Lesson Plan: The Yellow Fever Outbreak

Grade Level: 8–12 **Subject Areas: History, Science (Biology), Health**
Duration: 1–2 class periods (45–60 minutes each
Check One: **Day "Before" _____ Day "Of" _____ Day "After" _____**

Title:

Lesson Goals

Central Focus

Lesson Objectives

By the end of this lesson, students will be able to:

- Explain the historical significance of major yellow fever outbreaks (e.g., Yellow Fever Epidemic of 1878 Memphis outbreak, include materials on Philadelphia outbreak).
- Analyze the social, medical, and political responses to the outbreaks.
- Evaluate the importance of free African Americans' work with the sick and dying during the outbreak, as well as its relevance today.
- Outline the cause, treatment, and prevention methods for yellow fever.
- Identify three different ways to prevent yellow fever today. (Prevention of Mosquito spread, Cleanliness processes, Travel protections, etc)
- Describe what yellow fever is and how it spreads.
- Evaluate the impact of yellow fever on public health policy and urban development.

Knowledge of Students

Prior Academic Learning and Prerequisite Skills:

Personal/Cultural/Community Assets:

Supporting Students' Learning

Planned Supports: Alternate Lesson Plans

Preconceptions, Common Errors, and Misconceptions:
Lesson Plan: Memphis—The Rebuilding of a Modern City in the Aftermath of Yellow Fever

Politics Of Yellow Fever
https://www.nlm.nih.gov/exhibition/politicsofyellowfever/index.html

Lesson Considerations

Grouping Strategies:

Differentiation:

- **Modifications:**
- **Accommodations:**

Lesson Plan Details:

Materials:

- **Needed by Teacher:**
  - Projector or smartboard
  - Printed handouts or digital access to primary sources
  - Map of affected regions
  - Access to internet or library for research
  - Chart paper or digital tools for group presentations
- **Needed by Students:**

- Printed handouts or digital access to primary sources
- Map of affected regions
- Access to internet or library for research
- Chart paper or digital tools for group presentations

Lesson Introduction "Before": Introduction (10–15 minutes)

- **Introducing Yellow Fever Scenario**
- **Add part of video**
- **Discussion Prompt: "What do you think life was like during a disease outbreak in the 1700s?"**
  - Fear, safety, etc
  - An 1878 illustration from Frank Leslie's Illustrated Newspaper, depicting hungry citizens in Memphis. https://dp.la/primary-source-sets/the-yellow-fever-epidemic-of-1878/sources/1245
  - Frank Leslie's Illustrated Newspaper in 1879 depicting camps established outside of Memphis during the yellow fever epidemic. https://dp.la/primary-source-sets/the-yellow-fever-epidemic-of-1878/sources/1243
  - See additional Frank Leslie illustrations on the web.

Learning Activities "During":

- **Briefly introduce yellow fever: symptoms, transmission (mosquito-borne), and mortality rate. (HIIM)**
  - Yellow Fever: Symptoms, Diagnosis, and Treatment https://www.cdc.gov/yellow-fever/symptoms-diagnosis-treatment/index.html
  - "Yellow fever." MedlinePlus: Medical Encyclopedia.
  - Thomas Summers was a doctor active during the epidemic. In chapter one, he summarizes the contemporary medical understanding of the etiology of yellow fever. https://dp.la/primary-source-sets/the-yellow-fever-epidemic-of-1878/sources/1239
  - Excerpts from Dr. Dromgoole's Heroes, Honors, and Horrors of 1878, published in 1879. https://dp.la/primary-source-sets/the-yellow-fever-epidemic-of-1878/sources/1246
  - An 1856 map showing geographic distribution of health and disease, including fever districts in the United States and West Indies. https://dp.la/primary-source-sets/the-yellow-fever-epidemic-of-1878/sources/1240
  - **See included discussion page for additional resources.**

Closure "After": Wrap-Up & Reflection (10-20 minutes)

- **Discuss: "What lessons can we learn from the yellow fever outbreak that apply to modern pandemics?"**
  - **Vaccine issues**
    - **Encephalitis-** While rare, the yellow fever vaccine can be associated with encephalitis (also known as neurotropic disease or YEL-AND)
    - **Guillain-Barré syndrome (GBS) -** While extremely rare, some cases of Guillain-Barré syndrome (GBS) have been reported after COVID-19 vaccination. Optional: Compare to COVID-19 or other recent outbreaks.

Extension Activity: Career Connections

- **See slides for a lesson plan with Middle Schols and Careers and links https://www.bls.gov/ooh/life-physical-and-social-science/epidemiologists.htm#tab-4**

- **See Yourself in a Public Health career-** https://www.cdc.gov/stem/careers/

Evidence of Student Learning:

Formative Assessment: Politics of Yellow Fever Handout

- **Objective(s) Being Assessed:** Website reliability, Yellow Fever pandemic causes
- **Feedback**: Question and answer- https://www.cdc.gov/yellow-fever/causes-and-spread/index.html
- **Modifications/Accommodations:** Answer in a group/group work
- **Evidence of Student Understanding:** Student answers similar to provided answers

Summative Assessment: Yellow Fever cards

- **Objective(s) Being Assessed:** Knowledge of Pandemic or Epidemic stages & Prevention - https://www.cdc.gov/yellow-fever/prevention/index.html
- **Feedback:** group answers/work
- **Modifications/Accommodations:** Answer as a class or as a Jeopardy game
- **Evidence of Student Understanding** Student discussion indicates knowledge and interest.

Supporting Literacy Development:

- **Vocabulary/Key Phrases:**
  - https://www.yalemedicine.org/news/covid-19-glossary
  - Add Yellow Fever Cards to terminology/vocabulary list

Language Supports:

- Google Translate (Spanish available)

NOTE: Attach any Relevant handouts, activities, templates, PPT slides, etc. that are referenced and utilized in this lesson.

References

The Yellow Fever Epidemic of 1878
Created By Samantha Gibson, Digital Public Library of America
https://dp.la/primary-source-sets/the-yellow-fever-epidemic-of-1878/teaching-guide-print

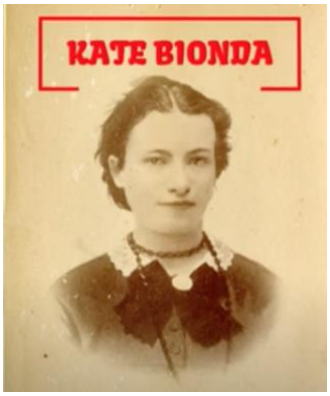
"Hungry in Memphis," Digital Public Library of America, Courtesy of Memphis Public Library via Digital Library of Tennessee.
https://dp.la/item/e553fbc33f392f27d735c6216876ebf7

Welcome Collection: The yellow fever epidemic of 1878 in Memphis, Tenn.
https://iiif.wellcomecollection.org/pdf/b20394858

Yellow Fever: Symptoms, Diagnosis, and Treatment
https://www.cdc.gov/yellow-fever/symptoms-diagnosis-treatment/index.html

The politics of Yellow Fever: Yellow Fever in 1793 and Today-Lesson Plan Philadelphia outbreak
https://www.nlm.nih.gov/exhibition/politicsofyellowfever/education-lessonplan1.html

LIV'IN IN MEMPHIS

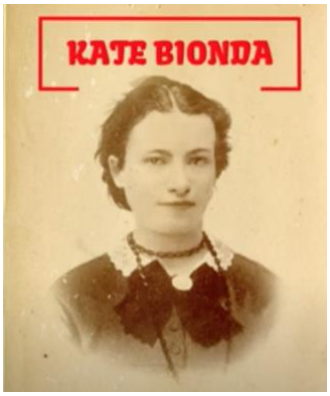


Ms. Kate, her given name was Kate Bionda (Be On Da) was sit-in at her restaurant, as she did each day at noon, speaking with her customers. There was a visitor today, as there most days. She could tell he was not from these parts. That was not unusual as by the early 20th century, we were the world's largest spot cotton market and the world's largest hardwood lumber market.

People came from all over. Not just from Mississippi anymore, but New Orleans too. But Ms. Kate liked it here. The weather was just right, and she did not have as many pesky "skiters" (or Mosquitoes to you Northerners). Her guest talked about all the things he had seen in his travels. He looked a little travel weary...lost some color in his face. He said he felt a little aches and pains…but thought he was ok.

Later in the week Ms. Kate felt a little ill herself. She thought about going to the doctor. Her symptoms were starting to get serious.

Livin' in Memphis

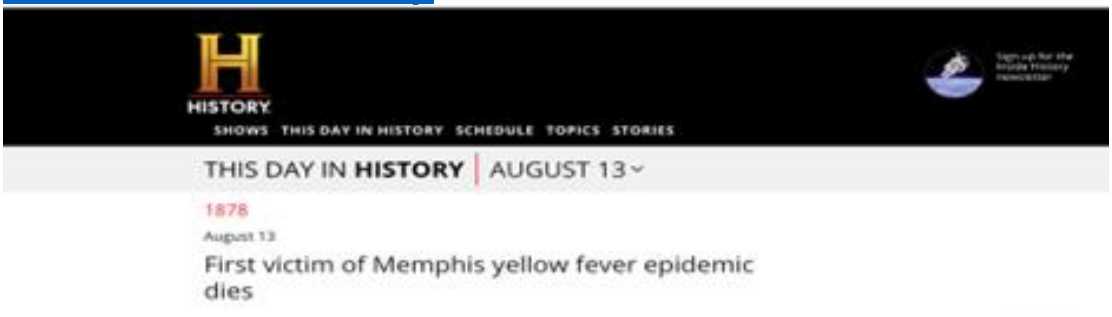


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1. https://www.history.com/this-day-in-history/first-victim-of-memphis-yellow-fever-epidemic-dies
2. https://en.wikipedia.org/wiki/History_of_Memphis,_Tennessee
3. https://www.cdc.gov/yellowfever/index.html#:~:text=Yellow%20fever%20is%20a%20very,person%27s%20symptoms%2C%20and%20travel%20history.



Instructions for CDC CARDS ACTIVITY

- Remove the page numbers before you make copies of the activity cards.
- Copy the activity cards onto cardstock to make it easier to put in order and not bend the pages. You may want to cover the cards with plastic by laminating them.
- Make enough copies of the cards so that your class can work in groups of three or four.
- The object of the lesson is to pretend to make it a competitive activity. You may want to give a prize to who comes in first period or simply give a prize like candy to all of your class.
- Tell the students that you want them to put the cards in order according to what they have learned from the yellow fever lesson that you guys have been working on.
- Remind them that this is what the CDC says is how we look at the yellow fever Pandemic, and similar Epidemics or Pandemics, from first instance to treatment or cure.
- You can also just use the cards as a study guide and provide it to students at the beginning of the lesson and have them review it throughout the lesson.

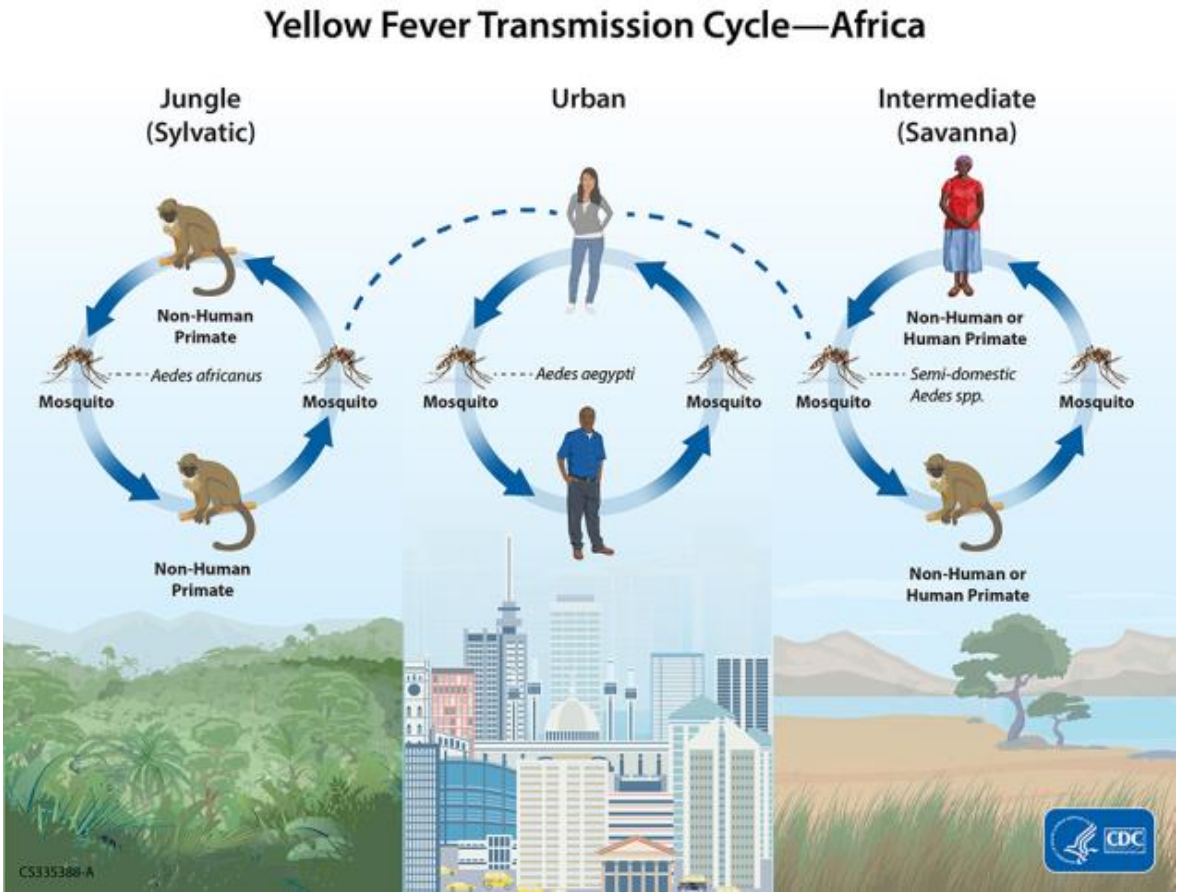
Yellow Fever Cards
Signs And Symptoms



The yellow fever virus is found in tropical and subtropical areas of Africa and South America. The virus is spread to people by the bite of an infected mosquito. Yellow fever is a very rare cause of illness in U.S. travelers. Illness ranges from a fever with aches and pains to severe liver disease with bleeding and yellowing skin (jaundice). Yellow fever infection is diagnosed based on laboratory testing, a person's symptoms, and travel history. There is no medicine to treat or cure infection. To prevent getting sick from yellow fever, use insect repellent, wear long-sleeved shirts and long pants, and get vaccinated.

Yellow Fever Cards

TRANSMISSION



Yellow Fever Cards

Symptoms

Most people infected with yellow fever virus will either have no symptoms or mild symptoms and completely recover. For people who develop symptoms, the time from infection until illness is typically 3 to 6 days.

- Initial symptoms can include sudden onset of fever, chills, severe headache, back pain, general body aches, nausea, vomiting, fatigue (feeling tired), weakness.
    - Most people who develop symptoms improve within one week.
    - For some people who recover, weakness and fatigue (feeling tired) might last several months.
- A few people will develop a more severe form of the disease.
    - For 1 out of 7 people who have the initial symptoms, there will be a brief remission (a time you feel better) that may last only a few hours or for a day, followed by a more severe form of the disease.
    - Severe symptoms include high fever, yellow skin or eyes (jaundice), bleeding, shock, and organ failure.
    - Among those who develop severe disease, 30-60% die.
- Once you have been infected, you are likely protected from future infections.

Yellow Fever Cards

Pathogenesis

After transmission from a mosquito, the viruses replicate in the lymph nodes and infect a certain type of cell which are present in tissues in the body's external environment, such as the skin and the inner lining of
the nose, lungs, stomach and intestines. From there, they reach the liver and infect other parts of the body.

Fatality may occur when there is multiple organ failure.

Yellow Fever Cards

Diagnosis

See your healthcare provider if you have visited an area where yellow fever is found and have symptoms described above.

- Tell your healthcare provider when and where you traveled.
- Your healthcare provider can order blood tests to look for yellow fever or other similar viruses, like dengue.

Yellow Fever Cards

Treatment

- There is no medicine to treat yellow fever. However, a vaccine is available to prevent disease.
- Rest, drink fluids, and use over-the-counter pain relievers to reduce fever and relieve aching.
  - Avoid certain medications, such as aspirin or other nonsteroidal anti-inflammatory drugs, for example ibuprofen (Advil, Motrin), or naproxen (Aleve), which may increase the risk of bleeding.
- People with severe symptoms of yellow fever infection should be hospitalized for close observation and supportive care.
- If after returning from travel you have symptoms of yellow fever (usually about a week after being bitten by an infected mosquito), protect yourself from mosquito bites for up to 5 days after symptoms begin. This will help prevent spreading yellow fever to uninfected mosquitoes that can spread the virus to other people.

Yellow Fever Cards
Prevention of Yellow Fever

Yellow fever virus is spread to people through the bite of an infected mosquito. Mosquitoes bite during the day and night. The best way to prevent yellow fever virus infection is to protect yourself from mosquito bites. Use insect repellent, wear long-sleeved shirts and pants, treat clothing and gear, and get vaccinated before traveling, if vaccination is recommended for you.

Prevent Mosquito Bites



Use insect repellent: When used as directed, EPA-registered insect repellents are proven safe and effective, even for pregnant and breastfeeding women.



- Dress your child in clothing that covers arms and legs.
- Cover strollers and baby carriers with mosquito netting.
- When using insect repellent on your child:
- Always follow label instructions.



- Wear loose-fitting, long-sleeved shirts and pants
- Treat clothing and gear
- Take steps to control mosquitoes indoors and outdoors

Prevent Mosquito Bites When Traveling Overseas

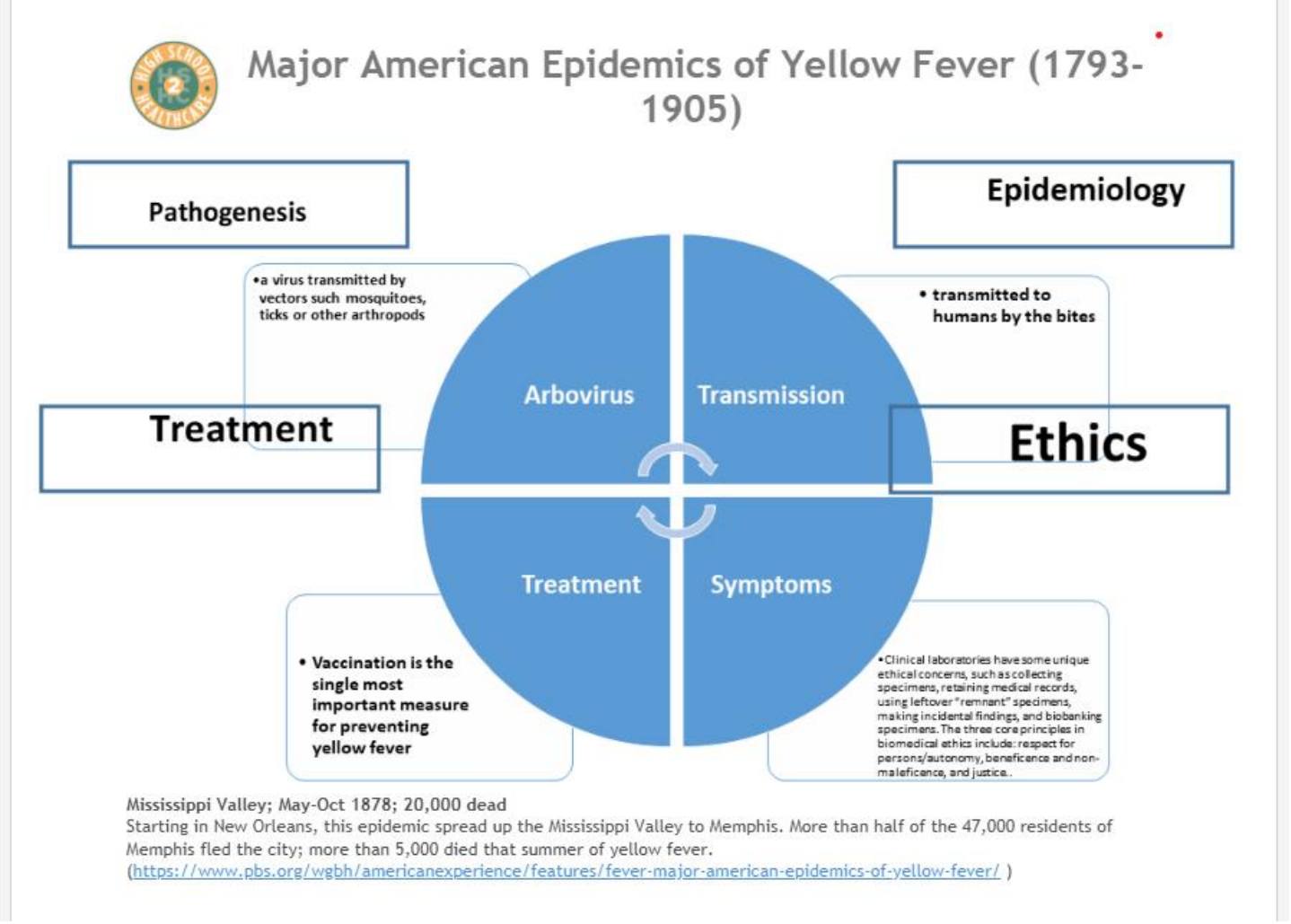
- Keep mosquitoes out of your hotel room or lodging
- Choose a hotel or lodging with air conditioning or window and door screens.
- Use a mosquito net if you are unable to stay in a place with air conditioning or window and door screens or if you are sleeping outside.

Yellow Fever Cards

Vaccine

A safe and effective yellow fever vaccine has been available for more than 80 years.

- A single dose provides lifelong protection for most people.
- The vaccine is a live, weakened form of the virus given as a single shot.
- Vaccine is recommended for people aged 9 months or older and who are traveling to or living in areas at risk for yellow fever virus in Africa and South America.
- Yellow fever vaccine may be required for entry into certain countries.
- Vaccination requirements and recommendations for specific countries are available on the CDC Travelers' Health page.



*This graphic is entitled "How did Yellow Fever" Start in the Folder

Yellow Fever Information: https://www.nlm.nih.gov/politicsofyellowfever

Politics of Yellow Fever in Alexander Hamilton's America
Lesson Plan: Yellow Fever in 1793 and Today

Student Name: _____
Date/Class Period:_____

Instructions: Using the following current and reliable health information websites, gather and summarize information about yellow fever.

- "Yellow fever." MedlinePlus: Medical Encyclopedia. https://medlineplus.gov/ency/article/001365.htm
- "Climate Change." MedlinePlus: Health Topics. https://medlineplus.gov/climatechange.html
- "Yellow Fever." Center for Disease Control and Prevention. https://www.cdc.gov/yellowfever/index.html

1. What causes yellow fever? Where is it found most frequently?

2. How do people get yellow fever?

3. What are common symptoms of yellow fever?

4. Are there treatments or cures for yellow fever?

5. Is our area prone to yellow fever? If not, why is it important still to have good information about the disease?

6. What are some ways to prevent yellow fever?

7. Which one of the prevention methods above can you use to help prevent speared of yellow fever or other mosquito-borne diseases?

DISCUSSION PAGE

The Yellow Fever Epidemic of 1878

Discussion questions

1. At the time of the 1878 epidemic, doctors and scientists did not yet know exactly what caused yellow fever. Dr. Summers describes yellow fever as the "most formidable malady known to warm latitudes" and the "curse of our land." Based on chapter one of *Yellow Fever*, explain what factors doctors had identified as possible causes of yellow fever. What causes does Dr. Summers rule out? Given that the disease is transmitted via mosquito bite, how accurate or "close" do you think nineteenth-century scientists were to identifying the cause of the disease?
2. Using *Yellow Fever* and the map, explain how the 1878 epidemic challenged and/or confirmed prevailing knowledge about the circumstances under which yellow fever occurred.
3. What do the *Frank Leslie's* excerpt about the yellow-fever camps and the image of hungry citizens reveal about the impact of the disease beyond the medical crisis?
4. What does the title of Dr. Dromgoole's book tell you about the epidemic?
5. Much of the medical care provided during the yellow fever epidemic was offered by volunteer organizations including the Howard Association and Sisters of Charity. What do the "Brave Women in Memphis" excerpt from Dr. Dromgoole's book and the "Sisters of Charity" illustration reveal about the role of women in treatment?
6. Based on the report from the expedition of the War Department, what can you infer about the involvement of the federal government in addressing the fever epidemic? How helpful do you think the efforts of this expedition were?
7. Using the image from New York and the letter from Boston abolitionist William Lloyd Garrison, what can you learn about how Northern communities reacted to the yellow fever epidemic?
8. Using the Sanitary Code of New Orleans, explain some ways the city applied lessons learned during the 1878 outbreak. The link between mosquito bites and the transmission of yellow fever was discovered shortly after this document was published. How do you think that discovery would impact the guidelines provided in this document?

Classroom activities

Ask students to imagine themselves as news reporters during the 1878 yellow fever outbreak. Using the primary sources in this set, ask students to write an article about some aspects of the crisis. They should select at least three figures (real or imagined) featured in the sources of this set. For example, students may elect to "interview" one of the hungry Memphis residents waiting for food, a person who lived in the Father Matthew refugee camp, a Howard Association doctor, or one of the participants in the War Department expedition. Ask students to consider their angle and (imagined) audience. What questions would your students ask of their "interviewees"?

About This Guide

This teaching guide helps instructors use a specific primary source set, The Yellow Fever Epidemic of 1878, in the classroom. It offers discussion questions, classroom activities, and primary source analysis tools. It is intended to spark pedagogical creativity by giving a sample approach to the material. Please feel free to share, reuse, and adapt the resources in this guide for your teaching purposes.