Lesson Number: MS.CAS.1.8

# Power, Structural, and Technical System Careers

***Middle School Food and Agricultural Literacy Curriculum***

## Precepts

I. Professional Growth

I1. Make clear decisions in my professional life.

## National Standards

CS.02.03.01.a. Explore various career interests/ options.

CS.09.02.01.a. Demonstrate basic computer and software systems skills.

NL-ENG.K-12.4 – Communication Skills

NL-ENG.K-12.12 – Applying Language Skills

NT.K-12.5 – Technology Research Tools

## Student Learning Objectives

As a result of this **unit** the students will…

Explore the eight pathways of the Agriculture, Food and Natural Resources (AFNR) career clusters.

As a result of this **lesson** the students will…

Discuss career opportunities related to power, structural, and technical systems in agriculture.

## Content Outline

**I. Discuss career opportunities related to *power*, *structural,* and *technical* systems in agriculture.**

A. Introduce the titles of 15 career opportunities with in ***power***, ***structural,*** and ***technical*** systems.

1. Agricultural Engineer
2. Diesel Mechanic
3. Waste Water Treatment Plant Operator
4. Equipment/Parts Manager
5. Agricultural Software Developer
6. Computer Service Support Technician
7. Global Positioning Satellite Technician
8. Machinery Operator
9. Agricultural Electrician
10. Database Administrator
11. Computer Programmer
12. Agricultural Construction/Contractor
13. Spray Business Utilizing GPS
14. Welder
15. Concrete Specialist

B. Research three of these careers

## Time

Instruction time for this lesson: 45 minutes.

## Resources

Brain, Marshall. "How Horse Works." 01 April 2000. HowStuffWorks.com. Retrieved from http://auto.howstuffworks.com/horse.htm — National FFA Organization. (2009). LifeKnowledge Precepts and Signs of Success — *Occupational employment statistics*. (2009, May 4). Retrieved from http://www.bls.gov/oes/current/oes172021.htm — States' Career Clusters Initiative. (2009). Agriculture, Food and Natural Resources Model. — Retrieved July 22, 2009, from States' Career Clusters Initiative Web site: http://www.careerclusters.org/resources/ClusterDocuments/agdocuments/1AGModel.pdf

## Tools, Equipment, and Supplies

Overhead projector/transparencies
MS.CAS.1.8.AS.A – two copies for every two students or two copies per group size selected by the teacher, Card stock is preferable.
MS.CAS.1.8.AS.B – one per student
Computer lab with Internet access
MS.CAS.1.8.ASSESS.A – one per student
MS.CAS.1.8.TM.A – one per teacher

## Key Terms

The following terms are presented in this lesson and appear in ***bold italics:***

***Power***

***Structural***

***Technical***

## Interest Approach

Cut apart two copies of **MS.CAS.1.8.AS.A** per two students or larger group if the teacher prefers ahead of time or hand out complete sheets and allow students to cut apart the cards prior to playing in Objective 1.

Welcome back! Thanks for coming to class today. As we all know, we have been discussing the different systems in agriculture. Today we are going to focus in on one particular system and have the opportunity to focus in on one career within this system, go on a web quest scavenger hunt, and share what we know with our classmates. But first we need to go over a few questions.

## Power, Structural, and Technical System Careers

Please raise your hand and wait to be called on.

Question #1 – What is your favorite car?

Elicit responses from the class and use follow-up questions.

Question #2 – Why is that your favorite car? Is it because of the color? Is it because it looks cool? Is it because it has a nice stereo? Is it because it goes fast? What makes it go fast? What is a measure of ***power*** in automobiles?

The word to listen for is horse***power***. Keep asking questions to lead students to that answer. An excellent description can be found at http://auto.howstuffworks.com/horse.htm. If a computer and projector are available, pull up the website and read through it together.

Horse***power,*** huh? Are there actually horses under the hood of the car? Of course not. Where do you think the term came from?

Take this as far as the teacher would like or move on. The teacher may allow students to bring in the correct definition for an extra point on the worksheet.

Great answers! Isn't it amazing that we see commercials all of the time that use terms like these and we never even think about what it actually means. The great thing is that there are people who design, build, and constantly try to improve on current technology, and they know exactly what these terms mean.

# Summary of Content and Teaching Strategies

**Objective 1.** As a result of this unit the student will discuss career opportunities related to ***power***, ***structural,*** and ***technical*** systems in agriculture.

In order to make the right decisions in our professional lives we are going to take a close look at careers in the ***power***, ***structural,*** and ***technical*** systems. When we hear the words ***power*** and ***structural*** many of us immediately think about the traditional careers in this sector. Some of those might be diesel mechanics and plumbers. These are still valid careers and a lot of people find fulfillment in these careers.

Let's use these as a beginning point but not limit us to these traditional areas. People also apply knowledge of engineering, hydraulics, pneumatics, electronics, ***power*** structures, and controls to the field of agriculture.

Cut apart two copies of **MS.CAS.1.8.AS.A** per two students or larger group if the teacher prefers ahead of time or hand out complete sheets and allow students to cut apart the cards prior to playing.

Let's take the next several minutes to discover the vast career opportunities in this system. In order to do this we are going to play a game. Who has played Memory Match?

Elicit responses from the class and allow students to explain how to play. If students are not familiar with the rules of the game, simply explain the rules to the group.

When I say GO, quickly and quietly find a partner, have a seat next to them, and focus your attention on me. GO!

Great job finding a partner! When I say DON'T FORGET, each group will be provided a set of memory match cards. Each of the cards has an exact match. First we will shuffle the cards. We will place the cards face down in neat rows on the table in front of us. One person will turn over two cards. If the cards match, the player who found the match may place the cards in front of them and take another turn. If the cards do not match it will be the next player's turn. Continue until all cards are matched. We will have seven minutes to find all of the matches. What questions are there? DON'T FORGET!

Allow students to play more than once if time allows. Vary the directions if you would like. Examples include – no talking during play, team versus team to see who can get them all matched first. The goal is to introduce students to numerous careers and cement their learning.

Nice job with memory match. Next we are going to go on a web quest to learn more about three careers in the ***power, structural, and technical*** system.

We will use the *Go-Get-It e-Moment®* to collect the necessary information. Distribute one copy of **MS.CAS.1.8.AS.B** to each student.

When I say CHOOSE, take the next two minutes to select three careers from the Memory Match cards and write them on the worksheet next to Career 1, Career 2, and Career 3. Once we have each selected three careers for further study, stack the cards neatly and place them on the corner of the table and await further instructions. What questions are there? CHOOSE!

After students have selected their three careers, move into the research portion of the web quest.

When I say GO, let's move to the computer area and search for the rest of the information that is required on the worksheet. We will have ten minutes to complete this task.

Adjust time as necessary.

There is a suggested website on the worksheet but let's not limit ourselves to just that site. There are numerous web pages that contain the required information, so make sure to write the complete web address that we used to answer the questions on the worksheet. What questions are there? GO!

## Review/Summary

Utilize the *Me-You-Us e-Moment*® to debrief.

Thanks for using your time wisely and working so hard to find the necessary information. Let's finish up the day with a quick review. First, answer the questions to yourself. Here are the questions:

Display **MS.CAS.1.8.TM.A**.

What did I learn that would help me make clear decisions in my professional life?

What information surprised me the most?

Which careers that we discovered today interest me enough to merit further study?

Thanks for reflecting on these questions. Now, turn to your neighbor and ask them the same questions. Be ready to give your answers to the whole group.

Who will be the first to share their response to question one?

Pause and allow volunteer to answer question one.

Thanks, question two?

Pause and allow volunteer to answer question two.

Question three?

Pause and allow volunteer to answer question three.

Thank you for being attentive learners today. Let's remember the information about careers in ***power***, ***structural,*** and ***technical*** systems as we continue to discover our interests this year!

## Application

**Extended classroom activity:**

Invite a guest speaker in to talk about agriculture engineering or how computers are used in agriculture.

Research what horse***power*** is.

***FFA activity:***

Participate in the Ag Mechanics CDE if available in your state or utilize CDE materials for a local CDE.

***SAE activity:***

Shadow someone in the ***power***, ***structural***, and ***technical*** systems area and keep records of what they do on an hourly basis and report back to class.
Participate in a placement SAE in one of these areas.

## Evaluation

MS.CAS.1.8.ASSESS.A

## Answers to Evaluation

Answers will vary.

| | | |
|---|---|---|
| Power, Structural and Technical Systems Memory Match<br>**Agricultural Engineer** | Power, Structural and Technical Systems Memory Match<br>**Diesel Mechanic** | Power, Structural and Technical Systems Memory Match<br>**Waste Water Treatment Plant Operator** |
| Power, Structural and Technical Systems Memory Match<br>**Equipment/Parts Manager** | Power, Structural and Technical Systems Memory Match<br>**Agricultural Software Developer** | Power, Structural and Technical Systems Memory Match<br>**Computer Service Support Technician** |
| Power, Structural and Technical Systems Memory Match<br>**Global Positioning Satellite Technician** | Power, Structural and Technical Systems Memory Match<br>**Machinery Operator** | Power, Structural and Technical Systems Memory Match<br>**Agricultural Electrician** |
| Power, Structural and Technical Systems Memory Match<br>**Database Administrator** | Power, Structural and Technical Systems Memory Match<br>**Computer Programmer** | Power, Structural and Technical Systems Memory Match<br>**Agricultural Construction/ Contractor** |
| Power, Structural and Technical Systems Memory Match<br>**Spray Business Utilizing GPS** | Power, Structural and Technical Systems Memory Match<br>**Welder** | Power, Structural and Technical Systems Memory Match<br>**Concrete Specialist**<br>**Feed bunks, water storage etc.** |

# Becoming Familiar with Careers in Power, Structural, and Technical Systems

**Name** _____

**Date** _____

Directions – Complete the worksheet utilizing a web search. There is a website provided but we are not limited to just this site.

www.bls.gov – Type the career in the search box on this page and look for occupational employment statistics. Example – http://www.bls.gov/oes/current/oes172021.htm will yield the required information for an agricultural engineer.

***Career 1 –*** _____

***Website*** _____

***What do they do?*** _____

***What kind of training do they need?*** _____

***What are the prospects/job outlook for this career?*** _____

***How much do they make? (specify hourly, monthly, yearly, average, median, entry level, etc.)*** _____

***Career 2 –*** _____

***Website*** _____

***What do they do?*** _____

***What kind of training do they need?*** _____

***What are the prospects/job outlook for this career?*** _

***How much do they make? (specify hourly, monthly, yearly, average, median, entry level, etc.)*** _____

***Career 3 –*** _____

***Website*** _____

***What do they do?*** _____

***What kind of training do they need?*** _____

***What are the prospects/job outlook for this career?*** _____

***How much do they make? (specify hourly, monthly, yearly, average, median, entry level, etc.)*** _____

**Name**_____

1. **List five careers in the power, structural, and technical systems.**

- _____
- _____
- _____
- _____
- _____

Answer each question in at least 3 sentences.

2. **If you were to select a career in this system which one would it be and why?**

_____

_____

_____

3. **What is one thing you could do right now to further study a career in this area?**

_____

_____

_____

4. **List one of the careers you researched and the training required to be successful.**

_____

_____

_____

# Review Questions

**What did I learn that would help me make clear decisions in my professional life?**

**What information surprised me the most?**

**Which careers that we discovered today interest me enough to merit further study?**