



**Section 1—Plant Assets**

**Plant assets** are tangible assets used in a company's operations that have a useful life of more than one accounting period. Plant assets are also called *plant and equipment; property, plant, and equipment;* or *fixed assets.* For many companies, plant assets make up the single largest class of assets they own.

Plant assets are set apart from other assets by two important features.

First, *plant assets are used in operations.* This makes them different from, for instance, inventory that is held for sale and not used in operations. The distinctive feature here is use, not type of asset. A company that purchases a computer to resell it reports it on the balance sheet as inventory. If the same company purchases this computer to use in operations, however, it is a plant asset.

Another example is land held for future expansion, which is reported as a long-term investment. However, if this land holds a factory used in operations, the land is part of plant assets.

The second important feature is that *plant assets have useful lives extending over more than one accounting period.* This makes plant assets long term and not a current assets such as supplies that are normally consumed in a short time period after they are placed in use.

The accounting for plant assets reflects these two features.

Since plant assets are used in operations, we try to match their costs against the revenues they generate.

Also, since their useful lives extend over more than one period, our matching of costs and revenues must extend over several periods.

**An important exception is land; land cost is not allocated to expense when we expect it to have an indefinite life.**

There are three main issues in accounting for plant assets:

(1) computing the costs of plant assets

(2) allocating the costs of most plant assets (less any salvage amounts) against revenues for the periods they benefit--depreciation

(3) recording the disposal of plant assets.

**COST DETERMINATION**

Plant assets are recorded at cost when acquired. This is consistent with the *cost principle.* **Cost includes all normal and reasonable expenditures necessary to get the asset in place and ready for its intended use.**

The cost of a factory machine, for instance, includes its invoice cost less any cash discount for early payment, plus any necessary freight, unpacking, assembling, installing, and testing costs. Examples are the costs of building a base or foundation for a machine, providing electrical hookups, and testing the asset before using it in operations.

**To be recorded as part of the cost of a plant asset--an expenditure must be normal, reasonable, and necessary in preparing it for its intended use. Focus on this when trying to determine what costs should be added to an asset.**

If an asset is damaged during unpacking, the repairs are not added to its cost. Instead, they are charged to an expense account. Nor is a paid traffic fine for moving heavy machinery on city streets without a proper permit part of the machinery's cost, but payment for a proper permit is included in the cost of machinery. Charges are sometimes incurred to modify or customize a new plant asset. These charges are added to the asset's cost.

**Land**

When land is purchased for a building site, its cost includes the

* total amount paid for the land, including any real estate commissions, title insurance fees, legal fees
* any accrued property taxes paid by the purchaser
* payments for surveying, clearing, grading, and draining
* government assessments, whether incurred at the time of purchase or later, for items such as public roadways, sewers, and sidewalks. These assessments are included because they permanently add to the land's value.
* land purchased as a building site for a future building sometimes includes structures that must be removed. Add the cost of removal less any salvage

**Starbucks** paid $167,000 cash to acquire land for a retail store.

* This land had an old service garage that was removed at a net cost of $13,000 ($15,000 in costs less $2,000 proceeds from salvaged materials).
* Additional closing costs total $10,000, consisting of brokerage fees ($8,000), legal fees ($1,500), and title costs ($500).

The cost of this land to Starbucks is $190,000



**Land Improvements**

Land has an indefinite (unlimited) life and is not usually used up over time. However, **Land improvements** such as

* parking lot surfaces,
* driveways,
* fences,
* shrubs,
* lighting systems

All of these have limited useful lives and are used up. While the costs of these improvements increase the usefulness of the land, they are **charged to a separate Land Improvement account** so that their costs can be allocated to the periods they benefit.

**Buildings**

A Building account is charged for the costs of purchasing or constructing a building that is used in operations.

**When purchased,** a building's costs usually include its

* purchase price,
* brokerage fees,
* taxes,
* title fees
* attorney fees
* all expenditures to ready it for its intended use, including any necessary repairs or renovations such as
	+ wiring,
	+ lighting,
	+ flooring

When a company **constructs a building** or any plant asset for its own use, its costs include

* materials
* labor
* reasonable amount of indirect overhead cost.
	+ Overhead includes the costs of items such as heat, lighting, power, and depreciation on machinery used to construct the asset.
* design fees,
* building permits
* insurance during construction.
	+ However, costs such as insurance to cover the asset *after* it is placed in use are operating expenses.

**Machinery and Equipment**

The costs of machinery and equipment consist of **all costs normal and necessary to purchase them and prepare them for their intended use.** These include the

* purchase price,
* taxes,
* transportation charges,
* insurance while in transit
* installing, assembling, and testing of the machinery and equipment.

**Lump-Sum Purchase**

Plant assets sometimes are purchased as a group in a single transaction for a lump-sum price.

When this occurs, we allocate the cost of the purchase among the different types of assets acquired based on their *relative market values*, which can be estimated by appraisal or by using the tax-assessed valuations of the assets.

**CarMax** paid $90,000 cash to acquire a group of items consisting of land appraised at $30,000, land improvements appraised at $10,000, and a building appraised at $60,000. The $90,000 cost is allocated on the basis of these appraised values



**DEPRECIATION**

**Depreciation** is the process of allocating the cost of a plant asset to expense in the accounting periods benefiting from its use.

Depreciation does not measure the decline in the asset's market value each period, nor does it measure the asset's physical deterioration.

 Since depreciation reflects the cost of using a plant asset, depreciation charges are only recorded when the asset is actually in service.

**Factors in Computing Depreciation**

Factors that determine depreciation are (1) cost, (2) salvage value, and (3) useful life.



The **cost** of a plant asset consists of all necessary and reasonable expenditures to acquire it and to prepare it for its intended use.

**Salvage value** is an estimate of the asset's value at the end of its benefit period.

The **useful life** of a plant asset is **the length of time it is productively used in a company's operations.**

For example, the productive life of a computer can be eight years or more. Some companies, however, trade in old computers for new ones every two years. In this case, these computers have a two-year useful life.

**Depreciation Methods**

Depreciation methods are used to allocate a plant asset's cost over the accounting periods in its useful life.

* Straight Line Method The most frequently used method of depreciation is the straight-line method.
* Units of Production Method
* Double Declining Balance



**Straight-Line Method Straight-line depreciation** charges the same amount of expense to each period of the asset's useful life.

1. Determine depreciable base



1. Divide the depreciable base by number of months in the useful life and multiply this product by the number of months associated with the accounting period.

Example 1. If the machine was placed in service on Jan 1 and we are preparing financial statements as of Dec 31, then …





Example 2. If the machine was placed in service on July 1 and we are preparing financial statements as of Dec 31, then …



The $1,800 Depreciation Expense is reported on the income statement among operating expenses. The $1,800 Accumulated Depreciation is a **contra asset account** to the Machinery account in the balance sheet.

**Very important concept: The net balance sheet amount is the asset book value, or simply *book value*, and is computed as the asset's total cost less its accumulated depreciation.**



The book value of this machine declines by $1,800 each year due to depreciation. Important to know when we calculate the gain or loss on the disposal of property, plant and equipment.

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| http://textflow.mheducation.com/figures/007742994X/wiL25389_0808.png |

**Units-of-Production Method**

The use of some plant assets varies greatly from one period to the next. A builder, for instance, might use a piece of construction equipment for a month and then not use it again for several months. When equipment use varies from period to period, the units-of-production depreciation method can better match expenses with revenues.

**Units-of-production depreciation** charges a varying amount to expense for each period of an asset's useful life depending on its usage.

**NOTE:** We start with cost minus salvage.





**Declining-Balance Method**

**NOTE:** We start with Cost minus Accumulated Depreciation or Book Value not depreciable base for double declining balance.

An **accelerated depreciation method** yields larger depreciation expenses in the early years of an asset's life and less depreciation in later years.



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| http://textflow.mheducation.com/figures/007742994X/wiL25389_0812.png |

\* Year 2015 depreciation is $1,296 − $1,000 = $296 (never depreciate book value below salvage value).

**Comparing Depreciation Methods**

While depreciation expense per period differs for different methods, total depreciation expense of $9,000 is the same over the machine's useful life.



Each method starts with a total cost of $10,000 and ends with a salvage value of $1,000. The difference is the pattern in depreciation expense over the useful life..

**Partial-Year Depreciation**

Plant assets are purchased and disposed of at various times. When an asset is purchased (or disposed of) at a time other than the beginning or end of an accounting period, depreciation is recorded for part of a year. This is done so that the year of purchase or the year of disposal is charged with its share of the asset's depreciation.

**NOTE: Always calculate depreciation per month and pay attention to the date when the asset was purchased and the financial statement date.**

**Change in Estimates for Depreciation**

Depreciation is based on estimates of salvage value and useful life. During the useful life of an asset, these estimates can change. Use the new estimate to compute depreciation for current and future periods.

Pay close attention to the wording of these exercises.

**An Example.** At the beginning of an asset's third year, its book value is $6,400, computed as $10,000 minus $3,600. Assume that at the beginning of its third year, the estimated number of years remaining in its useful life changes from three to four years *and* its estimate of salvage value changes from $1,000 to $400.

**NOTE:** We start with book value (Cost minus Acc Deprc)

Straight-line depreciation for each of the four remaining years is computed as:



Revising an estimate of the useful life or salvage value of a plant asset is referred to as a **change in an accounting estimate** and is reflected in current and future financial statements, not in prior statements.

**Reporting Depreciation**

Both the cost and accumulated depreciation of plant assets are reported on the balance sheet or in its notes. Which company will need to replace its assets soon?



**DISPOSALS OF PLANT ASSETS**

Plant assets are disposed of for several reasons but regardless of the reason, disposals of plant assets occur in one of three basic ways: discarding, sale, or exchange. We will learn about discarding and sales.

**Asset Disposal - Journal entry steps.**

1. Credit the asset based on the general ledger amount.
2. Debit the accumulated depreciation based on the general ledger amount.
3. If the asset is not fully depreciated, record Loss on Disposal of Asset for the difference. NOTE: There can only be a loss on an asset disposal

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**Fully Depreciated Example:**

A machine costing $8,000 with accumulated depreciation of $8,000 is discarded. When accumulated depreciation equals the asset's cost, it is said to be *fully depreciated* (zero book value). The entry to record the discarding of this asset is



**Not Fully Depreciated Example:**

How do we account for discarding an asset that is not fully depreciated or one whose depreciation is not up-to-date? Bring depreciation up-to-date.



NOTE: There can only be a loss when an asset is discarded and only if it is not fully depreciated.

**Selling Plant Assets** Companies often sell plant assets when they restructure or downsize operations.

**Journal entry steps.**

1. Credit the asset based on the general ledger amount.
2. Debit the accumulated depreciation based on the general ledger amount.
3. Record the cash received.
4. If there is a difference, either debit Loss on Asset Disposal or credit Gain on Asset Disposal.

**Sale at Book Value**



**Sale above Book Value**



**Sale below Book Value**



**Section 2—Natural Resources**

**Natural resources** are assets that are physically consumed when used.

Examples are standing timber, mineral deposits, and oil and gas fields.

These assets represent soon-to-be inventories of raw materials that will be converted into one or more products by cutting, mining, or pumping. Until that conversion takes place, they are noncurrent assets and are shown in a balance sheet using titles such as timberlands, mineral deposits, or oil reserves

**Cost Determination and Depletion**

Natural resources are recorded at cost, which includes all expenditures necessary to acquire the resource and prepare it for its intended use. **Depletion** is the process of allocating the cost of a natural resource to the period when it is consumed. Natural resources are reported on the balance sheet at cost less *accumulated depletion.* The depletion expense per period is usually based on units extracted from cutting, mining, or pumping. This is similar to units-of-production depreciation.

To illustrate a mineral deposit with an estimated 250,000 tons of available ore. It is purchased for $500,000, and we expect zero salvage value.



Depletion expense for the first year is recorded as follows.



The period-end balance sheet reports the mineral deposit



**Plant Assets Used in Extracting**

The conversion of natural resources by mining, cutting, or pumping usually requires machinery, equipment, and buildings. When the usefulness of these plant assets is directly related to the depletion of a natural resource, their costs are depreciated using the units-of-production method in proportion to the depletion of the natural resource.

**Section 3—Intangible Assets**

**Intangible assets** are nonphysical assets (used in operations) that confer on their owner long-term rights, privileges, or competitive advantages.

Examples are

* patents,
* copyrights,
* licenses,
* leaseholds,
* franchises,
* goodwill, and
* trademarks.

**Cost Determination and Amortization**

**An intangible asset is recorded at cost when purchased.** If an intangible is **not purchased**, only some limited costs can be capitalized.

Intangibles are then separated into those with limited lives or indefinite lives.

* If an intangible has a **limited life**, its cost is systematically allocated to expense over its estimated useful life through the process of **amortization.** .
* If an intangible asset has an **indefinite life** — meaning that no legal, regulatory, contractual, competitive, economic, or other factors limit its useful life—it should not be amortized.

Amortization of intangible assets is similar to depreciation of plant assets and the depletion of natural resources in that it is a process of cost allocation. However, **only the straight-line method is used for amortizing intangibles.**

The effects of amortization are recorded in a contra account (Accumulated Amortization). The gross acquisition cost of intangible assets is disclosed in the balance sheet along with their accumulated amortization (these disclosures are new).

Many intangibles have limited lives due to laws, contracts, or other asset characteristics.

Examples are

* patents,
* copyrights, and
* leaseholds.

Other intangibles such as goodwill, trademarks, and trade names have lives that cannot be easily determined.

**The cost of intangible assets is amortized over the periods expected to benefit by their use, but in no case can this period be longer than the asset's legal existence.**

**Goodwill:** The values of some intangible assets such as goodwill continue indefinitely into the future and are not amortized. It is tested each year for impairment.

Any intangible asset that is not amortized is tested annually for **impairment**—if necessary, an impairment loss is recorded.

**Types of Intangibles**

**Patents**

The federal government grants patents to encourage the invention of new technology, mechanical devices, and production processes. A **patent** is an exclusive right granted to its owner to manufacture and sell a patented item or to use a process for **20 years**. When patent rights are purchased, the cost to acquire the rights is debited to Patents.

A patent's cost is amortized over its estimated useful life (not to exceed 20 years). If we purchase a patent costing $25,000 with a useful life of 10 years, we make the following adjusting entry at the end of each of the 10 years to amortize one-tenth of its cost.



**Copyrights**

A **copyright** gives its owner the exclusive right to publish and sell a musical, literary, or artistic work during the life of the creator plus **70 years**, although the useful life of most copyrights is much shorter. The costs of a copyright are amortized over its useful life. The only identifiable cost of many copyrights is the fee paid to the Copyright Office of the federal government or international agency granting the copyright. Normally, this is expensed but if the copyright is purchased, then it is recorded at the purchase price.

**Franchises and Licenses**

**Franchises** and **licenses** are rights that a company or government grants an entity to deliver a product or service under specified conditions. Many organizations grant franchise and license rights — **McDonald's**, **Pizza Hut**, and **Major League Baseball** are just a few examples. The costs of franchises and licenses are debited to a Franchises and Licenses asset account and are amortized over the lives of the agreements. **If an agreement is for an indefinite or perpetual period, those costs are not amortized.**

**Trademarks and Trade Names**

Companies often adopt unique symbols or select unique names and brands in marketing their products. A **trademark** or **trade (brand) name** is a symbol, name, phrase, or jingle identified with a company, product, or service. Examples are Nike swoosh, Big Mac, Coca-Cola, and Corvette.

Ownership and exclusive right to use a trademark or trade name are often established by showing that one company used it before another. Ownership is best established by registering a trademark or trade name with the government's Patent Office.

The cost of developing, maintaining, or enhancing the value of a trademark or trade name (such as advertising) is charged to expense when incurred. If a trademark or trade name is purchased, however, its cost is debited to an asset account and then amortized over its expected life. If the company plans to renew indefinitely its right to the trademark or trade name, the cost is not amortized.

**Goodwill**

**Goodwill** has a specific meaning in accounting. Goodwill is the amount by which a company's value exceeds the value of its individual assets and liabilities. This usually implies that the company as a whole has certain valuable attributes not measured among its individual assets and liabilities. These can include superior management, skilled workforce, good supplier or customer relations, quality products or services, good location, or other competitive advantages.

To keep accounting information from being too subjective, goodwill is not recorded unless an entire company or business segment is purchased. Purchased goodwill is measured by taking the purchase price of the company and subtracting the market value of its individual net assets.

Suppose White Corporation acquired Mocha, Inc. on January 1, 2016. The sum of the market values of Mocha’s assets was $9 million and its liabilities totaled $1 million, so Mocha’s net assets totaled $8 million.

Suppose White paid $10 million to purchase Mocha. In this case, White paid $2 million above the market value of Mocha’s net assets. Therefore, that $2 million is considered goodwill and is computed as follows:



Goodwill is measured as the excess of the cost of an acquired entity over the value of the acquired net assets. Goodwill is recorded as an asset, and it is *not* amortized. Instead, goodwill is annually tested for impairment.

**Leaseholds**

Property is rented under a contract called a **lease.**

**Leasehold Improvements** A lessee sometimes pays for alterations or improvements to the leased property such as partitions, painting, and storefronts. These alterations and improvements are called **leasehold improvements**, and the lessee debits these costs to a Leasehold Improvements account. Since leasehold improvements become part of the property and revert to the lessor at the end of the lease, the lessee amortizes these costs over the life of the lease or the life of the improvements, whichever is shorter.