

# Sharing Inexpensive Health Science Activities for Use at Home or School



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# General Disclaimers

- The lessons we are teaching can be found in multiple courses and are often **Repeating** standards; therefore some of our ideas may have been done in previous courses
- Yes everything old is new again. We are experienced teachers that have taken some old ideas and modernized and improved on them
- Safety is the utmost. Make sure you monitor the students at all times when performing activities
- Before performing and after every activity make sure you stress to your students their hands should be washed
- Rubrics should be used only if they apply to you and your class. Sometimes, the teachers have skills sheets/competencies which are better suited to evaluate students

# Standards for this Webinar

- **7.1 Infection Control**
- **7.1.1 Explain principles of infection transmission**
  - c. Recognize chain of infection
  - d. Describe mode of transmission
    - Common vehicle (air, food, water)
    - Direct
- **7.1.2 Differentiate methods of controlling the spread and growth of pathogens**
  - a. Asepsis
    - Antisepsis
    - Disinfection
  - b. Standard precautions
    - Handwashing
    - Gloving (if time permits)
    - Personal Protective Equipment (PPE)
  - c. Isolation Precaution
    - Transmission Based Contact

# Activities

- Chain of Infection
  - Mobile
- Handwashing
  - Video – Youtube of E2 Handwashing
  - Making something similar to germ glo
  - Making hand sanitizer
- Sterile Gloves (if time permits)
  - Preparing inexpensive way to do procedure
- Taking off gloves
  - Ice cream Syrup Activity
- Disease Spreading Activity
- Case Study for Introduction to a Standard
- Discuss immune and lymphatic systems

# Introduction to a Standard

We start an introduction to a standard with a case study. This usually gets the students' attention. This case study is part of our infection disease module. Its easy to make up your own. For example:

## **Infectious Diseases**

- Nobu, a 20-year-old college sophomore is feeling awful. He is tired, hot, nauseous, and all his body parts ache. In addition, he has not eaten that day. He takes Tylenol every 4 hours and feels better, but when the 4 hours are up, he feels terrible again. His roommates encourages him to go to the clinic that is on campus.
- The nurse takes a medical history on Nobu. He has no underlying medical issues. He considers himself healthy and in good shape. Nobu said he has a scratchy throat and his nose is stuffed up. Nobu said he does not know anyone else that is sick. However, he is in a college dorm with 200 students and takes classes in large lecture halls. He cannot remember if he had a flu shot earlier in the school year. His temperature is at 102 degrees Fahrenheit, his pulse rate and respiratory rate are slightly elevated, and his blood pressure is in normal range. An X-Ray shows that his lungs are clear.

# Introduction to a Standard Cont

- A nasal swab is taken and a flu test is done. Nobu's flu test is positive. Nobu has Influenza A (H1N1). With an early onset flu diagnosis, Nobu is prescribed a common antiviral medicine and told to hydrate often. For his fever and body pain, he is told to continue to take Tylenol. He is advised to avoid contact with others for a few days, to rest and not to go to class. He is told to come back to the clinic if he develops a cough, or if his ears hurt. A week later Nobu returns to class and although he feels a lot better, he still gets tired easily.
- Having the "flu" is an example of an infectious disease. This is a highly contagious respiratory infection caused by a virus. There were no antibiotics given to Nobu since antibiotics do not work against viruses.
- Students will investigate different types of microorganisms. Preventing and controlling the spread of disease will be emphasized.

# Chain of Infection Activity

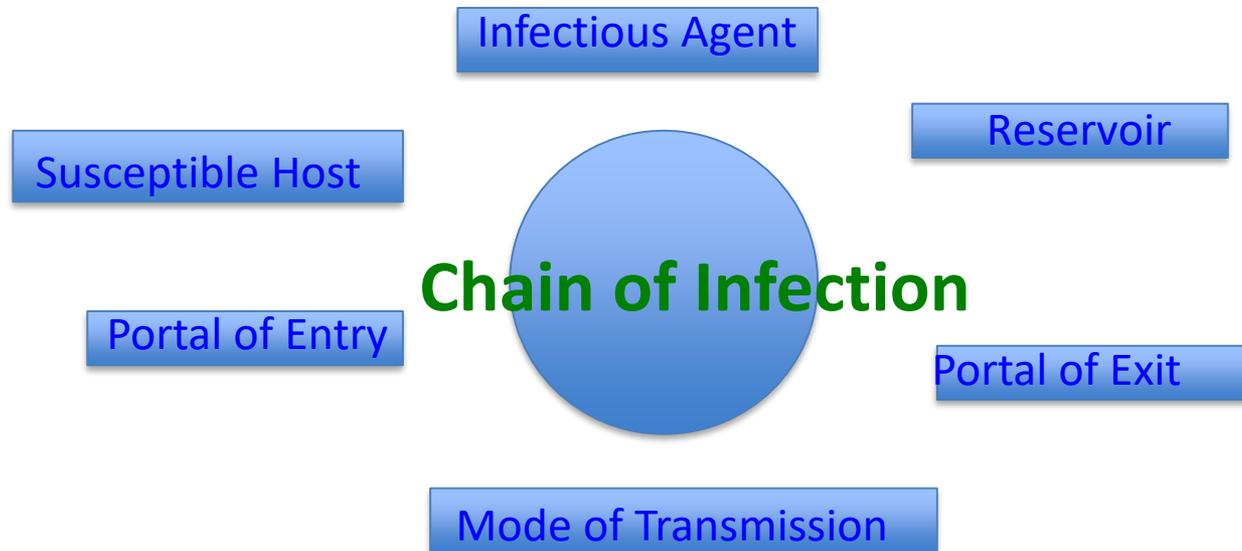
- **7.1 Infection Control**

- Explain principles of infection transmission
- Recognize chain of infection

**Activity 1:** Using the chain of infection chart and the case study provided put the students in groups to place the agent in one of the six components of the chain of infection. Also its important for the students to know how to break the chain of infection

# Chain of Infection Chart

**Influenza A (H1N1)**



# Chain of Infection Activity Cont

- **Activity 2: The students are placed in\*\*\* groups to make mobiles. Once the mobiles are made, each group presents to the class**
  - **Directions: The students of placed in groups of 3-4 normal times (Presently, 1 student per mobile). Using hangers and appropriate information the students are given a infectious agent (virus, bacteria, fungus). Rubric should be followed!**
  - **The following information need to be attached to the hanger: microbe, disease it causes, symptoms, epidemiology treatment, and treatment success rate, and disease prognosis. The chain of infection components should also be put on this mobile**
  - **Students need to get creative with how the mobile is put together and the material they use**
  - **All the students in their group will have a part in presenting their mobile to the class**

# Mobile Picture



# Chain of Infection Activity Mobile Rubric

	Name		Class	Date	Title	
<b>Scoring Criteria</b>	<b>Excellent 5</b>	<b>Good 4</b>	<b>Needs some improvement 3</b>	<b>Needs much improvement 2</b>	<b>Kidding Right? 1</b>	<b>No evidence seen 0</b>
Is prepared and ready to present 1-2 min						
Clearly and effectively communicates ALL of the information						
Integrated a variety of creative components						
Presentation holds audience attention						
Each image and font is easy to read						
Grammar, spelling, and punctuation are correct						
Proper intro and closing						
All components of COI are included						
All students present and are confident						
Use of fillers is minimal						
Score /50 x100= %						

# Handwashing

## Washing Hands Properly

- The hands should be washed frequently since throughout the day people touch others and surfaces and acquire germs on the hands
- Wet the hands with clean, running water, preferably warm. If the water is too hot, the skin might get damaged. If cold water is used it will be more difficult to have a foamy lather. Turn off the tap and apply soap. Regular soap is as effective as antibacterial soap. Lather all of the surfaces of the hand, the fingers, between the fingers, and underneath the nails. **A nail brush should no longer be used. Show another way to clean nails.** It is important to rub your hands together and apply friction since that helps rid the hands of microorganisms.
- Make sure the hands are rubbed for at least 20 seconds. **Common songs to sing for 20 seconds could be “Happy Birthday” twice, two or three verses of “The Wheels on the Bus”, choruses of “Love on Top” by Beyoncé, “Raspberry Beret” by Prince, and “Truth Hurts” by Lizzo. Rinse well. The hands can be dried with a clean towel or air-dried (not hand dryer).**

# How to Make Hand Sanitizer at Home

- **Using an alcohol-based hand sanitizer**
  - This is an acceptable replacement when soap and water are not available. Make sure the sanitizer contains at least 60% of alcohol. Apply the gel product (small amount) to the palm of one hand, rub both hands together, and rub the gel over all surfaces of the hands and fingers until hands are dry.
- **How to Make (DIY) hand sanitizer**
  - To prevent the spread of infectious diseases it is best to use soap and proper handwashing techniques. But, if they are not available, the next best option according to the Centers of Disease Control and Prevention (CDC) Trusted Source is to use an alcohol-based sanitizer that contains at least 60% of alcohol.

# Directions for making hand sanitizer

- Use 2/3 of a cup of rubbing alcohol (if over 70% of alcohol concentration, make sure water is added)
- Use 1/3 cup of Aloe Vera to help with the dryness of skin
- Eight to 10 drops of scented oil can be used in order for the disinfectant to smell better (lemon can also be used)
- Mix well and fill a small bottle

# Direction of making disinfectant wipes

- Have a jar filled with wash clothes (or paper towels)
- Mix in a bowl - 2 cups of warm water
- 1 cup of rubbing alcohol of at least 60 to 70 % alcohol concentration
- Scented oil can be added
- Pour the cleaning mix into the jar over the wash clothes (or paper towels)
- Put the lid on and use as needed
- \*\*\* Do not use homemade hand sanitizers on children's skin as they may be more likely to use them improperly which might lead to injury.

# Accelerated Handwashing and Glove Activity

- **7.1.2 Differentiate methods of controlling the spread and growth of pathogens**
  - a. Standard precautions
    - Handwashing
    - Gloving
    - Personal Protective Equipment (PPE)
  - b. Isolation Precaution
    - Transmission Based Contact

# Accelerated Handwashing and Glove Activity

**Objective:** Students will learn how to remove gloves safely that are contaminated

**Materials:**

Gloves (2 pr per student)

Newspaper or something similar

Mixing Bowl

Trash bags

Strawberry Ice cream Syrup

Paper towels

**Procedure:**

1. Pour syrup in bowl
  2. Cover all tables with newspaper or bulletin board paper
  3. Each student will put on a pair of gloves
  4. Each student takes a turn and puts fingers up to the first knuckle in the syrup
  5. Explain to student how to remove glove without getting syrup on their skin
  6. Classroom discussion on the difficulty on removing contaminated gloves
  7. Teacher demonstration on how to safely remove gloves
  8. Repeat glove removal using a new pair of gloves
  9. Clean up and put everything in the trash bags
- \*\*\* Removal of gloves is easier if excess syrup is wiped off using paper towels before removing gloves

# DIY Germ Glow in the Dark

- Simple Procedure to Make
  - Inexpensive lotion
  - Mix with Glow in the Dark Glitter (Michael's, any craft store, Amazon, etc. )
  - Shake bottle to mix
- Students put this on their hands, and then they wash hands properly (as taught)
- Students will go into a dark room and check out their hands to see how well they washed

# Personal Protective Equipment

## Disclaimer:

- At this time PPE is difficult to obtain
- Since this is consumable material and teachers typically have to order this each year. We do not have this luxury! Also, the material cannot be shared between students. We have brainstormed some household goods that can be used

# Personal Protective Equipment Cont.

- Gloves – rubber gloves used to wash dishes
- Isolation gown – an old male button down shirt. Either saw ties for the neck portion and waist portion, or safety pin the strips of fabric
- Bouffant – shower cap
- Safety goggles – glasses
- Mask – we should all have masks!

# Disease Spreading Activity

**Purpose:** Students will perform a hands on simulation on how a disease spread throughout a population.

**Hypothesis:** If one person initially has a disease, how many do you predict will get the disease as people interact?

Prediction: \_\_\_\_\_

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**Materials:** citric acid (can be purchased from the grocery store) baking soda water, 3 oz. paper bathroom cups

- Teacher set up: Put water in a cup for every participant. In one cup add a teaspoon of citric acid. Citric acid can be found in the grocery store with the fresh produce or with food preservatives. Ask a grocer if you cannot find it.
- Personally, document which cup has the citric acid. I usually mark the cups 1-20 if I have 20 participants and pick one to be the contaminant.
- Don't worry about the chemical reaction of citric acid and baking soda.  
sodium citrate + carbon dioxide+ water
- Dolls were used in our homeschool setting when we did not have enough participants.  
water+ citric Acid + baking soda
- Science Fact: Sodium citrate helps prevent some kidney stones. It can be used to treat metabolic acidosis, a condition in some people with kidney problems when they produce too much acid.

# Disease Spreading Activity

## Procedure:

- Fill each paper cup half full of water. One cup contains more than water, it contains water and dissolved citric acid.
- Have participants pick up a cup and exchange water. Students are not to taste or smell contents in the cups.
- Have students exchange cup contents with at least three other people.
- Make sure students record their contacts in order.
- After students have exchanged cup contents, have each student come to your table to be tested.
- Sprinkle a teaspoon of baking soda into each cup.
- If the cup bubbles, that student has the disease.
- Record results
- When a disease outbreak initially occurs, scientists from the CDC, NIH, and WHO may go to the Hot Zone, a place where the disease is believed to have started to determine how much of a health threat this disease may be to others. These scientists are looking for Patient Zero to see how he/she may have gotten the disease either through food, sexual contact, or from another animal. Based on the outcome, scientist can determine the likelihood of a pandemic.

# Disease Spreading Activity



- Dolls were used in our homeschool setting when we did not have enough participants
- Teddy bears and stuffed animals work just as well

# Disease Spreading Activity

- Your task as a class is to determine the initial source of your group's infection. Use the chart below to find Patient Zero.

Students	Contact 1	Contact 2	Contact 3
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

# Disease Spreading Activity

- **Questions**

- Who was Patient Zero in your cluster?
- How did you determine this person was Patient Zero ?
- During the COVID19 pandemic, we here the term Contact Tracing what does that mean? How does Contact Tracing differ from finding Patient Zero?

- **Flattening the Curve**

- When the COVID 19 coronavirus became a pandemic in 2020, there was a push to “Flatten the Curve” in terms of the medical resources needed to tackle the situation. In order to Flatten the Curve, schools, businesses and common areas were closed. People were encouraged to stay at home and grocery stores and restaurants offered curbside pick up.

- **Questions**

- How could these habits help to keep the rate of infections down?
- How would this help people in the medical fields?
- How would this have had an impact on your Disease Activity?

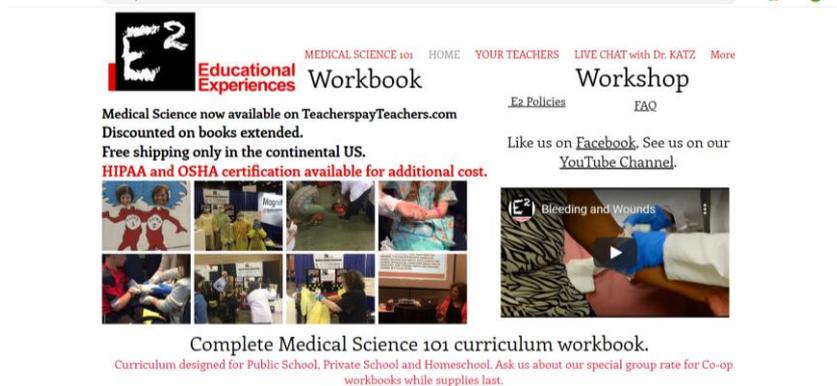
# Lymphatic and Immune System

- Discussion (only if time allows)
- We have great ideas to make these two difficult systems easier for students to understand
- But..... we may have to wait until **next time!!!!**

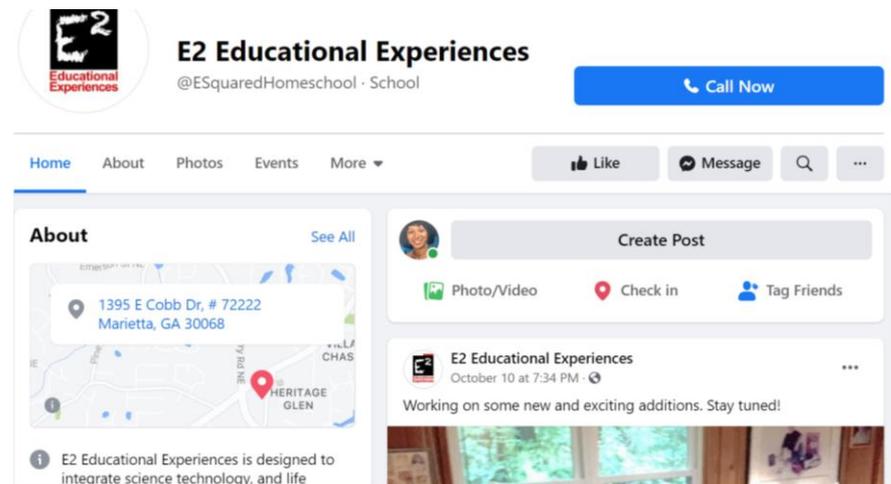
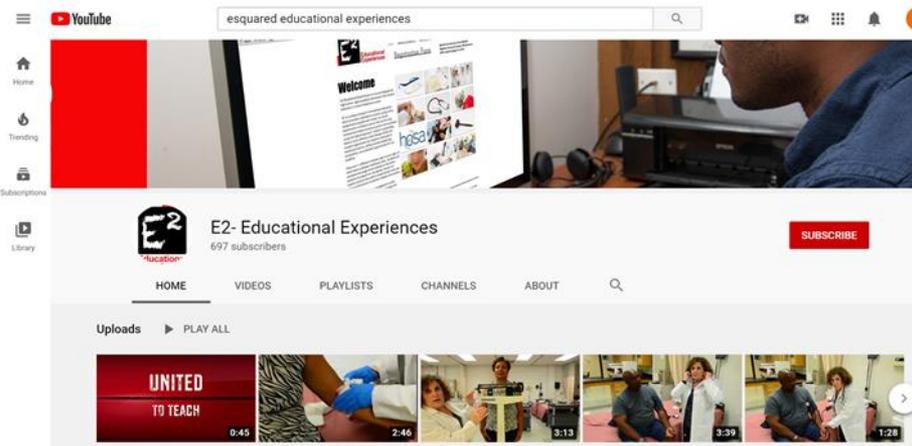


# Information

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- Subscribe to our YouTube Channel or Facebook



# Social Media Information

## MEDICAL SCIENCE 101 FOR HOMESCHOOL STUDENTS



Dr. Ellen Katzowitz is a recently retired educator who taught Medical Science, Biotechnology, and Internship in a magnet program. She has dedicated her life to helping her students pursue a career in healthcare. She has been the inspirational force in many of her students achieving their goals of becoming physicians, dentists, nurses, physical therapists, and even hospital administrators. She is eager to share her knowledge with your children. Dr. Ellen Katzowitz has a Doctor of Education from the University of Georgia.

Dr. Erika Ijames-Wilson has over 25 years of experiences in the science classroom and in a leadership role in high school. She has taught biology, physics, chemistry, zoology, and anatomy, just to name a few. She has taught valedictorians to students with special needs. Her years in leadership have allowed her access to college administrators looking for the ideal candidates for their institutions. She is an expert on college scholarships and the successful transition from high school to college.

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## Thank You

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