



Teaching Guide

For

Nike Inventory Allocation Module

**Illinois Transportation, Distribution and Logistics
Math and Science Project**

2007

Table of Contents

Acknowledgements

We would like to recognize the following people for their contribution to this module:

Brian Wiesner, Manley Career Academy, Chicago, IL
Thomas Vazquez, Benito Juarez High School, Chicago, IL
Tom Kodogeorgiou, Daley College, Chicago, IL

Problem Solving Activity

Overview of Module

- Scenario Focus (Pathway, Job Titles, Related Subject Matter)
- Description of the Problem to be solved
- TDL Cluster Knowledge and Skills and Performance Elements Addressed
- Illinois Learning Standards Addressed
- Objectives
- Measurement Criteria
- Teacher Notes
- Time Required to Complete Problem
- Support Materials and Resources Necessary for Completion of Scenario

Lesson 1 with Handout 1 and 2

Lesson 2 with Handout 3, 4 and 5

Lesson 3 with Handout 6

Lesson 4 with Handout 7

Teacher Assessment Materials

- Final Evaluation
- Solution Checker
- Sample Solution for Problem

Appendix

Glossary of Terms

Scenario Focus

Primary Career Pathway: Sales and Services

Occupation/Job Titles Related to this Scenario: Sales Manager, Account Manager, Store Manager

Recommended Teaching Subject Areas: Marketing, Management, Math, Communication

Teacher/Writer Information

Brian Wiesner, Manley Career Academy, Chicago, IL, 773-534-6900

Thomas Vazquez, Benito Juarez High School, Chicago, IL, 773-534-7030

Tom Kodogeorgiou, Daley College, Chicago, IL, 773-838-7500

Business/Industry/Government Partner

Darron Trobetsky, Midwest Sales Manager, Nike, Chicago, IL

Scenario Problem Statement and Performance Elements

You have received a memo telling you about the launching of the 2006 Nike Pulse Footwear line in October. One of your Footlocker accounts on Madison and Austin Avenue in Chicago, IL has a current budget inventory of \$30,000 to introduce a combination of 6 new products from this line. We need to come up with a strategy to allocate this urban footwear to this particular Westside Chicago retailer to come up with the greatest profit from the sales of these shoes. We must stock 270 pairs and cannot stock more than 330 due to space on our existing shelves. Supply of the Pinchot Leather is limited to 60 initial pairs and 60/week after that. All other shoes are offered at an unlimited supply.

TDL Cluster Knowledge and Skills and Performance Elements

- Determine customer needs and requirements.
- Select distribution and product mix from given constraints.
- Define and explain the measures for market performance.
- Explain the impact of social changes including consumer attitudes and preferences, demographics, and population shifts.
- Develop work plans and budgets that allocate resources and goods.

Illinois Learning Standards:

Math

- Solve problems involving multiple rates, measures and conversions. (H-7C.7)
- Solve problems involving time, temperature, mass, speed, distance, density and monetary values. (H-7C.4)
- Determine the best measure of central tendency from mean, median, or mode. (H-10A.2)

Language Arts

- Communicate information and ideas in narrative informative and persuasive writing with clarity and effectiveness.
- Deliver planned oral presentations. (4.B.3a)

What I Want Students to Know	What I Want Students to be Able to Do
<ul style="list-style-type: none">• Definitions for logistics, supply chain, demand, inventory cost, profit margin.• Understand the role of marketing allocation in the retail industry• Career Opportunities in logistics and distribution• Understand the importance of turning over inventory versus profit per sale• Understand how business uses primary and secondary data to determine potential demand in order to make decisions• Understand how to work with a budget and marketing constraints.	<ul style="list-style-type: none">• Gather demand data using survey and data collection• Calculate selling price, unit profit, and unit inventory cost• Determine an allocation of a brand based on gathered and secondary (internet) data.• Use Microsoft Excel to create a spreadsheet with variable inputs• Write a business report• Make a presentation with visuals.

Objectives:

- Learn about the role of logistics and marketing within the retail industry.
- Acquire the skills needed to develop an allocation of products to maximize profit in an at-the-door analysis of a retail business supported by a manufacturer and distributor.
 - Determine how demand is measured by businesses through primary and secondary data.
 - Calculate sales price, unit profit and unit inventory cost given constraints of a marketing allocation inventory problem.
 - Allocate products from a line of products during a specific season within constraints of an inventory budget, inventory amount control and supply constraint.
 - Justify the allocation in terms of data collected and historical information as well as demographics.
 - Use Microsoft Excel to help modify product mix and obtain quick profit and inventory cost calculations.
- Prepare a written business report.
- Deliver an oral presentation of the distribution plan.

Measurement Criteria for an acceptable solution:

1. Analyzed primary data collected from surveys to propose allocation.
2. Answered the problem completely including sizes and colors.
3. Used reasonable assumptions and justified allocation accordingly.
4. Stayed within all business constraints.
5. Developed Microsoft Excel spreadsheet.
6. All calculations were correct using formulas and excel.
7. Business report included a cover letter, introduction stating the purpose of the report, documentation to support recommendations, a detailed explanation of costs, and tables, charts and spreadsheets to more clearly communicate recommended distribution plan.
8. 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 may include basic business principles, writing reports and making presentations (Powerpoint technology).

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. Make sure students know there is not simply one correct answer depending on their route of completion. The students will have to make assumptions and justify them.

Use discretion in providing Nike employee contact information. Only contact any employees you have been given company permission to contact. You should direct students to the company and retailer (Athlete's Foot) website for information.

Time Required to Complete Problem: 7 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:

- Catalog or promotional material describing the shoes to be introduced
- Computer access to internet and Microsoft Excel, Word processing, and PowerPoint software
- Handouts (see each lesson)
- Websites (see each lesson)
- Optional Web camera to have interview with business partner

Lesson 1

TOPIC	The Supply Chain	TIME ESTIMATE	55 minutes
--------------	------------------	----------------------	------------

OBJECTIVES	
<ul style="list-style-type: none"> • Students will be able to define the supply chain. • Students will be able to define each part of the supply chain and describe the functions of each part. • Students will be able to explain the importance of the supply chain as it pertains to each part of the supply chain. 	

MATERIALS & RESOURCES	
<ul style="list-style-type: none"> • Handout #1, Nike Problem Interoffice Memo • Handout #2, Supply Chain 	

LESSON DESCRIPTION & ACTIVITIES		
Steps	No. of Minutes	ACTIVITIES
1	10	- Introduction to Project <ul style="list-style-type: none"> • As a bellringer, distribute Handout 1, The Nike Problem, and have students read. • Lead a class discussion on the problem. Discuss the principles of business that they will use as well as the different forms of mathematics and decision making techniques.
2	10	- Distribute Handout 2, Supply chain for the students to read. - Review the definition of the supply chain and the functions of the parts within the supply chain as a class. Be sure to talk about the reverse flow of information.
3	10	- Read the example of a specific supply chain, the Hanes situation. - Allow students time to diagram a supply chain for the production and sale of Hanes undergarments. - Select one or two students to share their sketch on the board or overhead.

4	12	<ul style="list-style-type: none"> - Ask students to finish reading Handout 2 - Lead a discussion on the reasons the supply chain is important to each separate enterprise within the supply chain. Focus especially on the benefits to the consumer. - Make a chart on the overhead, board or computer listing the benefits so students can copy them in a notebook.
5	13	<ul style="list-style-type: none"> - Have students complete the activity at the end of Handout 2. If you are short on time this can be assigned as homework. - Share student responses.



Nike Midwest Sales Distribution Division
Chicago, IL

To: Sales Manager – Midwest Footlocker Accounts

From: Darron Trobetsky, Midwest Sales Manager

As you know, we are launching the 2006 Nike Men’s Pulse Footwear line in October. One of your Footlocker accounts on Madison and Austin has a current inventory budget of \$30,000 to introduce a combination of 6 new products from this line. We need to come up with a strategy to allocate this urban footwear to this particular Westside Chicago retailer.

We must make sure that we can build an assortment plan to emphasize their past successes, energize new selling opportunities, and grow their business profitably. The plan should maximize our profitability and make sure that this location can turn over as many pairs of boots as possible.

The cost, profit, and demand information is shown in the chart below.

Product	Inventory Cost (\$)	Nike Profit Margin	Demand
Men’s Pinchot Leather	80	20 %	Extremely High
Men’s Air Max Round Mound	120	40 %	Medium
Men’s Mad Jibe	85	50 %	Low
Women’s Air Baltoro	80	40 %	Low
Women’s Air Max GOA VI	150	40 %	Medium
Women’s Hypnotize	120	30 %	High

As you know the Pinchot Men’s Leather is a very innovative and high demand boot. Because of limited release on this footwear, we can only supply this Foot Locker with a maximum of 60 units. This is an extremely high rate of supply. Other boots will certainly not move as quickly. Any store should be able to sell as many of these as we can supply. As many pairs as needed can be provided for all the other products.

In addition, this Athlete’s Foot retailer has an agreement with Nike that they will keep a minimum number of pairs of 2006 Nike Pulse Footwear of 270 and a maximum of 330 pairs in stock.

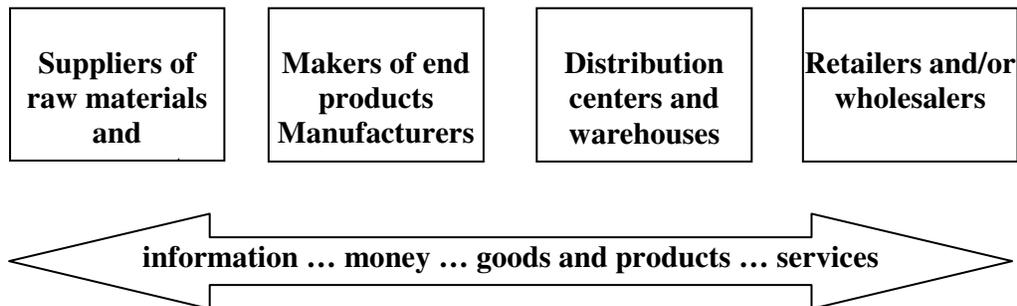
Please run an at-the-door analysis and within the allocation include shoe sizes and colors. Get back to me by Friday with your recommendations. Prepare a written business report with details and present it at our next management team meeting this Friday.

If you have any questions, please let me know.

Supply Chain

Definition: Supply Chain: The functions and activities starting with suppliers through production and distribution to customers and end users that provide products, services, and information that add value for the customers.

The basic supply chain is comprised of four enterprises and looks like this...



Parts of the supply Chain

- Suppliers - Companies that supply raw materials, chemicals, packaging and specific parts to manufacturers.
- Manufacturers - Companies that assemble end products from raw materials that come from suppliers. These finished products will be sold to consumers or other companies.
- Distributors - Warehousing facilities that receive and store finished products until they are ordered by retail stores or by private consumers. The warehouses may be owned by the manufacturers or may be rented from outside companies.
- Retailers - Stores that order the finished products from distributors and sell them directly to consumers.

Note: Notice the reverse flow in the supply chain, this is a flow of information based on computer tracked sales. This allows for better decision making along the entire supply chain.

Example of a Specific Supply Chain

Boacha Fabrics is a company that supplies raw cotton to Hanes. Hanes plants use the raw cotton to sew various undergarments, and then ship them to warehouses, which are also owned by Hanes. Wal-Mart and other stores order the finished products to sell to people.

Mini-Activity: Construct a diagram outlining the supply chain for Hanes undergarments. Do not forget to label all parts.

Why is the Supply Chain Management important?

- The main focus of supply chain management is to provide consumers with affordable prices on various products
- Supply Chain management allows for all parts of the supply chain to be aware of inventory levels and thus the availability of supplies/parts
- Information is kept in real time so through the use of barcodes and computer programs allowing all companies in the supply chain to make on the spot decisions in order for better business operations
- Customer service efficiency is increased due to the flow of information in real time
- Inventory and production can be coordinated between separate companies so only product that is needed is produced, excess inventory can be kept to a minimum
- Businesses work together establishing long lasting relationships that can be beneficial to all parts of the supply chain

Activity:

1. Although the basic supply chain consists of four parts, real life supply chains are much more complex. Think of other companies, products, services that might be involved in the Hanes example. Sketch the new supply chain for Hanes involving all the new things you came up with.
2. Knowing that all Nike shoes are made in Asia and that their only distribution center is in Memphis, Tennessee, design a mock supply chain for the Nike shoes we will work with in the problem. Think about what materials shoes are made of and where these materials would come from.
3. Reread the Nike problem...
 - a) What part of the Nike supply chain is our specific problem dealing with?
 - b) Begin applying your new knowledge of the supply chain to formulate questions that may be useful in creating a solution.

Lesson 2

TOPIC	Determining Profits	TIME ESTIMATE	55 minutes
--------------	---------------------	----------------------	------------

OBJECTIVES

- Students will be able to define demand, inventory cost, and profit margin.
- Students will be able to calculate profit and sales price from profit margin of a product.
- Students will be able to use and define the words allocate, turn over, innovative, throughput, limited release, at-the-door as they pertain to business.

MATERIALS & RESOURCES

- Handout #3, "Understanding Demand, Inventory costs, and Profit Margin"
- Handout #4, "Calculating Profit from Cost and Profit Margin"
- Handout #5, "Analyzing and Allocating to meet Inventory needs"
- Calculators

LESSON DESCRIPTION & ACTIVITIES

Steps	No. of Minutes	ACTIVITIES
1	5	- As a bell ringer, brainstorm 3 retail products during the month of December. These could be Xmas tree bulbs, sugar, toothpaste, bread, etc. Place them in the order from highest demand to lowest demand based on your historical knowledge and experience with these products.
2	20	- Distribute Handout 3 and have student read and complete the exercises. - Go over each of these terms with the class. (May want to have the students write each word with definition in their notebook.) - Review their answers to the exercises. - Lead a discussion on how businesses make profit and what these three terms have to do with it.
3	25	- Distribute Handout 4. Ask the students to fill in the three selected products from the first activity and determine a retail price for them.

		<ul style="list-style-type: none"> - Have them calculate the inventory cost for each product using 5%, 20% and 40% as the profit margins. Inventory cost is the cost that the retailer would need to pay for them and keep them in stock. - Continue with Handout 4 and have the students complete the calculations by determining the unit profit and the profit for 200 units of each product they selected.
4	5	- Distribute Handout 5 for students to read as homework.

"Understanding Demand, Inventory costs, and Profit Margin"

Suppose you are the owner of a Sherwin-Williams paint store on Western Avenue. The paint is made in Dallas, Texas at the paint and coatings factory. In turn, these gallons are shipped to a distributor in Chicago and then when you need to stock your shelves, you must obtain material from this distributor. The Sherwin-Williams store is called the retailer.

The cost to keep products (gallons of paint) in your inventory is called the inventory cost. Suppose you need 100 gallons of Brand X exterior house paint to place on your shelves in the store. Each gallon costs \$16 from the Sherwin-Williams distribution warehouse.

(1) Your inventory cost for this item in your store would be:

$$100 \text{ gallons paint} \times \$16/\text{gallon} = \$1600 \text{ total inventory cost}$$

Since you bought these gallons for \$1600, you must sell them at a higher price. You plan on making 20% for each gallon you sell. This percentage increase to your inventory cost is called the margin. Where have you heard this term before? It is also known as profit margin. Margin and profit margin are synonyms. They mean the same thing.

(2) What will be your sales price of one of the gallons of paint if you make your 20% margin? Take the inventory cost and multiply by the margin (in decimal form) and then add this to your inventory cost:

$$\$16/\text{gallon} \times 0.20 = \$3.20 \text{ (this } \$3.20 \text{ is sometimes called } \underline{\text{markup}}.)$$

$$\$16.00 + \$3.20 = \$19.20 \underline{\text{ sale price.}}$$

You might be able to sell this particular type of paint at a higher margin during the Summer months when there is a higher demand. Demand is one's willingness and ability to buy something. Maybe I have the ability to buy a new Toyota Camry (meaning I have the money) but if I am not willing to buy one, there is *no demand*. On the other hand I may have the willingness to buy this new car, but may not have the ability (no funds). So there is still *no demand* for it. Only if I have both the willingness and ability is there a demand.

Exercises:

- (1) Calculate the markup of a \$20 gallon of interior paint if the margin is 10%, 20%, and 25%.
- (2) Calculate the selling price for the \$20 gallon of paint at the 3 margins.

Calculating Profit from Inventory Cost and Profit Margin

- Step 1:** Transfer your 3 retail products from your bell ringer into the chart below under products. Do this a total of 3 (3 sets of 3 products) times for the different profit margins given
- Step 2:** Determine a retail price for each of the 3 products and fill in these prices
- Step 3:** Based on the retail price and profit margin, calculate an inventory cost per product (Hint: You will need to divide retail price by the profit margin such as $\$1.99/1.20$ for the 20% example).

Name of Product	Inventory Cost	Profit Margin	Retail Price of Product	Unit profit	Profit for 200 units
		5 %			
		20 %			
		40 %			
		5 %			
		20 %			
		40 %			
		5 %			
		20 %			
		40 %			

- Step 4:** Next, calculate a unit profit. This is the profit on one unit of inventory. (Hint: Take Retail Price minus Inventory Cost).
- Step 5:** Calculate a profit for 200 units of each product (Hint: Take the unit profit and multiply by 200).

Analyzing and Allocating to meet Inventory needs

In order to determine how profitable a company is, we might look at all the stores and branches, such as Sherwin-Williams house paint stores. This might be important if management wants to look at the overall picture. But if we are the manager of one retail store, we might take a look at our individual sales and profits at this location on Western Avenue in Chicago. This is called an at-the-door analysis.

We might try to focus on how we allocate our products in this particular store. Allocation consists of two things. The first is to determine what kinds of products and sizes to keep at this particular retailer, or **what are we going to carry on our shelves** at this particular Sherwin-Williams. The second it to determine **how many of each item** we are going to carry. It would breakdown all items and quantities. For instance:

100 gallons of interior latex brand X,
300 gallons of interior latex brand Y
250 gallons of interior latex brand Z

Retailers must try to maximize the amount of profit with sales of their merchandise and services. How do they do this? They must come up with innovative (modernize, change and develop unique products) ideas for their products. The iPod comes to mind as an extremely innovative product. Businesses will come up with something which sets them apart so they can charge higher prices and maximize their profit. Often times companies will introduce these innovative products as limited releases. This means that they are trying to introduce a very small number of these so they can charge higher retail prices. They do this to try to generate a greater demand by *limiting its release*.

They must also be able to turnover their inventory. This means that for each unit on their shelves, they want to make sure it sells so they don't have all their funds tied up in purchasing unused inventory. Sometimes we want to know how long it takes to turnover our inventory. If you are a clothing retailer, you might want to know that it took 3 months to turnover 200 White Sox baseball jerseys.

Another term that is used frequently is throughput. Throughput is sometimes used as a synonym with turnover but a better definition could be a percentage of items you have turned over. Using the previous baseball jersey example, if after a 3 month period you sold 180 jerseys you would have $(180/200)$ 90% throughput.

Lesson 3

TOPIC	Research and Development	TIME ESTIMATE	110 minutes
--------------	--------------------------	----------------------	-------------

OBJECTIVES

- Students will be able to find the mean, median, and mode of a set of numbers.
- Students will be able to develop surveys to be used for research and development.
- Students will be able to determine the usefulness of several research and development tactics based on a given situation.

MATERIALS & RESOURCES

- Handout #6, "Research and Development"
- Handout #1, The Nike Problem from Lesson 1

LESSON DESCRIPTION & ACTIVITIES

Steps	No. of Minutes	ACTIVITIES
1	5	<ul style="list-style-type: none"> - As a bell ringer ask students to find the average of the 5, 10, 15 and also ask them, what is the average or "most common" hair color in the room? - Have a short discussion about the two problems. Briefly introduce the idea that a set can have multiple statistical averages. This should not be new to students and should be a good way to get students hooked.
2	8	<ul style="list-style-type: none"> - Distribute Handout 6 and have students read the first part--only the definitions of statistics, mean, median, and mode. - Go over the three example problems as a class. Have students write these problems in a notebook.
3	12	<ul style="list-style-type: none"> - Allow the students to do the three practice problems in groups or individually. Circle the room to ensure all students understand the problems and are coming up with the correct solutions. - Talk about the problems as a class. Give the answers to the students so they can check and discuss the significance of each

		problem. Problems 1 and 3 can be used to contrast each other to show why one statistical average may be more useful than another in some cases. Ask "Which statistical average truly reflects the set of numbers in each problem?"
4	15	<ul style="list-style-type: none"> - Ask students to read the rest of Handout 6. - Review the tactics used in research and development. Write a concise definition of each on the board and have students copy them in a notebook. Try to incorporate as much student involvement as possible.
5	55	<ul style="list-style-type: none"> - Divide students into groups and have them come up with some ideas for the survey. Leave many things open to their creativity. - Prepare the survey questions for administering.
6	10	- Suggest students spend some time in groups developing a plan for how they will administer the surveys. They should consider who they will survey (friends, classmates, family); how many each member of the group will survey; various age groups, etc.
7	5	- Administer the survey. This may be a homework assignment as it will need to be done outside of class time.

Research and Development

DEF: **STATISTICS** - The collection, analysis, and interpretation of numerical data.

DEF: **MEAN** - The mean of a set of numbers is the arithmetic average of all the numbers.

Ex: The mean of 1, 6, 8 is $(1+6+8)/3 = 15/3 = 5$

DEF: **MEDIAN** - The median of a set of numbers is the middle number of the set.

Ex: The median of 1, 6, 8 is 6.

Note: In order to find the median the set of numbers must be ordered.

Q1: What is the median of 1, 6, 8, 10?

Since there is no middle number you take the average of the two middle numbers, thus the median is $(6+8)/2 = 14/2 = 7$.

DEF: **MODE** - The mode of a set of numbers is the number that appear most often.

Ex: The mode of 1,2,7,7,8 is 7 because it appears twice while the others only appear once.

Mini-Activity: Find the mean, median and mode for the following sets of numbers.

1. {5, 5, 5, 5}

2. {2, 5, 3, 7, 3, 5, 3, 9}

3. {10, 20, 30, 40, 100}

Although these three stats can be very useful in real life, companies may opt for other types of research and development which are more appropriate for certain situations.

I. The first method is simply to study the demographics of an area and think about the purchasing patterns that those demographics follow.

Note: Demographics are the statistical characteristics of human populations such as age.

An example of this is...A video game store was looking to open a new location. They were thinking about opening one in Palm Springs, Florida until they found out it was a retirement community. They decided this would not be a wise move because retirees are unlikely to play many video games.

II. Another method companies may use is to set up focus groups. This is a tactic related to demographic data. A representative from a company will sit down with a small group of a target demographic and ask questions pertaining to purchasing preferences. These questions could be about products the members of the focus group already own or about new products that are soon to hit the market. Questions will be specific and will focus on

particular information the company wants to know. The company representatives will be interested in things like style preference, color preference, etc. Members of the focus group are often given compensation for participating such as free products from the company.

III. The last tactic we will talk about is surveys. General surveys are distributed to the public and then collected for data analysis. The questions on surveys are usually much more general than in the focus groups, and surveys may target a specific demographic or may include answers from several demographics. Questions will often pertain to color preference, size, price ranges, etc.

Activity:

1. Compare and Contrast focus groups and surveys. What are the similarities and differences? What are the advantages and disadvantages of each? Which is more appropriate in our Nike problem?
2. Design a survey we can use in our Nike problem. What types of questions will be helpful to us? Can we use any of the statistical averages to help us design the survey and then analyze data?

Lesson 4

TOPIC	Developing an Allocation Solution in Excel Spreadsheet	TIME ESTIMATE	190 minutes
--------------	--	----------------------	-------------

OBJECTIVES	
<ul style="list-style-type: none"> • Students will create list of questions to ask the business partner. • Students will analyze data and develop solution to the problem. • Students will create on paper the profit per shoe type, overall profit, inventory cost per shoe type, and overall inventory cost given their solution allocations. • Students will create an excel spreadsheet so they can adjust their solutions depending on demand information collected and other factors to maximize their profit. • Students will prepare business report and presentation of their solution. 	

MATERIALS & RESOURCES	
<ul style="list-style-type: none"> • Handout #7, "Microsoft Excel Introduction and Solution" • Computer with access to Excel, Word Processing and Presentation Software 	

LESSON DESCRIPTION & ACTIVITIES		
Steps	No. of Minutes	ACTIVITIES
1	5	- As a group bell ringer, students will brainstorm a list of questions to ask our business partner. Depending on availability of business partner, a web cam meeting will be scheduled or an email will be sent to obtain final questions that students need help with. If a web cam meeting is arranged or if the business partner can visit the class, this will extend the amount of time estimated.
2	25	- Based on their demand data from the surveys, students will work in their groups to determine an allocation. They will sketch out on paper the column headings and calculations needed. These include Nike shoe type, inventory cost per pair, margin, quantity allocated including total quantity, profit per pair, overall profit per shoe type including profit for the allocation, and overall inventory cost per shoe type including inventory cost for the allocation. They

		need to perform the calculations before they start to create the Excel spreadsheet.
3	10	- Introduction to Microsoft Excel. Have the students work in groups of two, open up excel, and explain the A1 and other designations. Show how they can input words and numbers. Refer to Handout 7 where necessary.
4	50	- Students will work in their group creating a spreadsheet to reflect their hand calculations. They will be able to move the numbers of pairs and see how profit and inventory cost changes.
5	20	- As a final consideration, based on student survey and statistical data, students should determine the size and color breakdown of each shoe type.
6	50	- Allow time for students to prepare final written report in proper format and to develop their oral presentation.
7	30	- Students present their presentation of the solution. - Ask Students to discuss the specific things they learned as a result of this activity.

Introduction to Excel

- Step 1 Choose Start from the Taskbar
- Step 2 Choose Programs
- Step 3 Choose Microsoft Excel
- Step 4 This screen is called a workbook. It's made up of worksheets. This is Sheet 1. There are rows (identified with numbers) and column (identified with letters). Using your mouse, click on a rectangle on the worksheet. Notice that the rectangle you clicked on has a bold border. These rectangles are called cells. You may have selected cell F6 or D8 etc.
- Step 5 You can place words or numbers into each of the cells. Place a couple of numbers in each by selecting the cell with your mouse and entering in some values. Type in some words in different cells. Notice you have some overlap in the cells with your words depending on how many letters each words or group of words contains.
- Step 6 Let's make a simple spreadsheet to start our Nike project. Let's take the columns from the table in Handout 5 and enter the information in the cells on the worksheet. This is called populating the data.
- Step 7 First start in cell A1. Place the word Product in the cell. Don't worry if the word goes outside the cell. Just type and we'll figure this out later. Using the tab key, hit it twice so you are now in cell C1. Place the next heading, tab twice, and so on.
- Step 8 You should have 4 columns with headings. Now move to cell C1 and type Pinchot Leather. Hit enter. Notice that it moves you to cell D1 so you can continue to enter the names of the Nike Pulse Footwear. Populate the worksheet with all the numbers and words given. Remember to use the decimal 0.20 instead of 20% for the Profit Margin column.

Step 9 Let's make another column for retail price. Remember, this is the price to sell each Pulse Footwear. Tab twice from the Demand column and place a new Retail Price column. Now we want to add a formula to a cell so we can multiply Inventory Cost times Profit Margin plus the Inventory Cost to get Price. In the cell under the Retail Price column, for the Pinchot Leather type

$$=(C3*E3)+C3$$

This means that whatever is in cell C3 (Inv Cost of Pinchot Leather) it is multiplied by whatever is in cell E3 (Profit Margin) and then added to C3.

Step 10 Now you'll have to perform this for all Nike Pulse shoes, making sure the correct cell is keyed in for the formula. For example, for the Air Max Round Mound, under Retail Price column type

$$=(C4*E4)+C4$$

Continue with this until you are done with all 6 shoes. Now you can change the margin or Inventory cost to determine several new retail prices. Try changing the margin on the Pinchot Leathers from 20 to 50% and see how this affects the retail price (you should get \$120 for this price).

Step 11 You can use the + to add, the - to subtract, the * to multiply, and the / to divide. You can also use parentheses to make sure this is done first. Microsoft Excel follows the same order of operations we learned in Algebra class which is PEMDAS. The + function is very good for determining the total value of certain columns. This will be important when you need to figure out total profit and total inventory cost (remember, you only have \$30,000 of total inventory).

Step 12 As a team, you will need to create a brand new Microsoft Excel spreadsheet with the following columns:

Nike Shoe Type
Inventory Cost per pair

Margin
Quantity (number of pairs) allocated
Profit per pair
Overall Profit
Overall Inventory Cost

Make sure you also **total** the Overall profit column, the quantity of shoes (must be between 270 and 330) and the Overall Inventory Cost to keep this under \$30,000.

HINT: I would sketch out on paper what this is going to look like before entering all the information onto a Microsoft Excel Worksheet. You are responsible for determining the quantity allocated. Using the skills we developed over the previous lessons, you should be able to come up with the profit per pair, the overall profit for each shoe type, and the overall inventory cost for each shoe.

Do not forget to save your work once you start!

Teacher

Assessment Materials

FINAL EVALUATION

Problem Statement to be Solved:

You have received a memo telling you about the launching of the 2006 Nike Pulse Footwear line in October. One of your Footlocker accounts on Madison and Austin Avenue in Chicago, IL has a current budget inventory of \$30,000 to introduce a combination of 6 new products from this line. We need to come up with a strategy to allocate this urban footwear to this particular Westside Chicago retailer to come up with the greatest profit from the sales of these shoes. We must stock 270 pairs and cannot stock more than 330 due to space on our existing shelves. Supply of the Pinchot Leather is limited to 60 initial pairs and 60/week after that. All other shoes are offered at an unlimited supply.

Measurement Criteria that would describe an acceptable solution

1. Analyzed primary data collected from surveys to propose allocation
2. Answered the problem completely including sizes and colors
3. Used reasonable assumptions and justified allocation accordingly
4. Stayed within all business constraints
5. Developed Microsoft Excel spreadsheet
6. All calculations were correct using formulas and excel)
7. Business report included a cover letter, introduction stating the purpose of the report, documentation to support recommendations, a detailed explanation of costs, and tables, charts and spreadsheets to more clearly communicate recommended distribution plan.
8. 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

1. Solving the Problem—60 points

- Students analyzed primary data collected from surveys to propose allocation (10 points)
- Students answered the problem completely including sizes and colors (5 points)
- Students used reasonable assumptions and justified allocation accordingly (10 points)
- Students kept within all business constraints (5 points)
- Microsoft Excel spreadsheet developed and included (10 points)
- All calculations were correct using formulas and excel (20 points)

2. Business Report—20 points

- Cover Page included (2 points)
- Introduction clear along with purpose of the report (3 points)
- Documentation and assumptions to support proposed solution (5 points)
- Detailed explanation of costs with tables and charts and spreadsheets (10 points)

3. Presentation--20 points

- Presentation presented the information with visual aids and/or handouts (10 points)
- The presentation met the 7 requirements of effective business presentations (10 pts total)
 - 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.

Solution Checker for 2006 Nike Inventory Allocation Problem

- (1) Did you take into account that the Pinchot Men's Leather has a supply limit of 60 units/week?
- (2) How many pairs do you have in your inventory? Is this between 270 and 330 total pairs?
- (3) Can you cover the weekly demand for each product (other than Pinchot Men's Leather)? Meaning are the demands consistent (low, medium, high)?
- (4) What is the total inventory cost? Is it under the \$30,000 budget?
- (5) Did you present your product mix by using all 6 products?
- (6) Did you allocate number of sizes and colors within each shoe type?
- (7) What is your overall profit?

Possible Problem Solution

Nike Inventory Allocation

Nike Shoe Type	Inventory Cost	Margin	Quantity	Profit/Pair	Profit	Total Inventory Cost
Men's Pinchot Leather	80	0.2	60	16	960	4800
Men's Air Max Round Mound	120	0.4	40	48	1920	4800
Men's Mad Jibe	85	0.5	60	42.50	2550	5100
Women's Air Baltoro	80	0.4	70	32	2240	5600
Women's Air Max GOA VI	150	0.4	30	60	1800	4500
Women's Hypnotize	120	0.3	40	36	1440	4800
Totals			300		10,910	29,600

APPENDIX

GLOSSARY of TERMS Related to this Scenario

Demand

A want for a specific product that is backed by an ability and willingness to buy them

Supply

The amounts of a good or service that a firm will offer for sale at different prices during a specific time period

Inventory

A physical count of particular products in stock at any given time

Retail Price

The price that a consumer must pay for goods sold

Profit Margin (Margin)

A measure of profitability expressed as a percentage. The percentage increase from inventory cost to retail price.

Profit

The difference between retail sales price and the costs of manufacture

Allocate

This is the process of determining how to distribute a set amount of anything among 2 or more things. For example, allocating \$1000 monthly pay among all the bills in your household is allocating.

Turnover

The process of getting rid of all the items of a specific type in your inventory is known as turnover. For example, selling all 50 Honda Accords on your automotive lot would be turning over this inventory.

Throughput

The percentage of items that a firm sells versus how many they originally purchased is known as throughput. For example, if you buy 100 widgets and you sell 75, you have 75% throughput on these widgets. Businesses try to maximize this percentage.

Limited Release

A product that is only put on the market for short time or only offered sparingly can be classified as a limited release product.

At-the-door

This is a business term used to describe business done at a specific retail store. For example, an at-the-door count of inventory of women's size 10 tennis sneakers at a Foot Locker on the corner of State and Michigan.

Microsoft Excel

A spreadsheet program from Microsoft, part of their Microsoft Office suite of productivity tools for Microsoft Windows and Macintosh. Excel is probably the most widely used spreadsheet in the world

Spreadsheet/Worksheet

A spreadsheet is a rectangular table (or grid) of information, often financial information.

Cell

A cell is the rectangular box on a Microsoft Excel spreadsheet from which you can enter numbers, words, or formulas.

Populating the Data

Placing data such as numbers or words into all fields of a Microsoft Excel spreadsheet is called populating the data. Completing a table so that all cells are filled is an exercise in populating the data.

Innovative

Something new - must be substantially different, not an insignificant change. The change usually increases value, customer value, or producer value. Innovations are intended to make someone better off, and the succession of many innovations grows the whole economy.

Inventory Cost

The total cost to stock a certain amount of products on your shelves is called inventory cost.

Markup

Amount added to the cost of an item to determine its retail selling price.

Unit

One of anything. For example, one unit of soup is one can.

Supply Chain

The functions and activities starting with suppliers through production and distribution to customers and end users that provide products, services, and information that add value for the customers.

Suppliers

Companies that supply raw materials, chemicals, packaging and specific parts to manufacturers.

Manufacturers

Companies that assemble end products from raw materials that come from suppliers. These finished products will be sold to consumers or other companies.

Distributors

Warehousing facilities that receive and store finished products until they are ordered by retail stores or by private consumers. The warehouses may be owned by the manufacturers or may be rented from outside companies.

Retailers

Stores that order the finished products from distributors and sell them directly to consumers.

Statistics

The collection, analysis, and interpretation of numerical data.

Mean

The mean of a set of numbers is the arithmetic average of all the numbers.

Ex: The mean of 1, 6, 8 is $(1+6+8)/3 = 15/3 = 5$

Median

The median of a set of numbers is the middle number of the set.

Ex: The median of 1, 6, 8 is 6.

Note: In order to find the median the set of numbers must be ordered.

Mode

The mode of a set of numbers is the number that appear most often.

Ex: The mode of 1,2,7,7,8 is 7 because it appears twice while the others only appear once.

Demographics

The statistical characteristics of human populations such as age.

Focus_Group

A small group of consumers targeted by a company for research and development.

Group members are asked question pertaining to purchasing patterns.

Survey

A general questionnaire given out by companies to collect data pertaining to purchasing patterns and other valuable information.