Lesson Number: MS.AI.2.3

Using Math to Understand the Economic Impact of Agricultural Issues

Middle School Food and Agricultural Literacy Curriculum

Precepts

J. Mental Growth

J2. Think creatively

National Standards

ABS.05.01.01.a. Identify accounting information in AFNR business reporting and management.

NL-ENG.K-12.3 – Evaluation Strategies

NL-ENG.K-12.8 – Developing Research Skills

NM-NUM.6-8.2 – Understand Meanings of Operations and How They Relate to One Another

NM-COMM.PK-12.1 – Organize and Consolidate Their Mathematical Thinking Through Communication

NM-REP.PK-12.1 – Create and Use Representations to Organize, Record, and Communicate Mathematical Ideas

NSS-EC.5-8.13 – Income and Earning

Student Learning Objectives

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

Discuss the economic impacts of agriculture.

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

Define income, expense, and profit.

Create a graph that illustrates farm expenses.

Content Outline

Objective 1. Define *income*, *expense*, and *profit*.

I. Define *Income*, *Expense*, and *Profit*.

A. ***Profit***: returns, proceeds, or revenue, as from property or investments.

B. ***Income***: the monetary payment received for goods or services, or from other sources, as rents or investments.

C. ***Expense***: cost or charge

Time

Instruction time for this lesson: 45 minutes.

Resources

Farm Bureau. (2010). Food & farm facts. Retrieved from http://www.fb.org/index.php?fuseaction=yourag.facts — http://agedlearning.org — National FFA Organization. (2003). LifeKnowledge Precepts and Signs of Success.

Tools, Equipment, and Supplies

Overhead projector
Paper
Colored Pencils
Calculators
MS.AI.2.3.ASSESS.A – one per student
MS.AI.2.3.TM.A – one per teacher
MS.AI.2.3.TM.B – one per teacher
MS.AI.2.3.AS.A – one per student

Key Terms

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

Income

Expense

Profit

Interest Approach

Students are given a scenario that a wealthy alumnus has donated money to their class to start an agriculture business. Students will pair up and decide if the business should offer a product or service then compile a list of items that the business would need. Students will write their ideas on the board then discuss those items.

Congratulations! A wealthy alumnus has decided to donate money to our class for us to create an agriculture-based business. We can only spend the money on starting the business, not for continued operation. When you hear MONEY you will have three minutes to decide what kind of business our class should operate with your shoulder partner.

It is best to give students a short amount of time to complete a task so it creates a sense of urgency to get started and finish on time. If more time is needed, which is usually the situation, provide an extra two or three minutes for this task.

Decide if we should offer a product or a service then identify the things we would need for that business. What can I clarify? MONEY!

I have overheard some interesting ideas. We will not be keeping these ideas to ourselves, so place your ideas off to the side it is important that you understand some concepts to accurately gauge how well this business will thrive.

Summary of Content and Teaching Strategies

Objective 1. Define *income*, *expense*, and *profit*.

Please locate your notebooks and record the following definitions…

What is the purpose of any business?

Allow students to answer then draw their attention back to making money.

All of your thoughts are right, but let's focus on this desire to make money. In the business world, we have a term for making money, we call it ***profit***. In your notes, capture this definition of ***profit***.

Display first bullet point on **MS.AI.2.3.TM.A**.

The goal of every business is to make a ***profit***. How do we make a ***profit*** in business?

Lead students into realizing that in order to make a ***profit***, you must bring in more money than you spend.

When we bring money to our business by either offering a service or selling a product, we call that money ***income***. Every month, as a teacher, for providing this service of teaching, I receive an ***income*** in the form of a paycheck. To anchor our understanding of ***income***, jot this down in your notes:

Display second bullet point on **MS.AI.2.3.TM.A**.

If money brought in is ***income***, then what do we call money that goes out of the business?

Allow time for students to respond.

We call this money ***Expenses***. For our business there will be ***expense***s. Let's add the definition of ***Expense***s to our list.

Display third bullet point on **MS.AI.2.3.TM.A**.

Very good! With those three definitions, we have a beginning understanding of how a business works. There are many different types of agriculture businesses, and even people involved in production agriculture need an understanding of ***profit***, ***income***, and expenses.

Let's revisit our ideas. When you hear ACCOUNTING, you will have five minutes to regroup with your partner and your original list of ideas. Label each item on your business needs list as ***profit***, ***income***, or ***expense***. What questions do you have? ACCOUNTING!

Provide students time to label.

As we look over our labeled list, do you see more money coming in or going out?

Students should comment on more money going out.

I'm confident that all of our business ideas are viable, but let's choose one of our business ideas that falls in the agriculture product category. Who will share their business idea for an agriculture product?

After students share their ideas, have them decide which idea they want to work with.

On average, what do you think is the greatest ***expense*** farmers have in producing food?

Allow for students to respond.

As we move on we will see if your responses are correct and we will look at how those ***expenses*** compare to each other.

Objective 2. Create a graph that illustrates farm *expenses*.

In just a second I am going to reveal a list that contains the average ***expenses*** a farmer has in producing their crop or product. Let's see if this list matches up with what we thought would cost the most.

Using Math to Understand the Economic Impact of Agricultural Issues

Use **MS.AI.2.3.TM.B** to identify average farm ***expenses***.

How does this list compare to what we thought? Some things are correct, but we missed a few things too. How is the data on this list expressed?

Students should answer "percentages."

Percentages! That's right! What type of chart is used to express percentages?

Students should respond with "pie chart."

A pie chart. Correct! We are going to use these numbers to create our own pie charts.

Pass out the paper, colored pencils, and calculators. Students should create a pie chart that represents the data.

Do you think these ***expenses*** are higher or lower than the previous year? They are actually higher, 14.2 percent higher in fact. Why do you think that is?

Lead students to understand that because of rising energy costs, economic recession, and competition from other sources, all of these things have led to higher input costs.

As consumers, it is important to understand how a business functions and how ***expenses*** can affect the life of our business.

Review/Summary

Utilize the *Almanac/Encyclopedia e-Moment*® to review the key concepts. This activity helps students make meaningful connections with new information. Ideally, each student will have his or her own reference book, either an almanac or encyclopedia. Students will locate a word or topic in the reference book, most often it will be an unrelated item to the information presented in class.

Students will share the connection they made between the term learned in class and the term located in the reference book. For example, students learned about expense.

Let's say they chose the term "tornado" from the reference book. Students must explain how these seemingly disconnected terms are related and make the connection that like a tornado, ***expenses*** are in a constant cycle/whirlwind in any business.

Each student should match ***income, expense, and profit*** with at least one term from the reference book. Distribute reference books and **MS.AI.2.3.AS.A**.

To further demonstrate the widespread use or continuous undercurrent of ***income, expense, and profit*** in multiple situations, we're going to use these reference books and our creative minds to accomplish this. The goal of this activity is to create connections between seemingly unconnected terms. Please look at the sheet I just gave you. Pretend that we chose the word "tornado" in our reference books. Now, write the word "tornado" in the first blank cell in the column "Unrelated Terms." Next, think of how "***expenses***" and "tornado" are alike in some way. Who will share their thoughts?

Have students share ideas, but direct them toward the conclusion that ***expenses*** are in a constant cycle/whirlwind or other appropriate connections.

I have some visionaries in this class! Fantastic! Write down the connection between "***expenses***" and "tornado" in the column titled "Connection."

Allow time for students to include answer.

When you hear BRIDGE you will have 10 minutes to complete this activity sheet. Simply repeat the steps that we just made and turn in your work when you are finished. BRIDGE.

We've made some awesome connections today by making a hypothetical situation a real learning situation. Continue to bridge the gaps like what was done today and someday you'll be making enough money that you can give it away too!

Application

Extended classroom activity:

Have students create a list of all the ***expenses*** their family has in a week. Then put them into categories and create a pie chart of the ***expenses***.

FFA activity:

Have students give a speech to another class about the importance of knowing where your money goes. Use their business idea as an example.

SAE activity:

Students should interview an agriculture business person about ***income***, ***expenses***, and ***profit*** and how they keep track of that information.

Evaluation

MS.AI.2.3.ASSESS.A

Answers to Evaluation

1. Profit: returns, proceeds, or revenue, as from property or investments.
2. Income: the monetary payment received for goods or services, or from other sources, as rents or investments.
3. Expense: cost or charge

Name: ______________________________

Short answer

Answer the questions in complete sentences. Include examples discussed in class to strengthen your response.

1. **What is profit?**

____

____

2. **What is income?**

____

____

3. **What is expense?**

____

____

TERMS TO KNOW

- **Profit: returns, proceeds, or revenue, as from property or investments.**

- **Income: the monetary payment received for goods or services, or from other sources, as rents or investments.**

- **Expense: cost or charge**

Average Farm Expenses

From Farm Bureau

Fertilizer, Seed, Crop-Protecting Chemicals	18.5 percent
Feed	15.6 percent
Miscellaneous	11.0 percent
Capital Upkeep and Replacement	9.8 percent
Farm Labor	9.3 percent
Interest, Property Taxes	8.6 percent
Fuel, Electricity	7.1 percent
Purchased livestock	6.1 percent
Repair, maintenance	5.3 percent
Farm services	5.2 percent
Rent	3.5 percent

Name ______________________________

Connect the Dots

Directions: Locate a word from the dictionary that is not related in meaning to the term in the first column. Write the word, or unrelated term, you found in the dictionary in the middle column. In the last column describe how the terms in the first and middle columns are similar in some way.

TERM	UNRELATED TERM	CONNECTION
Expense		
Expense		
Expense		
Income		
Income		
Income		
Profit		
Profit		
Profit		