Chapter 10

Plant Assets, Natural Resources, and Intangible Assets

STUDY OBJECTIVES

After studying this chapter, you should be able to:

1. Describe how the cost principle applies to plant assets.
2. Explain the concept of depreciation.
3. Compute periodic depreciation using different methods.
4. Describe the procedure for revising periodic depreciation.
5. Distinguish between revenue and capital expenditures, and explain the entries for each.
6. Explain how to account for the disposal of a plant asset.
7. Compute periodic depletion of natural resources.
8. Explain the basic issues related to accounting for intangible assets.
9. Indicate how plant assets, natural resources, and intangible assets are reported.

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- Scan **Study Objectives**
- Read **Feature Story**
- Read **Preview**
- Read text and answer DO IT! p. 442 p. 449 p. 452 p. 457
- Work **Comprehensive** DO IT! p. 461 p. 462
- Review **Summary of Study Objectives**
- Answer **Self-Study Questions**
- Complete **Assignments**

Feature Story

HOW MUCH FOR A RIDE TO THE BEACH?

It's spring break. Your plane has landed, you've finally found your bags, and you're dying to hit the beach—but first you need a "vehicular unit" to get

you there. As you turn away from baggage claim you see a long row of rental agency booths. Many are names you are familiar with—Hertz, Avis, and Budget. But a booth at the far end catches your eye—Rent-A-Wreck (*www.rent-a-wreck.com*). Now there's a company making a clear statement!

Any company that relies on equipment to generate revenues must make decisions about what kind of equipment to buy, how long to keep it, and how vigorously to maintain it. Rent-A-Wreck has decided to rent used rather than new cars and trucks. It rents these vehicles across the United States, Europe, and Asia. While the big-name agencies push vehicles with that "new car smell," Rent-A-Wreck competes on price. The message is simple: Rent a used car and save some cash. It's not a message that appeals to everyone. If you're a marketing executive wanting to impress a big client, you probably don't want to pull up in a Rent-A-Wreck car. But if you want to get from point A to point B for the minimum cash per mile, then they are playing your tune. The company's message seems to be getting across to the right clientele. Revenues have increased significantly.

When you rent a car from Rent-A-Wreck, you are renting from an independent business person who has paid a "franchise fee" for the right to use the Rent-A-Wreck name. In order to gain a franchise, he or she must meet financial and other criteria, and must agree to run the rental agency according to rules prescribed by Rent-A-Wreck. Some of these rules require that each franchise maintain its cars in a reasonable fashion. This ensures that, though you won't be cruising down Daytona Beach's Atlantic Avenue in a Mercedes convertible, you can be reasonably assured that you won't be calling a towtruck.

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Inside Chapter 10...

Preview of Chapter 10

The accounting for long-term assets has important implications for a company's reported results. In this chapter, we explain the application of the cost principle of accounting to property, plant, and equipment, such as Rent-A-Wreck vehicles, as well as to natural resources and intangible assets such as the "Rent-A-Wreck" trademark. We also describe the methods that companies may use to allocate an asset's cost over its useful life. In addition, we discuss the accounting for expenditures incurred during the useful life of assets, such as the cost of replacing tires and brake pads on rental cars.

The content and organization of Chapter 10 are as follows.

Plant Assets, Natural Resources, and Intangible Assets

Plant Assets	Natural Resources	Intangible Assets	Statement Presentation and Analysis
• Determining the cost of plant assets • Depreciation • Expenditures during useful life • Plant asset disposals	• Depletion	• Accounting for intangibles • Research and development costs	• Presentation • Analysis

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SECTION 1 Plant Assets

Plant assets are resources that have three characteristics: they have a physical substance (a definite size and shape), are used in the operations of a business, and are not intended for sale to customers. They are also called **property, plant, and equipment; plant and equipment;** and **fixed assets**. These assets are expected to provide services to the company for a number of years. Except for land, plant assets decline in service potential over their useful lives.

Because plant assets play a key role in ongoing operations, companies keep plant assets in good operating condition. They also replace worn-out or outdated plant assets, and expand productive resources as needed. Many companies have substantial investments in plant assets. Illustration 10-1 shows the

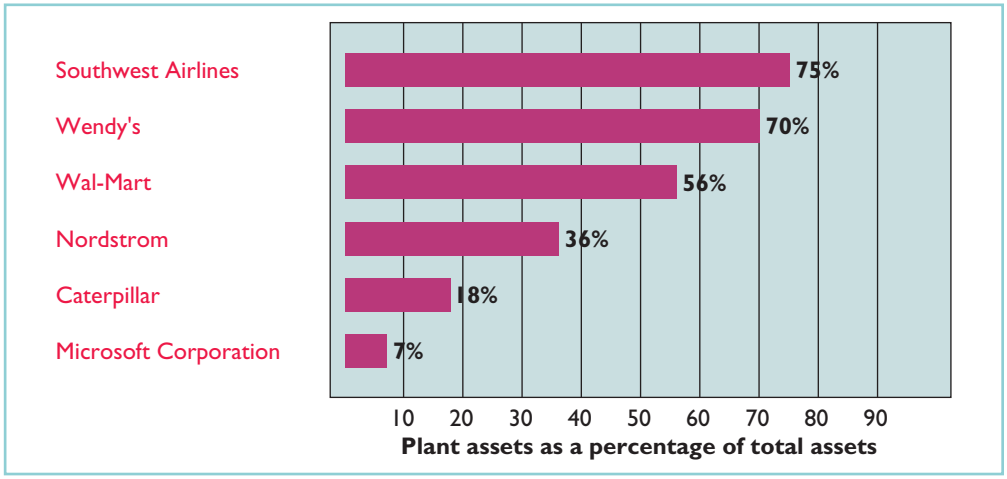

Illustration 10-1
Percentages of plant assets in relation to total assets

percentages of plant assets in relation to total assets of companies in a number of industries.

DETERMINING THE COST OF PLANT ASSETS

STUDY OBJECTIVE 1
Describe how the cost principle applies to plant assets.

The cost principle requires that companies record plant assets at cost. Thus Rent-A-Wreck records its vehicles at cost. **Cost consists of all expenditures necessary to acquire the asset and make it ready for its intended use.** For example, the cost of factory machinery includes the purchase price, freight costs paid by the purchaser, and installation costs. Once cost is established, the company uses that amount as the basis of accounting for the plant asset over its useful life.

In the following sections, we explain the application of the cost principle to each of the major classes of plant assets.

Land

Companies acquire **land** for use as a site upon which to build a manufacturing plant or office. The cost of land includes (1) the cash purchase price, (2) closing costs such as title and attorney's fees, (3) real estate brokers' commissions, and (4) accrued property taxes and other liens assumed by the purchaser. For example, if the cash price is $50,000 and the purchaser agrees to pay accrued taxes of $5,000, the cost of the land is $55,000.

Companies record as debits (increases) to the Land account all necessary costs incurred to make land **ready for its intended use**. When a company acquires vacant land, these costs include expenditures for clearing, draining, filling, and grading. Sometimes the land has a building on it that must be removed before construction of a new building. In this case, the company debits to the Land account all demolition and removal costs, less any proceeds from salvaged materials.

HELPFUL HINT
Management's intended use is important in applying the cost principle.

To illustrate, assume that Hayes Manufacturing Company acquires real estate at a cash cost of $100,000. The property contains an old warehouse that is razed at a net cost of $6,000 ($7,500 in costs less $1,500 proceeds from salvaged materials). Additional expenditures are the attorney's fee, $1,000, and the real estate broker's commission, $8,000. The cost of the land is $115,000, computed as follows.

Illustration 10-2
Computation of cost of land

Land	
Cash price of property	$100,000
Net removal cost of warehouse	6,000
Attorney's fee	1,000
Real estate broker's commission	8,000
Cost of land	**$115,000**

When Hayes records the acquisition, it debits Land for $115,000 and credits Cash for $115,000.

Land Improvements

Land improvements are structural additions made to land. Examples are driveways, parking lots, fences, landscaping, and underground sprinklers. The cost of land improvements includes all expenditures necessary to make the improvements

ready for their intended use. For example, the cost of a new parking lot for Home Depot includes the amount paid for paving, fencing, and lighting. Thus Home Depot debits to Land Improvements the total of all of these costs.

Land improvements have limited useful lives, and their maintenance and replacement are the responsibility of the company. Because of their limited useful life, companies expense (depreciate) the cost of land improvements over their useful lives.

Buildings

Buildings are facilities used in operations, such as stores, offices, factories, warehouses, and airplane hangars. Companies debit to the Buildings account all necessary expenditures related to the purchase or construction of a building. When a building is **purchased**, such costs include the purchase price, closing costs (attorney's fees, title insurance, etc.) and real estate broker's commission. Costs to make the building ready for its intended use include expenditures for remodeling and replacing or repairing the roof, floors, electrical wiring, and plumbing. When a new building is **constructed**, cost consists of the contract price plus payments for architects' fees, building permits, and excavation costs.

In addition, companies charge certain interest costs to the Buildings account: Interest costs incurred to finance the project are included in the cost of the building when a significant period of time is required to get the building ready for use. In these circumstances, interest costs are considered as necessary as materials and labor. However, the inclusion of interest costs in the cost of a constructed building is **limited to the construction period**. When construction has been completed, the company records subsequent interest payments on funds borrowed to finance the construction as debits (increases) to Interest Expense.

Equipment

Equipment includes assets used in operations, such as store check-out counters, office furniture, factory machinery, delivery trucks, and airplanes. The cost of equipment, such as Rent-A-Wreck vehicles, consists of the **cash purchase price, sales taxes, freight charges, and insurance during transit paid by the purchaser**. It also includes expenditures required in assembling, installing, and testing the unit. However, Rent-A-Wreck does not include motor vehicle licenses and accident insurance on company vehicles in the cost of equipment. These costs represent annual recurring expenditures and do not benefit future periods. Thus, they are treated as expenses as they are incurred.

To illustrate, assume Merten Company purchases factory machinery at a cash price of $50,000. Related expenditures are for sales taxes $3,000, insurance during shipping $500, and installation and testing $1,000. The cost of the factory machinery is $54,500, computed as follows.

Illustration 10-3
Computation of cost of factory machinery

Factory Machinery	
Cash price	$50,000
Sales taxes	3,000
Insurance during shipping	500
Installation and testing	1,000
Cost of factory machinery	**$54,500**

Merten makes the following summary entry to record the purchase and related expenditures:

Factory Machinery	54,500	
Cash		54,500
(To record purchase of factory machine)		

A	=	L	+	OE
+54,500				
−54,500				

Cash Flows −54,500

For another example, assume that Lenard Company purchases a delivery truck at a cash price of $22,000. Related expenditures consist of sales taxes $1,320, painting and lettering $500, motor vehicle license $80, and a three-year accident insurance policy $1,600. The cost of the delivery truck is $23,820, computed as follows.

Delivery Truck

Cash price	$22,000
Sales taxes	1,320
Painting and lettering	500
Cost of delivery truck	**$23,820**

Illustration 10-4
Computation of cost of delivery truck

Lenard treats the cost of the motor vehicle license as an expense, and the cost of the insurance policy as a prepaid asset. Thus, Lenard makes the following entry to record the purchase of the truck and related expenditures:

Delivery Truck	23,820	
License Expense	80	
Prepaid Insurance	1,600	
Cash		25,500
(To record purchase of delivery truck and related expenditures)		

A	=	L	+	OE
+23,820				
				−80 Exp
+1,600				
−25,500				

Cash Flows −25,500

ACCOUNTING ACROSS THE ORGANIZATION

Many U.S. Firms Use Leases

Leasing is big business for U.S. companies. For example, business investment in equipment in a recent year totaled $709 billion. Leasing accounted for about 31% of all business investment ($218 billion).

Who does the most leasing? Interestingly major banks, such as Continental Bank, J.P. Morgan Leasing, and US Bancorp Equipment Finance, are the major lessors. Also, many companies have established separate leasing companies, such as Boeing Capital Corporation, Dell Financial Services, and John Deere Capital Corporation. And, as an excellent example of the magnitude of leasing, leased planes account for nearly 40% of the U.S. fleet of commercial airlines. In addition, leasing is becoming increasingly common in the hotel industry. Marriott, Hilton, and InterContinental are increasingly choosing to lease hotels that are owned by someone else.

Why might airline managers choose to lease rather than purchase their planes?

DO IT!

COST OF PLANT ASSETS

Assume that Drummond Heating and Cooling Co. purchases a delivery truck for $15,000 cash, plus sales taxes of $900 and delivery costs of $500. The buyer also pays $200 for painting and lettering, $600 for an annual insurance policy, and $80 for a motor vehicle license. Explain how each of these costs would be accounted for.

action plan

- ✔ Identify expenditures made in order to get delivery equipment ready for its intended use.
- ✔ Treat operating costs as expenses.

Solution

The first four payments ($15,000, $900, $500, and $200) are expenditures necessary to make the truck ready for its intended use. Thus, the cost of the truck is $16,600. The payments for insurance and the license are operating costs and therefore are expensed.

Related exercise material: **BE10-1, BE10-2, E10-1, E10-2, E10-3,** and **DO IT! 10-1.**

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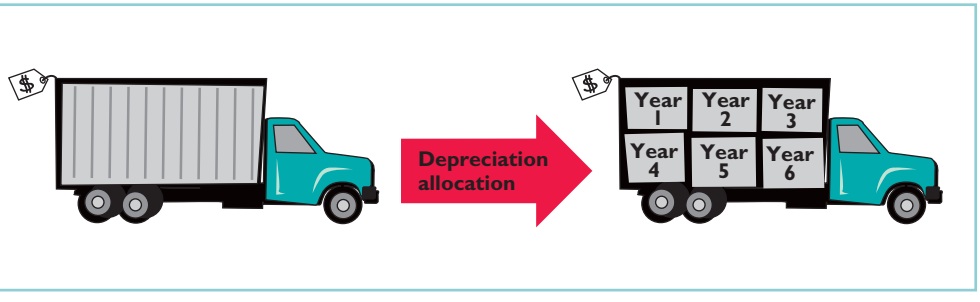
DEPRECIATION

STUDY OBJECTIVE 2

Explain the concept of depreciation.

As explained in Chapter 3, **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**. Cost allocation enables companies to properly match expenses with revenues in accordance with the matching principle (see Illustration 10-5).

Illustration 10-5
Depreciation as a cost allocation concept



It is important to understand that **depreciation is a process of cost allocation. It is not a process of asset valuation**. No attempt is made to measure the change in an asset's market value during ownership. So, the **book value** (cost less accumulated depreciation) of a plant asset may be quite different from its market value.

ETHICS NOTE

When a business is acquired, proper allocation of the purchase price to various asset classes is important, since different depreciation treatment can materially affect income. For example, buildings are depreciated, but land is not.

Depreciation applies to three classes of plant assets: land improvements, buildings, and equipment. Each asset in these classes is considered to be a **depreciable asset**. Why? Because the usefulness to the company and revenue-producing ability of each asset will decline over the asset's useful life. Depreciation **does not apply to land** because its usefulness and revenue-producing ability generally remain intact over time. In fact, in many cases, the usefulness of land is greater over time because of the scarcity of good land sites. Thus, **land is not a depreciable asset**.

During a depreciable asset's useful life its revenue-producing ability declines because of **wear and tear**. A delivery truck that has been driven 100,000 miles will be less useful to a company than one driven only 800 miles.

Revenue-producing ability may also decline because of obsolescence. **Obsolescence** is the process of becoming out of date before the asset physically wears out. For example, major airlines moved from Chicago's Midway Airport to Chicago-O'Hare International Airport because Midway's runways were too short for jumbo jets. Similarly, many companies replace their computers long before they originally planned to do so because improvements in new computing technology make the old computers obsolete.

Recognizing depreciation on an asset does not result in an accumulation of cash for replacement of the asset. The balance in Accumulated Depreciation represents the total amount of the asset's cost that the company has charged to expense. It is not a cash fund.

Note that the concept of depreciation is consistent with the going-concern assumption. The **going-concern assumption** states that the company will continue in operation for the foreseeable future. If a company does not use a going-concern assumption, then plant assets should be stated at their market value. In that case, depreciation of these assets is not needed.

Factors in Computing Depreciation

Three factors affect the computation of depreciation:

1. **Cost.** Earlier, we explained the issues affecting the cost of a depreciable asset. Recall that companies record plant assets at cost, in accordance with the cost principle.
2. **Useful life.** **Useful life** is an estimate of the expected *productive life*, also called *service life*, of the asset. Useful life may be expressed in terms of time, units of activity (such as machine hours), or units of output. Useful life is an estimate. In making the estimate, management considers such factors as the intended use of the asset, its expected repair and maintenance, and its vulnerability to obsolescence. Past experience with similar assets is often helpful in deciding on expected useful life. We might reasonably expect Rent-A-Wreck and Avis to use different estimated useful lives for their vehicles.
3. **Salvage value.** **Salvage value** is an estimate of the asset's value at the end of its useful life. This value may be based on the asset's worth as scrap or on its expected trade-in value. Like useful life, salvage value is an estimate. In making the estimate, management considers how it plans to dispose of the asset and its experience with similar assets.

Illustration 10-6 summarizes the three factors used in computing depreciation.

ALTERNATIVE TERMINOLOGY

Another term sometimes used for salvage value is *residual value*.

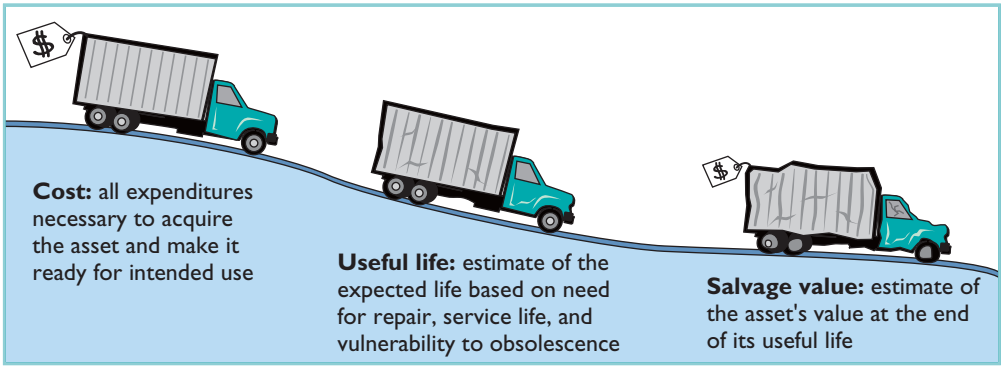


Illustration 10-6
Three factors in computing depreciation

HELPFUL HINT

Depreciation expense is reported on the income statement. Accumulated depreciation is reported on the balance sheet as a deduction from plant assets.

Depreciation Methods

STUDY OBJECTIVE 3
Compute periodic depreciation using different methods.

Depreciation is generally computed using one of the following methods:

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

Each method is acceptable under generally accepted accounting principles. Management selects the method(s) it believes to be appropriate. The objective is to select the method that best measures an asset's contribution to revenue over its useful life. Once a company chooses a method, it should apply it consistently over the useful life of the asset. Consistency enhances the comparability of financial statements. Depreciation affects the balance sheet through accumulated depreciation and the income statement through depreciation expense.

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.

Illustration 10-7
Delivery truck data

Cost	$13,000
Expected salvage value	$ 1,000
Estimated useful life in years	5
Estimated useful life in miles	100,000

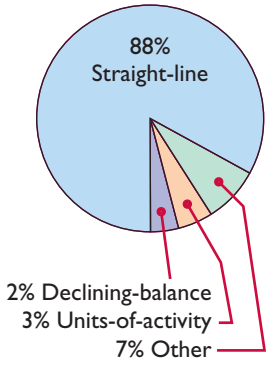


Illustration 10-8
Use of depreciation methods in 600 large U.S. companies

Illustration 10-8 (in the margin) shows the use of the primary depreciation methods in 600 of the largest companies in the United States.

STRAIGHT-LINE

Under the **straight-line method**, companies expense the same amount of depreciation for each year of the asset's useful life. It is measured solely by the passage of time.

In order to compute depreciation expense under the straight-line method, companies need to determine depreciable cost. **Depreciable cost** is the cost of the asset less its salvage value. It represents the total amount subject to depreciation. Under the straight-line method, to determine annual depreciation expense, we divide depreciable cost by the asset's useful life. Illustration 10-9 shows the computation of the first year's depreciation expense for Barb's Florists.

Cost	–	Salvage Value	=	Depreciable Cost
$13,000	–	$1,000	=	$12,000

Depreciable Cost	÷	Useful Life (in years)	=	Annual Depreciation Expense
$12,000	÷	5	=	$2,400

Illustration 10-9
Formula for straight-line method

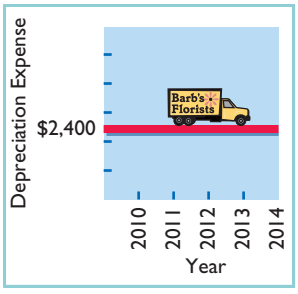
Alternatively, we also can compute an annual **rate** of depreciation. In this case, the rate is 20% (100% ÷ 5 years). When a company uses an annual straight-line rate, it applies the percentage rate to the depreciable cost of the asset. Illustration 10-10 shows a **depreciation schedule** using an annual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

BARB'S Fflorists

Year	Computation: Depreciable Cost	×	Depreciation Rate	=	Annual Depreciation Expense	End of Year: 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).

Illustration 10-10
Straight-line depreciation schedule



Note that the depreciation expense of $2,400 is the same each year. The book value (computed as cost minus accumulated depreciation) at the end of the useful life is equal to the expected $1,000 salvage value.

What happens to these computations for an asset purchased **during** the year, rather than on January 1? In that case, it is necessary to **prorate the annual depreciation** on a time basis. If Barb's Florists had purchased the delivery truck on April 1, 2010, the company would own the truck for nine months of the first year (April–December). Thus, depreciation for 2010 would be $1,800 ($12,000 × 20% × 9/12 of a year).

The straight-line method predominates in practice. Such large companies as Campbell Soup, Marriott, and General Mills use the straight-line method. It is simple to apply, and it matches expenses with revenues when the use of the asset is reasonably uniform throughout the service life. For simplicity, Rent-A-Wreck is probably using the straight-line method of depreciation for its vehicles.

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.

To illustrate, assume that Barb's Florists drives its delivery truck 15,000 miles in the first year. Illustration 10-11 shows the units-of-activity formula and the computation of the first year's depreciation expense.

ALTERNATIVE TERMINOLOGY

Another term often used is the *units-of-production method*.

HELPFUL HINT

Under any method, depreciation stops when the asset's book value equals expected salvage value.

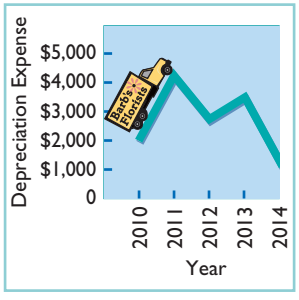
Depreciable Cost	÷	Total Units of Activity	=	Depreciation Cost per Unit
$12,000	÷	100,000 miles	=	$0.12

Depreciable Cost per Unit	×	Units of Activity during the Year	=	Annual Depreciation Expense
$0.12	×	15,000 miles	=	**$1,800**

Illustration 10-11
Formula for units-of-activity method

The units-of-activity depreciation schedule, using assumed mileage, is as follows.

Illustration 10-12
Units-of-activity depreciation schedule



BARB'S FLORISTS

	Computation				End of Year	
Year	Units of Activity	× Depreciation Cost/Unit	=	Annual Depreciation Expense	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).

This method is easy to apply for assets purchased mid-year. In such a case, the company computes the depreciation using the productivity of the asset for the partial year.

The units-of-activity method is not nearly as popular as the straight-line method (see Illustration 10-8, page 444), primarily because it is often difficult for companies to reasonably estimate total activity. However, some very large companies, such as Chevron and Boise Cascade (a forestry company), do use this method. When the productivity of an asset varies significantly from one period to another, the units-of-activity method results in the best matching of expenses with revenues.

DECLINING-BALANCE

The **declining-balance method** produces a decreasing annual depreciation expense over the asset's useful life. The method is so named because the periodic depreciation is based on a **declining book value** (cost less accumulated depreciation) of the asset. With this method, companies compute annual depreciation expense by multiplying the book value at the beginning of the year by the declining-balance depreciation rate. **The depreciation rate remains constant from year to year, but the book value to which the rate is applied declines each year.**

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%). Illustration 10-13 shows the declining-balance formula and the computation of the first year's depreciation on the delivery truck.

Illustration 10-13
Formula for declining-balance method

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

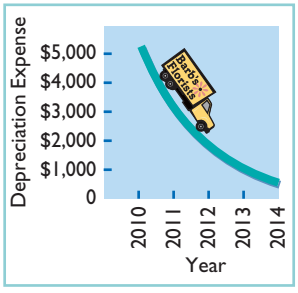
The depreciation schedule under this method is as follows.

BARB'S FLORISTS

Year	Computation: Book Value Beginning of Year	×	Depreciation Rate	=	Annual Depreciation Expense	End of Year: Accumulated Depreciation	Book Value
2010	$13,000		40%		**$5,200**	$ 5,200	$7,800
2011	7,800		40		**3,120**	8,320	4,680
2012	4,680		40		**1,872**	10,192	2,808
2013	2,808		40		**1,123**	11,315	1,685
2014	1,685		40		**685***	12,000	**1,000**

*Computation of $674 ($1,685 × 40%) is adjusted to $685 in order for book value to equal salvage value.

Illustration 10-14
Double-declining-balance depreciation schedule



The delivery equipment is 69% depreciated ($8,320 ÷ $12,000) at the end of the second year. Under the straight-line method, the truck would be depreciated 40% ($4,800 ÷ $12,000) at that time. Because the declining-balance method produces higher depreciation expense in the early years than in the later years, it is considered an **accelerated-depreciation method**. The declining-balance method is compatible with the matching principle. It matches the higher depreciation expense in early years with the higher benefits received in these years. It also recognizes lower depreciation expense in later years, when the asset's contribution to revenue is less. Some assets lose usefulness rapidly because of obsolescence. In these cases, the declining-balance method provides the most appropriate depreciation amount.

HELPFUL HINT

The method recommended for an asset that is expected to be significantly more productive in the first half of its useful life is the declining-balance method.

When a company purchases an asset during the year, it must prorate the first year's declining-balance depreciation on a time basis. For example, if Barb's Florists had purchased the truck on April 1, 2010, depreciation for 2010 would become $3,900 ($13,000 × 40% × 9/12). The book value at the beginning of 2011 is then $9,100 ($13,000 − $3,900), and the 2011 depreciation is $3,640 ($9,100 × 40%). Subsequent computations would follow from those amounts.

COMPARISON OF METHODS

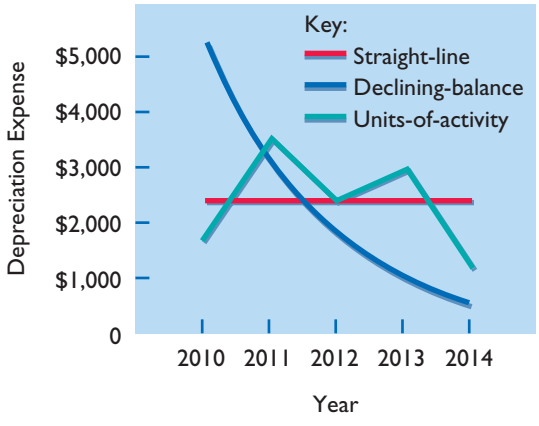
Illustration 10-15 compares annual and total depreciation expense under each of the three methods for Barb's Florists.

Year	Straight-Line	Units-of-Activity	Declining-Balance
2010	$ 2,400	$ 1,800	$ 5,200
2011	2,400	3,600	3,120
2012	2,400	2,400	1,872
2013	2,400	3,000	1,123
2014	2,400	1,200	685
	$12,000	**$12,000**	**$12,000**

Illustration 10-15
Comparison of depreciation methods

Annual depreciation varies considerably among the methods, but **total depreciation is the same for the five-year period** under all three methods. Each method is acceptable in accounting, because each recognizes in a rational and systematic manner the decline in service potential of the asset. Illustration 10-16 (page 448) graphs the depreciation expense pattern under each method.

Illustration 10-16
Patterns of depreciation



Depreciation and Income Taxes

The Internal Revenue Service (IRS) allows corporate taxpayers to deduct depreciation expense when they compute taxable income. However, the IRS does not require the taxpayer to use the same depreciation method on the tax return that is used in preparing financial statements.

Many corporations use straight-line in their financial statements to maximize net income. At the same time, they use a special accelerated-depreciation method on their tax returns to minimize their income taxes. Taxpayers must use on their tax returns either the straight-line method or a special accelerated-depreciation method called the **Modified Accelerated Cost Recovery System** (MACRS).

Revising Periodic Depreciation

STUDY OBJECTIVE 4
Describe the procedure for revising periodic depreciation.

Depreciation is one example of the use of estimation in the accounting process. Management should periodically review annual depreciation expense. If wear and tear or obsolescence indicate that annual depreciation estimates are inadequate or excessive, the company should change the amount of depreciation expense.

When a change in an estimate is required, the company makes the change in **current and future years**. **It does not change depreciation in prior periods.** The rationale is that continual restatement of prior periods would adversely affect confidence in financial statements.

HELPFUL HINT
Use a step-by-step approach: (1) determine new depreciable cost; (2) divide by remaining useful life.

To determine the new annual depreciation expense, the company first computes the asset's depreciable cost at the time of the revision. It then allocates the revised depreciable cost to the remaining useful life.

To illustrate, assume that Barb's Florists decides on January 1, 2013, to extend the useful life of the truck one year because of its excellent condition. The company has used the straight-line method to depreciate the asset to date, and book value is $5,800 ($13,000 − $7,200). The new annual depreciation is $1,600, computed as follows.

Illustration 10-17
Revised depreciation computation

Book value, 1/1/13	$5,800	
Less: Salvage value	1,000	
Depreciable cost	$4,800	
Remaining useful life	3 years	(2013–2015)
Revised annual depreciation ($4,800 ÷ 3)	**$1,600**	

Barb's Florists makes no entry for the change in estimate. On December 31, 2013, during the preparation of adjusting entries, it records depreciation expense of $1,600. Companies must describe in the financial statements significant changes in estimates.

DO IT!

On January 1, 2010, Iron Mountain Ski Corporation purchased a new snow-grooming machine for $50,000. The machine is estimated to have a 10-year life with a $2,000 salvage value. What journal entry would Iron Mountain Ski Corporation make at December 31, 2010, if it uses the straight-line method of depreciation?

STRAIGHT-LINE DEPRECIATION

action plan

- ✔ Calculate depreciable cost (Cost − Salvage value).
- ✔ Divide the depreciable cost by the estimated useful life.

Solution

$$\text{Depreciation expense} = \frac{\text{Cost} - \text{Salvage value}}{\text{Useful life}} = \frac{\$50{,}000 - \$2{,}000}{10} = \$4{,}800$$

The entry to record the first year's depreciation would be:

Dec. 31	Depreciation Expense	4,800	
	Accumulated Depreciation		4,800
	(To record annual depreciation on snow-grooming machine)		

Related exercise material: **BE10-3, BE10-4, BE10-5, BE10-6, BE10-7, E10-5, E10-6, E10-7, E10-8,** and **DO IT! 10-2.**

The Navigator

EXPENDITURES DURING USEFUL LIFE

STUDY OBJECTIVE 5

Distinguish between revenue and capital expenditures, and explain the entries for each.

During the useful life of a plant asset, a company may incur costs for ordinary repairs, additions, or improvements. **Ordinary repairs** are expenditures to **maintain** the operating efficiency and productive life of the unit. They usually are fairly small amounts that occur frequently. Examples are motor tune-ups and oil changes, the painting of buildings, and the replacing of worn-out gears on machinery. Companies record such repairs as debits to Repair (or Maintenance) Expense as they are incurred. Because they are immediately charged as an expense against revenues, these costs are often referred to as **revenue expenditures**.

Additions and improvements are costs incurred to **increase** the operating efficiency, productive capacity, or useful life of a plant asset. They are usually material in amount and occur infrequently. Additions and improvements increase the company's investment in productive facilities. Companies generally debit these amounts to the plant asset affected. They are often referred to as **capital expenditures**. Most major U.S. corporations disclose annual capital expenditures.

Companies must use good judgment in deciding between a revenue expenditure and capital expenditure. For example, assume that Rodriguez Co. purchases a number of wastepaper baskets. Although the proper accounting would appear to be to capitalize and then depreciate these wastepaper baskets over their useful life, it would be more usual for Rodriguez to expense them immediately. This practice is justified on the basis of **materiality**. Materiality refers to the impact of an item's size on a company's financial

ETHICS NOTE

WorldCom perpetrated the largest accounting fraud in history by treating $7 billion of "line costs" as capital expenditures. *Line costs* are rental payments to access other companies' networks. Like any other rental payment, they should have been expensed as incurred. Instead, capitalization delayed expense recognition to future periods and thus boosted current-period profits.

operations. The **materiality principle** states that if an item would not make a difference in decision making, the company does not have to follow GAAP in reporting that item.

PLANT ASSET DISPOSALS

STUDY OBJECTIVE 6
Explain how to account for the disposal of a plant asset.

Companies dispose of plant assets in three ways—retirement, sale, or exchange—as Illustration 10-18 shows. 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.

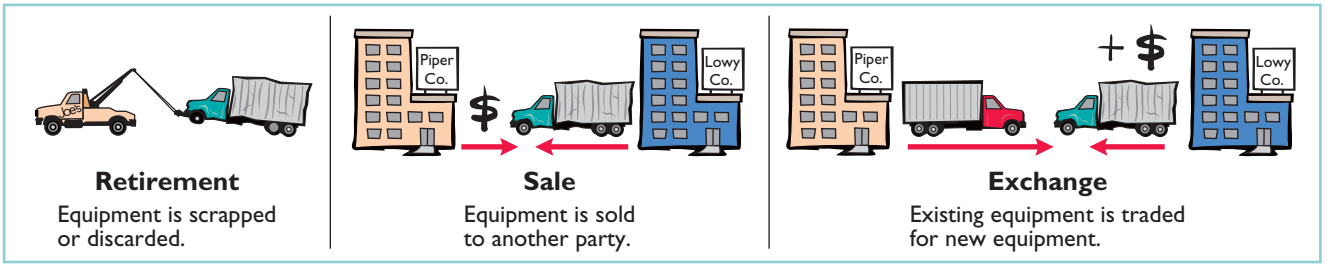


Illustration 10-18
Methods of plant asset disposal

At the time of disposal, the company records depreciation for the fraction of the year to the date of disposal. The book value is then eliminated by (1) debiting (decreasing) Accumulated Depreciation for the total depreciation to date, and (2) crediting (decreasing) the asset account for the cost of the asset. In this chapter we examine the accounting for the retirement and sale of plant assets. In the appendix to the chapter we discuss and illustrate the accounting for exchanges of plant assets.

Retirement of Plant 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.

A	=	L	+	OE
+32,000				
−32,000				

Cash Flows
no effect

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

HELPFUL HINT
When a company disposes of a plant asset, the company must remove from the accounts all amounts related to the asset. This includes the original cost in the asset account and the total depreciation to date in the accumulated depreciation account.

What happens if a fully depreciated plant asset is still useful to the company? In this case, the asset and its accumulated depreciation continue to be reported on the balance sheet, without further depreciation adjustment, until the company retires the asset. Reporting the asset and related accumulated depreciation on the balance sheet informs the financial statement reader that the asset is still in use. Once fully depreciated, no additional depreciation should be taken, even if an asset is still being used. In no situation can the accumulated depreciation on a plant asset exceed its cost.

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)			

A	=	L	+	OE
+14,000				
				−4,000 Exp
−18,000				

Cash Flows
no effect

Companies report a loss on disposal in the "Other expenses and losses" section of the income statement.

Sale of Plant Assets

In a disposal by sale, the company compares the book value of the asset with the proceeds received from the sale. If the proceeds of the sale **exceed** the book value of the plant asset, **a gain on disposal occurs**. If the proceeds of the sale **are less than** the book value of the plant asset sold, **a loss on disposal occurs**.

Only by coincidence will the book value and the fair market value of the asset be the same when the asset is sold. Gains and losses on sales of plant assets are therefore quite common. For example, Delta Airlines reported a $94,343,000 gain on the sale of five Boeing B727-200 aircraft and five Lockheed L-1011-1 aircraft.

GAIN ON DISPOSAL

To illustrate a gain, assume that on July 1, 2010, Wright Company sells office furniture for $16,000 cash. The office furniture originally cost $60,000. As of January 1, 2010, it had accumulated depreciation of $41,000. Depreciation for the first six months of 2010 is $8,000. Wright records depreciation expense and updates accumulated depreciation to July 1 with the following entry.

July 1	Depreciation Expense	8,000		
	Accumulated Depreciation—Office Furniture		8,000	
	(To record depreciation expense for the first 6 months of 2010)			

A	=	L	+	OE
				−8,000 Exp
−8,000				

Cash Flows
no effect

After the accumulated depreciation balance is updated, the company computes the gain or loss. Illustration 10-19 shows this computation for Wright Company, which has a gain on disposal of $5,000.

Cost of office furniture	$60,000
Less: Accumulated depreciation ($41,000 + $8,000)	49,000
Book value at date of disposal	11,000
Proceeds from sale	16,000
Gain on disposal	**$ 5,000**

Illustration 10-19
Computation of gain on disposal

Wright records the sale and the gain on disposal as follows.

A = L + OE
+16,000
+49,000
−60,000
+5,000 Rev

Cash Flows
+16,000

July 1	Cash	16,000	
	Accumulated Depreciation—Office Furniture	49,000	
	Office Furniture		60,000
	Gain on Disposal		5,000
	(To record sale of office furniture at a gain)		

Companies report a gain on disposal in the "Other revenues and gains" section of the income statement.

LOSS ON DISPOSAL

Assume that instead of selling the office furniture for $16,000, Wright sells it for $9,000. In this case, Wright computes a loss of $2,000 as follows.

Illustration 10-20
Computation of loss on disposal

Cost of office furniture	$60,000
Less: Accumulated depreciation	49,000
Book value at date of disposal	11,000
Proceeds from sale	9,000
Loss on disposal	**$ 2,000**

Wright records the sale and the loss on disposal as follows.

A = L + OE
+9,000
+49,000
−2,000 Exp
−60,000

Cash Flows
+9,000

July 1	Cash	9,000	
	Accumulated Depreciation—Office Furniture	49,000	
	Loss on Disposal	2,000	
	Office Furniture		60,000
	(To record sale of office furniture at a loss)		

Companies report a loss on disposal in the "Other expenses and losses" section of the income statement.

DO IT!

PLANT ASSET DISPOSAL

Overland Trucking has an old truck that cost $30,000, and it has accumulated depreciation of $16,000 on this truck. Overland has decided to sell the truck. (a) What entry would Overland Trucking make to record the sale of the truck for $17,000 cash? (b) What entry would Overland trucking make to record the sale of the truck for $10,000 cash?

action plan

- ✔ At the time of disposal, determine the book value of the asset.
- ✔ Compare the asset's book value with the proceeds received to determine whether a gain or loss has occurred.

Solution

(a) Sale of truck for cash at a gain:

	Cash	17,000	
	Accumulated Depreciation—Truck	16,000	
	Truck		30,000
	Gain on Disposal [$17,000 − ($30,000 − $16,000)]		3,000
	(To record sale of truck at a gain)		

(b) Sale of truck for cash at a loss:

Cash	10,000	
Loss on Disposal [$10,000 − ($30,000 − $16,000)]	4,000	
Accumulated Depreciation—Truck	16,000	
Truck		30,000
(To record sale of truck at a loss)		

Related exercise material: **BE10-9, BE10-10, E10-9, E10-10,** and **DO IT! 10-3.**

The Navigator

SECTION 2 Natural Resources

Natural resources consist of standing timber and underground deposits of oil, gas, and minerals. These long-lived productive assets have two distinguishing characteristics: (1) They are physically extracted in operations (such as mining, cutting, or pumping). (2) They are replaceable only by an act of nature.

The acquisition cost of a natural resource is the price needed to acquire the resource **and** prepare it for its intended use. For an already-discovered resource, such as an existing coal mine, cost is the price paid for the property.

The allocation of the cost of natural resources to expense in a rational and systematic manner over the resource's useful life is called **depletion**. (That is, *depletion* is to natural resources as *depreciation* is to plant assets.) **Companies generally use the units-of-activity method** (learned earlier in the chapter) **to compute depletion**. The reason is that **depletion generally is a function of the units extracted during the year**.

HELPFUL HINT
On a balance sheet, natural resources may be described more specifically as *timberlands, mineral deposits, oil reserves,* and so on.

STUDY OBJECTIVE 7
Compute periodic depletion of natural resources.

Under the units-of-activity method, companies divide the total cost of the natural resource minus salvage value by the number of units estimated to be in the resource. The result is a **depletion cost per unit of product**. They then multiply the depletion cost per unit by the number of units extracted and sold. The result is the **annual depletion expense**. Illustration 10-21 shows the formula to compute depletion expense.

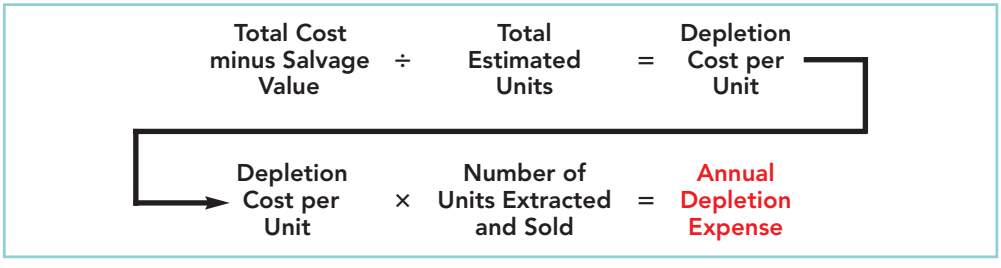


Illustration 10-21
Formula to compute depletion expense

To illustrate, assume that Lane Coal Company invests $5 million in a mine estimated to have 10 million tons of coal and no salvage value. In the first year, Lane extracts and sells 800,000 tons of coal. Using the formulas above, Lane computes the depletion expense as follows:

$$\$5{,}000{,}000 \div 10{,}000{,}000 = \$0.50 \text{ depletion cost per ton}$$

$$\$0.50 \times 800{,}000 = \$400{,}000 \text{ annual depletion expense}$$

ETHICS NOTE
Investors were stunned at news that Royal Dutch/Shell Group had significantly overstated its reported oil reserves—and perhaps had done so intentionally.

A = L + OE
−400,000 Exp
−400,000
Cash Flows
no effect

Lane records depletion expense for the first year of operation as follows.

Dec. 31	Depletion Expense	400,000	
	Accumulated Depletion		400,000
	(To record depletion expense on coal deposits)		

The company reports the account Depletion Expense as a part of the cost of producing the product. Accumulated Depletion is a contra-asset account, similar to accumulated depreciation. It is deducted from the cost of the natural resource in the balance sheet, as Illustration 10-22 shows.

Illustration 10-22
Statement presentation of accumulated depletion

LANE COAL COMPANY
Balance Sheet (partial)

Coal mine	$5,000,000	
Less: Accumulated depletion	**400,000**	$4,600,000

Many companies do not use an Accumulated Depletion account. In such cases, the company credits the amount of depletion directly to the natural resources account.

Sometimes, a company will extract natural resources in one accounting period but not sell them until a later period. In this case, the company does not expense the depletion until it sells the resource. It reports the amount not sold as inventory in the current assets section.

SECTION 3 Intangible Assets

Intangible assets are rights, privileges, and competitive advantages that result from the ownership of long-lived assets that do not possess physical substance. Evidence of intangibles may exist in the form of contracts or licenses. Intangibles may arise from the following sources:

1. Government grants, such as patents, copyrights, and trademarks.
2. Acquisition of another business, in which the purchase price includes a payment for the company's favorable attributes (called *goodwill*).
3. Private monopolistic arrangements arising from contractual agreements, such as franchises and leases.

Some widely known intangibles are Microsoft's patents, McDonald's franchises, Apple's trade name iPod, J.K. Rowlings' copyrights on the Harry Potter books, and the trademark Rent-A-Wreck in the Feature Story.

ACCOUNTING FOR INTANGIBLE ASSETS

STUDY OBJECTIVE 8
Explain the basic issues related to accounting for intangible assets.

Companies record intangible assets at cost. Intangibles are categorized as having either a limited life or an indefinite life. If an intangible has a **limited life**, the company allocates its cost over the asset's useful life using a process similar to depreciation. The process of allocating the cost of intangibles is referred to as **amortization**. The cost of intangible assets with **indefinite lives should not be amortized**.

To record amortization of an intangible asset, a company increases (debits) Amortization Expense, and decreases (credits) the specific intangible asset. (Unlike depreciation, no contra account, such as Accumulated Amortization, is usually used.)

Intangible assets are typically amortized on a straight-line basis. For example, the legal life of a patent is 20 years. Companies **amortize the cost of a patent over its 20-year life or its useful life, whichever is shorter**. To illustrate the computation of patent amortization, assume that National Labs purchases a patent at a cost of $60,000. If National estimates the useful life of the patent to be eight years, the annual amortization expense is $7,500 ($60,000 ÷ 8). National records the annual amortization as follows.

Dec. 31	Amortization Expense—Patent	7,500	
	Patent		7,500
	(To record patent amortization)		

HELPFUL HINT

Amortization is to intangibles what *depreciation* is to plant assets and *depletion* is to natural resources.

A	=	L	+	OE
				−7,500 Exp
−7,500				

Cash Flows
no effect

Companies classify Amortization Expense—Patents as an operating expense in the income statement.

There is a difference between intangible assets and plant assets in determining cost. For plant assets, cost includes both the purchase price of the asset and the costs incurred in designing and constructing the asset. In contrast, cost for an intangible asset includes **only the purchase price**. Companies expense any costs incurred in developing an intangible asset.

Patents

A **patent** is an exclusive right issued by the U.S. Patent Office that enables the recipient to manufacture, sell, or otherwise control an invention for a period of 20 years from the date of the grant. A patent is nonrenewable. But companies can extend the legal life of a patent by obtaining new patents for improvements or other changes in the basic design. **The initial cost of a patent is the cash or cash equivalent price paid to acquire the patent.**

The saying, "A patent is only as good as the money you're prepared to spend defending it" is very true. Many patents are subject to litigation. Any legal costs an owner incurs in successfully defending a patent in an infringement suit are considered necessary to establish the patent's validity. **The owner adds those costs to the Patent account and amortizes them over the remaining life of the patent.**

The patent holder amortizes the cost of a patent over its 20-year legal life or its useful life, whichever is shorter. Companies consider obsolescence and inadequacy in determining useful life. These factors may cause a patent to become economically ineffective before the end of its legal life.

Copyrights

The federal government grants **copyrights** which give the owner the exclusive right to reproduce and sell an artistic or published work. Copyrights extend for the life of the creator plus 70 years. The cost of a copyright is the **cost of acquiring and defending it**. The cost may be only the $10 fee paid to the U.S. Copyright Office. Or it may amount to much more if an infringement suit is involved.

The useful life of a copyright generally is significantly shorter than its legal life. Therefore, copyrights usually are amortized over a relatively short period of time.

Trademarks and Trade Names

A **trademark** or **trade name** is a word, phrase, jingle, or symbol that identifies a particular enterprise or product. Trade names like Wheaties, Game Boy, Frappuccino, Kleenex, Windows, Coca-Cola, and Jeep create immediate product identification.

They also generally enhance the sale of the product. The creator or original user may obtain exclusive legal right to the trademark or trade name by registering it with the U.S. Patent Office. Such registration provides 20 years of protection. The registration may be renewed indefinitely as long as the trademark or trade name is in use.

If a company purchases the trademark or trade name, its cost is the purchase price. If a company develops and maintains the trademark or trade name, any costs related to these activities are expensed as incurred. Because trademarks and trade names have indefinite lives, they are not amortized.

Franchises and Licenses

When you fill up your tank at the corner Shell station, eat lunch at Taco Bell, or rent a car from Rent-A-Wreck, you are dealing with franchises. A **franchise** is a contractual arrangement between a franchisor and a franchisee. The franchisor grants the franchisee the right to sell certain products, provide specific services, or use certain trademarks or trade names, usually within a designated geographical area.

Another type of franchise is that entered into between a governmental body (commonly municipalities) and a company. This franchise permits the company to use public property in performing its services. Examples are the use of city streets for a bus line or taxi service, use of public land for telephone and electric lines, and the use of airwaves for radio or TV broadcasting. Such operating rights are referred to as **licenses**.

When a company can identify costs with the purchase of a franchise or license, it should recognize an intangible asset. Companies should amortize the cost of a limited-life franchise (or license) over its useful life. If the life is indefinite, the cost is not amortized. Annual payments made under a franchise agreement are recorded as **operating expenses** in the period in which they are incurred.

ACCOUNTING ACROSS THE ORGANIZATION

ESPN Wins Monday Night Football Franchise

What is a well-known franchise worth? Recently ESPN outbid its rivals for the right to broadcast Monday Night Football. At a price of $1.1 billion per year—nearly twice what rival ABC paid in previous years—it isn't clear who won and who lost.

When bidding for a unique franchise like Monday Night Football, management must consider many factors to determine a price. As part of the deal, ESPN also got wireless rights and Spanish-language telecasts. By its estimation, ESPN will generate a profit of $200 million per year from Monday Night Football. ABC was losing $150 million per year.

Another factor in the decision was ESPN management's concern that if ESPN didn't win the bid, a buyer would emerge that would use Monday Night Football as a launching pad for a new sports network. ESPN doesn't want any more competitors than it already has. It is hard to put a price tag on the value of keeping the competition to a minimum.

Source: Ronald Grover and Tom Lowry, "A Ball ESPN Couldn't Afford to Drop," *BusinessWeek*, May 2, 2005, p. 42.

? How should ESPN account for the $1.1 billion per year franchise fee?

Goodwill

Usually, the largest intangible asset that appears on a company's balance sheet is goodwill. **Goodwill** represents the value of all favorable attributes that relate to a company. These include exceptional management, desirable location, good customer relations, skilled employees, high-quality products, and harmonious relations

with labor unions. Goodwill is unique: Unlike assets such as investments and plant assets, which can be sold *individually* in the marketplace, goodwill can be identified only with the business as a whole.

If goodwill can be identified only with the business as a whole, how can its amount be determined? One could try to put a dollar value on the factors listed above (exceptional management, desirable location, and so on). But the results would be very subjective, and such subjective valuations would not contribute to the reliability of financial statements. **Therefore, companies record goodwill only when an entire business is purchased. In that case, goodwill is the excess of cost over the fair market value of the net assets (assets less liabilities) acquired.**

In recording the purchase of a business, the company debits (increases) the net assets at their fair market values, credits (decreases) cash for the purchase price, and debits goodwill for the difference. **Goodwill is not amortized** (because it is considered to have an indefinite life). Companies report goodwill in the balance sheet under intangible assets.

RESEARCH AND DEVELOPMENT COSTS

Research and development costs are expenditures that may lead to patents, copyrights, new processes, and new products. Many companies spend considerable sums of money on research and development (R&D). For example, in a recent year IBM spent over $6.15 billion on R&D.

HELPFUL HINT

Research and development (R&D) costs are not intangible assets. But because they may lead to patents and copyrights, we discuss them in this section.

Research and development costs present accounting problems. For one thing, it is sometimes difficult to assign the costs to specific projects. Also, there are uncertainties in identifying the extent and timing of future benefits. As a result, companies usually record R&D costs **as an expense when incurred**, whether the research and development is successful or not.

To illustrate, assume that Laser Scanner Company spent $3 million on R&D. This expenditure resulted in two highly successful patents, obtained with $20,000 in lawyers' fees. The company would add the lawyers' fees to the patent account. The R&D costs, however, cannot be included in the cost of the patent. Instead, the company would record the R&D costs as an expense when incurred.

Many disagree with this accounting approach. They argue that expensing R&D costs leads to understated assets and net income. Others, however, argue that capitalizing these costs will lead to highly speculative assets on the balance sheet. It is difficult to determine who is right. The controversy illustrates how difficult it can be to establish proper guidelines for financial reporting.

DO IT!

CLASSIFICATION CONCEPTS

Match the statement with the term most directly associated with it.

Copyright	Depletion
Intangible asset	Franchise
Research and development costs	

1. _____ The allocation of the cost of a natural resource to expense in a rational and systematic manner.
2. _____ Rights, privileges, and competitive advantages that result from the ownership of long-lived assets that do not possess physical substance.
3. _____ An exclusive right granted by the federal government to reproduce and sell an artistic or published work.

action plan

- ✔ Know that the accounting for intangibles often depends on whether the item has a finite or indefinite life.
- ✔ Recognize the many similarities and differences between the accounting for natural resources, plant assets, and intangible assets.

4. _____ A right to sell certain products or services or to use certain trademarks or trade names within a designated geographic area.
5. _____ Costs incurred by a company that often lead to patents or new products. These costs must be expensed as incurred.

Solution

1. Depletion
2. Intangible assets
3. Copyright
4. Franchise
5. Research and development

Related exercise material: **BE10-11, BE10-12, E10-11, E10-12, E10-13,** and **DO IT! 10-4.**

The Navigator

STATEMENT PRESENTATION AND ANALYSIS

Presentation

STUDY OBJECTIVE 9

Indicate how plant assets, natural resources, and intangible assets are reported.

Usually companies combine plant assets and natural resources under "Property, plant, and equipment" in the balance sheet. They show intangibles separately. Companies disclose either in the balance sheet or the notes the balances of the major classes of assets, such as land, buildings, and equipment, and accumulated depreciation by major classes or in total. In addition, they should describe the depreciation and amortization methods that were used, as well as disclose the amount of depreciation and amortization expense for the period.

Illustration 10-23 shows the financial statement presentation of property, plant, and equipment and intangibles by The Procter & Gamble Company (P&G) in its 2007 balance sheet. The notes to P&G's financial statements present greater details about the accounting for its long-term tangible and intangible assets.

Illustration 10-23
P&G's presentation of property, plant, and equipment, and intangible assets

THE PROCTER & GAMBLE COMPANY
Balance Sheet (partial)
(in millions)

	June 30	
	2007	**2006**
Property, plant, and equipment		
Buildings	$ 6,380	$ 5,871
Machinery and equipment	27,492	25,140
Land	849	870
	34,721	31,881
Accumulated depreciation	(15,181)	(13,111)
Net property, plant, and equipment	19,540	18,770
Goodwill and other intangible assets		
Goodwill	56,552	55,306
Trademarks and other intangible assets, net	33,626	33,721
Net goodwill and other intangible assets	$90,178	$89,027

Illustration 10-24 shows another comprehensive presentation of property, plant, and equipment, from the balance sheet of Owens-Illinois. The notes to the financial statements of Owens-Illinois identify the major classes of property, plant, and equipment. They also indicate that depreciation and amortization are by the straight-line method, and depletion is by the units-of-activity method.

OWENS-ILLINOIS, INC.
Balance Sheet (partial)
(in millions)

Property, plant, and equipment			
Timberlands, at cost, less accumulated depletion		$ 95.4	
Buildings and equipment, at cost	$2,207.1		
Less: Accumulated depreciation	1,229.0	978.1	
Total property, plant, and equipment			$1,073.5
Intangibles			
Patents			410.0
Total			$1,483.5

Illustration 10-24
Owens-Illinois' presentation of property, plant, and equipment, and intangible assets

Analysis

Using ratios, we can analyze how efficiently a company uses its assets to generate sales. The **asset turnover ratio** analyzes the productivity of a company's assets. It tells us how many dollars of sales a company generates for each dollar invested in assets. This ratio is computed by dividing net sales by average total assets for the period. The formula in Illustration 10-25 shows the computation of the asset turnover ratio for The Procter & Gamble Company. P&G's net sales for 2007 were $76,476 million. Its total ending assets were $138,014 million, and beginning assets were $135,695 million.

Net Sales	÷	Average Total Assets	=	Asset Turnover Ratio
$76,476	÷	$\frac{\$138{,}014 + \$135{,}695}{2}$	=	.56 times

Illustration 10-25
Asset turnover formula and computation

Thus, each dollar invested in assets produced $0.56 in sales for P&G. If a company is using its assets efficiently, each dollar of assets will create a high amount of sales. This ratio varies greatly among different industries—from those that are asset intensive (utilities) to those that are not (services).

Be sure to read **ALL ABOUT YOU: *Buying a Wreck of Your Own*** on page 460 for information on how topics in this chapter apply to your personal life.

Buying a Wreck of Your Own

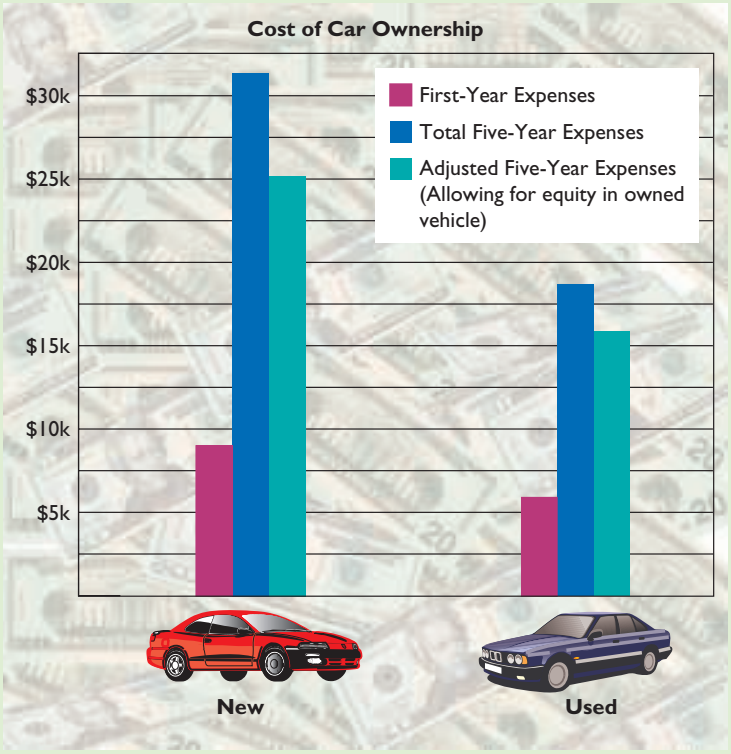
The opening story to this chapter discusses car rental company Rent-A-Wreck. Recall that Rent-A-Wreck determined it can maximize its profitability by buying and renting used, rather than new, cars. What about *you*? Could you maximize your economic well-being by buying a used car rather than a new one?

Some Facts

- In a recent year, nearly 17 million new cars were sold in the U.S., compared to sales of 44 million used cars.
- The cost of an average new car has risen in recent years, to about $22,000. The price of the average used car has actually been falling, and is now about $8,100.
- Financial institutions typically require a down payment of at least 10% of the value of a vehicle on a vehicle loan. Thus, the average new car will require a much higher down payment. However, interest rates on used-car loans are higher than on new-car loans.
- A new car typically loses at least 30% of its value during the first two years, and about 40 to 50% after three years. Some brands maintain their value better than others.
- The price of new cars has increased faster than average annual incomes in recent years.
- To keep monthly car payments down, car companies will now provide financing for up to six years. (It used to be two or three years.) With such a long loan, you might end up "upside down on the loan"—that is, you might actually owe more money than the car is worth if you decide to sell the car before the end of the loan.

About the Numbers

There are many costs to consider in deciding whether to buy a new or used car. These costs include the down payment, monthly loan payments, insurance, maintenance and repair costs, and state (department of motor vehicle) fees. The graph below compares the total costs over five years for the typical new versus used car.



Source for graph: Phillip Reed, "Compare the Costs: Buying vs. Leasing vs. Buying a Used Car," *www.edmunds.com/advice/buying/articles/47079/article.html* (accessed May 2006).

What Do You Think?

Should you buy a new car?

YES: I have enough stress in my life. I don't want to worry about my car breaking down—and if it does break down, I want it to be covered by a warranty. Besides, I have an image to maintain—I don't want to be seen in anything less than the latest styling and the latest technology.

NO: I'm a college student, and I need to keep my costs down. Also, used cars are a lot more dependable than they used to be. In addition, my self-image is strong enough that I don't need a fancy new car to feel good about myself (despite what the car advertisements say).

Source: Michelle Krebs, "Should You Buy New or Used?" *www.cars.com/go/advice,* May 3, 2005.

The authors' comments on this situation appear on page 483.

Comprehensive DO IT! 1

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

action plan

- ✔ Under the straight-line method, apply the depreciation rate to depreciable cost.
- ✔ Under the units-of-activity method, compute the depreciation cost per unit by dividing depreciable cost by total units of activity.
- ✔ Under the declining-balance method, apply the depreciation rate to **book value** at the beginning of the year.

Solution to Comprehensive DO IT! 1

(a)

Straight-Line Method

	Computation				End of Year	
Year	Depreciable Cost*	× Depreciation Rate	= Annual Depreciation Expense		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

	Computation				End of Year	
Year	Units of Activity	× Depreciation Cost/Unit	= Annual Depreciation Expense		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

	Computation				End of Year	
Year	Book Value Beginning of Year	× Depreciation Rate*	= Annual Depreciation Expense		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

*¼ × 2.
**Adjusted to $250 because ending book value should not be less than expected salvage value.

The Navigator

Comprehensive DO IT! 2

On January 1, 2010, Skyline Limousine Co. purchased a limo at an acquisition cost of $28,000. The vehicle has been depreciated by the straight-line method using a 4-year service life and a $4,000 salvage value. The company's fiscal year ends on December 31.

Instructions

Prepare the journal entry or entries to record the disposal of the limousine assuming that it was:

(a) Retired and scrapped with no salvage value on January 1, 2014.

(b) Sold for $5,000 on July 1, 2013.

action plan

- ✔ At the time of disposal, determine the book value of the asset.
- ✔ Recognize any gain or loss from disposal of the asset.
- ✔ Remove the book value of the asset from the records by debiting Accumulated Depreciation for the total depreciation to date of disposal and crediting the asset account for the cost of the asset.

Solution to Comprehensive DO IT! 2

(a)	1/1/14	Accumulated Depreciation—Limousine	24,000	
		Loss on Disposal	4,000	
		Limousine		28,000
		(To record retirement of limousine)		
(b)	7/1/13	Depreciation Expense	3,000	
		Accumulated Depreciation—Limousine		3,000
		(To record depreciation to date of disposal)		
		Cash	5,000	
		Accumulated Depreciation—Limousine	21,000	
		Loss on Disposal	2,000	
		Limousine		28,000
		(To record sale of limousine)		

The Navigator

SUMMARY OF STUDY OBJECTIVES

1 Describe how the cost principle applies to plant assets. The cost of plant assets includes all expenditures necessary to acquire the asset and make it ready for its intended use. Cost is measured by the cash or cash equivalent price paid.

2 Explain the concept of depreciation. Depreciation is the allocation of the cost of a plant asset to expense over its useful (service) life in a rational and systematic manner. Depreciation is not a process of valuation, nor is it a process that results in an accumulation of cash.

3 Compute periodic depreciation using different methods. Three depreciation methods are:

Method	Effect on Annual Depreciation	Formula
Straight-line	Constant amount	Depreciable cost ÷ Useful life (in years)
Units-of-activity	Varying amount	Depreciation cost per unit × Units of activity during the year
Declining-balance	Decreasing amount	Book value at beginning of year × Declining-balance rate

4 Describe the procedure for revising periodic depreciation. Companies make revisions of periodic depreciation in present and future periods, not retroactively. They determine the new annual depreciation by dividing the depreciable cost at the time of the revision by the remaining useful life.

5 Distinguish between revenue and capital expenditures, and explain the entries for each. Companies incur revenue expenditures to maintain the operating efficiency and productive life of an asset. They debit these expenditures to Repair Expense as incurred. Capital expenditures increase the operating efficiency, productive capacity, or expected useful life of the asset. Companies generally debit these expenditures to the plant asset affected.

6 Explain how to account for the disposal of a plant asset. The accounting for disposal of a plant asset through retirement or sale is as follows:

(a) Eliminate the book value of the plant asset at the date of disposal.

(b) Record cash proceeds, if any.

(c) Account for the difference between the book value and the cash proceeds as a gain or loss on disposal.

7 **Compute periodic depletion of natural resources.** Companies compute depletion cost per unit by dividing the total cost of the natural resource minus salvage value by the number of units estimated to be in the resource. They then multiply the depletion cost per unit by the number of units extracted and sold.

8 **Explain the basic issues related to accounting for intangible assets.** The process of allocating the cost of an intangible asset is referred to as amortization. The cost of intangible assets with indefinite lives are not amortized. Companies normally use the straight-line method for amortizing intangible assets.

9 **Indicate how plant assets, natural resources, and intangible assets are reported.** Companies usually combine plant assets and natural resources under property, plant, and equipment; they show intangibles separately under intangible assets. Either within the balance sheet or in the notes, companies should disclose the balances of the major classes of assets, such as land, buildings, and equipment, and accumulated depreciation by major classes or in total. They also should describe the depreciation and amortization methods used, and should disclose the amount of depreciation and amortization expense for the period. The asset turnover ratio measures the productivity of a company's assets in generating sales.

GLOSSARY

Accelerated-depreciation method Depreciation method that produces higher depreciation expense in the early years than in the later years. (p. 447).

Additions and improvements Costs incurred to increase the operating efficiency, productive capacity, or useful life of a plant asset. (p. 449).

Amortization The allocation of the cost of an intangible asset to expense over its useful life in a systematic and rational manner. (p. 454).

Asset turnover ratio A measure of how efficiently a company uses its assets to generate sales; calculated as net sales divided by average total assets. (p. 459).

Capital expenditures Expenditures that increase the company's investment in productive facilities. (p. 449).

Copyright Exclusive grant from the federal government that allows the owner to reproduce and sell an artistic or published work. (p. 455).

Declining-balance method Depreciation method that applies a constant rate to the declining book value of the asset and produces a decreasing annual depreciation expense over the useful life of the asset. (p. 446).

Depletion The allocation of the cost of a natural resource to expense in a rational and systematic manner over the resource's useful life. (p. 453).

Depreciation The process of allocating to expense the cost of a plant asset over its useful (service) life in a rational and systematic manner. (p. 442).

Depreciable cost The cost of a plant asset less its salvage value. (p. 444).

Franchise (license) A contractual arrangement under which the franchisor grants the franchisee the right to sell certain products, provide specific services, or use certain trademarks or trade names, usually within a designated geographical area. (p. 456).

Going-concern assumption States that the company will continue in operation for the foreseeable future. (p. 443).

Goodwill The value of all favorable attributes that relate to a business enterprise. (p. 456).

Intangible assets Rights, privileges, and competitive advantages that result from the ownership of long-lived assets that do not possess physical substance. (p. 454).

Licenses Operating rights to use public property, granted to a business enterprise by a governmental agency. (p. 456).

Materiality principle If an item would not make a difference in decision making, a company does not have to follow GAAP in reporting it. (p. 450).

Natural resources Assets that consist of standing timber and underground deposits of oil, gas, or minerals. (p. 453).

Ordinary repairs Expenditures to maintain the operating efficiency and productive life of the unit. (p. 449).

Patent An exclusive right issued by the U.S. Patent Office that enables the recipient to manufacture, sell, or otherwise control an invention for a period of 20 years from the date of the grant. (p. 455).

Plant assets Tangible resources that are used in the operations of the business and are not intended for sale to customers. (p. 438).

Research and development (R&D) costs Expenditures that may lead to patents, copyrights, new processes, or new products. (p. 457).

Revenue expenditures Expenditures that are immediately charged against revenues as an expense. (p. 449).

Salvage value An estimate of an asset's value at the end of its useful life. (p. 443).

Straight-line method Depreciation method in which periodic depreciation is the same for each year of the asset's useful life. (p. 444).

Trademark (trade name) A word, phrase, jingle, or symbol that identifies a particular enterprise or product. (p. 455).

Units-of-activity method Depreciation method in which useful life is expressed in terms of the total units of production or use expected from an asset. (p. 445).

Useful life An estimate of the expected productive life, also called service life, of an asset. (p. 443).

APPENDIX Exchange of Plant Assets

STUDY OBJECTIVE 10
Explain how to account for the exchange of plant assets.

Ordinarily, companies record a gain or loss on the exchange of plant assets. The rationale for recognizing a gain or loss is that most exchanges have **commercial substance**. An exchange has commercial substance if the future cash flows change as a result of the exchange.

To illustrate, Ramos Co. exchanges some of its equipment for land held by Brodhead Inc. It is likely that the timing and amount of the cash flows arising from the land will differ significantly from the cash flows arising from the equipment. As a result, both Ramos and Brodhead are in different economic positions. Therefore **the exchange has commercial substance**, and the companies recognize a gain or loss in the exchange. Because most exchanges have commercial substance (even when similar assets are exchanged), we illustrate only this type of situation, for both a loss and a gain.

Loss Treatment

To illustrate an exchange that results in a loss, assume that Roland Company exchanged a set of used trucks plus cash for a new semi-truck. The used trucks have a combined book value of $42,000 (cost $64,000 less $22,000 accumulated depreciation). Roland's purchasing agent, experienced in the second-hand market, indicates that the used trucks have a fair market value of $26,000. In addition to the trucks, Roland must pay $17,000 for the semi-truck. Roland computes the cost of the semi-truck as follows

Illustration 10A-1
Cost of semi-truck

Fair value of used trucks	$26,000
Cash paid	17,000
Cost of semi-truck	$43,000

Roland incurs a loss on disposal of $16,000 on this exchange. The reason is that the book value of the used trucks is greater than the fair market value of these trucks. The computation is as follows.

Illustration 10A-2
Computation of loss on disposal

Book value of used trucks ($64,000−$22,000)	$42,000
Fair market value of used trucks	26,000
Loss on disposal	**$16,000**

In recording an exchange at a loss, three steps are required: (1) Eliminate the book value of the asset given up, (2) record the cost of the asset acquired, and (3) recognize the loss on disposal. Roland Company thus records the exchange on the loss as follows.

A	=	L	+	OE
+43,000				
+22,000				
				−16,000 Exp
−64,000				
−17,000				

Cash Flows
−17,000

Semi-truck	43,000	
Accumulated Depreciation—Used Trucks	22,000	
Loss on Disposal	16,000	
Used Trucks		64,000
Cash		17,000
(To record exchange of used trucks for semi-truck.)		

Gain Treatment

To illustrate a gain situation, assume that Mark Express Delivery decides to exchange its old delivery equipment plus cash of $3,000 for new delivery equipment. The book

value of the old delivery equipment is $12,000 (cost $40,000 less accumulated depreciation $28,000). The fair market value of the old delivery equipment is $19,000.

The cost of the new asset is the fair market value of the old asset exchanged plus any cash paid (or other consideration given up). The cost of the new delivery equipment is $22,000 computed as follows.

Fair market value of old delivery equipment	$19,000
Cash paid	3,000
Cost of new delivery equipment	**$22,000**

Illustration 10A-3 Cost of new delivery equipment

A gain results when the fair market value of the old delivery equipment is greater than its book value. For Mark Express there is a gain of $7,000 on disposal, computed as follows.

Fair market value of old delivery equipment	$19,000
Book value of old delivery equipment ($40,000−$28,000)	12,000
Gain on disposal	**$ 7,000**

Illustration 10A-4 Computation of gain on disposal

Mark Express Delivery records the exchange as follows.

Delivery Equipment (new)	22,000	
Accumulated Depreciation—Delivery Equipment (old)	28,000	
Delivery Equipment (old)		40,000
Gain on Disposal		7,000
Cash		3,000
(To record exchange of old delivery equipment for new delivery equipment)		

A	=	L	+	OE
+22,000				
+28,000				
−40,000				
				+7,000 Rev
−3,000				

Cash Flows
−3,000

In recording an exchange at a gain, the following three steps are involved: (1) Eliminate the book value of the asset given up, (2) record the cost of the asset acquired, and (3) recognize the gain on disposal. Accounting for exchanges of plant assets becomes more complex if the transaction does not have commercial substance. This issue is discussed in more advanced accounting classes.

SUMMARY OF STUDY OBJECTIVE FOR APPENDIX

10 Explain how to account for the exchange of plant assets. Ordinarily companies record a gain or loss on the exchange of plant assets. The rationale for recognizing a gain or loss is that most exchanges have commercial substance. An exchange has commercial substance if the future cash flows change as a result of the exchange.

Note: All **asterisked** Questions, Exercises, and Problems relate to material in the appendix to the chapter.

SELF-STUDY QUESTIONS

Answers are at the end of the chapter.

(SO 1) **1.** Erin Danielle Company purchased equipment and incurred the following costs.

Cash price	$24,000
Sales taxes	1,200
Insurance during transit	200
Installation and testing	400
Total costs	$25,800

What amount should be recorded as the cost of the equipment?

a. $24,000.
b. $25,200.
c. $25,400.
d. $25,800.

(SO 2) **2.** Depreciation is a process of:

a. valuation.
b. cost allocation.

c. cash accumulation.
d. appraisal.

(SO 3) **3.** Micah Bartlett Company purchased equipment on January 1, 2009, at a total invoice cost of $400,000. The equipment has an estimated salvage value of $10,000 and an estimated useful life of 5 years. The amount of accumulated depreciation at December 31, 2010, if the straight-line method of depreciation is used, is:
a. $80,000.
b. $160,000.
c. $78,000.
d. $156,000.

(SO 3) **4.** Ann Torbert purchased a truck for $11,000 on January 1, 2009. The truck will have an estimated salvage value of $1,000 at the end of 5 years. Using the units-of-activity method, the balance in accumulated depreciation at December 31, 2010, can be computed by the following formula:
a. ($11,000 ÷ Total estimated activity) × Units of activity for 2010.
b. ($10,000 ÷ Total estimated activity) × Units of activity for 2010.
c. ($11,000 ÷ Total estimated activity) × Units of activity for 2009 and 2010.
d. ($10,000 ÷ Total estimated activity) × Units of activity for 2009 and 2010.

(SO 3) **5.** Jefferson Company purchased a piece of equipment on January 1, 2010. The equipment cost $60,000 and had an estimated life of 8 years and a salvage value of $8,000. What was the depreciation expense for the asset for 2011 under the double-declining-balance method?
a. $6,500.
b. $11,250.
c. $15,000.
d. $6,562.

(SO 4) **6.** When there is a change in estimated depreciation:
a. previous depreciation should be corrected.
b. current and future years' depreciation should be revised.
c. only future years' depreciation should be revised.
d. None of the above.

(SO 4) **7.** Able Towing Company purchased a tow truck for $60,000 on January 1, 2010. It was originally depreciated on a straight-line basis over 10 years with an assumed salvage value of $12,000. On December 31, 2012, before adjusting entries had been made, the company decided to change the remaining estimated life to 4 years (including 2012) and the salvage value to $2,000. What was the depreciation expense for 2012?
a. $6,000.
b. $4,800.
c. $15,000.
d. $12,100.

(SO 5) **8.** Additions to plant assets are:
a. revenue expenditures.
b. debited to a Repair Expense account.
c. debited to a Purchases account.
d. capital expenditures.

(SO 6) **9.** Bennie Razor Company has decided to sell one of its old manufacturing machines on June 30, 2010. The machine was purchased for $80,000 on January 1, 2006, and was depreciated on a straight-line basis for 10 years assuming no salvage value. If the machine was sold for $26,000, what was the amount of the gain or loss recorded at the time of the sale?
a. $18,000.
b. $54,000.
c. $22,000.
d. $46,000.

(SO 7) **10.** Maggie Sharrer Company expects to extract 20 million tons of coal from a mine that cost $12 million. If no salvage value is expected, and 2 million tons are mined and sold in the first year, the entry to record depletion will include a:
a. debit to Accumulated Depletion of $2,000,000.
b. credit to Depletion Expense of $1,200,000.
c. debit to Depletion Expense of $1,200,000.
d. credit to Accumulated Depletion of $2,000,000.

(SO 8) **11.** Which of the following statements is *false*?
a. If an intangible asset has a finite life, it should be amortized.
b. The amortization period of an intangible asset can exceed 20 years.
c. Goodwill is recorded only when a business is purchased.
d. Research and development costs are expensed when incurred, except when the research and development expenditures result in a successful patent.

(SO 8) **12.** Martha Beyerlein Company incurred $150,000 of research and development costs in its laboratory to develop a patent granted on January 2, 2010. On July 31, 2010, Beyerlein paid $35,000 for legal fees in a successful defense of the patent. The total amount debited to Patents through July 31, 2010, should be:
a. $150,000.
b. $35,000.
c. $185,000.
d. $170,000.

(SO 9) **13.** Indicate which of the following statements is *true*.
a. Since intangible assets lack physical substance, they need be disclosed only in the notes to the financial statements.
b. Goodwill should be reported as a contra-account in the owner's equity section.
c. Totals of major classes of assets can be shown in the balance sheet, with asset details disclosed in the notes to the financial statements.
d. Intangible assets are typically combined with plant assets and natural resources and shown in the property, plant, and equipment section.

(SO 9) **14.** Lake Coffee Company reported net sales of $180,000, net income of $54,000, beginning total assets of $200,000, and ending total assets of $300,000. What was the company's asset turnover ratio?
a. 0.90
b. 0.20
c. 0.72
d. 1.39

(SO 10) *15. Schopenhauer Company exchanged an old machine, with a book value of $39,000 and a fair market value of $35,000, and paid $10,000 cash for a similar new machine. The transaction has commercial substance. At what amount should the machine acquired in the exchange be recorded on Schopenhauer's books?
a. $45,000.
b. $46,000.
c. $49,000.
d. $50,000.

*16. In exchanges of assets in which the exchange has commercial substance: (SO 10)
a. neither gains nor losses are recognized immediately.
b. gains, but not losses, are recognized immediately.
c. losses, but not gains, are recognized immediately.
d. both gains and losses are recognized immediately.

Go to the book's companion website, **www.wiley.com/college/weygandt**, for Additional Self-Study questions.

The Navigator

QUESTIONS

1. Tim Hoover is uncertain about the applicability of the cost principle to plant assets. Explain the principle to Tim.
2. What are some examples of land improvements?
3. Dain Company acquires the land and building owned by Corrs Company. What types of costs may be incurred to make the asset ready for its intended use if Dain Company wants to use (a) only the land, and (b) both the land and the building?
4. In a recent newspaper release, the president of Keene Company asserted that something has to be done about depreciation. The president said, "Depreciation does not come close to accumulating the cash needed to replace the asset at the end of its useful life." What is your response to the president?
5. Robert is studying for the next accounting examination. He asks your help on two questions: (a) What is salvage value? (b) Is salvage value used in determining periodic depreciation under each depreciation method? Answer Robert's questions.
6. Contrast the straight-line method and the units-of-activity method as to (a) useful life, and (b) the pattern of periodic depreciation over useful life.
7. Contrast the effects of the three depreciation methods on annual depreciation expense.
8. In the fourth year of an asset's 5-year useful life, the company decides that the asset will have a 6-year service life. How should the revision of depreciation be recorded? Why?
9. Distinguish between revenue expenditures and capital expenditures during useful life.
10. How is a gain or loss on the sale of a plant asset computed?
11. Mendez Corporation owns a machine that is fully depreciated but is still being used. How should Mendez account for this asset and report it in the financial statements?
12. What are natural resources, and what are their distinguishing characteristics?
13. Explain what depletion is and how it is computed.
14. What are the similarities and differences between the terms depreciation, depletion, and amortization?
15. Pendergrass Company hires an accounting intern who says that intangible assets should always be amortized over their legal lives. Is the intern correct? Explain.
16. Goodwill has been defined as the value of all favorable attributes that relate to a business enterprise. What types of attributes could result in goodwill?
17. Kenny Sain, a business major, is working on a case problem for one of his classes. In the case problem, the company needs to raise cash to market a new product it developed. Joe Morris, an engineering major, takes one look at the company's balance sheet and says, "This company has an awful lot of goodwill. Why don't you recommend that they sell some of it to raise cash?" How should Kenny respond to Joe?
18. Under what conditions is goodwill recorded?
19. Often research and development costs provide companies with benefits that last a number of years. (For example, these costs can lead to the development of a patent that will increase the company's income for many years.) However, generally accepted accounting principles require that such costs be recorded as an expense when incurred. Why?
20. McDonald's Corporation reports total average assets of $28.9 billion and net sales of $20.5 billion. What is the company's asset turnover ratio?
21. Resco Corporation and Yapan Corporation operate in the same industry. Resco uses the straight-line method to account for depreciation; Yapan uses an accelerated method. Explain what complications might arise in trying to compare the results of these two companies.
22. Lopez Corporation uses straight-line depreciation for financial reporting purposes but an accelerated method for tax purposes. Is it acceptable to use different methods for the two purposes? What is Lopez's motivation for doing this?
23. You are comparing two companies in the same industry. You have determined that May Corp. depreciates its plant assets over a 40-year life, whereas Won Corp. depreciates its plant assets over a 20-year life. Discuss the implications this has for comparing the results of the two companies.
24. Wade Company is doing significant work to revitalize its warehouses. It is not sure whether it should capitalize these costs or expense them. What are the implications for current-year net income and future net income of expensing versus capitalizing these costs?

25. PEPSICO What classifications and amounts are shown in PepsiCo's Note 4 to explain its total property, plant, and equipment (net) of $11,228 million?

26. When assets are exchanged in a transaction involving commercial substance, how is the gain or loss on disposal computed?

***27.** Tatum Refrigeration Company trades in an old machine on a new model when the fair market value of the old machine is greater than its book value. The transaction has commercial substance. Should Tatum recognize a gain on disposal? If the fair market value of the old machine is less than its book value, should Tatum recognize a loss on disposal?

BRIEF EXERCISES

Determine the cost of land. (SO 1)

BE10-1 The following expenditures were incurred by Obermeyer Company in purchasing land: cash price $70,000, accrued taxes $3,000, attorneys' fees $2,500, real estate broker's commission $2,000, and clearing and grading $3,500. What is the cost of the land?

Determine the cost of a truck. (SO 1)

BE10-2 Neeley Company incurs the following expenditures in purchasing a truck: cash price $30,000, accident insurance $2,000, sales taxes $1,500, motor vehicle license $100, and painting and lettering $400. What is the cost of the truck?

Compute straight-line depreciation. (SO 3)

BE10-3 Conlin Company acquires a delivery truck at a cost of $42,000. The truck is expected to have a salvage value of $6,000 at the end of its 4-year useful life. Compute annual depreciation for the first and second years using the straight-line method.

Compute depreciation and evaluate treatment. (SO 3)

BE10-4 Ecklund Company purchased land and a building on January 1, 2010. Management's best estimate of the value of the land was $100,000 and of the building $200,000. But management told the accounting department to record the land at $220,000 and the building at $80,000. The building is being depreciated on a straight-line basis over 20 years with no salvage value. Why do you suppose management requested this accounting treatment? Is it ethical?

Compute declining-balance depreciation. (SO 3)

BE10-5 Depreciation information for Conlin Company is given in BE10-3. Assuming the declining-balance depreciation rate is double the straight-line rate, compute annual depreciation for the first and second years under the declining-balance method.

Compute depreciation using the units-of-activity method. (SO 3)

BE10-6 Speedy Taxi Service uses the units-of-activity method in computing depreciation on its taxicabs. Each cab is expected to be driven 150,000 miles. Taxi no. 10 cost $33,500 and is expected to have a salvage value of $500. Taxi no. 10 is driven 30,000 miles in year 1 and 20,000 miles in year 2. Compute the depreciation for each year.

Compute revised depreciation. (SO 4)

BE10-7 On January 1, 2010, the Ramirez Company ledger shows Equipment $29,000 and Accumulated Depreciation $9,000. The depreciation resulted from using the straight-line method with a useful life of 10 years and salvage value of $2,000. On this date, the company concludes that the equipment has a remaining useful life of only 4 years with the same salvage value. Compute the revised annual depreciation.

Prepare entries for delivery truck costs. (SO 5)

BE10-8 Firefly Company had the following two transactions related to its delivery truck.

1. Paid $45 for an oil change.
2. Paid $400 to install special shelving units, which increase the operating efficiency of the truck.

Prepare Firefly's journal entries to record these two transactions.

Prepare entries for disposal by retirement. (SO 6)

BE10-9 Prepare journal entries to record the following.

(a) Gomez Company retires its delivery equipment, which cost $41,000. Accumulated depreciation is also $41,000 on this delivery equipment. No salvage value is received.

(b) Assume the same information as (a), except that accumulated depreciation is $39,000, instead of $41,000, on the delivery equipment.

Prepare entries for disposal by sale. (SO 6)

BE10-10 Chan Company sells office equipment on September 30, 2010, for $20,000 cash. The office equipment originally cost $72,000 and as of January 1, 2010, had accumulated depreciation of $42,000. Depreciation for the first 9 months of 2010 is $5,250. Prepare the journal entries to **(a)** update depreciation to September 30, 2010, and **(b)** record the sale of the equipment.

Prepare depletion expense entry and balance sheet presentation for natural resources. (SO 7)

BE10-11 Olpe Mining Co. purchased for $7 million a mine that is estimated to have 35 million tons of ore and no salvage value. In the first year, 6 million tons of ore are extracted and sold.

(a) Prepare the journal entry to record depletion expense for the first year.

(b) Show how this mine is reported on the balance sheet at the end of the first year.

BE10-12 Galena Company purchases a patent for $120,000 on January 2, 2010. Its estimated useful life is 10 years.

Prepare patent expense entry and balance sheet presentation for intangibles. (SO 8)

(a) Prepare the journal entry to record patent expense for the first year.
(b) Show how this patent is reported on the balance sheet at the end of the first year.

BE10-13 Information related to plant assets, natural resources, and intangibles at the end of 2010 for Spain Company is as follows: buildings $1,100,000; accumulated depreciation—buildings $650,000; goodwill $410,000; coal mine $500,000; accumulated depletion—coal mine $108,000. Prepare a partial balance sheet of Spain Company for these items.

Classify long-lived assets on balance sheet. (SO 9)

BE10-14 In its 2007 annual report Target reported beginning total assets of $37.3 billion; ending total assets of $44.6 billion; property and equipment (net) of $24.1 billion; and net sales of $61.5 billion. Compute Target's asset turnover ratio.

Analyze long-lived assets. (SO 9)

***BE10-15** Rivera Company exchanges old delivery equipment for new delivery equipment. The book value of the old delivery equipment is $31,000 (cost $61,000 less accumulated depreciation $30,000). Its fair market value is $19,000, and cash of $5,000 is paid. Prepare the entry to record the exchange, assuming the transaction has commercial substance.

Prepare entry for disposal by exchange. (SO 10)

***BE10-16** Assume the same information as BE10-15, except that the fair market value of the old delivery equipment is $38,000. Prepare the entry to record the exchange.

Prepare entry for disposal by exchange. (SO 10)

DO IT! REVIEW

DO IT! 10-1 African Lakes Company purchased a delivery truck. The total cash payment was $27,900, including the following items.

Explain accounting for cost of plant assets. (SO 1)

Negotiated purchase price	$24,000
Installation of special shelving	1,100
Painting and lettering	900
Motor vehicle license	100
Annual insurance policy	500
Sales tax	1,300
Total paid	$27,900

Explain how each of these costs would be accounted for.

DO IT! 10-2 On January 1, 2010, Pine Grove Country Club purchased a new riding mower for $15,000. The mower is expected to have an 8-year life with a $1,000 salvage value. What journal entry would Pine Grove make at December 31, 2010, if it uses straight-line depreciation?

Calculate depreciation expense and make journal entry. (SO 2)

DO IT! 10-3 Ritenour Manufacturing has an old factory machine that cost $50,000. The machine has accumulated depreciation of $28,000 and a fair value of $26,000. Ritenour has decided to sell the machine.

Make journal entries to record plant asset disposal. (SO 6)

(a) What entry would Ritenour make to record the sale of the truck for $26,000 cash?
(b) What entry would Ritenour make to record the sale of the truck for $15,000 cash?

DO IT! 10-4 Match the statement with the term most directly associated with it.

Match intangibles classifications concepts. (SO 7, 8)

Goodwill	Amortization
Intangible assets	Franchise
Research and development costs	

1. _____ Rights, privileges, and competitive advantages that result from the ownership of long-lived assets that do not possess physical substance.
2. _____ The allocation of the cost of an intangible asset to expense in a rational and systematic manner.
3. _____ A right to sell certain products or services, or use certain trademarks or trade names within a designated geographic area.
4. _____ Costs incurred by a company that often lead to patents or new products. These costs must be expensed as incurred.
5. _____ The excess of the cost of a company over the fair market value of the net assets required.

EXERCISES

Determine cost of plant acquisitions.
(SO 1)

E10-1 The following expenditures relating to plant assets were made by Spaulding Company during the first 2 months of 2010.

1. Paid $5,000 of accrued taxes at time plant site was acquired.
2. Paid $200 insurance to cover possible accident loss on new factory machinery while the machinery was in transit.
3. Paid $850 sales taxes on new delivery truck.
4. Paid $17,500 for parking lots and driveways on new plant site.
5. Paid $250 to have company name and advertising slogan painted on new delivery truck.
6. Paid $8,000 for installation of new factory machinery.
7. Paid $900 for one-year accident insurance policy on new delivery truck.
8. Paid $75 motor vehicle license fee on the new truck.

Instructions

(a) Explain the application of the cost principle in determining the acquisition cost of plant assets.

(b) List the numbers of the foregoing transactions, and opposite each indicate the account title to which each expenditure should be debited.

Determine property, plant, and equipment costs.
(SO 1)

E10-2 Trudy Company incurred the following costs.

1.	Sales tax on factory machinery purchased	$5,000
2.	Painting of and lettering on truck immediately upon purchase	700
3.	Installation and testing of factory machinery	2,000
4.	Real estate broker's commission on land purchased	3,500
5.	Insurance premium paid for first year's insurance on new truck	880
6.	Cost of landscaping on property purchased	7,200
7.	Cost of paving parking lot for new building constructed	17,900
8.	Cost of clearing, draining, and filling land	13,300
9.	Architect's fees on self-constructed building	10,000

Instructions

Indicate to which account Trudy would debit each of the costs.

Determine acquisition costs of land.
(SO 1)

E10-3 On March 1, 2010, Penner Company acquired real estate on which it planned to construct a small office building. The company paid $80,000 in cash. An old warehouse on the property was razed at a cost of $8,600; the salvaged materials were sold for $1,700. Additional expenditures before construction began included $1,100 attorney's fee for work concerning the land purchase, $5,000 real estate broker's fee, $7,800 architect's fee, and $14,000 to put in driveways and a parking lot.

Instructions

(a) Determine the amount to be reported as the cost of the land.

(b) For each cost not used in part (a), indicate the account to be debited.

Understand depreciation concepts.
(SO 2)

E10-4 Chris Rock has prepared the following list of statements about depreciation.

1. Depreciation is a process of asset valuation, not cost allocation.
2. Depreciation provides for the proper matching of expenses with revenues.
3. The book value of a plant asset should approximate its market value.
4. Depreciation applies to three classes of plant assets: land, buildings, and equipment.
5. Depreciation does not apply to a building because its usefulness and revenue-producing ability generally remain intact over time.
6. The revenue-producing ability of a depreciable asset will decline due to wear and tear and to obsolescence.
7. Recognizing depreciation on an asset results in an accumulation of cash for replacement of the asset.
8. The balance in accumulated depreciation represents the total cost that has been charged to expense.
9. Depreciation expense and accumulated depreciation are reported on the income statement.
10. Four factors affect the computation of depreciation: cost, useful life, salvage value, and residual value.

Instructions
Identify each statement as true or false. If false, indicate how to correct the statement.

E10-5 Younger Bus Lines uses the units-of-activity method in depreciating its buses. One bus was purchased on January 1, 2010, at a cost of $168,000. Over its 4-year useful life, the bus is expected to be driven 100,000 miles. Salvage value is expected to be $8,000.

Compute depreciation under units-of-activity method. (SO 3)

Instructions
(a) Compute the depreciation cost per unit.
(b) Prepare a depreciation schedule assuming actual mileage was: 2010, 26,000; 2011, 32,000; 2012, 25,000; and 2013, 17,000.

E10-6 Kelm Company purchased a new machine on October 1, 2010, at a cost of $120,000. The company estimated that the machine will have a salvage value of $12,000. The machine is expected to be used for 10,000 working hours during its 5-year life.

Determine depreciation for partial periods. (SO 3)

Instructions
Compute the depreciation expense under the following methods for the year indicated.
(a) Straight-line for 2010.
(b) Units-of-activity for 2010, assuming machine usage was 1,700 hours.
(c) Declining-balance using double the straight-line rate for 2010 and 2011.

E10-7 Brainiac Company purchased a delivery truck for $30,000 on January 1, 2010. The truck has an expected salvage value of $2,000, and is expected to be driven 100,000 miles over its estimated useful life of 8 years. Actual miles driven were 15,000 in 2010 and 12,000 in 2011.

Compute depreciation using different methods. (SO 3)

Instructions
(a) Compute depreciation expense for 2010 and 2011 using (1) the straight-line method, (2) the units-of-activity method, and (3) the double-declining balance method.
(b) Assume that Brainiac uses the straight-line method.
(1) Prepare the journal entry to record 2010 depreciation.
(2) Show how the truck would be reported in the December 31, 2010, balance sheet.

E10-8 Jerry Grant, the new controller of Blackburn Company, has reviewed the expected useful lives and salvage values of selected depreciable assets at the beginning of 2010. His findings are as follows.

Compute revised annual depreciation. (SO 4)

Type of Asset	Date Acquired	Cost	Accumulated Depreciation 1/1/10	Useful Life in Years		Salvage Value	
				Old	Proposed	Old	Proposed
Building	1/1/04	$800,000	$114,000	40	50	$40,000	$37,000
Warehouse	1/1/05	100,000	25,000	25	20	5,000	3,600

All assets are depreciated by the straight-line method. Blackburn Company uses a calendar year in preparing annual financial statements. After discussion, management has agreed to accept Jerry's proposed changes.

Instructions
(a) Compute the revised annual depreciation on each asset in 2010. (Show computations.)
(b) Prepare the entry (or entries) to record depreciation on the building in 2010.

E10-9 Presented below are selected transactions at Ingles Company for 2010.

Journalize entries for disposal of plant assets. (SO 6)

Jan. 1 Retired a piece of machinery that was purchased on January 1, 2000. The machine cost $62,000 on that date. It had a useful life of 10 years with no salvage value.
June 30 Sold a computer that was purchased on January 1, 2007. The computer cost $40,000. It had a useful life of 5 years with no salvage value. The computer was sold for $14,000.
Dec. 31 Discarded a delivery truck that was purchased on January 1, 2006. The truck cost $39,000. It was depreciated based on a 6-year useful life with a $3,000 salvage value.

Instructions
Journalize all entries required on the above dates, including entries to update depreciation, where applicable, on assets disposed of. Ingles Company uses straight-line depreciation. (Assume depreciation is up to date as of December 31, 2009.)

Journalize entries for disposal of equipment.
(SO 6)

E10-10 Beka Company owns equipment that cost $50,000 when purchased on January 1, 2007. It has been depreciated using the straight-line method based on estimated salvage value of $5,000 and an estimated useful life of 5 years.

Instructions
Prepare Beka Company's journal entries to record the sale of the equipment in these four independent situations.

(a) Sold for $28,000 on January 1, 2010.
(b) Sold for $28,000 on May 1, 2010.
(c) Sold for $11,000 on January 1, 2010.
(d) Sold for $11,000 on October 1, 2010.

Journalize entries for natural resources depletion.
(SO 7)

E10-11 On July 1, 2010, Hurtig Inc. invested $720,000 in a mine estimated to have 800,000 tons of ore of uniform grade. During the last 6 months of 2010, 100,000 tons of ore were mined and sold.

Instructions
(a) Prepare the journal entry to record depletion expense.
(b) Assume that the 100,000 tons of ore were mined, but only 80,000 units were sold. How are the costs applicable to the 20,000 unsold units reported?

Prepare adjusting entries for amortization.
(SO 8)

E10-12 The following are selected 2010 transactions of Franco Corporation.

Jan. 1 Purchased a small company and recorded goodwill of $150,000. Its useful life is indefinite.
May 1 Purchased for $90,000 a patent with an estimated useful life of 5 years and a legal life of 20 years.

Instructions
Prepare necessary adjusting entries at December 31 to record amortization required by the events above.

Prepare entries to set up appropriate accounts for different intangibles; amortize intangible assets.
(SO 8)

E10-13 Herzogg Company, organized in 2010, has the following transactions related to intangible assets.

1/2/10	Purchased patent (7-year life)	$560,000
4/1/10	Goodwill purchased (indefinite life)	360,000
7/1/10	10-year franchise; expiration date 7/1/2018	440,000
9/1/10	Research and development costs	185,000

Instructions
Prepare the necessary entries to record these intangibles. All costs incurred were for cash. Make the adjusting entries as of December 31, 2010, recording any necessary amortization and reflecting all balances accurately as of that date.

Calculate asset turnover ratio.
(SO 9)

E10-14 During 2010 Nasra Corporation reported net sales of $4,900,000 and net income of $1,500,000. Its balance sheet reported average total assets of $1,400,000.

Instructions
Calculate the asset turnover ratio.

Journalize entries for exchanges.
(SO 10)

***E10-15** Presented below are two independent transactions. Both transactions have commercial substance.

1. Sidney Co. exchanged old trucks (cost $64,000 less $22,000 accumulated depreciation) plus cash of $17,000 for new trucks. The old trucks had a fair market value of $36,000.
2. Lupa Inc. trades its used machine (cost $12,000 less $4,000 accumulated depreciation) for a new machine. In addition to exchanging the old machine (which had a fair market value of $9,000), Lupa also paid cash of $3,000.

Instructions
(a) Prepare the entry to record the exchange of assets by Sidney Co.
(b) Prepare the entry to record the exchange of assets by Lupa Inc.

Journalize entries for the exchange of plant assets.
(SO 10)

***E10-16** Coran's Delivery Company and Enright's Express Delivery exchanged delivery trucks on January 1, 2010. Coran's truck cost $22,000. It has accumulated depreciation of $15,000 and a fair market value of $4,000. Enright's truck cost $10,000. It has accumulated depreciation of $8,000 and a fair market value of $4,000. The transaction has commercial substance.

Instructions
(a) Journalize the exchange for Coran's Delivery Company.
(b) Journalize the exchange for Enright's Express Delivery.

EXERCISES: SET B

Visit the book's companion website at **www.wiley.com/college/weygandt**, and choose the Student Companion site, to access Exercise Set B.

PROBLEMS: SET A

P10-1A Diaz Company was organized on January 1. During the first year of operations, the following plant asset expenditures and receipts were recorded in random order.

Determine acquisition costs of land and building.

(SO 1)

	Debits	
1.	Cost of filling and grading the land	$ 4,000
2.	Full payment to building contractor	700,000
3.	Real estate taxes on land paid for the current year	5,000
4.	Cost of real estate purchased as a plant site (land $100,000 and building $45,000)	145,000
5.	Excavation costs for new building	35,000
6.	Architect's fees on building plans	10,000
7.	Accrued real estate taxes paid at time of purchase of real estate	2,000
8.	Cost of parking lots and driveways	14,000
9.	Cost of demolishing building to make land suitable for construction of new building	15,000
		$930,000
	Credits	
10.	Proceeds from salvage of demolished building	$ 3,500

Instructions

Analyze the foregoing transactions using the following column headings. Insert the number of each transaction in the Item space, and insert the amounts in the appropriate columns. For amounts entered in the Other Accounts column, also indicate the account titles.

Totals
Land $162,500
Building $745,000

Item	Land	Building	Other Accounts

P10-2A In recent years, Juresic Transportation purchased three used buses. Because of frequent turnover in the accounting department, a different accountant selected the depreciation method for each bus, and various methods were selected. Information concerning the buses is summarized below.

Compute depreciation under different methods.

(SO 3)

Bus	Acquired	Cost	Salvage Value	Useful Life in Years	Depreciation Method
1	1/1/08	$ 96,000	$ 6,000	5	Straight-line
2	1/1/08	120,000	10,000	4	Declining-balance
3	1/1/09	80,000	8,000	5	Units-of-activity

For the declining-balance method, the company uses the double-declining rate. For the units-of-activity method, total miles are expected to be 120,000. Actual miles of use in the first 3 years were: 2009, 24,000; 2010, 34,000; and 2011, 30,000.

Instructions

(a) Compute the amount of accumulated depreciation on each bus at December 31, 2010.

(a) Bus 2, 2009, $90,000

(b) If bus no. 2 was purchased on April 1 instead of January 1, what is the depreciation expense for this bus in (1) 2008 and (2) 2009?

P10-3A On January 1, 2010, Pele Company purchased the following two machines for use in its production process.

Compute depreciation under different methods.

(SO 3)

Machine A: The cash price of this machine was $38,000. Related expenditures included: sales tax $1,700, shipping costs $150, insurance during shipping $80, installation and testing costs $70, and $100 of oil and lubricants to be used with the machinery during its first year of operations. Pele estimates that the useful life of the machine is 5 years with a $5,000 salvage value remaining at the end

of that time period. Assume that the straight-line method of depreciation is used.

Machine B: The recorded cost of this machine was $160,000. Pele estimates that the useful life of the machine is 4 years with a $10,000 salvage value remaining at the end of that time period.

Instructions

(a) Prepare the following for Machine A.
- **(1)** The journal entry to record its purchase on January 1, 2010.
- **(2)** The journal entry to record annual depreciation at December 31, 2010.

(b) (2) 2010 DDB depreciation $80,000

(b) Calculate the amount of depreciation expense that Pele should record for machine B each year of its useful life under the following assumptions.
- **(1)** Pele uses the straight-line method of depreciation.
- **(2)** Pele uses the declining-balance method. The rate used is twice the straight-line rate.
- **(3)** Pele uses the units-of-activity method and estimates that the useful life of the machine is 125,000 units. Actual usage is as follows: 2010, 45,000 units; 2011, 35,000 units; 2012, 25,000 units; 2013, 20,000 units.

(c) Which method used to calculate depreciation on machine B reports the highest amount of depreciation expense in year 1 (2010)? The highest amount in year 4 (2013)? The highest total amount over the 4-year period?

Calculate revisions to depreciation expense.

(SO 3, 4)

P10-4A At the beginning of 2008, Lehman Company acquired equipment costing $90,000. It was estimated that this equipment would have a useful life of 6 years and a residual value of $9,000 at that time. The straight-line method of depreciation was considered the most appropriate to use with this type of equipment. Depreciation is to be recorded at the end of each year.

During 2010 (the third year of the equipment's life), the company's engineers reconsidered their expectations, and estimated that the equipment's useful life would probably be 7 years (in total) instead of 6 years. The estimated residual value was not changed at that time. However, during 2013 the estimated residual value was reduced to $5,000.

Instructions

Indicate how much depreciation expense should be recorded each year for this equipment, by completing the following table.

Year	Depreciation Expense	Accumulated Depreciation
2008		
2009		
2010		
2011		
2012		
2013		
2014		

2014 depreciation expense, $12,800

Journalize a series of equipment transactions related to purchase, sale, retirement, and depreciation.

(SO 3, 6, 9)

P10-5A At December 31, 2010, Jimenez Company reported the following as plant assets.

Land		$ 4,000,000
Buildings	$28,500,000	
Less: Accumulated depreciation—buildings	12,100,000	16,400,000
Equipment	48,000,000	
Less: Accumulated depreciation—equipment	5,000,000	43,000,000
Total plant assets		$63,400,000

During 2011, the following selected cash transactions occurred.

April 1 Purchased land for $2,130,000.

May 1 Sold equipment that cost $780,000 when purchased on January 1, 2007. The equipment was sold for $450,000.

June 1 Sold land purchased on June 1, 2001 for $1,500,000. The land cost $400,000.

July 1 Purchased equipment for $2,000,000.

Dec. 31 Retired equipment that cost $500,000 when purchased on December 31, 2001. No salvage value was received.

Instructions

(a) Journalize the above transactions. The company uses straight-line depreciation for buildings and equipment. The buildings are estimated to have a 50-year life and no salvage value. The equipment is estimated to have a 10-year useful life and no salvage value. Update depreciation on assets disposed of at the time of sale or retirement.

(b) Record adjusting entries for depreciation for 2011.

(c) Prepare the plant assets section of Jimenez's balance sheet at December 31, 2011.

(b) Depreciation Expense—building $570,000; equipment $4,772,000
(c) Total plant assets $61,270,000

P10-6A Puckett Co. has office furniture that cost $75,000 and that has been depreciated $50,000. Record the disposal under the following assumptions.

Record disposals.

(SO 6)

(a) It was scrapped as having no value.

(b) It was sold for $21,000.

(c) It was sold for $31,000.

P10-7A The intangible assets section of Redeker Company at December 31, 2010, is presented below.

Prepare entries to record transactions related to acquisition and amortization of intangibles; prepare the intangible assets section.

(SO 8, 9)

Patent ($70,000 cost less $7,000 amortization)	$63,000
Franchise ($48,000 cost less $19,200 amortization)	28,800
Total	$91,800

The patent was acquired in January 2010 and has a useful life of 10 years. The franchise was acquired in January 2007 and also has a useful life of 10 years. The following cash transactions may have affected intangible assets during 2011.

Jan. 2	Paid $45,000 legal costs to successfully defend the patent against infringement by another company.
Jan.–June	Developed a new product, incurring $140,000 in research and development costs. A patent was granted for the product on July 1. Its useful life is equal to its legal life.
Sept. 1	Paid $50,000 to an extremely large defensive lineman to appear in commercials advertising the company's products. The commercials will air in September and October.
Oct. 1	Acquired a franchise for $100,000. The franchise has a useful life of 50 years.

Instructions

(a) Prepare journal entries to record the transactions above.

(b) Prepare journal entries to record the 2011 amortization expense.

(c) Prepare the intangible assets section of the balance sheet at December 31, 2011.

(b) Amortization Expense—Patents $12,000
Amortization Expense—Franchise $5,300
(c) Total intangible assets $219,500

P10-8A Due to rapid turnover in the accounting department, a number of transactions involving intangible assets were improperly recorded by the Thorne Company in 2010.

Prepare entries to correct errors made in recording and amortizing intangible assets.

(SO 8)

1. Thorne developed a new manufacturing process, incurring research and development costs of $136,000. The company also purchased a patent for $60,000. In early January, Thorne capitalized $196,000 as the cost of the patents. Patent amortization expense of $9,800 was recorded based on a 20-year useful life.
2. On July 1, 2010, Thorne purchased a small company and as a result acquired goodwill of $92,000. Thorne recorded a half-year's amortization in 2010, based on a 50-year life ($920 amortization). The goodwill has an indefinite life.

Instructions

Prepare all journal entries necessary to correct any errors made during 2010. Assume the books have not yet been closed for 2010.

1. R&D Exp. $136,000

P10-9A Lebo Company and Ritter Corporation, two corporations of roughly the same size, are both involved in the manufacture of in-line skates. Each company depreciates its plant assets using the straight-line approach. An investigation of their financial statements reveals the following information.

Calculate and comment on asset turnover ratio.

(SO 9)

	Lebo Co.	Ritter Corp.
Net income	$ 800,000	$1,000,000
Sales	1,200,000	1,080,000
Average total assets	2,500,000	2,000,000
Average plant assets	1,800,000	1,000,000

Instructions

(a) For each company, calculate the asset turnover ratio.

(b) Based on your calculations in part (a), comment on the relative effectiveness of the two companies in using their assets to generate sales and produce net income.

PROBLEMS: SET B

Determine acquisition costs of land and building.

(SO 1)

P10-1B Dewey Company was organized on January 1. During the first year of operations, the following plant asset expenditures and receipts were recorded in random order.

		Debits
1.	Accrued real estate taxes paid at time of purchase of real estate	$ 5,000
2.	Real estate taxes on land paid for the current year	7,500
3.	Full payment to building contractor	500,000
4.	Excavation costs for new building	19,000
5.	Cost of real estate purchased as a plant site (land $75,000 and building $25,000)	100,000
6.	Cost of parking lots and driveways	18,000
7.	Architect's fees on building plans	9,000
8.	Installation cost of fences around property	6,000
9.	Cost of demolishing building to make land suitable for construction of new building	17,000
		$681,500
	Credit	
10.	Proceeds from salvage of demolished building	$ 3,500

Instructions

Analyze the foregoing tranactions using the following column headings. Insert the number of each transaction in the Item space, and insert the amounts in the appropriate columns. For amounts entered in the Other Accounts column, also indicate the account title.

Totals
Land $118,500
Building $528,000

Item	Land	Building	Other Accounts

Compute depreciation under different methods.

(SO 3)

P10-2B In recent years, Pablo Company purchased three machines. Because of heavy turnover in the accounting department, a different accountant was in charge of selecting the depreciation method for each machine, and each selected a different method. Information concerning the machines is summarized below.

Machine	Acquired	Cost	Salvage Value	Useful Life in Years	Depreciation Method
1	1/1/07	$105,000	$ 5,000	10	Straight-line
2	1/1/08	150,000	10,000	8	Declining-balance
3	11/1/10	100,000	15,000	6	Units-of-activity

For the declining-balance method, the company uses the double-declining rate. For the units-of-activity method, total machine hours are expected to be 25,000. Actual hours of use in the first 3 years were: 2010, 2,000; 2011, 4,500; and 2012, 5,500.

Instructions

(a) Machine 2, 2009, $28,125

(a) Compute the amount of accumulated depreciation on each machine at December 31, 2010.

(b) If machine 2 had been purchased on May 1 instead of January 1, what would be the depreciation expense for this machine in (1) 2008 and (2) 2009?

Compute depreciation under different methods.

(SO 3)

P10-3B On January 1, 2010, Arlo Company purchased the following two machines for use in its production process.

Machine A: The cash price of this machine was $55,000. Related expenditures included: sales tax $2,750, shipping costs $100, insurance during shipping $75, installation and testing costs $75, and $90 of oil and lubricants to be used with the machinery during its first year of operation. Arlo estimates that the useful life of the machine is 4 years with a $5,000 salvage value remaining at the end of that time period.

Machine B: The recorded cost of this machine was $100,000. Arlo estimates that the useful life of the machine is 4 years with a $10,000 salvage value remaining at the end of that time period.

Instructions

(a) Prepare the following for Machine A. (a) (2) $13,250

(1) The journal entry to record its purchase on January 1, 2010.

(2) The journal entry to record annual depreciation at December 31, 2010, assuming the straight-line method of depreciation is used.

(b) Calculate the amount of depreciation expense that Arlo should record for machine B each year of its useful life under the following assumption.

(1) Arlo uses the straight-line method of depreciation.

(2) Arlo uses the declining-balance method. The rate used is twice the straight-line rate.

(3) Arlo uses the units-of-activity method and estimates the useful life of the machine is 25,000 units. Actual usage is as follows: 2010, 5,500 units; 2011, 7,000 units; 2012, 8,000 units; 2013, 4,500 units.

(c) Which method used to calculate depreciation on machine B reports the lowest amount of depreciation expense in year 1 (2010)? The lowest amount in year 4 (2013)? The lowest total amount over the 4-year period?

P10-4B At the beginning of 2008, Anfernee Company acquired equipment costing $200,000. It was estimated that this equipment would have a useful life of 6 years and a residual value of $20,000 at that time. The straight-line method of depreciation was considered the most appropriate to use with this type of equipment. Depreciation is to be recorded at the end of each year.

Calculate revisions to depreciation expense.

(SO 3, 4)

During 2010 (the third year of the equipment's life), the company's engineers reconsidered their expectations, and estimated that the equipment's useful life would probably be 7 years (in total) instead of 6 years. The estimated residual value was not changed at that time. However, during 2013 the estimated residual value was reduced to $5,000.

Instructions

Indicate how much depreciation expense should be recorded for this equipment each year by completing the following table.

Year	Depreciation Expense	Accumulated Depreciation
2008		
2009		
2010		
2011		
2012		
2013		
2014		

2014 depreciation expense, $31,500

P10-5B At December 31, 2010, Starkey Company reported the following as plant assets.

Journalize a series of equipment transactions related to purchase, sale, retirement, and depreciation.

(SO 3, 6, 9)

Land		$ 2,000,000
Buildings	$20,000,000	
Less: Accumulated depreciation—buildings	8,000,000	12,000,000
Equipment	30,000,000	
Less: Accumulated depreciation—equipment	4,000,000	26,000,000
Total plant assets		$40,000,000

During 2011, the following selected cash transactions occurred.

April 1 Purchased land for $1,200,000.

May 1 Sold equipment that cost $420,000 when purchased on January 1, 2007. The equipment was sold for $240,000.

June 1 Sold land purchased on June 1, 2001, for $1,000,000. The land cost $340,000.

July 1 Purchased equipment for $1,100,000.

Dec. 31 Retired equipment that cost $300,000 when purchased on December 31, 2001. No salvage value was received.

Instructions

(a) Journalize the above transactions. Starkey uses straight-line depreciation for buildings and equipment. The buildings are estimated to have a 50-year useful life and no salvage value.

(b) Depreciation expense—Building $400,000; Equipment $2,983,000
(c) Total plant assets $38,295,000

The equipment is estimated to have a 10-year useful life and no salvage value. Update depreciation on assets disposed of at the time of sale or retirement.

(b) Record adjusting entries for depreciation for 2011.
(c) Prepare the plant assets section of Starkey's balance sheet at December 31, 2011.

Record disposals.
(SO 6)

P10-6B Bobby's has delivery equipment that cost $40,000 and that has been depreciated $26,000. Record the disposal under the following assumptions.

(a) It was scrapped as having no value.
(b) It was sold for $29,000.
(c) It was sold for $10,000.

Prepare entries to record transactions related to acquisition and amortization of intangibles; prepare the intangible assets section.
(SO 8, 9)

P10-7B The intangible assets section of Time Company at December 31, 2010, is presented below.

Patent ($100,000 cost less $10,000 amortization)	$ 90,000
Copyright ($60,000 cost less $24,000 amortization)	36,000
Total	$126,600

The patent was acquired in January 2010 and has a useful life of 10 years. The copyright was acquired in January 2007 and also has a useful life of 10 years. The following cash transactions may have affected intangible assets during 2011.

Jan. 2	Paid $45,000 legal costs to successfully defend the patent against infringement by another company.
Jan.–June	Developed a new product, incurring $230,000 in research and development costs. A patent was granted for the product on July 1. Its useful life is equal to its legal life.
Sept. 1	Paid $125,000 to an Xgames star to appear in commercials advertising the company's products. The commercials will air in September and October.
Oct. 1	Acquired a copyright for $200,000. The copyright has a useful life of 50 years.

(b) Amortization Expense—Patents $15,000; Amortization Expense—Copyrights $7,000
(c) Total intangible assets, $349,000

Instructions

(a) Prepare journal entries to record the transactions above.
(b) Prepare journal entries to record the 2011 amortization expense for intangible assets.
(c) Prepare the intangible assets section of the balance sheet at December 31, 2011.
(d) Prepare the note to the financials on Time's intangibles as of December 31, 2011.

Prepare entries to correct errors made in recording and amortizing intangible assets.
(SO 8)

P10-8B Due to rapid turnover in the accounting department, a number of transactions involving intangible assets were improperly recorded by Wasp Company in 2010.

1. Wasp developed a new manufacturing process, incurring research and development costs of $110,000. The company also purchased a patent for $50,000. In early January, Wasp capitalized $160,000 as the cost of the patents. Patent amortization expense of $8,000 was recorded based on a 20-year useful life.
2. On July 1, 2010, Wasp purchased a small company and as a result acquired goodwill of $200,000. Wasp recorded a half-year's amortization in 2010, based on a 50-year life ($2,000 amortization). The goodwill has an indefinite life.

Instructions

R&D Exp. $110,000

Prepare all journal entries necessary to correct any errors made during 2010. Assume the books have not yet been closed for 2010.

Calculate and comment on asset turnover ratio.
(SO 9)

P10-9B McLead Corporation and Gene Corporation, two corporations of roughly the same size, are both involved in the manufacture of canoes and sea kayaks. Each company depreciates its plant assets using the straight-line approach. An investigation of their financial statements reveals the following information.

	McLead Corp.	Gene Corp.
Net income	$ 300,000	$ 325,000
Sales	1,100,000	990,000
Average total assets	1,000,000	1,050,000
Average plant assets	750,000	770,000

Instructions

(a) For each company, calculate the asset turnover ratio.
(b) Based on your calculations in part (a), comment on the relative effectiveness of the two companies in using their assets to generate sales and produce net income.

PROBLEMS: SET C

Visit the book's companion website at **www.wiley.com/college/weygandt**, and choose the Student Companion site, to access Problem Set C.

COMPREHENSIVE PROBLEM: CHAPTERS 3 TO 10

Winterschid Company's trial balance at December 31, 2010, is presented below. All 2010 transactions have been recorded except for the items described below and on page 480.

	Debit	Credit
Cash	$ 28,000	
Accounts Receivable	36,800	
Notes Receivable	10,000	
Interest Receivable	–0–	
Merchandise Inventory	36,200	
Prepaid Insurance	3,600	
Land	20,000	
Building	150,000	
Equipment	60,000	
Patent	9,000	
Allowance for Doubtful Accounts		$ 500
Accumulated Depreciation—Building		50,000
Accumulated Depreciation—Equipment		24,000
Accounts Payable		27,300
Salaries Payable		–0–
Unearned Rent		6,000
Notes Payable (short-term)		11,000
Interest Payable		–0–
Notes Payable (long-term)		35,000
Winterschid, Capital		113,600
Winterschid, Drawing	12,000	
Sales		900,000
Interest Revenue		–0–
Rent Revenue		–0–
Gain on Disposal		–0–
Bad Debts Expense	–0–	
Cost of Goods Sold	630,000	
Depreciation Expense—Buildings	–0–	
Depreciation Expense—Equipment	–0–	
Insurance Expense	–0–	
Interest Expense	–0–	
Other Operating Expenses	61,800	
Amortization Expense—Patents	–0–	
Salaries Expense	110,000	
Total	$1,167,400	$1,167,400

Unrecorded transactions

1. On May 1, 2010, Winterschid purchased equipment for $13,200 plus sales taxes of $600 (all paid in cash).
2. On July 1, 2010, Winterschid sold for $3,500 equipment which originally cost $5,000. Accumulated depreciation on this equipment at January 1, 2010, was $1,800; 2010 depreciation prior to the sale of the equipment was $450.
3. On December 31, 2010, Winterschid sold for $9,000 on account inventory that cost $6,300.
4. Winterschid estimates that uncollectible accounts receivable at year-end is $4,000.
5. The note receivable is a one-year, 8% note dated April 1, 2010. No interest has been recorded.
6. The balance in prepaid insurance represents payment of a $3,600 6-month premium on September 1, 2010.

7. The building is being depreciated using the straight-line method over 30 years. The salvage value is $30,000.
8. The equipment owned prior to this year is being depreciated using the straight-line method over 5 years. The salvage value is 10% of cost.
9. The equipment purchased on May 1, 2010, is being depreciated using the straight-line method over 5 years, with a salvage value of $1,800.
10. The patent was acquired on January 1, 2010, and has a useful life of 10 years from that date.
11. Unpaid salaries at December 31, 2010, total $2,200.
12. The unearned rent of $6,000 was received on December 1, 2010, for 3 months rent.
13. Both the short-term and long-term notes payable are dated January 1, 2010, and carry a 9% interest rate. All interest is payable in the next 12 months.

Instructions

(a) Prepare journal entries for the transactions listed above.

(b) Totals $1,201,290

(b) Prepare an updated December 31, 2010, trial balance.

(c) Prepare a 2010 income statement and an owner's equity statement.

(d) Total assets $260,400

(d) Prepare a December 31, 2010, classified balance sheet.

CONTINUING COOKIE CHRONICLE

(Note: This is a continuation of the Cookie Chronicle from Chapters 1 through 9.)

CCC10 Natalie is also thinking of buying a van that will be used only for business. Natalie is concerned about the impact of the van's cost on her income statement and balance sheet. She has come to you for advice on calculating the van's depreciation.

Go to the book's companion website, **www.wiley.com/college/weygandt**, *to see the completion of this problem.*

BROADENING YOUR PERSPECTIVE

FINANCIAL REPORTING AND ANALYSIS

Financial Reporting Problem: PepsiCo, Inc.

BYP10-1 The financial statements and the Notes to Consolidated Financial Statements of PepsiCo, Inc. are presented in Appendix A.

Instructions

Refer to PepsiCo's financial statements and answer the following questions.

(a) What was the total cost and book value of property, plant, and equipment at December 29, 2007?

(b) What method or methods of depreciation are used by the company for financial reporting purposes?

(c) What was the amount of depreciation and amortization expense for each of the three years 2005–2007?

(d) Using the statement of cash flows, what is the amount of capital spending in 2007 and 2006?

(e) Where does the company disclose its intangible assets, and what types of intangibles did it have at December 29, 2007?

Comparative Analysis Problem: PepsiCo, Inc. vs. The Coca-Cola Company

BYP10-2 PepsiCo's financial statements are presented in Appendix A. Financial statements of The Coca-Cola Company are presented in Appendix B.

Instructions

(a) Compute the asset turnover ratio for each company for 2007.
(b) What conclusions concerning the efficiency of assets can be drawn from these data?

Exploring the Web

BYP10-3 A company's annual report identifies the amount of its plant assets and the depreciation method used.

Address: www.reportgallery.com, or go to **www.wiley.com/college/weygandt**

Steps

1. From Report Gallery Homepage, choose **Search by Alphabet**, and pick a letter.
2. Select a particular company.
3. Choose the most recent **Annual Report**.
4. Follow instructions below.

Instructions

(a) What is the name of the company?
(b) At fiscal year-end, what is the net amount of its plant assets?
(c) What is the accumulated depreciation?
(d) Which method of depreciation does the company use?

CRITICAL THINKING

Decision Making Across the Organization

BYP10-4 Reimer Company and Lingo Company are two proprietorships that are similar in many respects. One difference is that Reimer Company uses the straight-line method and Lingo Company uses the declining-balance method at double the straight-line rate. On January 2, 2008, both companies acquired the following depreciable assets.

Asset	Cost	Salvage Value	Useful Life
Building	$320,000	$20,000	40 years
Equipment	110,000	10,000	10 years

Including the appropriate depreciation charges, annual net income for the companies in the years 2008, 2009, and 2010 and total income for the 3 years were as follows.

	2008	2009	2010	Total
Reimer Company	$84,000	$88,400	$90,000	$262,400
Lingo Company	68,000	76,000	85,000	229,000

At December 31, 2010, the balance sheets of the two companies are similar except that Lingo Company has more cash than Reimer Company.

Sally Vogts is interested in buying one of the companies. She comes to you for advice.

Instructions

With the class divided into groups, answer the following.

(a) Determine the annual and total depreciation recorded by each company during the 3 years.
(b) Assuming that Lingo Company also uses the straight-line method of depreciation instead of the declining-balance method as in (a), prepare comparative income data for the 3 years.
(c) Which company should Sally Vogts buy? Why?

Communication Activity

BYP10-5 The following was published with the financial statements to American Exploration Company.

AMERICAN EXPLORATION COMPANY
Notes to the Financial Statements

Property, Plant, and Equipment—The Company accounts for its oil and gas exploration and production activities using the successful efforts method of accounting. Under this method, acquisition costs for proved and unproved properties are capitalized when incurred.... The costs of drilling exploratory wells are capitalized pending determination of whether each well has discovered proved reserves. If proved reserves are not discovered, such drilling costs are charged to expense.... Depletion of the cost of producing oil and gas properties is computed on the units-of-activity method.

Instructions
Write a brief memo to your instructor discussing American Exploration Company's note regarding property, plant, and equipment. Your memo should address what is meant by the "successful efforts method" and "units-of-activity method."

Ethics Case

BYP10-6 Buster Container Company is suffering declining sales of its principal product, nonbiodegradeable plastic cartons. The president, Dennis Harwood, instructs his controller, Shelly McGlone, to lengthen asset lives to reduce depreciation expense. A processing line of automated plastic extruding equipment, purchased for $3.1 million in January 2010, was originally estimated to have a useful life of 8 years and a salvage value of $300,000. Depreciation has been recorded for 2 years on that basis. Dennis wants the estimated life changed to 12 years total, and the straight-line method continued. Shelly is hesitant to make the change, believing it is unethical to increase net income in this manner. Dennis says, "Hey, the life is only an estimate, and I've heard that our competition uses a 12-year life on their production equipment."

Instructions
(a) Who are the stakeholders in this situation?
(b) Is the change in asset life unethical, or is it simply a good business practice by an astute president?
(c) What is the effect of Dennis Harwood's proposed change on income before taxes in the year of change?

"All About You" Activity

BYP10-7 Both the "All About You" story and the Feature Story at the beginning of the chapter discussed the company Rent-A-Wreck. Note that the tradename Rent-A-Wreck is a very important asset to the company, as it creates immediate product identification. As indicated in the chapter, companies invest substantial sums to ensure that their product is well-known to the consumer. Test your knowledge of who owns some famous brands and their impact on the financial statements.

Instructions
(a) Provide an answer to the five multiple-choice questions below.
(1) Which company owns both Taco Bell and Pizza Hut?
(a) McDonald's. **(c)** Yum Brands.
(b) CKE. **(d)** Wendy's.
(2) Dairy Queen belongs to:
(a) Breyer. **(c)** GE.
(b) Berkshire Hathaway. **(d)** The Coca-Cola Company.

(3) Phillip Morris, the cigarette maker, is owned by:
- **(a)** Altria.
- **(b)** GE.
- **(c)** Boeing.
- **(d)** ExxonMobil.

(4) AOL, a major Internet provider, belongs to:
- **(a)** Microsoft.
- **(b)** Cisco.
- **(c)** NBC.
- **(d)** Time Warner.

(5) ESPN, the sports broadcasting network, is owned by:
- **(a)** Procter & Gamble.
- **(b)** Altria.
- **(c)** Walt Disney.
- **(d)** The Coca-Cola Company.

(b) How do you think the value of these brands is reported on the appropriate company's balance sheet?

Answers to Insight and Accounting Across the Organization Questions

p. 441 Many U.S. Firms Use Leases

Q: Why might airline managers choose to lease rather than purchase their planes?

A: *The reasons for leasing include favorable tax treatment, better financing options, increased flexibility, reduced risk of obsolescence, and low airline income.*

p. 456 ESPN Wins Monday Night Football Franchise

Q: How should ESPN account for the $1.1 billion per year franchise fee?

A: *Since this is an annual franchise fee, ESPN should expense it each year, rather than capitalizing and amortizing it.*

Authors' Comments on *All About You: Buying a Wreck of Your Own* (p. 460)

As the data in the box suggest, this decision can have significant implications for your personal budget. For many college students, vehicle costs are among their biggest expenses—and vehicle expenses often offer the greatest opportunities for savings. But for many people their vehicle choice is not just about how to get around. Some view their car as an expression of their personality. That said, many people simply don't realize just how much this particular expression of their personality is actually costing them.

You should approach this decision using the skills you have acquired in your business studies. Evaluate your transportation needs, collect information about all of your alternatives, and understand exactly what the real costs are of each. For example, everyone knows that the original purchase price of a new car is higher than a used car, but few people stop to consider the fact that insurance costs and annual motor vehicle costs on a new vehicle are also much higher.

We cannot tell you whether a new or used car is right for you, but we do hope that we have convinced you to carefully consider all aspects of the financial implications of your decision the next time you shop for new wheels. In later chapters we will provide you with additional tools to help you evaluate this decision.

Answers to Self-Study Questions

1. d **2.** b **3.** d **4.** d **5.** b **6.** b **7.** d **8.** d **9.** a **10.** c **11.** d **12.** b **13.** c **14.** c ***15.** a ***16.** d