



Plants Have Issues Too – Issues Related to Plant Production

Middle School Food and Agricultural Literacy Curriculum

Precepts

- J. Mental Growth
 - J1. Think critically
 - J2. Think creatively
 - J4. Solve problems

National Standards

- CS.02.04.01.c. Demonstrate critical and creative thinking skills while completing a task.
- CS.02.04.02.c. Implement effective problem solving strategies.
- NL-ENG.K-12.12 – Applying Language Skills
- NL-ENG.K-12.4 – Communication Skills
- NS.5-8.3 – Life Science
- NS.5-8.5 – Science and Technology
- NS.5-8.6 – Science in Personal and Social Perspectives
- NSS-EC.5-8.1 – Productive Resources

Student Learning Objectives

- As a result of this **unit** the student will...
- Examine the components of Food and Agricultural Literacy: Applying Mathematics and Science Concepts Curriculum
- As a result of this **lesson**, the student will ...
- Explain consumer, production, and processing issues related to plant science.

Content Outline

Note to Teacher: This lesson closely follows the format of **MS.IAS.8.3** which is the issues related to animal science. Both lessons are developed as exclusive, stand-alone lessons, but are best taught together with only a review of the stages of production in lesson 8.3.

Objective 1. Explain **consumer**, **production**, and **processing issues** related to plant.

Time

Instruction time for this lesson: 45 minutes.

Resources

Herren, R.V. (2007). *The Science of Agriculture*. New York, NY: Thomson: Delmar Learning.

Tools, Equipment and Supplies

- Transparencies/Projector
- Writing Surface
- Articles that address different viewpoints on each of the plant issues listed below (Internet and computer access if students are to research their own articles)
- Large pieces of paper (butcher paper would work best)
- Plant products
- Markers
- MS.IAS.8.2.TM.A – one per teacher
- MS.IAS.8.2.TM.B – one per teacher
- MS.IAS.8.2.AS.A – two per student
- MS.IAS.8.2.ASSESS.A – one per student

Key Terms

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

- Production**
- Processing**
- Consumer**
- Issues**

What are the stages of producing plant products?

Production Phase

- The **processing** of planting, tending, and harvesting plants in order to produce a product.

Processing Phase

- The **processing** of plants into products to be used by **consumers**.

Consumer Phase

- The phase that starts when the **consumer** buys a product to the point that it is consumed.

Issues Related to the Three Phases of Plant

Production

- Chemical and Pesticide Safety
- Genetically Modified Organisms
- Environmental Concerns of Crop **Production**



Plants Have Issues Too – Issues Related to Plant Production

Before teaching this lesson refer to **MS.IAS.7.1**

Interest Approach

Prior to class, arrange the desks so there are groups of four to five students. At each group station have a large piece of paper (butcher paper or poster paper) and markers.

As students walk in, have a number of plant products sitting in the front of the classroom. On the board or writing surface, have the question, "What did it take to get these products to the grocery store and into our classroom?" Products could include cereal, bread, cotton t-shirts, jar of corn, or any other plant product.

As you find your seat think about the question on the board that corresponds to the products we have at the front of the class. You'll see stations around the room. Create groups of four to five at each station and wait for further instructions.

So many times we eat our food without ever thinking about where our food came from or the processes that had to happen to get the products to the **consumer**. When I say BROCOLLI your group's task is to map out every step that was required to produce one item of food that you choose in five minutes. For example, the first step for cereal might be planting wheat seeds and the last step is packaging the final product. Think of as many as you can. What questions are there? BROCOLLI!

Monitor students as they create this timeline. Some students may need prompts to get their ideas flowing. Answers should include areas of production, processing, and consumption. Give students benchmarks to let them know the time that is left.

Time is up! Great job! Your groups identified many of the major steps of producing, **processing**, and consuming plant products. Who will share the steps they came up with in regards to their product?

Allow student groups to share the product they chose and the steps they came up with. You could begin to challenge some of their steps setting the context for the issues/concerns associated with plant production. Allow as many groups to share as time permits. Wrap up the sharing after five to ten minutes.

As you can see, there are many important steps involved in creating these products.

It is important that each of us know where our food comes from, the processes that are used to produce our food, and the **issues** associated with producing this food. If you are informed about your food, you can make better decisions about what you choose to buy or eat!

Today we are going to discuss and research together the **issues** associated with producing plant products. We are going to learn more about the three phases of **production**, which are **production**, **processing**, and **consumption**, and we are going to look at different **issues** that occur at each stage.

Use Motion e-Moment® to emphasize new concepts with the students.

These three phases are important to remember. Let's make a motion for each of the phases. First is **production**. This is where we are growing the products whether it is plants or animals. Who will make a motion to represent **production**?

Have the student share the motion.

Okay class, let's all give it a try. Who will create a motion for **processing**? This is the phase where we take raw products and change them so that people can consume them.

Have a student create a motion.

Great! Let's try it, class. The last phase is consumption. This one is easy. Who will create a motion for this phase? *Have a student create a motion.* Good. Let's all do the motion together.

You might look at your lunch differently today! Let's get started!

Summary of Content and Teaching Strategies

Objective 1. Explain consumer, production, and processing issues related to plant science.

Utilize **MS.IAS.8.2.TM.A** as an overview of content

A. What are the stages of producing plant products?



Lesson Number: MS.IAS.8.2

Middle School Food and Agricultural Literacy Curriculum

Plants Have Issues Too – Issues Related to Plant Production

The best place to start is to learn the three major phases of **production**. Who will share again the phases I just mentioned?

Elicit responses from students. Answers should be production, processing, and consumption.

Exactly. **Production, Processing, and Consumption** are the three phases. Let's create our own definitions for these words. When I say DEFINE, work with your group to create a definition for each of the phases. DEFINE!

Be available for students' feedback. Let them know at four minutes that they have 30 seconds to wrap up their definitions. Write the three words on the board while they are working.

Who will share their definitions first?

Group shares their definitions. Work through each group.

Those were great definitions. Let's combine our ideas into one definition.

Using student feedback, write a definition on the board for each of the phases.

Now that we know what the three phases are, go back to your chart and separate the steps you wrote down into the three phases. You have two minutes so stay focused.

Move to each group and provide feedback on their choices.

Because of your quick work, we now understand the three phases of **production** and what happens within each phase. Next, we will begin to explore some of the basic **issues** or concerns that are common in each phase.

B. **Issues** Related to the Three Phases of Animal Production

Utilize **MS.IAS.8.2.TM.B** as an overview of content.

We see things in the news all the time about plant **production**, but can you believe everything that you hear or see? Absolutely not! Every time we read or hear something, we have to think about all the different points of view on that **issue**. Let's give that a try.

At this point in the lesson, students will analyze a number of articles and report back in terms of what the issue is really about and the various points of view. You can do this by either having articles pre-selected and printed off, projecting specific articles onto a smart board or projection screen or have students do their own research on the Internet. If possible, find articles that relate to issues found in your community.

The point is for students to explore the real issues that arise and then critically evaluate and learn about the three major issues listed. For this lesson plan, the printed off articles will be the method used.

Students remain in their three original groups.

What do you think the **issues** in plant agriculture are?

Allow students to respond.

Collect answers on a writing surface

You are right. Those **issues** can be summed up into three main **issues** we will look at today:

Chemical and Pesticide Safety

Genetically Modified Organisms

Environmental Concerns of Crop **Production**

Hand out articles that you have pre-selected and printed off in relation to these topics. Try to find two articles for each topic posing different viewpoints.

Each group has been given two articles dealing with one of the three **issues**. Your task is to read the articles, take notes on the **Issues** Review Sheet (**MS.IAS.8.2.AS.A**) and be prepared to share with the group in less than five minutes the various viewpoints of the issue your group has. You have 10 minutes to read and assess the articles. What questions are there? Get started!

Monitor student progress. Answer any student questions about the articles and provide time benchmarks to keep the students on track.

Give the students a one-minute reminder.

Great job! Let's discuss the **issues**. As a hint, you will need to form an opinion on each issue at the end of class so make sure you are listening and thinking about the **issues**. The presenters should clearly share their ideas on the issue and each audience member should be taking notes on the issue. Which group will be the first to share their issue and the different opinions on that issue?



Lesson Number: MS.IAS.8.2

Middle School Food and Agricultural Literacy Curriculum

Plants Have Issues Too – Issues Related to Plant Production

Choose one group.

Just a reminder you have only five minutes to share.

Allow all three groups to present.

You all did an excellent job summarizing the issues. As you can see, many people have different opinions about these three important issues. Having different opinions is OK, but it is important that your opinion is based on facts and is an educated opinion – not just an opinion based on what you hear.

Review/Summary

Hopefully today you have formed some educated opinions of your own! What if the local news station showed up right now to interview you? What would you say? Let's give it a try!

Use the Eye Witness News e-Moment:

The teacher plays the role of the news anchor. Each student must assume the character of a citizen being interviewed on the local news. The questions are centered on production agriculture.

Good evening, folks! We are here at the international plant convention and are trying to get to the bottom of the key issues of producing food from plants. Let's start with you, Sir/Ma'am.

Choose a student. Continue interviewing students until all the questions have been answered. Make it fun by adjusting to the answers and asking students to respond to each other's responses. Start with the following three questions.

Do you believe it is OK to eat food that has had chemicals sprayed on it?

I've heard people call genetically modified food " Frankenfood." Is it really?

Does growing plants for **production** hurt or help the environment?

Thanks to all the experts! Signing off.

Before we leave, turn to someone near you, give him or her a high five, and tell them, "You know what you're talking about!" Today we have looked at the three major **issues** associated with growing plants. You can now be an educated **consumer** and producer of plants!

Application

Extended classroom activity:

This lesson (along with lesson **MS. IAS.8.3**) can be extended by designing a structured controversy. This would include students conducting research on the three issues and preparing an argument for a debate. Students must also be able to debate the opposing view. The flow of the debate would be as follows:

- Side 1 presents their opening statement
- Side 2 presents their opening statement
- Side 2 asks questions to Side 1
- Side 1 asks questions to Side 2
- Both teams switch their side and give closing statements debate for the opposing team.

FFA activity:

This lesson plan closely ties to the Agricultural Issues contest. At this point, teachers can take a few minutes to explain what the contest is, how it relates to the lesson, show a video of a previous team that competed, have chapter members who have done the contest present to the class or even let them choose an issue and develop a presentation.

SAE activity:

Any students that have an SAE involving plants could serve as "experts" and provide their opinions or real life issues that they have faced. Guest speakers who are involved in plant science could discuss the issues and careers in the industry.



Lesson Number: MS.IAS.8.2

Middle School Food and Agricultural Literacy Curriculum

Plants Have Issues Too – Issues Related to Plant Production

Evaluation

To evaluate students' understanding you have the option of collecting the issue review sheets or utilizing **MS.IAS.8.2.ASSESS.A.**

Answers to Evaluation

For MS.IAS.8.2.ASSESS.A use the following answers:

- Answers vary depending on the student's opinion. Look for elements that are relevant to the discussions that occurred during the lesson.
- Answers vary depending on the student's opinion. Look for elements that are relevant to the discussions that occurred during the lesson.
- Answers vary depending on the student's opinion. Look for elements that are relevant to the discussions that occurred during the lesson.



What are the stages of producing plant products?

Production Phase:

- The processing of planting, tending, and harvesting plants in order to produce a product.

Processing Phase:

- The processing of plants into products to be used by consumers.

Consumer Phase:

- The phase that starts when the consumer buys a product and ends at the point that it is consumed.



Issues Related to the Three Phases of Plant Production

- **Chemical and Pesticide Safety**
- **Genetically Modified Organisms**
- **Environmental Concerns of Crop Production**



Issues Review Sheet

Article Name:

Who wrote the article? How does that affect what he/she had to say?

Overview: What are the main points in the article?

What do you agree with?

What do you disagree with?



Name: _____

1. What is your educated opinion about the effect of plant production on the environment?

2. What is your educated opinion on the use of pesticides and other chemicals?

3. Do you believe genetically modified crops are safe to eat? Why or why not?
