

SUSTAINABLE BIOECONOMY

FOR ARID REGIONS



STEM Career Exploration

OVERVIEW

In this lesson students explore a range of STEM careers with a focus on agriculture, sustainability and bioeconomies. By watching interviews on the SBAR YouTube channel, students meet scientists, engineers, extension agents, graduate students and others working in arid lands. Students learn about a wide variety of careers and the problems those careers are helping solve.

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STUDENT LEARNING OBJECTIVES:

After completing these activities, the students will be able to:

1. Describe the characteristics of STEM careers and their contributions to solving problems.
2. Reflect on their own interests and career aspirations.
3. Recognize different career choices.
4. Imagine possible career paths for themselves.

TIME REQUIRED:

50 minutes

10 minutes teacher preparation

RESOURCES:

1. STEM Career Exploration Lesson Plan
2. SBAR Career Exploration Playlist on YouTube: [Sustainable Bioeconomy for Arid Regions: Career Exploration Playlist](#)

EQUIPMENT AND SUPPLIES NEEDED:

1. Device with access to YouTube Videos: [Sustainable Bioeconomy for Arid Regions: Career Exploration Playlist](#)
2. Exploring Careers: Who, What, Where, How Worksheet (page 3)
3. Exploring Careers: Solving Problems Worksheet (page 4)
4. Post-it notes

THIS LESSON PLAN WOULD WORK WELL AS PART OF:

- Science curriculum
- Sustainability curriculum
- Career and Technical Education curriculum

THIS LESSON IS ALIGNED WITH COMMON CORE, AFNR AND FFA STANDARDS. See page 6 for detail standards.



LESSON PLAN:

1. Bell Ringer (5 minutes):

As a group, discuss the following questions:

- What is a STEM career? (*Careers in fields of science, technology, engineering and mathematics*)
- List STEM careers you know about? (*science teacher, chemical engineer, microbiologist*)
- How is agriculture part of STEM? (*plant and animal genetics, bioenergy, biofuels*)

2. Watch Careers Videos: Who, What, Where, How (15 minutes)

Explain to the students they will be watching interview videos and completing worksheets to help organize information. Give students the link to the SBAR Career Exploration Playlist and tell them to choose 3 or 4 videos to watch. Give students the Who, What, Where, How worksheet, and tell them to complete a row in the worksheet after they finish each video. Remind the students to pay attention to the who, what, where and how in each interview. If there is time, they can view additional videos and take notes.

3. Watch Career Videos: Solving Problems (15 minutes)

Tell the students to watch 3 additional videos, focusing on what problems the person is solving in their career. Ask students to complete the Solving Problems worksheet while watching.

4. Whole Class Discussion (10 minutes)

After students have completed the two worksheets, divide into small groups. Give students sticky notes and pose the following question:

- What kind of problems would you be interested in solving to improve people's lives?

Students write their ideas on post-it notes with one problem per sticky note and discuss these with their group members. After sharing in their groups, students post the sticky notes on the board. As the students bring sticky notes to the board, the teacher will organize problems by themes such as:

- | | |
|---------------------------------------|---|
| a. water shortage and drought | d. health and medical issues |
| b. land and environmental destruction | e. food security (everyone has enough food) |
| c. climate change (weather impacts) | f. jobs and economic security |

Teachers can explore with students that some careers address problems in multiple ways. Teachers can also ask students to help put the problems into the categories.

5. Wrap Up (5 minutes)

The teacher picks a few pressing problems, asks students to share their ideas about the problems they have identified, and asks them to identify careers that work to address these issues. The teacher asks students to share:

- careers they found interesting
- a career they had never heard of before
- a career area they would like to learn more about

Exploring Careers Worksheet: Who, What, Where, How

Name _____

Who was interviewed: Name	What is their job title?	Where do they do their job (inside, outside, mix)	How does this person try to fix a problem?
<i>Ex. Dr. Aliyana Garza-Brown</i>	<i>State Hydrologist</i>	<i>Mostly outside, but the samples go to a lab for more testing.</i>	<i>Test water at well sites, lakes, rivers, spills to better understand if there are contaminations to fix them and make water safer to drink.</i>

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Exploring Careers Worksheet: Solving Problems

Name _____

Please answer questions in complete sentences.

<p>Define problems: What problems or issues are these people addressing? List them with details.</p> <p>1.</p> <p>2.</p> <p>3.</p>	<p>Why are these problems important? Defend your answer.</p> <p>1.</p> <p>2.</p> <p>3.</p>
<p>Personal Interest: Which career did you find most interesting? List three reasons why:</p> <p>Career: _____</p> <p>1.</p> <p>2.</p> <p>3.</p>	<p>Career Choice: Where would you like to work? What kinds of problems would you like to focus on solving? Explain your reasons.</p>



STANDARDS DETAIL:

Common Core State Standards

CCSS.ELA-LITERACY.SL.6.1/7.1: Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 or 7 topics, texts, and issues, building on others' ideas and expressing their own clearly

CCSS.ELA-LITERACY.SL.6.2: Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.

CCSS.ELA-LITERACY.SL.7.2: Analyze the main ideas and supporting details presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how the ideas clarify a topic, text, or issue under study.

CCSS.ELA-LITERACY.SL.8.1: Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.

AFNR Career Ready Practices

CRP.02: Apply appropriate academic and technical skills. Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive.

CRP.02.01. Use strategic thinking to connect and apply academic learning, knowledge and skills to solve problems in the workplace and community.

CRP.02.02. Use strategic thinking to connect and apply technical concepts to solve problems in the workplace and community.

CRP.03.02 Design and implement a personal financial management plan.

CRP.04: Communicate clearly, effectively, and with reason. Career-ready individuals communicate thoughts, ideas and action plans with clarity, whether using written, verbal and/or visual methods.

CRP.07: Employ valid and reliable research strategies. Career-ready individuals are discerning in accepting and using new information to make decisions, change practices or inform strategies.

CRP.08: Utilize critical thinking to make sense of problems and persevere in solving them.

CRP.11. Use technology to enhance productivity

FFA Precept

FFA.PL-A. Action: Assume responsibility and take the necessary steps to achieve the desired results, no matter what the goal or task at hand.

FFA.PL-E. Awareness: Understand personal vision, mission and goals.

FFA.PL-F. Continuous Improvement: Accept responsibility for learning and personal growth.

FFA.PG-J. Mental Growth: Embrace cognitive and intellectual development relative to reasoning, thinking, and coping.

FFA.CS-M. Communication: Effectively interact with others in personal and professional settings.

FFA.CS-N. Decision Making: Analyze a situation and execute an appropriate course of action.

FFA.CS-O. Flexibility/Adaptability: Be flexible in various situations and adapt to change.



AUTHOR BIOGRAPHY

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Ali Yaylali has a PhD in Language, Reading, and Culture Program from the University of Arizona. His research relates to science writing in high school science classrooms. He worked in the SBAR project as a graduate fellow. Ali is currently an Assistant Professor at Eastern Kentucky University.