



## **AgExplorer and Zoetis Virtual Field Trip Educator Guide**

**Watch the Virtual Field Trip:** This activity accompanies the STEM Careers Improving Animal Health virtual field trip and design to be completed while or immediately after watching the show. [Check it out here.](#)

### **Overview**

The AgExplorer and Zoetis Virtual Field Trip introduces students to scientists, researchers, veterinarians, statisticians, and engineers that make major contributions by developing technologies that contribute to healthy animals and a safe food supply. As livestock production and the rate of pet ownership both continue to increase along with growing world populations, rising demand for meat, and increased standard of living, animal health medicines and vaccines will be needed in greater supply. Take your students inside Zoetis, a global animal health company built on more than 60 years of experience, to find out how professionals in the STEM fields are researching and developing medicines and vaccines to help address these challenges and improve animal health.

The Virtual Field Trip will highlight a variety of skills, competencies, and careers necessary to the agriculture industry. These companion activities help engage students prior to and during the Virtual Field Trip, and extend the learning from the Virtual Field Trip to the classroom.

### **Objectives**

Students will be able to

- investigate careers related to agriculture and animal health.
- reflect on the importance of collaboration and learning from success and challenges in the scientific process and in their personal experiences.
- explore how genetics/biotechnology has benefited animal health and society.

### **Materials**

- Copies of OWL chart
- Copies of *Applying Your Knowledge and Skills to Careers in Agriculture* capture sheet
- Copies of *Personal Reflection Graphic Organizer*
- Copies of *Genetic Selection Graphic Organizer*

- A computer with access to the Internet
- A projector and screen

## **Engage**

1. Begin class by handing each student a copy of the OWL (Observe, Wonder, Learn) chart.
2. Show the [Zoetis introductory video \(2 minutes\)](#).
3. Ask students to complete the **Observe** column of the OWL chart in which they explain what they learned as a result of watching the introductory video. Randomly call on students to share their responses with the rest of the class.
4. Next, ask students to complete the final two (**Wonder and Learn**) columns of the OWL chart and call on students to share out what they have written using equitable calling strategies.
5. Introduce students to the Virtual Field Trip by highlighting the following key points:
  - A passion for animals inspires discovery, education, and STEM-related career paths.
  - Scientists, researchers, veterinarians, and engineers can make major contributions by developing technologies that contribute to healthy animals and a safe food supply.
  - Professionals involved in advanced manufacturing processes must be able to identify problems, create solutions, think critically, collaborate, work toward a common goal, communicate effectively, and apply new technologies and skills.

## **During the Virtual Field Trip**

1. Distribute the **Applying Your Knowledge and Skills to Careers in Agriculture** capture sheet to students.
2. Guide students to brainstorm their personal talents and interests and write them on the capture sheet. Then, direct students to watch the AgExplorer and Zoetis Virtual Field Trip. While they watch, students should look to match some of their talents and interests with the careers featured in the presentation.

## **After the Virtual Field Trip**

*Two activity options are available for students to apply and summarize their learning*

### **Activity #1 (Personal Reflection)**

In segment 2 of the Virtual Field Trip, students heard from the Executive Director of Animal Genetics. The Director explained that science is not just about successful inventions. Scientists experience failure all the time and all of the failures act as real

building blocks of invention because they ultimately lead to new discoveries. Failure is a part of the experimental process and learning from failure helps one make improvements in their work. Now, students will reflect on their own experiences.

Ask students to think of a time in their life when they experienced a setback or failure and have them describe an important lesson that they learned from it. What new discovery did they make after experiencing this setback or failure? Distribute the **Personal Reflection Graphic Organizer** for students to organize their ideas. Once completed, invite students to share out their experiences with a peer. Guide them to use the following sentence starters during their discussion:

Scientists are not always successful with an experiment the first time, just like you overcame the challenge of . . . .

Scientists learn from their mistakes, just like how you learned . . .

### **Activity #2 (Genetic Selection)**

As students learned in the Virtual Field Trip, farmers have, for centuries, bred for specific traits in their animals and plants. Today, genetic tests help farmers make genetic predictions in beef and dairy cattle to select animals with desirable production and health traits. This allows us to accelerate and improve animal selection decisions that have been made for decades. In this activity, students will research and summarize various ways that scientists and farmers improve the health of animals.

Distribute the **Genetic Selection Graphic Organizer** to students. Ask students to differentiate between a companion animal and farm animal. Then, invite students to select three animals to research; 1 companion animal and 2 farm animals.

Companion animals include dogs, cats, and horses. We keep them healthy with products and services designed for their needs.

Farm animals include pigs and cattle. We support them by keeping them well-nourished and healthy to increase productivity to accommodate our growing global population.

Guide students to complete the graphic organizer. Students will make connections to how different products and services designed for animals are similar to the care we receive as humans. They will then summarize their learning using the reflective questions that focus on the type of animal, animal health product, and benefits to the animal. Useful information on these topics is available at the following website:

<https://www.zoetis.com/>

Students should visit the site and click on the animal species headings at the bottom of the home page to search for the relevant information.

## **HS National Standards**

### **Common Core State Standards Connections: ELA/Literacy**

WHST.9-12.5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

### **Next Generation Science Standards**

LS1. A Structure and Function

All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells.

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level.

### **Agriculture Food and Natural Resources (AFNR) Standards**

AS.02.01. Demonstrate management techniques that ensure animal welfare.

AS.02.02 Analyze procedures to ensure that animal products are safe for consumption (e.g., use in food system, etc.).

Name \_\_\_\_\_

Date \_\_\_\_\_

### OWL CHART

<b>OBSERVE</b> What did you learn as a result of watching the introductory video? (List at least 5 items)	<b>WONDER</b> What question(s) do you hope to answer at the end of the virtual field trip? (List at least 3 questions)	<b>LEARN</b> What topics do you want to learn about during the virtual field trip? (List at least 3 topics)

Name \_\_\_\_\_

Date \_\_\_\_\_

## Applying Your Knowledge and Skills to Careers in Agriculture

### Capture Sheet

(To be completed during the virtual field trip)

Many careers in agriculture involve developing technologies that contribute to healthy animals and a safe food supply. The demands of a growing population are resulting in strong job opportunities in this area. Your interests, abilities, and goals all influence your career choices.

The STEM professionals you will hear from during the virtual field trip will mention many talents, skills, interests, and hobbies that drew them to their work. **Listen out for any that you share with them and list them below.**

While watching the AgExplorer and Zoetis Virtual Field Trip, complete the table below:

List <b>two</b> skills or interests each professional highlighted as being critical to their work.	
<b>Executive Director of Animal Research</b>	
<b>Executive Director of Animal Genetics</b>	
<b>Director of Global Diagnostics</b>	
<b>Site Leader for Pharmaceutical Manufacturing</b>	

Now, match some of your talents and interests to each career highlighted.

What are your talents and skills? List three to five.

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What are interests or hobbies you enjoy? List three to five.

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List two careers from the Virtual Field Trip that are most interesting to you based on your skills and interests.

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Why is it important to a company like Zoetis or other agricultural companies to have a diverse group of careers and employees?

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Scenario: Pretend that you have to convince your English class that careers in agriculture reach far beyond a farmer or rancher. What are three key points you would share based on the information learned during the VFT.

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## Personal Reflection Graphic Organizer

Scientists experience failure all the time and all of the failures act as real building blocks of invention because they ultimately lead to new discoveries. Failure is a part of the experimental process and learning from failure helps one make improvements in their work. Think of a time in your life when you experienced a setback or failure and describe an important lesson you learned from it. What new discovery did you make after experiencing this setback or failure?

**Directions:** Use the chart below to plan your personal reflection essay describing a setback or failure you encountered and what new discovery you made from this experience.

### Introduction

#### Body Paragraph 1 –

*Describe a time you experienced a setback.*

#### Body Paragraph 2 –

*What lesson(s) did you learn from this experience?*

#### Body Paragraph 3 –

*How do you apply these lessons to your life now?*

### Conclusion

## Genetic Selection Graphic Organizer

Genetic tests help farmers make genetic predictions in beef and dairy cattle to select animals with desirable production and health traits. This allows us to accelerate and improve animal selection decisions that have been made for decades. In this activity, you will research and summarize various ways that scientists and farmers improve the health of animals and make a connection to how this is similar to the care we receive as humans.

**Directions:** Complete the chart using the **animal species headings** at the bottom of the home page and then answer the questions below.

Companion animals include cats, dogs, and horses

Farm animals include beef cattle, dairy cattle, fish, pigs, poultry, and sheep

Visit: <https://www.zoetis.com/>

Species of Animal	Animal Health Product	2 Benefits to Animal (include at least one body system targeted)	How is this similar to human care? (list at least one example)
Companion animal: _____			
Farm animal: _____			
Farm animal: _____			

What benefits to society come from treating animals with these health products? (Hint: View the “Responsibility” link on the Zoetis web site for guidance.)

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In your opinion, why is it our responsibility to protect: 1) farm animal health and 2) companion animal health?

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