



Let's Research Technology in Agriculture!

Middle School Food and Agricultural Literacy Curriculum

Precepts

- F. Continuous Improvement
- F4. Adapt to emerging technologies

National Standards

CS.10.01.01.b. Discuss the use of mechatronics (such as lasers and robotics) and their impact on AFNR systems.

CS.10.01.01.c. Evaluate the importance of new and emerging communication systems and how they impact AFNR systems.

BS.01.01.02.a. Investigate current applications of biotechnology in agriculture.

PST.05.02.04.a. Identify the importance and uses of computer-based systems in agriculture, food and natural resources.

PST.05.03.01.a. Identify geospatial technologies, including global positioning, geographical information and remote sensing.

PST.05.03.03.a. Identify uses, components and setup of precision technology in agriculture, food and natural resources.

NL-ENG.K-12.3 – Evaluation Strategies

NL-ENG.K-12.4 – Communication Skills

NS.5-8.2 – Physical Science

NS.5-8.3 – Life Science

NS.5-8.4 – Earth and Space Science

NS.5-8.5 – Science and Technology

NT.K-12.2 – Social, Ethical, and Human Issues

Student Learning Objectives

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

Recognize the significance of emerging technology in agriculture.

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

Research emerging technologies and the opportunities they may create within agriculture.

Time

Instruction time for this lesson: 45 minutes.

Resources

National FFA Organization. (2009). *LifeKnowledge Online*. Retrieved July 9, 2009, from <http://agedlearning.org> — National FFA Organization. (2003). *LifeKnowledge Precepts and Signs of Success*.

Tools, Equipment, and Supplies

Overhead projector/transparencies
Computers – one per partner group
Poster paper – one per student
Markers
Note cards – approximately 10 per student
MS.AST.4.3.AS.A – one copy, cut and hung up around room
MS.AST.4.3.TM.A – one per teacher
MS.AST.4.3.ASSESS.A – one per teacher

Key Terms

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

Emerging technologies

Content Outline

- I. **Research *emerging technologies* and the opportunities they may create within agriculture.**
- II. **Create a flyer for an Ag Technology Project Guidelines**
 - A. Title: Must include name of technology
 - B. History: One paragraph summary of the history of that technology
 - C. Problem: What is the problem it helps solve?
 - D. Predict: Predict how this will be used in the future.
 - E. Depict: Create an illustration or some type of visual to include on flyer
- III. **Topics to research**
 - A. GPS and agriculture
 - B. Robotics and agriculture
 - C. NASA and agriculture
 - D. RFID and agriculture



Lesson Number: MS.AST.4.3

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We are also going to continue to use our predicting skills as we predict what might happen in the future of agriculture. Tune in as we explore technology!

Summary of Content and Teaching Strategies

Objective 1. Research **emerging technologies** and the opportunities they may create within agriculture.

Students will be creating a piece of promotional material for a certain agricultural technology. They will be further researching the agricultural technologies that were presented in **MS.AST.4.1**. These technologies include the following: GPS and agriculture, robotics and agriculture, NASA and agriculture, RFID and agriculture, and phone-controlled sprinklers and agriculture.

Other examples could be a specific robot in agriculture, precision farming, agriculture technologies in the medical field (pig heart valve, skin grafts, pharmaceuticals, etc.), rotary milking parlors or milking robots.

Have students draw the topics out of a hat and work with a partner to create their promotional material. These topics can be found on **MS.AST.4.3.AS.A**. Use the transparency master **MS.AST.4.3.TM.A** to provide them with guidelines for their flyer. For this activity you may want to pre-assign partners.

With a partner your task will be to promote an agriculture technology topic. We will be creating a brochure or flyer about this technology. Look for all directions for this on this overhead. Let's go through the guidelines.

Creating a flyer for an Ag Technology Project Guidelines

1. Title: Must include name of technology
2. History: One paragraph summary of the history of that technology
3. Problem: What is the problem it helps solve?
4. Predict: Predict how this will be used in the future.
5. Depict: Create an illustration or some type of visual to include on flyer.

- E. Phone-controlled sprinklers and agriculture
- F. A specific robot in agriculture
- G. Precision farming
- H. Agriculture technologies in the medical field (pig heart valve, skin grafts, pharmaceuticals, etc.)
- I. Rotary milking parlors
- J. Milking robots

Interest Approach

Students will be creating skits about the future. Groups of three to four will create a one-minute skit. Encourage costumes and props if desired.

How many of you have ever traveled through time? What?! Nobody has ever traveled through time? Well, that's how we are going to start our class today! Let's pretend that today is actually 100 years into the future. That's a long ways away, huh?

In your table groups we will be creating short skits. The topic is "What we did last weekend." Remember this isn't just an ordinary weekend; this is a weekend 100 years in the future. So use your group's brain waves to imagine what teenagers might do in the future. Feel free to create costumes or use props. We only have five minutes to prepare your skit!

Watch groups closely. If needed, give students more time to create their skits. After groups are finished planning, have them share their skit with the class. Be sure to celebrate each group!

Today we will be talking about the future of technology in agriculture. When people are faced with new things introduced into the world, how do they react?

Answer may look like: they resist change, they don't like it.

We should always be open and ready to learn about new technology. We can do a little research, just like we will be doing today, before counting a new technology out. Also, let's teach others about it, too. For example, why not teach your grandma all about sending text messages next time you see her?

We have already done a lot of predicting for the future. Some of these skits just may come true. Today we are going to do a little more research on **emerging technologies** in agriculture.



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We can use the computer for our research. However, feel free to make the flyer on the poster paper provided at the front of the room. We also have markers for you to make your flyers more creative and colorful! We will be sharing these with the class so let's put forth our best effort! Each partner group will be drawing a topic about technology in agriculture out of a hat.

Research for students may be difficult. Have them type in the topic they drew, word for word, into a search engine. Feel free to suggest other search terms for students as needed.

Give the class frequent time updates. After about 10 minutes of research tell students they should begin working on their flyers. After another 10-15 minutes they should be wrapping up in order to have plenty of time for class sharing.

As students are sharing, have them write down facts they learned on note cards. Have each student write two note cards per group. They can use front and back of the note cards, writing only one fact per side. This will be used later for a review game.

As we are listening to our classmates share their flyers, we will be writing down facts about their technologies. Write one fact per side of the note card. Each person will get 10 note cards. How many total facts is that? That's right – 20 facts. Later, we will be playing a game with these facts by matching up the facts to the technology they represent. Use one note card per group. What questions do you have? Let's begin!

Review/Summary

Using the note cards they created, students will perform the \$10,000 Pyramid e-Moment®. They will need to get into groups of three for this activity. Set up two chairs facing each other. Two students sit in the chairs. They are called the Player and the Clue Giver. The third student, the Teleprompter, stands behind the Player so that the Player can't see him. The Teleprompter holds the note cards above the Player's head. The Clue Giver reads the cards and tries to get the Player to guess what agriculture technology he is describing.

The first thing we need to do is to get into groups of three and arrange our chairs so that they are facing each other. It helps to model this at the front of the room.

Next we need two people to sit in the chairs. The third person will stand behind one of the chairs. The person behind the chair is given all the note cards.

Assign each person his or her role. Ask questions to clarify who is performing what role.

The person holding the cards, please raise your hand. You are the Teleprompter. Your task is to hold the cards so that only the person facing you can see the cards.

Raise your hand if you are facing the Teleprompter. You are the Clue Giver. Your task is to read the card and to give hints so that the person facing you can guess what agriculture technology topic you are talking about.

Raise your hand if you are facing the Clue Giver. You are the Player. You get to try to guess what technology the Clue Giver is talking about. Once you know the answer, announce it and get a new card to guess.

Who needs more information about their role?

The great thing about this game is that after every three cards you get to rotate positions. That way everyone gets the chance to play each role. Let's begin the game!

After five to seven minutes of review have them wrap up their game and go back to their seats.



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Application

Extended classroom activity:

Create and film infomercials about students' assigned agriculture technology.

FFA activity:

Have a guest speaker from a college in your area speak about careers or majors that deal directly with emerging technologies in agriculture.

SAE activity

Have students predict/create new proficiency award areas that FFA members might be able to apply for 20 years from now.

Evaluation

MS.AST.4.3.ASSESS.A.

Answers to Evaluation

see MS.AST.4.3.ASSESS.A (RUBIC)



Possible Topics

- **GPS and agriculture**
- **Robotics and agriculture**
- **NASA and agriculture**
- **RFID and agriculture**
- **Phone-controlled sprinklers and agriculture**
- **A specific robot in agriculture**
- **Precision farming**
- **Agriculture technologies in the medical field (pig heart valve, skin grafts, pharmaceuticals, etc)**
- **Rotary milking parlors**
- **Milking robots**



Creating a Flyer for an Ag Technology Project Guidelines

Title: Must include name of technology

History: One paragraph summary of the history of that technology

Problem: What is the problem it helps solve?

Predict: how this will be used in the future.

Depict: Create an illustration or some type of visual to include on flyer.



Evaluation: Journal Entry

Name _____

Directions: Imagine that it is 100 years from today. What kinds of agricultural technologies do you think you will see in that world?



Criteria	Proficient	Satisfactory	Unsatisfactory
Reflection on Learning	5 Conclusions clearly drawn and explained, accounting for at least half of the journal entry.	3 Some conclusions drawn, but loosely connected to the events of the lab. Less than half of the journal entry.	1 Conclusions unclear. Small part of the journal entry or not included at all.
Neatness and Conventions	5 The writing is especially neat. Complete sentences written in paragraph structure. No spelling errors.	3 The writing is generally neat and legible. Complete sentences. Few spelling errors.	1 The writing is sloppy and illegible. Some sentences are incomplete. Several words are misspelled.
Length – one point given for each sentence up to 10.			
Total			/20