



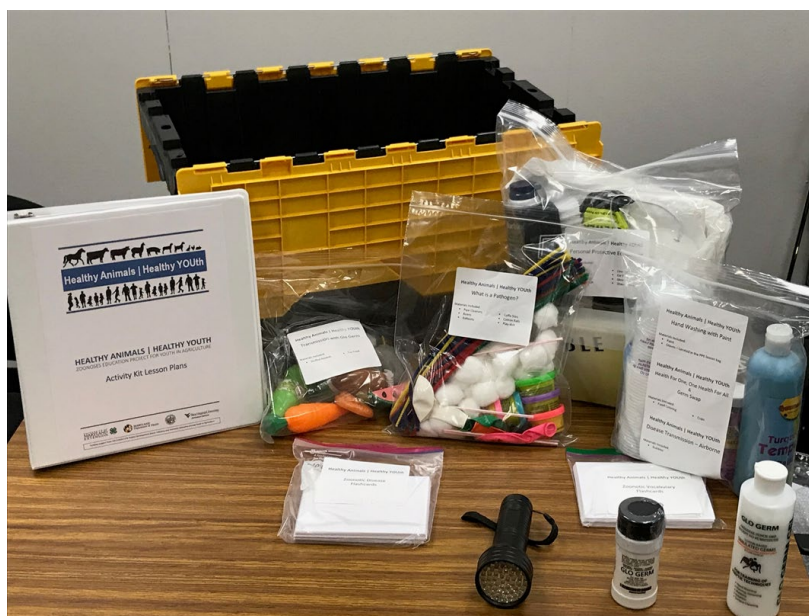
Healthy Animals | Healthy YOUTH



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ZOONOSIS EDUCATION PROJECT FOR YOUTH IN AGRICULTURE

Activity Kit & Lesson Plans



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Funding support from CDC/USDA/CSTE Project Development Grant: Influenza and Zoonoses Education among Youth in Agriculture



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ZOONOSIS EDUCATION PROJECT FOR YOUTH IN AGRICULTURE

Activity Kit Lesson Plans

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ZONOSSES EDUCATION PROJECT FOR YOUTH IN AGRICULTURE

Activity Kit Contents

COVERED TOPICS

- What is Zoonosis?
- Identifying Zoonotic Diseases
- Disease Transmission
- Hand Washing
- Biosecurity
- Antimicrobial Resistance
- Animal Health Checks
- Personal Protective Equipment
- Careers

Section 1

What is Zoonosis?

1. Introduction to Zoonosis
2. Zoonosis Matching Game -Flashcards
3. Diseases that Animals and Humans Share - Flashcards
4. Zoonosis Jeopardy Game

Section 2

Identifying Zoonotic Diseases

1. What is a pathogen? - “Build a parasite”
2. Health for One, One Health for All
3. An Introduction to Identifying Zoonotic Diseases -
(Available on Healthy Animals|Healthy YOUTH
Facilitators’ Resource Webpage)

Section 3

Disease Transmission

1. Routes of Transmission (Worksheet)
2. Disease Transmission through Direct Contact
3. Disease Transmission via Aerosol and Droplets
4. Direct Contact Glo Germ Activity
5. Germ Swap
6. Got Immunity?

Section 4

Hand Washing

1. Glo Germ Handwashing Demonstration
2. Painted Hands: Hand Sanitizer and PPE Glove Use
3. Hand Washing and Hand Sanitizer Use

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Section 5

Biosecurity

1. Down and Dirty with Biosecurity
2. Biosecurity Lessons
 - Develop a Simple Biosecurity Plan
 - Internal and External Biosecurity Measures
 - Spreading Disease One Touch at A time
3. Building on Biosecurity, Reducing the Risk
4. Basics of Biosecurity

Section 6

Antimicrobial Resistance

1. Antibiotic Resistance

Section 7

Animal Health Checks

1. MDA Equine Self Certification Form
2. MDA Livestock Self Certification Form
3. MDA Poultry Self Certification Form
4. MDA Rabbit Self Certification Form

Section 8

Personal Protective Equipment

1. PPE Safe Removal Activity
2. Sequence for Putting On and Removing PPE – CDC

Section 9

Careers

1. Bridging Human and Animal Health

NOTE: This Activity Kit includes activities created or adapted by the Maryland & West Virginia Healthy Animals | Healthy YOUTH Team; activities created by University of Maryland Extension AGsploration Team and University of Idaho Extension; activities created by Michigan State University Extension (also a participant of the Influenza and Zoonoses Education Among Youth in Agriculture program); and information from the Maryland Department of Agriculture and the CDC.

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ZOONOSIS EDUCATION PROJECT FOR YOUTH IN AGRICULTURE

Credits

PROJECT PARTNERS

- Maryland Department of Health
- University of Maryland Extension 4-H
- Maryland Department of Agriculture
- West Virginia University Extension Service

PROJECT FUNDING

The Maryland & West Virginia Healthy Animals | Healthy YOUTH: Zoonoses Education Project for Youth in Agriculture received funding support from the CDC/USDA/CSTE Project Development Grant: Influenza and Zoonoses Education among Youth in Agriculture

Maryland & West Virginia

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ZOONOSIS EDUCATION PROJECT FOR YOUTH IN AGRICULTURE

Activity Kit Contents

SECTION 1

Section 1

What is Zoonosis?

1. Introduction to Zoonosis
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ZOONOSIS EDUCATION PROJECT FOR YOUTH IN AGRICULTURE

Zoonoses Fact Sheet

Activity Materials:

- No materials needed

Methods of transmission:

- Direct Contact
- Indirect Contact
- Oral
- Aerosol/Droplet
- Vector borne

Introduction:

People and animals have been living closely together for centuries. Today, we continue to frequently interact with animals in various ways—animals serve as pets, small and large livestock are important to agriculture, animals provide recreation and entertainment, and wild animals are part of the natural ecosystem. People, animals, and insects frequently interact and share environments, and because of this, diseases have the potential to be passed back and forth.

As we improve our understanding of the interconnection between people, animals, plants, and their shared environment as it relates to disease, we are able to better manage animal and human health risks. Now, more than ever, a *One Health* approach towards the prevention and control of diseases that spread between people and animals is needed to achieve local and global health security.

What are zoonotic diseases?

Zoonotic diseases, or zoonoses, are diseases that can be spread between animals, people, or produce. Zoonoses are one example of how the health of people is related to the health of animals and environment. Some of these diseases you may be familiar with or have heard of, such as *E. coli*, influenza, or rabies. Others, including Q fever, toxoplasmosis, or psittacosis, may be new to you. There are even some diseases that scientists do not

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know much about because they are so new or are not seen very often in the United States. These are called emerging diseases. Zoonotic diseases can affect people and animals differently. In some cases, the disease can cause sickness in both animals and people. Sometimes, animals are just ‘carriers’ of the disease-causing germ, but don’t get sick. The germs that cause zoonotic diseases can be **viruses, bacteria, fungi, or parasites**.

There are many different zoonotic diseases, which have the potential to spread in many different ways and over long distances. This is true for several reasons:

1. We interact with animals, animal products, or produce in our daily lives.
2. We raise animals for food, work, enjoyment, or business.
3. We keep animals in and around our homes as pets, to perform work, or for recreation.
4. We come into close contact with animals at fairs, events, shows, or zoos.
5. We may encounter wildlife or insects that spread disease when we are outdoors.
6. We eat many products that come from animals, such as eggs, milk, cheese, and meat.

How are zoonotic diseases spread?

The way a disease can be spread is called the mode or route of transmission. There are five major ways that zoonotic diseases can be spread. Remember, these diseases can be spread in both directions - from animals to people and from people to animals.

A. Direct contact— the disease can be spread through animal bites or scratches or by interacting very closely with or touching an animal that has a disease-causing germ.

B. Indirect contact—the disease can be spread by touching non-living objects (called fomites), that an animal with a disease-causing germ has had contact with. This can include buckets, brushes, towels, shearing and grooming tools, animal bedding (such as straw shavings), equipment for animal health checks and tagging, and even fences that sick animals may rub up against.

C. Oral—the disease can be spread by eating food or drinking water or milk with a disease-causing germ. This can happen if milk is not pasteurized or if food is not cooked to the correct temperatures that prevent growth. Also, if someone does not wash their hands before eating or drinking after handling animals with a disease-causing germ. Some produce can carry disease-causing germs as well.

D. Aerosol/Droplet—the disease can be spread by breathing in a disease-causing germ from the air. This often happens when an animal is giving birth and droplets from reproductive tissues (placenta or fluids) get in the air OR when the environment has disease-causing germ in the soil from an animal’s urine or feces and a person breathes in the dust particles.

E. Vector borne—the disease is spread by some type of insect or bug (like mosquitoes or ticks) that picks up the disease from an animal and then transmits to a person when they are bitten.

How can we prevent zoonotic diseases?

We don't always know if an animal is carrying a disease. This happens because we can't see the disease-causing germs and because the animals might not get sick. Luckily, there are several steps that we can follow all the time to make sure we and our animals stay healthy.

The most important thing is to properly wash hands before and after interacting with animals. Good hand hygiene is key! The second thing is to be aware of the disease-causing germs that animals can carry and know how they can be spread to people. Be a responsible and knowledgeable animal owner, handler, or trainer. For example, if you are at a public fair with your animal, remind other people to wash their hands—provide washing stations and antiseptic cleaners if needed. Other ways to stay safe include handling and preparing food safely, keeping insects and bugs away from your home, animals and barns, and being careful around animals that could be aggressive, protective or dangerous. Staying safe around pets, livestock, small stock, and wild animals is always important.

To keep ourselves healthy, we also need to keep our animals healthy. Make sure you are caring for your animals properly. Give them fresh food and water, clean their bedding often, and exercise them and yourself as well. Have your local veterinarian do regular health examinations and give vaccinations and medications as needed. If one animal gets sick, keep it separated from other animals until it gets better so that other animals don't get sick as well. Also, if you are travelling with animals, try to keep their stress level low and limit travel to minimal amounts, at cooler times and when traffic and traffic waits are low.



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ZOONOSIS EDUCATION PROJECT FOR YOUTH IN AGRICULTURE

Zoonosis Matching Game

ACTIVITY MATERIALS

- Zoonotic Disease Flashcard Set

Objectives

- Determine the definition of each zoonotic term/disease.
- Match terms with the correct corresponding definition.

Background Information

This activity is designed to give participants a basic understanding of essential vocabulary related to zoonotic diseases. This lesson features a matching game to help participants gain an understanding of those vocabulary words and the importance of zoonotic awareness.

Conduct the Activity

There are many ways that you can choose to play this game. Feel free to use any or all of the options below or make your own spin off! We recommend that you go over the vocabulary with the group before playing the games, but if you are dealing with an advanced group this may not be necessary.

Option One – Find Your Match

1. Assign cards with a term to half of the group and cards with the matching definitions to the other half of the group. You may need to use a portion of the cards if you have a smaller group and use the remaining cards in another round.
2. Once the group each has a card, give them 60

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seconds (more or less depending on how advanced the group is) and tell them to find the person with the matching card to theirs!

3. Once time is up, see which members found the correct match. Rearrange members into the correct pairs if they are wrong.
4. Repeat this exercise, or use the cards you were unable to fit in the first round!

Option Two – Working Together

1. Split your group into multiple teams. The groups could be as small as two or as big as you want, depending on how advanced the members are.
2. Split the cards up between each of groups, making sure each group has the matching definition card for each term given to them. You may also print off multiple copies of the cards so each group has the full set.
3. Allow each group a certain amount of time to try to match each term to its definition.
4. Once they are done, go over the correct matches with all the groups or allow groups to switch stations to see if another group can fix any wrong matches.

Option Three – Classroom Style

1. Arrange your group in a way so they are all facing you. You may choose to familiarize the group with the terms and definitions before moving on to the next steps.
2. Hold up each definition and read it off to the members of the group, asking them to try recall the matching term. It may be helpful to have a list of the possible terms somewhere they can see.
3. If they cannot recall the term, you may tell them what the correct term is or put the definition aside and come back to it.
4. To make this a little more difficult, you can try reading off the term instead of the definitions and ask that members try to recall the definition of each term.

Option Four – Memory

1. Put matching terms and definitions face down in a grid like fashion. Feel free to choose the amount of terms you choose to use depending on your group size and previous knowledge. Be sure to include the definition for each term you put down.
 2. Ask each group member to flip over two cards at a time, with the ultimate goal of flipping over the matching term and definition. The first few rounds will likely not result in matches, but will help with memorizing some of the locations of specific words/definitions.
 3. If a member thinks they have a match, ask them to remove the word and definition from the grid. Review their match; if it is correct, leave it out of the game until the end. If it is wrong, put face down in their original positions and resume gameplay.
-

-
4. The game ends when all terms and definitions are matched. You can choose to tally matches from each individual group member to find a “winner”, or allow for a collaborative win.

Activity Wrap-Up

Engage the students in discussion about the new terms they learned. Why is it important to learn about zoonosis?

Source: Maine, One Health - Activity 1 Matching Game

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ZOONOSES EDUCATION PROJECT FOR YOUTH IN AGRICULTURE

Zoonosis Matching Game

Ascaris	A roundworm that lives in the gut of some animals and can cause illness
Asymptomatic	When a living thing does not show signs of illness
Bacteria	A single-celled germ that cannot be seen with the naked eye and can cause illness
Biosecurity	Practices to prevent the spread of illness
Campylobacter	A germ that lives in the gut of its host and can cause diarrhea, intestinal swelling, vomiting and abortions in humans and animals
Centers for Disease Control and Prevention (CDC)	An agency that protects the health, safety, and security of Americans from disease threats
Cryptosporidium	A protozoal parasite that can cause stomach diarrhea and is often spread through water or animal contact
Cull	The killing of animals done to stop the spread of illness
Disease	An illness that affects a person, animal, or plant
E. Coli	Bacteria normally found in the intestines of people and animals, but when conditions and sanitation are poor the bacteria can cause scours (diarrhea)
Enteric Disease	Stomach illnesses caused by germs that enter the body through the mouth
Epidemiology	The study of the cause, spread, and control of illnesses
Fomite	A nonliving object that can carry and spread germs
Foodborne Illness	An illness caused by eating or drinking something with harmful germs

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Incubation Period	The time between when a human or animal is exposed to a germ and when they get sick
Influenza (Flu)	An illness of the lungs that can spread quickly to other humans or animals
Leptospirosis	A spiral-shaped bacteria that can affect the liver and kidneys as well as other organs.
Orf/Sore Mouth	A contagious, viral disease affecting the mouth nose and feet
Q Fever	Caused by a bacteria and is associated with abortion in pregnant sheep, goats and camelids but may be also carried by normal animals
Quarantine	Keeping sick animals away from healthy animals to avoid the spread of illness
Rabies	A severe, viral disease that can affect all mammals. Infection results in damage to the nervous system and ultimately death
Ringworm	A contagious fungal infection that causes circular bald patches on the skin
Salmonella	A germ that can cause stomach illness in humans
Symptom	Any feeling of illness that cannot be measured such as a sore throat
Vaccine	A shot given to prevent a specific disease
Vector	A living thing that can spread an illness to others
Virus	A small germ that can cause illness and needs a living thing to spread Example: Influenza (Flu)
Zoonotic Diseases	Illnesses that can be spread between humans and animals

Ascaris

A roundworm that lives in the gut of some animals and can cause illness

Bacteria

A single-celled germ that cannot be seen with the naked eye and can cause illness

Biosecurity

Practices to prevent the spread
of illness

Campylobacter

A germ that lives in the gut of
its host and can cause diarrhea,
intestinal swelling, vomiting and
abortions in humans and
animals

Center for Disease Control and Prevention (CDC)

An Agency that protects the health, safety, and security of Americans from disease threats

Cryptosporidium

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Cull

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Bacteria normally found in the intestines of people and animals, but when conditions and sanitation are poor the bacteria can cause scours (diarrhea)

Enteric Disease

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Epidemiology

The study of the cause, spread,
and control of illnesses

Fomite

A nonliving object that can carry
and spread germs

Foodborne Illness

An illness caused by eating or drinking something with harmful germs

Incubation Period

The time between when a human or animal is exposed to a germ and when they get sick

Influenza (Flu)

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Orf/Sore Mouth

A contagious, viral disease affecting the mouth nose and feet

Q Fever

Caused by a bacteria and is associated with abortion in pregnant sheep, goats and camelids but may be also carried by normal animals.

Quarantine

Keeping sick animals away from healthy animals to avoid the spread of illness

Rabies

A severe, viral disease that can affect all mammals. Infection results in damage to the nervous system and ultimately death

Ringworm

A highly contagious fungal infection that causes circular bald patches on the skin

Salmonella

A germ that can cause stomach illness in humans

Symptom

Any feeling of illness that cannot be measured such as a sore throat

Vaccine

A shot given to prevent a specific disease

Vector

A living thing that can spread an illness to others

Virus

A small germ that can cause illness and needs a living thing to spread

Example: Influenza (Flu)

Zoonotic Disease

Illnesses that can spread
between humans and animals

Asymptomatic

When a living thing does not
show signs of illness



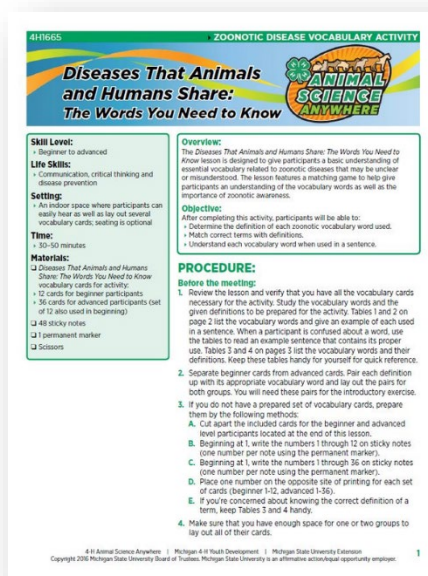
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ZOONOSIS EDUCATION PROJECT FOR YOUTH IN AGRICULTURE

Diseases That Animals and Humans Share

ACTIVITY MATERIALS

- Diseases That Animals and Humans Share: The Words You Need to Know vocabulary cards
- 48 sticky notes
- Permanent marker
- Scissors



Activity Lesson Plan

This activity was created by Michigan 4-H and can be retrieved from the MSU Extension 4-H Animal Science website at: <https://www.canr.msu.edu/resources/diseases-that-animals-and-humans-share-the-words-you-need-to-know>

Overview

In this activity, youth learn vocabulary terms related to zoonotic diseases.

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JEOPARDY JEOPARDY JEOPARDY JEOPARDY JEOPARDY JEOPARDY

JEOPARDY!

JEOPARDY JEOPARDY JEOPARDY JEOPARDY JEOPARDY



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ZOONOSSES

TEAM

JEOPARDY

JEOPARDY!



ZOONOSES TERMS

JEOPARDY!



DISEASE TRANSMISSION

JEOPARDY!



BIOSECURITY TRANSMISSION

JEOPARDY!



“FAIR PLAY”

JEOPARDY!



Theme



Timer



Lose



Cheer



Boo



Silence

HAND WASHING

JEOPARDY!



Theme



Timer



Lose



Cheer



Boo



Silence

ZOOONOTIC DISEASES

JEOPARDY!



**ZOONOSSES
TERMS**

**DISEASE
TRANSMISSION**

**BIOSECURITY
ESSENTIALS**

“FAIR PLAY”

**HAND
WASHING**

**ZOONOTIC
DISEASES**

\$100

\$100

\$100

\$100

\$100

\$100

\$200

\$200

\$200

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\$300

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\$300

\$300

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\$400

\$400

\$400

\$400

\$400

\$400

\$500

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\$500

FINAL JEOPARDY

JEOPARDY!



Theme



Timer



Lose



Cheer



Boo



Silence

**GO TO
ANSWER
(question)**



Disease



JEOPARDY!



**A disease that is
spread between
animals and humans**



Start Timer

GO TO
ANSWER
(question)

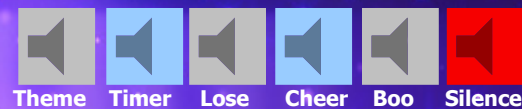
JEOPARDY!



Zoonosis



JEOPARDY!



**People who live or work
with animals are at risk
of infection with
zoonotic diseases.
True or False**



Start Timer

GO TO
ANSWER
(question)

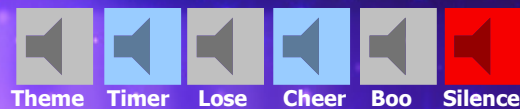
JEOPARDY!



True



JEOPARDY!



Viruses, bacteria, parasites and fungi which cause disease



Start Timer

GO TO
ANSWER
(question)

JEOPARDY!



Pathogen



JEOPARDY!



**People that are younger –
under the age of 5 years,
people that are older – over
the age of 65 years,
women who are pregnant,
people with compromised
immune systems or having
underlying health problems**



Start Timer

GO TO
ANSWER
(question)

JEOPARDY!



**Groups of people
at higher risk for
getting sick from
a zoonotic
disease**



JEOPARDY!



**This type of transmission
occurs when a healthy
animal or person comes
in contact with an
infected animal or person**



Start Timer

GO TO
ANSWER
(question)

JEOPARDY!



Direct Contact Transmission



JEOPARDY!



**Sneezing is a common
example of this type of
transmission**



Start Timer

GO TO
ANSWER
(question)

JEOPARDY!



Aerosol or Droplets Transmission



JEOPARDY!



An example of this type of disease transmission could be a person dropping his/her candy bar (or baby pacifier) onto the ground where it can become contaminated and then picking it up and putting it in his/her mouth



Start Timer

GO TO
ANSWER
(question)

JEOPARDY!



Ingestion (or Oral) Transmission



JEOPARDY!



**Insects and pests that
carry pathogens from
an infected animal to
one that is healthy**



Start Timer

GO TO
ANSWER
(question)

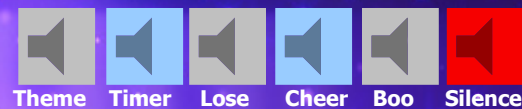
JEOPARDY!



Vector



JEOPARDY!



**The term used to
describe objects or
surfaces that may have
become contaminated
with pathogens**



**GO TO
ANSWER
(question)**

JEOPARDY!



Fomite



JEOPARDY!



**The term used to
describe a series of
practices designed to
prevent the
introduction and
spread of pathogens**



Start Timer

GO TO
ANSWER
(question)

JEOPARDY!



Biosecurity



JEOPARDY!



**Care for sick animals
(first OR last) when
working with a group
of animals**



Start Timer

GO TO
ANSWER
(question)

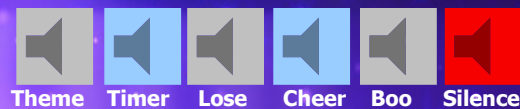
JEOPARDY!



Last



JEOPARDY!



**Maintain fences and
structures to keep
_____ in and
_____ out in order to
limit contact between
them**



Start Timer

GO TO
ANSWER
(question)

JEOPARDY!



Livestock in and Wildlife out



JEOPARDY!



When bringing home a new animal or an animal returning from the fair, this biosecurity practice should be followed before co-mingling exhibit animals with other herd animals



Start Timer

GO TO
ANSWER
(question)

JEOPARDY!



Isolation or Quarantine



JEOPARDY!



The two primary components of biosecurity



Start Timer

GO TO
ANSWER
(question)

JEOPARDY!



- 1) Keeping disease from entering an area,**
- 2) Preventing disease from spreading to other locations**



JEOPARDY!



Animal doctor



Start Timer

GO TO
ANSWER
(question)

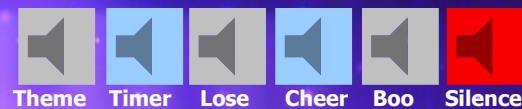
JEOPARDY!



Veterinarian



JEOPARDY!



**This agency
determines animal
health guidelines for
Maryland (West
Virginia) fairs and
shows**



Start Timer

GO TO
ANSWER
(question)

JEOPARDY!



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JEOPARDY!



**DO complete this
before loading your
animal and taking it
to a fair or show**



Start Timer

GO TO
ANSWER
(question)

JEOPARDY!



Exhibitor's Self-Certification of Animal Health Form



JEOPARDY!



**Do not wear clothing
worn at the fair out
with animals at your
farm without first
doing this**



Start Timer

GO TO
ANSWER
(question)

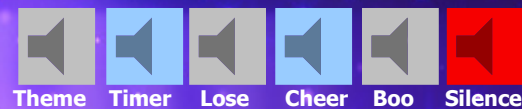
JEOPARDY!



Laundering



JEOPARDY!



**Federal USDA tags are
required for animals
being exhibited in
Maryland to improve
this**



Start Timer

GO TO
ANSWER
(question)

JEOPARDY!



Animal Disease Traceability



JEOPARDY!



**Many germs are
spread by not _____
hands with soap and
clean, running water**



Start Timer

**GO TO
ANSWER
(question)**

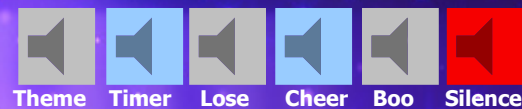
JEOPARDY!



Washing



JEOPARDY!



When handwashing, scrub all surfaces of your hands, including the palms, backs, fingers, between your fingers and under your nails. Keep scrubbing for at least _____ seconds



Start Timer

GO TO
ANSWER
(question)

JEOPARDY!



20 seconds



JEOPARDY!



If soap and water are not available, use this to clean hands (it will quickly reduce the number of germs)



Start Timer

GO TO
ANSWER
(question)

JEOPARDY!



Hand Sanitizer



JEOPARDY!



**If soap and water are
not available, use an
_____ - based hand
sanitizer that contains
at least 60% _____ to
clean hands**



Start Timer

GO TO
ANSWER
(question)

JEOPARDY!



**Alcohol-based hand
sanitizer that
contains at least 60%
alcohol**



JEOPARDY!



DAILY DOUBLE

**This item from people or animals
is an important source of germs
like *Salmonella*, *E. Coli* and
Norovirus that cause diarrhea,
and it can spread some
respiratory infections like
Adenovirus and *Hand-Foot-Mouth*
disease**



Start Timer

GO TO
ANSWER
(question)

JEOPARDY!



Feces



JEOPARDY!



This zoonotic disease is a severe, viral disease that can affect all mammals. Infection results in damage to the nervous system and ultimately death. Since this disease is life-threatening in both animals and humans, vaccination is highly recommended.



Start Timer

GO TO
ANSWER
(question)

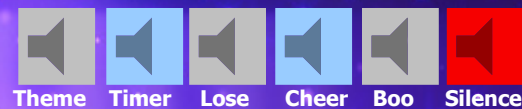
JEOPARDY!



Rabies



JEOPARDY!



**This species is a
carrier of the H1N1
influenza virus**



Start Timer

GO TO
ANSWER
(question)

JEOPARDY!



Swine



JEOPARDY!



**This is a highly
contagious fungal
infection of the
skin**



Start Timer

GO TO
ANSWER
(question)

JEOPARDY!



Ringworm



JEOPARDY!



This bacteria is normally found in the intestines of people and animals, but when conditions and sanitation are poor the bacteria can cause scours (diarrhea) in animals.

In humans, this bacteria can cause abdominal cramping, bloody diarrhea, and occasionally, especially in young children and the elderly, life threatening kidney disease.



Start Timer

GO TO
ANSWER
(question)

JEOPARDY!



E. Coli



JEOPARDY!



This is a contagious, viral disease affecting the mouth, nose and feet – most often in sheep and goats. Transmission to humans occurs when a break in the skin comes into contact with the virus (through an infected animal or fomite)



Start Timer

GO TO
ANSWER
(question)

JEOPARDY!



Orf/Sore Mouth (Contagious Ecthyma)

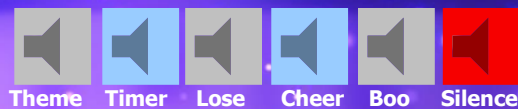


JEOPARDY!



FINAL JEOPARDY!

JEOPARDY!



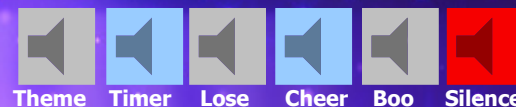
The meaning of “VCPR”



Start Timer

GO TO
ANSWER
(question)

JEOPARDY!



Veterinary – Client – Patient Relationship



JEOPARDY!





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ZOONOSSES

Team Jeopardy

Category / Points Level	Your Team's Answer
ZOONOSSES TERMS	
100	
200	
300	
400	
500	
DISEASE TRANSMISSION	
100	
200	
300	
400	
500	
BIOSECURITY ESSENTIALS	
100	
200	
300	
400	
500	
"FAIR PLAY"	
100	
200	
300	
400	
500	
HANDWASHING	
100	
200	
300	
400	
500	
ZOONOTIC DISEASES	
100	
200	
300	
400	
500	



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ZONOOSES EDUCATION PROJECT FOR YOUTH IN AGRICULTURE

Activity Kit Contents

SECTION 2

Section 2 Identifying Zoonotic Diseases

1. What is a pathogen? - “Build a parasite”
2. Health for One, One Health for All
3. An Introduction to Identifying Zoonotic Diseases
(Available on Healthy Animals|Healthy YOUTH
Facilitators’ Resource Webpage)

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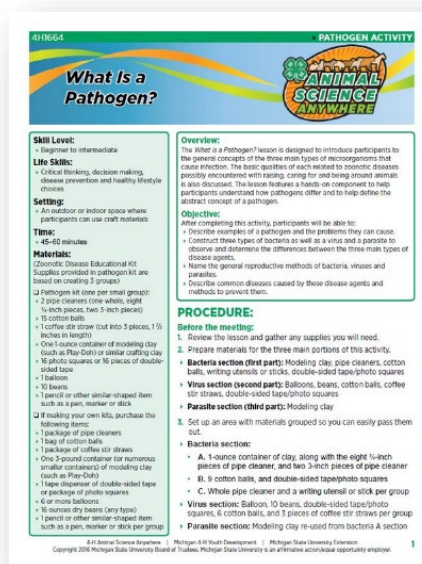
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ZOONOSIS EDUCATION PROJECT FOR YOUTH IN AGRICULTURE

What is a Pathogen?

ACTIVITY MATERIALS

- Pipe cleaners
- Cotton balls
- Coffee stir straws
- Small containers of Play-Doh
- Double-sided tape
- Photo squares
- Balloons
- Dry beans (any type)
- Pencils, pen, marker or stick



Activity Lesson Plan

This activity was created by Michigan 4-H and can be retrieved from the MSU Extension 4-H Animal Science website at: <https://www.canr.msu.edu/resources/what-is-a-pathogen>

Overview

In this activity, youth learn about bacteria, viruses, and parasites as they build simple models of these pathogens.

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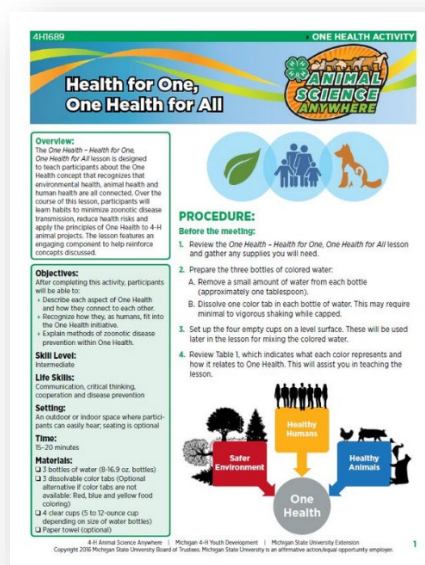
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ZOONOSIS EDUCATION PROJECT FOR YOUTH IN AGRICULTURE

Health for One, One Health for All

ACTIVITY MATERIALS

- 8 (16.9oz.) bottles of water
- Red, blue and yellow food coloring
- 4 clear cups
- Paper towel (optional)



Activity Lesson Plan

This activity was created by Michigan 4-H and can be retrieved from the MSU Extension 4-H Animal Science website at: <https://www.canr.msu.edu/resources/health-for-one-one-health-for-all>

Overview

In this activity, youth learn about the One Health concept that human, animal and environmental health are all connected.

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ZOONOSIS EDUCATION PROJECT FOR YOUTH IN AGRICULTURE

Activity Kit Contents

SECTION 3

Section 3 Disease Transmission

1. Routes of Transmission (Worksheet)
2. Disease Transmission through Direct Contact
3. Disease Transmission via Aerosol and Droplets
4. Direct Contact Glo Germ Activity
5. Germ Swap
6. Got Immunity?

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Zoonosis Disease Transmission: Routes of Transmission

Instructions:

Match the route of transmission to ways it can be prevented. Only one letter may be used per blank, but letters may be used more than once.

Routes of Transmission:

- A. Direct Contact
- B. Aerosol/Droplet
- C. Indirect Contact
- D. Ingestion (Oral)
- E. Vectors

Ways to prevent Disease Transmission:

- _____ 1. Use insect control products
- _____ 2. Isolate sick animals
- _____ 3. Provide fresh air to humans and animals
- _____ 4. Dispose of or wash boots and clothing after animal contact
- _____ 5. Wash your hands before preparing food
- _____ 6. Work with your veterinarian to check and treat your animals for parasites
- _____ 7. Wear gloves when working with sick animals
- _____ 8. Store food at the proper temperature
- _____ 9. Wear respiratory protection when working with animals
- _____ 10. Decrease humidity and odor build-up in barns
- _____ 11. Clean and disinfect any equipment used with sick animals
- _____ 12. Increase the distance between healthy and sick animals
- _____ 13. Wash your hands after cleaning pens or contact with manure
- _____ 14. Cook meat to the appropriate internal temperature
- _____ 15. Avoid sharing equipment, or clean and disinfect equipment when sharing is necessary

Source: Maine, One Health – Activity 2 Zoonotic Disease Course

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ZOONOSIS EDUCATION PROJECT FOR YOUTH IN AGRICULTURE

Disease Transmission Through Direct Contact

ACTIVITY MATERIALS

- No materials needed

METHODS OF DISEASE TRANSMISSION

- Direct Contact
- Indirect Contact
- Oral
- Aerosol/Droplet
- Vector borne

Objective

- This activity will help participants explore the routes of disease transmission.
- This activity will help demonstrate how germs could spread through direct contact.

Background Information

An easy way to catch most infectious diseases is by coming in contact with a person or animal who has the infection. Two ways infectious diseases could spread through direct contact are:

- *Person to person / Animal to animal.* A common way infectious diseases spread is through the direct transfer of germs (pathogens), including bacteria, viruses, fungi, and parasites, from one individual to another. This can occur when the individual with the pathogen touches, kisses or rubs noses, or bites an individual that is not infected.

Germs can also spread through the exchange of body fluids from sexual contact. The individual who passes the germ may have no symptoms of the disease, but may simply be a carrier.

- *Animal to person / Person to animal.* Being bitten or scratched by an infected animal — even a pet — can make you sick and, in extreme circumstances, can be fatal. Handling animal waste can be hazardous, too, especially when direct contact with waste occurs. For example, pregnant women can acquire a toxoplasmosis infection by scooping a cat's litter box. Also, sometimes a sick person can cause a healthy animal to become sick.

Conduct the Activity

1. Select one student to secretly pretend to be infected by a disease. Instruct the student to squeeze the other participants hand while shaking hands.

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2. Once an individual's hand is squeezed, that person is also "infected" with the disease and must squeeze others hands when they shake another's hand.
 3. This can be done quickly, even with a 30 second or one minute time limit. After about 30 seconds, ask the students if they had their hand squeezed, if so they have been "infected" by the disease.

Activity Wrap-Up

To conclude this activity, see if the youth participants can identify situations where direct contact can occur, such as:

1. Public places where people come into direct contact with others
2. Farms where animals come into direct contact with one another
3. Places where animals and people come into direct contact with each other

Note: Animals on a farm may be contained in close quarters and can spread disease through direct contact. Disease can be spread through direct contact by infected animals that may not yet show symptoms. If an animal shows symptoms of illness, it should be separated from the herd or flock for treatment.

Source: Saskatchewan Science Center – Classroom Activity Disease Transmission

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Disease Transmission via Aerosol and Droplets

ACTIVITY MATERIALS

- Liquid bubble solution
- Box of tissues*

*not included in kit

METHODS OF DISEASE TRANSMISSION

- Direct Contact
- Indirect Contact
- Oral
- Aerosol/Droplet
- Vector borne

Objectives

- This activity will help demonstrate how disease can spread through the air via aerosol or droplet transmission.

Background Information

You can catch some diseases simply by breathing in disease-causing germs. The disease which spread by this method are called airborne diseases.

Airborne diseases can spread when an infected person coughs, sneezes, or talks, spewing nasal and throat secretions into the air. This is called aerosol or droplets transmission. Certain viruses or bacteria take flight and hang in the air or land on other people or surfaces.

When you breathe airborne pathogenic organisms in, they take up residence inside you. You can also pick up germs when you touch an infected surface, and then touch your own eyes, nose, or mouth.

Conduct the Activity

1. Discuss with the youth participants their ideas about what aerosol or droplets disease transmission might be.
2. Inform the students that for this activity, bubbles will represent pathogens in the air. Each time a bubble lands on them they have become “infected” with an airborne pathogen. This shows the students how some diseases are spread through the air.
3. Give each student a tissue. Have them stop the bubbles from landing on themselves by blocking the bubbles with the tissue.
4. If they successfully block the bubbles, they will not become “infected”.

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Activity Wrap-Up

This activity is a positive way to encourage the use of tissues when sneezing. It provides a visual representation youth participants can use to understand the importance of covering sneezes to keep pathogens from spreading through the air.

- Ask the participants if they can see the aerosol or droplets emitted by someone when they sneeze or cough.
- When someone sneezes or coughs, how far do you think the aerosol or droplets can travel? How can we find out?
- If you do not have a tissue to catch a sneeze or cough, would it be better to sneeze or cough into your hand or into your elbow? Why? Would a person be more likely to spread germs caught in their hand or their elbow?
- Demonstrate how a person would catch a sneeze or cough in their elbow joint.
- Talk with the students about how germs can attach to dust particles and travel through the air. What PPE could we use to help prevent breathing in airborne germs?

Source: Saskatchewan Science Center – Classroom Activity Disease Transmission

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Disease Transmission

Direct Contact Glo Germ Activity

ACTIVITY MATERIALS

- 3 to 4 Small Stuffed Animals
- 3 to 4 Plastic Toy Food Items
- Glo Germ Powder
- UV Flashlight
- Sink, water, and soap*

*Not included in the kit

METHODS OF DISEASE TRANSMISSION

- Direct Contact
- Indirect Contact
- Oral
- Aerosol/Droplet
- Vector borne

WORKING WITH GLO GERM

Glo Germ consists of an odorless lotion (or powder) which glows brightly when exposed to ultraviolet light.

NOTE: A little bit of Glo Germ goes a long, long way!

Objectives

- This activity will help participants explore the routes of disease transmission.
- This activity will help demonstrate how germs could spread through direct contact.

Background Information

Proper Hand Washing Technique

Proper hand washing technique:

1. Wet your hands with clean running water (warm or cold) and apply soap.
2. Lather your hands by rubbing them together with the soap.
3. Scrub all surfaces of your hands, including the palms, backs, fingers, between your fingers, and under your nails. Keep scrubbing for at least 20 seconds. Need a timer? Hum the "Happy Birthday" song twice.
4. Rinse your hands under clean, running water.
5. Dry your hands using a clean towel or air dry them. Do not dry on clothes, which may be contaminated by germs!

About Glo Germ

Glo Germ™ is a product sold both in liquid and powder form that contains proven safe ingredients formulated to be the same size as bacteria, basically 5 microns in size. When used in either the powder or liquid-based form, with the use of an ultra-violet light, it simulates the spread of germs, teaching how quickly and broadly germs can be spread in a short period of time. (Source:

www.glogerm.com)

Glo Germ lotion is applied like a typical hand lotion. Glo Germ lotion works well to demonstrate handwashing. The lotion form is generally easier for youth to apply. Glo Germ

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powder is more difficult to apply for handwashing demonstrations (very chalky). However, Glo Germ powder works well to demonstrate germ transmission by cross-contamination and direct contact.

In this activity, we will use “props” that will be passed around, such as stuffed animals, plastic toy food items, or other similar items like a grooming comb that you may have handy. These items may represent animals touched at a fair or farm, shared barn equipment (water buckets, stall rakes, wheelbarrows, hog panels, etc.) These items are wiped with Glo Germ powder, which is not easily seen with the naked eye. The use of an ultraviolet (UV) light enables the powder to “glow.”

Conduct the Activity

Activity Part 1: Petting or Handling an Animal

1. Cover 1 small stuffed animal with a small amount of Glo Germ powder all around the animal.
2. Introduce your stuffed animal to the youth participants as your “favorite pet” and invite them to pet and hold it. Encourage one person after another to pet or hold your “favorite pet”.
3. You can keep a second pet “germ-free” by not applying any Glo Germ material to it. Use this one to show that although this item was not shedding any pathogens at the beginning, now that it’s been handled by many people who were exposed to “infected” pet, it becomes contaminated (i.e. it glows) by the end of the activity.
4. Use the UV light to show the Glo Germ on everyone’s hands, and talk about the germs might have spread through direct contact.
5. With Glo Germ still on the participants hands, proceed to Part 2 of the activity

Activity Part 2: Eating Without Washing Hands after Animal Contact

1. Pass around 3 to 4 clean Plastic Toy Food items. Explain to the participants that we are going to see what could happen when we choose to eat after handling animals if we do not wash our hands.
2. Ask the participants to share the food, passing the items around so that everyone gets some. It’s nice to share, right?
3. Have the participants bring the plastic food items to the UV light and check for the presence of germs. Are they contaminated?
4. Do they glow under the UV light?
5. Talk with the participants what might happen if this was real food and they had eaten it? Oral Transmission!

Activity Part 3: Handwashing

1. Have the youth participants wash their hands at the sink and return to the classroom.
 2. Once all of the participants have washed their hands, attempting to remove all of the simulation germs, gather them to check their hands again with the UV light.
 3. Turning the lights off will help show the areas missed more easily.
 4. Turn on the UV light and have them show the palm and back of their hands. Show students that, although thorough cleaning attempts are made, germs and other unclean particles remain.
-

The Glo Germ sticks on like germs. Pay particular attention to the back of their hands, between their fingers, and around their finger nails.

5. Review the proper handwashing technique from the *Background Information* section above with the participants.
6. Have the participants repeat the hand washing steps until all germs are gone and they have learned the proper technique to wash their hands.

Alternate Germ Transmission Activity

1. Put a small amount of Glo Germ powder on the palm your right hand. Shake several individuals' hands when they walk into the session.
2. Demonstrate with the UV flashlight, how the Glo Germ transferred from your hands to their hands. People can spread germs to other people too.
3. Do the same with fomites, such as an animal brush, halter, or animal cage. Glo Germ will transfer from these objects to participants' hands. Use the UV flashlight to reveal the presence of germs.

Activity Wrap-Up

Wrap-up by engaging the youth participants in a discussion about how germs are transmitted between animals and people and between people and people. Discuss the importance of handwashing. The following questions may be used to begin the discussion:

- How were germs that cause illness spread from one individual to another in this activity?
- Why would you need to thoroughly wash your hands after working with animals, touching their pens or cages, and handling their waste material? Especially before eating!
- Do you think you do a good job of washing your hands each time you wash? What do you need to do differently?

Source: *Maine, One Health – Activity 4 Glow Germ*

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ZOONOSIS EDUCATION PROJECT FOR YOUTH IN AGRICULTURE

Germ Swap

ACTIVITY MATERIALS

SIMPLE VERSION

- Disposable cup for each participant
- Food coloring
- Water*

ADVANCED VERSION*

- Disposable cup for each participant
- 1/8 cup (30ml) distilled water per participant*
- Sodium Carbonate Standard Solution 0.02N (Hach, cat. #18149) (Positive Solution) (LABELED SC)*
- Phenolphthalein Solution 0.1% (Hach, cat. #189753) (Testing Solution) (LABELED PH)
- Dropper bottle*
- Measuring utensils*
- Disposal container large enough to accommodate liquid from all participant cups*

*Items not included in kit

Objectives

- This activity will help explain who is at highest risk for becoming ill from a disease.
- This activity will help explain ways zoonotic diseases might spread to you or your animals on the farm and at exhibitions.
- This activity will help describe measures to prevent zoonotic diseases from spreading to you and your animals on the farm and at exhibitions.

Background Information

Some people are carriers of disease. Initially, these carriers may appear healthy or show only mild signs of disease. At some point they may eventually get sick, but they may not be recognized as having the disease until they've exposed and infected others. This is one reason why some pathogens can spread so quickly.

This activity is designed to simulate the uncontrolled spread of a disease through a population. Cups have been half-filled with water, all cups receive a few drops of food coloring (same color) except for one or two cups that receive a few drops of a second color of food coloring. The one or two people with the cups containing the second color of food coloring will be the infected or original carriers of the "disease," but they will carry this disease in a cup rather than in their body—and appear healthy on the outside. The original carrier(s) will make contact with other participants who will then make contact with others. At the end of the activity, everyone will be (visually) tested to see who has become infected, and we'll discuss how to trace the infection back to its source.



NOTE: We will not be wearing nitrile gloves for this activity, but you still need to be careful with your cup and solution as we work through this activity. If you spill any on yourself, immediately go to a bathroom to wash it off. It may stain clothing.

Conduct the Activity

Simple Version of Germ Swap with Food Coloring

This is the “modified” or “simple” version of the germ swap activity. This activity uses food coloring, so the ingredients are easily accessible. Because this activity uses food coloring, the participants must be careful not to spill or it may be easier to complete this activity outdoors when possible.

1. Line one clear plastic cup on a table for each youth participant in the group. Place 2-3 oz. of clean water in each cup. Explain that each represents a pig at an exhibition.
2. Put 1-2 drops of blue food coloring in 9 of every 10 of the participant’s cups. This represents a 90% “healthy” pig population.
3. Put 2-3 drops of yellow food coloring in the remaining 1 of every 10 of the participant’s cups. This represents a 10% “ill” pig population.
4. Have each participant pick a cup, but don’t reveal quite yet what the colors mean
5. Instruct everyone to mingle and join up in pairs. For each pair, there will be a person A and B (this is just for explanation purposes). Have person A pour the contents of their cup into person B’s cup. Then have person B pour ½ of the mixed liquid from their cup back into person A’s cup, so they have even amounts again. This act is supposed to replicate “swapping” germs.
6. Have the participant’s pair up with a different person. Repeat the “germ” swapping process from Step 5 two more times.
7. Afterwards, see how many people have “green”, infected cups from the initial 10% of infected animals.
8. This activity demonstrates how 1 sick pig per 10 can turn into many more in a barn at a fair or farm.

Advanced Version of Germ Swap

This is the advanced version of the germ swap activity. It requires a more extensive list of materials which are not included in the kit.

Before participants arrive:

1. Add approximately 1/8 cup (30ml) of distilled water to a disposable cup for each participant; filling the cup about 1/3 full. This should be done just before the activity begins, to ensure pH changes do not occur. **Do not use tap water**, as not all water sources are pH neutral.
 2. To make “positive germs” add ¼ teaspoon (~25 drops) of Sodium Carbonate standard solution to one cup (more if you have a large group). Place a small, inconspicuous mark on each of the “infected cups”, to be identifiable later.
-

-
3. Add stock Phenolphthalein solution to a dropper bottle for easier distribution.

Once participants arrive:

1. Pass out one cup to each participant, explaining that each represents an animal at an exhibition. Point out that each cup and the liquid inside looks the same. Discuss animal contact within a show setting, and then instruct students to exchange water (swap germs) with three other participants. To complete an exchange, the participant should pour their fluid into another participant's cup, and then half should be poured back into the original cup. As students are exchanging germs, announce that an "X" amount animal(s) came to the show already infected with a respiratory disease. The "X" amount of animals will be equal to the amount of cups with Sodium Carbonate, AKA the "infected" cups.
2. As students finish swapping, ask if they can tell who is "infected" and how many additional animals they think may now be "infected".
3. To determine whether each individual's animal is "infected," add up to 4 drops (~100ul) of phenolphthalein solution to each cup. If the liquid turns pink the animal is infected, if the liquid remains clear the animal is negative. Discuss how diseases spread within the animal population and allow participants time to figure out who started as "infected" by tracking their swapping partners. Confirm using the inconspicuous marks on the infected cups.
4. Pour liquid from all cups in disposal container and thoroughly wash and rinse cups, if you plan to reuse.

Activity Wrap-Up

- Discuss with the youth participants the possible multiplication effect of a disease that is spreading.
- What percentage of the population was infected with just two rounds of the germ swap activity? How much would that percentage increase with one more round?
- What is an epidemic? *An epidemic is the quick spread of infectious disease to a large number of people in a population within a short period of time.*
- What could be done to prevent the spread of the disease?

Source: Maine, One Health - Activity 2 Germ Swap

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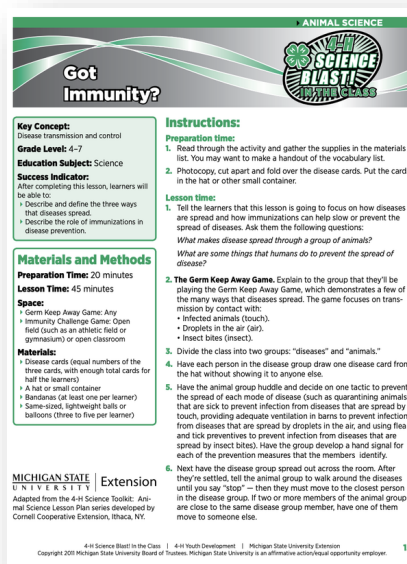
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Got Immunity?

ACTIVITY MATERIALS

- Disease cards
- A hat or small container
- Bandanas (one per learner)
- Lightweight balls or balloons (three to five per learner)



Activity Lesson Plan

This activity was created by Michigan 4-H and can be retrieved from the MSU Extension 4-H Animal Science website at: <https://www.canr.msu.edu/resources/4-h-science-blast-in-the-class-got-immunity>

Overview

In this activity, youth learn about how diseases are spread and how immunizations can help reduce the spread of disease.

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Activity Kit Contents

SECTION 4

Section 4 **Hand Washing**

1. Glo Germ Handwashing Demonstration
2. Painted Hands: Hand Sanitizer and PPE Glove Use
3. Hand Washing and Hand Sanitizer Use

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Glo Germ Handwashing Demonstration

ACTIVITY MATERIALS

- Glow Germ lotion
- UV black light
- Sink*
- Soap and water*

(* not included in the kit)

WORKING WITH GLO GERM

Glo Germ is a fantastic product which safely and graphically demonstrates to students and adults alike how germs are spread. Glo Germ consists of an odorless lotion (or powder) which glows brightly when exposed to ultraviolet light.

NOTE: A little bit of Glo Germ goes a long, long way! Apply it sparingly.

Objectives

- This activity will help demonstrate how germs spread.
- This activity will also help demonstrate how hands should be properly washed to reduce the spread of germs.

Background Information

Germs are present in many places. They can get on our hands through normal, everyday activities. Germs can be present in higher levels around animals or other people, especially animals or people that are sick. Cleaning your hands with soap and water is one of the most important steps you can take to avoid getting sick and spreading germs.

Proper Hand Washing Technique

Proper hand washing technique:

1. Wet your hands with clean running water (warm or cold) and apply soap.
2. Lather your hands by rubbing them together with the soap.
3. Scrub all surfaces of your hands, including the palms, backs, fingers, between your fingers, and under your nails. Keep scrubbing for at least 20 seconds. Need a timer? Hum the "Happy Birthday" song twice.
4. Rinse your hands under clean, running water.
5. Dry your hands using a clean towel or air dry them. Do not dry on clothes, which may be contaminated by germs!

About Glo Germ

Glo Germ™ is a product sold both in liquid and powder form that contains proven safe ingredients formulated to be the same size as bacteria, basically 5 microns in size. When used in either the powder or liquid-based form, with

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the use of an ultra-violet light, it simulates the spread of germs, teaching how quickly and broadly germs can be spread in a short period of time. (Source: www.glogerm.com)

Glo Germ lotion is applied like a typical hand lotion. Glo Germ lotion works well to demonstrate handwashing. The lotion form is generally easier for youth to apply. Glo Germ powder is more difficult to apply for handwashing demonstrations (very chalky). Glo Germ powder works well to demonstrate germ transmission by cross-contamination.

Conduct the Activity

Begin by engaging the youth participants in a discussion about the spread of disease. The following questions may be used to begin the discussion:

- How can illnesses spread from one individual to another?
- Have you ever gotten sick after you have been near another sick person?
- What is an epidemic? *An epidemic is the quick spread of infectious disease to a large number of people in a population within a short period of time.*
- What are some of the basic steps to staying healthy and not spreading illness?

Next, briefly explain to the youth participants that they are about to experience a visualization exercise that will simulate how germs spread. Explain how fluorescent materials are more visible under an ultra-violet (UV) light. Under normal light some fluorescent materials are hard to see with our eyes. Similarly, germs cannot be seen with our naked eyes (we use a microscope and coloring agents). Finally, describe how the fluorescent Glo Germ lotion will represent germs and the task of this activity is to get rid of all the “germs.”

Activity Part 1: Germ Transmission

1. Place a nickel size portion (about 5mL) of Glo Germ lotion into the palm of each youth participant’s hand.
 2. Instruct the youth to rub the lotion into their hands, being certain to cover the tops and bottoms of their hands. Instruct them to be sure to cover the finger tips and between their fingers.
 3. You can now explain that the lotion represents times when they get their hands dirty through coughing, sneezing, shaking hands, touching unclean things, and so forth. Can they see the “germs” on their hand? *No.*
 4. Next, turn off some of the lights to darken the room. Turning out the lights will help the UV flashlight to illuminate the germs better. *Note:* If turning some of the lights off is not an option, you can create a simple “disclosure center”, a cardboard box turned on its side to create a dark environment that allows the students to see the simulation germs on their hands without turning off the lights.
 5. Turn on the UV light to illuminate the “germs”. Wave the UV light over the participants’ hands or other areas they may have (i.e. counters, doorknobs, pencils or other areas where the participants’ hands may have touched). Explain how germs and other unclean particles are often invisible to the human eye just like the fluorescent Glo Germ lotion, but they still exist (hence they show up under the UV light).
-

Activity Part 2: Handwashing Test

1. Have the youth participants wash their hands at the sink and return to the classroom.
2. Once all of the participants have washed their hands, attempting to remove all of the simulation germs, gather them to check their hands again with the UV light.
3. Turn the lights off once again or have them line up at the disclosure center.
4. Turn on the UV light and have them show the palm and back of their hands. Show students that, although thorough cleaning attempts are made, germs and other unclean particles remain. The Glo Germ sticks on like germs. Pay particular attention to the back of their hands, between their fingers, and around their finger nails.
5. Review the proper handwashing technique from the *Background Information* section above with the participants.
6. Have the participants repeat the hand washing steps until all germs are gone and they have learned the proper technique to wash their hands.
7. Teach the following principles: Don't touch the edge of the sink once the hands have been washed. Use warm water that is not too hot or too cold. Regular soap is recommended just as much as antibacterial soap. Liquid soap may perform better. Dry their hands with a pre-prepared paper towel and then turn off the sink with the paper towel.

Activity Wrap-Up

Wrap-up by engaging the youth participants in a discussion about the importance of handwashing. The following questions may be used to begin the discussion:

- How can germs that cause illness spread from one individual to another?
- What important step to staying healthy and not spreading illness was demonstrated in this activity?
- Do you think you do a good job of washing your hands each time you wash? What do you need to do differently?
- Have you had any experiences where you have observed others not washing their hands, when they should have done so?
- Why would you need to thoroughly wash your hands after working with animals, touching their pens or cages, and handling their waste material?



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Painted Hands: Hand Sanitizer and PPE Glove Use

ACTIVITY MATERIALS

- Washable paint
- PPE gloves
- Glitter
- Hand Lotion
- Sink*
- Soap and water*

(* not included in the kit)

WHAT IS "PPE"?

Personal protective equipment, commonly referred to as "PPE", is equipment worn to minimize exposure to hazards that cause serious workplace injuries and illnesses.

Objectives

- This activity will help demonstrate how germs spread.
- This activity will help demonstrate how hands should be cleaned with an alcohol-based hand sanitizer to reduce the spread of germs.
- This activity will demonstrate the proper method to remove personal protective gloves from the hands.
- This activity can also be used to help demonstrate how hands should be properly washed to reduce the spread of germs.

Background Information

Proper Use of an Alcohol-based Hand Sanitizer

Germs are present in many places. They can get on our hands through normal, everyday activities. Germs can be present in higher levels around animals or other people, especially animals or people that are sick. Cleaning your hands with soap and water is one of the most important steps you can take to avoid getting sick and spreading germs. When soap and water is not available, alcohol-based hand sanitizers can be used to help kill germs on the skin that could cause illness.

An alcohol-based hand sanitizer that contains 60% alcohol should be used. To use, place enough sanitizer in your palm to cover all surfaces of your hands. Then rub your hands together until all surfaces have been covered by the sanitizer. Continue to rub until your hands feel dry. Do not rinse or wipe off the sanitizer before it is dry.

Note: Hand sanitizers will not work effectively on hands that are visibly dirty or greasy. (Source: www.cdc.gov)

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Proper Hand Washing Technique

Proper hand washing technique:

1. Wet your hands with clean running water (warm or cold) and apply soap.
2. Lather your hands by rubbing them together with the soap.
3. Scrub all surfaces of your hands, including the palms, backs, fingers, between your fingers, and under your nails. Keep scrubbing for at least 20 seconds. Need a timer? Hum the "Happy Birthday" song twice.
4. Rinse your hands under clean, running water.
5. Dry your hands using a clean towel or air dry them. Do not dry on clothes, which may be contaminated by germs!

Safe Removal of PPE Gloves

Personal protective equipment, commonly referred to as "PPE", is equipment worn to minimize exposure to hazards that cause serious workplace injuries and illnesses. These injuries and illnesses may result from contact with chemical, radiological, physical, electrical, mechanical, or other workplace hazards. Personal protective equipment may include items such as gloves, safety glasses and shoes, earplugs or muffs, hard hats, respirators, coveralls, vests and full body suits. (Source: www.osha.gov)

Individuals should follow recommended practices when putting on and removing all types of PPE. All PPE should be removed using procedures that will avoid contaminating personal clothing, skin and mucous membranes.

With regards to glove removal, it should be assumed the outside of the gloves are contaminated. Therefore, it is important to follow these steps recommended by the Centers for Disease Control and Prevention (CDC) for removing PPE gloves:

1. Using a gloved hand, grasp the palm area of the other gloved hand and peel off the first glove.
2. Hold the removed glove in the gloved hand.
3. Slide fingers of ungloved hand under the remaining glove at wrist and peel off the second glove over the first glove.
4. Discard gloves in a waste container.
5. If your hands get contaminated during glove removal, immediately wash your hands with soap and water or use an alcohol-based hand sanitizer.

For more information about how to properly put on and remove personal protective equipment, check out this CDC website: <https://www.cdc.gov/hai/prevent/ppe.html>.

Conduct the Activity

Briefly explain to the youth participants that they are about to experience two-part exercise that will first demonstrate how to properly use an alcohol-based sanitizer and second how to safely remove PPE gloves without contaminating their clothing or skin.

Activity Part 1: Use of Alcohol-based Hand Sanitizer

1. Have youth participants put on PPE gloves.
2. Place a nickel size portion (about 5mL) of washable paint into each youth participant's gloved palm. The paint simulates hand sanitizer.
3. Have the youth participants close their eyes and "clean" their hands with the paint, again, as if it was hand sanitizer.
4. When finished "cleaning" their hands, participants open their eyes. They will see which areas of their hands they missed. Did the participants cover the tops and bottoms of their hands? How about the finger tips and between fingers? Point out that spots on the back of their hands and between their fingers that need to be covered with sanitizer as well. Review the proper technique for applying an alcohol-based hand sanitizer.
5. Have youth participants keep their gloves on for Part 2 of this activity. Remind them to hold their hands up and in front of them, being careful not to touch objects in the room, their clothing or skin (especially their eyes and nose), and other participants.

Activity Part 2: Safe Removal of PPE Gloves

Next, we can use the paint-covered gloves to simulate glove that have been infected with germs. The paint now represents germs. Continue to remind the youth participants to hold their hands up and in front of them, being careful not to touch objects in the room, their clothing or skin (especially their eyes and nose), and other participants. Remember the paint now represents germs, and they don't want to spread the germs.

1. Ask the participants for ideas about how they could safely remove the contaminated gloves.
2. Following the discussion, have one or two youth participants try to demonstrate how to remove the gloves without contaminating their clothes or skin.
3. Review the recommended glove removal technique described in the *Background Information* above.
4. Ask the remaining participants to remove their gloves, following the recommended technique.
5. And then, check to see if anyone has been contaminated, as shown by paint on their hands.
6. If anyone has been contaminated, they should wash their hands with soap and water.
7. Additional teaching point: gloves can be torn or punctured, exposing the skin underneath!

Alternate Hand Sanitizer Activity

Much like Activity 1, this will simulate the use of alcohol based hand sanitizer. The glitter represents germs and the paint represents the alcohol based hand sanitizer applied to disinfect the hands.

1. Apply a generous amount of hand lotion to the palm of the hand. Before smoothing out the lotion, sprinkle glitter on top of the hand lotion.
 2. Ask the youth to rub in the hand lotion all over their hands. The hand lotion will allow for the glitter to stick to the hands anywhere it is applied. Allow to dry.
 3. Place a dime size portion of washable paint into each youth participant's glittered palm. The paint simulates hand sanitizer.
 4. Have the youth participants close their eyes and "clean" their hands with the paint, again, as if it was hand sanitizer.
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-
5. When finished “cleaning” their hands, participants open their eyes. They will see which areas of their hands they missed. Did the participants cover the tops and bottoms of their hands? How about the finger tips and between fingers? Are there glitter spots that are not coated with paint? Point out that spots on the back of their hands and between their fingers that need to be covered with sanitizer as well. Review the proper technique for applying an alcohol-based hand sanitizer.
 6. You can also reference this lessons video on the Healthy Animals | Healthy Youth Website.

Activity Wrap-Up

Wrap-up by engaging the youth participants in a discussion about the spread of disease. The following questions may be used to begin the discussion:

- How can germs that cause illness spread from one individual to another?
- Have you ever gotten sick after you have been near another sick person?
- What is an epidemic? *An epidemic is the quick spread of infectious disease to a large number of people in a population within a short period of time.*
- What are some of the basic steps to staying healthy and not spreading illness?
- Do you think you do a good job of washing your hands each time you wash? What do you need to do differently?
- Have you had any experiences where you have observed others not washing their hands, when they should have done so?

Handwashing and Hand Sanitizer Use

at Home, at Play, and Out and About



Germ is everywhere! They can get onto hands and items we touch during daily activities and make you sick. Cleaning hands at key times with soap and water or hand sanitizer is one of the most important steps you can take to avoid getting sick and spreading germs to those around you.

There are important differences between washing hands with soap and water and cleaning them with hand sanitizer. For example, alcohol-based hand sanitizers don't kill ALL types of germs, such as a stomach bug called norovirus, some parasites, and *Clostridium difficile*, which causes severe diarrhea. Hand sanitizers also may not remove harmful chemicals, such as pesticides and heavy metals like lead. Handwashing reduces the amounts of all types of germs, pesticides, and metals on hands. Knowing when to clean your hands and which method to use will give you the best chance of preventing sickness.

When should I use?

Soap and Water

- Before, during, and after preparing food
- Before eating food
- Before and after caring for someone who is sick
- Before and after treating a cut or wound
- After using the bathroom, changing diapers, or cleaning up a child who has used the bathroom
- After blowing your nose, coughing, or sneezing
- After touching an animal, animal food or treats, animal cages, or animal waste
- After touching garbage
- If your hands are visibly dirty or greasy

Alcohol-Based Hand Sanitizer

- Before and after visiting a friend or a loved one in a hospital or nursing home, unless the person is sick with *Clostridium difficile* (if so, use soap and water to wash hands).
- If soap and water are not available, use an alcohol-based hand sanitizer that contains at least 60% alcohol, and wash with soap and water as soon as you can.

* Do **NOT** use hand sanitizer if your hands are visibly dirty or greasy: for example, after gardening, playing outdoors, or after fishing or camping (unless a handwashing station is not available). Wash your hands with soap and water instead.



U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

How should I use?

Soap and Water

- **Wet** your hands with clean running water (warm or cold) and apply soap.
- **Lather** your hands by rubbing them together with the soap.
- **Scrub** all surfaces of your hands, including the palms, backs, fingers, between your fingers, and under your nails. Keep scrubbing for 20 seconds. Need a timer? Hum the “Happy Birthday” song twice.
- **Rinse** your hands under clean, running water.
- **Dry** your hands using a clean towel or air dry them.



Alcohol-Based Hand Sanitizer

Use an alcohol-based hand sanitizer that contains at least 60% alcohol. Supervise young children when they use hand sanitizer to prevent swallowing alcohol, especially in schools and childcare facilities.

- **Apply.** Put enough product on hands to cover all surfaces.
- **Rub** hands together, until hands feel dry. This should take around 20 seconds.

Note: Do not rinse or wipe off the hand sanitizer before it's dry; it may not work as well against germs.



For more information, visit the CDC handwashing website, www.cdc.gov/handwashing.



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ZOONOSIS EDUCATION PROJECT FOR YOUTH IN AGRICULTURE

Activity Kit Contents

SECTION 5

Section 5 **Biosecurity**

1. Down and Dirty with Biosecurity
2. Biosecurity Lessons
 - Develop a Simple Biosecurity Plan
 - Internal and External Biosecurity Measures
 - Spreading Disease One Touch at A time
3. Building on Biosecurity, Reducing the Risk
4. Basis of Biosecurity

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Down and Dirty with Biosecurity



GOAL STATEMENT:

Students will gain an understanding of biosecurity and develop a biosecurity plan for a hypothetical livestock production facility.

OBJECTIVES:

- Students will define biosecurity.
- Students will make personal connections between biosecurity practices that keep farms safe and security measures that keep them safe in their everyday lives.
- Students will research steps that producers can take to maximize biosecurity.
- Students will create a biosecurity plan for a hypothetical farm and share their ideas with the class.

REQUIRED MATERIALS:

- Healthy/unhealthy animal photographs (printed copies or projected) and teacher key
- Copies of "One Minute Mysteries" worksheet (1 per student)
- Copies of "Biosecurity for Livestock Facilities" worksheet (1 per student)
- "Hypothetical Livestock Production Facility Scenarios" printed with scenarios cut apart
- Markers, colored pencils, etc.
- Chart paper or poster board

AMOUNT OF TIME TO ALLOW:

70 minutes. Extension activities will take additional time.

Background Information



From viruses to bacteria, coccidia to fungi, diseases can be a problem. For this reason, it is important for facilities like schools and even farms to have a plan in place that details how the spread of disease will be prevented. This set of guidelines is called a biosecurity plan. **Biosecurity** is the sum all the management strategies a site practices to reduce the risk that **pathogens** — disease-causing organisms — will spread to that site.

In schools, hand sanitizer is available for use, cafeterias follow strict food safety guidelines, and janitors clean regularly. Just like schools, farms must also implement practices that prevent disease. Disease can spread to people and animals through contaminated food, water, housing, equipment, and air. Some diseases — called **zoonotic diseases** — can spread between people and animals. Modern biosecurity techniques are a key element in disease control, providing a safer and healthier environment for livestock.

Since each farm is different, there is no “one size fits all” biosecurity plan. Biosecurity is a way of thinking as well as the adoption of a set of practices. Farm owners, managers, and employees must all follow the biosecurity plan to prevent the introduction of new pathogens into a herd and limit the spread of established pathogens within a herd.

Engagement

20 minutes



Ask students to define the term “biosecurity” as it relates to people and schools. Have students brainstorm ways we keep ourselves safe from disease in school (i.e. washing hands, cooking food thoroughly) and write them on the board. Next, ask students to apply the ideas they generated to a farm setting. What biosecurity practices may be used on farms to keep livestock safe from disease? Record student ideas on the board.

Divide students into groups and discuss the picture cards showing healthy and unhealthy animals. Once students have examined the photos, ask them to discuss the following questions within their groups:

- How can you tell if an animal is healthy or unhealthy?
- How are diseases spread? List as many ways as you can think of.
- What actions can we take to prevent the spread of disease?

Make a list of student ideas; these will be useful as the students create their biosecurity plans later. You may use the true/false activity provided at the end of this lesson to prompt discussion and help students generate more ideas.

Exploration

25 minutes



1. Distribute copies of the “One Minute Mysteries” worksheet and have students complete the worksheet within their groups. If time permits, discuss each scenario as a class. Ensure that students have a basic understanding of how to diagnose biosecurity problems and generate strategies to remedy them before proceeding.
2. Provide each group with one of the hypothetical livestock production facility scenarios and distribute copies of the “Biosecurity for Livestock Facilities” worksheet. Explain that each group will create a biosecurity plan that will prevent disease from coming onto their farm and ensure that their livestock remain healthy. The questions on the worksheet are designed to help students think through their scenarios and develop their biosecurity plans.
3. Provide groups with poster board and markers or other materials to create a graphic representation of their plan. Instruct students that their illustration should show at least 5 critical points where diseases could spread and at least 5 strategies they will implement to prevent the spread of disease.
4. When students have finished illustrating their plans, have them complete the conclusion and analysis questions on the worksheet.

Explanation

20 minutes



Have each group present an overview of their plan to the class. For each presentation, ask students which parts of their plan are most important for creating a secure environment and why.

Lead a discussion of the importance of biosecurity on farms from both ethical and business perspectives. Livestock producers have an ethical responsibility to keep their animals safe, and diseased animals cost producers money. Diseased animals reduce profits because of increased mortality, reduced performance, and increased medication costs.

Extension



Contact a local large-scale livestock operation, preferably poultry or swine if available. Ask the owner or manager to share their biosecurity plan and how they developed it.

Interview a local large animal veterinarian about biosecurity practices he or she implements.

Have students brainstorm biosecurity practices they could implement to keep their pets safe from infectious diseases.



Career Connections



- **Government Animal Health Specialist** — This person works for the U.S. Department of Agriculture (USDA) or Maryland Department of Agriculture (MDA) checking animals for signs of disease and dealing with disease outbreaks.
- **Farm Manager** — This person oversees the management of a farm and makes decisions about when, where, and how to house, feed, breed, harvest, treat, and otherwise care for the animals.
- **Large Animal Veterinarian or Vet Technician** — This person diagnoses, treats, and helps prevent disease in livestock animals.

Evaluation



Student understanding can be evaluated through class discussion or assessment of completed activity data sheets. The following questions may also be used to evaluate student learning.

1. List three biosecurity practices a farm might use to protect the health of its animals.
2. Imagine you are a farmer speaking to a group of customers who have never heard of biosecurity. Explain why you practice biosecurity on your farm.
3. List the steps a farm owner or manager would take to diagnose and correct a biosecurity problem.

References



“Poultry Facility Biosecurity.” John B. Carey, J. Fred Prochaska, Joan S. Jeffrey. Texas Agricultural Extension Service, The Texas A&M University System. <<http://posc.tamu.edu/wp-content/uploads/sites/20/2012/08/l-51821.pdf>>.

“Security Guide for Pork Producers.” National Biosecurity Center for Animal Health Emergencies. <<http://old.pork.org/filelibrary/biosecurity/securitybook.pdf>>.

United States Department of Agriculture, Animal and Plant Health Inspection Service, <<https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/animal-disease-information>>. [Choose species in the right-hand menu; each species page has a link for biosecurity information.]

Down and Dirty with Biosecurity



True/False Activity

Have students stand in a central part of the room. Assign one area of the room as the “true” area and another of the room as the “false” area. Read each statement and have students move to the area of the room that reflects their answer. Ask students to share why they chose the answer they did.

- **It is a good idea to wash your hands after you pet your friend’s cat before you pet your own.**
(True — Your friend’s cat could have an unknown illness that you would not want to transfer from cat to cat. It is a good health practice to wash your hands anytime after you pet an animal.)
- **When you bring a new dog home, it is okay for it to drink out of the same water bowl as your other dog.**
(False — The new dog may have an illness that you are not yet aware of, and the water bowl could transmit the pathogen.)
- **If you notice your dog has been acting like it might be sick, it is still okay to take him to the dog park.**
(False — Your dog could spread disease (even if it is only showing beginning signs of a disease) through the air or by coming in contact with an object or another dog.)
- **If a new animal looks healthy, and its previous owner said it was healthy, there’s no need to quarantine it (keep it separate from other animals for a period of time).**
(False — Infected/diseased animals can look perfectly healthy before signs of illness are present. It is ALWAYS a good idea to keep new animals away from other animals for a period of time.)
- **When introducing a new animal into a herd, it is important to separate that animal from other animals (quarantine) on the farm.**
(True — A quarantine period is a good opportunity to make sure the animal does not have any conditions that you were unaware of before you introduce the animal to the rest of the herd.)
- **Because bottle jaw (the hard swelling under the jaw of goats) is not contagious, it is not important to separate animals who have it from animals that do not.**
(False — Bottle jaw is caused by internal parasites or worms, which are contagious. The goat’s caretaker should deworm all of the goats that may have come in contact with the parasite and separate the affected goats until they are no longer ill).
- **Sore mouth is a disease that only affects a sheep’s mouth.**
(False — Sore mouth can be transmitted to other body parts that come in contact with the sores and can even be transmitted to humans.)





One Minute Mysteries

Read the following scenarios and determine what went wrong and how it could have been prevented. (HINT: more than one thing may be wrong.) Make some notes about each scenario, and discuss with your group.

1. Max owns a large horse barn and often hosts shows. Although Max requires all visiting horses to be up to date on their shots, he normally does not check their paperwork. In fact, Max knows some of his friends' horses aren't up to date, but he trusts that his friends make sure their horses are healthy before they take them anywhere. Max also loans out his horse trailer to whoever needs it. They don't even need to clean it when they're done using it! He notices that his horses seem to be getting sick more often than they did before he hosted shows.
2. Lexi likes to walk her neighbors' dogs on the weekends to earn some extra money. To save time, she often walks more than one at a time. She carries one portable water bowl for them on hot days, and since they all get along well, they drink out of the same bowl. One of the dogs she walked had a runny nose, but she assumed that it was just allergies and walked the dog as usual. A few days later, all of the dogs she walks are sick.
3. Taylor owns two horses that live in a pasture by her house. They are the only horses in the area, and they never travel. However, Taylor takes lessons on horses at a different barn and often rides her friends' horses. She wears the same boots wherever she rides. She has one set of brushes and tack that she uses on whichever horse she is riding. She only cleans the brushes when they are really dirty. Out of the blue, her normally healthy horses are coughing and have runny eyes.



Down and Dirty with Biosecurity



Hypothetical Livestock Production Facility Scenarios

Cut apart these scenarios to distribute to student groups.

You operate a poultry farm that contracts with a large-scale integrated chicken processing company. (The chicken company pays you to grow their birds in chicken houses on your farm.) Your farm has three chicken houses and receives regular health inspections from the company.

You have a small alpaca farm that focuses on selling fiber for crafts and breeding stock. You have frequent visitors to the farm who come to buy your fiber products and tour the farm.

You have a small pig operation with around 80 breeding sows (females). Your facility is in a very rural area and is more than 30 years old.

You operate a dairy farm, milking approximately 200 cows daily. There are not many outside visitors, except for daily visits from the milk hauler, your 5 employees, and occasional visits from the veterinarian, hoof trimmer, milk inspector, and salespeople.

You own and operate a beef farm of about 200 cattle. The cattle are in a rotational grazing pattern where they spend most of their time outside. You sell animals for breeding and also buy calves every spring that you feed through the summer and resell in the fall.

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Down and Dirty with Biosecurity



Name: _____

Date: _____ Period: _____

Biosecurity for Livestock Facilities

1. List at least 5 ways diseases could be brought onto your farm. Be specific.

2. What strategies will you implement to prevent disease from coming onto your farm? Be sure to address each point that you listed in question 1.

3. What is the most important part of your biosecurity plan? Why?

4. What does "biosecurity" mean?

5. Why do livestock producers need to keep their animals healthy?

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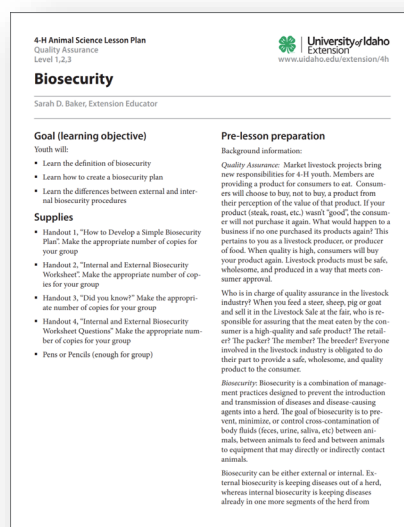
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ZOOLOSES EDUCATION PROJECT FOR YOUTH IN AGRICULTURE

Basics of Biosecurity

ACTIVITY MATERIALS

- Handouts (1 / youth learner)
 - Handout 1: How to Develop a Simple Biosecurity Plan
 - Handout 2: Internal and External Biosecurity Worksheet
 - Handout 3: Did you know?
 - Handout 4: Internal and External Biosecurity Worksheet Questions
- Pens / pencils



Activity Lesson Plan

This activity was created by Idaho 4-H and can be retrieved from the Idaho 4-H website (navigate to Animal Science Lesson Plans: Quality Assurance at:

<https://www.uidaho.edu/extension/4h/projects>

Overview

In this activity, youth learn about the general concepts of biosecurity and how to create a biosecurity plan for their project animals.

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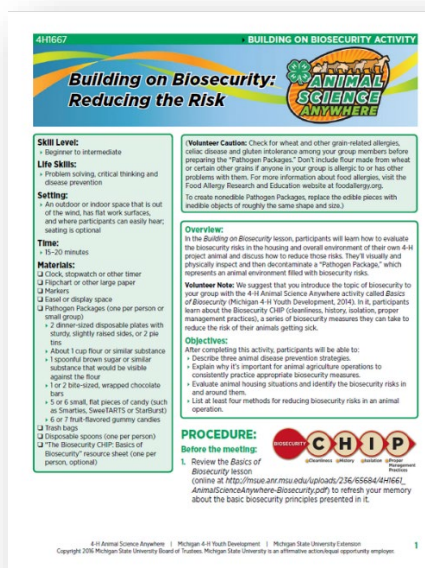
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ZOONOSIS EDUCATION PROJECT FOR YOUTH IN AGRICULTURE

Building on Biosecurity: Reducing the Risk

ACTIVITY MATERIALS

- “The Biosecurity CHIP: Basics of Biosecurity” resource sheet
- Clock / stopwatch / timer
- Flipchart / large paper
- Markers
- Pathogen Packages (household items)
 - 2 dinner-sized disposable plates or pie tins
 - 1 cup flour
 - 1 spoonful brown sugar
 - 1 or 2 bite-sized, wrapped chocolate bars
 - 5 or 6 small, flat pieces of candy (such as Smarties, SweeTARTS or StarBurst)
 - 6 or 7 fruit-flavored gummy candies
- Trash bags
- Disposable spoons (one per person)



Activity Lesson Plan

This activity was created by Michigan 4-H and can be retrieved from the MSU Extension 4-H Animal Science website at: <https://www.canr.msu.edu/resources/building-on-biosecurity-reducing-the-risk>

Overview

In this activity, youth learn about reducing biosecurity risks associated with their project animals and their housing and environment.

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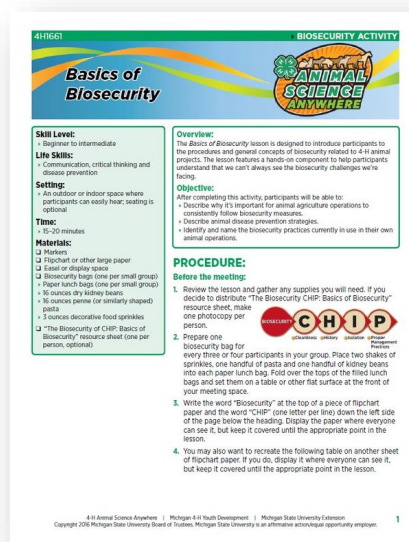
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ZOONOSIS EDUCATION PROJECT FOR YOUTH IN AGRICULTURE

Basics of Biosecurity

ACTIVITY MATERIALS

- “The Biosecurity of CHIP: Basics of Biosecurity” resource sheet
- Markers
- Flipchart / large paper
- Biosecurity bags (one per small group)
 - Paper lunch bags (one per small group)
 - 16 oz. dry kidney beans
 - 16 oz. penne pasta
 - 3 oz. decorative food sprinkles



Activity Lesson Plan

This activity was created by Michigan 4-H and can be retrieved from the MSU Extension 4-H Animal Science website at: <https://www.canr.msu.edu/resources/basics-of-biosecurity>

Overview

In this activity, youth learn about the general concepts of why understanding biosecurity is an important component to their animal projects.

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ZONOOSES EDUCATION PROJECT FOR YOUTH IN AGRICULTURE

Activity Kit Contents

SECTION 6

Section 6 Antimicrobial Resistance

1. Antibiotic Resistance

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Antibiotic Resistance

Materials Needed:

- 3-Page Worksheet Packet (1 per student)
- Light colored beads
- Dark Colored Beads
- Small Containers/Bowls
- Colored Pencils
- Ruler (or straight edge for graphs)

Objective

The purpose of this activity is to simulate the effects of antibiotics on susceptible and resistant bacteria in a population and observe how the population changes over time.

Overview

In many bacterial populations, most bacteria are antibiotic-susceptible. This means they can be killed by chemicals called antibiotics. Antibiotics are used to kill certain bacteria species. However, natural genetic variability among bacteria can create antibiotic-resistant individuals in the bacteria population. The antibiotic-resistant bacteria are not killed by an antibiotic that kills susceptible bacteria. If even only a few bacteria in a population are resistant when exposed to an antibiotic, their survival can lead to the ability to reproduce, passing their resistance genes to their offspring as they divide. This can lead to an increased level of resistance to the antibiotic in the bacteria population.

Note: See the **Additional Background Information** section at the end of this lesson for more details about antibiotic resistance.

This activity lets you model how antibiotic-resistant bacteria can affect the makeup of a population over time. In this activity, the dark-colored beads represent antibiotic-resistant bacteria with a thicker cell wall that does not allow the antibiotic to penetrate the cell. Therefore, they tend to survive after being exposed to the antibiotics. The light-colored beads represent bacteria with normal cell walls that allow the antibiotic to enter. They tend to die when exposed to the antibiotic.

Conduct the Activity

1. Divide youth into groups of 3-4 participants each.



-
2. Count 100 light-colored beads (represents the antibiotic-susceptible bacteria) and 100 dark-colored beads (represents the antibiotic-resistant bacteria) and place them in the container. Mix the beads together.
 3. Have one member of your group reach into the container without looking and remove about half of the bacteria (beads). These are the bacteria that were exposed to the antibiotic contained in the first dose. (Note: When we have an infection and we take a dose of an antibiotic, our bodies do not necessarily deliver that dose to all bacteria in the population. In this simulation, we are assuming that about half of the bacteria are exposed to each dose of antibiotic.
 4. Separate and count the number of light-colored and dark colored bacteria and record your results on your data chart.
 5. The light-colored bacteria die when being exposed to the antibiotic, so you should return the light-colored beads to their original cup.
 6. The dark-colored bacteria are resistant to the antibiotic; they survive and reproduce by dividing in half. Double the dark-colored bacteria you removed from the container by adding an equal number of dark beads/bacteria from the supply cup. Put the dark beads and their duplicates into the container and mix them.
 7. Simulate the effects of antibiotic doses 2, 3, 4, and 5 by repeating steps 3-6 above four more times.
 8. When the simulation is complete, separate all of the beads by color and place them back into their original cups.
 9. Use your data to make a bar graph of the number of light and dark colored bacteria taken from the container following exposures 1-5. Be sure to label the axes on your graph.
 10. Answer the questions on your worksheet.

Activity Wrap-Up

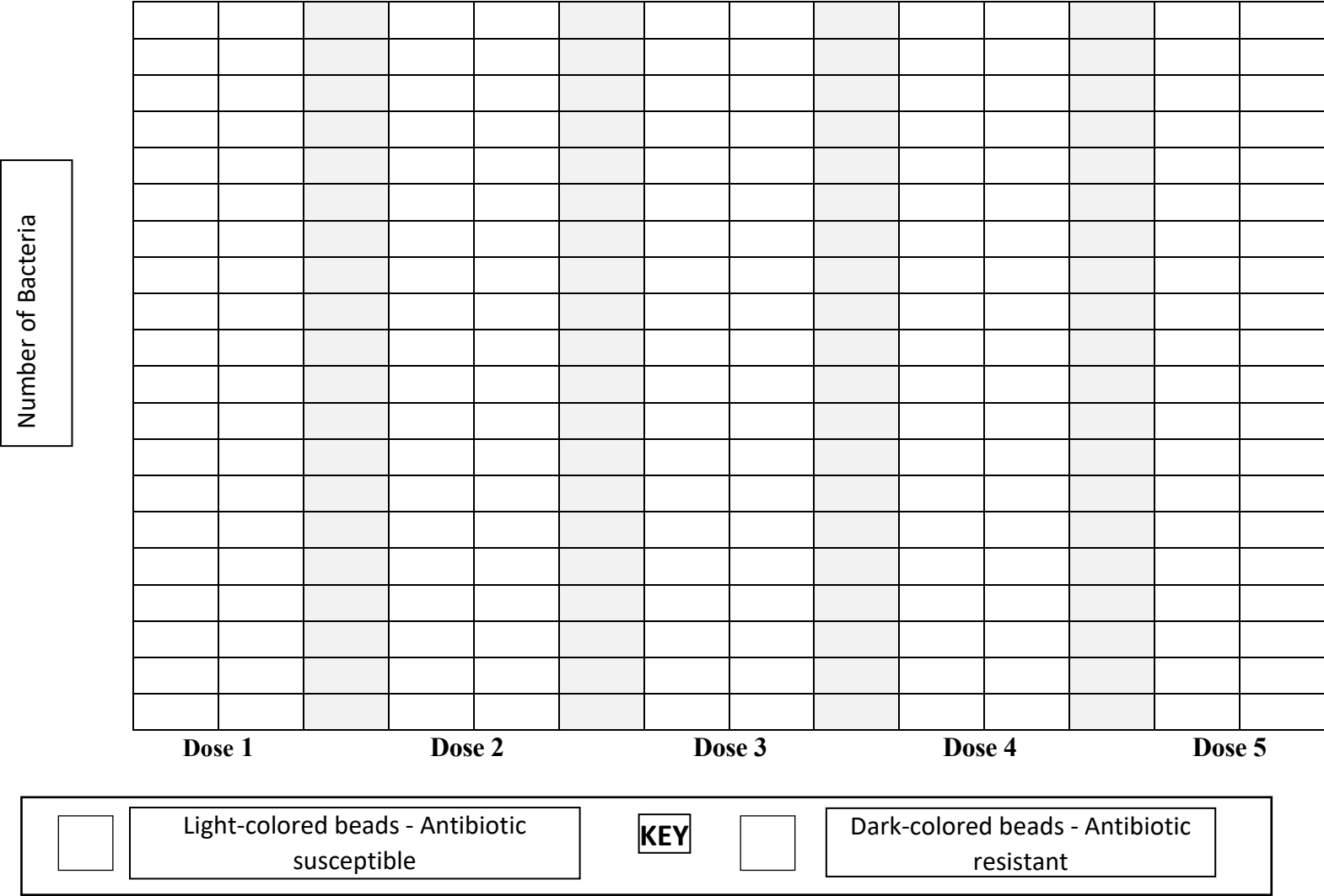
Wrap-up by engaging the youth participants in a discussion about how the level of antibiotic resistance can increase in a bacteria population. The following questions may be used to begin the discussion:

- Are antibiotics completely effective in killing all bacteria?
 - How can just a few antibacterial resistant individuals in a bacteria population lead to increased resistance in a population over time?
-

Antibiotic Resistance Data Table

Antibiotic Dose Number	Number of Light Beads (Antibiotic-Susceptible Bacteria)	Number of Dark Beads (Antibiotic-Resistant Bacteria)	Total Number of Bacteria Removed
1			
2			
3			
4			
5			

Graph: Effect of antibiotic exposure on susceptible (light) and resistant (dark) bacteria in a population.



Antibiotic Resistance Worksheet

1. Following the first dose of antibiotic:
 - A. How many light-colored beads (antibiotic-susceptible bacteria) were exposed to the antibiotic? _____
 - B. How many dark-colored beads (antibiotic-resistant bacteria) were exposed to the antibiotic? _____
 2. Following the fifth (final) dose of antibiotic:
 - A. How many light-colored beads (antibiotic-susceptible bacteria) were exposed to the antibiotic? _____
 - B. How many dark-colored beads (antibiotic-resistant bacteria) were exposed to the antibiotic? _____
 3. Describe how the populations of light beads (antibiotic-susceptible bacteria) and dark beads (antibiotic-resistant bacteria) changed after repeated dosing/exposure to the antibiotic.

 4. Explain *why* each color of beads (antibiotic-susceptible bacteria and antibiotic-resistant bacteria) increased or decreased in number over time.

 5. Natural selection happens when there is genetic variation in a population. Some organisms are better able to survive than others and reproduce at a higher rate. How does this activity demonstrate natural selection acting on a bacterial population?

 6. Evolution is change in the genetic makeup of a population over time due to natural selection. Predict how the population will look if the bacteria are exposed to five more doses of antibiotic.

 7. Why is antibiotic resistance a great concern in medicine?

-

Additional Background Information

Antibiotics have been widely used by in the medical field since Alexander Fleming discovered in 1928 that a fungus called *Penicillium* produces an antibiotic substance he called penicillin. Today there is a variety of antibiotics used in medicine; however, some antibiotics have become less effective over time due to the development of antibiotic resistance within bacterial populations. Antibiotic resistance develops in response to repeated dosing with the same antibiotic, causing the eventual proliferation of antibiotic-resistant bacteria.

Antibiotics are chemicals that kill bacteria by acting through various methods including blocking the synthesis of cell walls, inhibiting protein synthesis, cell membranes, inhibiting DNA or RNA, and disrupting various bacterial metabolic processes (Antimicrobial Resistance: <https://amrls.cvm.msu.edu/pharmacology/antimicrobials/mode-of-action>.) The term antimicrobial is a broader term referring to any substance that can kill microorganisms including bacteria, fungi, protists, and viruses. This lesson focuses on antibiotic resistance.

The following example illustrates how antibiotic resistance can increase by considering antibiotic-susceptible and antibiotic-resistant bacteria. In nearly all natural populations, there is genetic variability among individuals. Differences in DNA give individuals in a population different traits. (Think about the differences among people you know. Many of these differences are due to genetic variability.) In bacterial populations, some individuals tend to have a natural immunity when exposed to a specific antibiotic. When antibiotic exposure occurs, the susceptible bacteria are killed but the resistant bacteria are not. These resistant bacteria reproduce and pass down their resistance genes to future generations as they divide and reproduce. Over time, as susceptible bacteria decrease in number and only resistant bacteria remain and reproduce, the bacteria population becomes entirely resistant. Antibiotics that were once effective have no further action on the bacteria population.

Antibiotic resistance is of great concern. The ability to treat a wide range of bacterial diseases and illnesses is essential for human and veterinary medicine for treatment, control, and prevention of diseases. Unfortunately, overuse of antibiotics in non-human animals can pose resistance problems for humans. The reverse is also true. “Antimicrobial use in animals can contribute to the emergence of antimicrobial resistance in bacteria that may be transferred to humans, thereby reducing the effectiveness of antimicrobial drugs for treating human disease. The United States Food and Drug Administration Center for Veterinary Medicine has developed a multipronged strategy designed to limit or reverse resistance arising from the use of antibiotics in food-producing animals, while continuing to ensure the availability of safe and effective antibiotics for use in animals and humans.” (Food and Drug Administration, 2020: <https://www.fda.gov/animal-veterinary/safety-health/antimicrobial-resistance>).

The need to prevent overuse of antibiotics and other antimicrobials in veterinary medicine is becoming more important over time. Today, animal producers are required to obtain authorization from a licensed veterinarian to use medically-important antimicrobials when needed for treatment, control, and prevention of specific animal health problems. These regulations seem to be working. A report from the FDA in 2018 showed that domestic sales and distribution of medically-important antibiotics for use in livestock decreased by 33% from 2016 through 2017 and by 43% since sales peaked in 2015. Since 2009, the first year the FDA started collecting and reporting the data, sales have declined by 28% (University of Minnesota Center for Infectious Disease Research and Policy <http://www.cidrap.umn.edu/news-perspective/2018/12/fda-reports-major-drop-antibiotics-food-animals>).



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ZOONOSES EDUCATION PROJECT FOR YOUTH IN AGRICULTURE

Activity Kit Contents

SECTION 7

Section 7 Animal Health Checks

1. MDA Equine Self Certification Form
2. MDA Livestock Self Certification Form
3. MDA Poultry Self Certification Form
4. MDA Rabbit Self Certification Form

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Equine Exhibitor's Self Certification of Animal Health

I, the undersigned, hereby verify the following:

(Parent or guardian must sign for children under age 18)

1. I am the **owner/authorized caretaker/transporter** (*circle as applicable*) of the equine identified on the current, valid, "Equine Infectious Anemia" (Coggins) document.
2. I understand that any equine showing any signs of or having recent exposure to, contagious or infectious disease are not permitted to enter the fair/show premises. These conditions include but are not limited to the following:
 - ☐ **SKIN:** Visible evidence of skin infections (*bacterial or fungal*) with particular emphasis on *ringworm*.
 - ☐ **HEAD:** Discharge from the eyes or nose which is excessive in amount or opaque (yellow or white in color) as opposed to the normal clear nasal discharge commonly seen after exercise.
 - ☐ **RESPIRATORY:** Signs of infectious respiratory disease such as fever, coughing, labored breathing, increased respiratory rate and nasal discharge. Animals originating from premises where there is current infectious respiratory disease and animals with any known exposure to infectious respiratory disease shall be ineligible to show for a minimum of 21 days after exposure. Infectious respiratory disease shall include but not be limited to *Influenza, Rhinopneumonitis, and Strangles*.
 - ☐ **INTESTINAL:** Evidence of diarrhea which is watery and/or persistent in nature and more profuse than a looser stool which could be attributed to diet or nervousness.
 - ☐ **FEET:** Horses exhibiting any type of unsoundness are already excluded from showing by the rules governing horse for shows.
 - ☐ **OTHER:** Recent exposure to, or clinical signs of, any contagious or infectious disease conditions that would exclude equine from exhibition.
3. I have read and understand the above guidelines.
4. I have visually examined the equine I am presenting for exhibit.
5. I agree not to present for exhibition any equine showing any signs of contagious or infectious disease, or having any known recent (21 days) exposure to any contagious or infectious disease.

Date of inspection: _____ Number inspected _____ Signature _____

Printed Name _____ Event _____

(Parent or guardian must sign for children under age 18)

Date of inspection: _____ Number inspected _____ Signature _____

Printed Name _____ Event _____

(Parent or guardian must sign for children under age 18)

Date of inspection: _____ Number inspected _____ Signature _____

Printed Name _____ Event _____

(Parent or guardian must sign for children under age 18)

Date of inspection: _____ Number inspected _____ Signature _____

Printed Name _____ Event _____

(Parent or guardian must sign for children under age 18)



Livestock Exhibitor's Self Certification of Animal Health

I, the undersigned, hereby verify the following:

(Parent or guardian must sign for children under age 18)

1. I am the **owner/authorized caretaker/transporter** (*circle as applicable*) of the animal(s) identified on the current, valid, "Certificate of Veterinary Inspection" (CVI) document.
2. I understand that animals showing any signs of, or having recent exposure to, contagious or infectious disease are not permitted to enter the fair/show premises. These conditions include but are not limited to the following:
 - ☐ SKIN: Visible evidence of skin infections such as **ringworm, warts, mange, lice, and club lamb fungus.**
 - ☐ HEAD: Discharge from the eyes or nose or evidence of **soremouth, pinkeye, atrophic rhinitis, caseous lymphadenitis.**
 - ☐ RESPIRATORY: Infectious respiratory disease (**pneumonia**)
 - ☐ INTESTINAL: Diarrhea
 - ☐ FEET: Contagious hoof infections such as **footrot.** Exhibition of lame animals is discouraged.
 - ☐ OTHER: Recent exposure to, or clinical signs of, any contagious or infectious disease conditions that would exclude livestock from exhibition.
3. I have read and understand the above guidelines.
4. I have visually examined the animals I am presenting for exhibit.
5. I agree not to present for exhibition animals showing any signs of contagious or infectious disease, or having any known recent (21 day) exposure to any contagious or infectious disease.

Date of inspection: _____ Number inspected _____ Signature _____
Printed Name _____ Event _____
(Parent or guardian must sign for children under age 18)

Date of inspection: _____ Number inspected _____ Signature _____
Printed Name _____ Event _____
(Parent or guardian must sign for children under age 18)

Date of inspection: _____ Number inspected _____ Signature _____
Printed Name _____ Event _____
(Parent or guardian must sign for children under age 18)

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Date of inspection: _____ Number inspected _____ Signature _____
Printed Name _____ Event _____
(Parent or guardian must sign for children under age 18)

Date of inspection: _____ Number inspected _____ Signature _____
Printed Name _____ Event _____
(Parent or guardian must sign for children under age 18)



Poultry Exhibitor's Self Certification of Animal Health

Name of Owner: _____

Address: _____

Telephone Number: _____

I, the undersigned, hereby verify the following:

(Parent or guardian must sign for children under age 18)

1. I am the **owner/authorized caretaker/transporter** (*circle as applicable*) of the poultry identified on this form.
2. I understand that poultry showing any signs of, or having recent exposure to (within 21 days), contagious or infectious disease are not permitted to enter the fair/show premises. These conditions include but are not limited to the following:
 - ☐ FEATHERS: No signs of loss of feather, feather picked, soiled hackle feathers or evidence of egg clusters commonly caused by ***Lice or Mites***.
 - ☐ HEAD: No signs of swelling or puffiness on the head. No watery, large or swollen eyes and or crust on the eye lids commonly caused by ***Mycoplasma or Fowl pox***.
 - ☐ RESPIRATORY: No signs of infectious respiratory diseases such as nasal discharge, rattling cough or distressed breathing commonly caused by ***Infectious Bronchitis or Laryngotracheitis***.
 - ☐ INTESTINAL: No evidence of pasted vents, chalk-white feces or internal parasites consistent with ***Diarrhea***.
 - ☐ OTHER: NO unusual mortality in the last 30 days.
3. I have read and understand the above guidelines.
4. I have visually examined the poultry I am presenting for exhibit.
5. I agree not to present for exhibition poultry showing any signs of contagious or infectious disease.

#	Band #	Series of Band #	Age	Sex	Breed
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Date of inspection: _____ Number inspected _____ Signature _____

Printed Name _____ Event _____

(Parent or guardian must sign for children under age 18)



Rabbit Exhibitor's Self Certification of Animal Health

Name of Owner: _____

Address: _____

Telephone Number: _____

I, the undersigned, hereby verify the following:

(Parent or guardian must sign for children under age 18)

1. I am the **owner/authorized caretaker/transporter** (*circle as applicable*) of the rabbit(s) identified on this form, have been visually examined.
2. I understand that rabbits showing any signs of, or having recent exposure to (within 21 days), contagious or infectious disease are not permitted to enter the fair/show premises. These conditions include but are not limited to the following:
 - ☐ SKIN & HEAD: No visible evidence of skin infections, discharge for the eyes or nose or excessive head shaking with particular emphasis on ***Ear mites, Fur mites, Myxomatosis, and Ringworm.***
 - ☐ REPRODUCTIVE: No signs of sexually transmitted diseases with particular emphasis on ***Syphilis.***
 - ☐ RESPIRATORY: No signs of infectious respiratory disease such as sneezing, white nasal discharge or excessive tearing which are all common signs of ***Snuffles.***
 - ☐ INTESTINAL: No evidence of soft droppings, soiling on rump or hocks consistent with ***Diarrhea.***
 - ☐ OTHER: Recent exposure to, or clinical signs of, any contagious or infectious disease conditions that would exclude rabbits from exhibition. ***Viral Hemorrhagic Disease (VHD)***
3. I have read and understand the above guidelines.
4. I have visually examined the animals I am presenting for exhibit.
5. I agree not to present for exhibition rabbits showing any signs of contagious or infectious disease.

#	Tattoo	Registry Name or #	Date of Birth	Sex	Breed
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Date of inspection: _____ Number inspected _____ Signature _____

Printed Name _____ Event _____

(Parent or guardian must sign for children under age 18)



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ZOONOSIS EDUCATION PROJECT FOR YOUTH IN AGRICULTURE

Activity Kit Contents

SECTION 8

Section 8

Personal Protective Equipment

1. PPE Safe Removal Activity
2. Sequence for Putting On and Removing PPE – CDC

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PPE

Safe Removal Activity

ACTIVITY MATERIALS

- Shaving Cream
- PPE (Personal Protective Equipment)
 - Disposable Coveralls
 - Boot Covers
 - Gloves
 - Dust mask
 - Safety glasses
 - Ear plugs

WHAT IS "PPE"?

Personal protective equipment, commonly referred to as "PPE", is equipment worn to minimize exposure to hazards that cause serious workplace injuries and illnesses.

Objectives

- This activity will help demonstrate the importance of personal protective equipment (PPE).
- This activity will help demonstrate the importance of handwashing

Background Information

What is PPE?

Personal protective equipment, commonly referred to as "PPE", is equipment worn to minimize exposure to hazards that cause serious workplace injuries and illnesses. These injuries and illnesses may result from contact with chemical, radiological, physical, electrical, mechanical, or other workplace hazards. Personal protective equipment may include items such as gloves, safety glasses and shoes, earplugs or muffs, hard hats, respirators, coveralls, vests and full body suits. (Source: www.osha.gov)

Individuals should follow recommended practices when putting on and removing all types of PPE. The type of PPE used will vary with the level of protection needed for the situation. Generally, PPE is put on and adjusted to fit in the following order:

1. Coveralls: Wear coveralls or barn clothes whenever you have animal contact. Change immediately following being in the barn. Disposable coveralls are good to use when working with sick or contagious animals.
2. Boot Covers: Rubber boots are great to wear in the barn for everyday tasks. Clean and disinfect regularly. Have visitors wear boot covers to enter your barn or when you are visiting another farm.

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3. Mask: Protect yourself from inhaling dust-borne germs with a face mask or when in contact with sick or contagious animals.
 4. Goggles or Face Shield: Wear to protect your eyes from contact with germs, especially when working with contaminated fluids.
 5. Gloves: Protect your hands from infectious disease by wearing gloves when you work with animals; especially if they are sick.

All PPE should be removed using procedures that will avoid contaminating personal clothing, skin and mucous membranes. Also, be careful to not contaminate surrounding structures of the environment you are in. With regards to PPE removal, **it should be assumed the outside surfaces of all PPE equipment are contaminated**. Therefore, it is important to follow the steps recommended by the Centers for Disease Control and Prevention (CDC) for removing PPE. Generally, following this order for removal:

PPE Gloves

1. Remember, the outside of the gloves are contaminated.
2. Using a gloved hand, grasp the palm area of the other gloved hand and peel off the first glove.
3. Hold the removed glove in the gloved hand.
4. Slide fingers of ungloved hand under the remaining glove at wrist and peel off the second glove over the first glove.
5. Discard gloves in a waste container.
6. If your hands get contaminated during glove removal, immediately wash your hands with soap and water or use an alcohol-based hand sanitizer.

Goggles or Face Shield

1. Remember, the outside of the goggles are contaminated.
2. Remove goggles from the back if held in place with elastic bands or from the earpiece of glasses.
3. If reusable, place in the appropriate location for cleaning.

Coveralls

1. These are difficult to remove. Remember, the outside of the coveralls, especially the front and sleeves are contaminated.
2. Safe removal is more effective if two sets of gloves were put on so that the outer pair can be removed in the previous steps, leaving a clean pair remaining to protect you when unfastening the coveralls front closure. OR have a protected buddy assist unfastening the coveralls and pulling them over the shoulders.
3. Pull the arms out of the sleeves, with inner gloves or the help of your buddy, roll the coveralls from the waist down, from the inside of the coveralls. Step out of the coveralls and dispose.

Mask

1. Remember, the outside of the mask is contaminated.
 2. Remove mask, grasping the elastic band(s) behind the head and pulling forward over the head.
-

For more information about how to properly put on and remove personal protective equipment, check out this CDC website: <https://www.cdc.gov/hai/prevent/ppe.html>. Or this website of the World Health Organization: <https://www.who.int/csr/resources/publications/ebola/ppe-steps/en/>.

Conduct the Activity

1. Ask one volunteer to dress in PPE. Putting on the coveralls, boot covers, mask, goggles, and gloves.
2. Once dressed in PPE, place golf ball-sized (or smaller) amounts of shaving cream on different outside surfaces of the PPE, making sure to apply some to each glove. The shaving cream will represent “germs”.
3. Ask the volunteer to remove PPE, being careful not to contaminate his or her clothing, skin, eyes, mouth, etc.
4. Lead a group discussion about how “free from contamination” the volunteer was able to keep his/her clothing, skin, etc.
5. Review the proper techniques recommended by the CDC for PPE removal. What could the volunteer do differently next time?
6. If time permits, ask another volunteer to give it a try!
7. Discuss the importance of handwashing even when wearing gloves and other PPE. Even when hands were visibly contaminated, it was hard to stay clean.

Activity Wrap-Up

- For each of the PPE items from this activity, have the participants discuss which transmission method risks could be reduced. Transmission methods include direct contact, indirect contact, aerosol/droplet, oral, and vector-borne.
- What should you do if your hands become contaminated during PPE removal? Discuss the importance of handwashing following removal of PPE.

Source: Iowa State University, Blue Not Flu – Excellence in Exhibition: Preventing Disease in Animals and People PPE Activity

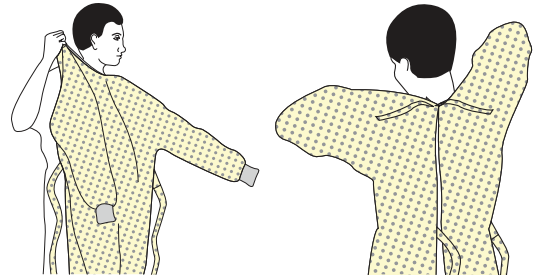
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SEQUENCE FOR **PUTTING ON** PERSONAL PROTECTIVE EQUIPMENT (PPE)

The type of PPE used will vary based on the level of precautions required, such as standard and contact, droplet or airborne infection isolation precautions. The procedure for putting on and removing PPE should be tailored to the specific type of PPE.

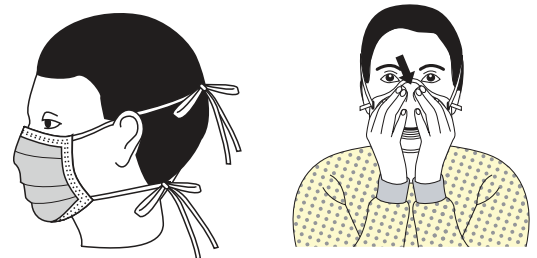
1. GOWN

- Fully cover torso from neck to knees, arms to end of wrists, and wrap around the back
- Fasten in back of neck and waist



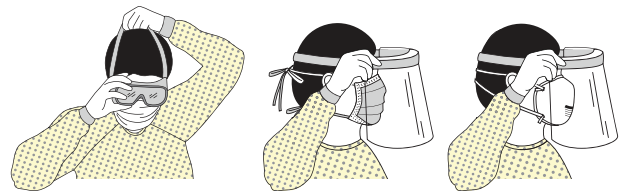
2. MASK OR RESPIRATOR

- Secure ties or elastic bands at middle of head and neck
- Fit flexible band to nose bridge
- Fit snug to face and below chin
- Fit-check respirator



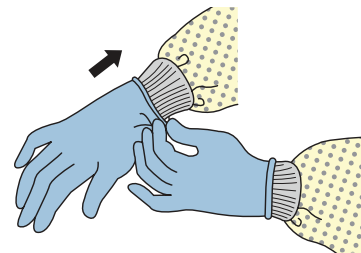
3. GOGGLES OR FACE SHIELD

- Place over face and eyes and adjust to fit



4. GLOVES

- Extend to cover wrist of isolation gown



USE SAFE WORK PRACTICES TO PROTECT YOURSELF AND LIMIT THE SPREAD OF CONTAMINATION

- Keep hands away from face
- Limit surfaces touched
- Change gloves when torn or heavily contaminated
- Perform hand hygiene



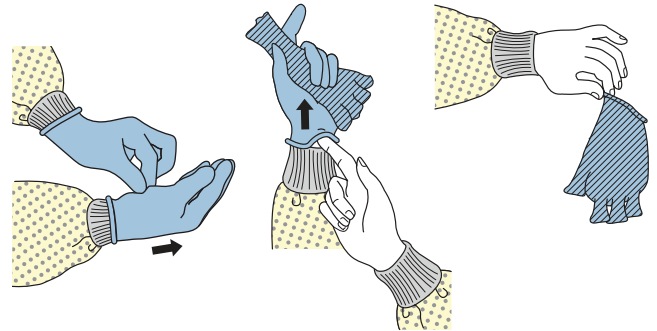
HOW TO SAFELY REMOVE PERSONAL PROTECTIVE EQUIPMENT (PPE)

EXAMPLE 1

There are a variety of ways to safely remove PPE without contaminating your clothing, skin, or mucous membranes with potentially infectious materials. Here is one example. **Remove all PPE before exiting the patient room** except a respirator, if worn. Remove the respirator **after** leaving the patient room and closing the door. Remove PPE in the following sequence:

1. GLOVES

- Outside of gloves are contaminated!
- If your hands get contaminated during glove removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Using a gloved hand, grasp the palm area of the other gloved hand and peel off first glove
- Hold removed glove in gloved hand
- Slide fingers of ungloved hand under remaining glove at wrist and peel off second glove over first glove
- Discard gloves in a waste container



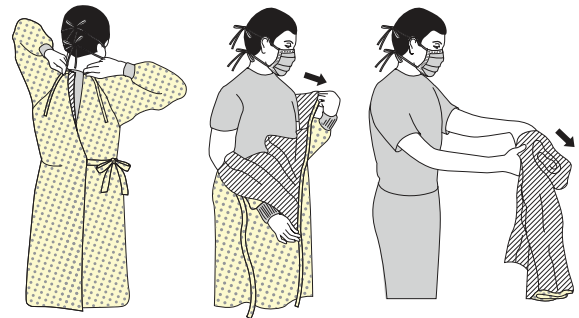
2. GOGGLES OR FACE SHIELD

- Outside of goggles or face shield are contaminated!
- If your hands get contaminated during goggle or face shield removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Remove goggles or face shield from the back by lifting head band or ear pieces
- If the item is reusable, place in designated receptacle for reprocessing. Otherwise, discard in a waste container



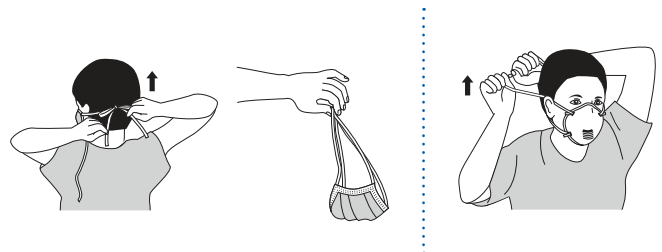
3. GOWN

- Gown front and sleeves are contaminated!
- If your hands get contaminated during gown removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Unfasten gown ties, taking care that sleeves don't contact your body when reaching for ties
- Pull gown away from neck and shoulders, touching inside of gown only
- Turn gown inside out
- Fold or roll into a bundle and discard in a waste container

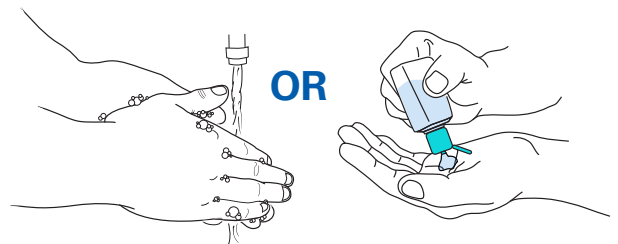


4. MASK OR RESPIRATOR

- Front of mask/respirator is contaminated — DO NOT TOUCH!
- If your hands get contaminated during mask/respirator removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Grasp bottom ties or elastics of the mask/respirator, then the ones at the top, and remove without touching the front
- Discard in a waste container



5. WASH HANDS OR USE AN ALCOHOL-BASED HAND SANITIZER IMMEDIATELY AFTER REMOVING ALL PPE



PERFORM HAND HYGIENE BETWEEN STEPS IF HANDS BECOME CONTAMINATED AND IMMEDIATELY AFTER REMOVING ALL PPE



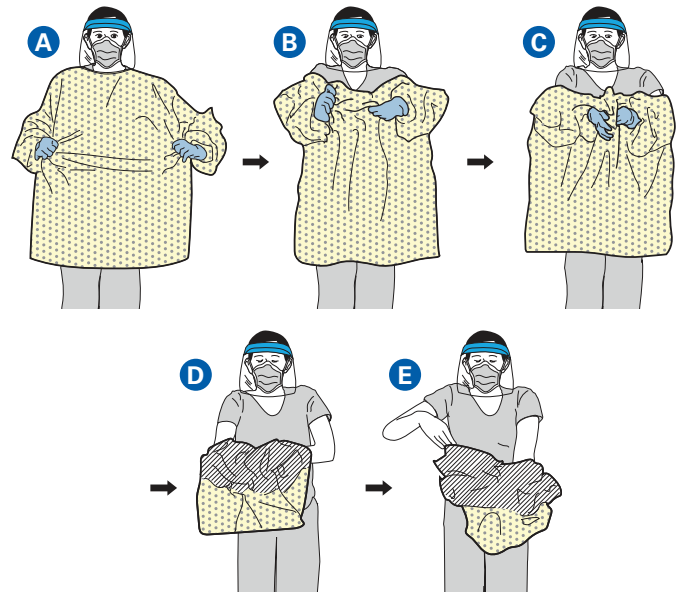
HOW TO SAFELY REMOVE PERSONAL PROTECTIVE EQUIPMENT (PPE)

EXAMPLE 2

Here is another way to safely remove PPE without contaminating your clothing, skin, or mucous membranes with potentially infectious materials. **Remove all PPE before exiting the patient room** except a respirator, if worn. Remove the respirator **after** leaving the patient room and closing the door. Remove PPE in the following sequence:

1. GOWN AND GLOVES

- Gown front and sleeves and the outside of gloves are contaminated!
- If your hands get contaminated during gown or glove removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Grasp the gown in the front and pull away from your body so that the ties break, touching outside of gown only with gloved hands
- While removing the gown, fold or roll the gown inside-out into a bundle
- As you are removing the gown, peel off your gloves at the same time, only touching the inside of the gloves and gown with your bare hands. Place the gown and gloves into a waste container



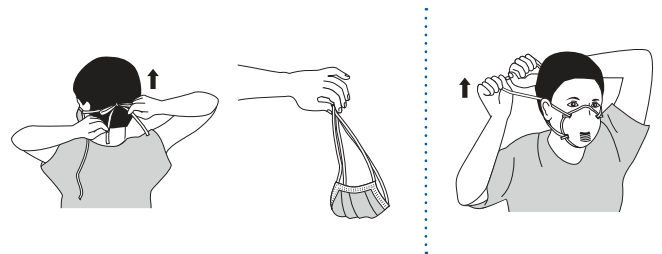
2. GOGGLES OR FACE SHIELD

- Outside of goggles or face shield are contaminated!
- If your hands get contaminated during goggle or face shield removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Remove goggles or face shield from the back by lifting head band and without touching the front of the goggles or face shield
- If the item is reusable, place in designated receptacle for reprocessing. Otherwise, discard in a waste container

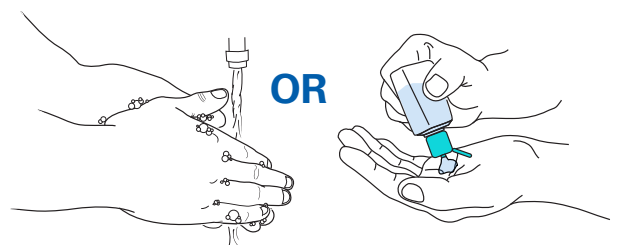


3. MASK OR RESPIRATOR

- Front of mask/respirator is contaminated — **DO NOT TOUCH!**
- If your hands get contaminated during mask/respirator removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Grasp bottom ties or elastics of the mask/respirator, then the ones at the top, and remove without touching the front
- Discard in a waste container



4. WASH HANDS OR USE AN ALCOHOL-BASED HAND SANITIZER IMMEDIATELY AFTER REMOVING ALL PPE



PERFORM HAND HYGIENE BETWEEN STEPS IF HANDS BECOME CONTAMINATED AND IMMEDIATELY AFTER REMOVING ALL PPE





Healthy Animals | Healthy YOUTH



HEALTHY ANIMALS | HEALTHY YOUTH

ZONOOSES EDUCATION PROJECT FOR YOUTH IN AGRICULTURE

Activity Kit Contents

SECTION 9

Section 9

Careers

1. Bridging Human and Animal Health

University programs, activities, and facilities are available to all without regard to race, color, sex, gender identity or expression, sexual orientation, marital status, age, national origin, political affiliation, physical or mental disability, religion, protected veteran status, genetic information, personal appearance, or any other legally protected class.

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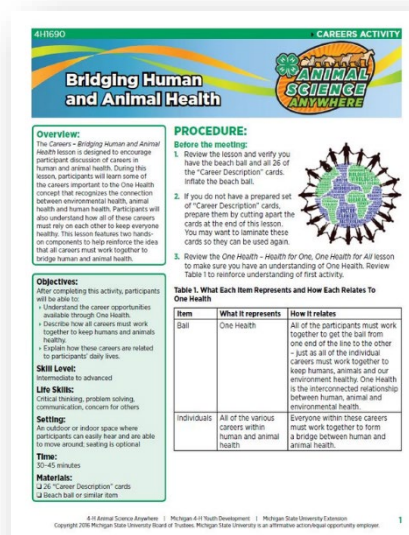
HEALTHY ANIMALS | HEALTHY YOUTH

ZOONOSIS EDUCATION PROJECT FOR YOUTH IN AGRICULTURE

Bridging Human and Animal Health

ACTIVITY MATERIALS

- Set of 26 “Career Description” cards
- Beach ball or similar item (one per person)



Activity Lesson Plan

This activity was created by Michigan 4-H and can be retrieved from the MSU Extension 4-H Animal Science website at: <https://www.canr.msu.edu/resources/bridging-human-and-animal-health>

Overview

In this activity, youth learn about careers in human and animal health.

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