Teaching Guide

For

Grain Storage Module

Illinois Transportation, Distribution and Logistics
Math and Science Project

2007

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Acknowledgements

We would like to recognize the following people for their contribution to this module:
Robert Emme, Mentor, Havana, IL
Don Hahn, local farmer, Havana, IL
Kraig Krause, local farmer, Havana, IL
Fred Serven, Manager ADM-Havana, Havana, IL

Problem Solving Activity

Teacher Assessment Materials

- Final Evaluation
- Scoring Guide
- Sample Solution for Problem 1A
- Sample Solution for Problem 1B

Appendix

Glossary of Terms

Scenario Focus

Primary Career Pathway: Warehousing and Distribution Center Operations, Sales and Services

Occupation/Job Titles Related to this Scenario: Regional Manager, Assistant Manager, Regional Superintendent, Assistant Superintendent, Superintendent Management Trainee, Merchandiser, Clerk, Grader/Weigher, Outside Laborer

Recommended Teaching Subject Areas: Communication, Math

Teacher/Writer Information

Raeann Emme, Havana Junior High remme0@roe38.k12.il.us
Dawn Hughes, Havana Junior High dhughes@roe38.k12.il.us
Phone No. 309-543-6677

Business/Industry/Government Partner

Fred Serven, Manager Havana ADM, (309)-543-3392, ADM, Havana, IL

Scenario Problem Statement and Performance Elements

Problem 1A

You are the Manager of ADM- Havana. You have been asked to maximize your revenue and present a plan. Currently you have 400,000 bushels of wheat in one of the grain bins in Havana. The rest of your bins are empty and ready for the farmers to harvest grain.

Background Information:

- There are 10,000 acres of corn around Mason City, IL that will yield 180 bushels per acre.
- There are 5,000 acres of soybeans that will yield 50 bushels per acre.

Storage Information:

- 2 bins in Havana are 80 ft. tall and hold 5,000 bushels per foot.
- 5 bins in Havana are 80 ft. tall and hold 400 bushels per foot.

Futures Market Information:

Oct. 1: CORN PRICES

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
Havana	$2.40	$2.50	$2.65	$2.70	$2.75	$2.80	$2.90	$2.92	$2.94	$2.93	$2.90

Oct. 1: BEAN PRICES

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
Havana	$5.78	$5.87	$6.09	$6.13	$6.16	$6.19	$6.15	$5.90	$5.95	$6.00	$6.00

Oct. 1: WHEAT PRICES

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
Havana	$3.20	$3.22	$3.40	$3.50	$3.60	$3.70	$3.80	$3.90	$4.00	$3.80	$3.90

Problem 1B

You are a farmer from Mason City, IL. It is 25 miles from your farm to Havana, 90 miles to Decatur, and 65 miles to Peoria. It will cost $1.40 a running mile to get your crop to the elevator. Your truck will hold 900 bushels of corn or 850 bushels of soybeans. To maximize your annual profit you need to determine which of the three options you should pursue. You will harvest 1,800,000 bushels of corn and 250,000 of soybeans. Currently, there are 400,000 bushels of wheat stored in Havana with zero storage cost.

Option 1: Harvest your crop and sell it immediately at one of the 3 elevators.

Option 2: Harvest your crop and store it in Havana or Mason City at 12 cents per bushel until you decide to sell.

Option 3: Build you own storage facility and store your crop until you are ready to sell. It will cost $1 per bushel to build.

Futures Market Information:

Oct. 1: CORN PRICES

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
Havana	$2.40	$2.50	$2.65	$2.70	$2.75	$2.80	$2.90	$2.92	$2.94	$2.93	$2.90
Peoria	$2.55	$2.55	$2.55	$2.55	$2.60	$2.65	$2.85	$2.85	$2.85	$2.85	$2.85

Oct. 1: BEAN PRICES

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
Havana	$5.78	$5.87	$6.09	$6.13	$6.16	$6.19	$6.15	$5.90	$5.95	$6.00	$6.00
Decatur	$5.90	$6.00	$6.10	$6.20	$6.25	$6.25	$6.25	$6.27	$6.27	$6.30	$6.33

Oct. 1: WHEAT PRICES

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
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TDL Cluster Knowledge and Skills and Performance Elements

- Determine size and configuration of storage structure.
- Analyze changing market needs.
- Organize information to use in written and oral report.
- Identify the best solution based on risks, costs, and benefits.

Illinois Learning Standards:

Math

- Select and explain an appropriate formula or strategy to find the surface area and volume of rectangular and triangular pyramids, cylinders and cones. (7.C.3a)
- Construct, read, and interpret tables, graphs, and charts to organize and represent data. (10.A.3a)
- Solve practical computation problems involving whole numbers, integers, and rational numbers. (6.B.3a)
- Select computational procedures and solve problems with whole numbers, fractions, decimals, percents and proportions. (6.C.3a)
- Show evidence that computational results using whole numbers, fractions, decimals, percents and proportions are correct and/or that estimates are reasonable. (6.C.3b)
- Construct and solve number sentences using a variable to represent an unknown quantity. (8.A.2b)

Language Arts:

- Produce documents that convey a clear understanding and interpretation of ideas and information and display focus, organization, elaboration, and coherence. (3.B.3a)
- Deliver planned oral presentations. (4.B.3a)
- Design and produce reports and multimedia presentations that represent group projects. (4.B.3b)

What I Want Students to Know	What I Want Students to be Able to Do
• Definitions for logistics and distribution. • Understand the role of logistics and distribution in the grain market industry. • Career opportunities in logistics and distribution • Major types of distribution channels • Major costs of distribution • Understand the factors concerning route planning for moving products to more than one location.	• Decide when and where to sell the commodity. • Decide how much commodity to store and where to store it. • Plan how to maximize the profit for the company. • Plan how to maximize the profit for the farmer. • Calculate cost of transportation for specific commodities. • Calculate cost of storing commodities at storage facilities. Write a business report and make a presentation.

Objectives:

- Learn about the role of logistics and distribution within the agricultural industry.
- Acquire the skills needed to develop a distribution plan for grain commodities in their communities.
    - Describe the major types of distribution channels for the physical distribution of products.
    - Describe and calculate the major types of costs in the physical distribution of products.
    - Identify and describe all possible routes between a location of origin and multiple locations to where you must travel; then select the lowest cost route.

- Prepare a written business report.
- Deliver an oral presentation of the business plan.

Measurement Criteria for an acceptable solution:

1. Selected the most cost effective means for delivering and selling commodity.
2. Evaluated alternative locations and cost differences.
3. All calculations were correct using formulas and charts provided.
4. Presentation presented the information with visual aids and/or handouts. The presentation met the 7 requirements of effective business presentations:
    - Evidence of preparedness and practice
    - Started on time
    - Dressed appropriately
    - Showed enthusiasm and confidence
    - Maintained eye contact, showed friendliness and respect
    - Spoke slowly and distinctly without grammatical errors or slang
    - Welcomed questions and answered completely; Accepted reactions without being defensive.

Teacher Notes:

Students should have a good working knowledge of math and formulas. Additional content on transportation modes, writing reports and making presentations may be necessary for some students. This can be done congruently with the scenario or prior to working on the scenario

Please review the materials needed prior to starting the problem solving activity so that you can make copies or obtain items needed. Notify students of the date that presentations will be made.

Use discretion in providing ADM employee contact information. Direct students to the company website for basic information. You may have available another business that you can work with in your local area. This material can be modified to incorporate that change. In addition, the field trip and information from the local farmers was extremely beneficial and should be included if possible.

Time Required to Complete Problem: 14 hours

Types of Materials included in this Module:

1. Lesson plans for each topic with discussion questions and student activities.
2. Copy of student handouts with activities for duplication.
3. Copy of material describing problem for students.
4. Evaluation with measurement criteria and scoring guide.
5. Teacher materials to assist in evaluation of problem and possible solution steps.
6. Glossary of terms related to this module.

Support Materials and Resources Necessary for Completion of Scenario:

- Computer access to internet
- Handouts (see each lesson)
- Websites (see each lesson)
- M&M candies
- Handheld GPS unit
- Calculators
- clipboards

Lesson 1

TOPIC	Overview of Logistics & Distribution	TIME ESTIMATE	45 minutes

OBJECTIVES
Students will be able to define logistics and distribution.

MATERIALS & RESOURCES
• Laptop & Projector • Flash Drive with Caterpillar Power Point Presentation

LESSON DESCRIPTION & ACTIVITIES

Steps	No. of Minutes	ACTIVITIES
1	20	- Introduction to Project 1. Explain TDL 2. Discuss TDL jobs & required mathematics -Question/Answer time
2	15	-Explanation of what students will be doing in this project.
3	10	-Question & Answer time -Discuss field trip to ADM

Lesson 2

TOPIC	Online ADM Information Activity	TIME ESTIMATE	45 minutes

OBJECTIVES
• Students will learn the basics of the ADM operation. • Students will learn the origin of grain commodities and their various modes of transportation/distribution.

MATERIALS & RESOURCES
• Handout #1 • Internet access for entire class • Websites: www.admworld.com

LESSON DESCRIPTION & ACTIVITIES

Steps	No. of Minutes	ACTIVITIES
1	5	- Distribute copies of Handout #1 to students. - Discuss Handout #1 requirements.
2	40	- Give students time to complete Handout #1.

Name _____

Go to www.admworld.com.

1. What does ADM stand for?

2. They are the world's agricultural producers of _____,

_____, _____, and _____.

3. We work with farmers across the world to turn these crops into _____

and _____, _____, _____, cocoa and

_____, _____ and biodiesel, as well as a wide portfolio of other

value-added food ingredients, animal nutrition and industrial products.

Click on English under North America. On the left side click on About ADM.

4. ADM serves as a vital link between _____ and
_____.

ADM takes crops and processes them to make _____ ingredients,

_____ _____ ingredients, _____ fuels and naturally

derived alternatives to industrial chemicals.

5. ADM was founded in _____ and incorporated in 1923, ADM is headquartered in_____, _____, and operates processing and manufacturing facilities across the United States and worldwide. Through our extensive global distribution facilities and capabilities, ADM makes a significant contribution to the world's economy and quality of life.

Click on Locations on the left side under the heading About ADM.

6. Besides the US, list the other five regions of the world where ADM has a facility and what they process.

Region	What do they process at the facility?

Click on FAQs on the left side under About ADM.

7. How many people does ADM employ worldwide?

8. On how many continents does ADM have offices and facilities? _____

9. In how many countries does ADM do business? _____

Click on Careers on the left side. Then click on Professional Staffing.

10. Choose Transportation from the list. Write at least four things an employee at ADM would do if employed in the field of transportation.

11. What are the educational requirements for this type of job?

12. What opportunities in transportation exist at ADM?

Click on Food Ingredients on the left side. Then click on Product Summary under that heading.

13. What are the four staple products of agriculture?

14. How many different food ingredients does ADM produce? _____

15. By using the tab on the left side of the page, research at least four more areas of industry that ADM is involved in.

Lesson 3

TOPIC	TDL Board Game	TIME ESTIMATE	45 minutes

OBJECTIVES
• Students will be able to define logistics and distribution. • Students will explain how products get from the manufacturer to the store.

MATERIALS & RESOURCES
• **TDL Tabletop Game (Materials available via www.tdlmathscience.org)** • **Handout #2**

LESSON DESCRIPTION & ACTIVITIES

Steps	No. of Minutes	ACTIVITIES
1	5	- Distribute copies of TDL Tabletop Game and game pieces to students. - Discuss game rules.
2	20	- Have students play Tabletop Game on logistics and distribution.
3	10	- Distribute Handout #2 and have students answer follow-up questions.
4	10	- Discuss student's answers to Handout #2 and answer any questions.

TDL Board Game

Name_____

1. What new terms did you learn and what do they mean?

2. What did you learn about transportation that you didn't know before?

3. What does a distribution center do?

4. Who does a store depend on to get their goods?

Lesson 4

TOPIC	Online Vocabulary Activity	TIME ESTIMATE	45 minutes

OBJECTIVES
Students will define the following terms: commodity, acre, bushel, futures, expenses, profit, distribution, revenue, and yield.

MATERIALS & RESOURCES
• Handout #3 • Internet access for all students. • www.wikipedia.org or utilize one of the search engines for each word

LESSON DESCRIPTION & ACTIVITIES

Steps	No. of Minutes	ACTIVITIES
1	5	- Distribute Handout #3. - Give Online Vocabulary Activity instructions: • Have students complete the column "What you think the word means." • After completing the above task, students may use an online reference source to complete the column "What the word actually means."
2	35	- Students will complete activity. - If time permits, students may complete Bonus activity on handout.
3	5	- Discuss activity/wrap-up.

Online Vocabulary Activity

Name_____

Define the following terms.

Vocabulary Word	*What you think the word means:*	*What the word actually means:*
Acre		
Bushel		
Commodity		
Crop		
Distribution		
Expenses		
Futures		
Profit		
Revenue		
Yield		

Bonus:

Find the average yield of corn per acre in Illinois: _____ bushels/acre

Find the average yield of beans per acre in Illinois: _____ bushels/acre

Find the average yield of corn per acre in the US: _____ bushels/acre

Find the average yield of beans per acre in the US: _____ bushels/acre

Lesson 5

TOPIC	ADM Field Trip	TIME ESTIMATE	2 hours

OBJECTIVES
• Students will learn the basics of the Havana ADM operations. • Students will tour the ADM facility. • Students will learn the origin of grain commodities and their various modes of transportation/distribution from Havana.

MATERIALS & RESOURCES
• School bus • Handout #4 • GPS Units • clipboards

LESSON DESCRIPTION & ACTIVITIES

Steps	No. of Minutes	ACTIVITIES
1	15	- Distribute Handout #4, clipboards, & handheld GPS units. - Travel to ADM or other company that will provide the information students need.
2	30	- Meet Fred Serven & staff. - Overview of Havana ADM operations.
3	45	- Tour Facilities.
4	15	- Question/Answer Time.
5	15	- Return to school.

ADM Field Trip

Name_____

1. How many days a week are you open?_____
2. What are your hours?_____
3. What types of grain do you accept?_____
4. How much grain is in a bushel?

   Corn-_____

   Beans-_____

   Wheat-_____
5. How much grain is brought to the elevator each year?
6. What is the process when a load of grain is brought to your facility?
7. What happens if moisture count in grain is too high?
8. What happens if moisture count in grain is too low?

9. What is a grain contract?

10. What is a grain market?

11. How many grain bins do you have in Havana?

12. After the farmer leaves the grain and it has been tested, where does it go?

13. How do you determine where the grain goes?

14. What other ADM elevators are near Havana?

15. How many employees work at the elevator?

16. What types of jobs are available at the elevator?

GPS ACTIVITY:

- Using your handheld GPS unit, measure the circumference of each bin.
- Ask an ADM staff member for the height of the bin.
- For homework, calculate the volume of each bin.

	Height	Circumference	Volume
Bin #1			
Bin #2			
Bin #3			
Bin #4			
Bin #5			

Lesson 6

TOPIC	Problem 1A Presentation	TIME ESTIMATE	45 minutes

OBJECTIVES
Students will gain an understanding of the TDL Problem they will have to solve.

MATERIALS & RESOURCES
• Handout #5 • Guest Speaker

LESSON DESCRIPTION & ACTIVITIES

Steps	No. of Minutes	ACTIVITIES
1	30	- Distribute Handout #5. - Guest Speaker, Fred Serven will present Problem 1A.
2	10	- Allow time for students to ask questions regarding Problem 1A.
3	5	- Allow time for students to ask any other questions regarding the trip to ADM.

Problem 1A

You are the Manager of ADM- Havana. You have been asked to maximize your revenue and present a marketing plan. Currently you have 400,000 bushels of wheat in one of the grain bins in Havana. The rest of your bins are empty and ready for the farmers to harvest grain.

Background Information:

- There are 10,000 acres of corn around Mason City, IL that will yield 180 bushels per acre.
- There are 5,000 acres of soybeans that will yield 50 bushels per acre.

Storage Information:

- 2 bins in Havana are 80 ft. tall and hold 5,000 bushels per foot.
- 5 bins in Havana are 80 ft. tall and hold 400 bushels per foot.

Futures Market Information:

Oct. 1: CORN PRICES

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
Havana	$2.40	$2.50	$2.65	$2.70	$2.75	$2.80	$2.90	$2.92	$2.94	$2.93	$2.90

Oct. 1: BEAN PRICES

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
Havana	$5.78	$5.87	$6.09	$6.13	$6.16	$6.19	$6.15	$5.90	$5.95	$6.00	$6.00

Oct. 1: WHEAT PRICES

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
Havana	$3.20	$3.22	$3.40	$3.50	$3.60	$3.70	$3.80	$3.90	$4.00	$3.80	$3.90

Lesson 7

TOPIC	M&M Futures Farming	TIME ESTIMATE	45 minutes

OBJECTIVES

- Students will demonstrate an understanding of marketing farm commodities by selling corn for a profit.
- Students will demonstrate the ability to equate simple math functions.
- Students will discover the challenges a farmer or Grain Manager faces when marketing corn by completing hands-on activity.

MATERIALS & RESOURCES

- Print Handout #6 from this website: www.agintheclassroom.org/060605/Teachers/Resource%20Guides/7_8math.pdf search='corn%20market%20math%20lesson%20futures%20market or this link http://www.agintheclassroom.org/060605/Teachers/Resource%20Guides/7_8math.pdf#search='corn%20market%20math%20lesson%20futures%20market
- Calculators
- M&M's (16 oz. bag, 1 per group)

LESSON DESCRIPTION & ACTIVITIES

Steps	No. of Minutes	ACTIVITIES
1	5	- Introduce Farmers Dilemma
2	5	- Distribute M&M's and Handout #6 (from above website) - Students should proceed with Step 1
3	15	- Handout #6, Step 2 and 3
4	10	- Proceed with Step 4 and 5 as a group
5	10	- Discussion Questions: • How many of you realized that a farmer only makes money at certain times of the year?

		• How is the method of payment different than when some of your parents receive their paychecks? • What are some school subjects a farmer must be familiar with or understand well? • How would budgeting funds come into play in a farmer's family life?

Lesson 8

TOPIC	Solving Problem 1A	TIME ESTIMATE	3 hours

OBJECTIVES
• Students will solve problem 1A. • Students will select the appropriate formula to find the volume of a cylinder. • Students will represent specific agricultural situations using variables. • Students will interpret tables, graphs and maps in conjunction with related text. • Students will communicate information and ideas in narrative informative and persuasive writing with clarity and effectiveness. • Students will plan oral presentations.

MATERIALS & RESOURCES
• Calculators • Handout #5 (Use from Lesson #6) • Computers with Presentation software

LESSON DESCRIPTION & ACTIVITIES

Steps	No. of Minutes	ACTIVITIES
1	5	- Distribute Handout #5 (Use from Lesson #6) - Review Problem 1A - Answer any questions regarding the problem
2	85	- Students will work in small groups to solve Problem 1A.
3	45	- Students will work in their small groups to prepare a PowerPoint presentation with their conclusions to Problem 1 A

Lesson 9

TOPIC	Guest Speakers - Local Farmers	TIME ESTIMATE	1 class period or 45 minutes

OBJECTIVES
Students will have a better understanding of farming, the futures market, and the decisions farmers make.

MATERIALS & RESOURCES
• Guest Speakers on farming • **Handout #7**

LESSON DESCRIPTION & ACTIVITIES

Steps	No. of Minutes	ACTIVITIES
1	5	- Distribute Handout #7. - Introduce Guest Speakers: Don Hahn & Kraig Krause
2	30	- Topic: A Farmer's Point of View on TDL.
3	10	- Question/Answer session - Wrap-up

Guest Speaker Handout

Name _____

General Questions about Farming

1. What type of education or background does a successful farmer need?

2. If you weren't from a farm family, how much money would it cost to get started in farming?

Land –

Equipment –

Seed –

Chemicals –

Other –

3. How does a farmer decide when to replace equipment? (a new combine, a new bin, etc.)

4. How long can a crop stay in storage?

5. If you decide to store some grain, what is the process?

6. How does a farmer know when to plant and when to harvest a crop?

Plant –

Harvest –

6. Would you recommend farming as a career?

Specific Questions about Hahn/Krause Farms

1. How many years have you been farming?

2. How many acres do you farm? What crops?

3. What is your average yield per acre?

4. What is the highest price you have ever sold your crops at?

5. Since you have been farming, what has happened to price of grain? (Do you make more now per bushel than 20 years ago?)

6. Have you ever made a mistake (as in money wise)?

7. Do you have any employees who work for you on the farm?

Futures Market

1. What is grain contract?

2. Who sets the grain prices?

3. How does a farmer decide when to sell their crop?

4. How does a farmer know which elevator to take the grain to?

5. What do you do if you have figured out what you want to do with your grain and the price changes?

Lesson 10

TOPIC	Problem 1A Student Presentations & Problem 1B Presentation	TIME ESTIMATE	1 class period

OBJECTIVES
• Students will submit their written business to ADM Manager, Fred Serven. • Students will deliver an oral presentation of their business plan. • Students will gain an understanding of the TDL Problem 1B they will have to solve.

MATERIALS & RESOURCES
• Handout #8 • Guest Speaker • Computer with software for presentations

LESSON DESCRIPTION & ACTIVITIES

Steps	No. of Minutes	ACTIVITIES
1	30	- Each group will give a 5 minute presentation on their solution to Problem 1A
2	5	- Distribute Handout #8 - Guest Speaker, Fred Serven will present Problem 1B.
3	10	- Students will have time to ask questions regarding Problem 1B.

Problem 1B

Problem 1B

You are a farmer from Mason City, IL. It is 25 miles from your farm to Havana, 90 miles to Decatur, and 65 miles to Peoria. It will cost $1.40 a running mile to get your crop to the elevator. Your truck will hold 900 bushels of corn or 850 bushels of soybeans. To maximize your annual profit you need to determine which of the three options you should pursue. You will harvest 1,800,000 bushels of corn and 250,000 of soybeans. 400,000 bushels of wheat are already being stored in Havana with zero storage cost.

Option 1: Harvest your crop and sell it immediately at one of the 3 elevators.

Option 2: Harvest your crop and store it in Havana or Mason City at 12 cents per bushel until you decide to sell.

Option 3: Build you own storage facility and store your crop until you are ready to sell. It will cost $1 per bushel to build.

Futures Market Information:

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Lesson 11

TOPIC	Solving Problem 1B	TIME ESTIMATE	3-4 class periods

OBJECTIVES
• Students will solve problem 1B. • Students will represent specific agricultural situations using variables. • Students will draw conclusions and evaluate data from a chart. • Students will prepare a written business report. • Students will prepare and deliver their oral presentation.

MATERIALS & RESOURCES
• Calculators • Handout #8 from previous lesson • Handout #9 • Computers with presentation software

LESSON DESCRIPTION & ACTIVITIES

Steps	No. of Minutes	ACTIVITIES
1	5	- Student will need to use Handout #8 from previous day. - Distribute Handout #9 to assist student in organizing data. - Review Problem 1B - Answer any questions regarding the problem
2	85	- Students will work in small groups to solve Problem 1B
3	45	- Students will work in small groups to prepare a business report and presentation with their conclusions to Problem 1B.
4	45	- Each group will present a 5 minute presentation with their solution to Problem 1B.

	Corn	**Beans**	**Wheat**
	1,800,000 bushels	*250,000 bushels*	*400,000 bushels*
Total Bushels Sold Now			
Sold Now Info Need: Location, Month (Nov) & Price/Bushel			
Earnings Before Trucking on Sold Now Crop			
Trucking Cost			
Total Earnings on Sold Now Crop			
Total Bushels Stored			
Sold When? Need: Location, Month & Price/Bushel			
Earnings Before Storage and Trucking Cost			
Stored Info Need: Place & Total Cost ($0.12 per bushel)			
Earnings Before Trucking on Stored Crop (earnings – storage cost)			
Trucking Cost			
Total Earnings on Stored Crop			
Total Earnings			

Teacher

Assessment Materials

FINAL EVALUATION

Problem Statement to be Solved:

Problem 1A

You are the Manager of ADM- Havana. You have been asked to maximize your revenue and present a business plan. Currently you have 400,000 bushels of wheat in one of the grain bins in Havana. The rest of your bins are empty and ready for the farmers to harvest grain.

Background Information:

- There are 10,000 acres of corn around Mason City, IL that will yield 180 bushels per acre.
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Storage Information:

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Oct. 1: BEAN PRICES

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
Havana	$5.78	$5.87	$6.09	$6.13	$6.16	$6.19	$6.15	$5.90	$5.95	$6.00	$6.00

Oct. 1: WHEAT PRICES

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
Havana	$3.20	$3.22	$3.40	$3.50	$3.60	$3.70	$3.80	$3.90	$4.00	$3.80	$3.90

Problem 1B

You are a farmer from Mason City, IL. It is 25 miles from your farm to Havana, 90 miles to Decatur, and 65 miles to Peoria. It will cost $1.40 a running mile to get your crop to the elevator. Your truck will hold 900 bushels of corn or 850 bushels of soybeans. To maximize your annual profit you need to determine which of the three options you should pursue. You will harvest 1,800,000 bushels of corn and 250,000 of soybeans. 400,000 bushels of wheat are already being stored in Havana with zero storage cost.

Option 1: Harvest your crop and sell it immediately at one of the 3 elevators.

Option 2: Harvest your crop and store it in Havana or Mason City at 12 cents per month per bushel until you decide to sell.

Option 3: Build you own storage facility and store your crop until you are ready to sell.

Futures Market Information:

Oct. 1: CORN PRICES

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
Havana	$2.40	$2.50	$2.65	$2.70	$2.75	$2.80	$2.90	$2.92	$2.94	$2.93	$2.90
Peoria	$2.55	$2.55	$2.55	$2.55	$2.60	$2.65	$2.85	$2.85	$2.85	$2.85	$2.85

Oct. 1: BEAN PRICES

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
Havana	$5.78	$5.87	$6.09	$6.13	$6.16	$6.19	$6.15	$5.90	$5.95	$6.00	$6.00
Decatur	$5.90	$6.00	$6.10	$6.20	$6.25	$6.25	$6.25	$6.27	$6.27	$6.30	$6.33

Oct. 1: WHEAT PRICES

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
Havana	$3.20	$3.22	$3.40	$3.50	$3.60	$3.70	$3.80	$3.90	$4.00	$3.80	$3.90

Measurement Criteria that would describe an acceptable solution:

1. Selected the most cost effective means for delivering & selling commodity.
2. Evaluated alternative locations and cost differences.
3. All calculations were correct using formulas and charts provided.
4. Presentation presented the information with visual aids and/or handouts and met the 7 requirements of effective business presentations:
    - Evidence of preparedness and practice
    - Started on time
    - Dressed appropriately
    - Showed enthusiasm and confidence
    - Maintained eye contact, showed friendliness and respect
    - Spoke slowly and distinctly without grammatical errors or slang
    - Welcomed questions and answered completely; accepted reactions without being defensive.

Suggested Scoring Guide	
Assignment	**Points**
Handout #1	10 points
Handout #2	5 points
Handout #3	5 points
Handout #4	15 points
Handout #6	10 points
Handout #7	10 points
Handout #9	25 points
Business Report 1B	25 points
Presentation 1A	10 points
Business Report 1B	25 points
Presentation 1B	10 points
Total Points – 150	

Sample Solution – Problem 1A

Scenario #1

*Store 160,000 beans x $6.19 (March) =	$ 990,400
*Sell 90,000 beans x $5.87 (Nov) =	$ 528,300
*Store 400,000 wheat x $4.00 (June) =	$1,600,000
*Store 400,000 corn x $2.94 (June) =	$1,176,000
*Sell 1,400,000 corn x $2.50 (Nov) =	$3,500,000
TOTAL……	$7,794,700

Scenario #2

*Store 400,000 wheat x $4.00 (June) =	$1,600,000
*Store 250,000 beans x $6.19 (March) =	$1,547,500

(Note: Can't mix crops. Available storage = 160,000)

*Store 160,000 corn x $2.94 (June) =	$ 470,400
*Sell 1,640,000 corn x $2.50 (Nov) =	$4,100,000
TOTAL……	$7,717,000

Scenario #3

*Sell 400,000 wheat x $4.00 (June) =	$1,600,000
*Sell 250,000 beans x $5.87 (Nov) =	$1,467,500
*Sell 1,240,000 corn x $2.50 (Nov) =	$3,100,000
*Store 560,000 corn x $2.94 (June) =	$1,646,400
TOTAL……	$7,813,900

Sample Solution – Problem 1B

	Corn	**Beans**	**Wheat**
	1,800,000 bushels	*250,000 bushels*	*400,000 bushels*
Total Bushels Sold Now	1,240,000	0	0
Sold Now Info Need: Location, Month (Nov) & Price/Bushel	Havana – November $2.50	0	0
Earnings Before Trucking on Sold Now Crop	$3,100,000	0	0
Trucking Cost	$96,460	0	
Total Earnings on Sold Now Crop	$3,003,540	0	0
Total Bushels Stored	560,000	250,000	400,000
Sold When? Need: Location, Month & Price/Bushel	Havana – June $2.94	Havana – March $6.19	Havana – June $4.00
Earnings Before Storage and Trucking Cost	$1,646,400	$1,547,500	$1,600,000
Stored Info Need: Place & Total Cost ($0.12 per bushel)	Havana $0.12 $67,200	$30,000	
Earnings Before Trucking on Stored Crop (earnings – storage cost)	$1,579,200	$1,517,500	$1,600,000
Trucking Cost	$43,610	$20,580	
Total Earnings on Stored Crop	$1,535,590	$1,496,920	$1,600,000
Total Earnings	$4,539,130	$1,496,920	$1,600,000

A P P E N D I X

GLOSSARY of TERMS

Distribution – The delivery of an item.

Commodity – Any unprocessed or partially processed good.

Crop – A cultivated product of the ground.

Bushel – A unit of dry measure containing 4 pecks.

Expenses – A cost.

Acre – A unit of land measure equal to 43,560 square feet.

Futures – Purchases for future receipt or delivery.

Profit – The monetary surplus left to a producer after deducting other expenses.

Revenue – A particular item or source of income.

Yield – To produce or furnish.