CHAPTER 6

Accounting for Long-Term Operational Assets

LEARNING OBJECTIVES

After you have mastered the material in this chapter, you will be able to:

1. Identify different types of long-term operational assets.
2. Determine the cost of long-term operational assets.
3. Explain how different depreciation methods affect financial statements.
4. Determine how gains and losses on disposals of long-term operational assets affect financial statements.
5. Show how revising estimates affects financial statements.
6. Explain how continuing expenditures for operational assets affect financial statements.
7. Explain how expense recognition for natural resources (depletion) affects financial statements.
8. Explain how expense recognition for intangible assets (amortization) affects financial statements.
9. Explain how expense recognition choices and industry characteristics affect financial performance measures.

CHAPTER OPENING

Companies use assets to produce revenue. Some assets, like inventory or office supplies, are called **current assets** because they are used relatively quickly (within a single accounting period). Other assets, like equipment or buildings, are used for extended periods of time (two or more accounting periods). These assets are called **long-term operational assets.**[1] Accounting for long-term assets raises several questions. For example, what is the cost of the asset? Is it the list price only or should the cost of transportation, transit insurance,

[1] Classifying assets as current versus long term is explained in more detail in Chapter 7.

setup, and so on be added to the list price? Should the cost of a long-term asset be recognized as expense in the period the asset is purchased or should the cost be expensed over the useful life of the asset? What happens in the accounting records when a long-term asset is retired from use? This chapter answers these questions. It explains accounting for long-term operational assets from the date of purchase through the date of disposal.

The Curious Accountant

In the normal course of operations, most companies acquire long-term assets each year. The way in which a company hopes to make money with these assets varies according to the type of business and the asset acquired. During 2009, **Weyerhaeuser Company** made cash acquisitions of property and equipment of $187 million and cash acquisitions of timber and timberlands of $52 million.

Can you think of how Weyerhaeuser's use of trees to produce revenue differs from its use of trucks? Do you think the procedures used to account for timber should be similar to or different from those used to account for trucks, and if so, how? (Answers on page 205.)

TANGIBLE VERSUS INTANGIBLE ASSETS

LO 1

Identify different types of long-term operational assets.

Long-term assets may be tangible or intangible. **Tangible assets** have a physical presence; they can be seen and touched. Tangible assets include equipment, machinery, natural resources, and land. In contrast, intangible assets have no physical form. Although they may be represented by physical documents, **intangible assets** are, in fact, rights or privileges. They cannot be seen or touched. For example, a patent represents an exclusive legal *privilege* to produce and sell a particular product. It protects inventors by making it illegal for others to profit by copying their inventions. Although a patent may be represented by legal documents, the privilege is the actual asset. Because the privilege cannot be seen or touched, the patent is an intangible asset.

Tangible Long-Term Assets

Tangible long-term assets are classified as (1) property, plant, and equipment; (2) natural resources, or (3) land.

Property, Plant, and Equipment

Property, plant, and equipment is sometimes called *plant assets* or *fixed assets.* Examples of property, plant, and equipment include furniture, cash registers, machinery, delivery trucks, computers, mechanical robots, and buildings. The level of detail used to account for these assets varies. One company may include all office equipment in one account, whereas another company might divide office equipment into computers, desks, chairs, and so on. The term used to recognize expense for property, plant, and equipment is **depreciation.**

Natural Resources

Mineral deposits, oil and gas reserves, timber stands, coal mines, and stone quarries are examples of **natural resources.** Conceptually, natural resources are inventories. When sold, the cost of these assets is frequently expensed as *cost of goods sold*. Although inventories are usually classified as short-term assets, natural resources are normally classified as long term because the resource deposits generally have long lives. For example, it may take decades to extract all of the diamonds from a diamond mine. The term used to recognize expense for natural resources is **depletion.**

Land

Land is classified separately from other property because land is not subject to depreciation or depletion. Land has an infinite life. It is not worn out or consumed as it is used. When buildings or natural resources are purchased simultaneously with land, the amount paid must be divided between the land and the other assets because of the nondepreciable nature of the land.

Intangible Assets

Intangible assets fall into two categories, those with *identifiable useful lives* and those with *indefinite useful lives.*

Intangible Assets with Identifiable Useful Lives

Intangible assets with identifiable useful lives include patents and copyrights. These assets may become obsolete (a patent may become worthless if new technology provides a superior product) or may reach the end of their legal lives. The term used when recognizing expense for intangible assets with identifiable useful lives is called **amortization.**

Intangible Assets with Indefinite Useful Lives

The benefits of some intangible assets may extend so far into the future that their useful lives cannot be estimated. For how many years will the **Coca-Cola** trademark attract

customers? When will the value of a McDonald's franchise end? There are no answers to these questions. Intangible assets such as renewable franchises, trademarks, and goodwill have indefinite useful lives. The costs of such assets are not expensed unless the value of the assets becomes impaired.

DETERMINING THE COST OF LONG-TERM ASSETS

LO 2

Determine the cost of long-term operational assets.

The **historical cost concept** requires that an asset be recorded at the amount paid for it. This amount includes the purchase price plus any costs necessary to get the asset in the location and condition for its intended use. Common cost components are:

- ***Buildings:*** (1) purchase price, (2) sales taxes, (3) title search and transfer document costs, (4) realtor's and attorney's fees, and (5) remodeling costs.
- ***Land:*** (1) purchase price, (2) sales taxes, (3) title search and transfer document costs, (4) realtor's and attorney's fees, (5) costs for removal of old buildings, and (6) grading costs.
- ***Equipment:*** (1) purchase price (less discounts), (2) sales taxes, (3) delivery costs, (4) installation costs, and (5) costs to adapt for intended use.

The cost of an asset does not include payments for fines, damages, and so on that could have been avoided.

CHECK YOURSELF 6.1

Sheridan Construction Company purchased a new bulldozer that had a $260,000 list price. The seller agreed to allow a 4 percent cash discount in exchange for immediate payment. The bulldozer was delivered FOB shipping point at a cost of $1,200. Sheridan hired a new employee to operate the dozer for an annual salary of $36,000. The employee was trained to operate the dozer for a one-time training fee of $800. The cost of the company's theft insurance policy increased by $300 per year as a result of adding the dozer to the policy. The dozer had a five-year useful life and an expected salvage value of $26,000. Determine the asset's cost.

Answer

List price	$260,000
Less: Cash discount ($260,000 × 0.04)	(10,400)
Shipping cost	1,200
Training cost	800
Total asset cost (amount capitalized)	$251,600

Basket Purchase Allocation

Acquiring a group of assets in a single transaction is known as a **basket purchase.** The total price of a basket purchase must be allocated among the assets acquired. Accountants commonly allocate the purchase price using the **relative fair market value method.** To illustrate, assume that Beatty Company purchased land and a building for $240,000 cash. A real estate appraiser determined the fair market value of each asset to be

Building	$270,000
Land	90,000
Total	$360,000

The appraisal indicates that the land is worth 25 percent ($90,000 ÷ $360,000) of the total value and the building is worth 75 percent ($270,000 ÷ $360,000). Using these percentages, the actual purchase price is allocated as follows.

Building	0.75 × $240,000 =	$180,000
Land	0.25 × $240,000 =	60,000
Total		$240,000

METHODS OF RECOGNIZING DEPRECIATION EXPENSE

LO 3

Explain how different depreciation methods affect financial statements.

The life cycle of an operational asset involves (1) acquiring the funds to buy the asset, (2) purchasing the asset, (3) using the asset, and (4) retiring (disposing of) the asset. These stages are illustrated in Exhibit 6.1. The stages involving (1) acquiring funds and (2) purchasing assets have been discussed previously. This section of the chapter describes how accountants recognize the *use* of assets (Stage 3). As they are used, assets suffer from wear and tear called *depreciation.* Ultimately, assets depreciate to the point that they are no longer useful in the process of earning revenue. This process usually takes several years. The amount of an asset's cost that is allocated to expense during an accounting period is called **depreciation expense.**

EXHIBIT 6.1

Life Cycle of an Operational Asset

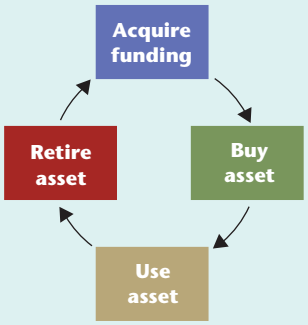
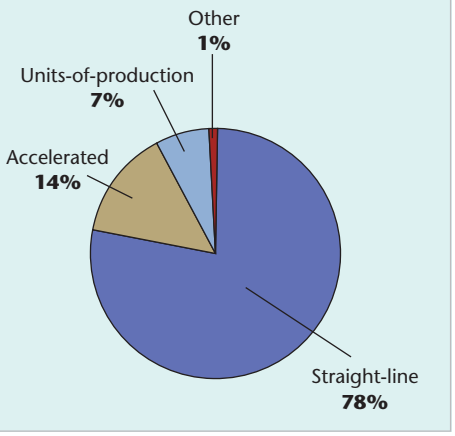


EXHIBIT 6.2

Depreciation Methods Used by U.S. Companies



Data Source: AICPA Accounting Trends and Techniques.

An asset that is fully depreciated by one company may still be useful to another company. For example, a rental car that is no longer useful to Hertz may still be useful to a local delivery company. As a result, companies are frequently able to sell their fully depreciated assets to other companies or individuals. The expected market value of a fully depreciated asset is called its **salvage value.** The total amount of depreciation a company recognizes for an asset, its **depreciable cost,** is the difference between its original cost and its salvage value.

For example, assume a company purchases an asset for $5,000. The company expects to use the asset for 5 years (the **estimated useful life**) and then to sell it for $1,000 (salvage value). The depreciable cost of the asset is $4,000 ($5,000 − $1,000). The portion of the depreciable cost ($4,000) that represents its annual usage is recognized as depreciation expense.

Accountants must exercise judgment to estimate the amount of depreciation expense to recognize each period. For example, suppose you own a personal computer. You know how much the computer cost, and you know you will eventually need to replace it. How would you determine the amount the computer depreciates each year you use it? Businesses may use any of several acceptable methods to estimate the amount of depreciation expense to recognize each year.

The method used to recognize depreciation expense should match the asset's usage pattern. More expense should be recognized in periods when the asset is used more and less in periods when the asset is used less. Because assets are used to produce revenue, matching expense recognition with asset usage also matches expense recognition with revenue recognition. Three alternative methods for recognizing depreciation expense are (1) straight-line, (2) double-declining-balance, and (3) units-of-production.

The *straight-line* method produces the same amount of depreciation expense each accounting period. *Double-declining-balance,* an accelerated method, produces more depreciation expense in the early years of an asset's life, with a declining amount of expense in later years. *Units-of-production* produces varying amounts of depreciation expense in different accounting periods (more in some accounting periods and less in others). Exhibit 6.2 shows the relative use of different depreciation methods by U.S. companies.

Answers to The Curious Accountant

Equipment is a long-term asset used for the purpose of producing revenue. A portion of the equipment's cost is recognized as depreciation expense each accounting period. The expense recognition for the cost of equipment is therefore spread over the useful life of the asset. Timber, however, is not used until the trees are grown. Conceptually, the costs of the trees should be treated as inventories and expensed as cost of goods sold at the time the products made from trees are sold. Even so, some timber companies recognize a periodic charge called *depletion* in a manner similar to that used for depreciation.

Accounting for unusual long-term assets such as timber requires an understanding of specialized "industry practice" accounting rules that are beyond the scope of this course. Many industries have unique accounting problems, and business managers in such industries must understand specialized accounting rules that relate to their companies.

Dryden Enterprises Illustration

To illustrate the different depreciation methods, consider a van purchased by Dryden Enterprises. Dryden plans to use the van as rental property. The van had a list price of $23,500. Dryden obtained a 10 percent cash discount from the dealer. The van was delivered FOB shipping point, and Dryden paid an additional $250 for transportation costs. Dryden also paid $2,600 for a custom accessory package to increase the van's appeal as a rental vehicle. The cost of the van is computed as follows.

List price	$23,500	
Less: Cash discount	(2,350)	$23,500 × 0.10
Plus: Transportation costs	250	
Plus: Cost of customization	2,600	
Total	$24,000	

The van has an estimated *salvage value* of $4,000 and an *estimated useful life* of four years. The following section examines three different patterns of expense recognition for this van.

Straight-Line Depreciation

The first scenario assumes the van is used evenly over its four-year life. The revenue from renting the van is assumed to be $8,000 per year. The matching concept calls for the expense recognition pattern to match the revenue stream. Because the same amount of revenue is recognized in each accounting period, Dryden should use **straight-line depreciation** because it produces equal amounts of depreciation expense each year.

Life Cycle Phase 1

The first phase of the asset life cycle is to acquire funds to purchase the asset. Assume Dryden acquired $25,000 cash on January 1, 2010, by issuing common stock. The effects on the financial statements follow.

Assets					=	Equity			Rev.	–	Exp.	=	Net Inc.	Cash Flow
Cash	+	Van	–	Acc. Dep.	=	Com. Stk.	+	Ret. Earn.						
25,000	+	NA	–	NA	=	25,000	+	NA	NA	–	NA	=	NA	25,000 FA

Life Cycle Phase 2

The second phase of the life cycle is to purchase the van. Assume Dryden bought the van on January 1, 2010, using funds from the stock issue. The cost of the van, previously computed, was $24,000 cash. The effects on the financial statements are:

Assets					=	Equity			Rev.	–	Exp.	=	Net Inc.	Cash Flow
Cash	+	Van	–	Acc. Dep.	=	Com. Stk.	+	Ret. Earn.						
(24,000)	+	24,000	–	NA	=	NA	+	NA	NA	–	NA	=	NA	(24,000) IA

Life Cycle Phase 3

Dryden used the van by renting it to customers. The rent revenue each year is $8,000 cash. The effects on the financial statements are shown next.

Assets					=	Equity			Rev.	–	Exp.	=	Net Inc.	Cash Flow
Cash	+	Van	–	Acc. Dep.	=	Com. Stk.	+	Ret. Earn.						
8,000	+	NA	–	NA	=	NA	+	8,000	8,000	–	NA	=	8,000	8,000 OA

Although illustrated only once, these effects occur four times—once for each year Dryden earns revenue by renting the van.

At the end of each year, Dryden adjusts its accounts to recognize depreciation expense. The amount of depreciation recognized using the straight-line method is calculated as follows.

(Asset cost − Salvage value) ÷ Useful life = Depreciation expense

($24,000 − $4,000) ÷ 4 years = $5,000 per year

Recognizing depreciation expense is an asset use transaction that reduces assets and equity. The asset reduction is reported using a **contra asset account** called **Accumulated Depreciation.** Recognizing depreciation expense *does not affect cash flow.* The entire cash outflow for this asset occurred in January 2010 when Dryden purchased the van. Depreciation reflects *using* tangible assets, not spending cash to purchase them. The effects on the financial statements are as follows.

Assets					=	Equity			Rev.	–	Exp.	=	Net Inc.	Cash Flow
Cash	+	Van	–	Acc. Dep.	=	Com. Stk.	+	Ret. Earn.						
NA	+	NA	–	5,000	=	NA	+	(5,000)	NA	–	5,000	=	(5,000)	NA

The Depreciation *Expense* account, like other expense accounts, is closed to the Retained Earnings account at the end of each year. The *Accumulated* Depreciation account, in contrast, increases each year, *accumulating* the total amount of depreciation recognized on the asset to date.

Life Cycle Phase 4

LO 4

Determine how gains and losses on disposals of long-term operational assets affect financial statements.

The final stage in the life cycle of a tangible asset is its disposal and removal from the company's records. Dryden retired the van from service on January 1, 2014, selling it for $4,500 cash. The van's **book value** (cost − accumulated depreciation) when it was sold was $4,000 ($24,000 cost − $20,000 accumulated depreciation), so Dryden recognized a $500 gain ($4,500 − $4,000) on the sale.

Gains are *like* revenues in that they increase assets or decrease liabilities. Gains are *unlike* revenues in that gains result from peripheral (incidental) transactions rather than routine operating activities. Dryden is not in the business of selling vans. Dryden's normal business activity is renting vans. Because selling vans is incidental to Dryden's normal operations, gains are reported separately, after operating income, on the income statement.

If Dryden had sold the asset for less than book value, the company would have recognized a loss on the asset disposal. Losses are similar to expenses in that they decrease assets or increase liabilities. However, like gains, losses result from peripheral transactions. Losses are reported as nonoperating items on the income statement.

The effects of the asset disposal on the financial statements are shown next.

Assets					=	Equity			Rev. or Gain	−	Exp. or Loss	=	Net Inc.	Cash Flow
Cash	+	Van	−	Acc. Dep.	=	Com. Stk.	+	Ret. Earn.						
4,500	+	(24,000)	−	(20,000)	=	NA	+	500	500	−	NA	=	500	4,500 IA

Although the gain reported on the 2014 income statement is $500, the cash inflow from selling the van is $4,500. Gains and losses are not reported on the statement of cash flows. Instead they are included in the total amount of cash collected from the sale of the asset. In this case, the entire $4,500 is shown in the cash flow from investing activities section of the 2014 statement of cash flows.

Financial Statements

Exhibit 6.3 displays a vertical statements model that shows the financial results for the Dryden illustration from 2010 through 2014. Study the exhibit until you understand how all the figures were derived. The amount of depreciation expense ($5,000) reported on the income statement is constant each year from 2010 through 2013. The amount of accumulated depreciation reported on the balance sheet grows from $5,000 to $10,000, to $15,000, and finally to $20,000. The Accumulated Depreciation account is a *contra asset account* that is subtracted from the Van account in determining total assets.

Study the timing differences between cash flow and net income. Dryden spent $24,000 cash to acquire the van. Over the van's life cycle, Dryden collected $36,500 [($8,000 revenue × 4 years = $32,000) plus ($4,500 from the asset disposal) = $36,500]. The $12,500 difference between the cash collected and the cash paid ($36,500 − $24,000) equals the total net income earned during the van's life cycle.

Although the amounts are the same, the timing of the cash flows and the income recognition are different. For example, in 2010 there was a $24,000 cash outflow to purchase the van and an $8,000 cash inflow from customers. In contrast, the income statement reports net income of $3,000. In 2014, Dryden reported a $500 gain on the asset disposal, but the amount of operating income and the cash flow from operating

EXHIBIT 6.3 Financial Statements under Straight-Line Depreciation

DRYDEN ENTERPRISES
Financial Statements

	2010	2011	2012	2013	2014
Income Statements					
Rent revenue	$ 8,000	$ 8,000	$ 8,000	$ 8,000	$ 0
Depreciation expense	(5,000)	(5,000)	(5,000)	(5,000)	0
Operating income	3,000	3,000	3,000	3,000	0
Gain on sale of van	0	0	0	0	500
Net income	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 500
Balance Sheets					
Assets					
Cash	$ 9,000	$17,000	$25,000	$33,000	$37,500
Van	24,000	24,000	24,000	24,000	0
Accumulated depreciation	(5,000)	(10,000)	(15,000)	(20,000)	0
Total assets	$28,000	$31,000	$34,000	$37,000	$37,500
Stockholders' equity					
Common stock	$25,000	$25,000	$25,000	$25,000	$25,000
Retained earnings	3,000	6,000	9,000	12,000	12,500
Total stockholders' equity	$28,000	$31,000	$34,000	$37,000	$37,500
Statements of Cash Flows					
Operating Activities					
Inflow from customers	$ 8,000	$ 8,000	$ 8,000	$ 8,000	$ 0
Investing Activities					
Outflow to purchase van	(24,000)				
Inflow from sale of van					4,500
Financing Activities					
Inflow from stock issue	25,000				
Net Change in Cash	9,000	8,000	8,000	8,000	4,500
Beginning cash balance	0	9,000	17,000	25,000	33,000
Ending cash balance	$ 9,000	$17,000	$25,000	$33,000	$37,500

activities is zero for that year. The gain is only indirectly related to cash flows. The $4,500 of cash received on disposal is reported as a cash inflow from investing activities. Because gains and losses result from peripheral transactions, they do not affect operating income or cash flow from operating activities.

Double-Declining-Balance Depreciation

For the second scenario, assume demand for the van is strong when it is new, but fewer people rent the van as it ages. As a result, the van produces smaller amounts of revenue as time goes by. To match expenses with revenues, it is reasonable to recognize more depreciation expense in the van's early years and less as it ages.

Double-declining-balance depreciation produces a large amount of depreciation in the first year of an asset's life and progressively smaller levels of expense in each succeeding year. Because the double-declining-balance method recognizes depreciation expense more rapidly than the straight-line method does, it is called an **accelerated**

depreciation method. Depreciation expense recognized using double-declining-balance is computed in three steps.

1. *Determine the straight-line rate.* Divide one by the asset's useful life. Because the estimated useful life of Dryden's van is four years, the straight-line rate is 25 percent (1 ÷ 4) per year.
2. *Determine the double-declining-balance rate.* Multiply the straight-line rate by 2 (*double* the rate). The double-declining-balance rate for the van is 50 percent (25 percent × 2).
3. *Determine the depreciation expense.* Multiply the double-declining-balance rate by the book value of the asset *at the beginning of the period* (recall that book value is historical cost minus *accumulated depreciation*). The following table shows the amount of depreciation expense Dryden will recognize over the van's useful life (2010–2013).

Year	Book Value at Beginning of Period	×	Double the Straight-Line Rate	=	Annual Depreciation Expense
2010	($24,000 − $ 0)	×	0.50	=	$12,000
2011	(24,000 − 12,000)	×	0.50	=	6,000
2012	(24,000 − 18,000)	×	0.50	=	~~3,000~~ 2,000
2013	(24,000 − 20,000)	×	0.50	=	~~2,000~~ 0

Regardless of the depreciation method used, *an asset cannot be depreciated below its salvage value.* This restriction affects depreciation computations for the third and fourth years. Because the van had a cost of $24,000 and a salvage value of $4,000, the total amount of depreciable cost (historical cost − salvage value) is $20,000 ($24,000 − $4,000). Because $18,000 ($12,000 + $6,000) of the depreciable cost is recognized in the first two years, only $2,000 ($20,000 − $18,000) remains to be recognized after the second year. Depreciation expense recognized in the third year is therefore $2,000 even though double-declining-balance computations suggest that $3,000 should be recognized. Similarly, zero depreciation expense is recognized in the fourth year even though the computations indicate a $2,000 charge.

CHECK YOURSELF 6.2

Olds Company purchased an asset that cost $36,000 on January 1, 2012. The asset had an expected useful life of five years and an estimated salvage value of $5,000. Assuming Olds uses the double-declining-balance method, determine the amount of depreciation expense and the amount of accumulated depreciation Olds would report on the 2014 financial statements.

Answer

Year	Book Value at Beginning of Period	×	Double the Straight-Line Rate*	=	Annual Depreciation Expense
2012	($36,000 − $ 0)	×	0.40	=	$14,400
2013	(36,000 − 14,400)	×	0.40	=	8,640
2014	(36,000 − 23,040)	×	0.40	=	5,184
Total accumulated depreciation at December 31, 2014					$28,224

*Double-declining-balance rate = 2 × Straight-line rate = 2 × (1 ÷ 5 years) = 0.40

EXHIBIT 6.4 Financial Statements under Double-Declining-Balance Depreciation

DRYDEN ENTERPRISES
Financial Statements

	2010	2011	2012	2013	2014
Income Statements					
Rent revenue	$15,000	$ 9,000	$ 5,000	$ 3,000	$ 0
Depreciation expense	(12,000)	(6,000)	(2,000)	0	0
Operating income	3,000	3,000	3,000	3,000	0
Gain on sale of van	0	0	0	0	500
Net income	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 500
Balance Sheets					
Assets					
Cash	$16,000	$25,000	$30,000	$33,000	$37,500
Van	24,000	24,000	24,000	24,000	0
Accumulated depreciation	(12,000)	(18,000)	(20,000)	(20,000)	0
Total assets	$28,000	$31,000	$34,000	$37,000	$37,500
Stockholders' equity					
Common stock	$25,000	$25,000	$25,000	$25,000	$25,000
Retained earnings	3,000	6,000	9,000	12,000	12,500
Total stockholders' equity	$28,000	$31,000	$34,000	$37,000	$37,500
Statements of Cash Flows					
Operating Activities					
Inflow from customers	$15,000	$ 9,000	$ 5,000	$ 3,000	$ 0
Investing Activities					
Outflow to purchase van	(24,000)				
Inflow from sale of van					4,500
Financing Activities					
Inflow from stock issue	25,000				
Net Change in Cash	16,000	9,000	5,000	3,000	4,500
Beginning cash balance	0	16,000	25,000	30,000	33,000
Ending cash balance	$16,000	$25,000	$30,000	$33,000	$37,500

Effects on the Financial Statements

Exhibit 6.4 displays financial statements for the life of the asset assuming Dryden uses double-declining-balance depreciation. The illustration assumes a cash revenue stream of $15,000, $9,000, $5,000, and $3,000 for the years 2010, 2011, 2012, and 2013, respectively. Trace the depreciation expense from the table above to the income statements. Reported depreciation expense is greater in the earlier years and smaller in the later years of the asset's life.

The double-declining-balance method smooths the amount of net income reported over the asset's useful life. In the early years, when heavy asset use produces higher revenue, depreciation expense is also higher. Similarly, in the later years, lower levels of revenue are matched with lower levels of depreciation expense. Net income is constant at $3,000 per year.

The depreciation method a company uses *does not* affect how it acquires the financing, invests the funds, and retires the asset. For Dryden's van, the accounting

effects of these life cycle phases are the same as under the straight-line approach. Similarly, the *recording procedures* are not affected by the depreciation method. Different depreciation methods affect only the amount of depreciation expense recorded each year, not which accounts are used.

Units-of-Production Depreciation

Suppose rental demand for Dryden's van depends on general economic conditions. In a robust economy, travel increases, and demand for renting vans is high. In a stagnant economy, demand for van rentals declines. In such circumstances, revenues fluctuate from year to year. To accomplish the matching objective, depreciation should also fluctuate from year to year. A method of depreciation known as **units-of-production depreciation** accomplishes this goal by basing depreciation expense on actual asset usage.

Computing depreciation expense using units-of-production begins with identifying a measure of the asset's productive capacity. For example, the number of miles Dryden expects its van to be driven may be a reasonable measure of its productive capacity. If the depreciable asset were a saw, an appropriate measure of productive capacity could be the number of board feet the saw was expected to cut during its useful life. In other words, the basis for measuring production depends on the nature of the depreciable asset.

To illustrate computing depreciation using the units-of-production depreciation method, assume that Dryden measures productive capacity based on the total number of miles the van will be driven over its useful life. Assume Dryden estimates this productive capacity to be 100,000 miles. The first step in determining depreciation expense is to compute the cost per unit of production. For Dryden's van, this amount is total depreciable cost (historical cost − salvage value) divided by total units of expected productive capacity (100,000 miles). The depreciation cost per mile is therefore $0.20 ([$24,000 cost − $4,000 salvage] ÷ 100,000 miles). Annual depreciation expense is computed by multiplying the cost per mile by the number of miles driven. Odometer readings indicate the van was driven 40,000 miles, 20,000 miles, 30,000 miles, and 15,000 miles in 2010, 2011, 2012, and 2013, respectively. Dryden developed the following schedule of depreciation charges.

Year	Cost per Mile (a)	Miles Driven (b)	Depreciation Expense (a × b)
2010	$.20	40,000	$8,000
2011	.20	20,000	4,000
2012	.20	30,000	6,000
2013	.20	15,000	~~3,000~~ 2,000

As pointed out in the discussion of the double-declining-balance method, an asset cannot be depreciated below its salvage value. Because $18,000 of the $20,000 ($24,000 cost − $4,000 salvage) depreciable cost is recognized in the first three years of using the van, only $2,000 ($20,000 − $18,000) remains to be charged to depreciation in the fourth year, even though the depreciation computations suggest the charge should be $3,000. As the preceding table indicates, the general formula for computing units-of-production depreciation is

$$\frac{\text{Cost} - \text{Salvage value}}{\text{Total estimated units of production}} \times \text{Units of production in current year} = \text{Annual depreciation expense}$$

EXHIBIT 6.5 Financial Statements under Units-of-Production Depreciation

DRYDEN ENTERPRISES
Financial Statements

	2010	2011	2012	2013	2014
Income Statements					
Rent revenue	$11,000	$ 7,000	$ 9,000	$ 5,000	$ 0
Depreciation expense	(8,000)	(4,000)	(6,000)	(2,000)	0
Operating income	3,000	3,000	3,000	3,000	0
Gain on sale of van	0	0	0	0	500
Net income	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 500
Balance Sheets					
Assets					
Cash	$12,000	$19,000	$28,000	$33,000	$37,500
Van	24,000	24,000	24,000	24,000	0
Accumulated depreciation	(8,000)	(12,000)	(18,000)	(20,000)	0
Total assets	$28,000	$31,000	$34,000	$37,000	$37,500
Stockholders' equity					
Common stock	$25,000	$25,000	$25,000	$25,000	$25,000
Retained earnings	3,000	6,000	9,000	12,000	12,500
Total stockholders' equity	$28,000	$31,000	$34,000	$37,000	$37,500
Statements of Cash Flows					
Operating Activities					
Inflow from customers	$11,000	$ 7,000	$ 9,000	$ 5,000	$ 0
Investing Activities					
Outflow to purchase van	(24,000)				
Inflow from sale of van					4,500
Financing Activities					
Inflow from stock issue	25,000				
Net Change in Cash	12,000	7,000	9,000	5,000	4,500
Beginning cash balance	0	12,000	19,000	28,000	33,000
Ending cash balance	$12,000	$19,000	$28,000	$33,000	$37,500

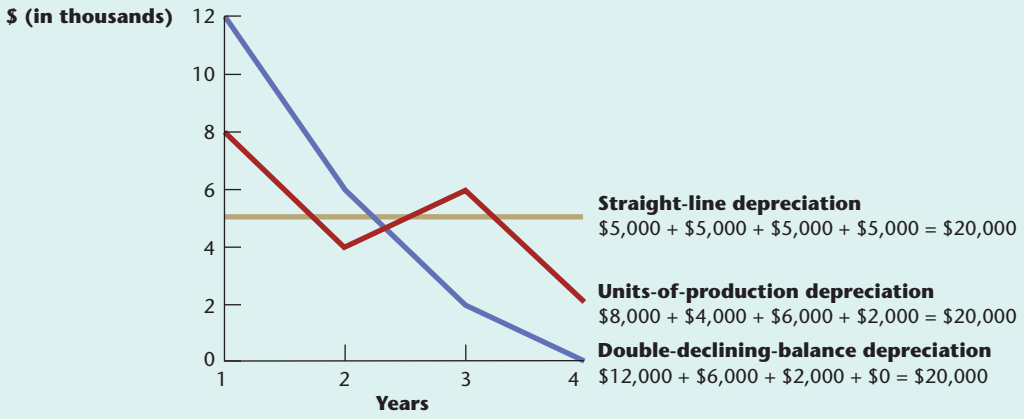
Exhibit 6.5 displays financial statements that assume Dryden uses units-of-production depreciation. The exhibit assumes a cash revenue stream of $11,000, $7,000, $9,000, and $5,000 for 2010, 2011, 2012, and 2013, respectively. Trace the depreciation expense from the schedule above to the income statements. Depreciation expense is greater in years the van is driven more and smaller in years the van is driven less, providing a reasonable matching of depreciation expense with revenue produced. Net income is again constant at $3,000 per year.

Comparing the Depreciation Methods

The total amount of depreciation expense Dryden recognized using each of the three methods was $20,000 ($24,000 cost − $4,000 salvage value). The different methods affect the *timing,* but not the *total amount,* of expense recognized. The different methods simply assign the $20,000 to different accounting periods. Exhibit 6.6 presents graphically the differences among the three depreciation methods discussed above. A company should use the method that most closely matches expenses with revenues.

EXHIBIT 6.6

Depreciation Expense under Different Depreciation Methods



REVISION OF ESTIMATES

LO 5

Show how revising estimates affects financial statements.

In order to report useful financial information on a timely basis, accountants must make many estimates of future results, such as the salvage value and useful life of depreciable assets and uncollectible accounts expense. Estimates are frequently revised when new information surfaces. Because revisions of estimates are common, generally accepted accounting principles call for incorporating the revised information into present and future calculations. Prior reports are not corrected.

To illustrate, assume that McGraw Company purchased a machine on January 1, 2012, for $50,000. McGraw estimated the machine would have a useful life of 8 years and a salvage value of $3,000. Using the straight-line method, McGraw determined the annual depreciation charge as follows:

($50,000 − $3,000) ÷ 8 years = $5,875 per year

At the beginning of the fifth year, accumulated depreciation on the machine is $23,500 ($5,875 × 4). The machine's book value is $26,500 ($50,000 − $23,500). At this point, what happens if McGraw changes its estimates of useful life or the salvage value? Consider the following revision examples independently of each other.

Revision of Life

Assume McGraw revises the expected life to 14, rather than 8, years. The machine's *remaining* life would then be 10 more years instead of 4 more years. Assume salvage value remains $3,000. Depreciation for each remaining year is:

($26,500 book value − $3,000 salvage) ÷ 10-year remaining life = $2,350

Revision of Salvage

Alternatively, assume the original expected life remained 8 years, but McGraw revised its estimate of salvage value to $6,000. Depreciation for each of the remaining four years would be

($26,500 book value − $6,000 salvage) ÷ 4-year remaining life = $5,125

The revised amounts are determined for the full year, regardless of when McGraw revised its estimates. For example, if McGraw decides to change the estimated useful life on October 1, 2017, the change would be effective as of January 1, 2017. The year-end adjusting entry for depreciation would include a full year's depreciation calculated on the basis of the revised estimated useful life.

CONTINUING EXPENDITURES FOR PLANT ASSETS

LO 6

Explain how continuing expenditures for operational assets affect financial statements.

Most plant assets require additional expenditures for maintenance or improvement during their useful lives. Accountants must determine if these expenditures should be expensed or capitalized (recorded as assets).

Costs That Are Expensed

The costs of routine maintenance and minor repairs that are incurred to *keep* an asset in good working order are expensed in the period in which they are incurred. Because they reduce net income when incurred, accountants often call repair and maintenance costs **revenue expenditures** (companies subtract them from revenue).

With respect to the previous example, assume McGraw spent $500 for routine lubrication and to replace minor parts. The effects on the financial statements follow.

Assets	=	Equity			Rev.	–	Exp.	=	Net Inc.	Cash Flow	
Cash	=	Com. Stk.	+	Ret. Earn.							
(500)	=	NA	+	(500)	NA	–	500	=	(500)	(500)	OA

Costs That Are Capitalized

Substantial amounts spent to improve the quality or extend the life of an asset are described as **capital expenditures.** Capital expenditures are accounted for in one of two ways, depending on whether the cost incurred *improves the quality* or *extends the life* of the asset.

Improving Quality

Expenditures such as adding air conditioning to an existing building or installing a trailer hitch on a vehicle improve the quality of service these assets provide. If a capital expenditure improves an asset's quality, the amount is added to the historical cost of the asset. The additional cost is expensed through higher depreciation charges over the asset's remaining useful life.

To demonstrate, return to the McGraw Company example. Recall that the machine originally cost $50,000, had an estimated salvage of $3,000, and had a predicted life of 8 years. Recall further that accumulated depreciation at the beginning of the fifth year is $23,500 ($5,875 × 4) so the book value is $26,500 ($50,000 − $23,500). Assume McGraw makes a major expenditure of $4,000 in the machine's fifth year to improve its productive capacity. The effects on the financial statements follow.

Assets					=	Equity			Rev.	–	Exp.	=	Net Inc.	Cash Flow	
Cash	+	Mach.	–	Acc. Dep.	=	Com. Stk.	+	Ret. Earn.							
(4,000)	+	4,000	–	NA	=	NA	+	NA	NA	–	NA	=	NA	(4,000)	IA

After recording the expenditure, the machine account balance is $54,000 and the asset's book value is $30,500 ($54,000 − $23,500). The depreciation charges for each of the remaining four years are

($30,500 book value − $3,000 salvage) ÷ 4-year remaining life = $6,875

Extending Life

Expenditures such as replacing the roof of an existing building or putting a new engine in an old vehicle extend the useful life of these assets. If a capital expenditure extends

the life of an asset rather than improving the asset's quality of service, accountants view the expenditure as canceling some of the depreciation previously charged to expense. The event is still an asset exchange; cash decreases, and the book value of the machine increases. However, the increase in the book value of the machine results from reducing the balance in the contra asset account, Accumulated Depreciation.

To illustrate, assume that instead of increasing productive capacity, McGraw's $4,000 expenditure had extended the useful life of the machine by two years. The effects of the expenditure on the financial statements follow.

Assets					=	Equity			Rev.	–	Exp.	=	Net Inc.	Cash Flow	
Cash	+	Mach.	–	Acc. Dep.	=	Com. Stk.	+	Ret. Earn.							
(4,000)	+	NA	–	(4,000)	=	NA	+	NA	NA	–	NA	=	NA	(4,000)	IA

After the expenditure is recognized, the book value is the same as if the $4,000 had been added to the Machine account ($50,000 cost − $19,500 adjusted balance in Accumulated Depreciation = $30,500). Depreciation expense for each of the remaining six years follows.

($30,500 book value − $3,000 salvage) ÷ 6-year remaining life = $4,583

CHECK YOURSELF 6.3

On January 1, 2012, Dager Inc. purchased an asset that cost $18,000. It had a five-year useful life and a $3,000 salvage value. Dager uses straight-line depreciation. On January 1, 2014, it incurred a $1,200 cost related to the asset. With respect to this asset, determine the amount of expense and accumulated depreciation Dager would report in the 2014 financial statements under each of the following assumptions.

1. The $1,200 cost was incurred to repair damage resulting from an accident.
2. The $1,200 cost improved the operating capacity of the asset. The total useful life and salvage value remained unchanged.
3. The $1,200 cost extended the useful life of the asset by one year. The salvage value remained unchanged.

Answer

1. Dager would report the $1,200 repair cost as an expense. Dager would also report depreciation expense of $3,000 ([$18,000 − $3,000] ÷ 5). Total expenses related to this asset in 2014 would be $4,200 ($1,200 repair expense + $3,000 depreciation expense). Accumulated depreciation at the end of 2014 would be $9,000 ($3,000 depreciation expense × 3 years).
2. The $1,200 cost would be capitalized in the asset account, increasing both the book value of the asset and the annual depreciation expense.

	After Effects of Capital Improvement
Amount in asset account ($18,000 + $1,200)	$19,200
Less: Salvage value	(3,000)
Accumulated depreciation on January 1, 2014	(6,000)
Remaining depreciable cost before recording 2014 depreciation	$10,200
Depreciation for 2014 ($10,200 ÷ 3 years)	$ 3,400
Accumulated depreciation at December 31, 2014 ($6,000 + $3,400)	$ 9,400

(*continued*)

3. The $1,200 cost would be subtracted from the Accumulated Depreciation account, increasing the book value of the asset. The remaining useful life would increase to four years, which would decrease the depreciation expense.

	After Effects of Capital Improvement
Amount in asset account	$18,000
Less: Salvage value	(3,000)
Accumulated depreciation on January 1, 2014 ($6,000 − $1,200)	(4,800)
Remaining depreciable cost before recording 2014 depreciation	$10,200
Depreciation for 2014 ($10,200 ÷ 4 years)	$ 2,550
Accumulated depreciation at December 31, 2014 ($4,800 + $2,550)	$ 7,350

NATURAL RESOURCES

LO 7

Explain how expense recognition for natural resources (depletion) affects financial statements.

The cost of natural resources includes not only the purchase price but also related items such as the cost of exploration, geographic surveys, and estimates. The process of expensing natural resources is commonly called depletion.[2] The most common method used to calculate depletion is units-of-production.

To illustrate, assume Apex Coal Mining paid $4,000,000 cash to purchase a mine with an estimated 16,000,000 tons of coal. The unit depletion charge is

$$\$4{,}000{,}000 \div 16{,}000{,}000 \text{ tons} = \$0.25 \text{ per ton}$$

If Apex mines 360,000 tons of coal in the first year, the depletion charge is:

$$360{,}000 \text{ tons} \times \$0.25 \text{ per ton} = \$90{,}000$$

The depletion of a natural resource has the same effect on the accounting equation as other expense recognition events. Assets (in this case, a *coal mine*) and stockholders' equity decrease. The depletion expense reduces net income. The effects on the financial statements follow.

Assets			=	Equity			Rev.	−	Exp.	=	Net Inc.	Cash Flow	
Cash	+	Coal Mine	=	Com. Stk.	+	Ret. Earn.							
(4,000,000)	+	4,000,000	=	NA	+	NA	NA	−	NA	=	NA	(4,000,000)	IA
NA	+	(90,000)	=	NA	+	(90,000)	NA	−	90,000	=	(90,000)	NA	

INTANGIBLE ASSETS

LO 8

Explain how expense recognition for intangible assets (amortization) affects financial statements.

Intangible assets provide rights, privileges, and special opportunities to businesses. Common intangible assets include trademarks, patents, copyrights, franchises, and goodwill. Some of the unique characteristics of these intangible assets are described in the following sections.

Trademarks

A **trademark** is a name or symbol that identifies a company or a product. Familiar trademarks include the Polo emblem, the name *Coca-Cola*, and the Nike slogan, "Just

[2]In practice, the depletion charge is considered a product cost and allocated between inventory and cost of goods sold. This text uses the simplifying assumption that all resources are sold in the same accounting period in which they are extracted. The full depletion charge is therefore expensed in the period in which the resources are extracted.

FOCUS ON INTERNATIONAL ISSUES

RESEARCH *AND* DEVELOPMENT VS. RESEARCH *OR* DEVELOPMENT

For many years some thought the companies that followed U.S. GAAP were at a disadvantage when it came to research and development (R&D) costs, because these companies had to immediately expense such cost, while the accounting rules of some other countries allowed R&D cost to be capitalized. Remember, recording costs as an asset—capitalizing it—means that net income is not immediately reduced. The global movement toward using IFRS is reducing, but not eliminating, the different accounting treatments for R&D.

Like U.S. GAAP, IFRS require *research* costs to be expensed, but they allow *development* costs to be capitalized. This IFRS rule itself can present challenges, because sometimes it is not clear where research ends and development begins. Basically, once research has produced a product, patent, and so forth, that the company believes will result in a revenue generating outcome, any additional costs to get it ready for market are development costs.

do it." Trademarks are registered with the federal government and have an indefinite legal lifetime.

The costs incurred to design, purchase, or defend a trademark are capitalized in an asset account called Trademarks. Companies want their trademarks to become familiar but also face the risk of a trademark being used as the generic name for a product. To protect a trademark, companies in this predicament spend large sums on legal fees and extensive advertising programs to educate consumers. Well-known trademarks that have been subject to this problem include **Coke**, **Xerox**, **Kleenex**, and **Vaseline**.

Patents

A **patent** grants its owner an exclusive legal right to produce and sell a product that has one or more unique features. Patents issued by the U.S. Patent Office have a legal life of 20 years. Companies may obtain patents through purchase, lease, or internal development. The costs capitalized in the Patent account are usually limited to the purchase price and legal fees to obtain and defend the patent. The research and development costs that are incurred to develop patentable products are usually expensed in the period in which they are incurred.

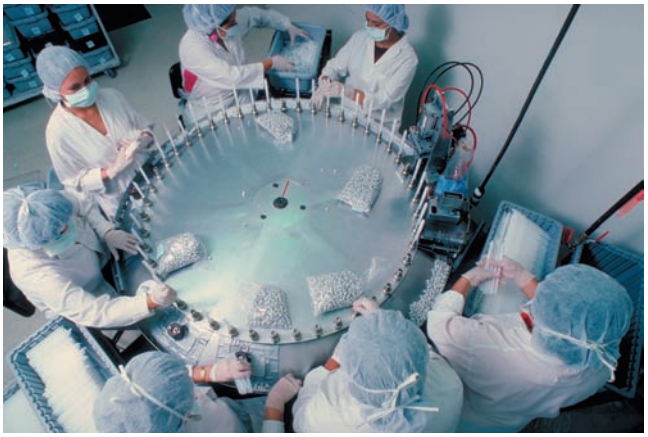
Copyrights

A **copyright** protects writings, musical compositions, works of art, and other intellectual property for the exclusive benefit of the creator or persons assigned the right by the creator. The cost of a copyright includes the purchase price and any legal costs associated with obtaining and defending the copyright. Copyrights granted by the federal government extend for the life of the creator plus 70 years. A radio commercial could legally use a Bach composition as background music; it could not, however, use the theme song from the movie, *The Matrix,* without obtaining permission from the copyright owner. The cost of a copyright is often expensed early because future royalties may be uncertain.

Franchises

Franchises grant exclusive rights to sell products or perform services in certain geographic areas. Franchises may be granted by governments or private businesses. Franchises granted

REALITY BYTES



On March 9, 2009, **Merck & Company** (Merck), one of the world's largest pharmaceutical companies, agreed to pay $41.1 billion to acquire **Schering-Plough Corporation** (S-P), another pharmaceutical company. At the time, S-P's balance sheet showed net assets (assets minus liabilities) of approximately $10.5 billion. Why would Merck pay the owners of S-P almost four times the net value of the assets shown on the company's balance sheet?

Merck was willing to pay four times the book value of the assets for three reasons. First, the value of the assets on S-P's balance sheet represented the historical cost of the assets. The current market value of these assets was probably higher than their historical cost, especially for assets such as the S-P's drug patents. Second, Merck believed that the two companies combined could operate at a lower cost than the two could as separate companies, thus increasing the total earnings they could generate. Finally, Merck probably believed that S-P had *goodwill* that enables a company to use its assets in a manner that will generate above average earnings. In other words, Merck was paying for a hidden asset not shown on S-P's balance sheet.

by governments include federal broadcasting licenses. Private business franchises include fast-food restaurant chains and brand labels such as **Healthy Choice**. The legal and useful lives of a franchise are frequently difficult to determine. Judgment is often crucial to establishing the estimated useful life for franchises.

Goodwill

Goodwill is the value attributable to favorable factors such as reputation, location, and superior products. Consider the most popular restaurant in your town. If the owner sells the restaurant, do you think the purchase price would be simply the total value of the chairs, tables, kitchen equipment, and building? Certainly not, because much of the restaurant's value lies in its popularity; in other words, its ability to generate a high return is based on the goodwill (reputation) of the business.

Calculating goodwill can be complex; here we present a simple example to illustrate how it is determined. Suppose the accounting records of a restaurant named Bendigo's show

Assets = Liabilities + Stockholders' Equity

$200,000 = $50,000 + $150,000

Assume a buyer agrees to purchase the restaurant by paying the owner $300,000 cash and assuming the existing liabilities. In other words, the restaurant is purchased at a price of $350,000 ($300,000 cash + $50,000 assumed liabilities). Now assume that the assets of the business (tables, chairs, kitchen equipment, etc.) have a fair market value of only $280,000. Why would the buyer pay $350,000 to purchase assets with a market value of $280,000? Obviously, the buyer is purchasing more than just the assets. The buyer is purchasing the business's goodwill. The amount of the goodwill is the difference between the purchase price and the fair market value of the assets. In this case, the goodwill is $70,000 ($350,000 − $280,000). The effects of the purchase on the financial statements of the buyer follow.

Assets					=	Liab.	+	Equity	Rev.	−	Exp.	=	Net Inc.	Cash Flow
Cash	+	Rest. Assets	+	Goodwill										
(300,000)	+	280,000	+	70,000	=	50,000	+	NA	NA	−	NA	=	NA	(300,000) IA

The fair market value of the restaurant assets represents the historical cost to the new owner. It becomes the basis for future depreciation charges.

EXPENSE RECOGNITION FOR INTANGIBLE ASSETS

As mentioned earlier, intangible assets fall into two categories, those with *identifiable useful lives* and those with *indefinite useful lives.* Expense recognition for intangible assets depends on which classification applies.

Expensing Intangible Assets with Identifiable Useful Lives

The costs of intangible assets with identifiable useful lives are normally expensed on a straight-line basis using a process called *amortization.* An intangible asset should be amortized over the shorter of two possible time periods: (1) its legal life or (2) its useful life.

To illustrate, assume that Flowers Industries purchased a newly granted patent for $44,000 cash. Although the patent has a legal life of 20 years, Flowers estimates that it will be useful for only 11 years. The annual amortization charge is therefore $4,000 ($44,000 ÷ 11 years). The effects on the financial statements follow.

Assets			=	Equity			Rev.	–	Exp.	=	Net Inc.	Cash Flow	
Cash	+	Patent	=	Com. Stk.	+	Ret. Earn.							
(44,000)	+	44,000	=	NA	+	NA	NA	–	NA	=	NA	(44,000)	IA
NA	+	(4,000)	=	NA	+	(4,000)	NA	–	4,000	=	(4,000)	NA	

Impairment Losses for Intangible Assets with Indefinite Useful Lives

Intangible assets with indefinite useful lives must be tested for impairment annually. The impairment test consists of comparing the fair value of the intangible asset to its carrying value (book value). If the fair value is less than the book value, an impairment loss must be recognized.

To illustrate, return to the example of the Bendigo's restaurant purchase. Recall that the buyer of Bendigo's paid $70,000 for goodwill. Assume the restaurant experiences a significant decline in revenue because many of its former regular customers are dissatisfied with the food prepared by the new chef. Suppose the decline in revenue is so substantial that the new owner believes the Bendigo's name is permanently impaired. The owner decides to hire a different chef and change the name of the restaurant. In this case, the business has suffered a permanent decline in value of goodwill. The company must recognize an impairment loss.

The restaurant's name has lost its value, but the owner believes the location continues to provide the opportunity to produce above-average earnings. Some, but not all, of the goodwill has been lost. Assume the fair value of the remaining goodwill is determined to be $40,000. The impairment loss to recognize is $30,000 ($70,000 − $40,000). The loss reduces the intangible asset (goodwill), stockholder's equity (retained earnings), and net income. The statement of cash flows would not be affected. The effects on the financial statements follow.

Assets	=	Liab.	+	Equity	Rev.	–	Exp./Loss	=	Net Inc.	Cash Flow
Goodwill	=			Ret. Earn.						
(30,000)	=	NA	+	(30,000)	NA	–	30,000	=	(30,000)	NA

BALANCE SHEET PRESENTATION

This chapter has explained accounting for the acquisition, expense recognition, and disposal of a wide range of long-term assets. Exhibit 6.7 illustrates typical balance sheet presentation of many of the assets discussed.

EXHIBIT 6.7

Balance Sheet Presentation of Operational Assets

Partial Balance Sheet

Long-Term Assets			
Plant and equipment			
Buildings	$4,000,000		
Less: Accumulated depreciation	(2,500,000)	$1,500,000	
Equipment	1,750,000		
Less: Accumulated depreciation	(1,200,000)	550,000	
Total plant and equipment			$2,050,000
Land			850,000
Natural resources			
Mineral deposits (Less: Depletion)		2,100,000	
Oil reserves (Less: Depletion)		890,000	
Total natural resources			2,990,000
Intangibles			
Patents (Less: Amortization)		38,000	
Goodwill		175,000	
Total intangible assets			213,000
Total long-term assets			$6,103,000

EFFECT OF JUDGMENT AND ESTIMATION

LO 9

Explain how expense recognition choices and industry characteristics affect financial performance measures.

Managers may have differing opinions about which allocation method (straight-line, accelerated, or units-of-production) best matches expenses with revenues. As a result, one company may use straight-line depreciation while another company in similar circumstances uses double-declining-balance. Because the allocation method a company uses affects the amount of expense it recognizes, analysts reviewing financial statements must consider the accounting procedures companies use in preparing the statements.

Assume that two companies, Alpha and Zeta, experience identical economic events in 2011 and 2012. Both generate revenue of $50,000 and incur cost of goods sold of $30,000 during each year. In 2011, each company pays $20,000 for an asset with an expected useful life of five years and no salvage value. How will the companies' financial statements differ if one uses straight-line depreciation and the other uses the double-declining-balance method? To answer this question, first compute the depreciation expense for both companies for 2011 and 2012.

If Alpha Company uses the straight-line method, depreciation for 2011 and 2012 is

$$\text{(Cost} - \text{Salvage)} \div \text{Useful life} = \text{Depreciation expense per year}$$

$$(\$20{,}000 - \$0) \div 5 \text{ years} = \$4{,}000$$

In contrast, if Zeta Company uses the double-declining-balance method, Zeta recognizes the following amounts of depreciation expense for 2011 and 2012.

	(Cost − Accumulated Depreciation)	×	2 × (Straight-Line Rate)	=	Depreciation Expense
2011	($20,000 − $ 0)	×	[2 × (1 ÷ 5)]	=	$8,000
2012	($20,000 − $8,000)	×	[2 × (1 ÷ 5)]	=	$4,800

Based on these computations, the income statements for the two companies are:

Income Statements

	2011		2012	
	Alpha Co.	Zeta Co.	Alpha Co.	Zeta Co.
Sales	$50,000	$50,000	$50,000	$50,000
Cost of goods sold	(30,000)	(30,000)	(30,000)	(30,000)
Gross margin	20,000	20,000	20,000	20,000
Depreciation expense	(4,000)	(8,000)	(4,000)	(4,800)
Net income	$16,000	$12,000	$16,000	$15,200

The relevant sections of the balance sheets are

Plant Assets

	2011		2012	
	Alpha Co.	Zeta Co.	Alpha Co.	Zeta Co.
Assets	$20,000	$20,000	$20,000	$20,000
Accumulated depreciation	(4,000)	(8,000)	(8,000)	(12,800)
Book value	$16,000	$12,000	$12,000	$ 7,200

The depreciation method is not the only aspect of expense recognition that can vary between companies. Companies may also make different assumptions about the useful lives and salvage values of long-term operational assets. Thus, even if the same depreciation method is used, depreciation expense may still differ.

Because the depreciation method and the underlying assumptions regarding useful life and salvage value affect the determination of depreciation expense, they also affect the amounts of net income, retained earnings, and total assets.

To promote meaningful analysis, public companies are required to disclose all significant accounting policies used to prepare their financial statements. This disclosure is usually provided in the footnotes that accompany the financial statements.

EFFECT OF INDUSTRY CHARACTERISTICS

As indicated in previous chapters, industry characteristics affect financial performance measures. For example, companies in manufacturing industries invest heavily in machinery while insurance companies rely more on human capital. Manufacturing companies therefore have relatively higher depreciation charges than insurance companies. To illustrate how the type of industry affects financial reporting, examine Exhibit 6.8. This exhibit compares the ratio of sales to property, plant, and equipment for two companies in each of three different industries.

EXHIBIT 6.8

Industry Data Reflecting the Use of Long-Term Tangible Assets

Industry	Company	Sales ÷ Property, Plant, and Equipment
Cable Companies	Charter Communications	0.90
	Cox Communications	0.73
Airlines	American	1.35
	United	1.31
Employment Agencies	Kelly Services	31.91
	Robert Half	30.20

The table indicates that for every $1.00 invested in property, plant, and equipment, **Kelly Services** produced $31.91 of sales. In contrast, **Cox Communications** and **United Airlines** produced only $0.73 and $1.31, respectively, for each $1.00 they invested in operational assets. Does this mean the management of Kelly is doing a better job than the management of Cox Communications or United Airlines? Not necessarily. It means that these companies operate in different economic environments. In other words, it takes significantly more equipment to operate a cable company or an airline than it takes to operate an employment agency.

<< A Look Back

This chapter explains that the primary objective of recognizing depreciation is to match the cost of a long-term tangible asset with the revenues the asset is expected to generate. The matching concept also applies to natural resources (depletion) and intangible assets (amortization). The chapter explains how alternative methods can be used to account for the same event (e.g., straight-line versus double-declining-balance depreciation). Companies experiencing exactly the same business events could produce different financial statements. The alternative accounting methods for depreciating, depleting, or amortizing assets include the (1) straight-line, (2) double-declining-balance, and (3) units-of-production methods.

The *straight-line method* produces equal amounts of expense in each accounting period. The amount of the expense recognized is determined using the formula [(cost − salvage) ÷ number of years of useful life]. The *double-declining-balance method* produces proportionately larger amounts of expense in the early years of an asset's useful life and increasingly smaller amounts of expense in the later years of the asset's useful life. The formula for calculating double-declining-balance depreciation is [book value at beginning of period × (2 × the straight-line rate)]. The *units-of-production method* produces expense in direct proportion to the number of units produced during an accounting period. The formula for the amount of expense recognized each period is [(cost − salvage) ÷ total estimated units of production = allocation rate × units of production in current accounting period].

This chapter showed how to account for *changes in estimates* such as the useful life or the salvage value of a depreciable asset. Changes in estimates do not affect the amount of depreciation recognized previously. Instead, the remaining book value of the asset is expensed over its remaining useful life.

After an asset has been placed into service, companies typically incur further costs for maintenance, quality improvement, and extensions of useful life. *Maintenance costs* are expensed in the period in which they are incurred. *Costs that improve the quality* of an asset are added to the cost of the asset, increasing the book value and the amount of future depreciation charges. *Costs that extend the useful life* of an asset are subtracted

from the asset's Accumulated Depreciation account thereby increasing the book value of the asset.

A Look Forward >>

In Chapter 7 we move from the assets section of the balance sheet to issues in accounting for liabilities.

A step-by-step audio-narrated series of slides is provided on the text website at www.mhhe.com/edmondssurvey3e

SELF-STUDY REVIEW PROBLEM

The following information pertains to a machine purchased by Bakersfield Company on January 1, 2012.

Purchase price	$ 63,000
Delivery cost	$ 2,000
Installation charge	$ 3,000
Estimated useful life	8 years
Estimated units the machine will produce	130,000
Estimated salvage value	$ 3,000

The machine produced 14,400 units during 2012 and 17,000 units during 2013.

Required

Determine the depreciation expense Bakersfield would report for 2012 and 2013 using each of the following methods.

a. Straight-line.
b. Double-declining-balance.
c. Units-of-production.

Solution to Requirements a–c.

a. Straight-line

Purchase price	$63,000	
Delivery cost	2,000	
Installation charge	3,000	
Total cost of machine	68,000	
Less: Salvage value	(3,000)	
	$65,000 ÷ 8 = $8,125	Depreciation per year
2012	$ 8,125	
2013	$ 8,125	

b. Double-declining-balance

Year	Cost	–	Accumulated Depreciation at Beginning of Year	×	2 × S-L Rate	=	Annual Depreciation
2012	$68,000	–	$ 0	×	(2 × 0.125)	=	$17,000
2013	68,000	–	17,000	×	(2 × 0.125)	=	12,750

c. Units-of-production

(1) (Cost − Salvage value) ÷ Estimated units of production = Depreciation cost per unit produced

$$\frac{\$68{,}000 - \$3{,}000}{130{,}000} = \$0.50 \text{ per unit}$$

(2) Cost per unit × Annual units produced = Annual depreciation expense

2012 $0.50 × 14,400 = $7,200
2013 0.50 × 17,000 = 8,500

KEY TERMS

Accelerated depreciation method 208
Accumulated Depreciation 206
Amortization 202
Basket purchase 203
Book value 207
Capital expenditures 214
Contra asset account 206
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Property, plant, and equipment 202
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QUESTIONS

1. What is the difference between the functions of long-term operational assets and investments?
2. What is the difference between tangible and intangible assets? Give an example of each.
3. What is the difference between goodwill and specifically identifiable intangible assets?
4. Define *depreciation*. What kind of asset depreciates?
5. Why are natural resources called *wasting assets?*
6. Is land a depreciable asset? Why or why not?
7. Define *amortization*. What kind of assets are *amortized?*
8. Explain the historical cost concept as it applies to long-term operational assets. Why is the book value of an asset likely to be different from the current market value of the asset?
9. What different kinds of expenditures might be included in the recorded cost of a building?
10. What is a basket purchase of assets? When a basket purchase is made, how is cost assigned to individual assets?
11. What are the stages in the life cycle of a long-term operational asset?
12. Explain straight-line, units-of-production, and double-declining-balance depreciation. When is it appropriate to use each of these depreciation methods?
13. What effect does the recognition of depreciation expense have on total assets? On total equity?
14. Does the recognition of depreciation expense affect cash flows? Why or why not?
15. MalMax purchased a depreciable asset. What would be the difference in total assets at the end of the first year if MalMax chooses straight-line depreciation versus double-declining-balance depreciation?
16. John Smith mistakenly expensed the cost of a long-term tangible fixed asset. Specifically, he charged the cost of a truck to a delivery expense account. How will this error affect the income statement and the balance sheet in the year in which the mistake is made?
17. What is *salvage value?*
18. What type of account (classification) is Accumulated Depreciation?
19. How is the book value of an asset determined?
20. Why is depreciation that has been recognized over the life of an asset shown in a contra account? Why not just reduce the asset account?
21. Assume that a piece of equipment cost $5,000 and had accumulated depreciation of

$3,000. What is the book value of the equipment? Is the book value equal to the fair market value of the equipment? Explain.

22. Why would a company choose to depreciate one piece of equipment using the double-declining-balance method and another piece of equipment using straight-line depreciation?
23. Why may it be necessary to revise the estimated life of a plant asset? When the estimated life is revised, does it affect the amount of depreciation per year? Why or why not?
24. How are capital expenditures made to improve the quality of a capital asset accounted for? Would the answer change if the expenditure extended the life of the asset but did not improve quality? Explain.
25. When a long-term operational asset is sold at a gain, how is the balance sheet affected? Is the statement of cash flows affected? If so, how?
26. Define *depletion*. What is the most commonly used method of computing depletion?
27. List several common intangible assets. How is the life determined that is to be used to compute amortization?
28. List some differences between U.S. GAAP and GAAP of other countries with respect to amortization and accounting for intangibles.
29. How can judgment and estimation affect information reported in the financial statements?

MULTIPLE-CHOICE QUESTIONS

Multiple-choice questions are provided on the text website at www.mhhe.com/edmondssurvey3e

EXERCISES

All applicable Exercises are available with McGraw-Hill's *Connect Accounting*.

Unless specifically included, ignore income tax considerations in all exercises and problems.

Exercise 6-1 *Long-term operational assets used in a business* LO 1

Required

Give some examples of long-term operational assets that each of the following companies is likely to own: *(a)* AT&T, *(b)* Caterpillar, *(c)* Amtrak, and *(d)* The Walt Disney Co.

Exercise 6-2 *Identifying long-term operational assets* LO 1

Required

Which of the following items should be classified as long-term operational assets?

a. Cash
b. Buildings
c. Production machinery
d. Accounts receivable
e. Prepaid rent
f. Franchise
g. Inventory
h. Patent
i. Tract of timber
j. Land
k. Computer
l. Goodwill

Exercise 6-3 *Classifying tangible and intangible assets* LO 1

Required

Identify each of the following long-term operational assets as either tangible (T) or intangible (I).

a. Retail store building
b. Shelving for inventory
c. Trademark
d. Gas well
e. Drilling rig
f. FCC license for TV station
g. 18-wheel truck
h. Timber
i. Log loader
j. Dental chair
k. Goodwill
l. Computer software

LO 2

Exercise 6-4 *Determining the cost of an asset*

Northeast Logging Co. purchased an electronic saw to cut various types and sizes of logs. The saw had a list price of $120,000. The seller agreed to allow a 5 percent discount because Northeast paid cash. Delivery terms were FOB shipping point. Freight cost amounted to $2,500. Northeast had to hire an individual to operate the saw. Northeast had to build a special platform to mount the saw. The cost of the platform was $1,000. The saw operator was paid an annual salary of $40,000. The cost of the company's theft insurance policy increased by $2,000 per year as a result of acquiring of the saw. The saw had a four-year useful life and an expected salvage value of $10,000.

Required

Determine the amount to be capitalized in the asset account for the purchase of the saw.

LO 2

Exercise 6-5 *Allocating costs on the basis of relative market values*

Midwest Company purchased a building and the land on which the building is situated for a total cost of $900,000 cash. The land was appraised at $200,000 and the building at $800,000.

Required

a. What is the accounting term for this type of acquisition?

b. Determine the amount of the purchase cost to allocate to the land and the amount to allocate to the building.

c. Would the company recognize a gain on the purchase? Why or why not?

d. Record the purchase in a statements model like the following one.

Assets	=	Liab.	+	Equity	Rev.	−	Exp.	=	Net Inc.	Cash Flow
Cash + Land + Building										

LO 2

Exercise 6-6 *Allocating costs for a basket purchase*

Jourdan Company purchased a restaurant building, land, and equipment for $700,000 cash. The appraised value of the assets was as follows:

Land	$160,000
Building	400,000
Equipment	240,000
Total	$800,000

Required

a. Compute the amount to be recorded on the books for each of the assets.

b. Record the purchase in a horizontal statements model like the following one.

Assets	=	Liab.	+	Equity	Rev.	−	Exp.	=	Net Inc.	Cash Flow
Cash + Land + Building + Equip.										

LO 3

Exercise 6-7 *Effect of depreciation on the accounting equation and financial statements*

The following events apply to The Pizza Factory for the 2012 fiscal year:

1. The company started when it acquired $18,000 cash from the issue of common stock.
2. Purchased a new pizza oven that cost $15,000 cash.

3. Earned $26,000 in cash revenue.
4. Paid $13,000 cash for salaries expense.
5. Paid $6,000 cash for operating expenses.
6. Adjusted the records to reflect the use of the pizza oven. The oven, purchased on January 1, 2012, has an expected useful life of five years and an estimated salvage value of $3,000. Use straight-line depreciation. The adjusting entry was made as of December 31, 2012.

Required

a. Record the above transactions in a horizontal statements model like the following one.

Event	Balance Sheet									Income Statement					Statemt. of Cash Flows
	Assets					=	Equity			Rev.	–	Exp.	=	Net Inc.	
	Cash	+	Equip.	–	A. Depr.	=	Com. Stock	+	Ret. Earn.						

b. What amount of depreciation expense would The Pizza Factory report on the 2012 income statement?

c. What amount of accumulated depreciation would The Pizza Factory report on the December 31, 2012, balance sheet?

d. Would the cash flow from operating activities be affected by depreciation in 2012?

Exercise 6-8 *Effect of double-declining-balance depreciation on financial statements* LO 3

Smith Company started operations by acquiring $100,000 cash from the issue of common stock. On January 1, 2012, the company purchased equipment that cost $100,000 cash. The equipment had an expected useful life of five years and an estimated salvage value of $20,000. Smith Company earned $92,000 and $65,000 of cash revenue during 2012 and 2013, respectively. Smith Company uses double-declining-balance depreciation.

Required

a. Record the above transactions in a horizontal statements model like the following one.

Event	Balance Sheet									Income Statement					Statemt. of Cash Flows
	Assets					=	Equity			Rev.	–	Exp.	=	Net Inc.	
	Cash	+	Equip.	–	A. Depr.	=	Com. Stock	+	Ret. Earn.						

b. Prepare income statements, balance sheets, and statements of cash flows for 2012 and 2013. Use a vertical statements format.

Exercise 6-9 *Events related to the acquisition, use, and disposal of a tangible plant asset: straight-line depreciation* LO 3, 4

CJ's Pizza purchased a delivery van on January 1, 2012, for $25,000. In addition, CJ's paid sales tax and title fees of $1,000 for the van. The van is expected to have a four-year life and a salvage value of $6,000.

Required

a. Using the straight-line method, compute the depreciation expense for 2012 and 2013.

b. Assume the truck was sold on January 1, 2015, for $12,000. Determine the amount of gain or loss that would be recognized on the asset disposal.

LO 3

Exercise 6-10 *Computing and recording straight-line versus double-declining-balance depreciation*

At the beginning of 2012, Precision Manufacturing purchased a new computerized drill press for $50,000. It is expected to have a five-year life and a $5,000 salvage value.

Required

a. Compute the depreciation for each of the five years, assuming that the company uses
- **(1)** Straight-line depreciation.
- **(2)** Double-declining-balance depreciation.

b. Record the purchase of the drill press and the depreciation expense for the first year under the straight-line and double-declining-balance methods in a financial statements model like the following one:

Assets					=	Equity	Rev.	–	Exp.	=	Net Inc.	Cash Flow
Cash	+	Drill Press	–	Acc. Dep.	=	Ret. Earn						

LO 4

Exercise 6-11 *Effect of the disposal of plant assets on the financial statements*

A plant asset with a cost of $40,000 and accumulated depreciation of $36,000 is sold for $6,000.

Required

a. What is the book value of the asset at the time of sale?

b. What is the amount of gain or loss on the disposal?

c. How would the sale affect net income (increase, decrease, no effect) and by how much?

d. How would the sale affect the amount of total assets shown on the balance sheet (increase, decrease, no effect) and by how much?

e. How would the event affect the statement of cash flows (inflow, outflow, no effect) and in what section?

LO 4

Exercise 6-12 *Effect of gains and losses on the accounting equation and financial statements*

On January 1, 2011, Gert Enterprises purchased a parcel of land for $12,000 cash. At the time of purchase, the company planned to use the land for future expansion. In 2012, Gert Enterprises changed its plans and sold the land.

Required

a. Assume that the land was sold for $11,200 in 2012.
- **(1)** Show the effect of the sale on the accounting equation.
- **(2)** What amount would Gert report on the income statement related to the sale of the land?
- **(3)** What amount would Gert report on the statement of cash flows related to the sale of the land?

b. Assume that the land was sold for $13,500 in 2012.
- **(1)** Show the effect of the sale on the accounting equation.
- **(2)** What amount would Gert report on the income statement related to the sale of the land?
- **(3)** What amount would Gert report on the statement of cash flows related to the sale of the land?

LO 3, 4

Exercise 6-13 *Double-declining-balance and units-of-production depreciation: gain or loss on disposal*

Print Service Co. purchased a new color copier at the beginning of 2011 for $35,000. The copier is expected to have a five-year useful life and a $5,000 salvage value. The expected copy

production was estimated at 2,000,000 copies. Actual copy production for the five years was as follows:

2011	550,000
2012	480,000
2013	380,000
2014	390,000
2015	240,000
Total	2,040,000

The copier was sold at the end of 2015 for $5,200.

Required

a. Compute the depreciation expense for each of the five years, using double-declining-balance depreciation.

b. Compute the depreciation expense for each of the five years, using units-of-production depreciation. (Round cost per unit to three decimal places.)

c. Calculate the amount of gain or loss from the sale of the asset under each of the depreciation methods.

Exercise 6-14 *Revision of estimated useful life* LO 5

On January 1, 2012, Harris Machining Co. purchased a compressor and related installation equipment for $64,000. The equipment had a three-year estimated life with a $4,000 salvage value. Straight-line depreciation was used. At the beginning of 2014, Harris revised the expected life of the asset to four years rather than three years. The salvage value was revised to $3,000.

Required

Compute the depreciation expense for each of the four years.

Exercise 6-15 *Distinguishing between revenue expenditures and capital expenditures* LO 6

Zell's Shredding Service has just completed a minor repair on a shredding machine. The repair cost was $900, and the book value prior to the repair was $5,000. In addition, the company spent $8,000 to replace the roof on a building. The new roof extended the life of the building by five years. Prior to the roof replacement, the general ledger reflected the Building account at $90,000 and related Accumulated Depreciation account at $40,000.

Required

After the work was completed, what book value should Zell's report on the balance sheet for the shredding machine and the building?

Exercise 6-16 *Effect of revenue expenditures versus capital expenditures on financial statements* LO 6

Sequoia Construction Company purchased a forklift for $110,000 cash. It had an estimated useful life of four years and a $10,000 salvage value. At the beginning of the third year of use, the company spent an additional $8,000 that was related to the forklift. The company's financial condition just prior to this expenditure is shown in the following statements model.

Assets				=	Equity			Rev.	–	Exp.	=	Net Inc.	Cash Flow
Cash	+	Forklift	Acc. Depr.	=	Com. Stk.	+	Ret. Earn.						
12,000	+	110,000	50,000	=	24,000	+	48,000	NA	–	NA	=	NA	NA

Required

Record the $8,000 expenditure in the statements model under each of the following *independent* assumptions:

a. The expenditure was for routine maintenance.
b. The expenditure extended the forklift's life.
c. The expenditure improved the forklift's operating capacity.

LO 6

Exercise 6-17 *Effect of revenue expenditures versus capital expenditures on financial statements*

On January 1, 2012, Valley Power Company overhauled four turbine engines that generate power for customers. The overhaul resulted in a slight increase in the capacity of the engines to produce power. Such overhauls occur regularly at two-year intervals and have been treated as maintenance expense in the past. Management is considering whether to capitalize this year's $25,000 cash cost in the engine asset account or to expense it as a maintenance expense. Assume that the engines have a remaining useful life of two years and no expected salvage value. Assume straight-line depreciation.

Required

a. Determine the amount of additional depreciation expense Valley would recognize in 2012 and 2013 if the cost were capitalized in the Engine account.
b. Determine the amount of expense Valley would recognize in 2012 and 2013 if the cost were recognized as maintenance expense.
c. Determine the effect of the overhaul on cash flow from operating activities for 2012 and 2013 if the cost were capitalized and expensed through depreciation charges.
d. Determine the effect of the overhaul on cash flow from operating activities for 2012 and 2013 if the cost were recognized as maintenance expense.

LO 7

Exercise 6-18 *Computing and recording depletion expense*

Ecru Sand and Gravel paid $600,000 to acquire 800,000 cubic yards of sand reserves. The following statements model reflects Ecru's financial condition just prior to purchasing the sand reserves. The company extracted 420,000 cubic yards of sand in year 1 and 360,000 cubic yards in year 2.

Assets			=	Equity			Rev.	–	Exp.	=	Net Inc.	Cash Flow
Cash	+	Sand Res.	=	Com. Stk.	+	Ret. Earn.						
700,000	+	NA	=	700,000	+	NA	NA	–	NA	=	NA	NA

Required

a. Compute the depletion charge per unit.
b. Record the acquisition of the sand reserves and the depletion expense for years 1 and 2 in a financial statements model like the preceding one.

LO 8

Exercise 6-19 *Computing and recording the amortization of intangibles*

Texas Manufacturing paid cash to purchase the assets of an existing company. Among the assets purchased were the following items.

Patent with 5 remaining years of legal life	$36,000
Goodwill	40,000

Texas's financial condition just prior to the purchase of these assets is shown in the following statements model:

Assets					=	Liab.	+	Equity	Rev.	–	Exp.	=	Net Inc.	Cash Flow
Cash	+	Patent	+	Goodwill										
94,000	+	NA	+	NA	=	NA	+	94,000	NA	–	NA	=	NA	NA

Required

a. Compute the annual amortization expense for these items if applicable.

b. Record the purchase of the intangible assets and the related amortization expense for year 1 in a horizontal statements model like the preceding one.

Exercise 6-20 *Computing and recording goodwill* LO 8

Mike Wallace purchased the business Magnum Supply Co. for $275,000 cash and assumed all liabilities at the date of purchase. Magnum's books showed assets of $280,000, liabilities of $40,000, and equity of $240,000. An appraiser assessed the fair market value of the tangible assets at $270,000 at the date of purchase. Wallace's financial condition just prior to the purchase is shown in the following statements model.

Assets					=	Liab.	+	Equity	Rev.	–	Exp.	=	Net Inc.	Cash Flow
Cash	+	Assets	+	Goodwill										
325,000	+	NA	+	NA	=	NA	+	325,000	NA	–	NA	=	NA	NA

Required

a. Compute the amount of goodwill purchased.

b. Record the purchase in a financial statements model like the preceding one.

Exercise 6-21 *Performing ratio analysis using real-world data* LO 9

American Greetings Corporation manufactures and sells greeting cards and related items such as gift wrapping paper. CSX Corporation is one of the largest railway networks in the nation. The following data were taken from one of the companies' December 28, 2007, annual report and from the other's February 28, 2007, annual report. Revealing which data relate to which company was intentionally omitted. For one company, the dollar amounts are in thousands, while for the other they are in millions.

	Company 1	Company 2
Sales	$10,030	$1,744,603
Depreciation costs	883	46,975
Net earnings	1,336	42,378
Current assets	2,491	799,281
Property, plant, and equipment	21,780	285,072
Total assets	$25,534	$1,778,214

Required

a. Calculate depreciation costs as a percentage of sales for each company.

b. Calculate property, plant, and equipment as a percentage of total assets for each company.

c. Based on the information now available to you, decide which data relate to which company. Explain the rationale for your decision.

d. Which company appears to be using its assets most efficiently? Explain your answer.

PROBLEMS

All applicable Problems are available with McGraw-Hill's *Connect Accounting*.

Problem 6-22 *Accounting for acquisition of assets including a basket purchase* LO 2

Khan Company made several purchases of long-term assets in 2012. The details of each purchase are presented here.

CHECK FIGURES
Total cost of equipment: $40,900
Cost allocated to copier: $7,500

New Office Equipment

1. List price: $40,000; terms: 1/10 n/30; paid within the discount period.
2. Transportation-in: $800.
3. Installation: $500.
4. Cost to repair damage during unloading: $500.
5. Routine maintenance cost after eight months: $120.

Basket Purchase of Office Furniture, Copier, Computers, and Laser Printers for $50,000 with Fair Market Values

1. Office furniture, $24,000.
2. Copier, $9,000.
3. Computers and printers, $27,000.

Land for New Headquarters with Old Barn Torn Down

1. Purchase price, $80,000.
2. Demolition of barn, $5,000.
3. Lumber sold from old barn, $2,000.
4. Grading in preparation for new building, $8,000.
5. Construction of new building, $250,000.

Required

In each of these cases, determine the amount of cost to be capitalized in the asset accounts.

LO 3, 4

eXcel

CHECK FIGURES
Net Income, 2011: $1,250
Total Assets, 2014: $35,700

Problem 6-23 *Accounting for depreciation over multiple accounting cycles: straight-line depreciation*

KC Company began operations when it acquired $30,000 cash from the issue of common stock on January 1, 2011. The cash acquired was immediately used to purchase equipment for $30,000 that had a $5,000 salvage value and an expected useful life of four years. The equipment was used to produce the following revenue stream (assume all revenue transactions are for cash). At the beginning of the fifth year, the equipment was sold for $4,500 cash. KC uses straight-line depreciation.

	2011	2012	2013	2014	2015
Revenue	$7,500	$8,000	$8,200	$7,000	$0

Required

Prepare income statements, statements of changes in stockholders' equity, balance sheets, and statements of cash flows for each of the five years.

LO 2, 3, 5, 6

CHECK FIGURES
b. Net Income, 2012: $23,200
Total Assets, 2014: $139,770

Problem 6-24 *Purchase and use of tangible asset: three accounting cycles, double-declining-balance depreciation*

The following transactions pertain to Optimal Solutions Inc. Assume the transactions for the purchase of the computer and any capital improvements occur on January 1 each year.

2012

1. Acquired $60,000 cash from the issue of common stock.
2. Purchased a computer system for $25,000 cash. It has an estimated useful life of five years and a $3,000 salvage value.
3. Paid $1,500 sales tax on the computer system.
4. Collected $35,000 in data entry fees from clients.
5. Paid $1,200 in fees to service the computers.
6. Recorded double-declining-balance depreciation on the computer system for 2012.
7. Closed the revenue and expense accounts to Retained Earnings at the end of 2013.

2013

1. Paid $800 for repairs to the computer system.
2. Bought a case of toner cartridges for the printers that are part of the computer system, $1,200.
3. Collected $38,000 in data entry fees from clients.
4. Paid $900 in fees to service the computers.
5. Recorded double-declining-balance depreciation for 2013.
6. Closed the revenue and expense accounts to Retained Earnings at the end of 2013.

2014

1. Paid $3,000 to upgrade the computer system, which extended the total life of the system to six years.
2. Paid $900 in fees to service the computers.
3. Collected $35,000 in data entry fees from clients.
4. Recorded double-declining-balance depreciation for 2014.
5. Closed the revenue and expense accounts at the end of 2014.

Required

a. Record the above transactions in a horizontal statements model like the following one.

Event	Balance Sheet										Income Statement					Statemt. of Cash Flows
	Assets					=	Equity				Rev.	–	Exp.	=	Net Inc.	
	Cash	+	Equip.	–	A. Depr.	=	Com. Stock	+	Ret. Earn.							

b. Use a vertical model to present financial statements for 2012, 2013, and 2014.

Problem 6-25 *Calculating depreciation expense using four different methods*

LO 3

eXcel

CHECK FIGURES

b. Depreciation Expense, 2012: $4,600

c. Depreciation Expense, 2013: $4,300

O'Brian Service Company purchased a copier on January 1, 2012, for $17,000 and paid an additional $200 for delivery charges. The copier was estimated to have a life of four years or 800,000 copies. Salvage was estimated at $1,200. The copier produced 230,000 copies in 2012 and 250,000 copies in 2013.

Required

Compute the amount of depreciation expense for the copier for calendar years 2012 and 2012, using these methods:

a. Straight-line.

b. Units-of-production.

c. Double-declining-balance.

Problem 6-26 *Effect of straight-line versus double-declining-balance depreciation on the recognition of expense and gains or losses*

LO 3, 4

eXcel

CHECK FIGURES

a. Depreciation Expense, Year 2: $6,400

b. Depreciation Expense, Year 2: $8,400

Same Day Laundry Services purchased a new steam press on January 1, for $35,000. It is expected to have a five-year useful life and a $3,000 salvage value. Same Day expects to use the steam press more extensively in the early years of its life.

Required

a. Calculate the depreciation expense for each of the five years, assuming the use of straight-line depreciation.

b. Calculate the depreciation expense for each of the five years, assuming the use of double-declining-balance depreciation.

c. Would the choice of one depreciation method over another produce a different amount of cash flow for any year? Why or why not?

d. Assume that Same Day Laundry Services sold the steam press at the end of the third year for $20,000. Compute the amount of gain or loss using each depreciation method.

LO 3, 4

Problem 6-27 *Computing and recording units-of-production depreciation*

McNabb Corporation purchased a delivery van for $25,500 in 2012. The firm's financial condition immediately prior to the purchase is shown in the following horizontal statements model:

Assets			=	Equity			Rev.	–	Exp.	=	Net Inc.	Cash Flow
Cash	+	Book Value of Van	=	Com. Stk.	+	Ret. Earn.						
50,000	+	NA	=	50,000	+	NA	NA	–	NA	=	NA	NA

CHECK FIGURES
a. Depreciation Expense, 2012: $7,500
c. Gain on Sale: $1,000

The van was expected to have a useful life of 150,000 miles and a salvage value of $3,000. Actual mileage was as follows:

2012	50,000
2013	70,000
2014	58,000

Required

a. Compute the depreciation for each of the three years, assuming the use of units-of-production depreciation.

b. Assume that McNabb earns $21,000 of cash revenue during 2012. Record the purchase of the van and the recognition of the revenue and the depreciation expense for the first year in a financial statements model like the preceding one.

c. Assume that McNabb sold the van at the end of the third year for $4,000. Calculate the amount of gain or lose from the sale.

LO 3

Problem 6-28 *Determining the effect of depreciation expense on financial statements*

CHECK FIGURES
a. Company A, Net Income: $20,000
c. Company A, Highest Book Value: $17,750

Three different companies each purchased a machine on January 1, 2012, for $54,000. Each machine was expected to last five years or 200,000 hours. Salvage value was estimated to be $4,000. All three machines were operated for 50,000 hours in 2012, 55,000 hours in 2013, 40,000 hours in 2014, 44,000 hours in 2015, and 31,000 hours in 2016. Each of the three companies earned $30,000 of cash revenue during each of the five years. Company A uses straight-line depreciation, company B uses double-declining-balance depreciation, and company C uses units-of-production depreciation.

Required

Answer each of the following questions. Ignore the effects of income taxes.

a. Which company will report the highest amount of net income for 2012?

b. Which company will report the lowest amount of net income for 2014?

c. Which company will report the highest book value on the December 31, 2014, balance sheet?

d. Which company will report the highest amount of retained earnings on the December 31, 2015, balance sheet?

e. Which company will report the lowest amount of cash flow from operating activities on the 2014 statement of cash flows?

LO 7

Problem 6-29 *Accounting for depletion*

CHECK FIGURES
a. Coal Mine Depletion, 2012: $280,000
b. Total Natural Resources: $2,971,000

Favre Exploration Corporation engages in the exploration and development of many types of natural resources. In the last two years, the company has engaged in the following activities:

Jan. 1, 2012 Purchased a coal mine estimated to contain 200,000 tons of coal for $800,000.
July 1, 2012 Purchased for $1,950,000 a tract of timber estimated to yield 3,000,000 board feet of lumber and to have a residual land value of $150,000.

July 5, 2012 Purchased a silver mine estimated to contain 30,000 tons of silver for $750,000.
Aug. 1, 2012 Purchased for $736,000 oil reserves estimated to contain 250,000 barrels of oil, of which 20,000 would be unprofitable to pump.

Required

a. Determine the amount of depletion expense that would be recognized on the 2012 income statement for each of the four reserves, assuming 70,000 tons of coal, 1,000,000 board feet of lumber, 9,000 tons of silver, and 50,000 barrels of oil are extracted.

b. Prepare the portion of the December 31, 2012, balance sheet that reports natural resources.

Problem 6-30 *Recording continuing expenditures for plant assets*

LO 3, 4, 5, 6

CHECK FIGURES
b. 2013 Depreciation Expense: $7,000
d. Loss on Sale: $3,250

Big Sky Inc. recorded the following transactions over the life of a piece of equipment purchased in 2011:

Jan. 1, 2011 Purchased the equipment for $36,000 cash. The equipment is estimated to have a five-year life and $6,000 salvage value and was to be depreciated using the straight-line method.
Dec. 31, 2011 Recorded depreciation expense for 2011.
May 5, 2012 Undertook routine repairs costing $750.
Dec. 31, 2012 Recorded depreciation expense for 2012.
Jan. 1, 2013 Made an adjustment costing $3,000 to the equipment. It improved the quality of the output but did not affect the life estimate.
Dec. 31, 2013 Recorded depreciation expense for 2013.
Mar. 1, 2014 Incurred $320 cost to oil and clean the equipment.
Dec. 31, 2014 Recorded depreciation expense for 2014.
Jan. 1, 2015 Had the equipment completely overhauled at a cost of $7,500. The overhaul was estimated to extend the total life to seven years and revised the salvage value to $4,000.
Dec. 31, 2015 Recorded depreciation expense for 2015.
July 1, 2016 Sold the equipment for $9,000 cash.

Required

a. Use a horizontal statements model like the following one to show the effects of these transactions on the elements of the financial statements. Use + for increase, − for decrease, and NA for not affected. The first event is recorded as an example.

Date	Assets	=	Liabilities	+	Equity	Net Inc.	Cash Flow
Jan. 1, 2011	+ −		NA		NA	NA	− IA

b. Determine the amount of depreciation expense Big Sky will report on the income statements for the years 2011 through 2015.

c. Determine the book value (cost − accumulated depreciation) Big Sky will report on the balance sheets at the end of the years 2011 through 2015.

d. Determine the amount of the gain or loss Big Sky will report on the disposal of the equipment on July 1, 2016.

Problem 6-31 *Accounting for continuing expenditures*

LO 5, 6, 7

CHECK FIGURE
Depreciation Expense: $8,000

Vernon Manufacturing paid $58,000 to purchase a computerized assembly machine on January 1, 2012. The machine had an estimated life of eight years and a $2,000 salvage value. Vernon's financial condition as of January 1, 2015, is shown in the following financial statements model. Vernon uses the straight-line method for depreciation.

Assets					=	Equity			Rev.	−	Exp.	=	Net Inc.	Cash Flow
Cash	+	Mach.	−	Acc. Dep.	=	Com. Stk.	+	Ret. Earn.						
15,000	+	58,000	−	21,000	=	8,000	+	44,000	NA	−	NA	=	NA	NA

Vernon Manufacturing made the following expenditures on the computerized assembly machine in 2015.

Jan. 2 Added an overdrive mechanism for $6,000 that would improve the overall quality of the performance of the machine but would not extend its life. The salvage value was revised to $3,000.
Aug. 1 Performed routine maintenance, $1,150.
Oct. 2 Replaced some computer chips (considered routine), $950.
Dec. 31 Recognized 2015 depreciation expense.

Required

Record the 2015 transactions in a statements model like the preceding one.

LO 8

CHECK FIGURE
Goodwill Purchased: $130,000

Problem 6-32 *Accounting for intangible assets*

Mia-Tora Company purchased a fast-food restaurant for $1,400,000. The fair market values of the assets purchased were as follows. No liabilities were assumed.

Equipment	$320,000
Land	200,000
Building	650,000
Franchise (5-year life)	100,000

Required

Calculate the amount of goodwill purchased.

LO 8

CHECK FIGURE
Impairment Loss: $40,000

Problem 6-33 *Accounting for goodwill*

Springhill Co. purchased the assets of Canyon Co. for $1,000,000 in 2012. The estimated fair market value of the assets at the purchase date was $920,000. Goodwill of $80,000 was recorded at purchase. In 2013, because of negative publicity, one-half of the goodwill purchased from Canyon Co. was judged to be permanently impaired.

Required

Explain how the recognition of the impairment of the goodwill will affect the 2013 balance sheet, income statement, and statement of cash flows.

LO 9

Problem 6-34 *Performing ratio analysis using real-world data*

Cooper Tire Rubber Company claims to be the fourth largest tire manufacturer in North America. Goodyear Tire & Rubber Company is the largest tire manufacturer in North America. The following information was taken from these companies' December 31, 2007, annual reports. All dollar amounts are in thousands.

	Cooper Tire	Goodyear Tire
Sales	$2,932,575	$19,644,000
Depreciation costs	131,007	610,000
Buildings, machinery, and equipment (net of accumulated depreciation)	949,458	4,383,000
Total assets	2,296,868	17,028,000
Depreciation method	"Straight-line or accelerated"	Straight-line
Estimated life of assets:		
Buildings	10 to 40 years	8 to 45 years
Machinery and equipment	4 to 14 years	3 to 30 years

Required

a. Calculate depreciation costs as a percentage of sales for each company.

b. Calculate buildings, machinery, and equipment as a percentage of total assets for each company.

c. Which company appears to be using its assets most efficiently? Explain your answer.

d. Identify some of the problems a financial analyst encounters when trying to compare the use of long-term assets of Cooper versus Goodyear.

ANALYZE, THINK, COMMUNICATE

ATC 6-1 Business Applications Case *Understanding real-world annual reports*

Required

Use the **Target Corporation**'s annual report in Appendix B to answer the following questions.

a. What method of depreciation does Target use?

b. What types of intangible assets does Target have?

c. What are the estimated lives that Target uses for the various types of long-term assets?

d. As of January 30, 2010, what is the original cost of Target's: Land; Buildings and improvements; and Fixtures and equipment (see the footnotes)?

e. What was Target's depreciation expense and amortization expense for 2009 (see the footnotes)?

ATC 6-2 Group Assignment *Different depreciation methods*

Sweet's Bakery makes cakes, pies, and other pastries that it sells to local grocery stores. The company experienced the following transactions during 2012.

1. Started business by acquiring $60,000 cash from the issue of common stock.

2. Purchased bakery equipment for $46,000 with a four year life and a $6,000 salvage value.

3. Had cash sales in 2012 amounting to $42,000.

4. Paid $8,200 of cash for supplies which were all used during the year to make baked goods.

5. Paid other operating expenses of $12,000 for 2012.

Required

a. Organize the class into two sections and divide each section into groups of three to five students. Assign each section a depreciation method: straight-line or double-declining-balance.

Group Task

Prepare an income statement and a balance sheet using the preceding information and the depreciation method assigned to your group.

Class Discussion

b. Have a representative of each section put its income statement on the board. Are there differences in net income? How will these differences in the amount of depreciation expense change over the life of the equipment?

ATC 6-3 Research Assignment *Comparing Microsoft's and Intel's operational assets*

Companies in different industries often use different proportions of current versus long-term assets to accomplish their business objective. The technology revolution resulting from the silicon microchip has often been led by two well-known companies: **Microsoft** and **Intel**. Although often thought of together, these companies are really very different. Using either the most current Forms 10-K or annual reports for Microsoft Corporation and Intel Corporation, complete the requirements below. To obtain the Forms 10-K, use either the EDGAR system following the instructions in Appendix A or the company's website. Microsoft's annual report is available on its website; Intel's annual report is its Form 10-K.

Required

a. Fill in the missing data in the following table. The percentages must be computed; they are not included in the companies 10-Ks. (*Note:* The percentages for current assets and property, plant, and equipment will not sum to 100.)

	Current Assets	Property, Plant, and Equipment	Total Assets
Microsoft			
Dollar Amount	$	$	$
% of Total Assets	%	%	100%
Intel			
Dollar Amount	$	$	$
% of Total Assets	%	%	100%

b. Briefly explain why these two companies have different percentages of their assets in current assets versus property, plant, and equipment.

ATC 6-4 Writing Assignment *Impact of historical cost on asset presentation on the balance sheet*

Assume that you are examining the balance sheets of two companies and note the following information.

	Company A	Company B
Equipment	$1,130,000	$900,000
Accumulated Depreciation	(730,000)	(500,000)
Book Value	$ 400,000	$400,000

Maxie Smith, a student who has had no accounting courses, remarks that Company A and Company B have the same amount of equipment.

Required

In a short paragraph, explain to Maxie that the two companies do not have equal amounts of equipment. You may want to include in your discussion comments regarding the possible age of each company's equipment, the impact of the historical cost concept on balance sheet information, and the impact of different depreciation methods on book value.

ATC 6-5 Ethical Dilemma *What's an expense?*

Several years ago, Wilson Blowhard founded a communications company. The company became successful and grew by expanding its customer base and acquiring some of its competitors. In fact, most of its growth resulted from acquiring other companies. Mr. Blowhard is adamant about continuing the company's growth and increasing its net worth. To achieve these goals, the business's net income must continue to increase at a rapid pace.

If the company's net worth continues to rise, Mr. Blowhard plans to sell the company and retire. He is, therefore, focused on improving the company's profit any way he can.

In the communications business, companies often use the lines of other communications companies. This line usage is a significant operating expense for Mr. Blowhard's company. Generally accepted accounting principles require operating costs like line use to be expensed as they are incurred each year. Each dollar of line cost reduces net income by a dollar.

After reviewing the company's operations, Mr. Blowhard concluded that the company did not currently need all of the line use it was paying for. It was really paying the owner of the lines

now so that the line use would be available in the future for all of Mr. Blowhard's expected new customers. Mr. Blowhard instructed his accountant to capitalize all of the line cost charges and depreciate them over 10 years. The accountant reluctantly followed Mr. Blowhard's instructions and the company's net income for the current year showed a significant increase over the prior year's net income. Mr. Blowhard had found a way to report continued growth in the company's net income and increase the value of the company.

Required

a. How does Mr. Blowhard's scheme affect the amount of income that the company would otherwise report in its financial statements and how does the scheme affect the company's balance sheet? Explain your answer.

b. Review the AICPA's Articles of Professional Conduct (see Chapter 4) and comment on any of the standards that were violated.

c. Review the fraud triangle discussed in Chapter 4 and comment on the features of the fraud triangle that are evident in this case.