free Library of Philadelphia.