Not Vaccinated?

Teacher Guide

Lesson Summary:

This lesson is designed to promote student conversations to overcome vaccine hesitancy. It is recommended that students work in pairs and that ample time be devoted to sharing answers with the class.

Consider creating a "Question Board" where students can write questions that they have about the COVID-19 vaccine. Take time to answer these questions at the end of the lesson. The teacher can answer the questions or assign the questions to students for their research.

Estimated Time Needed: 40-60 minutes

Key Concepts:

Lesson Part	Key Concept
Part 1: Listening	Listen to people's ideas
Part 2: Vaccines make a difference	Vaccines protect from diseases
Part 3: Understanding herd immunity	Herd immunity protects communities
Part 4: COVID-19 Vaccine Myth Busters	Facts can dispel myths/rumors
Part 5: Where are free COVID-19 vaccines available?	Vaccines are available in communities

Supplies Needed:

- Red 10 mm tribead – 1 per student pair
  https://www.amazon.com/Christmas-Red-Tri-Shaped-Beads-000/dp/B006CANYPU
- Penny – 1 per student pair

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Lesson Preparation:

- For Part 1: 1 copy of **Not Vaccinated?** student handout for each student. *Note: This may be distributed as a single packet with all the lesson parts OR distribute one lesson part at a time as you begin each part.*

- For Part 2: 1 copy of **Disease Descriptions** per pair of students.

- For Part 3: Access to YouTube video via computer, phone, or tablet. QR code and URL is in student handout.

- For Part 4: 1 color copy of **Myth and Fact** cards. To save class time, the teacher should cut the **Myth and Fact** sheet into 16 cards and place the cards in a plastic bag. Each pair of students will need one set of cards.

- For Part 5: Students will need internet access for their research. If internet access is not available, the teacher should print information about two or three locations near the school where students can get free COVID-19 vaccines.

Suggested information related to COVID-19 vaccines:

- **Science Buddies Herd Immunity Video and Teacher Information**
  https://www.sciencebuddies.org/stem-activities/model-herd-immunity?from=YouTube

- **CDC: Myths and Facts about COVID-19 Vaccines**
  https://www.cdc.gov/coronavirus/2019-ncov/vaccines/facts.html

- **CDC: Vaccines for COVID-19**
  https://www.cdc.gov/coronavirus/2019-ncov/vaccines/index.html

- **FDA: COVID-19 Vaccines**
  https://www.fda.gov/emergency-preparedness-and-response/coronavirus-disease-2019-covid-19/covid-19-vaccines

- **Herd immunity and COVID: What you need to know**
  https://www.mayoclinic.org/diseases-conditions/coronavirus/in-depth/herd-immunity-and-coronavirus/art-20486808#:~:text=Herd%20immunity%20occurs%20when%20a,just%20those%20who%20are%20immune

- **Behavioural Science-Informed Strategies for Increasing COVID-19 Vaccine Uptake in Children and Youth**
  https://covid19-sciencetable.ca/wp-content/uploads/2021/10/Behavioural-Science-Informed-Strategies-for-Increasing-COVID-19-Vaccine-Uptake-in-Children-and-Youth_published_20211026-2.pdf

Disease Descriptions

Measles causes a red, blotchy rash that usually appears first on the face and behind the ears, then spreads downward to the chest and back and finally to the feet. Measles is an infection caused by a highly contagious virus. Measles can be very serious, particularly for children younger than 5 years and adults older than 20 years. It may cause complications such as ear infections, diarrhea, pneumonia and encephalitis (brain inflammation). Once quite common, measles can now almost always be prevented with a vaccine that was introduced in 1963. In 2000, measles was declared eliminated from the United States. However, travelers from other countries can bring measles into the United States, and it can cause outbreaks among people who are not vaccinated.

Pertussis, also known as whooping cough, is a highly contagious respiratory disease. It is caused by the bacterium *Bordetella pertussis*. Pertussis often causes uncontrollable, violent coughing which makes it hard to breathe. It can be especially serious in babies who did not yet get the vaccine. About half of babies under age one who get whooping cough need to be hospitalized. Once quite common, pertussis can now almost always be prevented with a vaccine that was introduced in 1904.

Mumps causes puffy cheeks and a swollen jaw due to swelling of the salivary glands. Other symptoms of mumps include fever, head and muscle aches, and tiredness. Mumps is a contagious disease and there is no treatment. Mumps is still a threat today—every year, people in the United States get mumps. In recent years, mumps outbreaks have occurred in settings where there was close, extended contact with infected people, such as being in the same classroom or playing on the same sports team. Once quite common, mumps can now almost always be prevented with a vaccine that was introduced in 1948.

Smallpox is caused by a virus that is very contagious, disfiguring, and often deadly. It causes high fever, body aches, severe fatigue, and a blistering rash that can spread over the entire body. There is no treatment or cure for smallpox. The first use of smallpox vaccines began in 1776. Thanks to a worldwide vaccination program, the last naturally occurring case of smallpox was reported in 1977. In 1980, the World Health Organization declared that smallpox had been completely wiped out. Currently, people are not vaccinated for smallpox because there is no evidence of naturally occurring smallpox transmission anywhere in the world.

Diphtheria is disease caused by a virus. It can cause a thick covering in the back of the nose or throat that makes it hard to breathe or swallow. Diphtheria can also lead to heart failure, paralysis, and even death. Once quite common, diphtheria can now almost always be prevented with a vaccine that was introduced in 1963.

Polio is a crippling and potentially deadly infectious disease that is caused by poliovirus. The virus spreads from person to person and can invade an infected person's brain and spinal cord, causing paralysis. The first polio vaccine was introduced in 1955. Polio was eliminated in the United States in 1979 with vaccination. There were a few cases of polio in the United States in 1993 and 2022, possibly due to travelers from other countries who were infected with the poliovirus.

MYTH 1 **The ingredients in COVID-19 vaccines are dangerous.**	**FACT A** COVID-19 vaccination is recommended for people who are pregnant, trying to get pregnant now, or might become pregnant in the future, as well as their partners. Currently, no evidence shows that any vaccines, including COVID-19 vaccines, cause fertility problems (problems with trying to get pregnant) in women or men.
MYTH 2 **The natural immunity I get from being sick with COVID-19 is better than the immunity I get from COVID-19 vaccination.**	**FACT B** Vaccine safety experts study adverse events - health problems that are reported after a person has been vaccinated. They look for unusually high numbers of health problems, or a pattern of problems after people receive a particular vaccine. Studies of adverse events have not revealed that they were caused by COVID-19 vaccines.
MYTH 3 **COVID-19 vaccines cause new COVID-19 variants.**	**FACT C** Most COVID-19 tests available are viral tests that are used to see if you have a current infection. Viral tests are designed to determine whether the virus is present in your body. None of the authorized and recommended COVID-19 vaccines can cause you to test positive on viral tests.
MYTH 4 **COVID-19 vaccines cause health problems that begin after people have a COVID-19 vaccine.**	**FACT D** COVID-19 vaccination causes a more predictable immune response than infection with the virus that causes COVID-19. For people who already had COVID-19, those who do not get vaccinated after their recovery are more than 2 times as likely to get COVID-19 again than those who get fully vaccinated after their recovery.

MYTH 5 **COVID-19 vaccines will affect a person's fertility—both now and in the future.**	**FACT E** Nearly all the ingredients in COVID-19 vaccines are also ingredients in many foods – fats, sugars, and salts. COVID-19 vaccines do not contain ingredients like preservatives, tissues (like aborted fetal cells), antibiotics, food proteins, medicines, latex, or metals.
MYTH 6 **A COVID-19 vaccine can make people around me sick with COVID-19.**	**FACT F** The virus that causes COVID-19 constantly changes through a natural ongoing process of mutation (change). As the virus spreads, it has more opportunities to change. High vaccination coverage in a population reduces the spread of the virus and helps prevent new variants from emerging. COVID-19 vaccines can help prevent new variants from emerging.
MYTH 7 **COVID-19 vaccines contain mRNA that can alter my DNA (genes).**	**FACT G** Because none of the authorized COVID-19 vaccines in the United States contain live virus, the vaccine cannot make you or people around you sick. COVID-19 vaccines teach our immune systems how to fight the virus that causes COVID-19. Sometimes this process can cause symptoms, such as fever, that are normal signs that the body is building protection against the virus that causes COVID-19.
MYTH 8 **Getting a COVID-19 vaccine will cause me to test positive on a viral test.**	**FACT H** COVID-19 vaccines work by delivering instructions (mRNA) to our cells. mRNA vaccines do not change or interact with your DNA in any way. The mRNA in a COVID-19 vaccine never enters the nucleus of your cells. The mRNA in a COVID-19 vaccine is very fragile and breaks down after it produces the proteins that trigger an immune response.

Not Vaccinated?

Part 1: Listening

In the Monk County School District, only 34% of students aged 5 to 11 and 62% of students aged 12-17 have received two doses of a COVID-19 vaccine. Less than 32% of the older students have received the booster dose recommended for greater protection against COVID-19.

The board of education for the Monk County School District recognizes that students under the age of 18 need permission from their parent or guardian before they can be vaccinated. A team of high school students has volunteered to develop a program to encourage parents to have their children vaccinated against COVID-19.

To begin the program, the high school students thought it was important to listen to parents explain why they chose to not have their children get vaccinated to protect them from COVID-19.

1. Make a list of reasons why some parents might choose to not have their children vaccinated.

   Student answers will vary. Allow time for students to share their answers. It is important to listen without attempting to identify reasons that might be myths or rumors.

2. The team of students wants to create a program to encourage people to have their children vaccinated. Why do you think the team thought it was important to begin the program with parents' reasons for not having their children vaccinated?

   Student answers will vary. Allow time for students to share their answers.

Part 2: Vaccines make a difference

The students on the program planning team decided to first focus on how childhood vaccines had been important in protecting children from dangerous diseases. They found information about diseases that could result if children did not receive the usual recommended childhood vaccines.

1. Read the **Disease Descriptions** page to learn what it would be like to have the each of the diseases listed on the right. As you read the information on each disease, complete the chart below:

   - Put an "X" in front of the diseases that you had when you were a child.
   - Put an "X" in front of the diseases if you know someone other than you who had the disease.

_____ Measles	_____ Smallpox
_____ Pertussis	_____ Diphtheria
_____ Mumps	_____ Polio

Student answers will vary. Many students will say that they have not heard of these diseases. Refer students to the website on the following page more information.

2. Summarize the main trend or pattern that you observe in the data table on the right.

Deaths in the United States Due to Vaccine Preventable Diseases

Disease	Before 1900 Average Deaths Per Year	Deaths Reported in 2019
Measles	530,217	1,287
Pertussis	200,752	15,662
Mumps	162,344	3,509
Smallpox	29,005	0
Diphtheria	21,053	2
Polio	16,316	0

Source: https://www.cdc.gov/vaccines/ed/surv/downloads/VPD-morbidity-slide1-mmwr-508.pdf

3. Why do you think we rarely see widespread outbreaks of these diseases in the United States?

Because most people have been vaccinated to prevent these diseases.

4. What actions could people take to prevent widespread outbreaks of COVID-19?

They could get COVID-19 vaccines and boosters.

For more information about diseases that may be prevented by vaccines, see this website:

14 Diseases You Almost Forgot About

https://www.cdc.gov/vaccines/parents/diseases/forgot-14-diseases.html

Part 3: Understanding herd immunity

One of the students thought they should use a video that he found that modeled the spread of COVID-19 in a community.

View the video using your computer, phone, or tablet. *Mute the video sound so that you do not disturb your classmates.*

Video: Model How Herd Immunity Works

http://www.youtube.com/watch?v=hZ6IJOLaIyI

1. What color domino represents:

   - A person who is sick with COVID-19 ***Red***
   - A person who is not immune to COVID-19 ***Yellow***
   - A person who is immune to COVID-19 ***Green***

2. What does a yellow domino falling over represent?

   A person getting sick with COVID-19 is represented by a yellow domino falling over.

3. State two ways that a person could become immune to COVID-19.

   By getting sick with COVID-19.
   By getting a COVID-19 vaccination.

4. **Herd immunity** (or community immunity) occurs when a high percentage of a community is immune to a disease (through vaccination and/or prior illness). Explain how the model in the video illustrates how herd immunity can slow or stop the spread of COVID-19.

   When there are lots of green dominos, the number of yellow dominos falling decreases.

Another student made two diagrams to model how herd immunity could slow or stop the spread of COVID-19. These models are shown below.

KEY: ■ = **Sick** **X** = **Immune to Covid-19** **O** = **Not Immune to Covid-19**

Model **A**

X	X	X	X	X	X	X	O	X	X
O	X	X	X	O	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X
X	X	X	O	X	O	X	X	X	X
X	X	■	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	O	X	X	X
X	X	X	O	X	X	X	X	O	X
X	X	X	X	X	X	X	X	X	X

Model **B**

X	O	O	O	O	O	O	O	O	O
O	O	O	O	O	X	O	O	O	O
O	O	X	O	O	O	O	O	O	O
O	O	O	O	O	O	O	O	O	O
O	O	O	O	O	O	X	O	O	O
O	O	■	X	O	O	O	O	X	O
O	O	O	O	O	O	O	O	O	O
O	O	O	O	X	O	O	O	O	O
O	O	O	O	O	O	O	O	X	O
O	X	O	O	O	O	O	O	O	O

5. Which model (A or B) represents a community with herd immunity? Explain why you chose that answer.

   Model A because most of the community is represented by X's that indicate a person who is immune to COVID-19.

6. Explain why it would be difficult for COVID-19 to spread in the model that you selected.

   Because the sick person is surrounded by people who are immune to COVID-19.

7. Based on your experience with the video of the dominoes and the diagrams of models A and B, explain how herd immunity can slow the spread of COVID-19.

   It is difficult for the COVID-19 virus to spread because there are not many people who can be infected. For example, if someone infected with the virus is surrounded by people who are vaccinated against the virus, the disease cannot easily be passed on to anyone.

8. Children younger than 6 months should not be given COVID-19 vaccines. COVID-19 vaccines may also not be effective for people with immune systems that do not work properly. Explain why herd immunity is important these people.

   Herd immunity means that these people are less likely to come in contact with someone who has COVID-19.

Part 3: COVID-19 Vaccine Myth Busters

Myths and rumors may affect people's willingness to get vaccines. For example, some people believed the myth that vaccines cause autism. This myth has been "busted" because research by many scientists has shown that there is no link between autism and vaccinations.

Students on the program planning team created a card matching activity with accurate COVID-19 vaccine facts to help stop common myths and rumors. The statements on the yellow **Myth** cards represent some common myths about COVID-19 vaccines. The blue **Fact** cards summarize facts that could be used to dispel ("bust") the myth.

1. Work with your partner to match the yellow Myth cards with the appropriate blue Fact card.

2. For each of the yellow myth card numbers below, write the letter on the matching blue fact card.

1 _***E***__ 2 _***D***__ 3 _***F***_ 4 _***B***__ 5 _***A***__ 6 _***G***__ 7 _***H***__ 8 _***C***__

3. Describe another possible reason why some parents might think that the COVID-19 vaccine is not safe for their children.

Student answers will vary. Allow time for students to share their answers.

4. Do some research to find out if your answer in question 3 is a myth or a fact. Summarize the results of your research. Cite the source for the results of your research.

Student answers will vary. Allow time for students to share their answers.

The students used this information from the CDC (Centers for Disease Control) to make their **Myth** and **Fact** cards:

Myths and Facts about COVID-19 Vaccines

https://www.cdc.gov/coronavirus/2019-ncov/vaccines/facts.html

Part 4: Where are free COVID-19 vaccines available?

The students on the program planning team knew that people are more likely to get their children vaccinated if they can find free COVID-19 vaccines that are offered at convenient places and at convenient times. The program planning team will use internet resources to identify sites appropriate for the participants in their community.

1. Help the planning team find possible locations where free COVID vaccines are available at convenient locations near your home. Try these websites:
    - **Find Covid-19 Vaccines** https://www.vaccines.gov/search/
    - An internet search using "Free Covid vaccines near me"

2. Provide information on two locations near your home or school that give free COVID-19 vaccines. For each location, include the website, location address, distance from your home/school, hours that vaccines are available, and whether an appointment is needed.

    Student answers will vary. Allow time for students to share their answers.

3. Some people do not have computer skills/access or language skills to schedule appointments for vaccinations. What ideas do you have for ways to help these people get their family members vaccinated?

    Student answers will vary. Allow time for students to share their answers.

4. Some vaccine locations offer only one kind of COVID-19 vaccine. Are all COVID-19 vaccines currently available in the United States safe for children? Do internet research to answer this question. Provide the website for your information source.

    Student answers will vary. Allow time for students to share their answers.