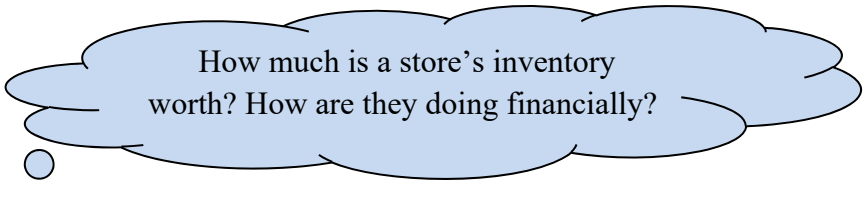
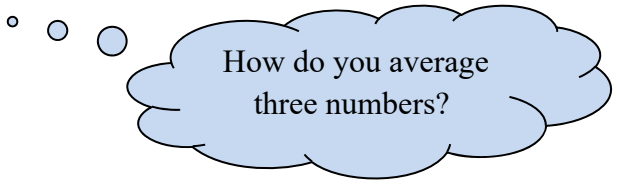


Business Mathematics
Class notes
Turnover and Valuation of Inventory (section 8.4)

Stores must know what they have in their inventory so that they know how much to re-order, what is making a profit, and other information needed for financial or tax papers.

Definition: Average inventory: a measure of the value of the entire inventory in a store. It is found by taking the **inventory** (total amount of products in dollars) over a time period and averaging them.

expl 1: Find the average inventory for the store below.



Date	Inventory Amount at Retail
Jan. 1	$42,312
July 1	$38,514
Dec. 31	$30,219

Definition: Inventory Turnover (aka **Inventory turns** or **stock turnover):** a measure of how well a company is doing financially. It measures how fast inventory is being sold or **turned over**. It is the number of times the average inventory is sold during a year.

Inventory can be valued at cost or retail so we could figure inventory turnover on either.

Depending on your type of business, flowers versus jewelry for instance, inventory turnover can differ greatly.

We have some formulas for finding this inventory turnover value. The first is based on the cost of the items and the second is based on the value at which the items would be sold (retail).

Turnover at retail is usually slightly lower due to **inventory shrinkage**. What do you think that is?

$$\text{Turnover at Cost} = \frac{\text{Cost of goods sold}}{\text{Average inventory at cost}}$$

$$\text{Turnover at Retail} = \frac{\text{Retail sales}}{\text{Average inventory at retail}}$$

expl 2: Find the stock turnover at cost and at retail. Round to the nearest hundredth.

Average inventory at cost: $68,080
Average inventory at retail: $125,240
Cost of goods sold: $573,330
Retail sales: $951,900

These numbers tell us how many times the store sold merchandise valued at its average inventory during the year. It has no units.

Methods for Tracking Inventory:

Companies must know what inventory has been sold, what is sitting in warehouses, what is on shelves, etc. There are many ways to track a store's inventory. We will cover five common ones. Here they are in summary. Later, we will do examples.

1. Weighted-average (aka **weighted cost**)**:** We find the weighted-average of the cost of an item and multiply that by the number of items currently in inventory.

2. FIFO (first-in, first-out): Here, we assume that the first goods to arrive are the first to be sold, and the last goods purchased are the ones, if any, remaining in inventory.

3. LIFO (last-in, first-out): Here, we assume that the last goods to arrive are the first to be sold, and the first goods purchased are the ones, if any, remaining in inventory.

4. Retail method: the cost of goods available for sale is found as a percent of the *retail* value of the goods available for sale during the same period. The decimal form of this percent is then multiplied by the retail value of the inventory at the *end* of the period. This results in an estimate of the inventory at cost. Here's the formula.

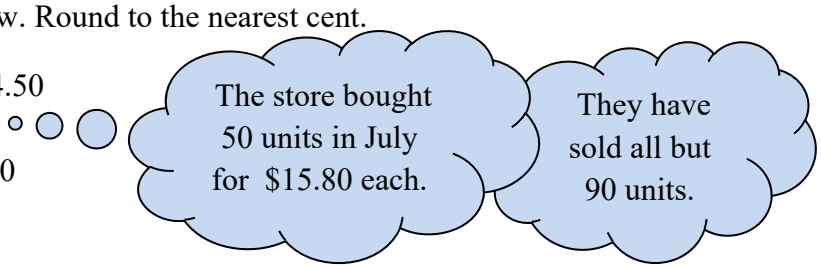
$$\text{Inventory value (retail method)} = \frac{\text{Cost of goods available for sale}}{\text{Retail value of those goods}} \times \text{Retail value of goods at end of period}$$

This fraction *must* be rounded to two decimal places *before* multiplying by the retail value of the goods at the end of the period.

5. Specific identification: This is useful when items are easily identified and costs do *not* fluctuate. Each item is coded with cost information. Since several items in stock may have been purchased at different times, at different costs, many businesses prefer to use inventory at retail. In this case, the retail value of all identical items is the same, making it easier to value inventory.

expl 3: Below you see the inventory at three separate times for a store. Find the inventory values using each of the three methods below. Round to the nearest cent.

Beginning inventory: 80 units at $14.50
July Inventory: 50 units at $15.80
October Inventory: 70 units at $13.90
Current Inventory: 90 units

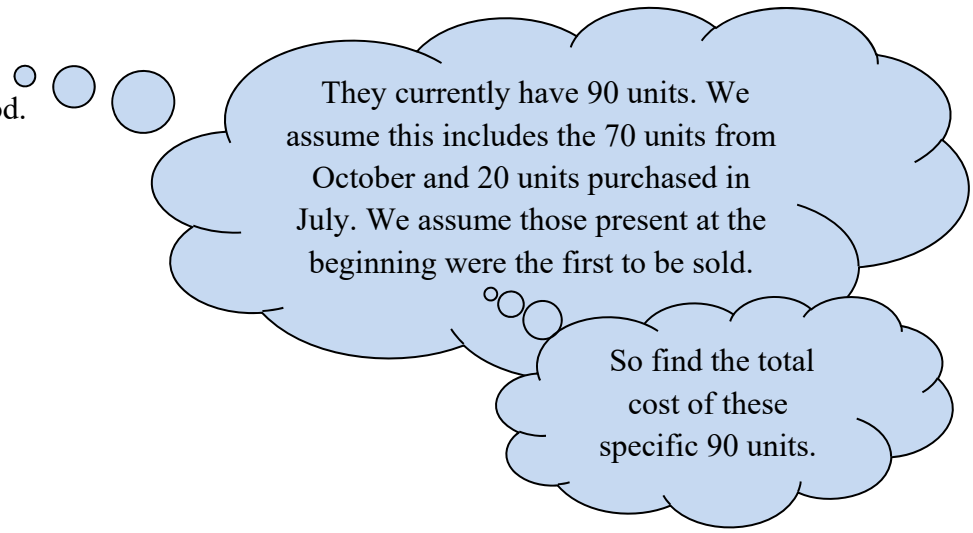


a.) Use the weighted-average method. Complete the table below.

Beginning inventory	80 units × $14.50 per unit	Cost for units =
July	50 units × $15.80 per unit	Cost for units =
October	70 units × $13.90 per unit	Cost for units =
	= Total number of units	Total cost for units =

The weighted-average of the cost of a unit is the total cost divided by the number of units. Round this to two decimal places, *then* multiply it by the number of units *currently* in inventory.

b.) Use the FIFO method.



expl 3 (continued) : Below you see the inventory at three separate times for a store. Find the inventory values using each of the three methods below. Round to the nearest cent.

Beginning inventory: 80 units at $14.50
July Inventory: 50 units at $15.80
October Inventory: 70 units at $13.90
Current Inventory: 90 units

c.) Use the LIFO method.

They have 90 units now. We assume that includes the 80 units we had at the beginning plus 10 more that were purchased in July. Those purchased later were sold first.

So find the total cost of these specific 90 units.

expl 4: The September 30 inventory of Liverpool Piano Repair was $43,750 at cost and $62,500 at retail. Purchases during the next three months totaled $51,600 at cost but $73,800 at retail. Net sales during that period were $92,500. Use the retail method to estimate the value of the inventory at cost on Dec. 31.

$$\text{Inventory value (retail method)} = \frac{\text{Cost of goods available for sale}}{\text{Retail value of those goods}} \times \text{Retail value of goods at end of period}$$

They sold $92,500 worth of stuff.

We need to find…

Cost of goods available for sale:

Retail value of those goods:

Retail value of goods at *end* of period:

Now do the calculation, remembering to round the fraction to two decimal places before multiplying.

Worksheet: Valuation of Inventory:
This worksheet will cover finding the inventory for a business using the FIFO and weighted-average methods. Also, you will find the average inventory for a store.