ACC250: Intro to Financial Accounting

Ch7. Inventory & Cost of Goods Sold

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Inventory Management

Income Statement Equation

Net Income = Revenues - Expenses

Companies have incentives to

- Maximize _____.
- Minimize _____.

Companies care about the quality of their inventory.

- Damaged, expired, or obsolete inventory is not sellable. $\rightarrow$ _____ expenses.

Companies need to manage their inventory amount.

- Having too little inventory can lead to stockouts. $\rightarrow$ _____ revenues.
- Having too much inventory can lead to excess inventory. $\rightarrow$ _____ mgt expenses.[1]

[1] Management expenses include costs of maintaining and storing inventory, such as insurance.

Recall: CGS and Inventory

Cost of Goods Sold (Expense)

The cost of the goods sold during a period.

Inventory (Asset)

The total value of the goods held for sale in the ordinary course of business.

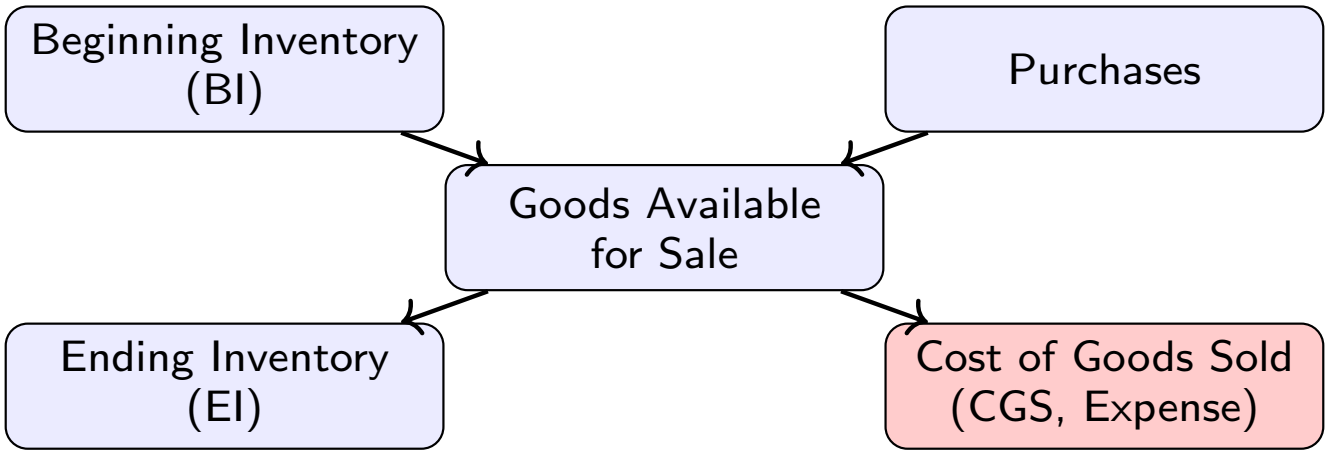
Recall: Inventory Equation

Inventory Equation

End. Inventory = Beg. Inventory + Purchases - Cost of Goods Sold

Inventory is

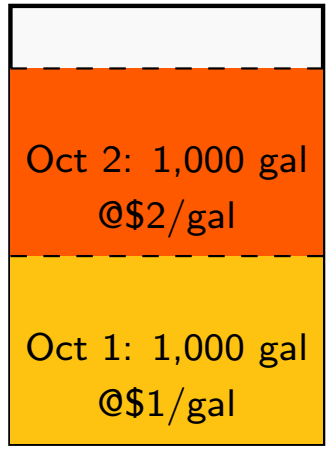
- _____ when purchased;
- _____ when sold.



Opening Illustration 1

Suppose a gas station buys two batches of gasoline:

- Oct 1 – Purchased 1,000 gallons @ \$1/gallon = \$1,000
- Oct 2 – Purchased 1,000 gallons @ \$2/gallon = \$2,000
- Oct 2 – Sold 100 gallons to customers



Can we answer the following questions?

- How much have we paid for the gasoline (CGAS)?[a]
- How much Cost of Goods Sold (CGS)?
- How much Ending Inventory (EI)?

[a] Cost of Goods Available for Sale. See Ch6.

Opening Illustration 2

Suppose Costco (COST) buys three batches of leggings from Lululemon (LULU):

- Oct 1 – Beginning Inventory: 10 units @ \$7 = \$70
- Oct 3 – Purchased 30 units @ \$8 = \$240
- Oct 5 – Purchased 10 units @ \$10 = \$100
- Oct 6 – Sold 35 units at \$20 each

Out of the 50 units available, if the firm sold 35 units at \$20 each, what would be the **CGS** and **EI**?

It'll be answered in Illustration 2!

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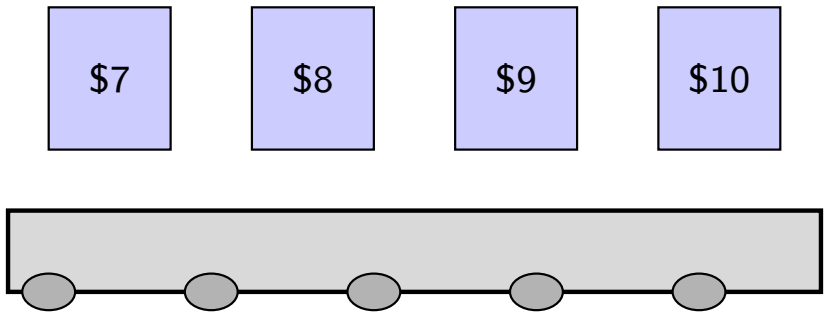
Inventory Costing Methods: Which one is **assumed** to be sold?

Four units of the same product but different input costs.
How much CGS if two units sold?



Inventory Costing Methods: Which one is **assumed** to be sold?

We need **Cost Flow Assumption** to calculate CGS and EI:

1. **Specific Identification**
   - Specific units are selected to be sold.
   - Used by high-value items such as cars, jewelry, real estate.
2. **FIFO (First-In, First-Out)**
   - First units purchased are the first units sold.
   - Used by most companies.
3. **LIFO (Last-In, First-Out)**
   - Last units purchased are the first units sold.
   - Used by companies with rising prices.

Steps to Calculate CGS and EI

Given the chosen inventory costing method, we follow the steps:

1. Calculate the Cost of Goods Available for Sale **(CGAS)**.
2. Calculate the Cost of Goods Sold **(CGS)**.
3. Calculate the Ending Inventory **(EI)**.

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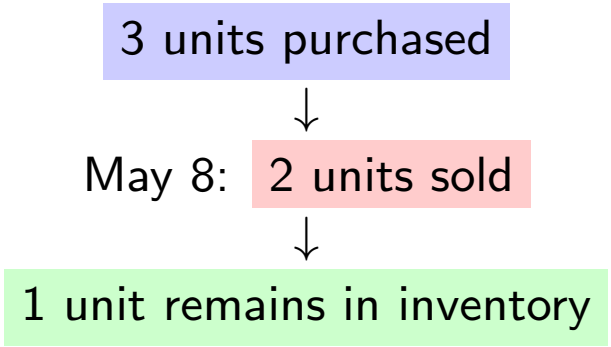
Illustration 1: Specific Identification Method

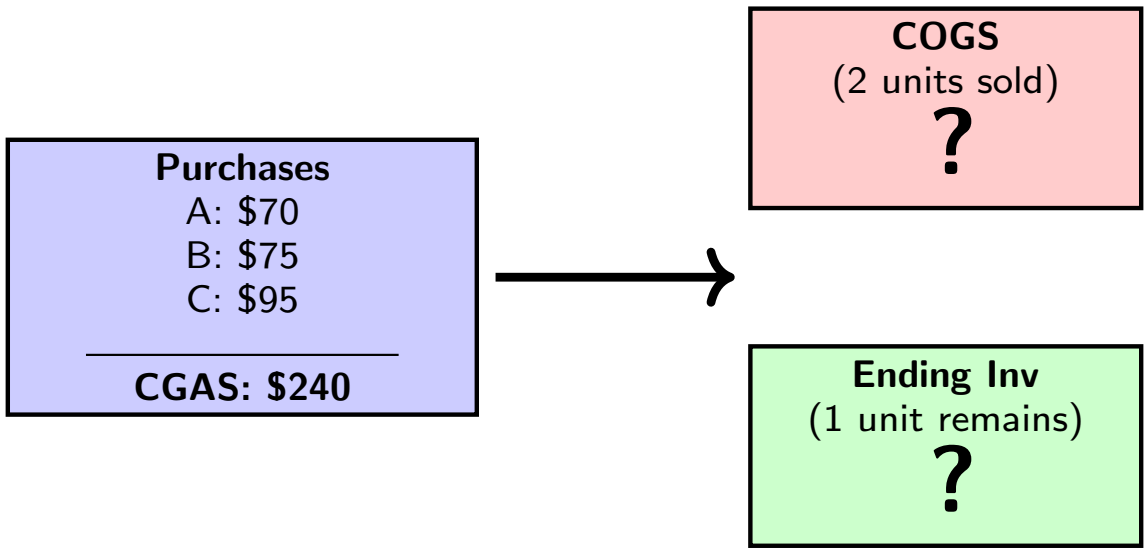
How much CGS and EI? Given Information:

- May 3 – Purchased 1 unit for \$70 (unit A)
- May 5 – Purchased 1 unit for \$75 (unit B)
- May 6 – Purchased 1 unit for \$95 (unit C)
- May 8 – Sold 2 units for \$125 each



Step 1: CGAS

We first calculate the Cost of Goods Available for Sale **(CGAS)**. It does not depend on the inventory costing method.[2]

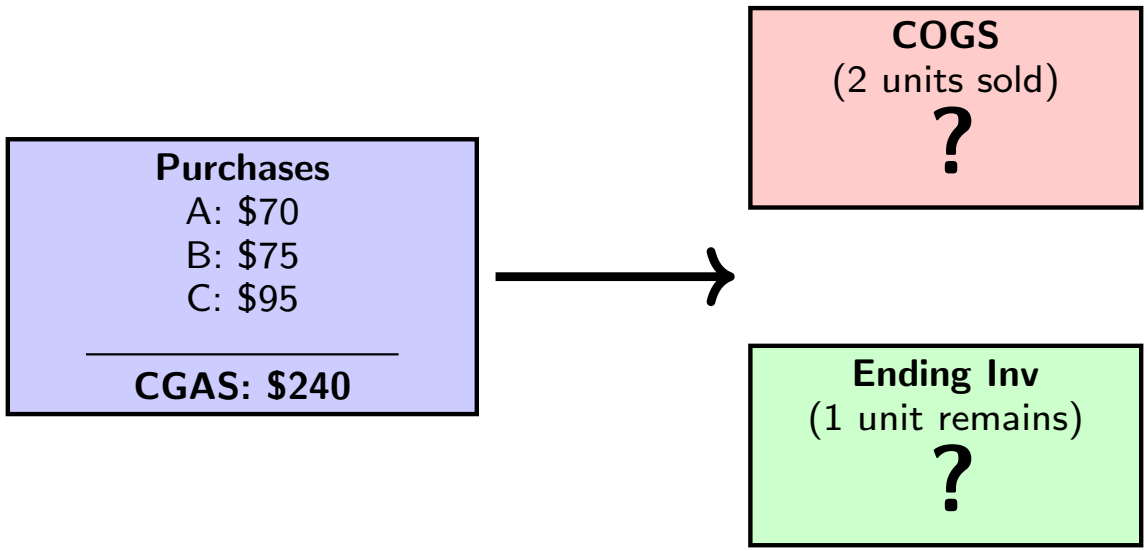


[2] Keep in mind that Cost Flow Assumption is about which units are _____.
CGAS is determined before the choice of **inventory costing method**.

Step 2 & 3 under Specific Identification Method

Specific Identification Method

- Specific units are selected to be sold.
- Used by high-value items such as cars, jewelry, real estate.

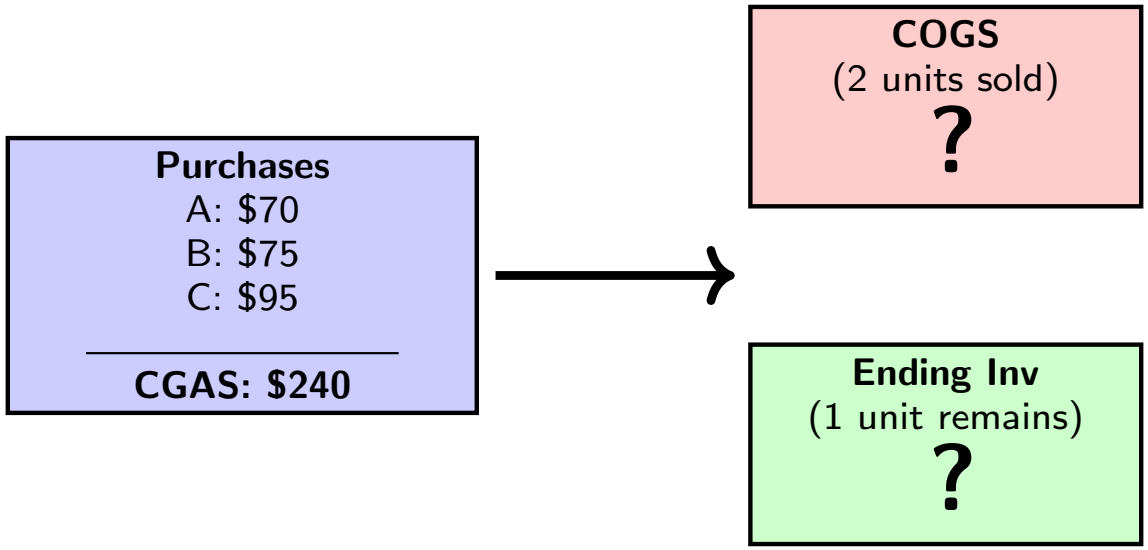


CGS and EI depend on the units that are **assumed to be sold**.

Which Units Sold?	CGAS	CGS	EI
A & B	$240		
B & C	$240		
A & C	$240		

FIFO Method (First-In, First-Out)

- First units purchased are the first units sold.
- Used by most companies.

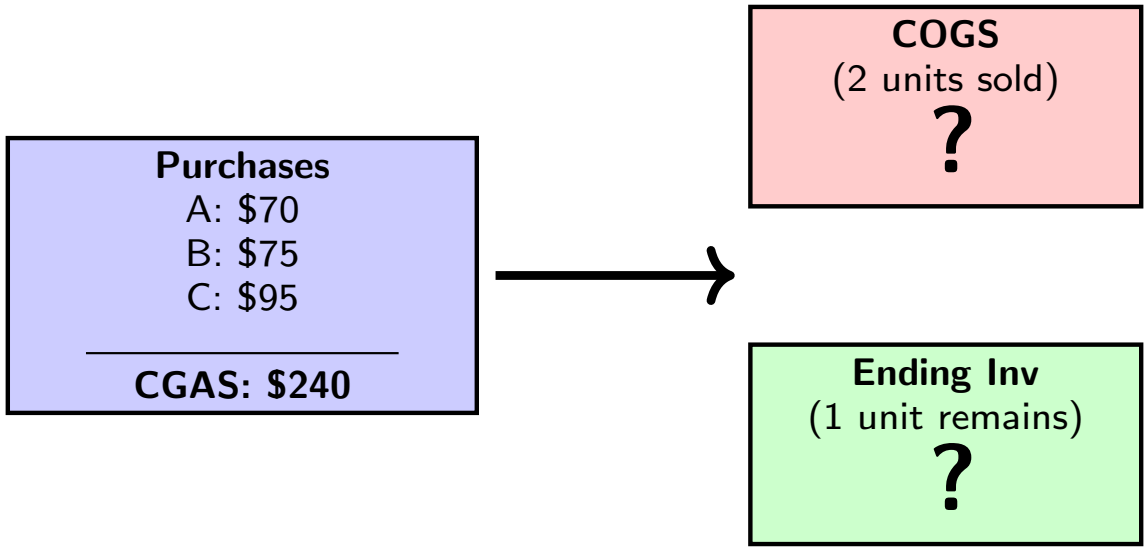


Method	CGAS	CGS	EI
FIFO	$240		

Step 2 & 3 under LIFO Method

LIFO Method (Last-In, First-Out)

- Last units purchased are the first units sold.
- Used by companies with rising prices.



Method	CGAS	CGS	EI
LIFO	$240	_____	____

Summary: Comparing Inventory Methods

We sold 2 units at \$125 each. So revenue is \$250.

Method	CGAS	COGS	Ending Inventory	Gross Profit
FIFO	\$240	\$145	\$95	____
LIFO	\$240	\$170	\$70	__
Specific ID	Varies	Varies	Varies	Varies

Implications: COGS, EI, and Gross Profit, and NI are different under different methods.

Summary: Comparing Inventory Methods

- Cash inflows (by selling inventory) are _____ for all methods.
- Cash outflows (by purchasing inventory) are _____ for all methods.
- But the _____ of CGAS to CGS and EI is different under different methods.

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Illustration 2: Multiple Purchases with Beginning Inventory

How much CGS and EI? Given Information:[3]

- Oct 1 – Beginning Inventory: 10 units @ \$7 = \$70
- Oct 3 – Purchased 30 units @ \$8 = \$240
- Oct 5 – Purchased 10 units @ \$10 = \$100
- Oct 6 – Sold 35 units (at \$20 each)

50 units available (10 + 30 + 10)

↓

Oct 6: 35 units sold

↓

15 units remain in inventory

[3] We focus on FIFO and LIFO. Too many items, so too many possibilities for Specific Identification.

Illustration 2: Multiple Purchases with Beginning Inventory

Oct 1: Beg. Inv.
10 units @ $7

$7	$7	$7	$7	$7	$7	$7	$7	$7	$7

Oct 3: Purchase
30 units @ $8

$8	$8	$8	$8	$8	$8	$8	$8	$8	$8
$8	$8	$8	$8	$8	$8	$8	$8	$8	$8
$8	$8	$8	$8	$8	$8	$8	$8	$8	$8

Oct 5: Purchase
10 units @ $10

$10	$10	$10	$10	$10	$10	$10	$10	$10	$10

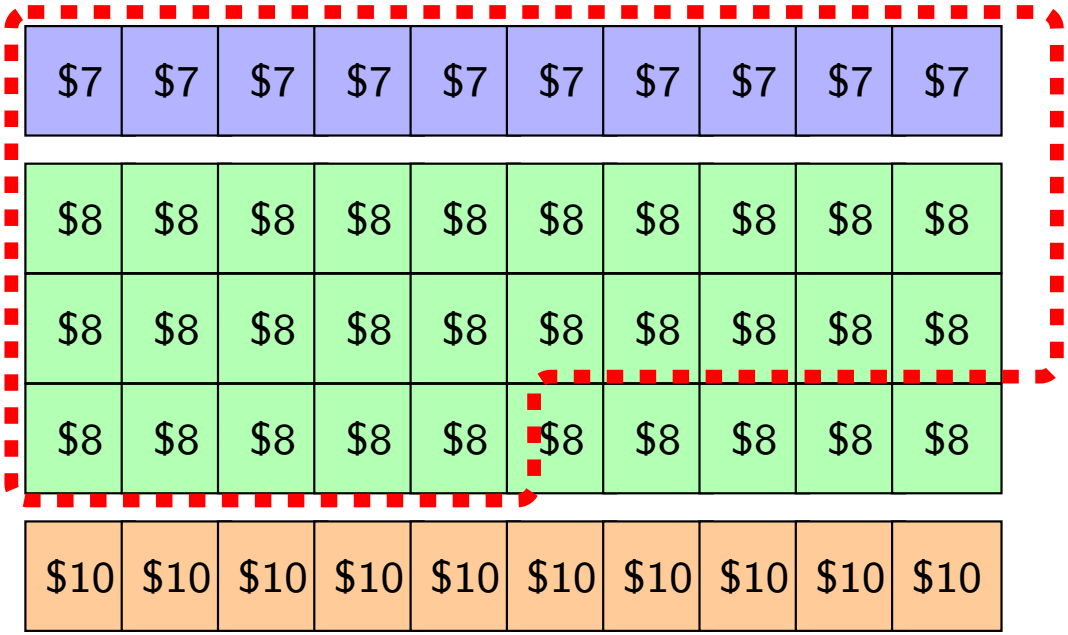
Question: Out of these 50 units, which 35 should be assigned to Cost of Goods Sold?

FIFO: First-In, First-Out (Sell oldest units first)

Oct 1: Beg. Inv.
10 units @ $7

Oct 3: Purchase
30 units @ $8

Oct 5: Purchase
10 units @ $10



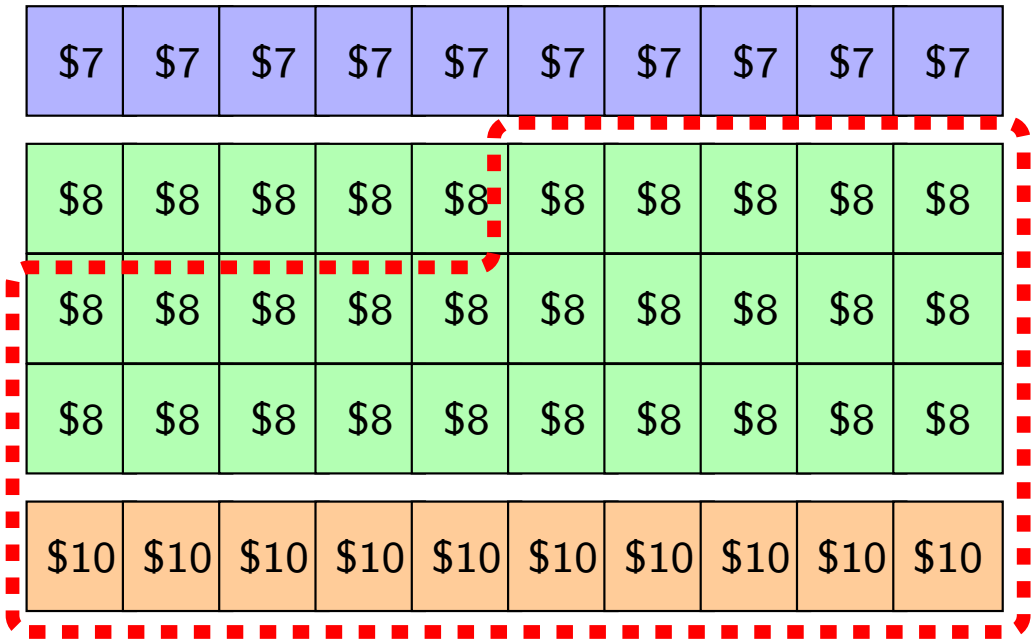
- CGS=Those in the **dashed line**= _____ = _____
- EI= Those not in the **dashed line**= _____ = _____

LIFO: Last-In, First-Out (Sell newest units first)

Oct 1: Beg. Inv.
10 units @ $7

Oct 3: Purchase
30 units @ $8

Oct 5: Purchase
10 units @ $10



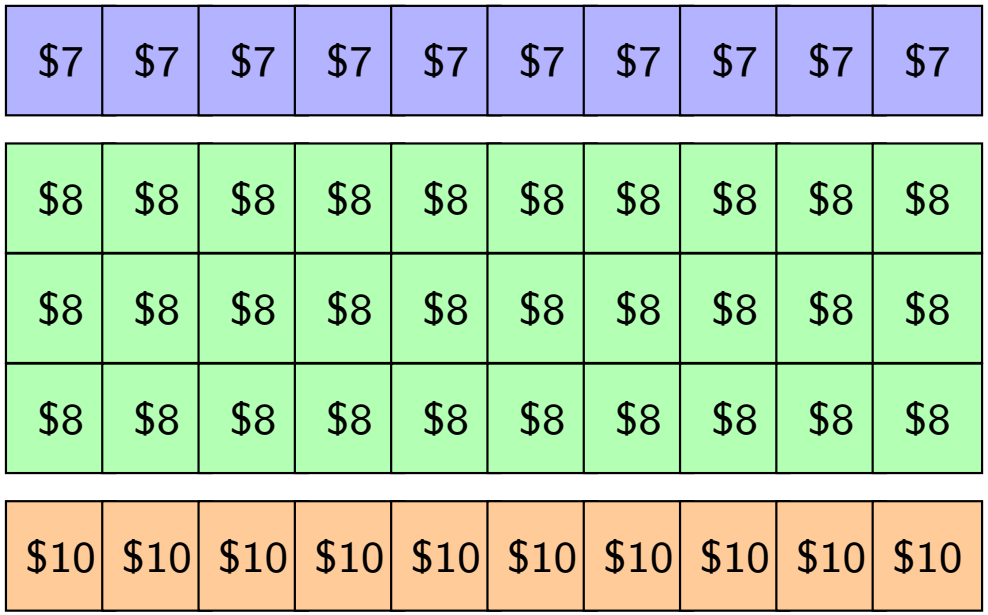
- CGS=Those in the **dashed line**= _____ = _____
- EI= Those not in the **dashed line**= _____ = _____

Summary

Oct 1: Beg. Inv.
10 units @ $7

Oct 3: Purchase
30 units @ $8

Oct 5: Purchase
10 units @ $10



	FIFO	LIFO
CGAS (Cost of Goods Available for Sale)		
CGS (Cost of Goods Sold)		
EI (Ending Inventory)		

Impact on Gross Profit and Net Income

Suppose that the firm sold 35 units for $20 each.

	FIFO	LIFO
Sales Revenues	$700	$700
Cost of Goods Sold (CGS)	**$270**	**$300**
Gross Profit	**$430**	**$400**
Expenses other than CGS	$320	$320
Net Income	**$110**	**$80**

Implications: FIFO and LIFO can lead to different _____ and _____.

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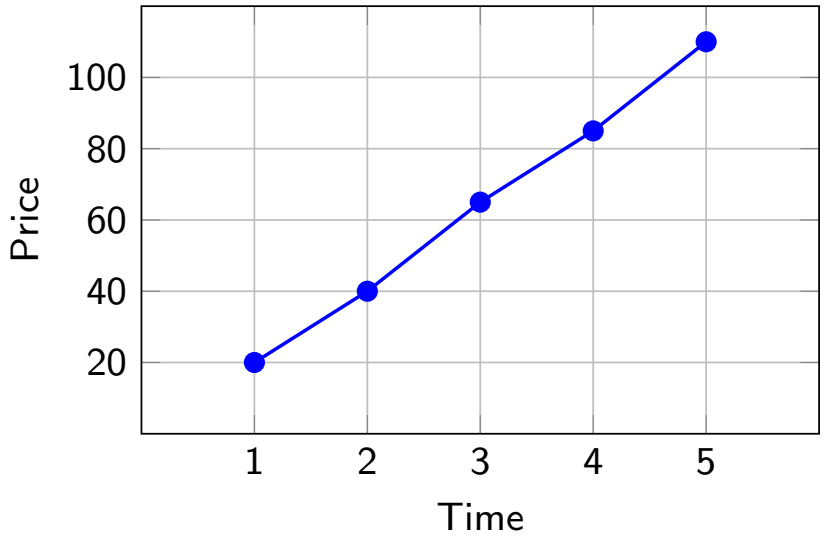
CGS and EI under Inflation

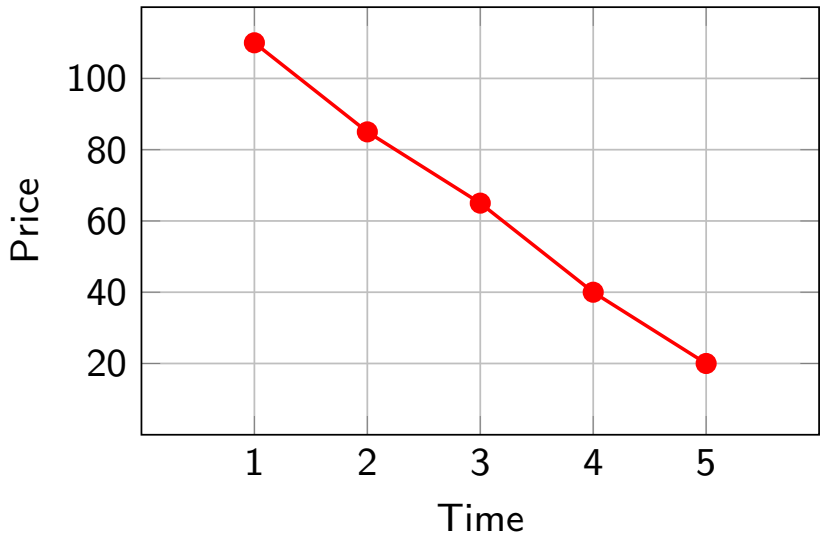
Suppose prices are rising.



	FIFO	**LIFO**
Units sold first?	The first units bought	The last units bought
The sold ones are:	the cheapest	the most expensive
Cost of Goods Sold	Lower	Higher
Ending Inventory	_____	_____
Gross Profit	_____	_____
Net Income	_____	_____

CGS and EI under Deflation

Suppose prices are falling.



	FIFO	**LIFO**
Units sold first?	The first units bought	The last units bought
The sold ones are:	the most expensive	the cheapest
Cost of Goods Sold	Higher	Lower
Ending Inventory	_____	_____
Gross Profit	_____	_____
Net Income	_____	_____

Note: We use the Periodic Inventory System in Ch7.

Perpetual inventory system (used in Ch6):

- This system is widely used in practice.
- But, it's more challenging to follow for some cost flow assumptions such as LIFO.

Periodic inventory system: Why do we use this here in Ch7?

- The majority of U.S. companies use FIFO.
- FIFO calculations don't differ between perpetual and periodic systems.
- So it's identical under both systems for FIFO.
- Additional benefits:
  - Easier to apply when calculating INVENTORY and CGS.
  - Easier to visualize the inventory flow.

Note: For further information, see **footnote 1** in Ch7; **Supplement 7A** for reasons why we use the perpetual inventory system in this chapter; and **Supplement 7B**, particularly for how to record inventory transactions using a FIFO perpetual inventory system. The details are beyond the scope of this course.

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Additional Exercise 1: Description

Exercise 1: JOP began operating on June 26 with no inventory on hand. The following transactions occurred during the month:

- June 27: Purchased 12 units at $8 each.
- June 28: Purchased 38 units at $9 each.
- June 29: Purchased 20 units at $11 each.
- June 30: Sold 46 units.

Required:

1. Calculate the number of units and cost of goods available for sale.
2. Calculate the number of units in ending inventory at June 30.
3. Calculate the cost of ending inventory and the cost of goods sold under FIFO.
4. Calculate the cost of ending inventory and the cost of goods sold under LIFO.

Additional Exercise 1: FIFO case

June 27: Purchase
12 units @ $8

June 28: Purchase
38 units @ $9

June 29: Purchase
20 units @ $11

- The number of units available for sale: $12 + 38 + 20 = 70$ units.
- The cost of goods available for sale: $658 (sum of the followings)
  - 12 units @ $8 = $96
  - 38 units @ $9 = $342
  - 20 units @ $11 = $220

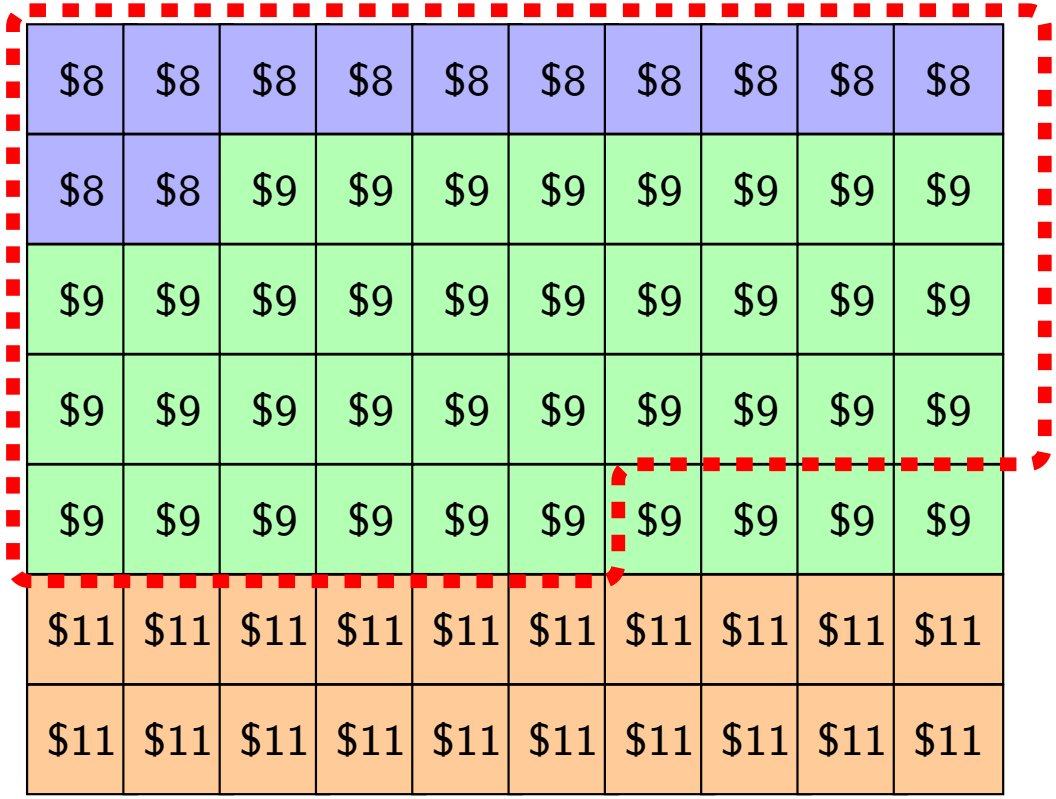
Additional Exercise 1: FIFO case

Under **FIFO**: Which units are sold? CGS?

June 27: Purchase
12 units @ $8

June 28: Purchase
38 units @ $9

June 29: Purchase
20 units @ $11



CGS= Sum of...

- 12 units @ $8 = $96
- 34 units @ $9 = $306

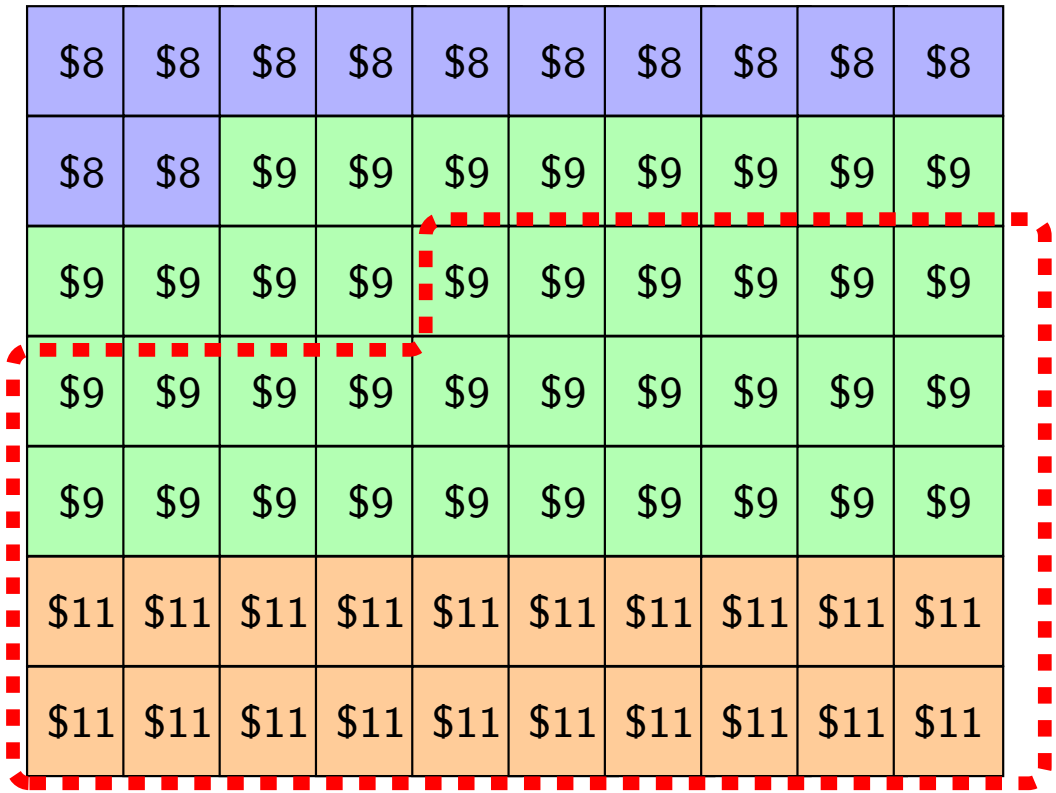
Additional Exercise 1: LIFO case

Under **LIFO**: Which units are sold? CGS?

June 27: Purchase
12 units @ $8

June 28: Purchase
38 units @ $9

June 29: Purchase
20 units @ $11



CGS= Sum of...

- 20 units @ $11 = $220
- 26 units @ $9 = $234

Additional Exercise 1: Summary Table

Summary of data:

Description	Value
Units of goods available for sale	70 units
Cost of goods available for sale	\$658
Units in EI	24 units
Units for CGS	46 units

	FIFO	LIFO
EI (cost)	\$256 ($\underline{20} \times \$11 + \underline{4} \times \$9$)	\$204 ($\underline{12} \times \$8 + \underline{12} \times \$9$)
CGS (cost)	\$402 ($\underline{12} \times \$8 + \underline{34} \times \$9$)	\$454 ($\underline{20} \times \$11 + \underline{26} \times \$9$)

Additional Exercise 2: Description

Exercise 2: The following are the transactions for the month of July:

- July 1: Beginning Inventory - 50 units @ $10 each.
- July 13: Purchase - 250 units @ $13 each.
- July 25: Sold 100 units @ $15 each.
- July 31: Ending Inventory - 200 units.

Required:

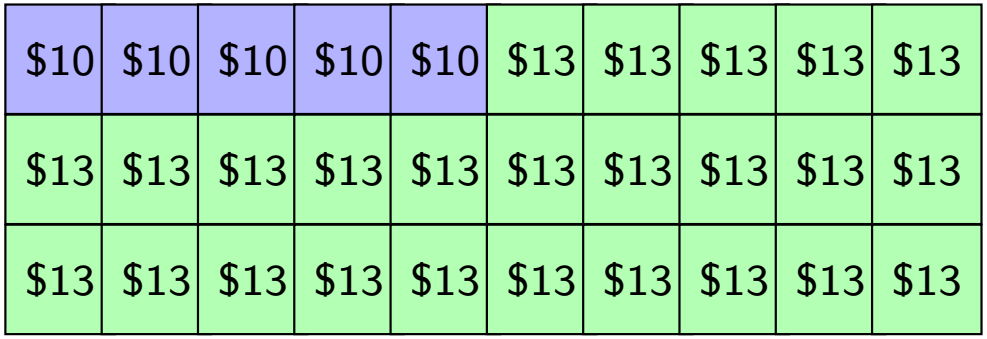
1. Calculate cost of goods available for sale and ending inventory under FIFO.
2. Calculate sales, cost of goods sold, and gross profit under FIFO.
3. Calculate cost of goods available for sale and ending inventory under LIFO.
4. Calculate sales, cost of goods sold, and gross profit under LIFO.

Assume a periodic inventory system is used.

Additional Exercise 2: Available for Sale

July 1: Beg. Inv.
50 units @ \$10

July 13: Purchase
250 units @ \$13



One box represents 10 units

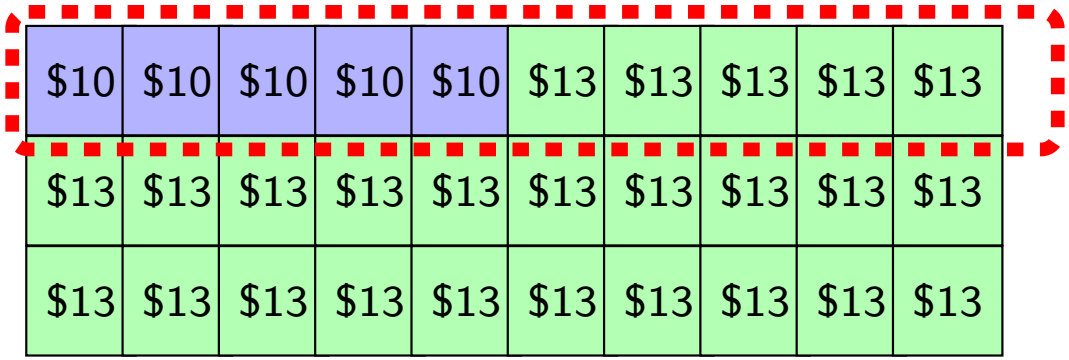
- The number of units available for sale: $50 + 250 = 300$ units.
- The cost of goods available for sale: \$3,750 (sum of the followings)
  - 50 units @ \$10 = \$500
  - 250 units @ \$13 = \$3,250
- Units sold: 100 units
- Units in ending inventory: 200 units

Additional Exercise 2: FIFO case

Under **FIFO**: Which units are sold? COGS?

July 1: Beg. Inv.
50 units @ $10

July 13: Purchase
250 units @ $13



One box represents 10 units

COGS = Sum of...

- 50 units @ $10 = $500
- 50 units @ $13 = $650
- **Total COGS = $1,150**

Ending Inventory:

- 200 units @ $13 = $2,600

Additional Exercise 2: FIFO - Income Statement

FIFO Periodic - Income Statement Items:

Item	**Amount**
Sales (100 units @ $15)	$1,500
Cost of Goods Sold	$1,150
Gross Profit	**$350**

Additional Exercise 2: LIFO case

Under **LIFO**: Which units are sold? COGS?

July 1: Beg. Inv.
50 units @ $10

July 13: Purchase
250 units @ $13

One box represents 10 units

COGS = Sum of...

- 100 units @ $13 = $1,300
- **Total COGS = $1,300**

Ending Inventory:

- 50 units @ $10 = $500
- 150 units @ $13 = $1,950
- **Total Ending Inventory = $2,450**

Additional Exercise 2: LIFO - Income Statement

LIFO Periodic - Income Statement Items:

Item	**Amount**
Sales (100 units @ $15)	$1,500
Cost of Goods Sold	$1,300
Gross Profit	**$200**

Additional Exercise 2: Summary Comparison

Summary of data:

Description	Value
Units of goods available for sale	300 units
Cost of goods available for sale	$3,750
Units in EI	200 units
Units for COGS	100 units
Sales Revenue	$1,500

	FIFO	LIFO
Ending Inventory (cost)	$2,600	$2,450
COGS (cost)	$1,150	$1,300
Gross Profit	$350	$200