



Teacher Guide 7: Prevention

NGSS Alignment:

Performance Expectations:

- HS-LS2-7 Human Impact Reduction Solution
- HS-LS2-8 Social Interactions and Group Behavior
- HS-PS1-2 Simple Chemical Reactions

Scientific & Engineering practices:

- Developing & Using Models
- Obtain, Evaluate, Communicate Information

Crosscutting Concepts:

- Cause & Effect: Mechanism & Explanation
- Patterns

Key Terms:

- Aerosols
- Congregate
- Correlate
- Disinfect
- Fomite
- Hydrophilic



- Hydrophobic
- Policy
- Risk
- Sanitize
- Syndemic
- Trend
- Vulnerability



The Module: Prevention

Narrative: While Tash ends up quarantining in a motel with other patients after testing positive for COVID-19, his friends Ray and June research ways to protect themselves from the disease and contemplate getting tested. After all, they wouldn't want to spread it to their families and friends like Tash may have. While the two know that wearing face masks and using hand sanitizer can help, they don't know what else they can do to prevent themselves from being infected. How do human activities contribute to spreading COVID-19, and what can help decrease this spread?

Performance Expectations:

- Identify human activities that contribute to the spread of COVID-19.
- Model the effects of soap on the novel coronavirus.
- Formulate a claim about wearing masks based on evidence.
- Identify patterns in positive COVID-19 cases using data tables and graphs.
- Assess the risk of participating in a particular activity.
- Communicate to the school community the necessary steps to slow the spread of COVID-19.

Challenges

1: How Does COVID-19 Spread?

2: Is Soap Really Effective Against COVID-19?

3: Why Should I Wear a Mask?



4: Do Preventative Measures Even Make a Difference?

5: Should I Get a Haircut?

6: Get the Word Out

Professional Opportunities:

Found out what the education, training and job prospects are for the following:

- Biochemist
- Biostatistician
- Chemist
- Clinical Laboratory Technologist



Challenge 1: How Does COVID-19 Spread?

Learning Target: I can identify human activities that contribute to the spread of COVID-19.

Time Required: 45-60 minutes

1.1 Watch: “How Does COVID-19 Spread?” [0:51] <https://youtu.be/WfJSVbQtHsk>

1.2 Read:

1. “How COVID-19 Spreads”
<https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/how-covid-spreads.htm>
2. “Understanding COVID-19 Risks and Vulnerabilities Among Black Communities in America: the Lethal Force of Syndemics”
<https://www.sciencedirect.com/science/article/pii/S1047279720301770?via%3Dihub>

1.3 Reflect and Write:

1. Are certain groups of people more at risk of contracting COVID-19 than others?
2. What activities can people curtail to slow the spread of COVID-19?

1.4 Discuss: Talk about your answers with another classmate or the whole class.



Challenge 2: Is Soap Really Effective Against COVID-19?

Learning Target: I can model the effects of soap on the novel coronavirus.

Time Required: 45-60 minutes

2.1 Watch: New York-Presbyterian Hospital - How Soap Suds Kill the Coronavirus

<https://www.youtube.com/watch?v=FYKypBqbTao>

2.2 Read: Yale School of Medicine - Why Soap Works

<https://medicine.yale.edu/news-article/23107/>

2.3 Reflect and Discuss:

1. Make a claim, supported by evidence, about how soap limits the spread of the novel coronavirus?
2. Which is better at limiting the spread of the novel coronavirus soap or hand sanitizer? Explain your answer using evidence from your research.

2.4 Develop a Model: With your partner create a diagram/poster that models the effects of soap on the novel coronavirus.



Challenge 3: Why Should I Wear a Mask?

Learning Target: I can formulate a claim about wearing masks based on evidence.

Time Required: 45-60 minutes

3.1 Watch: “What Face Masks Actually Do Against Coronavirus” [7:48]

<https://www.youtube.com/watch?v=P27HRCIMf2U>

3.2 Read: “Still Confused About Masks? Here’s the Science Behind How Face Masks Prevent Coronavirus”

<https://www.ucsf.edu/news/2020/06/417906/still-confused-about-masks-heres-science-behind-how-face-masks-prevent>

3.3 Reflect and Respond:

1. Summarize the benefits of wearing a mask.
2. Who does wearing a face mask benefit the most?
3. What evidence has been collected to support wearing masks?
4. What are the reasons that someone would refuse to wear a mask?
5. What factors may have contributed to people choosing not to wear masks?
6. Explain the importance of using updated scientific knowledge to make decisions. Give an example in another area of your life where using updated scientific knowledge has been helpful.

3.4 Write: Compose a letter to someone you know, classmate, friend, or family member, convincing them to wear a face mask in public settings.



Challenge 4: Do Preventative Measures Even Make a Difference?

Learning Target: I can identify patterns in positive COVID-19 cases using data tables and graphs.

Time Required: two 45-60 minute class periods

4.1 Read: At the beginning of the COVID-19 pandemic, officials, scientists, and leaders were unsure about the benefits of shutting down schools and other areas where large numbers of people congregate. Did they make the right decision?

4.2 Read: “Yale School of Public Health Issues Statement on Closing of New Haven Public Schools in Response to Coronavirus, Pledges Support”

<https://medicine.yale.edu/news-article/23089/>

4.3 Visit the John Hopkins University of Medicine, Coronavirus Resource Center at this link: <https://coronavirus.jhu.edu/>

1. Click on the “Tracking” link at the top of the page, scroll down and click on the box labeled “Timeline of COVID-19 policies, cases, and deaths in your state”.
2. Scroll down to the tab labeled “select another state”, choose Connecticut.
3. By clicking on the orange and green dashed lines the number of cases will be shown in a pop-up box and an explanation of the policies in place at the time will be displayed below the graph..
4. Also view the graphs for Florida and Texas.



4.4 Analyze and Interpret Data:

Connecticut

1. What is the overall pattern of the graph?
2. What does the pattern mean (suggest)?
3. Describe any correlations between either the orange or green dashed lines? (The orange dashed lines correspond with closure policies and the green dashed lines correspond with reopening policies.)

Florida

1. What is the overall pattern of the graph?
2. What does the pattern mean (suggest)?
3. Describe any correlations between either the orange or green dashed lines? (The orange dashed lines correspond with closure policies and the green dashed lines correspond with reopening policies.)

Texas

1. What is the overall pattern of the graph?
2. What does the pattern mean (suggest)?
3. Describe any correlations between either the orange or green dashed lines? (The orange dashed lines correspond with closure policies and the green dashed lines correspond with reopening policies.)

Reflect and Discuss:

- How do state closures and openings affect the number of COVID-19 cases?

Use the claim-evidence-reasoning format.



Challenge 5: Should I Get a Haircut?

Learning Target: I can assess the risk of contracting COVID-19 to determine whether or not I will participate in a particular activity.

Time Required: 45-60 minutes

(Kid visual)

June's 16th birthday is next week. She's wondering how she can celebrate and be safe.

June asked her friends, "Will I get the coronavirus if I get a haircut, go to the bakery, or play basketball with my friends?"

5.1 Reflect and Discuss:

1. Identify an activity that you would like to take part in.
2. Find the activity on the infographics
3. Make a claim as to whether it is safe or not for you to participate in that activity.

How do you know? What evidence do you have to support your claim?

4. Identify at least 2 more activities, then repeat the process.

5.2 Reflect and Discuss: In some cases the need to participate in an activity may outweigh the risk, like going to the doctor or emergency room. Use claim, evidence and reasoning for this, too.

<https://twitter.com/BlandfordBread/status/1279437650164879360/photo/1>



Challenge 6: Get the Word Out

Learning Target: I can communicate to my school community the necessary steps to slow the spread of COVID-19.

Time Required: two 45-60 minute class periods

6.1 Research and Create:

1. Research best practices for slowing the spread of COVID-19
2. Pick one to three practices that you would like to share with the school community.
3. You may choose to create a
 1. Digitally create a poster.
 - All artwork must be original.
 - The poster must be able to be printed at at least the 18 x 24 size.
 - Include a separate “Works Cited” page.
 2. Video
 - All artwork/footage must be original.
 - The length of the video must be between 30-60 seconds.
 - Include “Works Cited” at the end of the video
4. Gallery walk and peer review
5. Final submission



Examples from the Spanish Flu:

<p>Coughs and Sneezes Spread Diseases</p> <p>As Dangerous as Poison Gas Shells SPREAD OF SPANISH INFLUENZA MENACES OUR WAR PRODUCTION</p> <p>U. S. Public Health Service Begins Na- tion-wide Health Campaign.</p> <p>Public Health Poster 1918</p>	<p>Spanish Influenza has endangered the prosecution of the WAR in Europe. There are 3000 cases in the Navy Yard 30 deaths have already resulted. SPITTING SPREADS SPANISH INFLUENZA DONT SPIT</p>
<p>NH 1234 courtesy of the Naval History & Heritage Command</p>	<p>http://www.apimages.com/metadata/Index/Spit-Spreads-Death/38072711323741a1a7c5c9cbf8a87e47/12/0</p>

More examples:

https://www.cdc.gov/handwashing/materials.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fhandwashing%2Fresources.html



Professional Opportunities:

- Biochemist
 - CareerOneStop.org - Biochemists and Biophysicists
<https://www.careeronestop.org/Toolkit/Careers/Occupations/occupation-profile.aspx?keyword=Biochemists%20and%20Biophysicists&onetcode=19102100&location=north%20carolina>
 - ScienceBuddies.org - Science Careers: Interview with Stuart Barnscher
<https://www.sciencebuddies.org/science-engineering-careers/life-sciences/biochemist/stuart-barnscher-interview>
- Biostatistician
 - CareerOneStop.org - Biostatiscian
<https://www.careeronestop.org/Toolkit/Careers/Occupations/occupation-profile.aspx?keyword=Biostatisticians&onetcode=15204101&location=north%20carolina>
 - CareerGirlsBiostatistician: A Typical Day - Tara Maddala Career Girls Role Model <https://www.youtube.com/watch?v=u0A-gwpsQd8>
- Chemist
 - CareerOneStop.org - Chemist
<https://www.careeronestop.org/Toolkit/Careers/Occupations/occupation-profile.aspx?keyword=Chemists&onetcode=19203100&location=north%20carolina>
 - Newsy - The Chemist
<https://www.youtube.com/watch?v=Zw6x2mxbT58>



- Clinical Laboratory Technologists
 - CareerOneStop.org - Medical and Clinical Laboratory Technologist
<https://www.careeronestop.org/Toolkit/Careers/Occupations/occupation-profile.aspx?keyword=Medical%20and%20Clinical%20Laboratory%20Technologists&onetcode=29201100&location=north%20carolina>
 - Portland Community College - Medical Lab Technicians and Portland Community College
https://www.youtube.com/watch?time_continue=141&v=AC1RNPfgDrM&feature=emb_logo