17. Perpetual Inventory Systems

All of the preceding illustrations were based on the periodic inventory system. In other words, the ending inventory was counted and costs were assigned only at the end of the period. A more robust system is the perpetual system. With a perpetual system, a running count of goods on hand is maintained at all times. Modern information systems facilitate detailed perpetual cost tracking for those goods.

17.1 Perpetual FIFO

The following table reveals the FIFO application of the perpetual inventory system for Gonzales:

Date	Purchases	Sales	Cost of Goods Sold	Balance
1-Jan				4,000 X $12 = $ 48,000
5-Mar	6,000 X $16 = $ 96,000			4,000 X $12 = $ 48,000 6,000 X $16 = $ 96,000 $144,000
17-Apr		7,000 X $22 = $154,000	4,000 X $12 = $ 48,000 3,000 X $16 = $ 48,000 $ 96,000	3,000 X $16 = $ 48,000
7-Sep	8,000 X $17 = $136,000			3,000 X $16 = $ 48,000 8,000 X $17 = $136,000 $184,000
11-Nov		6,000 X $25 = $150,000	3,000 X $16 = $ 48,000 3,000 X $17 = $ 51,000 $ 99,000	5,000 X $17 = $ 85,000
31-Dec				5,000 X $17 = $ 85,000

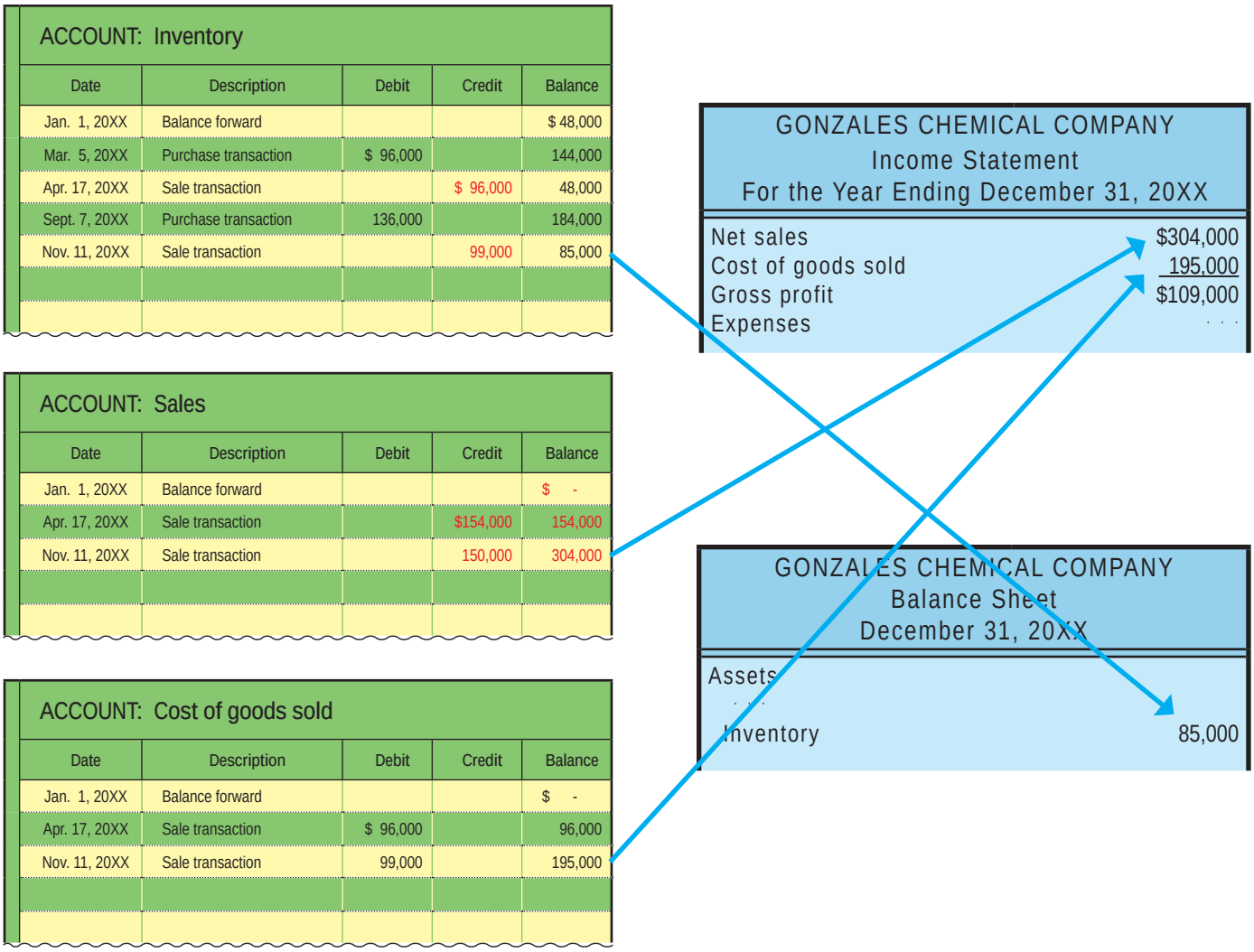
Two points come to mind when examining this table. First, there is considerable detail in tracking inventory using a perpetual approach; thank goodness for computers. Second, careful study is needed to discern exactly what is occurring on each date. For example, look at April 17 and note that 3,000 units remain after selling 7,000 units. This is determined by looking at the preceding balance data on March 5 (consisting of 10,000 total units (4,000 + 6,000)), and removing 7,000 units as follows: all of the 4,000 unit layer, and 3,000 of the 6,000 unit layer. Remember, this is the FIFO application, so the layers are peeled away based on the chronological order of their creation. In essence, each purchase and sale transaction impacts the residual composition of the layers associated with the item of inventory. Realize that this type of data must be captured and maintained for each item of inventory if the perpetual system is to be utilized; a task that was virtually impossible before cost effective computer solutions became commonplace. Today, the method is quite common, as it provides better "real-time" data needed to run a successful business.

17.2 Journal Entries

The table above provides information needed to record purchase and sale information. Specifically, Inventory is debited as purchases occur and credited as sales occur. Following are the entries:

3-5-XX	Inventory		96,000	
	Accounts Payable			96,000
	Purchased inventory on account (6,000 X $16)			
4-17-XX	Accounts Receivable		154,000	
	Sales			154,000
	Sold merchandise on account (7,000 X $22)			
4-17-XX	Cost of Goods Sold		96,000	
	Inventory			96,000
	To record the cost of merchandise sold ((4,000 X $12) + (3,000 X $16))			
9-7-XX	Inventory		136,000	
	Accounts Payable			136,000
	Purchased inventory on account (8,000 X $17)			
11-11-XX	Accounts Receivable		150,000	
	Sales			150,000
	Sold merchandise on account (6,000 X $25)			
11-11-XX	Cost of Goods Sold		99,000	
	Inventory			99,000
	To record the cost of merchandise sold ((3,000 X $16) + (3,000 X $17))			

Let's see how these entries impact certain ledger accounts and the resulting financial statements:



ACCOUNT: Inventory

Date	Description	Debit	Credit	Balance
Jan. 1, 20XX	Balance forward			$ 48,000
Mar. 5, 20XX	Purchase transaction	$ 96,000		144,000
Apr. 17, 20XX	Sale transaction		$ 96,000	48,000
Sept. 7, 20XX	Purchase transaction	136,000		184,000
Nov. 11, 20XX	Sale transaction		99,000	85,000

ACCOUNT: Sales

Date	Description	Debit	Credit	Balance
Jan. 1, 20XX	Balance forward			$ -
Apr. 17, 20XX	Sale transaction		$154,000	154,000
Nov. 11, 20XX	Sale transaction		150,000	304,000

ACCOUNT: Cost of goods sold

Date	Description	Debit	Credit	Balance
Jan. 1, 20XX	Balance forward			$ -
Apr. 17, 20XX	Sale transaction	$ 96,000		96,000
Nov. 11, 20XX	Sale transaction	99,000		195,000

GONZALES CHEMICAL COMPANY
Income Statement
For the Year Ending December 31, 20XX

Net sales	$304,000
Cost of goods sold	195,000
Gross profit	$109,000
Expenses	. . .

GONZALES CHEMICAL COMPANY
Balance Sheet
December 31, 20XX

Assets	
. . .	
Inventory	85,000

If you are very perceptive, you will note that this is the same thing that resulted under the periodic FIFO approach introduced earlier. So, another general observation is in order: The FIFO method will produce the same financial statement results no matter whether it is applied on a periodic or perpetual basis. This occurs because the beginning inventory and early purchases are peeled away and charged to cost of goods sold -- whether the associated calculations are done "as you go" (perpetual) or "at the end of the period" (periodic).

17.3 Perpetual LIFO

LIFO can also be applied on a perpetual basis. This time, the results will not be the same as the periodic LIFO approach (because the "last-in" layers are constantly being peeled away, rather than waiting until the end of the period). The following table reveals the application of a perpetual LIFO approach. Study it carefully, this time noting that sales transactions result in a peeling away of the most recent purchase layers. The journal entries are not repeated here for the LIFO approach. Do note, however, that the accounts would be the same (as with FIFO); only the amounts would change.

Date	Purchases	Sales	Cost of Goods Sold	Balance
1-Jan				4,000 X $12 = $ 48,000
5-Mar	6,000 X $16 = $ 96,000			4,000 X $12 = $ 48,000 6,000 X $16 = $ 96,000 $144,000
17-Apr		7,000 X $22 = $154,000	6,000 X $16 = $ 6,000 1,000 X $12 = $ 12,000 $108,000	3,000 X $12 = $ 36,000
7-Sep	8,000 X $17 = $136,000			3,000 X $12 = $ 36,000 8,000 X $17 = $136,000 $172,000
11-Nov		6,000 X $25 = $150,000	6,000 X $17 = $102,000	3,000 X $12 = $ 36,000 2,000 X $17 = $ 34,000 $ 70,000
31-Dec				3,000 X $12 = $ 36,000 2,000 X $17 = $ 34,000 $ 70,000

ACCOUNT: Inventory

Date	Description	Debit	Credit	Balance
Jan. 1, 20XX	Balance forward			$ 48,000
Mar. 5, 20XX	Purchase transaction	$ 96,000		144,000
Apr. 17, 20XX	Sale transaction		$108,000	36,000
Sept. 7, 20XX	Purchase transaction	136,000		172,000
Nov. 11, 20XX	Sale transaction		102,000	70,000

ACCOUNT: Sales

Date	Description	Debit	Credit	Balance
Jan. 1, 20XX	Balance forward			$ -
Apr. 17, 20XX	Sale transaction		$154,000	154,000
Nov. 11, 20XX	Sale transaction		150,000	304,000

ACCOUNT: Cost of goods sold

Date	Description	Debit	Credit	Balance
Jan. 1, 20XX	Balance forward			$ -
Apr. 17, 20XX	Sale transaction	$108,000		108,000
Nov. 11, 20XX	Sale transaction	102,000		210,000

GONZALES CHEMICAL COMPANY
Income Statement
For the Year Ending December 31, 20XX

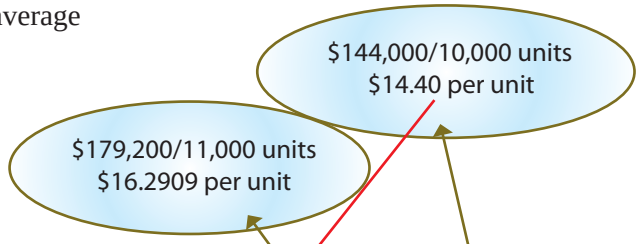
Net sales	$304,000
Cost of goods sold	210,000
Gross profit	$ 94,000
Expenses	

GONZALES CHEMICAL COMPANY
Balance Sheet
December 31, 20XX

Assets	
Inventory	70,000

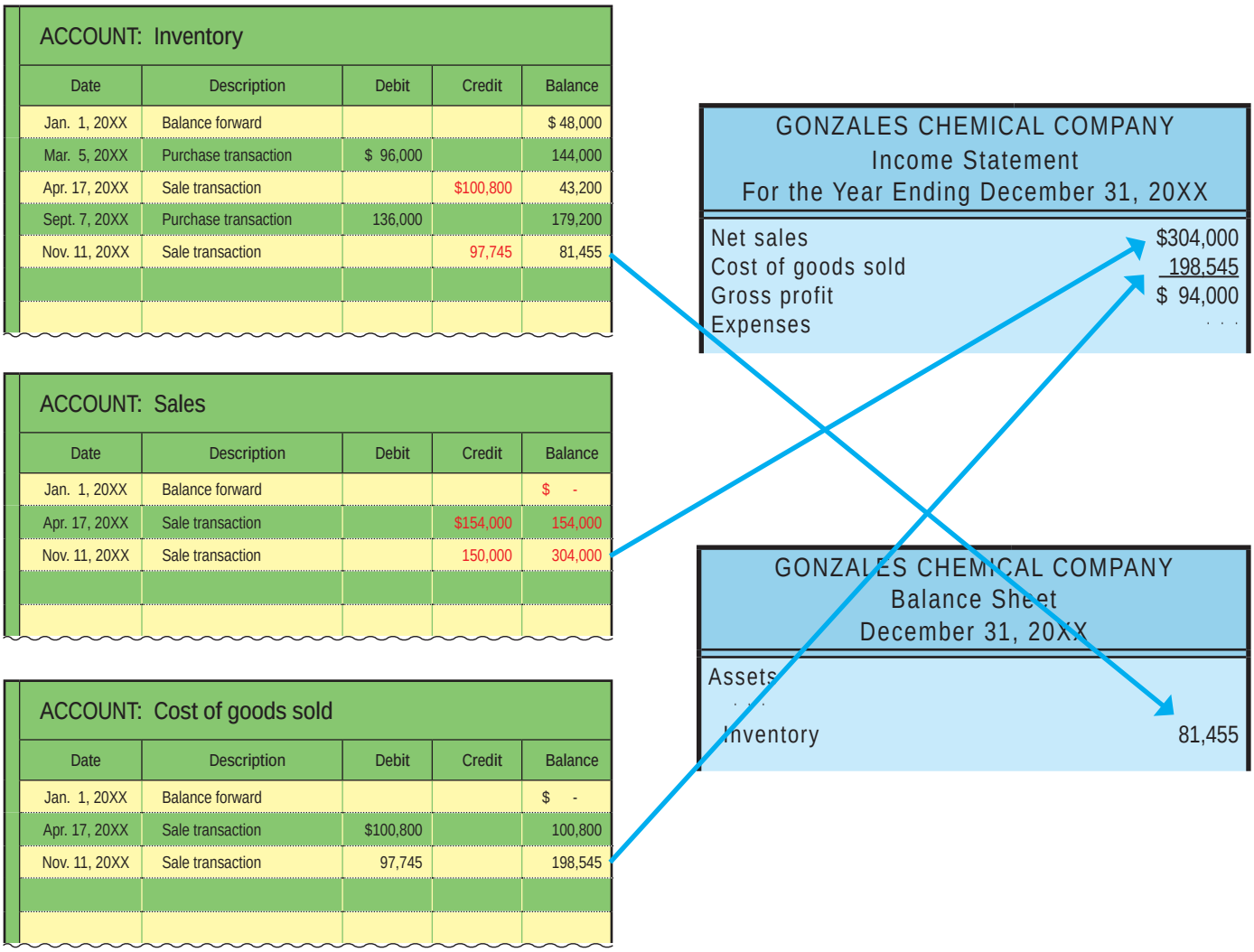
17.4 Moving Average

The average method can also be applied on a perpetual basis, earning it the name "moving average" approach. This technique is considerably more involved, as a new average unit cost must be computed with each purchase transaction. For the last time, we will look at the Gonzales Chemical Company data:



Date	Purchases	Sales	Cost of Goods Sold	Balance
1-Jan				4,000 X $12 = $ 48,000
5-Mar	6,000 X $16 = $ 96,000			4,000 X $12 = $ 48,000 6,000 X $16 = $ 96,000 $144,000
17-Apr		7,000 X $22 = $154,000	7,000 X $14.40 = $100,800	3,000 X $14.40 = $ 43,200
7-Sep	8,000 X $17 = $136,000			3,000 X $14.40 = $ 43,200 8,000 X $17 = $136,000 $179,200
11-Nov		6,000 X $25 = $150,000	6,000 X $16.2909 = $97,745	5,000 X $16.2909 = $ 81,455
31-Dec				5,000 X $16.2909 = $ 81,455

The resulting financial data using the moving-average approach are:



ACCOUNT: Inventory

Date	Description	Debit	Credit	Balance
Jan. 1, 20XX	Balance forward			$ 48,000
Mar. 5, 20XX	Purchase transaction	$ 96,000		144,000
Apr. 17, 20XX	Sale transaction		$100,800	43,200
Sept. 7, 20XX	Purchase transaction	136,000		179,200
Nov. 11, 20XX	Sale transaction		97,745	81,455

ACCOUNT: Sales

Date	Description	Debit	Credit	Balance
Jan. 1, 20XX	Balance forward			$ -
Apr. 17, 20XX	Sale transaction		$154,000	154,000
Nov. 11, 20XX	Sale transaction		150,000	304,000

ACCOUNT: Cost of goods sold

Date	Description	Debit	Credit	Balance
Jan. 1, 20XX	Balance forward			$ -
Apr. 17, 20XX	Sale transaction	$100,800		100,800
Nov. 11, 20XX	Sale transaction	97,745		198,545

GONZALES CHEMICAL COMPANY
Income Statement
For the Year Ending December 31, 20XX

Net sales	$304,000
Cost of goods sold	198,545
Gross profit	$ 94,000
Expenses	. . .

GONZALES CHEMICAL COMPANY
Balance Sheet
December 31, 20XX

Assets	
. . .	
Inventory	81,455

As with the periodic system, observe that the perpetual system produced the lowest gross profit via LIFO, the highest with FIFO, and the moving-average fell in between.