NEW HORIZONS

SUMMER 2020 TEACHING GUIDE



IN THIS GUIDE, YOU WILL FIND ACTIVITIES FOR SIX ARTICLES IN THE SUMMER ISSUE OF FFA NEW HORIZONS. WORKSHEET ANSWER KEYS CAN BE FOUND AT THE END OF THE ACTIVITY WORKSHEET. THE ACTIVITIES ARE ALIGNED TO EDUCATIONAL STANDARDS. (SEE EACH ACTIVITY FOR THE SPECIFIC STANDARDS.)

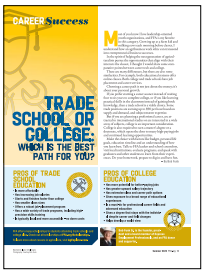
SCHOLARS SAY...

A compiled list of discipline-specific or academic vocabulary found throughout this issue of FFA New Horizons:

College
Robust
Trade school
Trajectory
Devastating
Disinfectant
Seamless
Bedrock
Eluviation
Granite
Horizon
Humus
Illuviation
Limestone
Organic material
Parent material
Profile
Sandstone
Subsoil
Topsoil
Silo
Entrapment
Fatalities
Stressors
Authentic
Colonized
Primitive
Intermediate
Aquaculture
Ecosystem
Hydroponics
Microscopy
Algae
Protocols
Ohana
Advocate
Automation
Variable-rate application
Coding
Troubleshooting
Perseverance
Variables

VOCABULARY ACTIVITY

Select ten vocabulary words and write a story using those words.



Trade School or College: Which Is the Best Path for You?

When deciding what path to travel after high school, there is no one set direction for everyone. Identify the pros and cons of a college education and a trade school education to determine which path may best suit your skills and career plans.

Appendix 1: Trade School or College: Which Is the Best Path for You?



Shelter From the Storm

What would happen to the animals in your community if a disaster were to hit? In this article, find out how FFA members are helping to plan for disaster.

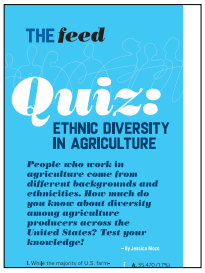
Appendix 2: Shelter From the Storm



Ag 101: Soil Horizons

To some, soil is just the material we walk and drive on. But to others, soil is a dynamic accumulation of layers that plays a large role in our lives.

Appendix 3: Soil



Big Screen on Middle America

Read this article to learn how a feature film, Silo, highlights the importance of agriculture safety.

Appendix 4 - Big Screen on Middle America



One Big Ohana:

Read this article to learn about the ecosystem and history of Hawaii and to discover what FFA activities and SAEs are like in the Hawaii FFA Association.

Appendix 5 - One Big Ohana



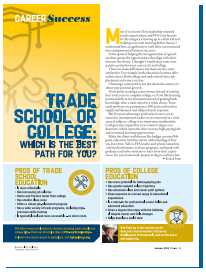
High-Tech Gardening

Read this article to learn how FFA members in Oregon are learning about FarmBot and putting it to use in their school greenhouse.

Appendix 6: High-Tech Gardening

NEW HORIZONS

SUMMER 2020 TEACHING GUIDE



ARTICLE SUMMARY

Trade School or College: Which Is the Best Path for You?

When deciding what path to travel after high school, there is no one set direction for everyone. Identify the pros and cons of a college education and a trade school education to determine which path may best suit your skills and career plans.

BELL RINGER:

In your own words, what is the difference between a trade school and a college? Is one better than another? Why or why not?

DISCUSSION QUESTIONS

1. What are the pros and cons of a trade school education?
2. What are the pros and cons of a college education?
3. What careers can you acquire after graduating from a trade school or a college?

ACTIVITY

Part 1: On their own paper, have students complete the bell ringer. Have students share their answers. Discuss why students have these beliefs. Next, hand out the worksheet "Trade School or College: Which Is the Best Path for You?" and read the article "Trade School or College: Which Is the Best Path for You?" in the summer issue of FFA New Horizons. Once all students have finished reading, set a timer for two minutes. In the first box on the worksheet, have students list as many careers as they can during the two minutes. After the two minutes have concluded, have students circle each career that would come from a trade school education in green and each career that would come from a college education in purple. Students may need to complete some research to determine the correct color to use. Once they have finished circling, have students identify and reflect (on their worksheet) which type of education was most common in their career list and why they think that is. Have a discussion with students about their thoughts. Have students identify two pros each for a college education and a trade school education and explain why these facts are positives. Have students share and discuss.

Part 2: Using AgEplorer.com, have students find two careers that they could be interested in — one that goes through a college education pathway and one that goes through a trade school pathway to employment. Students will create a job post for each using the template. When students have completed their job posts, have them hang them around the room and then walk around to look at all the different careers possible.

Part 3: In the space provided in the worksheet, have students draw a large outline of the state they live in. By using their resources online or their guidance counselor, have students research the various trade schools and colleges that exist in their state. On the map they drew, have students draw in the logo/mascot of each school and label it with a T for trade school or a C for college. Be sure to have students write the school name and the city where it is located.

FFA TIP

Invite former FFA members in to talk about their school choice, how they decided on a school and what impact it had on their career.

SAE TIP

Help students explore and conduct SAEs in their career interest area rather than an obvious opportunity available to them that is not related to their career interests. A student who lives on a dairy farm does not have to have a dairy cattle SAE if their career interest is software engineering. Challenge students to explore what other careers use the skills they learn in their SAEs.

VOCABULARY

College
Robust
Trade school
Trajectory

EXIT TICKET

Why is it important to be honest with yourself and evaluate your personal educational needs without thinking about what your friends are doing?

CAREER FOCUS AREA

Any

RELATABLE LINKS

College Search, https://FFA.box.com/v/collegesearch

"Power Up" Your Future With John Deere, https://FFA.box.com/v/powerup-future

RESOURCE HIGHLIGHT

Floriculture CDE

REFERENCES

AgExplorer: AgExplorer.FFA.org

APPENDICIES

Appendix 1: Trade School or College: Which Is the Best Path for You?

STANDARDS ALIGNMENT

• **AFNR Performance Element:** CS.05 • **FFA Precepts:** FFA.PL-A, FFA.PL-C, FFA.PL-F, FFA.CS-N • **Common Career Technical Core:** AG5 • **NASDCTEc – State Directors (Career Clusters)** AGC09.02 • **AFNR Career Ready Practices:** CRP.02, CRP.11 • **P21 Skills:** COMMUNICATION, INITIATIVE AND SELF-DIRECTION, LEADERSHIP AND RESPONSIBILITY

CAREER *Success*

TRADE SCHOOL OR COLLEGE: WHICH IS THE BEST PATH FOR YOU?

Most of you know I love leadership-oriented youth organizations, and FFA is my favorite in this category. Growing up as a farm kid and milking cows each morning before classes, I understand how an agribusiness work ethic can transcend into entrepreneurial business successes.

In the spirit of helping the next generation of agriculturalists pursue the opportunities that align with their interests the closest, I thought I would share some comparative points between career tech and college.

There are many differences, but there are also some similarities. For example, both educational systems offer online classes. Both college and trade schools have job placement and career services.

Choosing a career path is not just about the money; it's about your personal growth.

If you prefer starting a career sooner instead of waiting four to six years to complete college, or if you like learning practical skills in the classroom instead of gaining book knowledge, then a trade school is a viable choice. Some trade positions are earning up to $90 per hour based on supply and demand, and subject-matter expertise.

But if you are planning a professional career, are attracted to international studies or are interested in a wide array of subjects, college is an important consideration. College is also required to earn a master's degree or a doctorate, which opens the door to many high-paying jobs and continued learning opportunities.

Make the choice with factors like budget, personal life goals, education timeline and an understanding of how you learn best. Talk to FFA leaders and school counselors, visit local institutions, evaluate programs, and speak with graduates and other students to learn from their experiences. Do your homework, prepare to dig in and have fun.

– By Bob Funk

PROS OF TRADE SCHOOL EDUCATION



- Is more affordable
- Has increasing job salaries
- Starts and finishes faster than college
- Has smaller class sizes
- Offers a robust job-placement program
- Has a wide variety of trade programs, including high-precision skills training
- Is typically local and more accessible – no dorm costs

PROS OF COLLEGE EDUCATION

- Has more potential for better-paying jobs
- Has greater upward salary trajectory
- Has extensive class and career path options
- Gives exposure to a broad range of educational experiences
- Is a must-do for professional career fields and advanced education
- Gives a degree that stays with the individual despite career and field changes
- Helps develop a world view



FFA offers many scholarships to students attending trade schools and college alike. Check out all scholarships at **FFA.org/Scholarships.**

To learn more about careers in agriculture, visit **AgExplorer.com.**



Bob Funk Sr. is the founder, president and a board member of Express Employment Professionals, and an FFA donor and supporter.

Illustrations: iliyast, Getty Images
Photography: Courtesy Bob Funk

NAME: _____

Aligned to the following standards:
CS.05; FFA.PL-A; FFA.PL-C; FFA. PL-F; FFA.CS-N; AG5; AGC09.02; CRP.02; CRP.11

Appendix 1: Trade School or College: Which Is the Best Path for You?



Created: Summer 2020 by the National FFA Organization
Part 1

DIRECTIONS:
Read the article "Trade School or College: Which Is the Best Path for You?" in the summer 2020 issue of *FFA New Horizons* and complete the following activities.

Identify as many careers as you can in two minutes. Go!



After you have finished your two-minute list, circle each career that would come from a trade school education in green and each career that would come from a college education in purple.

Did you list more careers that come from a trade school education or a college education? Why?



What is the difference between a trade school and a four-year college education?

Identify two pros each for a college education and a trade school education.

College Education

1._____
a. Why is this a pro for you?

2._____
a. Why is this a pro for you?

Trade School Education

1._____
b. Why is this a pro for you?

2._____
c. Why is this a pro for you?

NAME: _____

Aligned to the following standards:
CS.05; FFA.PL-A; FFA.PL-C; FFA. PL-F; FFA.CS-N; AG5; AGC09.02; CRP.02; CRP.11

Part 2

DIRECTIONS:

Using AgExplorer.FFA.org, find two careers that you could be interested in — one that goes through a college education pathway and one that goes through a trade school pathway to employment. Create a job post for each using the template below.

Job Title: _____

Job Description:

Job Responsibilities (bulleted list):

Education Required:

Salary:

Image of the career:

Job Title: _____

Job Description:

Job Responsibilities (bulleted list):

Education Required:

Salary:

Image of the career:

NAME: _____

Aligned to the following standards:
CS.05; FFA.PL-A; FFA.PL-C; FFA. PL-F; FFA.CS-N; AG5; AGC09.02; CRP.02; CRP.11

Part 3

DIRECTIONS:

In the space below, draw a large outline of the state you live in. Using your resources online or from your guidance counselor, research the various trade schools and colleges that exist in your state. On the map you drew, draw in the logo/mascot of each school and label it with a T for trade school or a C for college. Be sure to include the school name and the city where it is located.

Why is it important to understand all your options when looking beyond high school?

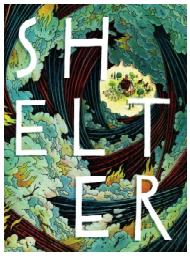
Identify three points that you learned through this lesson.

1.

2.

3.

NEW HORIZONS
SUMMER 2020 TEACHING GUIDE



ARTICLE SUMMARY

Shelter From the Storm

What would happen to the animals in your community if a disaster were to hit? In this article, find out how FFA members are helping to plan for disaster.

BELL RINGER:

What would you do if a disaster hit your community today?

DISCUSSION QUESTIONS

1. How do disasters impact entire communities?
2. What plans should you have for the animals in your community and household?

ACTIVITY

Part 1: Begin by having students read "Shelter From the Storm" in the summer 2020 issue of FFA New Horizons and complete the questions that follow. When students have finished answering questions, hold a discussion with students to discuss their thoughts about the article.

Part 2: Students will use their research skills to develop a disaster plan for their pets or livestock. Once students are finished, have them think-pair-share their plans and make edits and updates based on what they learn from their neighbors. Hold a class discussion about their plans.

Part 3: Lastly, students will develop a disaster plan for their families. Students need to consider all factors they would need in the event of an emergency. Students can use the template provided to plan. Again, have students think-pair-share their plans with their neighbors and make any modifications. Have a discussion with students about what they did and should include in their plans. Have students take their plans home and share them with others in their homes.

FFA TIP

Plan an event to educate the school community about planning for a disaster.

SAE TIP

Many disaster response efforts can be service-learning SAEs for individual students. Carefully review the service-learning SAE definition and the service-learning proficiency award description and think of responsible students who need an SAE.

VOCABULARY

Devastating
Disinfectant
Seamless

EXIT TICKET

What can you do right now to help prepare for a disaster?

CAREER FOCUS AREAS

Animal Systems Career Focus Area

RELATABLE LINK

Preparing for the Worst, https://FFA.box.com/v/preparingfortheworst

APPENDICIES

Appendix 2: Shelter From the Storm

STANDARDS ALIGNMENT

FFA Precept: FFA.PL_A, FFA.PL-E, FFA.PG-J, FFA.CS-N • **Common Core – Reading: Informational Text:** CCSS.ELA.RI.9-10.2, CCSS.ELA.RI-10.4 • **AFNR Career Ready Practices :** CRP.02, CRP.04 • **P21 Skills:** COMMUNICATION, CRITICAL THINKING AND PROBLEM SOLVING, FLEXIBILITY AND ADAPTABILITY, INITIATIVE AND SELF-DIRECTION, LEADERSHIP AND RESPONSIBILITY, THINK CREATIVELY


SHELTER

FROM THE STORM

BY JODI HELMER
ILLUSTRATIONS BY JOHN HENDRIX

FFA CHAPTERS CREATE DISASTER PLANS TO HELP THEIR COMMUNITIES WEATHER DIFFICULT SITUATIONS.

In 1998, Randy Thies got a call from Sarasota County Schools asking if the Sarasota Vo-Ag FFA Chapter at Suncoast Technical College could take care of cats and dogs belonging to first responders during an upcoming hurricane.

The school had no formal disaster plan for animals back then, but Thies, the agriculture teacher and FFA advisor, agreed to provide shelter and care for 35 companion animals. It sparked a tradition of pitching in during disasters.

"When hurricanes come through, there is a huge need for volunteers to come in and help with the animals," Thies explains. "It just continued to grow."

Over the past two decades, Suncoast Technical College has joined a handful of other local schools to turn their campuses into makeshift shelters for animals in need, and the FFA chapter has become an integral part of the disaster response team in Sarasota, Fla. During Hurricane Irma in 2017, FFA members helped care for 1,500 animals sheltered in three county schools.

This community dedication isn't limited to Sarasota. FFA chapters across the country are creating disaster plans to help the animals in their communities during natural disasters, ranging from hurricanes, floods and wildfires to threats to their schools. Their responses are often essential to weathering catastrophic events and rebuilding in the aftermath of a tragedy.





Left: Gridley FFA members create a plan for saving livestock during the 2017 Camp Fire in California. **Above:** Plant City FFA member Elizabeth Beck-Beckler shows her love for animals. **Opposite:** During Hurricane Irma in 2017, community members in Sarasota, Fla., brought their pets to Sarasota Vo-Ag FFA for care.

HOW TO DEVISE A DISASTER RESPONSE PLAN

A successful disaster response plan requires planning, execution and continual review. FFA chapters share their tips for getting it right.

CONSULT WITH EXPERTS. Mission Valley FFA met with a representative from the Department of Homeland Security who provided recommendations for what to include in each run-hide-fight bag. "We did some research and recommendations for disaster kits ranging from a few items to 50 items," recalls Kelly Hoelting, agriculture teacher and FFA advisor. "We really wanted his personal opinion on what would work best for our school."

APPOINT A LEAD CONTACT. Gridley FFA advisor Jenny Kaslin says having one person take the lead on communication helps students and staff know who to contact in a disaster. "Otherwise, everyone's asking people different questions and then information gets tossed around – and it may not be the correct information," she says.

PARTNER WITH LOCAL ORGANIZATIONS. There is strength in numbers. Sarasota Vo-Ag FFA advisor Randy Thies suggests reaching out to local partners to ask how FFA chapters can assist with other disaster response efforts for maximum impact.

STAY PREPARED. In addition to coordinating and participating in regular disaster response drills, Mission Valley FFA officer Will Blythe believes it's important to conduct regular inventories of disaster response aids. He is part of a team who checks all of the run-hide-fight bags and replaces missing or expired items such as flashlight batteries. "When we do an inventory, we can make sure all of the bags have everything they should in case of a disaster," he says.

PREPARING FOR THE WORST

As part of its disaster plan, the Sarasota Vo-Ag FFA Chapter participates in annual trainings that involve disinfecting and setting up kennels to ensure the process is seamless in the event of a hurricane or other natural disaster.

The kennels were harder to set up than students expected, some members admit.

"When there's a hurricane coming, it happens super fast, and it's good to know how to do everything in advance so we can just start loading up and getting ready and automatically know what to do," says FFA member Whitney Langdon. "We want everything to be perfect."

Members also received training through the American Red Cross and the Florida State Animal Response Coalition, a nonprofit organization that trains volunteers to save and protect companion animals during natural and manmade disasters. The training mirrors the lessons Thies teaches in the veterinary assisting class.

"A lot of students love animals and want to go on and be veterinarians or work in animal care facilities," Thies says. "Getting the background of helping animals and communities when a storm comes is good for them."

Learning how to set up a shelter, properly clean and disinfect cages, recognize signs of illness and distress, and care for and feed animals prepared member Cami Golden to deal with unfamiliar and frightened animals during a hurricane or other natural disasters.

It also provided valuable insight about the career possibilities. It was "a good training opportunity to help us get a good baseline idea of what it would be like to handle animals in our careers," she says.

In 2019, after Hurricane Dorian battered Plant City, Fla., Aniyah Betancourt, Kylie Harris, Yarel Santiago, Matthew Ayuso and other members of the Plant City FFA Chapter

decided it was time to prepare for the next disaster. The chapter focused on making sure local animals were safe.

"We tend to have a lot of storms in Florida; it's just a part of living here," Harris says. "Hurricane season can be devastating to some of us, and a lot of people don't stop to think that animals are also affected by this storm."

The chapter recently received an FFA Day of Service Mini Grant to host a disaster-relief drive to collect pet supplies. Its goal is to gather food, blankets, paper towels and other necessities to create relief kits that will be donated to two local shelters later this year, according to Cassie Miles, agriscience instructor and FFA advisor.

PARTNERING TO PROTECT ANIMALS

In 2017, after the Oroville Dam was damaged and members of the small town of Oroville, Calif., were forced to evacuate, the Gridley FFA Chapter realized it was time to create a plan for saving livestock in the event of a disaster. Its disaster plan proved invaluable when the Camp Fire, the deadliest and most destructive fire in California history, devastated local communities in 2018.

"When towns close to us started evacuating, our fairgrounds became the evacuation center for animals," recalls agriculture teacher and FFA advisor Jenny Kaslin. "We messaged our students through Facebook and Instagram that it was time to put the disaster plan into action, and we needed help setting up panels and pens."

Chapter president Zane Young was one of the students who drove livestock trailers into danger zones to move horses, sheep, goats, pigs and chickens to the rescue site at the fairgrounds.

Once the animals were settled at the fairgrounds, FFA members set up a feeding schedule and reached out to other chapters to take turns providing food and water to the rescued animals.

"Our plan through this was to divide the tasks. We had a group of people just unloading truckloads of donations; groups moving animals; groups setting up food and water; and groups doing first aid," Young recalls. "It was good to have a plan in place to avoid chaos and good for people to see FFA kids coming through, to know that there is an organization that is ready to serve its community and help everyone get through a disaster. Without a plan, that wouldn't happen." •





PREPARING FOR A DIFFERENT KIND OF DISASTER

In 2016, Mission Valley High School in Eskridge, Kan., received an FFA Living to Serve Grant to create disaster kits for each of its classrooms. The run-hide-fight bags contain items that could be used if an intruder comes into the school, including a first aid kit, flashlights, duct tape and wasp spray (which has a longer spray radius than pepper spray). The FFA chapter also put together tornado kits.

"Our FFA chapter is one of the largest organizations in our school," explains chapter officer Grace Deters. "We really felt that we needed to take initiative."

NAME: _____

Aligned to the following standards:
FFA.PL-A; FFA.PL-E; FFA.PG-J; FFA.CS-N; CCSS.ELA.RI.9-10.2; CCSS.ELA.RI.9-10.4; CRP.02; CRP.04

Appendix 2: Shelter From the Storm

Created: Summer 2020 by the National FFA Organization

Part 1

DIRECTIONS:

Read "Shelter from the Storm" in the summer 2020 issue of *FFA New Horizons* and complete the following activities.

In what year did Sarasota County Schools first get asked to help care for animals during an upcoming hurricane?

a. 1997
b. 1998
c. 1999
d. 2017



How many animals did the Sarasota County Schools agree to help in their first year?

a. 30
b. 35
c. 40
d. 1,500

Why is it important that that the Sarasota VoAg FFA Chapter participate in annual training?



Identify three skills that students learned through this experience that helped them prepare for future careers.

What did the Plant City FFA Chapter receive that helped them in their project efforts?

a. Day of Service Grant
b. FFA Day of Service Mini Grant
c. Grant for Growing
d. American Red Cross grant



What impact do these types of community events have on those in the local area?



NAME: _____

Part 2

DIRECTIONS:

Disaster can happen anywhere, and being prepared is crucial. Using your research skills, develop a disaster plan for your pet(s) or livestock (or a pet you would like to have).

Animal Species: _____ **Animal Name:** _____

Animal Veterinarian (name/number): _____

Unique identification characteristics: _____

- How much/what kind of food do you need to have? (Hint: Estimate 3 days)
- Medicine? (circle one) Yes No Med name? _____ Dosage: _____
- First aid kit supplies you could need:
- Crate, pet carrier, restraint needed?
- Sanitation: What do you need? (ex. bleach, litter box, etc.)
- Familiar items? (ex. favorite blanket, toy, etc.)
- Insert a picture of you and your animal in case you get separated.

What other steps can you take to make sure you are prepared in the event of a disaster?

NAME: _____

Part 3

DIRECTIONS:

Not only do we need our pets to be safe, but we also need to be safe in the event of a disaster. Develop a disaster plan for your family.

My Family Disaster Plan at a Glance

1. How are you going to receive emergency alerts and warnings? What if you do not have cell service?

2. Where is the best place in your home to shelter? Why?

3. What supplies do you need to have ready in your shelter location? Consider health needs, food/water needs, etc.

4. How can you safely evacuate your property? Draw a map below.

Why is it important to have a disaster plan in place?

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SUMMER 2020 TEACHING GUIDE



ARTICLE SUMMARY

Ag 101: Soil Horizons

To some, soil is just the material we walk and drive on. But to others, soil is a dynamic accumulation of layers that plays a large role in our lives.

BELL RINGER:

How has soil impacted you today?

DISCUSSION QUESTIONS

1. What role does soil play in our day-to-day lives?
2. What impact does soil have on our food system?

ACTIVITY

Part 1: Pass out the worksheet "Soil." Have students read the "Ag 101: Soil Horizons" article in the summer issue of FFA New Horizons and complete the soil profile and questions that follow. Hold a discussion about what they just read. Follow up by showing the video "Royal Soil Rap," https://youtu.be/HxqiRAdiGCw.

Part 2: Have students think about each basic horizon of a soil profile. They will create their own soil profile using everyday items that fall into the same category. For example, if the everyday item was candy, each horizon of the soil profile would be a different type of candy. Have students use the following parameters for their picture: (1) Select a category of everyday item you would like to use (Ex. candy). (2) Draw a soil profile using different items from that category to develop each layer of the profile (Ex. Starburst for bedrock). Be sure to select items from your category that match the color, look and texture of the actual soil profile horizons. (3) Label each horizon with the representative letter and name (Ex. O layer = organic material). When students are done, have them stand up and share their profile with the class. Hang the finished profiles up in the room to serve as a reminder of the different layers of a soil profile.

Part 3: Next, students will put together a physical representation of what a soil profile looks like using food. (Note: Check allergies in your class and substitute where needed.) In this lab, students will follow along to complete the chart and then color and draw in the cup outline on their worksheet. Follow the instructions on the "Teacher Lab Sheet" to prepare materials and guide yourself through this lab.

Part 4: Lastly, students will find out what the soil profile looks like in their area. Using the following resource from UC Davis, https://casoilresource.lawr.ucdavis.edu/gmap/, students will find their home and school on the map by using the "menu" button in the top left corner. Once they have found these two points on the map, have students answer the questions using the content in the left side bar. NOTE: Students must click on a specific spot and drop a red dot to have specific information populate in the side bar. When finished, have students discuss their findings with the class.

FFA TIP

Have students take what they have learned and consider competing in the local soil or land judging events.

SAE TIP

Challenge students to identify as many careers as possible related to soil, both agricultural and non-agricultural. Ask them to describe how knowledge of soil and soil science relate to the careers they name.

VOCABULARY

Bedrock
Eluviation
Granite
Horizon
Humus
Illuviation
Limestone
Organic material
Parent material
Profile
Sandstone
Subsoil
Topsoil

EXIT TICKET

Take a class trip outside and pull plugs with a soil probe from around the school. Discuss the different soils found and why they vary. Have students draw what they see and try to label the different layers.

CAREER FOCUS AREAS

Environmental Service Systems

Natural Resources Systems

Plant Systems

RELATABLE LINK

Syngenta: Why Is Soil So Important, https://FFA.box.com/v/whyissoilsoimportant

The Effects of Soil Quality on Animal Life

The Effects of Soil Erosion on Soil Profiles

REFERENCES

Royal Soil Rap: https://youtu.be/HxqiRAdiGCw

Soil4Kids, Soil Science Society of America: https://www.soils4kids.org/

UC Davis Soil Resource: https://casoilresource.lawr.ucdavis.edu/gmap/

APPENDICIES

Appendix 3: Soil

STANDARDS ALIGNMENT

FFA Precept: FFA.PL-A, FFA.CS-N, FFA.PL-F • **Common Core – Reading: Informational Text:** CCSS.RI.9-10.2, CCSS.RI.9-10.4 • **AFNR Career Ready Practices:** CRP.02, CRP.04, CRP.06, CRP.08 • **P21 Skills:** CRITICAL THINKING AND PROBLEM SOLVING, INITIATIVE AND SELF-DIRECTION, LEADERSHIP AND RESPONSIBILITY, THINK CREATIVELY

AG 101

SOIL HORIZONS

Six FFA experts tell us what's up with the layers of soil under our feet.



O HORIZON

The O horizon is typically at the top of the soil structure and is made up of mostly organic matter. This organic matter is vital to the growth of crops and other plants because it holds nutrients such as carbon, phosphorus, nitrogen and sulfur. The O horizon is formed over a process of hundreds of years from organic materials that slowly decompose. The O horizon also serves to absorb water and build soil structure.

– Ryan McMurray, Moapa Valley FFA

A HORIZON

Most commonly called topsoil, the A horizon is a layer of mineral soil that has a defined soil structure, and it is mostly made up of humus (decayed organic matter). The A horizon may be a result of soil disturbance by plant and animal activity. It is one of the layers we test for texture in the soils contest.

– Lacey Jones, Virgin Valley FFA

E HORIZON

The E horizon is a zone of eluviation, where organic matter, clay or both have washed out of the layer, usually giving it a lighter color and making it feel ashy or chalky to the touch. The texture is generally similar to the horizon above it but lower in clay content than the horizon below. The E horizon is not present in all soil profiles and can be found on sites with a high temporary water table or forest soils.

– Lilly Cook, North Shelby FFA



OUR SOIL SAVVY AUTHORS

MEET OUR EXPERTS. These six FFA members have successfully competed in soil judging career development events (CDEs) and share their soil horizon expertise for this graphic.

RYAN McMURRAY is the president of the Moapa Valley FFA Chapter in Nevada. He has been on his chapter's soil judging and homesite evaluation teams for four years and has led the teams as a CDE chair for the past three years. He has been the state high individual for both events multiple times.

LACEY JONES is a member of the Virgin Valley FFA Chapter in Mesquite, Nev. She has been on the chapter's soil judging team and competed in the state soil judging contest for the last two years. Jones is also a member of the school's flag football, track and cross-country teams.

LILLY COOK is the chapter reporter at North Shelby High School in Missouri. She was a member of the first-place Missouri State FFA Soils CDE team last year, and she placed second individually. Outside of FFA, Cook plays basketball and softball, and she is an active member of NHS, FCCLA and student council. Her supervised agricultural experience (SAE) is growing sweet corn.

NOAH ILES of the Higginsville FFA Chapter in Missouri developed strong critical thinking and problem-solving skills through his involvement in the soil judging CDE. Many of his favorite high school memories were made traveling to soil judging competitions with friends. His success has sparked an interest in pursuing a degree in natural resources.

TRAVIS BUCKLER has been a member of the Princeton FFA in Texas for three years. He raises calves with his family on their 680-acre farm, and his SAE is beef production. His favorite CDE event is soil judging, and his favorite chapter activity is the FFA Week Dodgeball Tournament.

MACKENZIE KEPHART currently serves as the Nevada FFA southern zone president. She has been on the winning Nevada FFA Soils CDE for two years and has attended various national FFA events and competed in livestock evaluation at the national level. Kephart will pursue a degree in livestock genetics and nutrition at Montana State University in the fall of 2020.

Illustration: John Hendrix

NAME: _____

Aligned to the following standards:
FFA.PL-A; FFA.CS-N; FFA.PL-F; CCSS.RI.9-10.2; CCSS.ELA. RI.9-10.4; CRP.02; CRP.04; CRP.06; CRP.08

Appendix 3: Soil

Created: Summer 2020 by the National FFA Organization
Part 1

DIRECTIONS:
Read "Ag 101: Soil Horizons" in the summer 2020 issue of *FFA New Horizons* and complete the following activities.



Image from Soils4Kids from the Soil Science Society of America.

Letter	Horizon Name	Short, one- to five-word description
____	_____	_____
____	_____	_____
____	_____	_____
____	_____	_____
____	_____	_____
____	_____	_____

Why is it important to understand soil?





Identify two ways soil has impacted you today.

1. _____

2. _____

NAME: _____

Aligned to the following standards:
FFA.PL-A; FFA.CS-N; FFA.PL-F; CCSS.RI.9-10.2; CCSS.ELA. RI.9-10.4; CRP.02; CRP.04; CRP.06; CRP.08

Part 2

DIRECTIONS:

While thinking about each basic horizon of a soil profile, you are going to create your own soil profile using everyday items that could represent each horizon.

1. Select a category of everyday item you would like to use. (Example: candy)
2. Draw a soil profile and use different items from that category to develop each layer of the profile. (Example: Oreo cookies for bedrock) Be sure to select items from your category that match the color, look and texture of the actual soil profile horizons.
3. Label each horizon with the representative letter and name. (Example: O layer = organic material)

Category Selected:
_____

Letter: _____ Name: _____	
Letter: _____ Name: _____	
Letter: _____ Name: _____	
Letter: _____ Name: _____	
Letter: _____ Name: _____	
Letter: _____ Name: _____	

NAME: _____

Aligned to the following standards:
FFA.PL-A; FFA.CS-N; FFA.PL-F; CCSS.RI.9-10.2; CCSS.ELA. RI.9-10.4; CRP.02; CRP.04; CRP.06; CRP.08

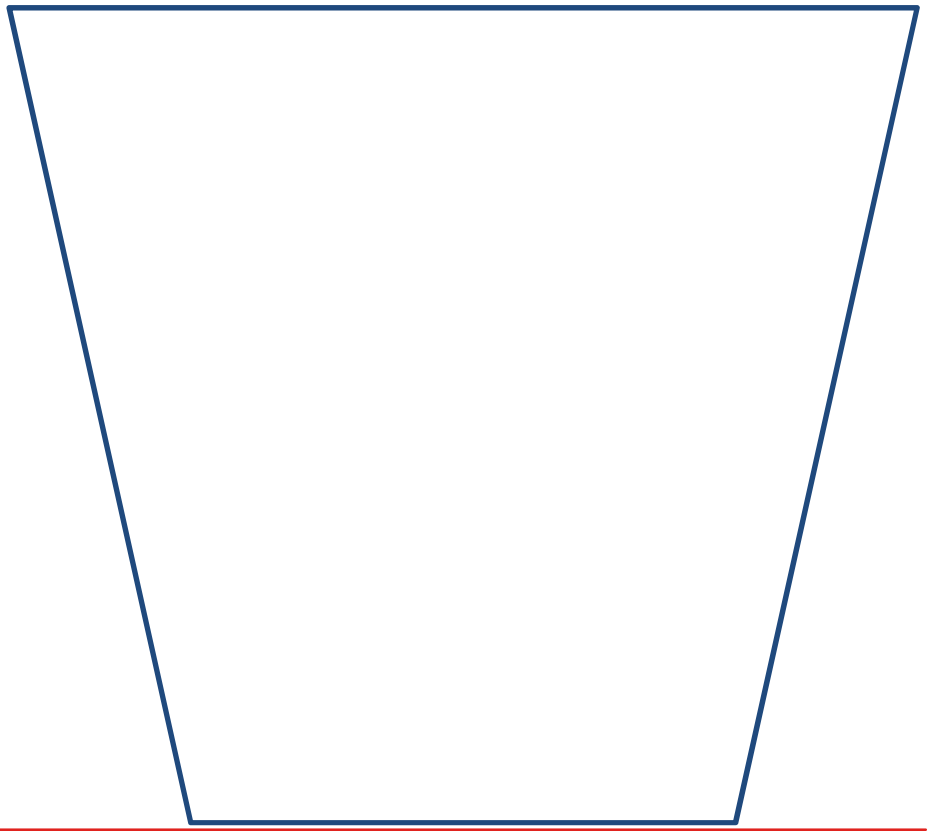
Part 3

DIRECTIONS:

Now let's put together a physical representation of what soil profile looks like! In this lab, you will follow along with your teacher and complete the chart below. During this time, you will be adding items to a cup you have been provided by your teacher. In the cup diagram at the bottom of this page, draw and color the items being added. Be sure to label the cup with the letter and horizon as you go. To complete the conclusion questions, refer to the "Ag 101: Soil Horizons" article in the summer 2020 issue of *FFA New Horizons*.

Horizon Letter and Name	Represented by	Description of Appearance

Your Soil Profile Cup



NAME: _____

1. Which horizon of the soil would be the richest in nutrients for plant growth?

_____

Why?



2. Which horizon of the soil do we test for the texture in a soil judging competition?

_____



3. The E horizon is not always represented in all soil profiles. In what type of site would an E horizon be found?

a. _____

b. _____

4. Which horizon is known as the zone of accumulation?

_____

Why?



5. What is the leaching process in horizon B called?

_____

6. Which layer is most likely to be caused by disturbance from plants or animals?

_____

Why?

7. What is the deepest horizon in the soil pit before the bedrock?

_____



8. The bedrock layer is commonly made up of what materials?

a. _____

b. _____

c. _____

9. Using AgExplorer.FFA.org, identify 3 careers in which having background knowledge in soil science would be extremely important.

a. _____

b. _____

c. _____

NAME: _____

Aligned to the following standards:
FFA.PL-A; FFA.CS-N; FFA.PL-F; CCSS.RI.9-10.2; CCSS.ELA. RI.9-10.4; CRP.02; CRP.04; CRP.06; CRP.08

Part 4

DIRECTIONS:

Now let's find out what the soil profile looks like in your area. Using the following resource from UC Davis, https://casoilresource.lawr.ucdavis.edu/gmap/, find your home and school on the map by using the "menu" button in the top left corner. Once you have found these two points on the map, answer the following questions using the content in the left side bar. NOTE: You must click on a specific spot and drop a red dot to have specific information populate in the side bar.

Home

1. Click on "map composition." What types of soils are present?

2. Looking at each of these types of soils, what conclusions can you draw about the soil where your home is located?

3. Select one of the soil types present and identify the taxonomic order.
   _____

4. Draw the soil profile.

School

1. Click on "map composition." What types of soils are present?

2. Looking at each of these types of soils, what conclusions can you draw about the soil where your home is located?

3. Select one of the soil types present and identify the taxonomic order.
   _____

4. Draw the soil profile.

How can understanding the soil in your local area help you in the future?

NAME: _____

Aligned to the following standards:
FFA.PL-A; FFA.CS-N; FFA.PL-F; CCSS.RI.9-10.2; CCSS.ELA. RI.9-10.4; CRP.02; CRP.04; CRP.06; CRP.08

Teacher Lab Sheet

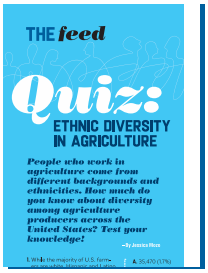
DIRECTIONS:

In this lab, students will use food to create their own soil profiles.

Supplies Needed:

- Clear plastic cups (1 per student)
- Plastic spoons (1 per student)
- Organic material (O): coconut colored green (if you have coconut allergies, sprinkles can be used instead)
- Topsoil (A): chocolate pudding (works well in the individual cups)
- Subsoil (B): vanilla pudding (works well in the individual cups)
- Parent Material (C): Crushed vanilla wafers
- Bedrock (R): Partially broken Oreos
- Optional: gummy worm (1 per student)

1. Prior to the beginning of class, have all materials purchased and prepared. Hide the materials so students cannot see them as they enter the class.
2. Hand out plastic cups and spoons to each student.
3. Tell students you are going to start from the bottom of the soil profile and work your way up. *Who can tell me which horizon is the deepest?* The answer would be the R horizon, or bedrock. *Who can tell me what everyday items would be a good representation for the bedrock layer?* Answers may include anything that could "resemble" a bedrock layer. *Today, we are going to use Oreos.* Walk around the classroom and place some Oreos in the bottom of each student's cup. During their wait or once they have received their Oreos, they should add the layer to their charts and draw the Oreos in their cups.
4. *Who can tell me which horizon is on top of the bedrock?* The answer would be the C horizon, or parent material. *Who can tell me what everyday items would be a good representation for the C horizon?* Answers may include anything that could "resemble" the C horizon. *Today, we are going to use crushed vanilla wafers.* Walk around the classroom and place some crushed vanilla wafers in each student's cup. During their wait or once they have received their crushed vanilla wafers, they should add the layer to their charts and draw the crushed vanilla wafers in their cups.
5. *Who can tell me which horizon is on top of the C horizon?* The answer would be the B horizon, or subsoil. *Who can tell me what everyday items would be a good representation for the B horizon?* Answers may include anything that could "resemble" the subsoil. *Today, we are going to use vanilla pudding.* Walk around the classroom and place some vanilla pudding into each student's cup. During their wait or once they have received their vanilla pudding, they should add the layer to their charts and draw the vanilla pudding in their cups.
6. *Who can tell me which horizon is on top of the E horizon?* The answer would be the A horizon, or topsoil. *Who can tell me what everyday items would be a good representation for the topsoil?* Answers may include anything that could "resemble" the topsoil. *Today, we are going to use chocolate pudding.* Walk around the classroom and place chocolate pudding in each student's cup. During their wait or once they have received their chocolate pudding, they should add the layer to their charts and draw the chocolate pudding in their cups.
7. *Who can tell me which horizon is on top of the A horizon?* The answer would be the O horizon, or organic material. *Who can tell me what everyday items would be a good representation for the organic material?* Answers may include anything that could "resemble" the organic material. *Today, we are going to use green coconut.* Walk around the classroom and sprinkle green coconut into each student's cup. During their wait or once they have received their green coconut, they should add the layer to their charts and draw the green coconut in their cups.
8. Next, you can walk around and add a gummy worm to each student's cup. *Why do we need worms in the soil?* Answers should include aeration, nutrition, etc. Discuss how organisms in the soil help to benefit the overall soil composition and can help with plant growth.
9. Once students finish their charts and pictures, have students answer the questions on the final page. At this time, students can consume their soil profiles. While they finish working, play the following song in the background: https://youtu.be/gx2wVHeiTKE.
10. Have students clean up and turn in their activity sheets.



ARTICLE SUMMARY

Big Screen on Middle America

Read this article to learn how a feature film, Silo, highlights the importance of agriculture safety.

BELL RINGER:

What are two or three general safety requirements in the agriculture industry?

DISCUSSION QUESTIONS

1. What are at least two safety requirements that you observe each day without realizing it?
2. Why is safety important?
3. In your daily routines, what is something that could be done to improve safety?

ACTIVITY

Part 1: On their own paper, have students complete the bell ringer and then share their answers. Next, pass out the worksheet "Big Screen on Middle America" to each student, and have students read "Big Screen on Middle America" in the summer issue of FFA New Horizons and complete the worksheet.

Part 2: Students will utilize this website, https://nasdonline.org/static_content/documents/7156/d002403.pdf, to learn more about grain bin safety.

Part 3: In this activity, students will plan and record a 30-second PSA (public service announcement) about grain bin safety. The students will determine an introduction, middle portion and closing portion for their message. Students will illustrate and write out their message for each portion on the appropriate spaces on the worksheet.

Part 4: Students will take what they have learned throughout the lesson and will work with a partner to create a mini lesson about grain bin safety for elementary students. Students will follow the steps on the worksheet to create the lesson. The lesson should last approximately 20 minutes. Students will determine an introduction, a middle portion of the lesson (with activity) and the end of the lesson (wrap-up).

FFA TIP

Have members plan a "Farm Safety Day" for elementary students. The safety day can include various topics such as grain bin safety, PTO (power takeoff) safety, chemical safety, etc. Members can research and present the information on the various topics and/or contact local experts in the community to present or co-present the information. Examples of individuals in the community that could help could include alumni and supporters, farmers, local extension agents, agricultural business persons, etc.

SAE TIP

Providing information about agriculture, food and natural resources to the public through mediums such as film, print and web can make a great SAE. Agriculture and natural resources topics such as farm or food safety, food production methods and agricultural issues is great preparation for careers in the communication and advocacy fields.

VOCABULARY

Silo
Entrapment
Fatalities
Stressors
Authentic

EXIT TICKET

How can you apply what you learned in the lesson in your daily life?

How can what you learned have an impact on your community and/or state?

CAREER FOCUS AREAS

Power, Structural and Technical Systems

RELATABLE LINKS

Ag Safety and Health, https://ag-safety.extension.org/entrapment-risk-due-to-flowing-grain/

Safety in Agriculture for Youth, https://ag-safety.extension.org/safety-in-agriculture-for-youth/

REFERENCE

Grain Safety, https://nasdonline.org/static_content/documents/7156/d002403.pdf

Entrapment Risk Due to Flowing Grain, https://ag-safety.extension.org/entrapment-risk-due-to-flowing-grain/

APPENDICIES

Appendix 4: Big Screen on Middle America

STANDARDS ALIGNMENT

FFA Precept: FFA.PL_A, FFA.PL-E, FFA.PG-J, FFA.CS-M, FFA.CS-N • **Common Core-Reading: Information Text:** CCSS.ELA.RI.9-10.2, CCSS.ELA.RI.9-10.4 • **Common Core – Writing:** CCSS.ELA.W.9-10.2, CCSS.ELA.W.9-10.4 • **Common Core – Speaking and Listening:** CCSS.SL.9-10.4, CCSS.SL.9-10.5 • **AFNR Career Ready Practices:** CRP.02, CRP.04 • **P21 Skills:** COMMUNICATION, CRITICAL THINKING AND PROBLEM SOLVING, FLEXIBILITY AND ADAPTABILITY, INITIATIVE AND SELF-DIRECTION, INFORMATION, COMMUNICATIONS, AND TECHNOLOGY, LEADERSHIP AND RESPONSIBILITY, THINK CREATIVELY

THE feed

Quiz: ETHNIC DIVERSITY IN AGRICULTURE

People who work in agriculture come from different backgrounds and ethnicities. How much do you know about diversity among agriculture producers across the United States? Test your knowledge!

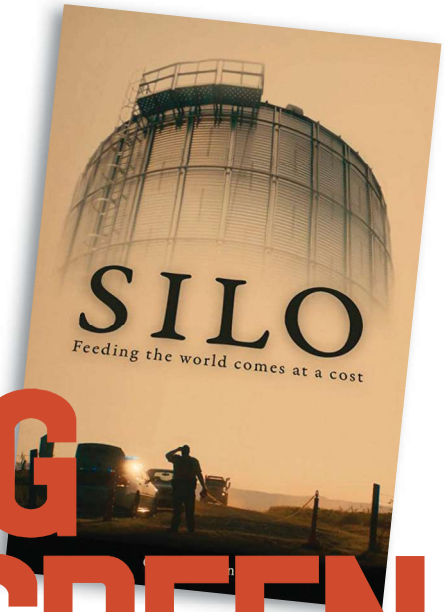
– By Jessica Mozo

1. While the majority of U.S. farmers are white, Hispanic and Latino farmers make up the second-largest ethnic group. Of the 2,042,220 farms in the U.S., how many farms have producers (or people involved in making decisions for the operation) who are Hispanic, Latino or Spanish?
2. American Indian and Alaska Native producers make up another sizable ethnic group among U.S. farmers. How many farms have producers who identify as American Indian or Alaska Native?
3. The number of black and African-American farmers continues to grow. How many farms had black or African-American producers in the U.S. in 2017?
4. How many U.S. farms reported having Asian producers in 2017?
5. Native Hawaiian and Pacific Islanders represent a small ethnic group in U.S. agriculture. How many farms had Native Hawaiian and Pacific Islander producers in 2017?

A. 35,470 (1.7%)
B. 18,338 (.9%)
C. 86,278 (4.2%)
D. 4,341 (.2%)
E. 60,083 (2.9%)

Answers: 1: C; 2: E; 3: A; 4: B; 5: D

Illustration: fona2, Getty Images.
Silo poster: Colby Groves



BIG SCREEN on Middle America

THIS FEATURE FILM HIGHLIGHTS THE IMPORTANCE OF AG SAFETY AND THE HEARTBEAT OF RURAL TOWNS.

Corn turns to quicksand and a community turns to each other. That's the story of *Silo*, a feature film bringing light to a danger on American farms: grain entrapment. (Grain bins account for 71 percent of confined-space incidents reported over the last 50 years, including 15 fatalities in 2018.) Originally inspired by the tragic true story of two Illinois teenagers, the movie depicts a small farm town that comes together to save a teen from a 50-foot-tall silo.

"A lot of the 'fringe' states don't understand what's happening in rural America. This film sets out to tell people," says Quint Pottinger, whose New Haven, Ky., farm was used for production. "It says, 'Here's how far ag safety has come, and here's how far it has to go.' It also highlights a bigger mental health issue. Farmers face a lot of stressors (finances, time and weather, for example) to get things done, and they enter dangerous situations without even thinking about it."

Pottinger, a former Kentucky state FFA president from the Larue County Chapter, also served as an advisor for the film, ensuring that farm tasks and processes were depicted accurately. "There wasn't a whole lot of correcting, though," he says. "They really did their homework to make it as authentic as possible to modern farm life."

The film is available for community screenings and includes a post-show grain-handling safety discussion guide. To view the trailer and schedule an event, visit **silothethefilm.com**.

– By Lauren Denton

NAME: _____

Aligned to the following standards:
FFA.PL-A; FFA.PL-E; FFA.PG-J; FFA.CS-M; FFA.CS-N; CCSS.W.9-10.2; CCSS.W.9-10.4; CCSS.RI.9-10.2; CCSS.RI.9-10.4; CCSS.SL.9-10.4; CCSS.SL.9-10.5; CRP.02; CRP.04

Appendix 4: Big Screen on Middle America

Created: Summer 2020 by the National FFA Organization

Part 1

DIRECTIONS:

Read the article "Big Screen on Middle America" in the summer 2020 issue of *FFA New Horizons* and answer the questions below.

1. What is the story of the feature film *Silo?*

2. Grain bins account for _____ percent of confined-_____ incidents reported over the last _____ years, including _____ fatalities in _____.

3. What does this film also highlight and bring attention to?



Part 2

DIRECTIONS:

Go to this website, https://nasdonline.org/static_content/documents/7156/d002403.pdf, to learn more about grain bin safety and answer the questions below.

1. In your own words, describe flowing grain:

2. If a person is caught in grain and buried up to their waist, how many pounds of force does it take to free them?
   A. 100
   B. 150
   C. 250
   D. 300

3. How can you free someone trapped in grain?

4. Why can someone potentially suffocate when trapped in grain?



NAME: _____

Part 3

DIRECTIONS:

For this activity, you will plan and record a 30-second PSA (public service announcement) about grain bin safety.

Use the space below to plan out your message for the PSA. (Use the boxes to illustrate the message and the lines to write out the message.) Next, use a cellphone or computer to record your PSA.

Introduction:

Middle:

End:

NAME: _____

Part 4

DIRECTIONS:

Work with a partner to create a mini lesson about grain bin safety that you can teach to elementary students.
Follow the steps below to create the lesson. Your lesson should last approximately 20 minutes.
Suggested websites to help with your creation and research:
Entrapment Risk Due to Flowing Grain, https://ag-safety.extension.org/entrapment-risk-due-to-flowing-grain/
Grain Safety background information and activity book, https://nasdonline.org/static_content/documents/7156/d002403.pdf

Introduction of lesson:
A lesson needs a brief introduction of what the students will be learning. Write the message you want to start your lesson with below:

_____
_____
_____

Middle of lesson: Activity
Create one activity for students to complete about grain bin safety. Information should include the name of activity, objective of the activity and step-by-step instructions for the students.

Name of Activity: _____
(*Example: Grain Bin Safety)*

Objective(s) of the activity:
(*Example: Understand grain bin hazards, identify the steps to rescue someone from grain bin entrapment, create a flyer about grain bin safety)*

_____
_____
_____

Step-by-Step Instructions:
(Example: When giving instructions, be as detailed as possible. For the flyer activity, you would tell students the requirements of what the flyer needs to contain. For example, the flyer needs to be creative and include 4 pictures, either hand-drawn or printed and taped on; it needs to include the hazards of grain bins and all the steps of how to rescue someone trapped in a grain bin.)

_____
_____
_____
_____
_____



End of lesson: Wrap-up
The end of the lesson should have students reflect on and process what they have just learned. Create three questions for students to reflect on what they have learned. Record the questions below next to each light bulb.





NEW HORIZONS

SUMMER 2020 TEACHING GUIDE



ARTICLE SUMMARY

One Big Ohana

Read this article to learn about the ecosystem and history of Hawaii and to discover what FFA activities and SAEs are like in the Hawaii FFA Association.

BELL RINGER:

When you hear "Hawaii" what are the first five things that pop into your head?

DISCUSSION QUESTIONS

1. How can you learn and apply things from someone in a different part of the country?

2. What do you think are some differences in agriculture between our area and Hawaii? What are the similarities?

ACTIVITY

Part 1: On their own paper, have students complete the bell ringer and then have students share their answers. Pass out the worksheet "One Big Ohana" to each student. Have students read "One Big Ohana" in the summer issue of FFA New Horizons to complete the worksheet.

Part 2: Students will utilize these websites (https://www.netstate.com/economy/hi_economy.htm, https://www.gohawaii.com and https://www.gohawaii.com/hawaiian-culture/hawaiian-language-guide) to learn more about the Hawaiian islands, the state flag, top agricultural products and the environment.

Part 3: Students will take what they have learned in the previous activities, along with further research, to design and create a travel flyer for Hawaii. Students need to include facts about the culture, traditions, climate, agriculture, etc. in the flyer.

FFA TIP

Have FFA members design and start an "FFA Chapter Exchange" program. Have students pick a state (not near your state) they would want to do an exchange with. Next, have students design the exchange (information they want to learn, items they would want to send/exchange, state agricultural facts, etc.). Have students determine what would be the best way to reach out to a chapter to potentially do an exchange with. (Once a way is determined, as the teacher, reach out to the advisor of that chapter to see if they would like to participate in the exchange.)

SAE TIP

For schools with aquaculture tanks, greenhouses, planters, school farms, etc., consider how you can turn these facilities into school-based SAE programs run by FFA members in your chapter. Some members may be owners and others employees. This business can be bought and sold by members as they enter and graduate.

VOCABULARY

Colonized
Primitive
Intermediate
Aquaculture
Ecosystem
Hydroponics
Microscopy
Algae
Protocols
Ohana
Advocate

EXIT TICKET

What are three new things you learned?

How can you apply what you learned to your daily life and FFA chapter and school activities?

CAREER FOCUS AREA

Agriculture Education

RELATABLE LINKS

SAE Idea Cards: Agricultural Communications and Education, https://FFA.box.com/s/x7e4v2qzxcwkleuqkun-3mt0421m5nejx

REFERENCES

Hawaii Economy, https://www.netstate.com/economy/hi_economy.htm

The Hawaiian Islands, https://www.netstate.com/economy/hi_economy.htm

Hawaiian Language, https://www.gohawaii.com/hawaiian-culture/hawaiian-language-guide

Weather, https://www.gohawaii.com/trip-planning/weather

APPENDICIES

Appendix 5: One Big Ohana

STANDARDS ALIGNMENT

FFA Precept: FFA.PL-A, FFA.PL-E, FFA.PG-J, FFA.CS-M, FFA.CS-N • **Common Core-Reading: Information Text:** CCSS.ELA.RI.9-10.2, CCSS.ELA.RI-10.4 • **Common Core-Writing:** CCSS.ELA.W.9-10.2, CCSS.ELA.W.9-10.4 • **Common Core-Speaking and Listening:** CCSS.SL.9-10.4 • **AFNR Career Ready Practices:** CRP.02, CRP.04 • **P21 Skills:** COMMUNICATION, CRITICAL THINKING AND PROBLEM SOLVING, FLEXIBILITY AND ADAPTABILITY, INITIATIVE AND SELF-DIRECTION, INFORMATION, COMMUNICATIONS, AND TECHNOLOGY, LEADERSHIP AND RESPONSIBILITY, THINK CREATIVELY



Waipahu Intermediate FFA members Kayla Nguyen and Cheydon Agos.

One Big Ohana

For these FFA members in Hawaii, agricultural education is like a family.



By Justin Davey
Photography by David Ekstrom









It's a state as lush in landscape as it is in history. Stretched across eight main islands (Hawaii, Maui, Oahu, Kauai, Molokai, Lanai, Niihau and Kahoolawe) far-flung off the western coast of the United States, the topography of Hawaii consists mainly of soaring volcanoes that plunge into low coastline.

The islands were colonized roughly 1,500 years ago. Farming practices then, as in most developing areas, were primitive and labor intensive. It's a part of Hawaiian history that some FFA members from Waipahu, about 30 minutes west of Honolulu on the island of Oahu, reflect on and respect. But while these members admire the past, they are forging ahead in a new era. They strive to grow, lead and succeed through agricultural education. In Hawaii, FFA is in bloom.

Agricultural Education Ecosystem

The Waipahu Intermediate FFA Chapter is regarded as a model FFA program in Hawaii. It is one of only two middle school FFA chapters in the state and the only middle school chapter on Oahu. The island may be small, but the 150 members of this urban chapter learn big lessons about agriculture and food. (A year-round tropical climate is ideal for growing many crops, including coffee, macadamia nuts, sugarcane, pineapple and many other fruits, and its access to the ocean makes fishing and aquaculture a staple.) Members maximize lawn space on the school grounds, build their own raised garden beds and grow their own vegetables as part of their supervised agricultural experience (SAE) projects. "One third of our FFA experience is an SAE, and I require all my students to do an agriscience project," says Ken Kozuma, the agriculture teacher and FFA advisor at Waipahu Intermediate School, which serves eighth-graders. "At their age, I think that's the best SAE for them to do; they research and experiment. They are growing things from ground zero. A lot of times, in the beginning, I have to encourage them to just do it, just try something. Then they learn through trial and error."

Kozuma partners with Jeffrey Garvey, the agriculture teacher and FFA advisor at Waipahu High School just up the road, to create an agricultural education ecosystem that captures students' attention at a young age, then excites them to continue to participate through high school.

"In the last two years, our intermediate school classes were just introductory – the basics of agriculture," Kozuma says. "But after attending a National Association of Agricultural Educators conference last year, I decided to focus this year more directly on agriscience and experiments." The courses are similar to a core agriculture class offered at the high school and provide a nice, broad base for students who decide to continue ag education after eighth grade.

"The high school goes in depth in more areas," he adds. "It offers more specialized classes."

"I have more of the applied courses," Garvey explains. Students at Waipahu High School, "ultimately work heavily on job training and learning to run our aquaculture and hydroponics systems, doing disease testing and microscopy work, growing algae and doing other things in our biotech class."

They also familiarize themselves with standard protocols, procedures and checklists that come in any business, Garvey says, by checking various aspects of the tilapia tanks in the aquaculture system. "What do you do when you show up at your job in the morning?" he asks students. "You don't pull out your phone. You go right to work, check everything, write things down, report incidents." Garvey simulates what students would do at a real job, so even

Clockwise from top right: Ag students harvest lettuce; Plants are grown on campus for SAE projects; Waipahu High School FFA president Vheena Sistoza works in the greenhouse; Ag student William Sagapolutele checks tilapia; Waipahu High School FFA advisor Jeffrey Garvey gives instructions; Waipahu Intermediate FFA member Noelle Espinosa works in a raised bed; Waipahu Intermediate FFA advisor Ken Kozuma walks the school garden.





if they don't go into agriculture, at least they come out of there knowing how to work better.

Keeping Members Engaged

The agricultural education ecosystem in Waipahu has captured FFA members' attention.

"I'm very interested in chemistry and physics, so being able to see how even the smallest measure of life, like a cell, can play into agriculture interests me," says Waipahu Intermediate FFA member Cheydon Agos. "I joined FFA because I was working on a science project and my science teacher thought I should talk about it with Mr. Kozuma to get another point of view. When Mr. Kozuma started talking about different aspects of my project and FFA, it opened my eyes to a whole new agricultural perspective."

"There's so much you can do in agriculture, and you meet a lot of people," adds Waipahu Intermediate FFA member Kayla Nguyen. "FFA is like one big ohana [family], and it's amazing that you can share your passions in agriculture with people across the country. No matter what education or career I decide to pursue, I know I'll always advocate for natural resources."

"In eighth grade, our FFA experience touched on community service and giving back to our community," says Vheena Sistoza, who is now the Waipahu High School FFA Chapter president. "Mr. Kozuma took us on a lot of field trips around the community, and agriculture became a passion for me."

Waipahu High School operates under a career academy model, where students choose which education pathway they want to take, such as health and sciences, arts and communications, industrial and engineering technology, professional and public services, and natural resources. While many activities and interests vie for high school students' time, and some students decide not to continue with agriculture (which falls under the natural resources pathway), FFA is finding ways to keep members engaged.

"I'll definitely participate in FFA in high school," Agos says. "It has given me so many opportunities to do new things outside the classroom, and another four years with FFA would really benefit my education."

"FFA has shown me that agriculture can be hands on, but it can also be about advocacy," Sistoza adds. "I realized that agriculture encompasses so much of our economy, and I keep learning more and more about how the world revolves around agriculture."

Waipahu Intermediate FFA has seen some early success, too. In its first year in existence (2017-18), Waipahu Intermediate FFA saw five members qualify for the National FFA Agriscience Fair. In its second year, seven members qualified. Kozuma credits that success to members getting to choose an agriscience project that interests them and then putting in the hard work to see their projects through.

"They get to choose what they want to do, and I think that really helps to create motivation and passion," he says. "I think the kids who are able to find success are the ones who are passionate about what they do and find a greater purpose in what they're doing." •

Watch Our Video
Hover your phone's camera over this code to learn more about Waipahu Intermediate FFA members' agriscience success.



More Cool Hawaiian Chapters

With 19 chapters across five islands, FFA is alive and well in Hawaii. Check out these five unique programs from across the islands.

- Kalani FFA (Oahu) offers a unique focus on robotics and received a FarmBeats kit from the National FFA Organization and Microsoft in 2018.
- Kapaa FFA (Kauai) is an emerging FFA chapter that is being revitalized after 30 years of dormancy.
- Lahainaluna FFA (Maui) is the oldest agricultural education program in the western U.S. and can date its ag classes back to the 1830s, almost a century before FFA.
- Molokai FFA (Molokai) serves the only high school on the entire island. Fun fact: The school mascot is the Molokai Farmers.
- Konawaena FFA (Big Island) was home to famous FFA alumni and astronaut Ellis Onizuka, who took an FFA emblem into space.

Aligned to the following standards:
FFA.PL-A; FFA.PL-E; FFA.PG-J; FFA.CS-M; FFA.CS-N; CCS. RI.9-10.2; CCSS.RI-10.4; CCSS.SL.9-10.4; CRP.02; CRP.04

NAME: _____

Appendix 5: One Big Ohana

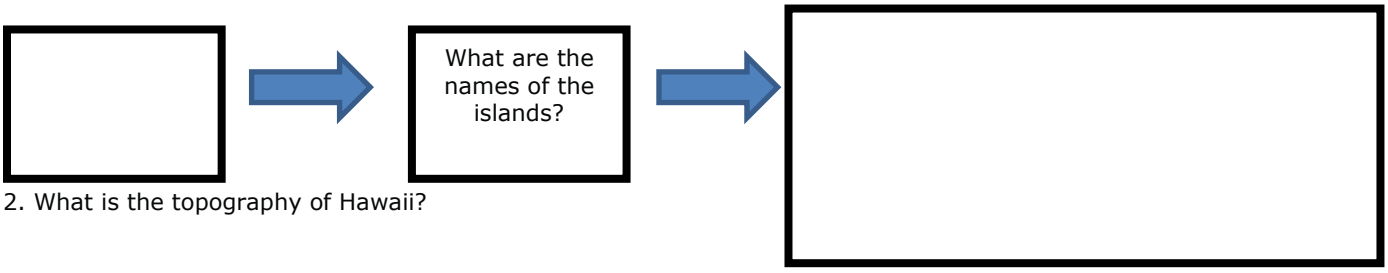
Created: Summer 2020 by the National FFA Organization

Part 1

DIRECTIONS:

Read the article "One Big Ohana" in the summer 2020 issue of *FFA New Horizons* and answer the questions below.

1. Hawaii is made up of how many islands? (*Write the number of islands in the first box and the names in the second blank box.)*



2. What is the topography of Hawaii?

3. When were the islands of Hawaii colonized?

4. What FFA program in Hawaii is regarded as a model program?

5. Hawaii's year-round tropical climate is ideal for growing many crops, including _____, macadamia _____, _____, pineapple and many other _____, and its access to the _____ makes fishing and aquaculture a staple.

6. What are three things the chapter members do for their supervised agricultural experience (SAE) programs?



7. Why did chapter member Cheydon Agos join FFA?

8. How can you apply what you learned from this article to your everyday life and/or FFA chapter?

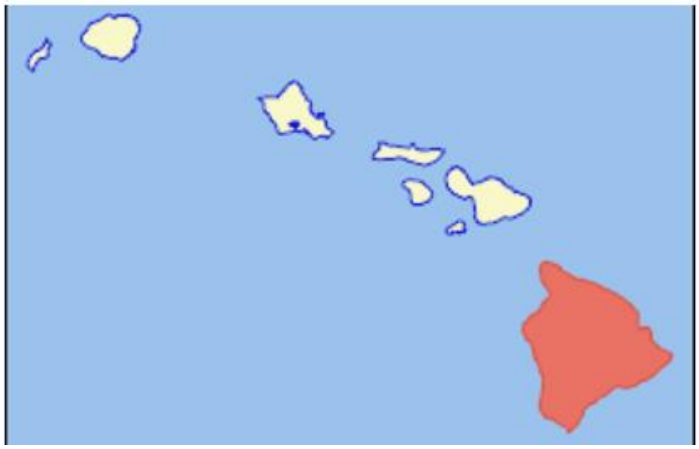
NAME: _____

Part 2

DIRECTIONS:

Answer the following questions to learn about Hawaii. Use the following websites to help with your research: https://www.netstate.com/economy/hi_economy.htm, https://www.gohawaii.com/ and https://www.gohawaii.com/hawaiian-culture/hawaiian-language-guide

1. Draw an arrow to each of the Hawaiian islands and label them.



2. Draw the state flag of Hawaii:

3. What are Hawaii's top 5 agricultural products?

1.
2.
3.
4.
5.

4. What are the two most valuable crops to Hawaii? _____ and _____

5. Describe the seasons that occur in Hawaii (type of season, temperature, when they occur):

How does this climate compare to the climate where you are from?

NAME: _____

Part 3

DIRECTIONS:

Create a travel flyer for Hawaii. Be sure to include facts about the culture, traditions, climate, agriculture, etc. Your flyer should be creative and utilize color and pictures (*there should be at least 3 pictures and they can be hand-drawn or printed and taped on)*. Use the following websites to help with your research: https://www.netstate.com/economy/hi_economy.htm, https://www.gohawaii.com/, https://www.gohawaii.com/hawaiian-culture/hawaiian-language-guide and https://www.gohawaii.com/trip-planning/weather

How do you say "welcome" in the Hawaiian language? *(Utilize the links at the top of this sheet to find the answer.)*

How do you say "good evening" in the Hawaiian language? *(Utilize the links at the top of this sheet to find the answer.)*

How can you apply information learned throughout this lesson into your daily life (school, FFA, other organizations, sports, etc.)?

NAME: _____

Travel Flyer Rubric

Area	4	3	2	1
Content	All content is included: culture, traditions, climate, agricultural facts	Most of the content is present; one area is missing.	Most of the content is present; two areas are missing.	Only one area of content is present.
Neatness and Creativity	The flyer is easy to read, and the layout of information and pictures is eye-catching. The flyer includes 3 pictures.	Most of the flyer is easy to read, and the layout of information and pictures is somewhat eye-catching. The flyer includes 2 pictures.	Most of the flyer is easy to read, and the layout is somewhat eye-catching. Only 1 picture is included.	The flyer is hard to read, and the layout of information is confusing and hard to follow. No pictures are included.
Color	Color was included on all of the flyer.	Color was included on most of the flyer.	Color was included on only a small portion of the flyer.	Color was included on little to none of the flyer.

Comments:


THE feed

FOR THE LOVE OF LOGAN

HIGH-TECH GARDENING

GET GROWING!

ARTICLE SUMMARY

High-Tech Gardening

Read this article to learn how FFA members in Oregon are learning about FarmBot and putting it to use in their school greenhouse.

BELL RINGER:

Describe "high-tech." What does it mean to you?

DISCUSSION QUESTIONS

1. What do you think "high-tech gardening" means?
2. How could "high-tech gardening" have an impact on workers? Consumers?

ACTIVITY

Part 1: On their own paper, have students complete the bell ringer and then share their answers. Next, pass out the worksheet "High-Tech Gardening" to each student. Have students read "High-Tech Gardening" in the summer issue of FFA New Horizons to complete the worksheet.

Part 2: Next, students will answer a variety of questions related to the types of robots that they have in their life (school, classroom, home, work, etc.), how robots are used in the agriculture industry and how they help. Students will also brainstorm and determine another industry where robots are utilized and how they are utilized.

Part 3: Students will design and create their own robot. Students will determine and design the look of the robot, the uses of it and the benefits of utilizing the robot.

FFA TIP

Have members work together in small groups to build the robot they designed. Hold a contest and have members vote on their favorite, based on creativity, design, etc.

SAE TIP

For students who want to start SAE programs involving agricultural technology and all things agriculture, check out the SAE Grants webpage to learn how FFA members can receive a grant to start or expand an SAE. Follow this link for more information, FFA.org/participate/grants-and-scholarships/sae-grants/.

VOCABULARY

Automation
Variable-rate application
Coding
Troubleshooting
Perseverance
Variables

EXIT TICKET

Summarize what you learned in one sentence.

CAREER FOCUS AREA

Plant Systems

RELATABLE LINKS

Living to Serve Grants, FFA.org/livingtoserve/grants/

Floriculture CDE Classroom Resource, https://FFA.box.com/s/t5y8razbtadxzsaitqe8xbkxp3d4a4uv

Nursery and Landscape CDE Classroom Resource, https://FFA.box.com/s/y1pow03ykhfo42ah783weu122x57uk3w

SAE Grants, FFA.org/participate/grants-and-scholarships/sae-grants/

REFERENCES

Hawaii Economy, https://www.netstate.com/economy/hi_economy.htm

The Hawaiian Islands, https://www.netstate.com/economy/hi_economy.htm

Hawaiian Language, https://www.gohawaii.com/hawaiian-culture/hawaiian-language-guide

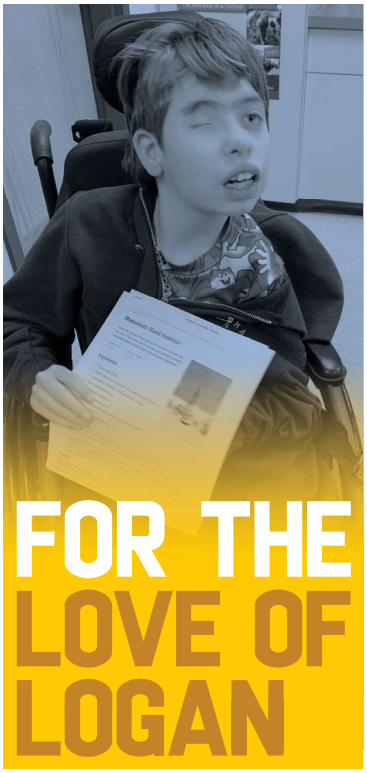
Weather, https://www.gohawaii.com/trip-planning/weather

APPENDICIES

Appendix 6: High-Tech Gardening

STANDARDS ALIGNMENT

FFA Precept: FFA.PL-A, FFA.PL-E, FFA.PG-J, FFA.CS-M, FFA.CS-N • **Common Core-Reading: Information Text:** CCSS.ELA.RI.9-10.2, CCSS.ELA.RI-9-10.4 • **Common Core-Writing:** CCSS.ELA.W.9-10.2, CCSS.ELA.W.9-10.4 • **Common Core-Speaking and Listening:** CCSS.SL.9-10.4 • **AFNR Career Ready Practices:** CRP.02, CRP.04 • **P21 Skills:** COMMUNICATION, CRITICAL THINKING AND PROBLEM SOLVING, FLEXIBILITY AND ADAPTABILITY, INITIATIVE AND SELF-DIRECTION, INFORMATION, COMMUNICATIONS, AND TECHNOLOGY, LEADERSHIP AND RESPONSIBILITY, THINK CREATIVELY



FOR THE LOVE OF LOGAN

Camas County FFA member Logan Schofield was born with multiple birth defects, rendering him nonverbal, blind in one eye and bound to a wheelchair. But that hasn't stopped the Idaho chapter from helping Schofield fully experience FFA.

A junior at Camas County High School, Schofield and his two brothers, Max (ninth grade) and Xander (seventh grade), all participate in the school's agriculture program led by first-year agriculture teacher and FFA advisor Riely Geritz.

"I have a background working with people with disabilities, and I feel strongly that agriculture programs should be completely inclusive," Geritz says. "It isn't always easy, but with a combination of support from his incredible paraprofessional, Sharon Kepford, deliberate conversations, and trying new things, Logan is able to be part of our class and get the objective out of hands-on assignments. His classmates have made that happen; they work to include him, fight over who gets to sit by him and talk to him about his favorite TV shows."

Schofield's care team noticed he enjoys smelling different scents and realized an opportunity for a one-of-a-kind supervised agricultural experience (SAE).

"His family uses lavender to relax him, and you can tell by his actions when he likes the way something smells," Geritz says. "His favorite scents are lavender and orange."

Schofield's paraprofessional educator found a recipe for bath bombs and helped Schofield mix the ingredients to make them for his SAE. Fellow FFA members jumped onboard, creating natural body products including lip balms, foot and hand scrubs, bath salts, soaps and hand sanitizers to be included in Schofield's SAE, which they named For the Love of Logan. The products are sold and the proceeds are given to Schofield's family for his medical expenses.



Logan Schofield fully experiences FFA thanks to the help of his Idaho chapter members.

"We began selling them at our town's Christmas tree lighting in December 2019, and by mid-January, we'd already sold $500 worth of products," Geritz says. "It's been a great way for our members to learn skills and show compassion, which they can use in their future careers."

For more information about the products, contact Geritz at **rgeritz@camascountyschools.org**.

– By Jessica Mozo

HIGH-TECH GARDENING

When members of the Sutherlin High School FFA, in Sutherlin, Ore., began experimenting with FarmBot, an open-source agricultural robot, their goal was to put it to work in their campus greenhouse.

"We used the technology to talk about things like automation and variable-rate application," says agricultural education instructor and FFA advisor Wes Crawford.

Funds from Grants for Growing, sponsored by retailer Tractor Supply Co., allowed students to build a 10×20-foot raised bed with tracks for the robot to run along. The robot was programmed to perform tasks like planting, watering and weeding.

"It presented a lot of opportunities for students to learn about CNC [computer numerical controlled] farming, coding and running experiments," explains Sterling Foster, 17.

Daniel Lyons, a senior, admits that building and troubleshooting the track system proved challenging, but it also provided a chance to work as a team to overcome obstacles.

"The biggest takeaway for me was perseverance," adds Alyssa McCormick, 17. "Technology comes with a lot of variables. When you get it figured out and you're able to actually witness it working, it's really amazing."

Sutherlin High School FFA set up the FarmBot at the Douglas County Fair in Roseburg, Ore., last summer. The project attracted a lot of attention, allowing students to showcase a unique FFA project and to challenge the views of a traditional agricultural program.

"An ag program is ultimately about production," Crawford says. "It's about all of the steps involved, from traditional ag methods to the real-world applications of technology, for things like irrigation and plant nutrition and the teamwork that goes into making it happen."

– By Jodi Helmer

GET GROWING!
Consider applying for Grants for Growing funds in the future. Learn more about the program at **FFA.org/GrantsForGrowing.**



The Sutherlin High School FFA Chapter experiments with FarmBot, an agricultural robot.



Photography: Riley Geritz, Wes Crawford

NAME: _____

Aligned to the following standards:
FFA.PL-A; FFA. PL-E; FFA.PG-J; FFA.CS-M; FFA.CS-N; CCSS.RI.9-10.2; CCSS.RI.9-10.4; CCSS.SL.9-10.4; CRP.02; CRP. 04; CCSS.W.9-10.2; CCSS.W.9-10.4

Appendix 6: High-Tech Gardening

Created: Summer 2020 by the National FFA Organization

Part 1

DIRECTIONS:

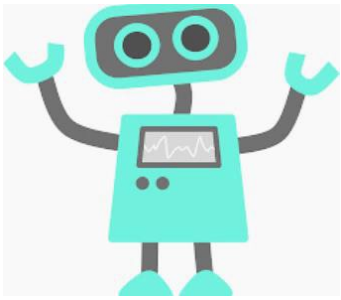
Read the article "High-Tech Gardening" in the summer 2020 issue of *FFA New Horizons* and complete the following activities.

1. In what state is the Sutherlin High School FFA chapter located? *Shade in the state.*



2. Sutherlin High School FFA began experimenting with Farm_____, an open-source agricultural _____. Their goal was to put it to _____ in their campus _____.

3. Using this technology, they were able to talk about what two things?



4. What grant did the students receive that allowed them to build a raised bed with tracks?

5. What tasks was the robot programmed to perform? *Identify 3.*

6. Students were able to learn about CNC (computer _____ controlled) farming, _____ and running experiments.

7. What was the biggest takeaway for student Alyssa McCormick?

	What does this word mean?	

NAME: _____

Part 2

Aligned to the following standards:
NRS.01; AGPE01.01; CCSS.RI.9-10.3; CCSS.SL.9-10.1; RST.9.10.1; RST.9.10.2; RST.9.10.4; RST.9.10.5; RST.9.10.6; RST.9.10.8; RST.9.10.9; WHST.9.10.7; WHST.9.10.9; MP3; MP6; AG-NR2; HS-LS2-6; HS-LS2-7

DIRECTIONS:

Answer the following questions to learn more about robots, how they are utilized in the agriculture industry and other industries and how they are present in your daily life.

1. What type of robots do you have in your life?
(School, classroom, home, work, etc.)
List 6 types.

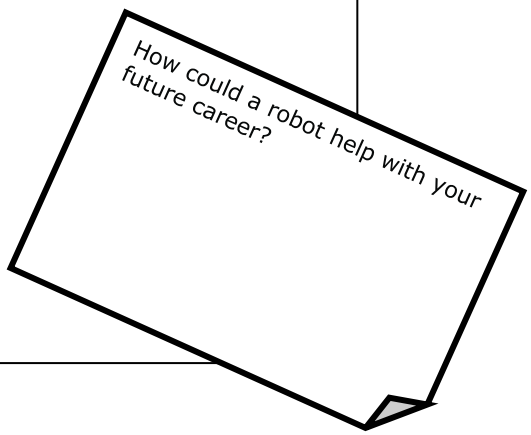




2. Do these robots help? Explain your answer.

3. How are robots used in the agriculture industry? *Utilize this site, and other similar sites,* https://builtin.com/robotics/farming-agricultural-robots, *to help start your research.*

4. Choose another industry and explain how robots are used.



NAME: _____

Part 3

DIRECTIONS:

Create your own robot. If you could design and create a robot, what would it look like? What would it do for you? Use the space below to design the robot and describe what it would do.

Describe the functions/actions it would perform:

What are the benefits of this robot?

NAME: _____

Aligned to the following standards:
CS.05; FFA.PL-A; FFA.PL-C; FFA. PL-F; FFA.CS-N; AG5; AGC09.02; CRP.02; CRP.11

Key — Appendix 1: Trade School or College: Which Is the Best Path for You?

Part 3

DIRECTIONS:

In the space below, draw a large outline of the state you live in. Using your resources online or from your guidance counselor, research the various trade schools and colleges that exist in your state. On the map you drew, draw in the logo/mascot of each school and label it with a T for trade school or a C for college. Be sure to include the school name and the city where it is located. Answers will vary by state.

Why is it important to understand all your options when looking beyond high school? Understanding all your options makes you more aware and helps you make an informed choice based upon your wants, needs, expectations and career goals.

Identify three points that you learned through this lesson. Answers will vary.

1.

2.

3.

NAME: _____

Aligned to the following standards:
FFA.PL-A; FFA.PL-E; FFA.PG-J; FFA.CS-N; CCSS.ELA.RI.9-10.2; CCSS.ELA.RI.9-10.4; CRP.02; CRP.04

Key — Appendix 2: Shelter From the Storm

Created: Summer 2020 by the National FFA Organization
Part 1

DIRECTIONS:
Read "Shelter From the Storm" in the summer 2020 issue of *FFA New Horizons* and complete the following activities.

In what year did Sarasota County Schools first get asked to help care for animals during an upcoming hurricane?

a. 1997
b. 1998
c. 1999
d. 2017



How many animals did the Sarasota County Schools agree to help in their first year?

a. 30
b. 35
c. 40
d. 1,500

Why is it important that that the Sarasota VoAg FFA Chapter participate in annual training? Example answer: Practicing helps to prepare individuals in case an emergency actually takes place. For example, students found that the kennels were difficult to put up. By having the experience provided by the training, they now know how to be more efficient.



Identify three skills that students learned through this experience that helped them prepare for future careers.

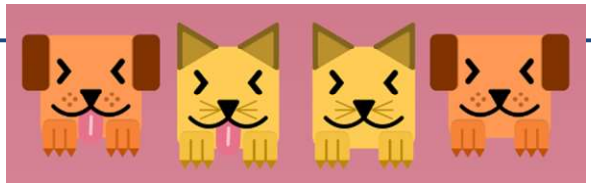
Learning how to set up a shelter, properly clean and disinfect cages, recognize signs of illness and distress and care for and feed animals during a hurricane or other natural disaster

What did the Plant City FFA Chapter receive that helped them in their project efforts?

a. Day of Service Grant
b. FFA Day of Service Mini Grant
c. Grant for Growing
d. American Red Cross grant



What impact do these types of community events have on those in the local area? Answers will vary.



NAME: _____

Part 3

DIRECTIONS:

Not only do we need our pets to be safe, but we also need to be safe in the event of a disaster. Develop a disaster plan for your family.

My Family Disaster Plan at a Glance

1. How are you going to receive emergency alerts and warnings? What if you do not have cell service?
   Answers will vary.

2. Where is the best place in your home to shelter? Why?
   Answers will vary.

3. What supplies do you need to have ready in your shelter location? Consider health needs, food/water needs, etc.
   Answers will vary.

4. How can you safely evacuate your property? Draw a map below.
   Answers will vary.

Why is it important to have a disaster plan in place? By planning for a disaster in advance, you can better ensure safety and survival in the unfortunate event of a disaster.

NAME: _____

Aligned to the following standards:
FFA.PL-A; FFA.CS-N; FFA.PL-F; CCSS.RI.9-10.2; CCSS.ELA. RI.9-10.4; CRP.02; CRP.04; CRP.06; CRP.08

Key — Appendix 3: Soil

Created: Summer 2020 by the National FFA Organization

Part 1

DIRECTIONS:

Read "Ag 101: Soil Horizons" in the summer issue of *FFA New Horizons* and complete the following activities.

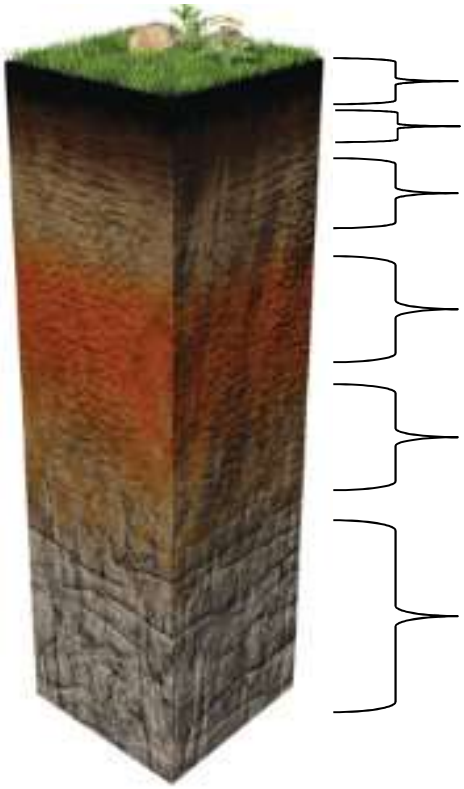


Image from Soils4Kids from the Soil Science Society of America.

Letter	Horizon Name	Short, one- to five-word description
O	Organic Material	Answer will vary.
A	Topsoil	Answers will vary.
E	Eluviated	Answers will vary.
B	Subsoil	Answers will vary.
C	Parent Material	Answers will vary.
R	Bedrock	Answers will vary.

Why is it important to understand soil?

Soil is important for many reasons. Soil is the foundation for our homes and roads, grows plants/crops, etc. By understanding soil, we can have a greater appreciation of agricultural production practices, understand where homes should and should not be built, etc. Answers will vary.





Identify two ways soil has impacted you today. Answers will vary.

1. _____

2. _____

NAME: _____

Aligned to the following standards:
FFA.PL-A; FFA.CS-N; FFA.PL-F; CCSS.RI.9-10.2; CCSS.ELA. RI.9-10.4; CRP.02; CRP.04; CRP.06; CRP.08

Part 2

DIRECTIONS:

While thinking about each basic horizon of a soil profile, you are going to create your own soil profile using everyday items that could represent each horizon.

1. Select a category of everyday item you would like to use. (Example: candy)
2. Draw a soil profile and use different items from that category to develop each layer of the profile. (Example: Oreo cookies for bedrock) Be sure to select items from your category that match the color, look and texture of the actual soil profile horizons.
3. Label each horizon with the representative letter and name. (Example: O layer = organic material)

Category Selected:
Answers will vary.

Letter: O Name: Organic Material	Images will vary.
Letter: A Name: Topsoil	Images will vary.
Letter: E Name: Eluviated	Images will vary.
Letter: B Name: Subsoil	Images will vary.
Letter: C Name: Parent Material	Images will vary.
Letter: R Name: Bedrock	Images will vary.

NAME: _____

Aligned to the following standards:
FFA.PL-A; FFA.CS-N; FFA.PL-F; CCSS.RI.9-10.2; CCSS.ELA. RI.9-10.4; CRP.02; CRP.04; CRP.06; CRP.08

Part 3

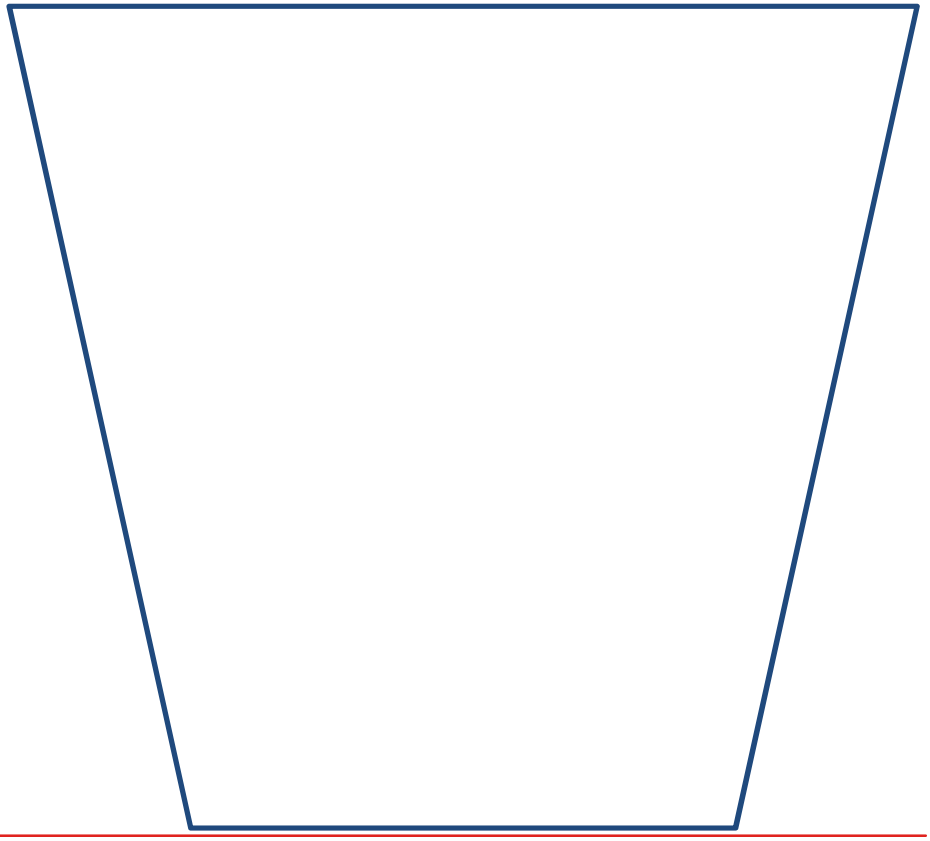
DIRECTIONS:

Now let's put together a physical representation of what soil profile looks like! In this lab, you will follow along with your teacher and complete the chart below. During this time, you will be adding items to a cup you have been provided by your teacher. In the cup diagram at the bottom of this page, draw and color the items being added. Be sure to label the cup with the letter and horizon as you go. To complete the conclusion questions, refer to the "Ag 101: Soil Horizons" article in the summer 2020 issue of *FFA New Horizons*.

Horizon Letter and Name	Represented by	Description of Appearance
O, Organic Material	Green coconut or sprinkles	Answers will vary.
A, Topsoil	Chocolate pudding	Answers will vary.
E, Eluviated		Answers will vary.
B, Subsoil	Vanilla pudding	Answers will vary.
C, Parent Material	Crushed vanilla wafers	Answers will vary.
R, Bedrock	Oreos	Answers will vary.

Your Soil Profile Cup

Images will vary. All labels should be the same as the first column above.

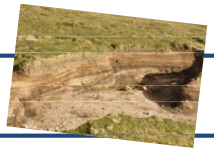


NAME: _____

1. Which horizon of the soil would be the richest in nutrients for plant growth?

O, organic material

Why? The layer is formed over hundreds of years from dead and decaying matter which lends itself to be high in essential nutrition for plant growth.



2. Which horizon of the soil do we test for the texture in a soil judging competition?

Horizon A



3. The E horizon is not always represented in all soil profiles. In what type of site would an E horizon be found?

a. High temporary water table

b. Forest soils

4. Which horizon is known as the zone of accumulation?

Horizon B

Why? It's named the zone of accumulation due to the build-up of minerals leached out of the A and E horizons.



5. What is the leaching process in horizon B called?

Illuviation

6. Which layer is most likely to be caused by disturbance from plants or animals?

Horizon A

Why? This layer is close to the top of soil profiles.

8. What is the deepest horizon in the soil pit before the bedrock?

Horizon C



8.The bedrock layer is commonly made up of what materials?

a. Sandstone

b. Granite

c. Limestone

9.Using AgExplorer.FFA.org, identify 3 careers in which having background knowledge in soil science would be extremely important. Answers will vary.

a. _____

b. _____

c. _____

NAME: _____

Aligned to the following standards:
FFA.PL-A; FFA.CS-N; FFA.PL-F; CCSS.RI.9-10.2; CCSS.ELA. RI.9-10.4; CRP.02; CRP.04; CRP.06; CRP.08

Part 4

DIRECTIONS:

Now let's find out what the soil profile looks like in your area. Using the following resource from UC Davis, https://casoilresource.lawr.ucdavis.edu/gmap/, find your home and school on the map by using the "menu" button in the top left corner. Once you have found these two points on the map, answer the following questions using the content in the left side bar. NOTE: You must click on a specific spot and drop a red dot to have specific information populate in the side bar.

Home

1. Click on "map composition." What types of soils are present? Answers will vary.

2. Looking at each of these types of soils, what conclusions can you draw about the soil where your home is located? Answers will vary.

3. Select one of the soil types present and identify the taxonomic order. Answers will vary.

   _____

4. Draw the soil profile. Answers will vary.

School

1. Click on "map composition." What types of soils are present? Answers will vary.

2. Looking at each of these types of soils, what conclusions can you draw about the soil where your home is located? Answers will vary.

3. Select one of the soil types present and identify the taxonomic order. Answers will vary.

   _____

4. Draw the soil profile. Answers will vary.

How can understanding the soil in your local area help you in the future? Understanding soil can help you in your future career, home ownership, gardening, etc.

NAME: _____

Aligned to the following standards:
FFA.PL-A; FFA.PL-C; FFA.PL-E; FFA.PL-F; FFA.PG-I; FFA.PG-J; FFA.CS-M; FFA.CS-N; CS.05; AG5; CCSS.SL.9-10.1; CCSS.SL.9-10.2; CRP.04; CRP.07; CRP.08; CRP.10

Key – Appendix 4: Big Screen on Middle America

Created: Spring 2020 by the National FFA Organization

Part 1

DIRECTIONS:

Read the article "Big Screen on Middle America" in the summer 2020 issue of *FFA New Horizons* and answer the questions below.

1. What is the story of the feature film *Silo?*
Corn turns to quicksand and a community turns to each other. The film brings light to a danger on American farms: grain entrapment.

2. Grain bins account for 71 percent of confined-space incidents reported over the last 50 years, including 15 fatalities in 2018.



3. What does this film also highlight and bring attention to?
It highlights a bigger mental health issue. Farmers face a lot of stressors and then enter dangerous situations without even thinking about it.

Part 2

DIRECTIONS:

Go to this website, https://nasdonline.org/static_content/documents/7156/d002403.pdf, to learn more about grain bin safety and answer the questions below.

1. In your own words, describe flowing grain:
This happens when grain is being moved by a grain-handling system. When a grain bin is emptied, gravity pulls the grain into an auger at the bottom.

2. If a person is caught in grain and buried up to their waist, how many pounds of force does it take free them?
   A. 100
   B. 150
   C. 250
   D. 300

3. How can you free someone trapped in grain?
The only way to free someone trapped in grain is to completely surround the victim with a barricade to prevent the grain from back filling around them. Grain bin rescue tubes are now available for first responders.

4. Why can someone potentially suffocate when trapped in grain?
Suffocation can happen if a person is pulled under the grain. The grain kernels do not allow enough oxygen to get to a person submerged under grain. Along with the depletion of oxygen, the heavy grain also puts pressure on the lungs, so they have trouble expanding. Every time the victim exhales, the grain settles reducing their lung capacity. In addition, grain dust can be highly combustible. Great care must be taken not to ignite it, causing an explosion.



NAME: _____

Aligned to the following standards:
FFA.PL-A; FFA.PL-C; FFA.PL-E; FFA.PL-F; FFA.PG-I; FFA.PG-J; FFA.CS-M; FFA.CS-N; CS.05; AG5; CCSS.SL.9-10.1; CCSS.SL.9-10.2; CRP.04; CRP.07; CRP.08; CRP.10

Key — Appendix 5: One Big Ohana

Created: Spring 2020 by the National FFA Organization

Part 1

DIRECTIONS:

Read the article "One Big Ohana" in the summer 2020 issue of *FFA New Horizons* and answer the questions below.

1. Hawaii is made up of how many islands? (*Write the number of islands in the first box and the names in the second blank box.)*

8	What are the names of the islands?	Hawaii, Maui, O'ahu, Kaua'I, Moloka'I, Lana'I, Ni'ihau and Kaho'olawe

2. What is the topography of Hawaii?

The topography consists mainly of soaring volcanoes.

3. When were the islands of Hawaii colonized?

1,500 years ago

4. What FFA program in Hawaii is regarded as a model program?
The Waipahu Intermediate FFA Chapter is regarded as a model FFA program in Hawaii.

5. Hawaii's year-round tropical climate is ideal for growing many crops, including coffee, macadamia nuts, sugarcane, pineapple and many other fruits, and its access to the ocean makes fishing and aquaculture a staple.

6. What are three things the chapter members do for their supervised agricultural experience(SAE) programs?

Maximize lawn space on the school grounds	Build their own raised garden beds	Grow their own vegetables

7. Why did chapter member Cheydon Agos join FFA?

Cheydon joined FFA because he was working on a science project, and his science teacher thought he should talk about it with Mr. Kozuma to get another point of view. When Mr. Kozuma started talking about different aspects of Cheydon's project and FFA, it opened Cheydon's eyes to a new agricultural perspective.

8. How can you apply what you learned from this article to your everyday life and/or FFA chapter?

Answers will vary.

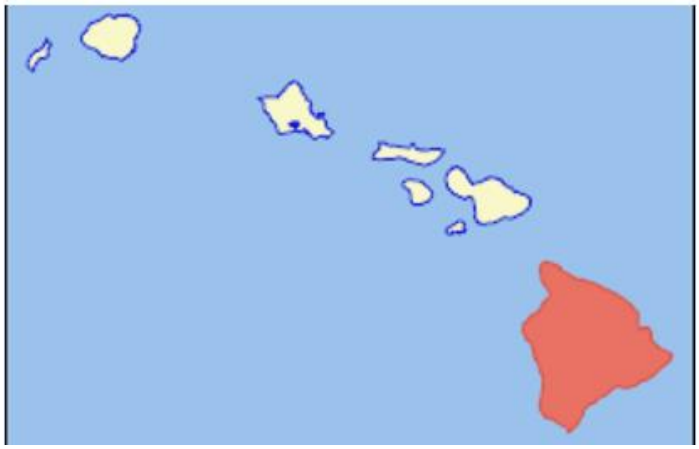
NAME: _____

Part 2

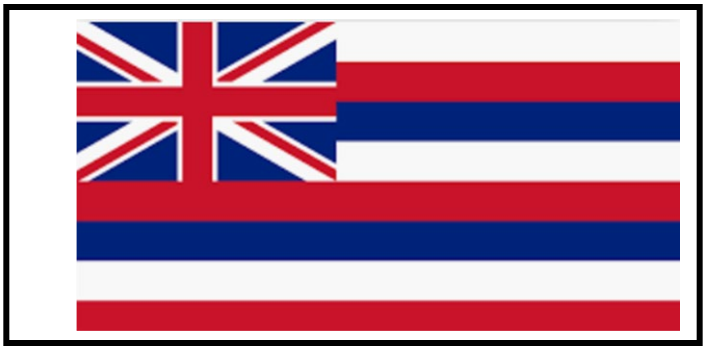
DIRECTIONS

Answer the following questions to learn about Hawaii. Use the following websites to help with your research: https://www.netstate.com/economy/hi_economy.htm, https://www.gohawaii.com/ and https://www.gohawaii.com/hawaiian-culture/hawaiian-language-guide

2. Draw an arrow to each of the Hawaiian islands and label them.



2. Draw the state flag of Hawaii:



3. What are Hawaii's top 5 agricultural products?

1. Greenhouse and nursery products
2. Pineapples
3. Cane for sugar
4. Macadamia nuts
5. Coffee

4. What are the two most valuable crops to Hawaii? Sugar cane and pineapples

5. Describe the seasons that occur in Hawaii (type of season, temperature, when they occur):

Two seasons: summer (May to October) and winter (November to April) Average daytime summer temperature is 85 degrees F. Average daytime winter temperature is 78 degrees F. Temperatures at night are approximately 10 degrees lower than the daytime.

How does this climate compare to the climate where you are from?
Answers will vary.

NAME: _____

Part 3

DIRECTIONS

Create a travel flyer for Hawaii. Be sure to include facts about the culture, traditions, climate, agriculture, etc. Your flyer should be creative and utilize color and pictures (*there should be at least 3 pictures and they can be hand-drawn or printed and taped on)*. Use the following websites to help with your research: https://www.netstate.com/economy/hi_economy.htm, https://www.gohawaii.com/, https://www.gohawaii.com/hawaiian-culture/hawaiian-language-guide and https://www.gohawaii.com/trip-planning/weather

Travel flyer designs will vary.

How do you say "welcome" in the Hawaiian language? *(Utilize the links at the top of this sheet to find the answer.)* E komo mai!

How do you say "good evening" in the Hawaiian language? *(Utilize the links at the top of this sheet to find the answer.)* Aloha ahiahi!

How can you apply information learned throughout this lesson into your daily life (school, FFA, other organizations, sports, etc.)? Answers will vary.

Aligned to the following standards:
NRS.01; AGPE01.01; CCSS.RI.9-10.3; CCSS.SL.9-10.1; RST.9.10.1; RST.9.10.2; RST.9.10.4; RST.9.10.5; RST.9.10.6; RST.9.10.8; RST.9.10.9; WHST.9.10.7; WHST.9.10.9; MP3; MP6; AG-NR2; HS-LS2-6; HS-LS2-7

Key – Appendix 6: High-Tech Gardening

Created: Summer 2020 by the National FFA Organization

Part 1

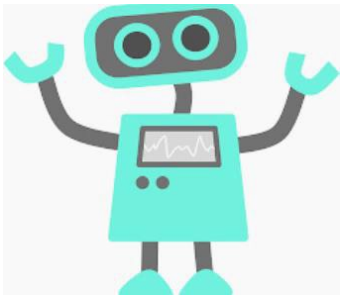
DIRECTIONS:

Read the article "High-Tech Gardening" in the summer 2020 issue of *FFA New Horizons* and complete the following activities.

1. In what state is the Sutherlin High School FFA chapter located? *Shade in the state.*



2. Sutherlin High School FFA began experimenting with FarmBot, an open-source agricultural robot. Their goal was to put it to work in their campus greenhouse.



3. Using this technology, they were able to talk about what two things?
   Automation and variable-rate application

4. What grant did the students receive that allowed them to build a raised bed with tracks?

   Funds from Grants for Growing, sponsored by Tractor Supply Co., allowed students to build a 10x20-foot raised bed with tracks for the robot to run along.

5. What tasks was the robot programmed to perform? *Identify 3.*

Planting	Watering	Weeding

6. Students were able to learn about CNC (computer numerical controlled) farming, coding and running experiments.

7. What was the biggest takeaway for student Alyssa McCormick?

Perseverance	What does this word mean?

continued effort to do or achieve something despite difficulties, failure, or opposition (https://www.merriam-webster.com/dictionary/perseverance)

Part 2

DIRECTIONS:

Answer the following questions to learn more about robots, how they are utilized in the agriculture industry and other industries and how they are present in your daily life.

1. What type of robots do you have in your life?
(School, classroom, home, work, etc.)
List 6 types.

Answers will vary.

2. Do these robots help? Explain your answer.

Answers will vary.





3. How are robots used in the agriculture industry? *Utilize this site, and other similar sites,* https://builtin.com/robotics/farming-agricultural-robots, *to help start your research.*

Answers will vary but might include the following:
Robots are utilized for harvesting purposes, such as a robot for strawberry-harvesting called Berry 5. It uses robotic components to grab the leaf, pick the berry and pack it. Another example of a robot utilized for harvest purposes is the "Vegebot." It has one camera that scans the lettuce and gives a thumbs up or down for harvesting. A second camera, near a blade, then guides the pick without crushing the plant. A machine-learning algorithm "teaches" the robot to avoid unripe or diseased lettuce.

An example in the greenhouse market is a robot, HV-100, that handles the important, but highly repetitive and strenuous, work of spacing container crops and plants.

4. Choose another industry and explain how robots are used.

How could a robot help with your future career?

Answers will vary.