Lesson Number: MS.IAS.7.2

Production Agriculture and the Environment

Middle School Food and Agricultural Literacy Curriculum

Precepts

C. Vision

C1. Contemplate the future

National Standards

CS.01.03.01.b. Utilize visioning skills to develop a plan.

CS.01.05.02.b. Demonstrate responsible citizenship.

NRS.05.01.01.a. Identify ways in which a message regarding natural resources may be communicated to the public.

NL-ENG.K-12.3 – Evaluation Strategies

NL-ENG.K-12.5 – Communication Strategies

NSS-C.5-8.5 – Roles of the Citizen

Student Learning Objectives

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

Explore practices, procedures, and methods of ***environmental stewardship***.

As a result of this **lesson**, the student will …

Examine the role of ***production agriculture*** practices on the environment.

Compare and contrast agriculture vs. ***environmental stewardship***.

Content Outline

Objective 1. Examine the role of ***production agriculture*** practices in the environment.

I. *Production agriculture* practices in the environment

A. What is ***production agriculture?***

1. ***Production agriculture:*** raising domesticated plants and animals for human consumption

B. How does ***production agriculture*** potentially impact the environment?

1. Water quality can be affected in positive and negative ways
2. Strong odors can be given off by farms
3. Farming could increase or decrease soil erosion depending on practices
4. Machinery and animals can be noisy to neighboring areas
5. ***Production agriculture*** balances the carbon cycle
6. Habitat for wildlife can be supported by ***production agriculture***

Time

Instruction time for this lesson: two 45-minute periods.

Resources

Biotechnology Online. (2001). Biotechnology online glossary. Retrieved July 28, 2009, from Biotechnology Online Web site: http://www.biotechnologyonline.gov.au/topitems/glossary.html. — Georgia Agriculture Education. (2004). The effects of production agriculture on wildlife. Retrieved July 28, 2009, from Georgia Agriculture Curriculum Resource and Reference Web site: http://aged.ces.uga.edu/browseable_folders/Power_Points/Forestry%20Natural %20Resources%20and%20Wildlife/The_Effects_of_Production_Agriculture_on_Wildlif e.ppt#1. — Livestock and Poultry Environmental stewardship Curriculum. (2005). LPES small farms fact sheet. Retrieved July 31, 2009, from Livestock and Poultry Environmental stewardship Curriculum Homepage: http://www.lpes.org/SmallFarms/1_FrmrEnv.pdf. — Merriam Webster Online Dictionary. (2009). Accountability. Retrieved July 29, 2009, from Merriam Webster Online Dictionary Web site: http://www.merriam-webster.com/dictionary/accountability. — National FFA Organization. (2003). LifeKnowledge Precepts and Signs of Success. — National FFA Organization. (2009). LifeKnowledge Online. Retrieved July 17, 2009, from http://agedlearning.org.

Tools, Equipment, and Supplies

Writing surface
Transparencies and projector
MS.IAS.7.2.TM.A – one per teacher
MS.IAS.7.2.TM.B – one per teacher
MS.IAS.7.2.ASSESS.A – one per student
Markers

Key Terms

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

Production agriculture

Environmental stewardship

Production Agriculture and the Environment

Objective 2. Compare and contrast agriculture vs. ***environmental stewardship.***

II. Agriculture vs. *environmental stewardship*

A. What is ***environmental stewardship?***

1. ***Environmental stewardship:*** the responsibility of humans to manage and care for the whole natural environment, not just the parts that benefit the human race

B. How are production agriculturalists stewards of the environment?

1. Agricultural producers rely on environmental resources for their operations and, therefore, must take care of the environment
2. Agricultural producers must make management decisions that will decrease environmental impact
   a. Not allowing farm animal waste to enter drinking water sources
   b. Limit the amount of pesticides and fertilizers used on soil
   c. Cover stock-piled animal manure and bedding to prevent water contamination
   d. Maintain healthy plants in pastures to prevent erosion
   e. Use fencing to control where animals have access
   d. Agricultural producers should learn about, plan for, and carry out best management practices for their farm

Before teaching this lesson, refer to lessons **MS.IAS.7.1** for background information on stewardship. Also, production agricultural practices will vary according to location. You may want to cater the ***production agriculture*** aspect of this lesson to what is relevant in your specific geographic location. You will instruct the students to talk with a friend throughout this lesson; how this is accomplished can be predetermined by you. It may be easiest to have students match up with someone sitting close by.

Interest Approach

In this interest approach, you will utilize the *Descartes e-Moment®* to assist students in accessing their prior knowledge and experience before introducing new content. Students will be writing a letter to themselves answering three questions:

1. What do you know about ***production agriculture*** and ***environmental stewardship***? 2. What do you think you understand about ***production agriculture*** and ***environmental stewardship***? 3. What don't you understand about ***production agriculture*** and ***environmental stewardship***? The letters will be short – allow a few minutes for thinking and writing on each question. After a few students have answered the first two questions, you may want to have them share aloud to stimulate other students' thinking. As students write, you should walk around the room and observe their thoughts. At the conclusion of this e-Moment, you will have more students share aloud. Prior to beginning this activity, have the phrases "***production agriculture***" and "***environmental stewardship***" displayed on a writing surface and then list the three questions above. This will help focus the students when they enter the classroom.

This interest approach should be delivered with enthusiasm.

One of the coolest things about being humans is that we all have our own unique thoughts, philosophies, or opinions about things. What are your thoughts about baseball? *Pause for a few seconds but do not allow students to respond.* I'm guessing that as soon as you heard the word baseball, your mind started racing with ideas. Someone who lives in New York might hold the philosophy that baseball is the greatest sport of all time and the Yankees are the best team! There may be disagreement, and that is fine. All of the great philosophers and writers are known for putting their thoughts down on paper, including things that they knew, thought they knew, or did not understand at all. Writing things down can be very helpful. Some may write in a diary or a journal, or you may have seen adults writing a list of things they needed to buy at the grocery story. Some people will write a note as a reminder of something to do later.

Gesture to the writing surface.

Observe that there are two phrases and three questions written. ***Production agriculture*** and ***environmental stewardship*** are the phrases. The first question asks, "What do you know about ***production agriculture*** and ***environmental stewardship***?" The second question reads, "What do you think you understand about ***production agriculture*** and ***environmental stewardship***?" Finally, the third question is, "What don't you understand about ***production agriculture*** and ***environmental stewardship***?" If you have not guessed, today we will be talking about ***production agriculture*** and ***environmental stewardship***.

Production Agriculture and the Environment

Summary of Content and Teaching Strategies

In this lesson, project **MS.IAS.7.2.TM.A** and **MS.IAS.7.2.TM.B**. to highlight content outline of Objectives 1 and 2. Keep the transparency master covered, and uncover as you discuss each component of the outline. Pose the question:

What is ***production agriculture?***

Pause for a few seconds.

There is some uncertainty about what ***production agriculture*** involves. Here is the definition. ***Production agriculture*** is the raising of domesticated plants and animals for human consumption. Think about that definition.

Pause for a few seconds.

Who will give an example of a plant or animal that might be raised for human consumption?

Allow students to share responses. Examples are items such as corn, hogs, apples, fish, sheep, wheat, cattle, etc.

Objective 1. Examine the role of ***production agriculture*** practices in the environment.

I. *Production agriculture* practices in the environment

A. What is ***production agriculture?***

1. ***Production agriculture:*** raising domesticated plants and animals for human consumption

Excellent examples of plants and animals that are raised through ***production agriculture***. Typically, these plants and animals are raised on farms and we call the people who raise them production agriculturalists. There are a variety of ways in which farms can have both a positive and negative impact on the environment. First, we will discuss potential negative impact, then positive impacts. When I say ENVIRONMENTAL IMPACT, answer this question: How might ***production agriculture*** impact the environment in negative and positive ways?

When I say GO, write a letter to yourself answering these three questions. Write this letter on a clean sheet of paper.

After writing for a few minutes, we will stop class and have a few people share aloud what they have written. This may help stimulate thinking for our classmates. You will have six minutes to complete this activity. What questions are there? GO.

After a few minutes of writing, stop the class and have a few volunteers read aloud what they have written. This may take a few minutes. Then, instruct students to continue writing. After six minutes of actual writing time have passed, you will continue.

Time is up. These were not the easiest questions to answer, but it is important to be aware of what you may already know when learning something new. It is important to be aware of what we do not understand as well. I am sure that we all wrote many interesting things. Who will share what is written in their letter?

Allow students to share their responses. If no students volunteer, prompt different students. After a few responses, continue:

Excellent letters. Consider those things we do not understand about ***production agriculture*** and ***environmental stewardship***.

Pause for a few seconds.

The last time we were together, we talked about stewardship and accountability. Today, we will discuss some of the confusing aspects of these two phrases and see how production agriculturists can be stewards of the environment. As we begin and continue through a discussion on ***production agriculture*** and ***environmental stewardship,*** refer back to the letter just written and make comparisons. Throughout class today, we should be focused and prepared to discuss potential environmental risks of ***production agriculture*** to better understand how agricultural producers can help the environment.

Production Agriculture and the Environment

Objective 2. Compare and contrast agriculture vs. ***environmental stewardship*.**

With a partner and 30 seconds, discuss possible negative impacts first then the positive impacts. What questions are there? ENVIRONMENTAL IMPACT

Pause for 30 seconds while students answer the question.

Time is up. Who will share their answer?

Allow students to share responses.

Great work!

If the following four examples are not given, verbally provide these reasons for the students.

B. How might ***production agriculture*** potentially impact the environment?

1. Water quality can be affected in positive and negative ways.
2. Strong odors can be given off by farms.
3. Farming could increase or decrease soil erosion depending on practices.
4. Machinery and animals can be noisy to neighboring areas.
5. ***Production agriculture*** balances the carbon cycle.
6. Habitat for wildlife can be supported by ***production agriculture***.

Let's do a quick check for understanding. If you understand what ***production agriculture*** is and could teach someone else, put a finger on your forehead. If you think you understand what ***production agriculture*** is, put a finger on your nose. If you do not understand what ***production agriculture*** is, put a finger on your chin.

Visually inspect for comprehension and re-teach if necessary.

Thank you. We have discussed how ***production agriculture*** can potentially have a negative impact on the environment. Because of this, agricultural producers have to practice ***environmental stewardship***.

II. Agriculture vs. *environmental stewardship*

A. What is ***environmental stewardship?***

1. ***Environmental stewardship:*** the responsibility of humans to manage and care for the whole natural environment, not just the parts that benefit the human race.

Think about what ***environmental stewardship*** means.

Pause for a few seconds.

Answer this next question to yourself: Do you think it is important for agricultural producers to practice ***environmental stewardship?***

Pause for a few seconds.

If your answer is yes, why? If your answer is no, why not?

Pause for a few seconds.

Who will provide the first response?

Allow students to share responses.

Great responses,everyone. It is very important for agricultural producers to practice ***environmental stewardship*** because they rely on the environment. Without environmental resources such as water and soil, agricultural producers would not be able to continue their farming operations.

B. How are production agriculturalists stewards of the environment?

1. Agricultural producers rely on environmental resources for their operations and, therefore, must take care of the environment.

Because agricultural producers need to protect the environment, they must make farm management decisions that will decrease the negative environmental impact. Before we discuss ways that agricultural producers can decrease environmental impact, we are going to consider a few farm types and identify possible positive and negative effects that these farms could have on the environment. We will be working in groups for this activity. To be successful, talking with your classmates as you move around the room will be necessary.

The next activity will be a gallery walk. You will post four writing surfaces (such as chart paper, poster board, etc.) around the room. Each writing surface will have a different title. Select four of the following farm titles or create your own titles that are specific to your geographic location: aquaculture farm (catfish, shrimp, etc.), corn farm, swine operation, navel orchard. You will need to be familiar with the different types of operations that you will use in the gallery walk. In addition to writing titles on the writing surfaces, you could print pictures of the different types of operations to provide students a visual as well. The groups will rotate around the room and the selected writer will print possible negative effects of each farming operation on the environment.

Divide the students into four groups and provide each group with a writing utensil.

Each group should select one person to be the writer. When I say AGRICULTURE, write what possible positive and negative impacts you think the farm listed could have on the environment. The writer will take ideas from the group members. After 30 seconds groups will rotate clockwise to the next poster and our process will repeat. What questions are there? AGRICULTURE!

At the conclusion of each 30 seconds, tell the students to rotate and start the next round by saying AGRICULTURE. Continue until the groups are back to their original station.

Great job, everyone! Now, return to your seats as we prepare to discuss the different possible impacts of each farm on the environment.

Keep in mind that we may have missed some, but we can always add to each list.

Next, you will review each farm and student-generated comment. If any possible impacts were not listed, add them to the list. Also, if some of the student-generated impacts are not legitimate, correct them. After you have reviewed the lists, continue.

Thank you for cooperating during that activity. You just pointed out that there are many ways that farms can both positively and negatively impact the environment, but we have already discussed that agricultural producers are stewards of the environment.

When I say DECREASE, write a list of things you think that agricultural producers could do to reduce negative environmental impact.

Work with a partner on this activity. You will have one minute to create this list. What questions are there? DECREASE

After one minute continue.

Time is up. I am anxious to hear your answers. Who will share first?

Allow students to share responses. If no students volunteer, prompt them by verbally providing examples from the list below.

Excellent work. We are on our way to becoming environmental stewards!

If the following six examples are not given, provide these reasons for the students.

2. Agricultural producers must make management decisions that will decrease environmental impact.
   a. Not allowing farm animal waste to enter drinking water sources
   b. Limit the amount of pesticides and fertilizers used on soil
   c. Cover stock-piled animal manure and bedding to prevent water contamination
   d. Maintain healthy plants in pastures to prevent erosion
   e. Use fencing to control where animals have access

f. Agricultural producers should learn about, plan for, and carry out best management practices for their farm

We just talked about things that agricultural producers could do to help keep the environment clean for future generations. Doing this requires a lot of planning from the agricultural producer.

Here's a question. What does your future look like?

Pause for a few seconds.

What goals are in your future?

Pause for a few seconds.

How are you preparing for the future?

Pause for a few seconds.

The agricultural producer must think about his or her actions in the present and in the future. ***Production agriculture*** and ***environmental stewardship*** go hand in hand. Keep in mind, however, that agricultural producers are not the only people who need to be stewards of the environment. We should all strive to keep our environment clean.

Review/Summary

For the review, you will utilize the Show What You Know e-Moment. For this e-Moment, you will tell students that it is time to "show what you know." You will give the students two questions to answer. Students can answer the questions by writing out the answer or drawing a picture and verbally explaining it. Students will answer the question without looking at notes. After questions have been answered, students will check their own work by comparing their response to any notes taken and your response. You will visually check each student's work by walking around and asking questions if necessary. Use the results of your visual inspection to determine if re-teaching or reinforcing is necessary before continuing with the assessment. If you are running short on time, tell the students to show their partner the answer written or drawn and explain the answer to the partner, then you will tell the class the correct

Thank you for participating in today's activities. It's time to show what you know! We are going to do a quick review of today's lesson.

Grab a scrap piece of paper and something to write with. Please get these items now.

Pause and allow students to gather materials. While students are getting paper, write the following two questions on a writing surface: 1. What is ***production agriculture?*** 2. What is ***environmental stewardship?***

Observe the two questions on the board. When I say SHOW WHAT YOU KNOW, answer these questions on your scrap paper. Write down your answer or draw a picture to answer each question. Do not write the questions; simply number the answers one and two. After you have completed your answers, check your own work by referring to any notes that you took. You will have two minutes to answer these questions. What questions are there? SHOW WHAT YOU KNOW.

Walk around visually inspecting answers and asking students to explain their pictures. After five minutes, continue.

Time is up, excellent responses to the questions. Now, check your answers with these. Number 1 – ***Production agriculture*** is the raising of domesticated plants and animals for human consumption. Number 2 – ***Environmental stewardship*** is the responsibility of humans to manage and care for the whole natural environment, not just the parts that benefit the human race. What questions are there about today's lesson?

Answer any questions and present material again if necessary before giving the assessment.

It is important to remember that production agriculturalists, or farmers, produce the food that we eat and many of the items that are used for our clothing and shelter. ***Production agriculture*** is a necessary component of meeting the needs of humans. Furthermore, these agricultural producers rely on resources from the environment in order to be successful. Because of this, production agriculturalists are stewards of the environment. It is important to be aware of how production agriculturalists take care of our environment so that we can communicate this information to those who are unaware – after all, without ***production agriculture***, we would not have food, clothing, or shelter. Let's keep this in mind as we continue learning about agriculture.

Application

Extended classroom activity:

In groups, students can write and act out a 30-second television commercial about ***environmental stewardship***. After writing the script, have students perform the commercial for the class. An alternate activity would be to write a 30-second public service announcement.

FFA activity:

Develop an agricultural awareness presentation that focuses on ***environmental stewardship***. FFA members can present to a local civic club (Rotary Club, Lions Club, Optimists Club, etc.) meetings.

SAE activity:

Interview a local agricultural producer or agriculture industry worker about ***environmental stewardship*** practices in his/her respective occupation.

Evaluation

For the evaluation, make the appropriate number of copies of **MS.IAS.7.2.ASSESS.A**.

Answers to Evaluation

1. b
2. a
3. b
4. d
5. a

Name _____

Directions: Read each statement and decide whether it is true or false.

1. _____Keeping two goldfish as pets at home is an example of *production agriculture*.

a. True

b. False

2. _____Capturing rainwater and using it to water plants instead of pulling water from a well is an example of *environmental stewardship*.

a. True

b. False

3. _____*Production agriculture* always has a negative impact on the environment.

a. False

b. True

Directions: Reach each question and circle the response that best answers the question.

4. _____Which of the following is an example of *production agriculture*?

a. raising fish to be sold to restaurants

b growing apples in an orchard

c. raising chickens for meat that will be sold to grocery stores

d. all of the above answers

5. _____Which of the following is an example of a production agriculturist practicing *environmental stewardship*?

a. using ladybugs to eat aphids instead of spraying an insecticide onto plants

b. allowing cattle to access a creek that runs into the public water supply

c. both a. and b.

d. neither a. nor b.

Production agriculture practices in the environment

What is *production agriculture*?

- ***production agriculture***: raising domesticated plants and animals for human consumption

How might *production agriculture* potentially impact the environment?

- Water quality can be affected in positive and negative ways.
- Strong odors can be given off my farms.
- Farming could increase or decrease soil erosion depending on practices.
- Machinery and animals can be noisy to neighboring areas.
- ***Production agriculture*** balances the carbon cycle.
- Habitat for wildlife can be supported by ***production agriculture***.

Agriculture vs. *environmental stewardship*

What is *environmental stewardship*?

- ***Environmental stewardship***: the responsibility of humans to manage and care for the whole natural environment, not just the parts that benefit the human race

How are production agriculturists stewards of the environment?

- Agricultural producers rely on environmental resources for their operations and, therefore, must take care of the environment
- Agricultural producers must make management decisions that will decrease environmental impact
- not allowing farm animal waste to enter drinking water sources.

- limit the amount of pesticides and fertilizers used on soil

- cover stock-piled animal manure and bedding to prevent water contamination

- maintain healthy plants in pastures to prevent erosion

- use fencing to control where animals have access

- agricultural producers should learn about, plan for, and carry out best management practices for their farm