
Intermediate Accounting

CHAPTER TWO PROPERTY, PLANT, AND EQUIPMENT (FIXED ASSETS)

Finance & Banking Department

2021-2022

CHAPTER TWO**PROPERTY, PLANT, AND EQUIPMENT (FIXED ASSETS)**

Companies like **Boeing, Target, and Starbucks** use assets of a durable nature. Such assets are called **property, plant, and equipment**. Other terms commonly used are **plant assets** and **fixed assets**. We use these terms interchangeably. Property, plant, and equipment include **land, building** structures (**offices, factories, warehouses**), and equipment (**machinery, computers, vehicles, furniture, tools**). The major characteristics of property, plant, and equipment are as follows.

- 1- **They are acquired for use in operations and not for resale.**
- 2- **They are long-term in nature and usually depreciated. Property, plant, and equipment yield services over a number of years.**
- 3- **They possess physical substance. Property, plant, and equipment are tangible assets characterized by physical existence or substance.**

Acquisition of Property, Plant, and Equipment

Most companies use historical cost as the basis for valuing property, plant, and equipment. **Historical cost** measures the cash or cash equivalent price of obtaining the asset and bringing it to the location and condition necessary for its intended use. For example, companies like **Kellogg Co.** consider the **purchase price, freight costs, sales taxes, and installation costs** of a productive asset as part of the asset's cost. It then allocates these costs to future periods through depreciation. Further, **Kellogg** adds to the asset's original cost any related costs incurred after the asset's acquisition, such as **additions, improvements, or replacements**, if they provide future service potential. Otherwise, **Kellogg** expenses these costs immediately. Subsequent to acquisition, companies should not write up property, plant, and equipment to reflect fair value when it is above cost. The main reasons for this position are as follows.

1. **Historical cost involves actual, not hypothetical, transactions and so is the most reliable.**
2. **Companies should not anticipate gains and losses but should recognize gains and losses only when the asset is sold.**

Cost of Land

All expenditures made to acquire land and ready it for use are considered part of the land cost. Thus, when Wal-Mart Stores, Inc. or Home Depot purchases land on which to build a new store, its land costs typically include (1) the purchase price; (2) closing costs, such as title to the land, attorney's fees, and recording fees; (3) costs incurred in getting the land in condition for its intended use, such as filling or clearing; and (4) any additional land improvements that have an indefinite life.

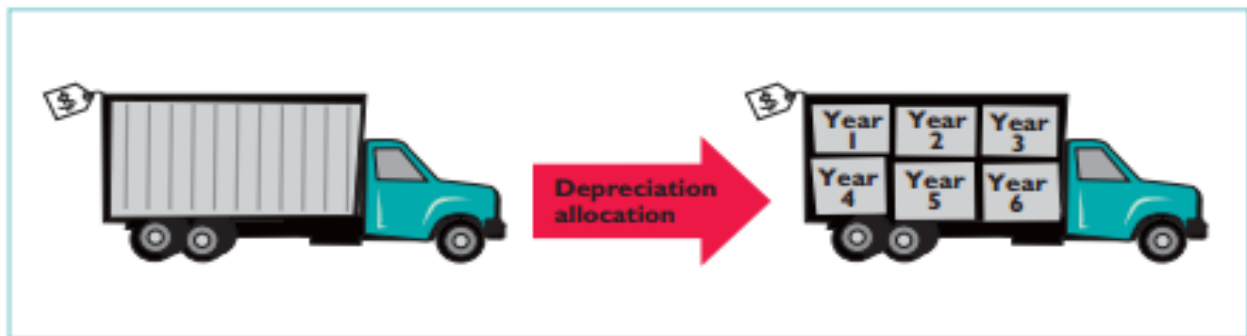
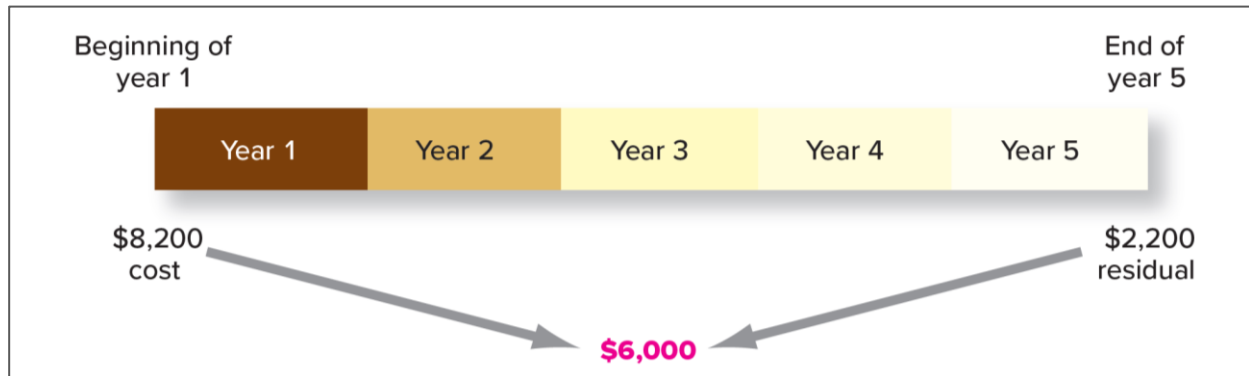
Example: Assume a company purchased a land, its original cost is \$ 50,000, while purchasing there are some other costs which are; \$2,500 attorney's fees, \$1,500 Recording Fees, and the company made filling for land its cost was \$1,000. Calculate the final cost of the land.

Example: A company bought a machine for production department, the machine cost was \$150,000, transportation cost \$2,000, and installation cost by engineers \$2,500. Calculate the machine cost.

DEPRECIATION

depreciation is the process of allocating to expense the cost of a plant asset over its useful (service) life in a rational and systematic manner.

Let's suppose that a company purchases a used truck for **\$8,200** to deliver products to customers. The company estimates that five years from the acquisition date the truck will be sold for **\$2,200**. It is estimated, then, that **\$6,000** ($\$8,200 - \$2,200$) of the truck's purchase cost will be used up (consumed) during a five-year useful life



Basic Factors for calculation depreciation:

The basic factors for calculation of depreciation on fixed assets are:

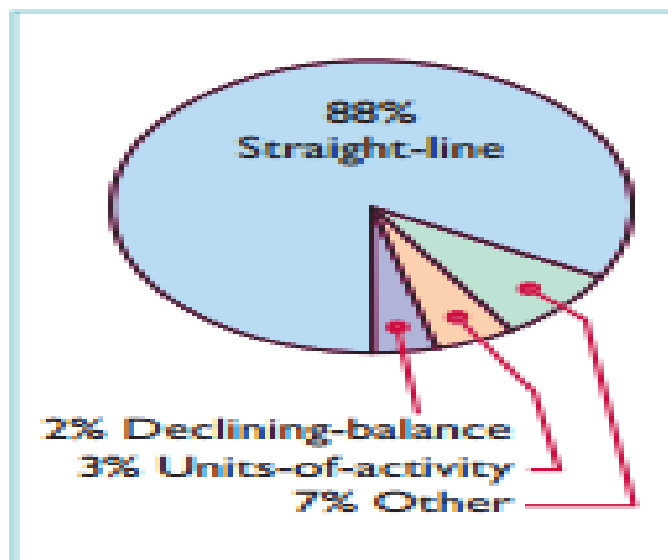
1. Cost of the assets.
2. Estimated working life of the assets.
3. Estimated scrap value at the end of its life time



Depreciation for Cost Allocation (Methods for Depreciation Calculate)

Depreciation is generally computed using one of the following methods:

1. Straight-line
2. Units-of-activity
3. Declining-balance



We will compare the three depreciation methods using the following data for a

small delivery truck purchased by Barb's Florists on January 1, 2010.

Cost \$13,000

Expected salvage value \$1,000

Estimated useful life in years 5

Estimated useful life in miles 100,000

1. Straight Line Method (Fixed percentage Method):

Under this method a fixed amount decreasing of the total cost of the asset every year. At the end of the useful life of the asset, the balance in that asset's account will be equal to its scrap value (if the value of scrap estimated at the beginning).

Under this method the form will be:

$$\text{Depreciation} = \frac{\text{Cost Price of asset} - \text{Scrap Value}}{\text{Estimated life of Asset in year}}$$

Or

$$D = \frac{C - S}{N}$$

Where:

- D = Amount of depreciation (for one year).
- C = Cost of asset.
- S = Scrap value.
- N = Working life in year.

Cost	-	Salvage Value	=	Depreciable Cost
\$13,000	-	\$1,000	=	\$12,000
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Depreciable Cost	÷	Useful Life (in years)	=	Annual Depreciation Expense
\$12,000	÷	5	=	\$2,400

Alternatively, we also can compute an annual **rate** of depreciation. In this case, the rate is 20% (100% ÷ 5 years). When a company uses an annual straight-line rate, it applies the percentage rate to the depreciable cost of the asset. Illustration 10-10 shows a **depreciation schedule** using an annual rate.

Year	Computation		=	Annual Depreciation Expense	End of Year	
	Depreciable Cost	× Depreciation Rate			Accumulated Depreciation	Book Value
2010	\$12,000	20%		\$2,400	\$ 2,400	\$10,600*
2011	12,000	20		2,400	4,800	8,200
2012	12,000	20		2,400	7,200	5,800
2013	12,000	20		2,400	9,600	3,400
2014	12,000	20		2,400	12,000	1,000

*Book Value = Cost – Accumulated depreciation = (\$13,000 – \$2,400).

2. Units-of-activity

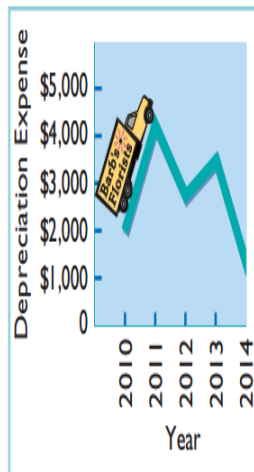
Under the units-of-activity method, useful life is expressed in terms of the total units of production or use expected from the asset, rather than as a time period. The units-of-activity method is ideally suited to factory machinery. Manufacturing companies can measure production in units of output or in machine hours. This method can also be used for such assets as delivery equipment (miles driven) and airplanes (hours in use). The units-of-activity method is generally not suitable for buildings or furniture, because depreciation for these assets is more a function of time than of use.

To use this method, companies estimate the total units of activity for the entire useful life, and then divide these units into depreciable cost. The resulting number represents the depreciation cost per unit. The depreciation cost per unit is then applied to the units of activity during the year to determine the annual depreciation expense

Depreciable Cost	÷	Total Units of Activity	=	Depreciation Cost per Unit
\$12,000	÷	100,000 miles	=	\$0.12
↓				
Depreciable Cost per Unit	×	Units of Activity during the Year	=	Annual Depreciation Expense
\$0.12	×	15,000 miles	=	\$1,800

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schedule



Year	Computation		=	Annual Depreciation Expense	End of Year	
	Units of Activity	Depreciation Cost/Unit			Accumulated Depreciation	Book Value
2010	15,000	\$0.12		\$1,800	\$ 1,800	\$11,200*
2011	30,000	0.12		3,600	5,400	7,600
2012	20,000	0.12		2,400	7,800	5,200
2013	25,000	0.12		3,000	10,800	2,200
2014	10,000	0.12		1,200	12,000	1,000

*(\$13,000 - \$1,800).

3. Declining-balance

The declining-balance method produces a decreasing annual depreciation expense over the asset's useful life.

At the beginning of the first year, book value is the cost of the asset. This is so because the balance in accumulated depreciation at the beginning of the asset's useful life is zero. In subsequent years, book value is the difference between cost and accumulated depreciation to date. Unlike the other depreciation methods, the declining-balance method does not use depreciable cost. That is, it ignores salvage value in determining the amount to which the declining-balance rate is applied. Salvage value, however, does limit the total depreciation that can be taken. Depreciation stops when the asset's book value equals expected salvage value. A common declining-balance rate is double the straight-line rate. The method is often called the double-declining-balance method. If Barb's Florists uses the double-declining-balance method, it uses a depreciation rate of 40% (2 the straight-line rate of 20%).

Book Value at Beginning of Year	×	Declining- Balance Rate	=	Annual Depreciation Expense
\$13,000	×	40%	=	\$5,200

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EXAMPLE

DuPage Company purchases a factory machine at a cost of \$18,000 on January 1, 2010. DuPage expects the machine to have a salvage value of \$2,000 at the end of its 4-year useful life.

During its useful life, the machine is expected to be used 160,000 hours. Actual annual hourly use was: 2010, 40,000; 2011, 60,000; 2012, 35,000; and 2013, 25,000.

Instructions

Prepare depreciation schedules for the following methods:

(a) straight-line.

(b) units-of-activity.

(c) declining-balance using double the straight-line rate.

Straight-Line Method

Year	Computation		=	Annual Depreciation Expense	End of Year	
	Depreciable Cost*	× Depreciation Rate			Accumulated Depreciation	Book Value
2010	\$16,000	25 %		\$4,000	\$ 4,000	\$14,000**
2011	16,000	25 %		4,000	8,000	10,000
2012	16,000	25 %		4,000	12,000	6,000
2013	16,000	25 %		4,000	16,000	2,000

*\$18,000 – \$2,000.

**\$18,000 – \$4,000.

(b)

Units-of-Activity Method

Year	Computation		=	Annual Depreciation Expense	End of Year	
	Units of Activity	× Depreciation Cost/Unit			Accumulated Depreciation	Book Value
2010	40,000	\$0.10*		\$4,000	\$ 4,000	\$14,000
2011	60,000	0.10		6,000	10,000	8,000
2012	35,000	0.10		3,500	13,500	4,500
2013	25,000	0.10		2,500	16,000	2,000

*(\$18,000 – \$2,000) ÷ 160,000.

(c)

Declining-Balance Method

Year	Computation		=	Annual Depreciation Expense	End of Year	
	Book Value Beginning of Year	× Depreciation Rate*			Accumulated Depreciation	Book Value
2010	\$18,000	50%		\$9,000	\$ 9,000	\$9,000
2011	9,000	50%		4,500	13,500	4,500
2012	4,500	50%		2,250	15,750	2,250
2013	2,250	50%		250**	16,000	2,000

* $\frac{1}{4} \times 2$.

**Adjusted to \$250 because ending book value should not be less than expected salvage value.

Disposal of fixed assets:

Companies dispose of plant assets in three ways—retirement, sale, or Exchange. Whatever the method, at the time of disposal the company must determine the book value of the plant asset.

As noted earlier, book value is the difference between the cost of a plant Asset and the accumulated depreciation to date.



1. Retirement of fixed Assets:

To illustrate the retirement of plant assets, assume that Hobart Enterprises retires its computer printers, which cost \$32,000. The accumulated depreciation on these printers is \$32,000. The equipment, therefore, is fully depreciated (zero book value).

The entry to record this retirement is as follows.

Accumulated Depreciation—Printing Equipment	32,000	
Printing Equipment		32,000
(To record retirement of fully depreciated equipment)		

If a company retires a plant asset before it is fully depreciated, and no cash is received for scrap or salvage value, a loss on disposal occurs. For example, assume that Sunset Company discards delivery equipment that cost \$18,000 and has accumulated depreciation of \$14,000. The entry is as follows

Accumulated Depreciation—Delivery Equipment	14,000	
Loss on Disposal	4,000	
Delivery Equipment		18,000
(To record retirement of delivery equipment at a loss)		

2. Sale of Fixed assets:

If the selling price is more than the book value of the asset, the transaction result is **gain**.

If the selling price is less than the book value of the asset, the transaction result will be **loss**.

Profit or Loss on Sold Assets = Selling Price – Book Value.

Book Value = Cost of an Assets – Balance of Accumulated Depreciation.

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Example: (1)

If a **car** costing 4500 \$ was sold on Apr. 1st 2007 by 700 \$ cash.

The balance of accumulated depreciation – car on Apr. 1st 2007 is 3250 \$.

Book value = 4500 – 3250 = 1250 \$

Profit or loss on sold = 700 – 1250 = (550) \$

The entries for sale in the journal are:

Apr. 1st. 2007 By sundries

Cash	700	
Accumulated Depreciation	3250	
Loss on Car Sold	550	
To Car		4500

(Being sold car by 700 \$ cash)

Apr. 1st. 2007 By Profit & Loss 550

To Loss on Car Sold 550

(Being close of loss on car sold in profit & loss account)

3. Exchanging of Fixed Assets:

The businesses in some cases exchanged its old assets with new assets, usually in this transaction the business must pay the difference between the value of old asset that owned and the value of the new one. In exchanging transaction we must remove the value of the old asset and the accumulated depreciation of it (in the same way we did in the sold of an assets), and in this case we must calculate the profit or loss that result from the transaction.

Example: (2)

An old car along with certain amount of money were taken from (Abdul Naser) against giving him an old car. The details of the deal are stated as follows:

Old Car:

Cost 20000 \$ - Accumulated Depreciation for car 17000 \$ -

Money paid 37000 \$ by cash.

New Car Value 38000 \$.

Book value of an old asset = 20000 – 17000 = 3000 \$

Profit or Loss on exchange – car = 38000 – (3000 + 37000)
= 38000 – 40000 = (2000) \$

And the entry will be:

By Sundries

Car (New car)	38000	
Accumulated Depreciation	17000	
Loss on Exchanged Asset – car	2000	
To Sundries		
Car (Old car)	20000	
Cash		37000

(Being exchange old car with new car)

Example: (3)

If you have this data about the asset (**car**) of (Mustafa Co.):

Cost price 24000 \$ - Accumulated depreciation 18000 \$.

And if you have these cases (about selling the car):

1. Sold the car worth 8000 \$ by cash.
2. Sold the car worth 6000 \$ by check.
3. Sold the car worth 4000 \$ by cash.

Instructions

Journalize each case of these cases as a part situation (using indirect method).

Example: (4)

If you have this data about the asset (**car**) of (Mustafa Co.):

Cost price of an old car 24000 \$ - Accumulated depreciation of an old car 18000 \$ - The value of new car 12000

And if you have these cases (about exchanging the old car with new car):

1. The business paid 6000 \$ by cash.
2. The business paid 8000 \$ by cash.
3. The business paid 4000 \$ by check.

Instructions

Journalize each case of these cases as a part situation (using indirect method).

Example: (5)

If you have this information about assets (Machinery) of (AL- Mustafa Co.):

Cost of Machinery 20000 \$ - Balance of accumulated depreciation 14000 \$.

And if you know that:

1. The business (Sold) (Half) of the machinery worth 10000 \$ by cash.
2. The business (Exchanged) the remaining of the machinery with new one valued 9000 \$ and paid 5000 \$ by check.

Instructions

Journalize the above transactions.

Example: (6)

If you have this information about the assets (Furniture) of (AL- Mustafa Co.):

Cost of the furniture 8000 \$ - Balance of accumulated depreciation 5000 \$.

And if you know that:

1. The business (Sold) (Half) of the furniture with **profit** equal to 20 % from the cost price.
2. The business (Exchanged) the remaining of the furniture with new one paid 500 \$ by check with **loss** equal to 10 % from the cost price.

Instructions

Journalize the above transactions.

Example: (7)

- At 1 / 7 / 2008 the business bought a (Furniture) worth 3850 \$ by cash.

- At 1 / 5 / 2009 the business **sold** the furniture worth 2000 \$ by check.

Instructions

1. Journalize purchasing entry at 1 / 7 / 2008.
2. Compute annual depreciation expenses using (Straight line method) if you know that the estimated scrap value are 250 \$ and the estimated working life are 3 years.
3. Journalize depreciation expenses entry by using (Indirect method) at 31/12/2008.

4. Journalize selling entry at 1 / 5 / 2009.

Example: (8)

- At 1 / 9 / 2007 the business bought (Machinery) with cost 7200 \$ by cash (There is no estimated scrap value and the estimated working life are 4 years).
- At 1 / 8 / 2009 the business (Exchanged) the machinery with new one valued with 5000 \$ and the business paid 1500 \$ by check.

Instructions

Journalize the necessary entries.

Example: (9)

- At 1 / 7 / 2007 (Al-Ali Co.) bought a machinery worth 3750 \$ by check, and paid 100 \$ as transportation expenses- 150 \$ as installation expenses by cash.
- At 1 / 4 / 2009 Sold the machinery worth 2000 \$ by check.

Instructions

Journalize the necessary entries.