



Contact Tracing – Student Instructions



Conduct a Disease Transmission Experiment

In this activity, you will be modeling disease **transmission** using baking soda or vinegar to represent a disease. Starting with one infected person, you will observe how the disease spreads through a population and conduct **contact tracing** to identify **index cases**. You will identify infected individuals using a color-changing pH indicator. To complete this activity, you will need the following:

Tools of the Trade

- Water
- Baking soda or vinegar
- 12 disposable bathroom cups, 3 oz. (or other small cups/containers)
- permanent marker
- pH Indicator (see note and recipes below)

What are pH indicators?

Some substances naturally change color with changes in pH. These pH indicators are useful for estimating the pH of a solution based on its color. Any color change you observe indicates a substance that is not pure water. You can purchase indicators locally from aquarium or pool stores or get them online. You can also easily make your own from certain food items – see the two recipes you can use here! Whatever you choose, you'll only need a few drops of indicator for each cup.

Try these natural pH indicator recipes!

Red Cabbage Juice

Put a handful of red cabbage into a blender with about 2 cups of water. Blend until cabbage is fully blended. Strain using a fine mesh strainer or coffee filter. Collect the juice to use as your pH indicator.

If you do not have a blender, you can also chop cabbage and boil it for ~15 minutes. Strain out the leaves and cool to use the juice as an indicator.

Blueberry Juice

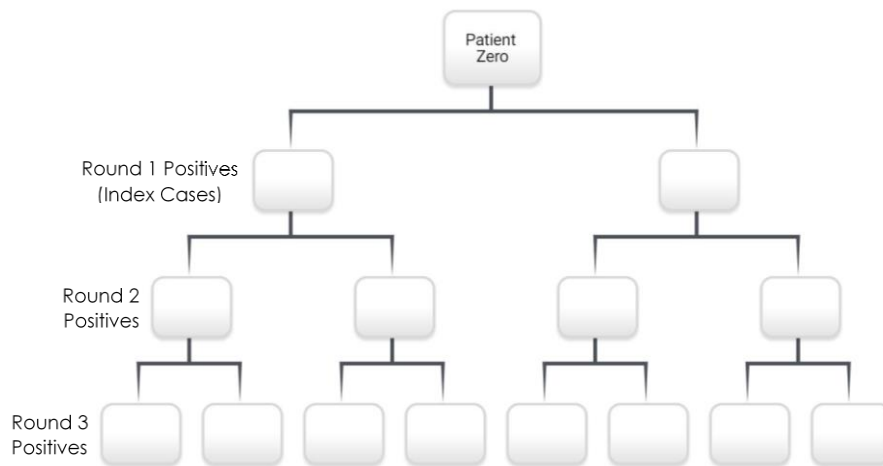
Mash a handful of blueberries with a spoon or potato masher. Add a little water and boil for 5-10 minutes to extract color. Strain the mixture using a fine mesh strainer or coffee filter and use the juice as your pH indicator.

Instructions

- Fill 11 cups about $\frac{1}{3}$ full of water. In the 12th cup, add your disease – either the baking soda or vinegar. If using baking soda, fill $\frac{1}{3}$ full of water, add about $\frac{1}{2}$ teaspoon baking soda, and stir until well dissolved. If using vinegar, fill cup $\frac{1}{3}$ full with vinegar.
- Mix up the cups so that you do not know which cup contains the disease mixture.
- Number your cups from 1-12 using a permanent marker. If you are using a container that is not disposable, use masking tape or another method to number them.
- Round 1:** Group your cups into 6 random pairs. Pour each pair of cups into each other and mix back and forth 2-3 times. Then divide the mixture again by putting half of the solution back in each cup. Record the pairings in the chart on the top of the next page.
- Round 2:** Mix up your cups and make new partners. **Do not repeat any groups from round 1.** Mix your liquids, divide back in half, and record the pairings.
- Round 3:** Mix up your cups and make new partners. **Do not repeat any groups from round 1 or 2.** Mix your liquids, divide back in half, and record the pairings.
- Add a few drops of your pH indicator to each cup. If a color change occurs, your cup has tested positive for the disease we are studying. Record your results in the chart on the next page.

Use the results of your activity to identify your initial **index cases**. Due to the limitations of this experiment, you will not be able to find a single initial **index case**, but you should be able to narrow it down to 2 individuals.

- Stuck? Cut out the 12 person cards and move them around to help you better visualize it.
- Start by writing your positive pairs in the bottom row and work your way up to the top.



Plan a Contact Tracing Interview

Case investigation and **contact tracing**, a core disease control measure employed by local and state health department personnel for decades, are key strategies for preventing further spread of COVID-19. Immediate action is needed. Communities must scale up and train a large workforce and work collaboratively across public and private agencies to stop the **transmission** of COVID-19. Case investigation and **contact tracing** are specialized skills. To be done effectively, they require people with the training, supervision, and access to social and medical support for patients and contacts. Your task is to plan a **contact tracing** interview with a patient who has recently been diagnosed with COVID-19.

Background information

David is a 42-year-old man who started feeling ill on July 13 and tested positive for COVID-19 on July 14. He is married with three kids (ages 4, 12, and 19) and lives with his wife (age 46) and mother-in-law (age 71). His 4-year-old daughter attends daycare during the week. His 12-year-old son is out of school for the summer and spends most days playing at friends' houses. His 19-year-old daughter is in college and is taking summer classes while living in a dorm on campus. His wife works full time in an office building but has just returned from a trip visiting relatives in another state. His mother-in-law lives with them and has some health problems, including diabetes and chronic congestive heart failure. She frequently attends events at the local senior center down the road from their house. While he generally works from home, he occasionally has to go into the office to meet with co-workers in person.

When David got tested, they gave him a flier containing a form that asked him to consider all of his activities for the previous 10 days. They informed him that a contact tracer from the local health department will be following up to ask him further questions about his activities and to determine if he has any **close contacts** who need to be notified and possibly tested. David's form responses are included on the next pages of this document.

Conduct an Interview

Use David's form responses from pages 4 and 5 in this document to plan your phone interview with him. Here are the general steps to conducting an interview with a patient:

1. Introduce yourself to the patient and explain the purpose of your call
2. Collect demographic information from patient
3. Assess patient's overall health and COVID-19 symptoms and provide self-care information
4. Develop a plan to monitor patient's health and respond to changes in health status
5. Review isolation procedures and provide resources
6. Identify **close contacts** and routes of exposure
7. Prompt for questions and provide contact information

More detailed interview tips including sample questions, sentence starters, and advice for creating open channels of communication are available here: <https://www.cdc.gov/coronavirus/2019-ncov/php/contact-tracing/case-investigator-guide.html>

Questions to answer on the Data Collection Sheet or a separate piece of paper:

- Based on David's background information, what questions do you have for him?
- What specific recommendations do you have for David based on his background information?

When you've written your questions, recruit a friend or family member to role play with you as David. If you enjoy this activity, more practice training scenarios are available here:

<https://www.cdc.gov/coronavirus/2019-ncov/downloads/php/contact-tracing/COVID19-Contact-Tracing-Scene-508.pdf>



Share Your Findings

The David J. Sencer CDC Museum uses award-winning exhibits and innovative programming to educate visitors about the value of public health and presents the rich heritage and vast accomplishments of CDC. Your findings could be a valuable contribution! Share your findings with the CDC Museum on Instagram using **@CDCmuseum**.

David received this flier when he tested positive for COVID-19 and added information to help him answer his contact tracer's questions over the phone.

3 Key Steps to Take While Waiting for Your COVID-19 Test Result

To help stop the spread of COVID-19, take these **3 key steps NOW** while waiting for your test results:

1 Stay home and monitor your health.

Stay home and monitor your health to help protect your friends, family, and others from possibly getting COVID-19 from you.

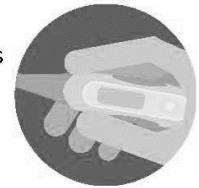
Stay home and away from others:

- If possible, stay away from others, especially people who are at higher risk for getting very sick from COVID-19, such as older adults and people with other medical conditions.
- If you have been in contact with someone with COVID-19, stay home and away from others for 14 days after your last contact with that person. Follow the recommendations of your local public health department if you need to quarantine.
- If you have a fever, cough or other symptoms of COVID-19, stay home and away from others (except to get medical care).



Monitor your health:

- Watch for fever, cough, shortness of breath, or other symptoms of COVID-19. Remember, symptoms may appear 2–14 days after exposure to COVID-19 and can include:
 - Fever or chills
 - Cough
 - Shortness of breath or difficulty breathing
 - Tiredness
 - Muscle or body aches
 - Headache
 - New loss of taste or smell
 - Sore throat
 - Congestion or runny nose
 - Nausea or vomiting
 - Diarrhea



2 Think about the people you have recently been around.

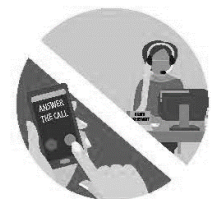
If you are diagnosed with COVID-19, a public health worker may call you to check on your health, discuss who you have been around, and ask where you spent time while you may have been able to spread COVID-19 to others. While you wait for your COVID-19 test result, think about everyone you have been around recently. This will be important information to give health workers if your test is positive.

Complete the information on the back of this page to help you remember everyone you have been around.

3 Answer the phone call from the health department.

If a public health worker calls you, answer the call to help slow the spread of COVID-19 in your community.

- Discussions with health department staff are **confidential**. This means that your personal and medical information will be kept private and only shared with those who may need to know, like your health care provider.
- Your name will not be shared with those you came in contact with. The health department will only notify people you were in close contact with (within 6 feet for more than 15 minutes) that they might have been exposed to COVID-19.



cdc.gov/coronavirus

Think About The People You Have Recently Been Around

If you test positive and are diagnosed with COVID-19, someone from the health department may call to check-in on your health, discuss who you have been around, and ask where you spent time while you may have been able to spread COVID-19 to others. This form can help you think about people you have recently been around so you will be ready if a public health worker calls you.

Things to think about. Have you:

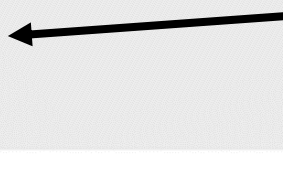
- Gone to work or school?
- Gotten together with others (eaten out at a restaurant, gone out for drinks, exercised with others or gone to a gym, had friends or family over to your house, volunteered, gone to a party, pool, or park)?
- Gone to a store in person (e.g., grocery store, mall)?
- Gone to in-person appointments (e.g., salon, barber, doctor's or dentist's office)?
- Ridden in a car with others (e.g., rideshare) or taken public transportation?
- Been inside a church, synagogue, mosque or other places of worship?



Who lives with you?

Hannah (wife - 46)
 Brandon (son - 12)
 Isabelle (daughter - 4)
 Iris (mother-in-law - 71)

David's Responses



Who have you been around (less than 6 feet for a total of 15 minutes or more) in the last 10 days? (You may have more people to list than the space provided. If so, write on the front of this sheet or a separate piece of paper.)

Name	Phone Number	Date you last saw them	Where you last saw them
Vega Family	555-4625	July 5	Backyard Barbecue
Blackmore Family	555-7412	July 5	Backyard Barbecue
Prince Family	555-2289	July 5	Backyard Barbecue
Burriss Family	555-1147	July 5	Backyard Barbecue
Dave	555-7788	July 7	Downtown Multiplex
Carolyn	555-1549	July 8	Work
Dr. Bautista	555-7387	July 8	Westside Animal Hospital
Arnav & Saniya	555-9234	July 10	Dinner at Burrito Depot
Tyreece	555-7841	July 10	Dinner at Burrito Depot
Jocelyn	555-1432	July 13	Visited College Dorm

What have you done in the last 10 days with other people?

Activity	Location	Date
Barbecue	Our backyard	July 5
Movie	Downtown Multiplex	July 7
Vet Appointment for Whiskers	Westside Animal Hospital	July 8
Picked up Hannah from Airport	International Airport	July 9
Grocery Shopping	Food N Stuff	July 10
Dinner with Friends	Burrito Depot	July 10
Church Service and Picnic	Bellview Church	July 11
Brandon's Soccer Game	Shady Pines Park	July 12
Renewed Driver's License	Dept of Driver Services	July 13