

OBJECTIVES

After reading this chapter, you will be able to:

- 1 Identify the factors involved in depreciation.
- 2 Explain the alternative methods of cost allocation, including time-based and activity-based methods.
- 3 Record depreciation.
- 4 Explain the conceptual issues regarding depreciation methods.
- 5 Understand the disclosure of depreciation.
- 6 Understand additional depreciation methods, including group and composite methods.
- 7 Compute depreciation for partial periods.
- 8 Explain the impairment of property, plant, and equipment.
- 9 Understand depreciation for income tax purposes.
- 10 Explain changes and corrections of depreciation.
- 11 Understand and record depletion.

Depreciation and Depletion

The Financial Effect of Impairments

Accounting for property, plant, and equipment involves many choices that affect the balance sheet and the income statement, but perhaps no choice involving property, plant, and equipment has generated as much regulatory scrutiny as the decision to record asset impairments. Under U.S. accounting standards, companies are required to evaluate their property, plant, and equipment when events or circumstances indicate that an asset may be impaired. For example, in November 2004, **DirecTV** announced that it was taking a \$1.47 billion write-down because of the company's decision to use several new satellites for high-definition TV broadcasting rather than their intended use to deliver Internet service. In DirecTV's third-quarter press release, this write-down was listed as a contributing factor to the company's quarterly loss of \$1.01 billion.

Because impairments produce conservative financial results (income is reduced and asset values lowered), why would asset impairment accounting be a focus of the Securities and Exchange Commission? One concern is that companies often take large



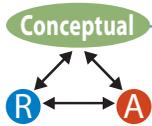
Credit: Associated Press, AP

write-downs to help their future earnings. When an asset impairment charge is taken, there is often very little of the asset's book value left to depreciate in future periods. For example, the book value of the DirecTV satellites was approximately \$1.9 billion prior to the impairment. After the impairment loss, the remaining book value to be depreciated was \$430 million, approximately 23% of the assets' original book value. Given a useful life of 12 to 16 years for satellites, as disclosed in DirecTV's annual report, the asset impairment taken by DirecTV will reduce depreciation expense by approximately \$90 million to \$120 million per year. With financial statement effects of this size, the SEC and investors will certainly take notice.

FOR FURTHER INVESTIGATION

For a discussion of asset impairments, consult the Business & Company Resource Center (BCRC):

- The Perils of Impairment. Daniel Berninger, *Telephony*, 0040-2656, Jan 31, 2005, v245, i2.



In Chapter 10, we described property, plant, and equipment as a group of assets held by a company for use for a period of more than one year. That is, the company acquired the assets for their long-term revenue-generating ability. Since the company uses these assets to earn revenue, the matching principle requires that the company match the expenses of the assets' use against the revenue. Over the life of the asset, the expense is the difference between the purchase price of the asset and its residual value (that is, future selling price).

Depreciation is the process of allocating in a systematic and rational manner this total expense to each period benefited by the asset. Land is not depreciated because it generally does not have a limited life and its residual value usually is higher than its cost. Thus, there is no expense to be recognized over the life of the asset and, therefore, no periodic cost allocation.

Terms used to describe this allocation process depend on the type of asset:

1. **Depreciation** is the allocation of the cost of *tangible assets*, such as property, plant, and equipment.
2. **Depletion** is the allocation of the cost of *natural resource assets*, such as oil, gas, minerals, and timber.
3. **Amortization** is the allocation of the cost of *intangible assets*, such as patents and copyrights. It may be used as a general term to describe the periodic allocation of costs; in that case, it is synonymous with depreciation and depletion.

These three terms all describe the same principle of a company allocating costs to match its expenses with revenue. However, they differ in their application to different types of assets. It is important to note that a company does *not* record depreciation, depletion, and amortization in an attempt to report the fair value of the asset. We discuss depreciation and depletion in this chapter, and the amortization of intangible assets in the next chapter.

FACTORS INVOLVED IN DEPRECIATION

A company considers four factors in the computation of depreciation for a period:

- Asset cost
- Service life
- Residual value
- Method of cost allocation¹

Asset Cost

The cost of an asset includes all the acquisition costs a company incurs to obtain the benefits from the asset. These costs include the contract price plus freight, assembly, installation, and testing costs, as we discussed in Chapter 10.

Service Life

The service life of an asset is the measure of the service units a company expects from the asset before its disposal. Service life may be measured in *units of time*, such as years and months, or *units of activity or output*, such as hours of operation of a machine, tons produced for a steel mill, or miles driven for a truck.

1 Identify the factors involved in depreciation.

1. The service life, residual value, and method of cost allocation are different for income tax purposes under the Modified Accelerated Cost Recovery System (MACRS), as we discuss later in the chapter.

The factors that limit the service life of an asset can be divided into two general categories:

- **Physical causes include wear and tear because of operational use, deterioration and decay that is independent of use but is a function of time (such as rust), and damage and destruction.**
- **Functional causes limit the service life of the asset through obsolescence and inadequacy, even though the physical life is not exhausted.**

Obsolescence is common in a technologically advanced economy when an asset becomes obsolete because of new technology. *Inadequacy* refers to the situation in which an asset is no longer suitable for the size of the company's operations. For example, a warehouse may be physically sound and useful, but too small for the company's operations.

When a company estimates the service life, it should consider all these factors because in many situations the service life is affected by a combination of factors. For example, the service life of a truck is likely to be affected by the passage of time (deterioration, decay, and possibly obsolescence) as well as by the amount of use. In addition, the company may be able to increase or decrease the service life by the amount it spends on repairs and maintenance as well as on improvements and replacements. You will have to rely on others, such as engineers, for advice about such estimates, but will still have to make your own judgment.

Residual Value

The residual (salvage) value is the net amount that a company expects to obtain from disposing of an asset at the end of its service life. It is the expected value of the asset at the end of its service life minus the costs of disposal, such as dismantling, removing, and selling the asset. The service life and the residual value are determined by company policy. A company may plan to hold an asset until it is physically exhausted or functionally obsolete and not useful to anyone else. Then, the expected residual value is the expected scrap value, which is probably very low. Alternatively, a company may plan to dispose of the asset when it still has considerable economic usefulness to others (the service life to the company is less than the physical life). Then, the expected residual value is the estimated net market value of the asset (the selling price less the disposal costs) at the time of the disposal, which may be relatively high. For example, many airlines sell their planes long before the end of their physical lives to replace them with technologically more advanced planes and to avoid passenger resistance to flying in old planes. In some situations, such as a nuclear power plant, the acquisition of an asset automatically creates an obligation related to the retirement of the asset. As we discussed in Chapter 10, a company computes the present value of the obligation and adds the same amount to the cost of the asset.

In practice, because the residual value is difficult to estimate, it often is ignored in computing the depreciation amount, or else a standard rate, such as 10% of original cost, is used. This practice is acceptable if it does not have a material effect on the measurement of income and the book value of the asset.

METHODS OF COST ALLOCATION

Accounting principles require that a company use a method of cost allocation that is "systematic and rational."² *Systematic* means that the calculation should follow a formula and not be determined in an arbitrary manner. *Rational* means that the amount of the depreciation should relate to the benefits that the asset produces in each period.

2 Explain the alternative methods of cost allocation, including time-based and activity-based methods.

2. *Accounting Terminology Bulletin No. 1* (New York: AICPA, 1953), par. 56.

Although these criteria may appear to be very general and to allow numerous methods, only the following methods are used frequently in practice:

1. Time-based methods
 - a. Straight line
 - b. Accelerated (declining charge)
 - (1) Sum of the years' digits
 - (2) Declining balance
2. Activity (or use) methods

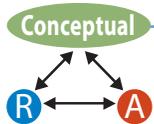
We discuss each of these methods in the following sections, using the data for the Troup Company shown in Example 11-1. **The depreciation base (depreciable cost) of the asset is the cost less the estimated residual value, or \$100,000.** The different depreciation methods all allocate the total of \$100,000 over the expected service life of the asset. However, they differ in the pattern in which the cost is allocated to each year or each unit produced. We discuss additional special depreciation methods later in the chapter.

EXAMPLE 11-1 Asset Information of the Troup Company

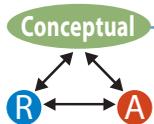
| | |
|--------------------------|-------------------------------------|
| Asset cost | \$120,000 |
| Date of purchase | January 1, 2006 |
| Estimated residual value | \$20,000 |
| Estimated service life | 5 years; 10,000 hours; 20,000 units |

Time-Based Methods

A company should use a time-based method when the service life of the asset is affected primarily by the passage of time and not by the use of the asset. This situation includes the physical causes of deterioration and decay and the functional causes of obsolescence and inadequacy. Two general categories of time-based methods are the straight-line method and the accelerated methods. **The straight-line method is appropriate when a company estimates that the benefits it will derive from the asset will be approximately constant each period of its life.** Since straight-line depreciation is the same each period, the matching principle is satisfied because the company matches, as an expense, an equal cost each period against benefits that are approximately the same each period. The straight-line method is appropriate if maintenance costs are expected to be the same each period. Then the total costs of depreciation and maintenance each period are equal and matched against benefits that are approximately the same each period.



The accelerated (or declining-charge) methods are appropriate when a company estimates that the benefits it will derive from the asset will decline each period. Thus, the accelerated methods match a depreciation cost that declines each period against revenues that also are declining each period. The benefits to be derived from the asset may be measured in physical terms or in dollars of revenue, as we discuss later. The choice of a particular accelerated method is basically arbitrary. This is because, in most situations, the particular declining depreciation amount of each method cannot be matched against the expected pattern of declining revenue. The estimates required cannot be that accurate. Instead, the general principle is that if declining benefits are expected, then an accelerated (declining-charge) method is selected.



Straight Line

The straight-line method allocates an equal cost to each period. For the Troup Company, we show the calculation in Example 11-2. The depreciation base of \$100,000 is allocated equally to the estimated life of five years at the rate of \$20,000 per year. The straight-line depreciation sometimes is expressed as a percentage of original cost

(\$20,000 ÷ \$120,000 = 16.67%) or of depreciable cost (\$20,000 ÷ \$100,000 = 20%). Although widely adopted, the use of the straight-line method may be criticized because it often is used for convenience when an activity method would be more appropriate.

EXAMPLE 11-2 Straight-Line Depreciation

| Year | Book Value of Asset at Beginning of Year | Depreciation | Book Value of Asset at End of Year ^b |
|------|--|-----------------------|---|
| 2006 | \$120,000 | \$20,000 ^a | \$100,000 |
| 2007 | 100,000 | 20,000 | 80,000 |
| 2008 | 80,000 | 20,000 | 60,000 |
| 2009 | 60,000 | 20,000 | 40,000 |
| 2010 | 40,000 | 20,000 | 20,000 |

$$\begin{aligned}
 \text{aDepreciation} &= \frac{\text{Cost} - \text{Residual Value}}{\text{Service Life}} \\
 &= \frac{\$120,000 - \$20,000}{5} \\
 &= \underline{\underline{\$20,000 \text{ per year}}}
 \end{aligned}$$

^b Cost minus depreciation; in 2006, \$120,000 – \$20,000

Sum of the Years' Digits

The sum-of-the-years'-digits method produces declining depreciation each period by applying a declining fraction each year to the depreciation base. The denominator of the fraction is the sum of the years' digits. So, for an asset with a five-year life, the sum is $5 + 4 + 3 + 2 + 1 = 15$.³ The numerator of the fraction is the years' digits taken in reverse order—that is, 5 the first year, 4 the second year, etc. An alternative way of looking at the numerator is that it is the number of years remaining in the asset's life as of the *beginning* of the year. The fractions for the five years of the asset's life are 5/15, 4/15, 3/15, 2/15, and 1/15. We show the calculation of the depreciation for the Troup Company in Example 11-3. Each year, the depreciation declines, and at the end of the fifth year, the book value of the asset is equal to the estimated residual value of \$20,000. Note that in this method, the depreciation base remains constant, while the fraction decreases each year.

EXAMPLE 11-3 Sum-of-the-Years'-Digits Depreciation

| Year | Depreciation Base | Fraction | Depreciation | Book Value of Asset at End of Year* |
|------|-------------------|----------|------------------|-------------------------------------|
| 2006 | \$100,000 | 5/15 | \$ 33,333 | \$86,667 |
| 2007 | 100,000 | 4/15 | 26,667 | 60,000 |
| 2008 | 100,000 | 3/15 | 20,000 | 40,000 |
| 2009 | 100,000 | 2/15 | 13,333 | 26,667 |
| 2010 | 100,000 | 1/15 | 6,667 | 20,000 |
| | | | <u>\$100,000</u> | |

*Cost minus accumulated depreciation; in 2006, \$120,000 – \$33,333

3. The general formula to compute the sum of the years' digits is $n(n + 1)/2$. So, for an asset with a 50-year life, the sum is $50(50 + 1)/2 = 1,275$.

Declining Balance

The declining-balance methods produce a declining depreciation amount each period by applying a *constant* rate to the book value of the asset at the beginning of the period. Note that the periodic depreciation declines because the book value is used and *not* the depreciation base. Also, the residual value is ignored in the calculation of the depreciation each period. However, the asset is not depreciated below the estimated residual value. The constant rate is a function of the straight-line rate. The highest rate that can be used is double the straight-line rate. This rate was established as the highest rate by the income tax regulations and was also adopted as the highest rate for financial reporting. An asset that has a five-year life is depreciated on a straight-line basis at the rate of 20% per year, so the double-declining rate is 40%. However, an alternative rate could be chosen, such as a 150% declining rate, which is 1½ times the straight-line rate or, in this example, 30% per year. We show both alternatives for the Troup Company in Example 11-4.

EXAMPLE 11-4 Declining-Balance Depreciation Methods

(a) Double-Declining-Balance

| Year | Book Value of Asset at Beginning of Year | Rate | Depreciation | Book Value of Asset at End of Year |
|------|--|------|------------------|------------------------------------|
| 2006 | \$120,000 | 40% | \$ 48,000 | \$72,000 |
| 2007 | 72,000 | 40% | 28,800 | 43,200 |
| 2008 | 43,200 | 40% | 17,280 | 25,920 |
| 2009 | 25,920 | — | 5,920 | 20,000 |
| 2010 | 20,000 | — | — | 20,000 |
| | | | <u>\$100,000</u> | |

(b) 150%-Declining-Balance

| Year | Book Value of Asset at Beginning of Year | Rate | Depreciation | Book Value of Asset at End of Year |
|------|--|------|------------------|------------------------------------|
| 2006 | \$120,000 | 30% | \$ 36,000 | \$84,000 |
| 2007 | 84,000 | 30% | 25,200 | 58,800 |
| 2008 | 58,800 | 30% | 17,640 | 41,160 |
| 2009 | 41,160 | 30% | 12,348 | 28,812 |
| 2010 | 28,812 | — | 8,812 | 20,000 |
| | | | <u>\$100,000</u> | |

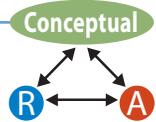
Note the special situations that arise toward the end of the asset's life. Under the double-declining-balance method, the book value at the beginning of 2009 is \$25,920. A strict application of the 40% rate would result in depreciation of \$10,368 ($\$25,920 \times 40\%$). However, this would reduce the book value below the estimated residual value. Therefore, the 2009 depreciation is only \$5,920, which reduces the \$25,920 book value to the \$20,000 residual value, and there is no depreciation in 2010. A similar issue arises under the 150%-declining-balance method. Applying the 30% rate in 2010 would result in depreciation of \$8,643.60 ($\$28,812 \times 30\%$), which would not reduce the book value to the residual value. Consequently, the depreciation in 2010 is \$8,812, which reduces the book value to the \$20,000 residual value.

Many companies avoid these problems by switching from the declining-balance method to the straight-line method during the life of the asset. The change in the

depreciation method might be made at the midpoint of the life of the asset, or when the depreciation under the straight-line method exceeds the declining-balance depreciation. Either method is systematic and rational if the company decides on the policy at the time of purchase and applies it to all assets. In addition, this practice avoids the possible distortion in the depreciation in the last years of the asset's life. The depreciation under this procedure probably will not be materially different from the continued application of the accelerated method.⁴

Activity Methods

A company should use an activity method when the service life of the asset is affected primarily by the amount the asset is used and not by the passage of time. The activity usually is measured in terms of the number of hours worked or the output produced (such as miles driven or tons produced). In the case of the Troup Company, one measure of the life of the asset is estimated to be 10,000 hours of activity. We show the calculation of the depreciation per hour in Example 11-5.



EXAMPLE 11-5 Depreciation Based on Activity

$$\begin{aligned} \text{Depreciation Rate} &= \frac{\text{Cost} - \text{Residual Value}}{\text{Total Lifetime Activity Level}} \\ &= \frac{\$120,000 - \$20,000}{10,000 \text{ hours}} \\ &= \underline{\underline{\$10 \text{ per hour}}} \end{aligned}$$

The depreciation base of \$100,000 is divided by the life of 10,000 hours to derive a depreciation rate of \$10 per hour. The total depreciation for the period is determined by multiplying the depreciation rate by the number of hours the asset is used in the period. For example, if the Troup Company uses the asset for 2,100 hours during 2006, the depreciation for the year is \$21,000 (\$10 × 2,100).

It is important to note that this application of the activity method has produced a constant depreciation rate per *hour*, but one that varies per *unit* of production as the output per hour changes. For example, if the company produces 2 units per hour, the depreciation cost per unit is \$5. If productivity increases so that the company produces 2.5 units per hour, the depreciation cost per unit is \$4, although the depreciation per hour remains at \$10. In contrast, if the activity method is based on the number of *units* expected to be produced over the life of the asset, then a depreciation rate is developed that is constant per *unit* produced but would vary per *hour* as productivity changes. For example, if the depreciation is based on the expected lifetime production of 20,000 units, the depreciation rate is \$5 per unit produced (\$100,000 ÷ 20,000). If productivity

4. Another depreciation method also solves the issue of computing the correct amount of depreciation in the last year of an asset's life. It is the **fixed-percentage-of-declining-balance method**, in which a percentage depreciation rate is calculated that is multiplied by the book value to reduce it to the residual value at the end of the service life. The depreciation rate is calculated as follows:

$$\text{Depreciation Rate} = 1 - n \sqrt[n]{\frac{\text{Residual Value}}{\text{Cost}}}$$

where n is the life of the asset. (The residual value cannot be zero because that makes the fraction zero and the depreciation rate 100%.) The Troup Company would compute the rate as follows:

$$\text{Depreciation Rate} = 1 - 5 \sqrt[5]{\frac{\$20,000}{\$120,000}} = 0.3012$$

This method is rarely used in practice because of its complexity.

increases so that the company produces 2.5 units per hour, the depreciation cost per unit remains at \$5, but the depreciation per hour increases to \$12.50.

Although an activity method is appropriate for many assets because their lives are limited by physical causes, it often is not used because of the difficulty of estimating the lifetime units of activity. Also it would be a costly method to implement because of the need to measure and record the activity level of each asset each period. However, it is the method used for depletion, as we discuss later in the chapter.

1 3

LINK TO RATIO ANALYSIS

While most U.S. companies use straight-line depreciation, they use varying estimates of service lives and residual values, which makes intercompany comparisons much more difficult. However, the required disclosures can be used by analysts to gain insights into a company's property, plant, and equipment. A useful measure that can be computed is the average age of a company's fixed assets. Consider the following data from **Intel's** 2004 annual report.

| (in millions) | 2004 | 2003 |
|--------------------------|---------------|----------|
| Accumulated Depreciation | \$24,065 | \$22,031 |
| Depreciation Expense | 4,590 | 4,651 |
| Depreciation Method | Straight-line | |

Based on this information, the average age of Intel's property, plant, and equipment can be computed as follows:

$$\text{Average Age}_{2004} = \frac{\text{Accumulated Depreciation}}{\text{Depreciation Expense}} = \frac{\$24,065}{\$4,590} = 5.2 \text{ years}$$

$$\text{Average Age}_{2003} = \frac{\text{Accumulated Depreciation}}{\text{Depreciation Expense}} = \frac{\$22,031}{\$4,651} = 4.7 \text{ years}$$

Based on the above analysis, it appears that the average age of Intel's assets has increased slightly during 2004. Analysts may monitor this trend for three reasons. First, the age of a company's assets affects its competitive position since old assets tend to be less efficient than newer assets. Second, the age of assets provides an indication of a company's capital replacement policy and assists analysts in estimating future capital expenditures. Third, all things being equal, a company's return on assets will increase as the company's assets get older, which may affect the company's perceived profitability.

RECORDING DEPRECIATION

3 Record depreciation.



It is important to note that a company may not expense all its depreciation cost in the period. A company includes depreciation on manufacturing assets as a cost of the inventory produced and records the depreciation as an increase (debit) to the Work in Process Inventory account. In other words, the company capitalizes the depreciation to inventory rather than expensing it directly. Costs incurred during the period either remain in the inventory accounts, Work in Process and Finished Goods Inventory, or they are included in Cost of Goods Sold. Only the portion of the total depreciation included in the units sold appears in the company's income statement as part of the cost of goods sold (and not separately as depreciation expense). Consequently, depreciation included in the cost of the units produced but not sold is part of the two inventory accounts on the company's balance sheet. Therefore, when a company sells in the current period units produced in previous periods, its cost of goods sold includes some depreciation cost from previous periods.

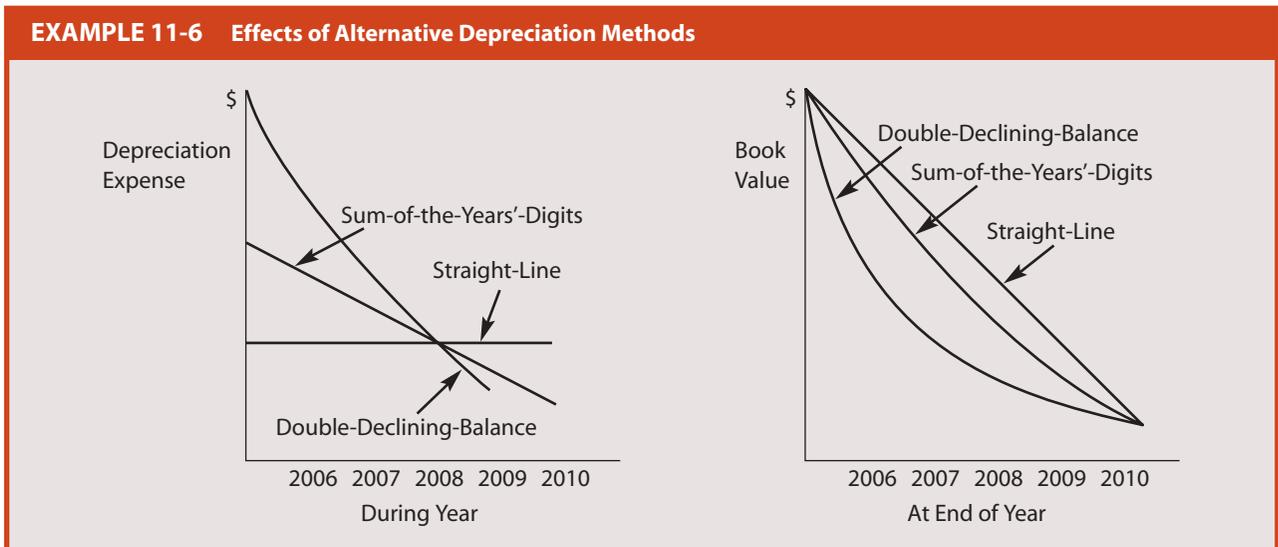
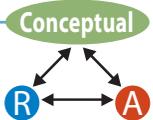
A manufacturing company records depreciation on assets used for its selling, general, and administrative functions as an expense in the period, and includes the total Depreciation Expense each period on its income statement. Similarly, a merchandising company records depreciation on all its assets as an expense each period. Note, however, that many companies choose to disclose their expenses under functional classifications, such as selling, general, and administrative expenses. Therefore, they would not separately report depreciation expense on their income statements. However, the total depreciation expense for the period is a required disclosure.

The credit entry to record depreciation is to a contra-asset account usually called Accumulated Depreciation, or Allowance for Depreciation. A company maintains a separate contra-asset account for each class of assets and should deduct this amount on its balance sheet directly from the cost of that asset class. Alternatively, the company may report the book value on the balance sheet and disclose the cost and accumulated depreciation in the notes to its financial statements. However, many companies combine all the accumulated depreciation amounts and report only the total since this limited disclosure is allowed by GAAP.

CONCEPTUAL EVALUATION OF DEPRECIATION METHODS

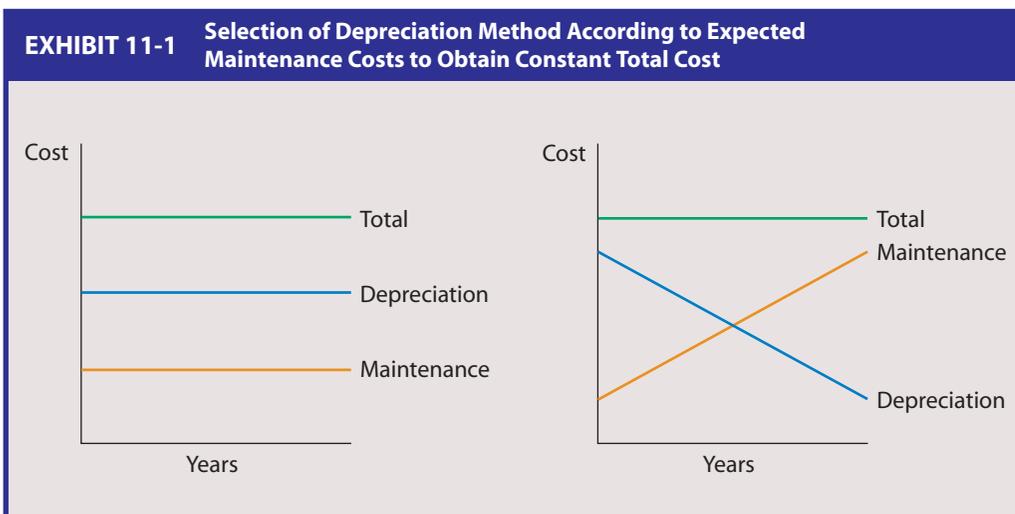
A company may use any of the previously discussed depreciation methods, provided the method relates the allocation of the depreciable cost of the asset to the expected pattern of benefits to be derived from the asset. The choice of a particular method can have a significant impact on a company's income and assets, as you can see by comparing the various depreciation amounts and the book value of the asset computed for the Troup Company. We show these differences in Example 11-6. Use of an inappropriate method has an adverse impact on the measurement of a company's income each year. However, the company's total income over the life of the asset is unaffected because it expenses the same total depreciable cost. For example, if an asset produces equal (or increasing) benefits each year but a company uses an accelerated depreciation method, its income will increase each year of the asset's life (if other factors remain the same each period). This will occur even though there has been no change in the activity each period. The rising income may be misleading to users of the financial statements.

4 Explain the conceptual issues regarding depreciation methods.



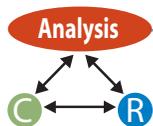
Three additional factors that should be considered when a company selects a depreciation method are repair and maintenance costs, changing prices, and the risk associated with the cash flows from the asset. However, none have been addressed by generally accepted accounting principles. A company should consider the selection of the depreciation

method together with the expected repair and maintenance costs, so that it evaluates the matching of the *total* costs associated with the asset and the benefits derived from the asset. For example, if a company expects that repair and maintenance costs and the total economic benefits of the asset all will remain similar each period, a similar total cost each period can be achieved through straight-line depreciation and the similar repair and maintenance costs. Alternatively, if a company expects increasing repair and maintenance costs, accelerated (declining-charge) depreciation and the increasing repair and maintenance costs each period may produce similar total costs each period. However, repair and maintenance costs would have to increase significantly to offset the decreasing depreciation amounts. We show these two situations in Exhibit 11-1. Alternatively, a company may expect that benefits will decline each year for the life of the asset, and that repair and maintenance costs are constant each period or are not rising as fast as the depreciation is declining. Then, a declining total cost will be achieved by using accelerated (declining-charge) depreciation along with the expected repair and maintenance costs.



Inflation is likely to have a significant effect on the measurement of the benefits, or revenue, over the life of the asset. In selecting a depreciation method, a company should consider whether its benefits are to be measured in terms of current dollars or dollars realized in future periods. Since GAAP is silent on this issue, either alternative is acceptable.

In these periods of rapid technological change, an asset may become obsolete before the end of its originally estimated useful life. Therefore, there is a greater risk associated with the estimated revenues near the end of the life of the asset than for those at the beginning. Use of accelerated depreciation may be appropriate in such situations because the lower depreciation recorded late in the life of the asset reduces the amount of revenues that have to be earned for the asset to be profitable.



A ratio commonly used in financial analysis is the rate of return on total assets, which is defined as (net) income divided by the assets. An unfortunate impact of recording depreciation is that the rate of return on assets increases over time. Refer back to the Troup Company example using straight-line depreciation in Example 11-2. Suppose, in addition, that net income after depreciation and income taxes is \$12,000 per year and that the company owns only this one asset. The rate of return earned by the company increases each year as we show in Example 11-7. (The calculation of the rate of return could also be based on the average of the beginning and ending book values of the asset.) The increase in the rate of return over the life of the asset would be even more dramatic if an accelerated depreciation method were used. As a result of this relationship, a user should always be

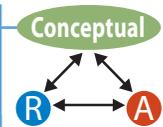
careful when calculating the rate of return during financial statement analysis. Comparison between two companies can be distorted if one company has a newer asset base and hence a lower rate of return. Alternatively, if one company is analyzed over time, its rate of return will increase as its asset base gets older, other things being equal.

EXAMPLE 11-7 Effect of Depreciation on Rate of Return

| Year | Net Income | Book Value of Asset at Beginning of Year | Rate of Return |
|------|------------|--|----------------|
| 2006 | \$12,000 | \$120,000 | 10% |
| 2007 | 12,000 | 100,000 | 12 |
| 2008 | 12,000 | 80,000 | 15 |
| 2009 | 12,000 | 60,000 | 20 |
| 2010 | 12,000 | 40,000 | 30 |

Depreciation is intended only to allocate the cost in a systematic and rational manner. It is *not* an attempt to measure the *fair value* of the asset. The only times that a company should expect to report the fair (market) value of a property, plant, and equipment asset is on the date of acquisition and the date of disposal. Therefore, accounting principles match the cost of the asset against the benefits it produces, rather than an alternative approach of valuing the asset at its fair value. Many users consider the fair value only to be relevant for assets that are held for sale rather than held for use.

Depreciation is *not* recorded in an attempt to provide funds for the replacement of the asset. Over the life of the asset, the total depreciation expense is equal to the depreciable cost. Since depreciation is a tax-deductible expense, there is an income tax savings over the life of the asset. However, the savings is equal only to the tax rate multiplied by the total amount of tax depreciation. Therefore, there will not be sufficient cash saved over the life of the asset to replace it. Also, the purchase of an asset requires that cash be available at the time of the purchase, or that the company be able to obtain the necessary funds by borrowing or selling stock. However, the cash saved in income taxes may have been used to help finance the company's operations and may not be available for asset acquisitions. Also, in times of rising prices, the cost of replacing the asset will be higher than the original cost, so that additional funds will be required for the replacement.



DISCLOSURE OF DEPRECIATION

APB Opinion No. 12 requires the following disclosure requirements for depreciation:

- Depreciation expense for the period
- Balances of major classes of depreciable assets, by nature or function, at the balance sheet date
- Accumulated depreciation, either by major classes of depreciable assets or in total, at the balance sheet date
- A general description of the method or methods used in computing depreciation with respect to major classes of depreciable assets⁵

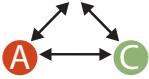
5 Understand the disclosure of depreciation.



5. "Omnibus Opinion—1967," APB Opinion No. 12 (New York: AICPA, 1971), par. 5.

We show the disclosure of these items for **Anheuser-Busch** in Real Report 11-1. The depreciation (and amortization) expense of \$932.7 million in 2004 was disclosed (after adjusting for the amortization expense) in the company's statement of cash flows under the indirect method.

Reporting



Real Report 11-1 Consolidated Balance Sheet

ANHEUSER-BUSCH COMPANIES, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (in part)

Note 1. Summary of Significant Accounting Principles and Policies (in part):

FIXED ASSETS

Fixed assets are carried at original cost less accumulated depreciation, and include expenditures for new facilities as well as those that increase the useful lives of existing facilities. The cost of routine maintenance, repairs and minor renewals is expensed as incurred. Depreciation expense is recognized using the straight-line method based on the following weighted average useful lives: buildings, 25 years; production machinery and equipment, 15 years; furniture and fixtures, 10 years; computer equipment, 3 years. When fixed assets are retired or sold, the book value is eliminated, and any gain or loss on disposition is recognized in cost of sales.

The components of plant and equipment as of December 31 are summarized below (in millions):

| | December 31 | |
|------------------------------|-------------------|-------------------|
| | 2004 | 2003 |
| Land | \$ 278.9 | \$ 278.8 |
| Buildings | 4,750.6 | 4,546.1 |
| Machinery and equipment | 11,907.4 | 11,208.0 |
| Construction in progress | 475.6 | 488.3 |
| Plant and equipment, at cost | 17,412.5 | 16,521.2 |
| Accumulated depreciation | (8,565.1) | (8,022.3) |
| Net plant and equipment | <u>\$ 8,847.4</u> | <u>\$ 8,498.9</u> |

Questions:

1. Why do you think the company selected its depreciation method?
2. What is the estimated average age of Anheuser-Busch's property, plant, and equipment at the end of 2004?

Analysis



We show the relative use of alternative depreciation methods by 600 surveyed companies in Exhibit 11-2. Note that the straight-line method is used by most companies. There are more than 600 responses because many companies use more than one method of depreciation. Even with the current disclosure requirements, the reader of a company's

EXHIBIT 11-2 Use of Alternative Depreciation Methods

| | Number of Companies | | | | | | | |
|--|---------------------|------|------|------|------|------|------|------|
| | 2003 | 2000 | 1997 | 1994 | 1990 | 1986 | 1982 | 1978 |
| Straight-line | 580 | 576 | 578 | 573 | 560 | 561 | 562 | 560 |
| Declining-balance | 22 | 22 | 26 | 27 | 38 | 49 | 57 | 67 |
| Sum-of-the-years'-digits | 5 | 7 | 10 | 9 | 11 | 14 | 20 | 35 |
| Accelerated method, not specified | 41 | 53 | 50 | 49 | 69 | 77 | 69 | 67 |
| Units-of-production | 30 | 34 | 39 | 49 | 50 | 48 | 62 | 44 |

Source: *Accounting Trends and Techniques* (New York: AICPA, 2004, 2001, 1998, 1995, 1991, 1987, 1983 and 1979).

financial statements is not able to evaluate whether the chosen depreciation method(s) is appropriate for the particular assets, but must accept that management and the company's auditors consider the method(s) to be systematic and rational. Nor is the reader able to estimate accurately the effect on income and assets of the use of an alternative depreciation method, which might be useful when comparing the financial activities of two companies using different depreciation methods.



LINK TO INTERNATIONAL DIFFERENCES

International accounting standards for depreciation are essentially the same as those in the United States. However, they only require that depreciation be “systematic,” rather than “systematic and rational.” International standards also require that the estimated useful lives and residual values of the assets, and the depreciation method, be reviewed at least once a year. They also require that companies disclose the accumulated depreciation for each class of asset, not just the total amount as allowed by U.S. standards. Also note that international standards allow a company to write up the value of its property, plant, and equipment assets to fair value, as we discussed in Chapter 10. Such a write-up would affect the amount of depreciation that the company records each period.⁶

ADDITIONAL DEPRECIATION METHODS

Some additional depreciation methods are **group-rate** and **composite-rate** methods, which are used frequently with the straight-line or accelerated methods, and **inventory systems**.⁷

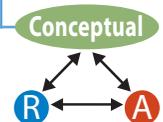
Group and composite depreciation are conceptually similar methods of applying depreciation to more than one asset. Group depreciation is applied to *homogeneous* assets that are expected to have similar service lives and residual values. Composite depreciation is applied to *heterogeneous* assets having some similar characteristics, but are expected to have varying service lives and residual values. Thus, group depreciation would be used for homogeneous assets such as laptops, whereas composite depreciation would be applied to heterogeneous assets such as office machines.

6 Understand additional depreciation methods, including group and composite methods.

Group Depreciation

A company uses group depreciation when it owns a group of homogeneous (similar) assets. Under this method, the company uses the following procedures:

- It capitalizes the assets in one asset account.
- It treats the group as one “asset” for purposes of depreciation.
- It bases the group depreciation rate on the average life of the assets in the group.
- It accumulates the depreciation in a single contra-asset account.
- It calculates the depreciation each period by multiplying this rate by the balance in the asset account.
- When an item in the group is retired, the company does not recognize a gain or loss on that item because the entire “asset” is not retired.



6. For additional discussion see Carrie Bloomer (editor), *The IASC–U.S. Comparison Project: A Report on the Similarities and Differences between IASC Standards and U.S. GAAP*, 2nd ed. (Norwalk, Conn: FASB, 1999).
7. Two other methods, the **compound-interest** and **sinking-fund** methods, are based on present value concepts. They result in an *increasing* depreciation amount and a constant rate of return on the asset each period. They are very rarely used because increasing depreciation each period generally is not considered to satisfy the matching principle.

- It records the retirement of an item in the group by a credit to the asset account for the original cost, and a debit to the accumulated depreciation account for the difference between the cost and the proceeds received.
- It recognizes a total net gain or loss on the group as a whole when the final unit in the group is retired.

Example: Group Depreciation

Suppose that a company purchases 10 cars for \$20,000 each, and the average expected service life is three years with a residual value of \$5,000 each. Of those cars, three are sold after two years for \$8,000 each, five after three years for \$6,000 each, and two after four years for \$4,800 each. The company computes the depreciation rate as follows:

$$\begin{aligned} \text{Depreciation} &= \frac{\text{Cost} - \text{Residual Value}}{\text{Life}} \\ &= \frac{\$200,000 - \$50,000}{3} \\ &= \$50,000 \text{ (or 25\% of the cost of the assets)} \end{aligned}$$

We show the journal entries used to record these events in Example 11-8. Depreciation expense is based on the original estimates, and the rate is not changed by the early retirement of three cars after the second year. No gain or loss is recognized on the retirement at the end of the second and third years. The journal entries in the fourth year (the year of the final retirement) need further explanation. First, the usual procedure in group depreciation is to multiply the asset cost by the group depreciation rate to determine the annual depreciation expense. However, it is a general rule that assets are not depreciated below their residual value. Since the book value of the group asset is \$11,000 (\$40,000 Cars – \$29,000 Accumulated Depreciation) at the beginning of the year and the residual value of the two remaining cars is \$10,000 (2 × \$5,000), the depreciation expense must be \$1,000 in this year. Second, the \$400 loss on the *entire* group is determined by comparing the \$9,600 (2 × \$4,800) proceeds to the \$10,000 book value at the end of the fourth year. ♦

Suppose the company purchases a new asset (i.e., more cars) before the group is retired. In this case, it computes a new depreciation rate by dividing the new depreciation base (book value at the beginning of the period plus the additional cost less the estimated residual value of the group) by the new weighted average of the remaining lives of the assets in the group.

Composite Depreciation

A company may apply composite depreciation to heterogeneous (dissimilar) assets that have somewhat similar characteristics or purposes. It uses similar procedures to group depreciation, as follows:

- The company combines the assets in one asset account and depreciates them accordingly.
- The company uses one accumulated depreciation account.
- The company does not recognize a gain or loss on each item retired.
- The company recognizes a net gain or loss when it retires the final asset.

Example: Composite Depreciation

Suppose that a company purchases three assets with the following characteristics:

| Asset | Cost | Residual Value | Life | Annual Depreciation |
|-------|-----------------|----------------|----------|---------------------|
| A | \$25,000 | \$5,000 | 10 years | \$2,000 |
| B | 13,000 | 1,000 | 6 | 2,000 |
| C | 12,000 | — | 4 | 3,000 |
| | <u>\$50,000</u> | <u>\$6,000</u> | | <u>\$7,000</u> |

EXAMPLE 11-8 Journal Entries for Group Depreciation

| | | | |
|---|--------------------|---------|--|
| 1. To record the purchase: | | | |
| Cars | 200,000 | | |
| Cash | | 200,000 | |
| 2. To record the first year's depreciation expense: | | | |
| Depreciation Expense | 50,000 | | |
| Accumulated Depreciation | | 50,000 | |
| 3. To record the second year's depreciation expense: | | | |
| Depreciation Expense | 50,000 | | |
| Accumulated Depreciation | | 50,000 | |
| 4. To record the disposal of three cars at the end of the second year for \$8,000 each: | | | |
| Cash | 24,000 | | |
| Accumulated Depreciation | 36,000 | | |
| Cars | | 60,000 | |
| 5. To record the third year's depreciation expense: | | | |
| Depreciation Expense [25% × (\$200,000 – \$60,000)] | 35,000 | | |
| Accumulated Depreciation | | 35,000 | |
| 6. To record the disposal of five cars at the end of the third year for \$6,000 each: | | | |
| Cash | 30,000 | | |
| Accumulated Depreciation | 70,000 | | |
| Cars | | 100,000 | |
| 7. To record the depreciation expense for the fourth year, the disposal of two cars at the end of the fourth year for \$4,800 each, and the <i>net</i> gain or loss of the <i>entire</i> group: | | | |
| Depreciation Expense | 1,000 ^a | | |
| Accumulated Depreciation | | 1,000 | |
| Cash | 9,600 | | |
| Accumulated Depreciation | 30,000 | | |
| Loss on Disposal | 400 ^b | | |
| Cars | | 40,000 | |

^a The depreciation expense is the amount needed to reduce the \$11,000 book value (\$40,000 remaining cost minus \$29,000 remaining accumulated depreciation) of the group to the estimated residual value (2 × \$5,000).

^b The loss is equal to the proceeds of \$9,600 (2 × \$4,800) minus the remaining book value of \$10,000 (\$40,000 – \$30,000).

Assuming that the company uses straight-line depreciation, it computes the composite depreciation rate as follows:

$$\text{Depreciation Rate} = \frac{\$7,000}{\$50,000} = 14\%$$

The company computes the depreciation by multiplying 14% by the cost of the assets remaining in service until the book value equals the estimated residual value of \$6,000. If the company purchases another asset, it may include the asset in the group by adding the cost to the asset account. Then it calculates a new composite depreciation rate.

The advantage of both the group and the composite methods is that they simplify a company's record keeping, especially when it acquires a large number of low-cost items. The methods also recognize that depreciation estimates are based on averages and that gains or losses on disposals of single assets are often immaterial. The major disadvantage of the two methods is that faulty estimates might be concealed for long periods. Also, gains and losses may be deferred beyond the period in which they actually occurred. This

is particularly true when heterogeneous assets are combined for the composite depreciation method, and the average life is the result of combining varying individual lives. ♦

Inventory Systems

The inventory (or appraisal) system typically is used in situations where there are large numbers of similar low-cost items, such as tools for a manufacturing company or dishes for a restaurant. The method is similar to a periodic inventory system, in that a cost is assigned to an expense by a physical count at the end of the year. That is, the cost that a company assigns to depreciation is determined by multiplying the physical number of units at the end of the year by the replacement cost. Then, it subtracts that amount from the “inventory” cost at the beginning of the year to determine the depreciation expense. The ending inventory usually is computed as the value (not the cost) of the assets, so that the depreciation becomes a measure of the change in the value of the assets. The method is criticized because it does not result in a systematic and rational allocation of cost, but rather is a measure of the value of the assets. Also, the value assigned to the inventory tends to be less reliable than cost.



SECURE YOUR KNOWLEDGE 11-1

- Depreciation, depletion, and amortization are allocation processes that attempt to match the cost of an asset against the revenue that the asset helps to generate.
- The four factors that must be considered in computing depreciation are:
 - Asset cost—acquisition cost, as discussed in Chapter 10.
 - Service life—the amount of use that the company expects from the asset prior to disposal, measured in units of time or in units of activity.
 - Residual value—the amount that a company expects to receive for an asset at the end of its useful life.
 - Method of cost allocation—must be systematic and rational.
- Time-based depreciation methods result in a depreciation amount that is related to the passage of time.
 - The straight-line method allocates an equal amount of the asset’s depreciable cost to each year of the service life.
 - Accelerated methods (sum-of-the-years’-digits and declining balance) result in periodic depreciation amounts that decline over the asset’s service life.
- Activity-based depreciation methods result in a depreciation rate that is based on estimated usage (e.g., number of hours worked or output produced), and this rate is then multiplied by actual usage to compute the depreciation amount.
- Depreciation on assets used for selling, general, and administrative functions is recorded as a current period expense on the income statement; however, depreciation on manufacturing assets is recorded as part of the cost of inventory.
- While a company selects from acceptable depreciation methods that are systematic and rational, this choice can have a significant impact on a company’s income and assets.
- A company may choose to combine multiple assets into one asset account and use group depreciation (for homogeneous assets) or composite depreciation (for heterogeneous assets) to simplify record keeping.

DEPRECIATION FOR PARTIAL PERIODS

Our discussion so far has assumed that assets are purchased on the first day of the fiscal year and disposed of on the last day. Of course, transactions occur throughout the fiscal year. Also, depreciation could be computed to the nearest day, but such precision is unnecessary, since the calculation of depreciation uses estimates. There are three common alternative policies that companies use to compute depreciation for partial periods.

7 Compute depreciation for partial periods.

Compute Depreciation to the Nearest Whole Month

Under this method, assets purchased on or before the 15th of the month are considered owned for the whole month; assets purchased after the 15th are considered *not* to be owned during the month. Similarly, assets sold on or before the 15th are considered not to be owned for the month; assets sold after the 15th are considered owned for the whole month. Depreciation is based on the fraction of the year the asset is used. When a company uses straight-line depreciation and calculates depreciation for months instead of years, it usually states the denominator of the depreciation calculation as the total months in the estimated service life. This results in a monthly depreciation amount. We show the more complex issues when a company uses accelerated depreciation methods.

Example: Depreciation for Partial Periods

Suppose Vann Company purchases a \$6,000 asset with a three-year life and no residual value on August 18. Thus four months remain in the year. It uses the *sum-of-the-years'-digits depreciation* method over four fiscal years and computes the amounts as follows:

| Fiscal Year | Annual Depreciation by Sum-of-the-Years'-Digits Method | | | Annual Depreciation |
|-------------|--|---|--|---------------------|
| | Months | Computation | | |
| 1 | 4 | $4/12 \times \$3,000$ | | \$1,000 |
| 2 | 12 | $8/12 \times \$3,000 + 4/12 \times \$2,000$ | | 2,667 |
| 3 | 12 | $8/12 \times \$2,000 + 4/12 \times \$1,000$ | | 1,667 |
| 4 | 8 | $8/12 \times \$1,000$ | | 666* |
| | | | | <u>\$6,000</u> |

*Adjusted for \$1 rounding error

If Vann Company use *double-declining depreciation* for partial periods, two alternatives are available. In the first alternative, it can use the double-declining-balance method in the same way as we just described for the sum-of-the-years'-digits method. That is, the depreciation on an annual basis is allocated to each fiscal year on the basis of the number of months. In the second alternative, after computing the depreciation for the first year as described for the first alternative, it can apply the double-declining-balance method by multiplying the book value by the appropriate percentage (66.7%). Using the same example of a \$6,000 asset with a three-year life and no residual value, Vann Company computes the depreciation under the two alternatives as follows:

| Fiscal Year | Annual Depreciation by the Double-Declining-Balance | | | Reported Annual Depreciation |
|----------------------|---|---|--|------------------------------|
| | Months | Computation | | |
| Alternative 1 | | | | |
| 1 | 4 | $4/12 \times \$4,000$ | | \$1,333 |
| 2 | 12 | $8/12 \times \$4,000 + 4/12 \times \$1,333$ | | 3,111 |
| 3 | 12 | $8/12 \times \$1,333 + 4/12 \times \667 | | 1,111 |
| 4 | 8 | $8/12 \times \$667$ | | 445 |
| | | | | <u>\$6,000</u> |
| Alternative 2 | | | | |
| Depreciation Year 1 | | $4/12 \times \$4,000$ | | \$1,333 |
| Depreciation Year 2 | | $0.667^* \times (\$6,000 - \$1,333)$ | | 3,113 |
| Depreciation Year 3 | | $0.667 \times (\$4,667 - \$3,113)$ | | 1,037 |
| Depreciation Year 4 | | Remaining balance | | 517 |
| | | | | <u>\$6,000</u> ♦ |

*Two times straight-line rate = $2 \times 1/3$

Compute Depreciation to the Nearest Whole Year

For this partial depreciation method, exactly the same procedure is used as for the monthly situation, except that six months is used as the cutoff instead of the 15th of the month. That is, assets purchased during the first six months of the year are considered to be owned for the entire year, and assets purchased during the second six months are not depreciated for that year. Using the same example, with straight-line depreciation there is no depreciation in the first fiscal year, since the asset was purchased in the second half of the year. However, a full year's depreciation is recorded in the last year. Under the sum-of-the-years'-digits method, depreciation in the four fiscal years is \$0, \$3,000, \$2,000, and \$1,000, respectively.

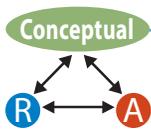
Compute One-Half Year's Depreciation on All Assets Purchased or Sold During the Year

Under this method, all assets purchased or sold during the fiscal year are considered to have been purchased or sold at the midpoint of the year. Therefore, one-half year's depreciation is recorded in all such situations. Using the same example, the depreciation for each fiscal year is computed as follows:

| Fiscal Year | Annual Depreciation by Sum-of-the-Years'-Digits Method | Computation | Reported Annual Depreciation |
|-------------|--|---|------------------------------|
| 1 | \$3,000 | $1/2 \times \$3,000$ | \$1,500 |
| 2 | 2,000 | $1/2 \times \$3,000 + 1/2 \times \$2,000$ | 2,500 |
| 3 | 1,000 | $1/2 \times \$2,000 + 1/2 \times \$1,000$ | 1,500 |
| 4 | — | $1/2 \times \$1,000$ | 500 |
| | <u>\$6,000</u> | | <u>\$6,000</u> |

IMPAIRMENT OF PROPERTY, PLANT, AND EQUIPMENT

8 Explain the impairment of property, plant, and equipment.



Users have been concerned for a long time about the values that a company assigns to its property, plant, and equipment. If the fair value of these noncurrent assets is less than their book value, then the company's past earnings may be overstated (because it did not record sufficient depreciation in prior years). Conservatism would suggest that the company write down these assets and recognize a loss. Also, if a company writes down an asset by too much, then future profits will be overstated (because it would record too little depreciation in future years). **FASB Statement No. 144**⁸ requires that a company review its property, plant, and equipment for impairment whenever events or changes in circumstances indicate that the book value of the property, plant, and equipment may not be recoverable. Examples of such events or changes in circumstances include:

- a significant decrease in the fair value of the asset,
- a significant change in the way the asset is used,
- a significant change in the business or regulatory environment,
- costs of constructing the asset that exceed the planned amount,
- a current period operating loss,
- a negative cash flow from operating activities,
- or an expectation that the asset will more-likely-than-not (i.e., more than 50% chance) be sold or otherwise disposed of before the end of its useful life.

8. "Accounting for the Impairment or Disposal of Long-Lived Assets," *FASB Statement of Financial Accounting Standards No. 144* (Norwalk, Conn.: FASB 2001). Certain assets are excluded from the scope of the *Statement*, including specialized assets in the record, music, broadcasting, and software industries. The *Statement* replaced, but made only minor changes to, *FASB Statement of Financial Accounting Standards No. 121* which was issued in 1995.

After the company identifies that an asset may be impaired, two steps are taken: (1) an impairment test, and (2) measurement of the loss.

Impairment Test

To test for impairment, the company estimates the future net cash flows expected to result from the use of the asset and its eventual sale. If the total expected cash flows (undiscounted) are less than the book value of the asset, the company must recognize an impairment loss. One of the major issues faced by the FASB was asset grouping. That is, does the company test individual assets or large groups of assets? The FASB resolved this issue by requiring that assets be grouped at the lowest level at which identifiable cash flows are largely independent of the cash flows of other groups of assets. (We will use the singular term “asset” to describe the group of assets identified by a company.) If the future cash flows exceed the book value, an impairment loss is *not* recognized, but a review of the company’s depreciation policies may be appropriate.

Measurement of the Loss

The impairment loss for an asset that the company intends to hold and use is the difference between the asset’s book value and its lower fair value.⁹ The fair value is the amount at which the asset could be bought or sold in a current transaction between willing parties. However, quoted market prices will often not be available for the assets covered by *FASB Statement No. 144*. Therefore, fair value may be measured by using the present value method to determine the discounted cash flows (as we discuss in the Time Value of Money Module). The discount rate is the rate of return that the company would require for a similar investment with similar risks. For example, this could be the rate used to evaluate capital budgeting projects.

Recording and Reporting the Loss

When a company recognizes an impairment loss (debit), it writes down the asset (credit) to reduce its book value to the lower fair value (as we show in the example that follows). The company reports the impairment loss on its income statement as part of income from continuing operations and reports the new (reduced) book value on its ending balance sheet. The reduced book value (i.e., fair value) becomes the new “cost” of the asset and is used to compute the depreciation over the remaining life of the asset. Once an asset has been written down, if the fair value later increases, the asset may *not* be written back up.

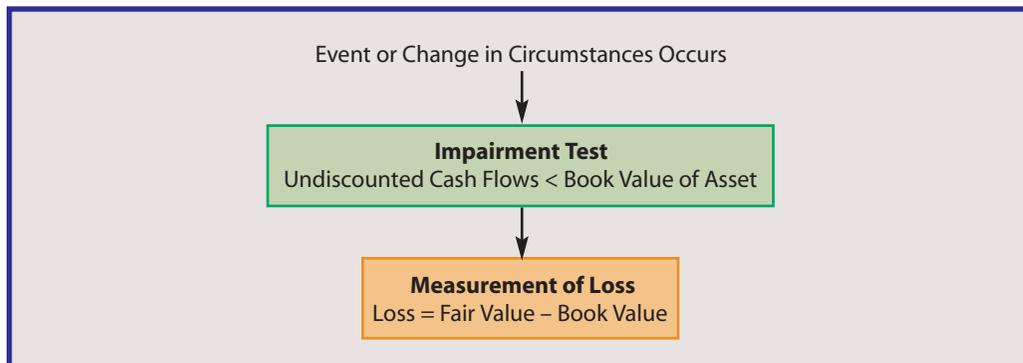


Disclosures

A company must include in its disclosures in the year of the write-down and the next two years (1) a description of the impaired asset and the circumstances leading to the impairment, (2) the amount of the loss, how the asset’s fair value was determined, (3) the income statement caption which includes the loss, and (4) the operating segment affected (if applicable).

9. The *Statement* also discusses the measurement of an impairment loss for an asset that the company *intends to sell*. The asset is reported at the lower of the (1) book value or (2) fair value less the costs to sell. The impairment loss is calculated in the same way as for an asset held for use, except that the estimated selling price less the costs to sell is used instead of the present value of the cash flows (or other measure of fair value). Thus, the GAAP related to an asset the company expects to sell is similar to that we discussed in Chapter 5 for the disposal of a component of a company and we do not discuss it further.

In summary, an impairment loss involves the following steps:



Example: Impairment Loss

Suppose that on January 1, 2004, the Hall Company purchased a factory for \$1 million and machinery for \$3 million. The asset(s) is held for use and not for sale. The company is depreciating the factory over 20 years and the machinery over 10 years, both by the straight-line method, to zero residual values. Late in 2007, because of technological changes in the industry and reduced selling prices for its products, the company believes that its asset(s) may be impaired and will have a remaining useful life of five years. The company combines the factory and machinery as a group because the cash flows from each are not separable and are independent of the company's other activities. To test for impairment, the company estimates that the asset will produce cash inflows of \$700,000 and will incur cash outflows of \$300,000 each year for the next five years. The company tests for impairment and measures the loss as follows:

Impairment Test

December 31, 2007

| | | |
|--|--------------------|---------------------------|
| Factory cost | \$1,000,000 | |
| Less: Accumulated depreciation (4 years × \$50,000) | <u>(200,000)</u> | |
| Book value | | \$ 800,000 |
| Machinery cost | \$3,000,000 | |
| Less: Accumulated depreciation (4 years × \$300,000) | <u>(1,200,000)</u> | |
| Book value | | <u>1,800,000</u> |
| Total Book Value | | <u><u>\$2,600,000</u></u> |

$$\begin{aligned}
 \text{Undiscounted expected net cash flows} &= 5 \text{ years} \times (\$700,000 \text{ cash inflows} - \\
 &\quad \$300,000 \text{ cash outflows}) \\
 &= 5 \times \$400,000 \\
 &= \underline{\underline{\$2,000,000}}
 \end{aligned}$$

Because \$2,000,000 is less than \$2,600,000, the company must recognize an impairment loss.

Since the company is not able to determine the fair value based on the selling price of the factory and machinery, it uses the present value method instead. To apply this method, the company uses a discount rate of 16% (which is the rate of return it uses to evaluate capital budgeting projects). It calculates the impairment loss of \$1,290,282 as follows:

Measurement of the Loss

$$\begin{aligned}
 \text{Present value of the expected net cash flows (fair value)} &= \$400,000 \times 3.274294 \\
 &\quad (n = 5, i = 0.16 \text{ from} \\
 &\quad \text{Table 4 in the Time Value} \\
 &\quad \text{of Money Module}) \\
 &= \underline{\underline{\$1,309,718}} \text{ (rounded)}
 \end{aligned}$$

$$\begin{aligned} \text{Impairment loss} &= \$1,309,718 \text{ fair value} - \$2,600,000 \text{ book value} \\ &= \underline{\underline{\$(1,290,282)}} \end{aligned}$$

Although the *Statement* does not specify how to record the write-down, it does indicate that the reduced book value of the asset is to be accounted for as the new cost. Therefore, we will treat the write-down as a “sale” with an acquisition at the new “cost.” We also assume that the new cost is allocated among the individual assets based on their relative fair values at their original acquisition date. Then the Hall Company records the loss as follows:

| | | |
|--|----------------------------|------------------|
| Loss from Impairment | 1,290,282 | |
| Accumulated Depreciation: Factory | 200,000 | |
| Accumulated Depreciation: Machinery | 1,200,000 | |
| Factory (new cost) | 327,429^a | |
| Machinery (new cost) | 982,289^b | |
| Factory (old cost) | | 1,000,000 |
| Machinery (old cost) | | 3,000,000 |

^a $\$1,309,718 \times [\$1,000,000 \div (\$3,000,000 + \$1,000,000)]$

^b $\$1,309,718 \times [\$3,000,000 \div (\$3,000,000 + \$1,000,000)]$

The company will depreciate the factory and machinery over their remaining useful life of five years. It reports the \$1,290,282 loss in income from continuing operations on its 2007 income statement, and the property, plant, and equipment at a total of \$1,309,718 on its 2007 ending balance sheet. ♦

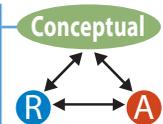


LINK TO ETHICAL DILEMMA

The fortunes of NetWorth, Inc. are in serious jeopardy. Several years ago, NetWorth was the high-technology darling of Wall Street with the business press constantly heaping praises on NetWorth’s innovative business model and solid management team. However, the recession during the last two years and increasing competition has certainly dampened its future prospects. During the last 18 months, NetWorth has reported only one quarterly profit and the Board of Directors is calling for a quick return to profitability. With current quarterly results looking disappointing, the CFO has called on you to perform an extensive analysis of all property, plant, and equipment items in an effort to identify the nonproductive assets and improve operational efficiency. After informing the CFO that preliminary results indicated an impairment loss of almost \$700 million needed to be recognized, you are instructed to increase the impairment amount by \$300 million and record a \$1 billion impairment loss. When you question the increase in the impairment amount, you are told that upper management thought your estimates of the usefulness of the assets were overly optimistic and that they changed several of your estimates, including the discount rate used in measuring the impairment loss. Since the changes resulted in more conservative financial statements, the CFO was sure you would not object. What is your reaction?

Conceptual Evaluation of Asset Impairment

FASB Statement No. 121 first established the impairment rules we just discussed. Although it has been replaced by *FASB Statement No. 144*, the principles it established have only changed slightly. *FASB Statement No. 121* was issued to enhance the usefulness of a company’s financial statements by recognizing the loss when incurred and reporting the fair value of productive assets. This should provide better financial reporting because the asset value reflects the value of the company’s investment. Thus, the information is expected to be more relevant and help users assess the return on investment, operating capability, and risk of the company. The information should also improve comparability across companies.



Although the *Statement* narrows GAAP, it still allows for significant management flexibility. For example, it does not require that assets be tested for impairment on a regular basis, because the FASB concluded that would be too costly. Management will also have some flexibility in deciding which assets to include in, and exclude from, each grouping. Also, estimating future cash flows is very subjective. For example, the company could use current or expected cost and volume information. Furthermore, the discount rate used to value the cash flows is a management choice.

The *Statement* was adopted by a 5-to-2 vote. The dissenters believed that the use of fair value is not appropriate if the asset will continue to be used, because there has not been an exchange transaction. They argued that such use of fair value is a precedent-setting departure from the transaction-based historical cost model (other than for certain investments in marketable securities, as we discuss in Chapter 15). Therefore, the dissenters argued that the asset should be recorded at recoverable cost, either measured on a present value or undiscounted basis. One dissenter also argued that fair value is not relevant and reliable information for property, plant, and equipment that is held and used in the normal course of business. Therefore, the fair value of an impaired asset is also not relevant and reliable. Also the write-down will “guarantee” future profits because of the lower depreciation expense in the future.

Two other concerns were also expressed. First, the cash flows expected by a company from using a specific asset are not necessarily the same as those used to determine the market value of the asset, since the company may use the asset differently from other companies. Therefore, the specific cash flows may not result in a measure of fair value. Second, the test for an impairment may differ for identical assets simply because of the depreciation method (or life) selected by the company. An asset depreciated by an accelerated method will have a lower book value than one depreciated by the straight-line method, and therefore be less likely to meet the impairment test. Even with these concerns, it is hoped that the *Statement* has improved financial reporting. For example, in 2004, **Corning** reported that it would record noncash charges of \$2.8 billion to \$2.9 billion as it reduced the value of the assets in its telecommunication business.



LINK TO INTERNATIONAL DIFFERENCES

Although international accounting standards for the impairment of assets are similar to those of the United States, there are some differences. International standards use the higher of the asset’s net selling price or value in use to determine if an asset is impaired compared to the undiscounted cash flows used in U.S. principles. Typically, this should mean that international companies will recognize impairment losses earlier than U.S. companies. Under international standards, the impairment loss is the difference between the book value and the “trigger” value defined above. Therefore, it is likely that the impairment losses measured under the two sets of principles would be different. Also, international standards allow impairment losses to be reversed, which is not allowed under U.S. standards.

DEPRECIATION AND INCOME TAXES

- 9 Understand depreciation for income tax purposes.

Companies follow different depreciation rules for computing taxable income than for computing income for financial reporting purposes. The use of different methods is appropriate because the purpose of the depreciation methods required by the income tax laws is to stimulate capital investment through the rapid recovery of capital costs. However, the purpose of accounting income is to present fairly the activities of the company over a particular period. Therefore, companies that are *not* required to follow GAAP may use the tax method in their financial statements.

For assets acquired before 1981, depreciation for income tax purposes is based on use of the straight-line, sum-of-the-years’-digits, and declining-balance methods we discussed

earlier. The asset may not be depreciated below the estimated residual value, and the IRS publishes tables that give a range of the estimated lives to use. For assets purchased in the years 1981 through 1986, the Accelerated Cost Recovery System (ACRS) is used. For assets purchased in 1987 and later, ACRS was modified and is known as MACRS.¹⁰ The following discussion is based on these latest rules.

MACRS Principles

For an asset purchased in 1987 or later, a company's computations of depreciation for federal income tax purposes and financial reporting purposes differ in three major respects:

1. A mandated tax life, which is usually shorter than the economic life
2. Acceleration of the cost recovery (except for a building)
3. Elimination of the residual value

Each of these differences tends to cause depreciation early in the life of an asset to be higher for income tax purposes than for financial statement reporting. This results in lowering income taxes payable in those years. Over the life of an asset, the sum of the total depreciation and the gain or loss on disposal for both income tax reporting and financial reporting usually will be the same for both methods. Therefore, a company's taxable income over the asset's life usually will be equal to its income before income taxes reported in its financial statements. However, the transfer of income tax payments from early in the life of the asset to later in the life is desirable when present value concepts are considered. Since MACRS depreciation is so different from the depreciation used in a company's financial statements, we briefly discuss it. You should also note that for income tax reporting a company may use the straight-line method over the mandated tax life instead of MACRS. Refer to the Internal Revenue Code, or an income tax book, for a more detailed and technical discussion.

Shorter Life

The MACRS establishes lives (recovery periods) of 3, 5, 7, 10, 15, 20, 27½ (residential rental buildings), and 39 (commercial buildings) years. Each asset is defined to be in one of the categories, and a company uses that life no matter what economic life it uses for financial reporting purposes.

Acceleration of Cost Recovery

The depreciation is computed based on the *cost* of the asset. The method used depends on the life of the asset mandated by MACRS, as follows:

| Method | MACRS Life (in years) |
|--------------------------|--------------------------|
| Double-declining-balance | 3, 5, 7, 10 |
| 150%-declining-balance | 15, 20 |
| Straight-line | 27½, 39 |

All the depreciation calculations for income tax purposes are based on the half-year convention. That is, a company records depreciation for half a year in the year of acquisition and in the last year of the MACRS life. Therefore, the depreciation for tax purposes is spread over one more tax year than the number of calendar years listed previously. Also, when one of the accelerated methods is used, a change is made to the straight-line

10. Following the terrorist attacks of 9/11/01, Congress enacted a temporary change in the MACRS rules. For assets (other than buildings) placed in service between 9/10/01 and 9/11/04, a company receives a tax deduction of 30% of the cost of the asset and then applies MACRS procedures to the remaining 70%. To assist in the economic recovery, Congress enacted a temporary change in the MACRS rules. For new assets (other than buildings) placed in service between 5/6/03 and 12/31/04, a company receives a tax deduction of 50% of the cost of the asset and then applies MACRS procedures to the remaining 50%. We do not include the effects of these temporary rules in the examples and homework throughout the book.

method in the period in which the straight-line depreciation exceeds the amount calculated under the accelerated method. The IRS has published tables to simplify the application of these methods, as we show in Exhibit 11-3.

| EXHIBIT 11-3 MACRS Depreciation as a Percentage of the Cost of the Asset | | | | | | |
|---|----------------------------|--------|--------|--------|-------|--------|
| Year of Life | Tax Life of Asset in Years | | | | | |
| | 3 | 5 | 7 | 10 | 15 | 20 |
| 1..... | 33.33% | 20.00% | 14.29% | 10.00% | 5.00% | 3.750% |
| 2..... | 44.45 | 32.00 | 24.49 | 18.00 | 9.50 | 7.219 |
| 3..... | 14.81 | 19.20 | 17.49 | 14.40 | 8.55 | 6.677 |
| 4..... | 7.41 | 11.52 | 12.49 | 11.52 | 7.70 | 6.177 |
| 5..... | | 11.52 | 8.93 | 9.22 | 6.93 | 5.713 |
| 6..... | | 5.76 | 8.92 | 7.37 | 6.23 | 5.285 |
| 7..... | | | 8.93 | 6.55 | 5.90 | 4.888 |
| 8..... | | | 4.46 | 6.55 | 5.90 | 4.522 |
| 9..... | | | | 6.56 | 5.91 | 4.462 |
| 10..... | | | | 6.55 | 5.90 | 4.461 |
| 11..... | | | | 3.28 | 5.91 | 4.462 |
| 12..... | | | | | 5.90 | 4.461 |
| 13..... | | | | | 5.91 | 4.462 |
| 14..... | | | | | 5.90 | 4.461 |
| 15..... | | | | | 5.91 | 4.462 |
| 16..... | | | | | 2.95 | 4.461 |
| 17..... | | | | | | 4.462 |
| 18..... | | | | | | 4.461 |
| 19..... | | | | | | 4.462 |
| 20..... | | | | | | 4.461 |
| 21..... | | | | | | 2.231 |

Residual Value

The residual value is *not* considered when the MACRS system is used, and so the asset is depreciated to a zero value at the end of its MACRS life. However, the entire proceeds from the disposal of the asset will be taxable since the entire value received will be a gain.

Example: MACRS

To show the use of the MACRS system and the differences from the calculation of depreciation for financial reporting, consider the following facts for an asset purchased by the Melville Company on January 1, 2006:

| | |
|--|-----------------------------|
| Cost | \$200,000 |
| Estimated economic life | 8 years |
| Estimated residual value | \$20,000 |
| Depreciation method for financial statements | Straight-line |
| MACRS life | 5 years |
| MACRS method | 200% declining balance |
| Disposal | \$15,000 on January 3, 2014 |

The company computes the MACRS depreciation using the rates from Exhibit 11-3 as follows:

| | | |
|-------|----------------------------|------------------|
| 2006: | $\$200,000 \times 20\%$ | = \$ 40,000 |
| 2007: | $\$200,000 \times 32\%$ | = \$ 64,000 |
| 2008: | $\$200,000 \times 19.20\%$ | = \$ 38,400 |
| 2009: | $\$200,000 \times 11.52\%$ | = \$ 23,040 |
| 2010: | $\$200,000 \times 11.52\%$ | = \$ 23,040 |
| 2011: | $\$200,000 \times 5.76\%$ | = \$ 11,520 |
| | | <u>\$200,000</u> |

Note that the total depreciation deductions on the company's income tax returns for 2006 through 2011 are \$200,000. Thus, the MACRS depreciation recovers the total cost of the asset on an accelerated basis and ignores any residual value. Also note that the MACRS depreciation is spread over six tax years, even though the tax life is five years. This is because of the half-year MACRS convention. Therefore, the MACRS depreciation is zero in 2012 and 2013. The taxable gain in 2014 when the asset is sold is \$15,000, since the company has depreciated the asset to a zero residual value. Therefore, the total effect on its taxable income for the years 2006 through 2013 is \$185,000 (\$200,000 – \$15,000).

The depreciation for financial reporting purposes is \$22,500 $[(\$200,000 - \$20,000) \div 8]$ for each of the eight years of the asset's economic life from 2006 through 2013. The loss on disposal in 2014 is \$5,000 (\$20,000 book value – \$15,000 proceeds). The total effect on the company's income before income taxes for the years 2006 through 2013 in its income statement is \$185,000 (\$180,000 + \$5,000), which is the same as the total effect on taxable income. The different amounts of depreciation for income tax reporting and financial reporting in each year result in temporary differences, which require interperiod tax allocation, as we discuss in Chapter 19. ♦



10 Explain changes and corrections of depreciation.



CHANGES AND CORRECTIONS OF DEPRECIATION

FASB statement No. 154, which we discuss more fully in Chapter 23, describes how a company may make each of the various changes in and corrections of depreciation for the following situations:

1. A change in an estimate of the residual value or the service life of a currently owned asset is accounted for prospectively. The company allocates the undepreciated cost of the asset at the beginning of the year of the change over the new remaining life, considering the new residual value. We include an example (using depletion) in the next section of the chapter.
2. A change in the depreciation method for currently owned assets is also accounted for prospectively. A company may change its depreciation method because of a change in the estimated future benefits expected from the asset. In this case, the company allocates the undepreciated cost of the asset at the beginning of the year over the remaining life (considering the residual value) using the new depreciation method. This change is called a change in accounting estimate that is effected by a change in accounting principle.¹¹
3. A correction of an error in depreciation is accounted for as a prior period restatement. The effect on the current period's financial statements involves a correction to the amount in the accumulated depreciation account and an adjustment to retained earnings (net of income taxes) for the amount of the error in previously reported net income. The company's previous financial statements are also corrected (restated). We show this reporting in Chapters 5 and 17, and more fully in Chapter 23, and it is consistent with the requirements of FASB Statement No. 154.

DEPLETION

11 Understand and record depletion.

Depletion is the allocation of the depletable cost for the use of a natural resource (wasting asset) to the periods in which benefits are received. It is the same concept as depreciation, but the different term is used for natural resources. Examples of such resources are oil, gas, minerals, timber, and gravel.

A company determines the recorded cost of natural resources by the same principles used for property, plant, and equipment. It is possible that there will be extensive reclamation costs. In this case the company would report a liability and add the same amount to the cost of the asset, as we discussed in Chapter 10.

A company usually records depletion using an activity method. The activity measure is the number of units of the resource that the company expects to extract over the life of the asset. A unit depletion rate is calculated as follows:

$$\text{Unit Depletion Rate} = \frac{\text{Cost} - \text{Residual Value}}{\text{Units}}$$

To determine the actual depletion for a period, the unit depletion rate is multiplied by the actual production for that period.

Example: Coal Mine Depletion

Suppose that the Reggio Company purchases land for \$3,000,000 from which it expects to extract 1,000,000 tons of coal, the estimated residual value is \$200,000, and it mines

11. If a company has a policy of switching depreciation methods at a specific point in the service life of an asset, this is *not* considered to be a change in accounting estimate that is effected by a change in accounting principle.

80,000 tons of coal in the first year. It calculates the depletion for that year as follows:

$$\begin{aligned}\text{Unit Depletion Rate} &= \frac{\$3,000,000 - \$200,000}{1,000,000 \text{ tons}} \\ &= \underline{\underline{\$2.80 \text{ per ton}}}\end{aligned}$$

$$\begin{aligned}\text{Depletion for Year} &= \$2.80 \times 80,000 \text{ tons} \\ &= \underline{\underline{\$224,000}}\end{aligned}$$

Reggio Company typically makes the journal entry to record the depletion directly to an inventory account. The reason for this is so that the cost is included in Cost of Goods Sold for the units that are sold and in ending inventory for the units on hand at the end of the period. The credit is made either to Accumulated Depletion or directly to the asset account because disclosure of the accumulated depletion amount is not required by GAAP. However, this disclosure is required by the SEC.

The nature of natural resources is such that additional capital expenditures may be made in future periods. In addition, the estimation of the remaining number of units is often uncertain and therefore subject to revision based on new geological information. When additional capital expenditures are incurred or estimates are revised, a new depletion rate is calculated. The new depletion rate is based on the current book value of the asset (including the additional capital expenditures), the new estimate of the residual value, and the new estimate of the remaining units as of the beginning of the year. ♦

Example: Revised Estimate Continuing the preceding example, suppose that at the beginning of the second year of operation of the coal mine, a new estimate indicates that the mine has a capacity to produce another 1,600,000 tons (for a lifetime production of 1,680,000 tons). The Reggio Company computes a new unit depletion rate as follows:

$$\begin{aligned}\text{Unit Depletion Rate} &= \frac{\text{Book Value} - \text{Residual Value}}{\text{Remaining Units}} \\ &= \frac{(\$3,000,000 - \$224,000) - \$200,000}{1,600,000} \\ &= \underline{\underline{\$1.61 \text{ per ton}}}\end{aligned}$$

The company uses the new unit depletion rate to compute each year's depletion until it makes new estimates and calculates another depletion rate. ♦

The cost of a natural resource asset may include certain tangible assets, such as buildings and roads on the site of a mine. Since the useful life of the tangible assets is limited by the life of the mine, a company depreciates their cost on the basis of the same activity method as it uses for the mine. Of course, if other improvements have a life shorter than the expected life of the mine, the company depreciates them over their expected economic lives.

Depletion for income tax purposes involves a different concept than for financial reporting. A company can deduct as depletion expense either the **cost depletion** just shown (based on the units sold) or **percentage depletion**. Under percentage (or **statutory**) depletion, the company deducts a stated percentage of gross income as depletion expense. This percentage varies, depending on the type of natural resource, from a minimum of 5% to a maximum of 22%. Also, the total depletion over the life of the asset for income tax purposes may exceed the cost of the asset less the expected residual value. Therefore, most companies use percentage depletion for income tax purposes and cost depletion for financial reporting. The percentage depletion in excess of cost depletion results in a permanent tax difference, as we discuss in Chapter 19.



SECURE YOUR KNOWLEDGE 11-2

- When assets are not purchased or disposed of on the first or last day of the fiscal year, depreciation may be allocated to the partial periods by:
 - Computing depreciation to the nearest whole month,
 - Computing depreciation to the nearest whole year, or
 - Computing one-half year's depreciation on all assets purchased or sold during the year.
- When the book value of property, plant, and equipment may not be recoverable, a company should:
 - Determine if an impairment exists by comparing the undiscounted cash flows to the book value of the asset, and
 - If an impairment has occurred, measure and record the impairment loss as the difference between the book value of the asset and the fair value of the asset.
- For income tax reporting, a company uses the Modified Accelerated Cost Recovery System (MACRS), an accelerated depreciation method in which assets are placed in defined recovery periods (useful lives) and depreciation is determined by applying predetermined depreciation rates to the cost of the asset. Alternatively, it may use the straight-line depreciation method.
- A change in depreciation method (e.g., straight-line to accelerated method) or any change in the estimates used to compute depreciation (e.g., residual value, service life) are accounted for prospectively.
- A correction of an error in depreciation is accounted for as a prior period restatement.
- Depletion of the cost of a natural resource is recorded using the activity method with the journal entry typically made directly to an inventory account.

SUMMARY

At the beginning of the chapter, we identified several objectives you would accomplish after reading the chapter. The objectives are listed below, each followed by a brief summary of the key points in the chapter discussion.

1. **Identify the factors involved in depreciation.** To record depreciation, a company considers the asset cost, its service life, its residual value, and the method of cost allocation.
2. **Explain the alternative methods of cost allocation, including time-based and activity-based methods.** Accounting principles require that the method of cost allocation be systematic and rational. The available methods include time-based methods, including straight-line, sum of the years' digits, and declining balance, and activity (or use) methods.
3. **Record depreciation.** A company includes depreciation on manufacturing assets as a cost of the inventory produced and records the depreciation as an increase to the Work in Process Inventory account. Depreciation on the remaining assets is expensed in the period.
4. **Explain the conceptual issues regarding depreciation methods.** The choice of a depreciation method has an impact on a company's income measurement and asset valuation. The method should be chosen so that it matches the cost of the asset against the benefits the asset produces. Additional factors that should be considered are repair and maintenance costs, changing prices, and the risk associated with the cash flows from the asset. Also, the rate of return on the asset increases as it ages.
5. **Understand the disclosure of depreciation.** A company is required to disclose depreciation expense for the period, balances of major classes depreciable assets by nature or function, accumulated depreciation either by major classes or in total, and a general description of the method or methods used in computing depreciation.
6. **Understand additional depreciation methods, including group and composite depreciation.** Group depreciation is used for homogeneous assets, whereas composite depreciation is used for heterogeneous assets. In both cases the individual assets are capitalized in one asset account and this asset is treated as a single asset for depreciation. A gain or loss on disposal is only recognized when the final individual asset is disposed of.

7. **Compute depreciation for partial periods.** Depreciation may be computed to the nearest whole month or to the nearest whole year. Alternatively, one-half year's depreciation may be computed on all assets purchased or sold during the year.
8. **Explain the impairment of property, plant, and equipment.** A company must review its property, plant, and equipment for impairment whenever events or changes in circumstances indicate the book value of the asset may not be recoverable. If the total expected cash flows (undiscounted) are less than the book value of the asset, an impairment loss is recognized. The impairment loss is the difference between the asset's book value and its lower fair value.
9. **Understand depreciation for income tax purposes.** Depreciation for income tax purposes uses the Modified Accelerated Cost Recovery System (MACRS). MACRS usually involves a shorter life, an accelerated method (except for buildings), and does not recognize a residual value.
10. **Explain changes and corrections of depreciation.** A change in an estimate of the residual value or the service life of a currently owned asset is accounted for prospectively. A change in the depreciation method for currently owned assets is accounted for prospectively. Adoption of a new depreciation method for newly acquired assets must be disclosed in the notes to the financial statements. A correction of an error in depreciation is treated as a prior period restatement.
11. **Understand and record depletion.** Depletion is the allocation of the depletable cost for the consumption of a natural resource asset to the periods in which the benefits are received. A company normally records depletion using an activity method.

ANSWERS TO REAL REPORT QUESTIONS

Real Report 11-1 Answers

1. Straight-line depreciation is the most widely used and easily understood of all the depreciation methods. The straight-line method tends to produce higher income and stockholders' equity amounts compared with the accelerated methods. Furthermore, many of Anheuser-Busch's fixed assets (land, buildings, machinery, and equipment) may provide benefits evenly over time, which is consistent with the results of the straight-line method. Additionally, any benefit derived from using an alternative depreciation method may not exceed the increased costs associated with that method. Finally, while Anheuser-Busch may use the straight-line method for financial reporting purposes, it is still free to use the IRS's modified accelerated cost recovery system (an accelerated method that would produce a higher amount of depreciation expense and lower taxable income relative to the straight-line method) for tax purposes.
2. The average age of Anheuser-Busch's property, plant, and equipment can be estimated by dividing accumulated depreciation by the annual depreciation expense. For Anheuser-Busch, the average age of its property, plant, and equipment at the end of 2004 is 9.2 years ($\$8,565.1 \div \932.7).

QUESTIONS

- Q11-1** Distinguish among the use of the terms *depreciation*, *depletion*, and *amortization*.
- Q11-2** Briefly explain the meaning of the four factors that are involved in the computation of a company's periodic charge for depreciation.
- Q11-3** What is the *depreciation base*?
- Q11-4** What is the objective of accounting for depreciation?
- Q11-5** Explain how recording depreciation affects a company's (a) income statement, (b) balance sheet, and (c) statement of cash flows.
- Q11-6** Does recording depreciation generate funds for the replacement of the asset? Explain.
- Q11-7** Under what circumstances is depreciation a fixed cost or a variable cost?
- Q11-8** What are the primary causes of depreciation? For each cause, indicate which depreciation method may be most appropriate. Would it be desirable to require all companies to use the same method?
- Q11-9** Under what circumstances are accelerated methods of depreciation most appropriate?
- Q11-10** Compare the group and composite methods of depreciation.
- Q11-11** Under what circumstances is an asset's depreciation amount not included in total in a company's current income statement?

Q11-12 In a year in which the cost of replacing an asset rises, should a company record depreciation for that asset? Why?

Q11-13 A company should use an accelerated depreciation method because of the large decline in the value of an asset early in its life. Evaluate this statement.

Q11-14 The manager of a utility stated that since its transmission lines are kept in good condition by regular repairs and maintenance and their efficiency remains constant, the lines do not depreciate. Do you agree with this statement?

Q11-15 What disclosures of depreciation are required in a company's financial statements and the accompanying notes?

Q11-16 Why might depreciation on a company's financial statements be different from depreciation the company computed for income tax purposes?

Q11-17 How does a company's depletion for income tax purposes vary from its depletion for financial reporting purposes?

MULTIPLE CHOICE (AICPA Adapted)

Select the best answer for each of the following.

M11-1 A method that excludes residual value from the base for the depreciation calculation is

- a. Straight-line c. Double-declining-balance
b. Sum-of-the-years'-digits d. Productive-output

Items 2 through 4 are based on the following information:

Vorst Corporation's schedule of depreciable assets at December 31, 2007 was as follows:

| Asset | Cost | Accumulated Depreciation | Acquisition Date | Residual Value |
|-------|------------------|--------------------------|------------------|-----------------|
| A | \$ 100,000 | \$ 64,000 | 2006 | \$20,000 |
| B | 55,000 | 36,000 | 2005 | 10,000 |
| C | 70,000 | 33,600 | 2005 | 14,000 |
| | <u>\$225,000</u> | <u>\$133,600</u> | | <u>\$44,000</u> |

Vorst takes a full year's depreciation expense in the year of an asset's acquisition, and no depreciation expense in the year of an asset's disposition. The estimated useful life of each depreciable asset is five years.

M11-2 Vorst depreciates asset A on the double-declining-balance method. How much depreciation expense should Vorst record in 2008 for asset A?

- a. \$32,000 c. \$14,400
b. \$25,600 d. \$6,400

M11-3 Using the same depreciation method as used in 2005, 2006, and 2007, how much depreciation expense should Vorst record in 2008 for asset B?

- a. \$6,000 c. \$11,000
b. \$9,000 d. \$12,000

M11-4 Vorst depreciates asset C by the straight-line method. On June 30, 2008, Vorst sold asset C for \$28,000 cash. How much gain (loss) should Vorst record in 2008 on the disposal of asset C?

- a. \$2,800 c. (\$5,600)
b. (\$2,800) d. (\$8,400)

M11-5 The composite depreciation method

- a. Is applied to a group of homogeneous assets
b. Is an accelerated method of depreciation
c. Does not recognize gain or loss on the retirement of single assets in the group
d. Excludes residual value from the base of the depreciation calculation

M11-6 On July 1, 2006, Mundo Corporation purchased factory equipment for \$50,000. Residual value was estimated at \$2,000. The equipment will be depreciated over 10 years using the double-declining-balance method. Counting the year of acquisition as one-half year, Mundo should record 2007 depreciation expense of

- a. \$7,680 c. \$9,600
b. \$9,000 d. \$10,000

M11-7 A fixed asset with a five-year estimated useful life is sold during the second year. How would the use of the straight-line method of depreciation instead of the double-declining-balance method of depreciation affect the amount of gain or loss on the sale of the fixed asset?

| | Gain | Loss |
|----|-----------|-----------|
| a. | No effect | No effect |
| b. | No effect | Increase |
| c. | Decrease | Increase |
| d. | Increase | Decrease |

M11-8 Crowder Company acquired a tract of land containing an extractable natural resource. Crowder is required by the purchase contract to restore the land to a condition suitable for recreational use after it has extracted the natural resource. Geological surveys estimate that the recoverable reserves will be 5,000,000 tons and that the land will have a value of \$1,000,000 after restoration. Relevant cost information follows:

| | |
|-----------------------------|-------------|
| Land | \$9,000,000 |
| Estimated restoration costs | 1,500,000 |

The company expects that the machine could be used for 10 years, after which the salvage value would be zero. However, Reveille, Inc. intends to use the machine only eight years, after which it expects to be able to sell it for \$9,800. The invoice for Machine #204 was paid April 10, 2007. The number of units produced in 2007 and 2008 were 23,200 and 29,000, respectively. Reveille computes depreciation to the nearest whole month.

Required

Compute the depreciation for the years indicated, using the following methods (round your answer to the nearest dollar):

- 2007: Units of production
- 2008: Sum-of-the-years'-digits method (*Contributed by Norma C. Powell*)

E11-4 Depreciation Methods The Nickle Company purchased an asset for \$17,000 on January 2, 2007. The asset has an expected residual value of \$1,000. The depreciation expense for 2007 and 2008 is shown next for three alternative depreciation methods:

| Year | Method A | Method B | Method C |
|------|----------|----------|----------|
| 2007 | \$4,000 | \$6,400 | \$6,375 |
| 2008 | 4,000 | 4,800 | 3,984 |

Required

- Which depreciation method is the company using in each example?
- Compute the depreciation expense for 2009 and 2010 under each method.

E11-5 Depreciation and Rate of Return The Burrell Company purchased a machine for \$20,000 on January 2, 2007. The machine has an estimated service life of five years and a zero estimated residual value. The asset earns income before depreciation and income taxes of \$10,000 each year. The tax rate is 30%.

Required

Compute the rate of return earned (on the average net asset value) by the company each year of the asset's life under the straight-line and the double-declining-balance depreciation methods. Assume that the machine is the company's only asset.

E11-6 Determination of Acquisition Cost On January 1, 2006, the Emming Corporation purchased some machinery. The machinery has an estimated life of 10 years and an estimated residual value of \$5,000. The depreciation on this machinery was \$20,000 in 2008.

Required

Compute the acquisition cost of the equipment under the following depreciation methods:

- Straight-line
- Sum-of-the-years'-digits
- Double-declining-balance

E11-7 Group Depreciation The Loban Company purchased four cars for \$9,000 each, and expects that they would be sold in three years for \$1,500 each. The company uses group depreciation on a straight-line basis.

Required

- Prepare journal entries to record the acquisition and the first year's depreciation.
- If one of the cars is sold at the beginning of the second year for \$7,000, what journal entry is required?

E11-8 Composite Depreciation The Wilcox Company acquires four machines that have the following characteristics:

| Machine | Cost | Estimated Residual Value | Estimated Service Life |
|---------|----------|--------------------------|------------------------|
| A | \$26,000 | \$2,000 | 6 years |
| B | 19,000 | 1,000 | 9 |
| C | 30,000 | 5,000 | 5 |
| D | 28,000 | — | 7 |

Required

- Prepare journal entries to record the acquisition and the first year's depreciation, assuming that the composite method is used on a straight-line basis.
- If the company sells machine B after four years for \$10,000, prepare the journal entry.
- What arguments may be used to support the composite depreciation method?

E11-9 AICPA Adapted Depreciation On January 2, 2007, Lapar Corporation purchased a machine for \$50,000. Lapar paid shipping expenses of \$500, as well as installation costs of \$1,200. The company estimated that the machine

would have a useful life of 10 years and a salvage value of \$3,000. In January 2008, the company made additions costing \$3,600 to the machine in order to comply with pollution-control ordinances. These additions neither prolonged the life of the machine nor increased the salvage value.

Required

If Lapar records depreciation under the straight-line method, how much is the depreciation expense for 2008?

E11-10 Partial Periods On May 10, 2007, the Horan Company purchased equipment for \$25,000. The equipment has an estimated service life of five years and zero residual value. Assume that straight-line depreciation is used.

Required

Compute the depreciation for 2007 for each of the following four alternatives:

1. The company computes depreciation to the nearest day. (Use 12 months of 30 days each.)
2. The company computes depreciation to the nearest month. Assets purchased in the first half of the month are considered owned for the whole month.
3. The company computes depreciation to the nearest whole year. Assets purchased in the first half of the year are considered owned for the whole year.
4. The company records one-half year's depreciation on all assets purchased during the year.

E11-11 Asset Impairment On January 1, 2003, the Vallahara Company purchased machinery for \$650,000 which it installed in a rented factory. It is depreciating the machinery over 12 years by the straight-line method to a residual value of \$50,000. Late in 2007, because of increasing competition in the industry, the company believes that its asset may be impaired and will have a remaining useful life of five years, over which it estimates the asset will produce total cash inflows of \$1,000,000 and will incur total cash outflows of \$825,000. The cash flows are independent of the company's other activities and will occur evenly each year. The company is not able to determine the fair value based on a current selling price of the machinery. The company's discount rate is 10%.

Required

1. Prepare schedules to determine whether, at the end of 2007, the machinery is impaired and, if so, the impairment loss to be recognized.
2. If the machinery is impaired, prepare the journal entry to record the impairment.

E11-12 Depreciation for Financial Statements and Income Tax Purposes The Dinkle Company purchased equipment for \$50,000. The equipment has an estimated residual value of \$5,000 and an expected useful life of 10 years. The company uses straight-line depreciation for its financial statements.

Required

What is the difference between the company's income before taxes reported on its financial statements and the taxable income reported on its tax return in each of the first two years of the asset's life if the asset was purchased on January 2, 2007 and its MACRS life is five years?

E11-13 Changes and Corrections of Depreciation The Bailand Company purchased a building for \$210,000 that had an estimated residual value of \$10,000 and an estimated service life of 10 years. The company purchased the building four years ago, and has used straight-line depreciation. At the beginning of the fifth year (before it records depreciation for the year), the following *independent* situations occur:

1. The company estimates that the asset has 8 years' life remaining (for a total of 12 years).
2. The company changes to the sum-of-the-years'-digits method
3. The company discovers that the estimated residual value has been ignored in the computation of the depreciation.

Required

For each of the independent situations, prepare all the journal entries relating to the building for the fifth year. Ignore income taxes.

E11-14 Depletion The Feller Company purchased a site for a limestone quarry for \$100,000 on January 2, 2007. It estimates that the quarry will yield 400,000 tons of limestone. It estimates that its retirement obligation has a fair value of \$20,000, after which the land could be sold for \$10,000. In 2007, 80,000 tons were quarried and 60,000 tons sold. Costs of production (excluding depletion) are \$4 per ton.

Required

1. Compute the depletion cost per ton.
2. Compute the total cost of the inventory at December 31, 2007.
3. Compute the total cost of goods sold for 2007.

E11-15 AICPA Adapted Depletion The Lorton Company acquired land containing coal. Lorton will restore the land to a condition suitable for recreational use after it has extracted the coal. Geological surveys estimate that the recoverable reserves will be 4,000,000 tons and that the land will have a value of \$1 million after restoration. Relevant cost information follows:

| | |
|---|--------------|
| Land | \$12,000,000 |
| Estimated fair value of retirement obligation | 1,200,000 |

Required

If Lorton maintains no inventories of coal, what is the depletion expense per ton of coal?

PROBLEMS

P11-1 Depreciation Methods The Winsey Company purchased equipment on January 2, 2007 for \$700,000. The equipment has the following characteristics:

| | | | |
|------------------------|-------------------------|--------------------------|----------|
| Estimated service life | 20 years | Estimated residual value | \$50,000 |
| | 100,000 hours | | |
| | 950,000 units of output | | |

During 2007 and 2008, the company used the machine for 4,500 and 5,500 hours, respectively, and produced 40,000 and 60,000 units, respectively.

Required 

Compute the depreciation for 2007 and 2008 under each of the following methods:

1. Straight-line
2. Hours worked
3. Units of output
4. Sum-of-the-years'-digits
5. Double-declining-balance
6. 150%-declining-balance
7. Compute the company's return on assets (net income divided by average total assets, as discussed in Chapter 6) for each method for 2007 and 2008, assuming that income before depreciation is \$100,000. For simplicity, use ending assets, and ignore interest, income taxes, and other assets.

P11-2 Depreciation Methods The Lord Company purchased a machine on January 2, 2007 for \$70,000. The machine had an expected residual value of \$10,000, an expected life of eight years or 24,000 hours, and a capacity to produce 100,000 units. During 2007, the company produced 12,000 units in 2,500 hours. In 2008, the company produced 15,000 units in 3,000 hours.

Required 

Prepare a schedule showing the depreciation for 2007 and 2008 and the book value of the asset at the end of 2007 and 2008 for each of the following methods:

1. Straight-line
2. Hours worked
3. Units of output

P11-3 Depreciation Methods The Sayers Company purchased a building for \$250,000 on January 2, 2007. The building has an expected residual value of \$20,000 at the end of its expected life of 20 years.

Required

Prepare a schedule showing the depreciation for 2007 and 2008 and the book value on December 31, 2007 and December 31, 2008 for each of the following methods:

1. Straight-line
2. Sum-of-the-years'-digits
3. Double-declining-balance

4. 150%-declining-balance
5. Compute the company's return on assets (net income divided by average total assets, as discussed in Chapter 6) for each method in 2007 and 2008 assuming that income before depreciation is \$50,000. For simplicity, use ending assets, and ignore interest, income taxes, and other assets. Why does the rate of return increase each year?

P11-4 Fixed Percentage of Declining Balance The Tubbs Company purchased a machine for \$8,000 that has an estimated residual value of \$1,000 and a life of three years.

Required

1. Compute the depreciation rate under the fixed-percentage-of-the-declining-balance method.
2. Compute the depreciation for each year of the asset's life.

P11-5 Changing Depreciation The Kam Company purchased a machine on January 2, 2007 for \$20,000. The machine had an expected life of eight years and a residual value of \$300. The double-declining-balance method of depreciation is used.

Required

1. Compute the depreciation for each year of the asset's life.
2. Assuming that the company has a policy of always changing to the straight-line method at the midpoint of the asset's life, compute the depreciation for each year of the asset's life.
3. Assuming that the company always changes to the straight-line method at the beginning of the year when the annual straight-line amount exceeds the double-declining-balance amount, compute the depreciation for each year of the asset's life.

P11-6 Cost of Asset and Depreciation Method The Heist Company purchased a machine on January 2, 2007 and uses the 150%-declining-balance depreciation method. The machine has an expected life of 10 years and an expected residual value of \$5,000. The following costs relate to the acquisition and use of the machine during the first year of its operations:

| | | | |
|-------------------------------|----------|--|---------|
| Invoice price | \$50,000 | Testing | \$1,100 |
| Discounts available and taken | 1,000 | Normal spoilage of materials during the year | 750 |
| Freight | 700 | Abnormal spoilage of materials during the year | 250 |
| Installation | 900 | Wages of machine operator | 15,000 |

Required

Compute the depreciation expense for 2007 and 2008.

P11-7 Depreciation and Partial Periods The following assets are owned by the Dinnell Company:

| | Asset | | |
|---------------------|---------------|--------------------------|--------------------------|
| | A | B | C |
| Year purchased | 2005 | 2006 | 2007 |
| Cost | \$20,000 | \$40,000 | \$100,000 |
| Expected life | 5 years | 8 years | 10 years |
| Residual value | \$2,000 | — | \$10,000 |
| Depreciation method | Straight-line | Sum-of-the-years'-digits | Double-declining-balance |

In the year of acquisition and retirement of an asset, the company records depreciation for one-half year. During 2008, asset A was sold for \$7,000.

Required

Prepare the journal entries to record depreciation on each asset for 2005 through 2008 and the sale of asset A.

P11-8 Group and Composite Depreciation The Cheadle Company purchased a fleet of 20 delivery trucks for \$8,000 each on January 2, 2007. It decided to use composite depreciation on a straight-line basis, and calculated the depreciation from the following schedule:

| Year | Number of Trucks to Be Retired at Year-End | Estimated Residual Value per Truck |
|------|--|---------------------------------------|
| 2008 | 2 | \$4,000 |
| 2009 | 6 | 4,000 |
| 2010 | 8 | 2,000 |
| 2011 | 4 | — |

The company actually retired the trucks according to the following schedule (assume each truck was retired at the beginning of the year):

| Year | Number of Trucks Retired | Total Proceeds from Retirements |
|------|--------------------------|---------------------------------|
| 2008 | 1 | \$ 4,000 |
| 2009 | 3 | 11,000 |
| 2010 | 6 | 19,000 |
| 2011 | 5 | 6,000 |
| 2012 | 3 | 4,000 |
| 2013 | 2 | 1,000 |

Required

1. Prepare the journal entries necessary to record the preceding events.
2. Assume that the company expected all the trucks to last four years and be retired for \$1,600 each. Using group depreciation, prepare journal entries for all six years, assuming the company retired the trucks as shown by the latter schedule.

P11-9 Composite Depreciation The Borrell Company purchased four delivery trucks on January 2, 2007 for \$22,000 each. The company expected two of the trucks to last five years and have a residual value of \$3,500 each. The other two trucks had an expected life of eight years and no residual value. The company uses straight-line depreciation on a composite basis.

Required

Prepare journal entries to record the following events:

1. January 1, 2009. One of the two trucks expected to last five years is destroyed in an accident. The truck was not insured and the scrap value is \$400.
2. January 5, 2009. A new truck is acquired for \$26,000. It has an expected life of four years and a residual value of \$3,920.
3. Depreciation expense for 2009.

P11-10 Asset Impairment On January 1, 2002, the Borstad Company purchased a factory for \$180,000 and machinery for \$1 million. It is depreciating the factory over 30 years and the machinery over 20 years, both by the straight-line method to zero residual values. Late in 2007, because of technological changes in the industry and reduced selling prices for its products, the company believes that its asset(s) may be impaired and will have a remaining useful life of eight years. The cash flows from the factory and machinery are not separable, and are independent of the company's other activities. The company estimates that the asset will produce cash inflows of \$400,000 and will incur cash outflows of \$295,000 each year for the next 8 years. It is not able to determine the fair value of the asset based on a current selling price of the factory and machinery. The company's discount rate is 12%.

Required

1. Prepare schedules to determine whether, at the end of 2007, the machinery is impaired and, if so, the impairment loss to be recognized.
2. Prepare the journal entry to record the impairment.
3. How would your answer to Requirement 1 change if the discount rate was 16% and the cash flows were expected to continue for 6 years?
4. How would your answer change if management planned to implement efficiencies that would save \$10,000 each year?

P11-11 Depreciation for Financial Statements and Income Tax Purposes The Hunter Company purchased a light truck on January 2, 2007 for \$18,000. The truck, which will be used for deliveries, has the following characteristics:

Estimated life: 5 years

Estimated residual value: \$3,000

Depreciation for financial statements: straight-line

Depreciation for income tax purposes: MACRS (three-year-life)

From 2007 through 2011, each year, the company had sales of \$100,000, cost of goods sold of \$60,000, and operating expenses (excluding depreciation) of \$15,000. The truck was disposed of on December 31, 2011 for \$2,000.

Required

1. Prepare an income statement for financial reporting through pretax accounting income for each of the five years, 2007 through 2011.
2. Prepare, instead, an income statement for income tax purposes through taxable income for each of the five years, 2007 through 2011.
3. Compare the total income for all five years under Requirement 1 and Requirement 2.

P11-12 Depletion On January 2, 2007, the Whistler Company purchased land for \$450,000, from which it is estimated that 400,000 tons of ore could be extracted. It estimates that it will cost \$80,000 to restore the land, after which it could be sold for \$30,000.

During 2007, the company mined 80,000 tons and sold 50,000 tons. During 2008, the company mined 100,000 tons and sold 120,000 tons. At the beginning of 2009, the company spent an additional \$100,000, which increased the reserves by 60,000 tons. In 2009, the company mined 140,000 tons and sold 130,000 tons. The company uses a FIFO cost flow assumption.

Required

1. Calculate the depletion included in the income statement and ending inventory for 2007, 2008, and 2009.
2. Prepare the natural resources section of the balance sheet on December 31, 2007, 2008, and 2009, assuming that an accumulated depletion account is used.

P11-13 Depletion On July 1, 2007, the Amplex Company purchased a coal mine for \$2 million. The estimated capacity of the mine was 800,000 tons. During 2007, the company mines 10,000 tons of coal per month and sells 9,000 tons per month. The selling price is \$30 per ton and production costs (excluding depletion and depreciation) are \$8 per ton. At the end of the mine's life, it is expected that it will cost \$300,000 to restore the land, after which it can be sold for \$100,000. The company also purchased some temporary housing for the miners at a cost of \$170,000. The housing has an expected life of 10 years but is expected to be sold for \$10,000 at the end of the mine's life. The company uses the FIFO cost flow assumption.

Required

1. Compute the company's expenses included on the 2007 income statement.
2. Compute the cost of the company's inventory at December 31, 2007.
3. In January 2008 a new estimate indicated that the capacity of the mine was only 500,000 tons at that time. Compute the company's expenses included on the 2008 income statement if the company mines and sells 10,000 tons per month.

P11-14 Changes and Corrections of Depreciation During 2007, the controller of the Ryel Company asked you to prepare correcting journal entries for the following three situations:

1. Machine A was purchased for \$50,000 on January 1, 2002. Straight-line depreciation has been recorded for five years, and the Accumulated Depreciation account has a balance of \$25,000. The estimated residual value remains at \$5,000, but the service life is now estimated to be one year longer than estimated originally.
2. Machine B was purchased for \$40,000 on January 1, 2005. It had an estimated residual value of \$5,000 and an estimated service life of 10 years. It has been depreciated under the double-declining-balance method for two years. Now, at the beginning of the third year, Ryel has decided to change to the straight-line method.
3. Machine C was purchased for \$20,000 on January 1, 2006. Double-declining-balance depreciation has been recorded for one year. The estimated residual value of the machine is \$2,000 and the estimated service life is five years. The computation of the depreciation erroneously included the estimated residual value.

Required

Prepare any necessary correcting journal entries for each situation. Also prepare the journal entry necessary for each situation to record the depreciation for 2007. (Assume that the debit is to Depreciation Expense.)

P11-15 AICPA Adapted Adjusting Entries You are engaged in the examination of the financial statements of the Madle Corporation for the year ended December 31, 2007. The schedules for the property, plant, and equipment and the related accumulated depreciation accounts that follow have been prepared by the client. You have checked the opening balances to your prior year's audit workpapers. Your examination reveals the following information:

1. All equipment is depreciated on the straight-line basis (no salvage value taken into consideration) using the following estimated lives: buildings 25 years, all other items 10 years. The company's policy is to take one-half year's depreciation on all asset acquisitions and disposals during the year.
2. The company completed the construction of a wing on the plant building on June 30. The useful life of the building was not extended by this addition. The lowest construction bid received was \$17,500, the amount recorded in the Buildings account. Company personnel were used to construct the addition at a cost of \$16,000 (materials \$7,500, labor \$5,500, and overhead \$3,000).
3. On August 18, \$5,000 was paid for paving and fencing a portion of land owned by the company and used as a parking lot for employees. The expenditure was capitalized to the Land account.
4. The amount shown in the Machinery and Equipment asset retirement column represents cash received on September 4 upon disposal of a machine purchased four years ago in July for \$48,000. The bookkeeper recorded depreciation expense of \$3,500 on this machine in 2007.
5. Sydney City donated land and building appraised at \$10,000 and \$40,000, respectively, to the Madle Corporation for a plant. On September 1, the company began operating the plant. Because no costs were involved, the bookkeeper made no entry to record the transaction.

MADLE CORP.
Analysis of Property, Plant, and Equipment, and of
Related Accumulated Depreciation Accounts
Year Ended December 31, 2007

| Description | Final 12/31/06 | Additions | Retirements | Per Books 12/31/07 |
|---------------------------|-------------------|-----------------|-----------------|-----------------------|
| Assets: | | | | |
| Land | \$ 22,500 | \$ 5,000 | — | \$ 27,500 |
| Buildings | 120,000 | 17,500 | — | 137,500 |
| Machinery and Equipment | 385,000 | 40,400 | \$26,000 | 399,400 |
| | <u>\$527,500</u> | <u>\$62,900</u> | <u>\$26,000</u> | <u>\$564,400</u> |
| Accumulated Depreciation: | | | | |
| Buildings | \$ 60,000 | \$ 5,150* | | \$ 65,150 |
| Machinery and Equipment | 173,250 | 39,220* | | 212,470 |
| | <u>\$233,250</u> | <u>\$44,370</u> | | <u>\$277,620</u> |

*Depreciation expenses for the year

Required

Prepare the formal journal entries that you would suggest at December 31, 2007 to adjust the accounts for the transactions noted previously. Disregard income tax implications. The books have not been closed. Computations should be rounded off to the nearest dollar.

P11-16 Comprehensive On December 31, 2007, the Vail Company owned the following assets:

| Asset | Date of Purchase | Cost | Accumulated Depreciation | Life in Years | Residual Value |
|------------------|---------------------|----------|-----------------------------|------------------|-------------------|
| Building | 1/1/2005 | \$50,000 | \$ 3,750 ^a | 40 | \$ 0 |
| Office machinery | 1/1/2005 | 20,000 | 9,760 ^b | 10 | 2,000 |
| Office fixtures | 1/1/2005 | 30,000 | 20,000 ^c | 5 | 5,000 |

a. Straight-line depreciation

b. Double-declining-balance depreciation

c. Sum-of-the-years'-digits depreciation

The company computes depreciation and amortization expense to the nearest whole year. During 2008, the company engaged in the following transactions:

- Jan. 3 Extended the building at a cost of \$30,000. The extension provided an addition to the service potential of the building.
- Mar. 7 Sold a piece of office machinery that had originally cost \$4,000 and that had accumulated depreciation of \$1,952 on December 31, 2007. The machine was sold for \$3,000.
- Apr. 28 Obtained a patent on an invention by paying \$7,000. The company expected that the patent would provide protection against competition for 10 years.
- May 16 Purchased office fixtures and office machinery for \$9,200. The supplier reduced the price because of the joint purchase. If purchased separately, the office fixtures would have cost \$6,000 and the office machinery \$4,000. Delivery costs paid by Vail were \$200. The machinery was accidentally damaged during installation and cost \$230 to repair. The office fixtures have an estimated life of five years and a residual value of \$250. The office machinery has an estimated life of 10 years and a residual value of \$500.
- Aug. 10 Exchanged the president's desk (classified as office fixtures) for a larger desk belonging to a friend of the president. The desk had cost \$600 and had accumulated depreciation on December 31, 2007 of \$400 and an estimated residual value of \$100. The new desk had a value of \$900 and \$700 cash was paid.
- Oct. 20 Serviced and adjusted the office machinery at a cost of \$125.

Required

1. Check the accuracy of the accumulated depreciation balances at December 31, 2007. (Round to the nearest whole dollar in all requirements.)
2. Prepare journal entries to record the preceding events in 2008, as well as the year-end recording of depreciation expense.
3. Prepare an Accumulated Depreciation account for each category of assets, enter the beginning balance, post the journal entries from Requirement 2, and compute the ending balance.

P11-17 AICPA Adapted Comprehensive On January 2, 2007, Brock Corporation purchased a tract of land (site number 101) with a building for \$600,000. Additionally, Brock paid a real estate broker's commission of \$36,000, legal fees

of \$6,000, and title guarantee insurance of \$18,000. The closing statement indicated that the land value was \$500,000 and the building value was \$100,000. Shortly after acquisition, the building was razed at a cost of \$75,000.

Brock entered into a \$3,000,000 fixed-price contract with Barnett Builders, Inc. on March 2, 2007 for the construction of an office building on land site number 101. The building was completed and occupied on September 30, 2008. Additional construction costs were incurred as follows:

| | |
|---|----------|
| Plans, specifications, and blueprints | \$12,000 |
| Architects' fees for design and supervision | 95,000 |

The company estimates that the building will have a 40-year life from date of completion and decides to use the 150%-declining-balance depreciation method.

To finance the construction cost, Brock borrowed \$3,000,000 on March 2, 2007. The loan is payable in 10 annual installments of \$300,000 plus interest at the rate of 14%. Brock's average amounts of accumulated building construction expenditures were as follows:

| | |
|--|------------|
| For the period March 2 to December 31, 2007 | \$ 900,000 |
| For the period January 1 to September 30, 2008 | 2,300,000 |

Required

1. Prepare a schedule that discloses the individual costs making up the balance in the Land account with respect to land site number 101 as of September 30, 2008.
2. Prepare a schedule that discloses the individual costs that the company should capitalize in the Office Building account as of September 30, 2008. Show supporting computations in good form.
3. Prepare a schedule showing the depreciation expense computation of the office building for the year ended December 31, 2008.

P11-18 AICPA Adapted Comprehensive Logan Corporation, a manufacturer of steel products, began operations on October 1, 2006. The accounting department of Logan has started the fixed asset and depreciation schedule shown as follows:

| Assets | Acquisition Date | Cost | Salvage | Depreciation Method | Estimated Life in Years | Depreciation Expense | |
|-------------------|--------------------|-------------------|----------|--------------------------|-------------------------|------------------------------|----------|
| | | | | | | Year Ended September 30 2007 | 2008 |
| Land A | October 1, 2006 | (1) ___ | N/A* | N/A | N/A | N/A | N/A |
| Building A | October 1, 2006 | (2) ___ | \$47,500 | Straight line | (3) ___ | \$14,000 | (4) ___ |
| Land B | October 3, 2006 | (5) ___ | N/A | N/A | N/A | N/A | N/A |
| Building B | Under construction | \$210,000 to date | — | Straight line | 30 | — | (6) ___ |
| Donated equipment | October 3, 2006 | (7) ___ | 2,000 | 150% declining balance | 10 | (8) ___ | (9) ___ |
| Machinery A | October 3, 2006 | (10) ___ | 5,500 | Sum of the years' digits | 10 | (11) ___ | (12) ___ |
| Machinery B | October 1, 2007 | (13) ___ | — | Straight line | 15 | — | (14) ___ |

* "N/A" means "not applicable"

You have been asked to assist in completing this schedule. In addition to ascertaining that the data already on the schedule are correct, you have obtained the following information from the company's records and personnel:

1. Depreciation is computed from the first of the month of acquisition to the first of the month of disposition.
2. Land A and building A were acquired from a predecessor corporation. Logan paid \$812,500 for the land and building together. At the time of acquisition, the land had an appraised value of \$72,000 and the building had an appraised value of \$828,000.
3. Land B was acquired on October 3, 2006 in exchange for 3,000 newly issued shares of Logan's common stock. At the date of acquisition, the stock had a par value of \$5 per share and a fair value of \$25 per share. During October 2006, Logan paid \$10,400 to demolish an existing building on this land so that it could construct a new building.
4. Construction of building B on the newly acquired land began on October 2, 2007. By September 30, 2008 Logan had paid \$210,000 of the estimated total construction costs of \$300,000. Estimated completion and occupancy are July 2009.
5. Certain equipment was donated to the corporation by a local university. An independent appraisal of the equipment when donated placed the fair value at \$16,000 and the salvage at \$2,000.

- Machinery A's total cost of \$110,000 includes installation expense of \$550 and normal repairs and maintenance of \$11,000. Salvage value is estimated at \$5,500. Machinery A was sold on February 1, 2008.
- On October 1, 2007, machinery B was acquired with a down payment of \$4,000 and the remaining payments to be made in ten annual installments of \$4,000 each beginning October 1, 2008. The prevailing interest rate was 10%. The data that follow were abstracted from present value tables:

| Present Value of \$1.00 at 10% | | Present Value of Annuity of \$1.00 in Arrears at 10% | |
|--------------------------------|-------|--|-------|
| 10 years | 0.386 | 10 years | 6.145 |
| 11 years | 0.350 | 11 years | 6.495 |
| 15 years | 0.239 | 15 years | 7.606 |

Required

For each numbered item in the schedule, supply the correct amount next to the corresponding number. Round each answer to the nearest dollar. Show supporting computations in good form.

P11-19 Errors Soon after December 31, 2007 the auditor requested a depreciation schedule for trucks of the Jarrett Trucking Company, showing the additions, retirements, depreciation, and other data affecting the income of the company in the four-year period 2004 to 2007, inclusive. The following data were in the truck account as of January 1, 2004:

| | | |
|-------------------------|---------------------------|-----------------|
| Truck no. 1 | Purchased January 1, 2001 | \$12,000 |
| Truck no. 2 | Purchased July 1, 2001 | 10,400 |
| Truck no. 3 | Purchased January 1, 2003 | 12,800 |
| Truck no. 4 | Purchased July 1, 2003 | <u>15,000</u> |
| Balance January 1, 2004 | | <u>\$50,200</u> |

The Accumulated Depreciation—Trucks account, previously adjusted to January 1, 2004 and duly entered in the ledger, had a balance on that date of \$16,460. This amount represented the straight-line depreciation on the four trucks from the respective dates of purchase, based on a five-year life and no residual value. No debits had been made to this account prior to January 1, 2004.

Transactions between January 1, 2004 and December 31, 2007 and their record in the ledger were as follows:

- July 1, 2004: Truck no. 1 was sold for \$1,000 cash. The entry was a debit to Cash and a credit to Trucks, \$1,000.
- January 1, 2005: Truck no. 3 was traded for a larger one (no. 5) with a five-year life. The agreed purchase price was \$12,000. The Jarrett Company paid the other company \$1,780 cash on the transaction. The entry was a debit to Trucks, \$1,780, and a credit to Cash, \$1,780.
- July 1, 2006: Truck no. 4 was damaged in a wreck to such an extent that it was sold as junk for \$50 cash. Jarrett Company received \$950 from the insurance company. The entry made by the bookkeeper was a debit to Cash, \$1,000, and credits to Miscellaneous Revenue, \$50, and Trucks, \$950.
- July 1, 2006: A new truck (no. 6) was acquired for \$20,000 cash and debited at that amount to the Trucks account. The truck has a five-year life.

Entries for depreciation had been made at the close of each year as follows: 2004, \$8,840; 2005, \$5,436; 2006, \$4,896; 2007, \$4,356.

Required

- For each of the four years, calculate separately the increase or decrease in earnings arising from the company's errors in determining or entering depreciation or in recording transactions affecting trucks.
- Prove your work by one compound journal entry as of December 31, 2007; the adjustment of the Trucks account is to reflect the correct balances, assuming that the books have not been closed for 2007.

P11-20 AICPA Adapted Comprehensive Information for Blake Corporation's property, plant, and equipment for 2007 is:

| Account Balances at January 1, 2007 | | |
|-------------------------------------|------------|-----------|
| | Debit | Credit |
| Land | \$ 150,000 | |
| Building | 1,200,000 | |
| Accumulated depreciation | | \$263,100 |
| Machinery and equipment | 900,000 | |
| Accumulated depreciation | | 250,000 |
| Automotive equipment | 115,000 | |
| Accumulated depreciation | | 84,600 |

Depreciation Method and Useful Life

Building: 150%-declining-balance; 25 years.

Machinery and equipment: Straight-line; 10 years.

Automotive equipment: Sum-of-the-years'-digits; 4 years.

Leasehold improvements: Straight-line.

The residual value of the depreciable assets is immaterial.

Depreciation is computed to the nearest month.

Transactions during 2007 and other information were as follows:

- On January 2, 2007, Blake purchased a new car for \$10,000 cash and a trade-in of a two-year-old car with a cost of \$9,000 and a book value of \$2,700. The new car has a cash price of \$12,000; the market value of the trade-in is not known.
- On April 1, 2007, a machine purchased for \$23,000 on April 1, 2002 was destroyed by fire. Blake recovered \$15,500 from its insurance company.
- On May 1, 2007, costs of \$168,000 were incurred to improve leased office premises. The leasehold improvements have a useful life of eight years. The related lease, which terminates on December 31, 2013, is renewable for an additional six-year term. The decision to renew will be made in 2013 based on office space needs at that time.
- On July 1, 2007, machinery and equipment were purchased at a total invoice cost of \$280,000; additional costs of \$5,000 for freight and \$25,000 for installation were incurred.
- Blake determined that the automotive equipment comprising the \$115,000 balance at January 1, 2007 would have been depreciated at a total amount of \$18,000 for the year ended December 31, 2007.

Required

- For each asset classification, prepare schedules showing depreciation and amortization expense, and accumulated depreciation and amortization that would appear on Blake's income statement for the year ended December 31, 2007 and on the balance sheet at December 31, 2007, respectively.
- Prepare a schedule showing the gain or loss from disposal of assets that would appear in Blake's income statement for the year ended December 31, 2007.
- Prepare the property, plant, and equipment section of Blake's December 31, 2007 balance sheet.

P11-21 AICPA Adapted Comprehensive The Plant Asset and Accumulated Depreciation accounts of Pell Corporation had the following balances at December 31, 2006:

| | Plant Asset | Accumulated Depreciation |
|-------------------------|----------------|-----------------------------|
| Land | \$ 350,000 | \$ — |
| Land improvements | 180,000 | 45,000 |
| Building | 1,500,000 | 350,000 |
| Machinery and equipment | 1,158,000 | 405,000 |
| Automobiles | 150,000 | 112,000 |

Depreciation method and useful lives:

- Land improvements: Straight-line; 15 years.
- Building: 150%-declining-balance; 20 years.
- Machinery and equipment: Straight-line; 10 years.
- Automobiles: 150%-declining-balance; 3 years.
- Depreciation is computed to the nearest month. No salvage values are recognized.

Transactions during 2007:

- On January 2, 2007, machinery and equipment were purchased at a total invoice cost of \$260,000, which included a \$5,500 charge for freight. Installation costs of \$27,000 were incurred.
- On March 31, 2007, a machine purchased for \$58,000 on January 3, 2003 was sold for \$36,500.
- On May 1, 2007, expenditures of \$50,000 were made to repave parking lots at Pell's plant location. The work was necessitated by damage caused by severe winter weather.
- On November 2, 2007, Pell acquired a tract of land with an existing building in exchange for 10,000 shares of Pell's \$20 par common stock, which had a market price of \$38 a share on this date. Pell paid legal fees and title insurance totaling \$23,000. The last property tax bill indicated assessed values of \$240,000 for land and \$60,000 for building. Shortly after acquisition, the building was razed at a cost of \$35,000 in anticipation of new building construction in 2008.
- On December 31, 2007, Pell purchased a new automobile for \$15,250 cash and trade-in of an automobile purchased for \$18,000 on January 1, 2006. The new automobile has a cash value of \$19,000.

Required

1. Prepare a schedule analyzing the changes in each of the plant assets during 2007, with detailed supporting computations. Disregard the related accumulated depreciation accounts.
2. For each asset classification, prepare a schedule showing depreciation expense for the year ended December 31, 2007.
3. Prepare a schedule showing the gain or loss from each asset disposal that Pell would recognize in its income statement for the year ended December 31, 2007.

P11-22 Comprehensive The Lurch Company's December 31, 2006 balance sheet follows:

| Assets | | |
|--------------------------------|-----------|--------------------|
| Cash | | \$ 540,000 |
| Inventory | | 450,000 |
| Prepaid rent | | 60,000 |
| Machine | \$500,000 | |
| Less: Accumulated depreciation | (135,000) | 365,000 |
| | | <u>\$1,415,000</u> |
| Liabilities and Equities | | |
| Accounts payable | | \$ 400,000 |
| Common stock, \$10 par | | 300,000 |
| Additional paid-in capital | | 515,000 |
| Retained earnings | | 200,000 |
| | | <u>\$1,415,000</u> |

During 2007, the following transactions occurred:

1. To avoid paying monthly rent of \$5,000 on existing plant facilities, the company decided to buy a tract of land and construct a building of its own on it. On January 2, 2007, Lurch exchanged 6,000 shares of its common stock to acquire the land; the stock was selling for \$25 per share. Construction of the building also began on January 2, 2007. At the time, Lurch borrowed funds by issuing a one-year, \$500,000 note at 12% to help finance the project. The principal and interest on the note are due January 3, 2008. Construction costs (paid in cash) that occurred evenly throughout the year totaled \$700,000. The building was completed on December 30, 2007 and the move-in to the new building was to occur during the next week.
2. On January 2, 2007 Lurch exchanged its one existing machine plus \$50,000 for a newer machine with a fair value of \$430,000. The new machine is to be depreciated using straight-line depreciation based on an economic life of five years and a residual value of \$55,000.
3. Lurch uses a FIFO perpetual inventory system. Lurch sold \$350,000 of its inventory for \$700,000 cash, paid for its beginning accounts payable, and purchased \$480,000 of inventory on account during the year.
4. On July 31, 2007, Lurch declared and paid a \$2.50 per share cash dividend to its shareholders.
5. Lurch is subject to a 30% income tax rate, and income taxes are accrued at year-end.

Required

Prepare Lurch's income statement and statement of retained earnings for the fiscal year ended December 31, 2007 and a balance sheet as of December 31, 2007. Show all supporting journal entries and computations made during 2007. (Contributed by Scott I. Jerris)

CASES

COMMUNICATION

C11-1 Depreciation

AICPA Adapted The certified public accountant is frequently called upon by management for advice regarding methods of computing depreciation. Although the question arises less frequently, of comparable importance is whether the depreciation method should be based on the consideration of the assets as units, as a group, or as having a composite life.

Required

1. Briefly describe the depreciation methods based on treating assets as:
 - a. Units
 - b. A group or as having a composite life
2. Explain the arguments for and against the use of each of the two methods.
3. Explain how retirements are recorded under each of the two methods.

C11-2 Capitalization and Depreciation

AICPA Adapted Gehl Company purchased significant amounts of new equipment this year to be used in its operations. The equipment was delivered by the suppliers, installed by Gehl, and placed into operation. Gehl purchased some for cash with discounts available for prompt payments. It purchased some under long-term payment plans, for which the interest charges approximate prevailing rates. As a result, Gehl is studying its capitalization and depreciation policies.

Required

1. What costs should Gehl capitalize for the new equipment purchased this year?
2. What factors cause the equipment to lose its future economic benefit?
3. What factors should be considered in computing the equipment's depreciation expense?
4. What theoretical justifications are there for the use of accelerated depreciation methods?

C11-3 Capitalization and Depreciation

AICPA Adapted At the beginning of the year, Patrick Company acquired a computer to be used in its operations. The computer was delivered by the supplier, installed by Patrick, and placed into operation. The estimated useful life of the computer is five years, and its estimated residual (salvage) value is significant.

During the year, Patrick received cash in exchange for an automobile that was purchased in a prior year.

Required

1. a. What costs should Patrick capitalize for the computer?
b. Explain the objective of depreciation accounting. (Do not discuss specific methods of depreciation.)
2. Explain the rationale for using accelerated depreciation methods.
3. How should Patrick account for and report the disposal of the automobile?

C11-4 Straight-Line and Composite Depreciation

AICPA Adapted Portland Co. uses the straight-line depreciation method for depreciable assets. All assets are depreciated individually, except manufacturing machinery, which is depreciated by the composite method.

During the year, Portland exchanged a delivery truck with Maine Co. for a larger delivery truck. It paid cash equal to 10% of the larger truck's value.

Required

1. Explain the factors that should influence Portland's selection of the straight-line depreciation method.
2. Explain how Portland should account for and report the truck exchange transaction.
3. a. What benefits should Portland derive from using the composite method rather than the individual basis for manufacturing machinery?
b. How should Portland calculate the manufacturing machinery's annual depreciation expense in its first year of operation?

C11-5 Operating and Capital Expenditures

AICPA Adapted Property, plant, and equipment (plant assets) generally represent a material portion of the total assets of most companies. Accounting for the acquisition and usage of such assets is, therefore, an important part of the financial reporting process.

Required

1. Distinguish between operating (revenue) and capital expenditures and explain why this distinction is important.
2. Briefly define depreciation as used in accounting.
3. Identify the factors that are relevant in determining the annual depreciation and explain whether these factors are determined objectively or whether they are based on judgment.
4. Explain why depreciation is usually shown in the net cash flow from operating activities section of the statement of cash flows.

CREATIVE AND CRITICAL THINKING

C11-6 Depreciation Concepts

AICPA Adapted Depreciation continues to be one of the most controversial, difficult, and important problem areas in accounting.

Required

1. a. Explain the conventional accounting concept of depreciation accounting, and
b. Discuss its conceptual merit with respect to (1) the value of the asset, (2) the amount(s) expensed, and (3) the discretion of management in selecting the method.
2. a. Explain the factors that should be considered when applying the conventional concept of depreciation to the determination of how the value of a newly acquired computer system should be assigned to

expense for financial reporting purposes. (Ignore income tax considerations for this case.)

- b. What depreciation methods might be used for the computer system?

C11-7 Depreciation Concepts

Prepare a short report that evaluates each of the following statements separately:

1. "Since our plant was shut down for part of the year, we will not depreciate it. Depreciating it for the full year would increase our costs and overstate the inventory."
2. "I think we should have increasing depreciation each period because it will increase the funds recovered near the end of the asset's life when maintenance costs are high and we will need to replace the asset. Also, I think tax rates will be higher toward the end of

the asset's life, so we will be better off to have larger depreciation then."

C11-8 Depreciation

AICPA Adapted May Manufacturing Company was organized January 2, 2007. During 2007, it has used in its reports to management the straight-line method of depreciating its plant assets.

On November 9, you are having a conference with May's officers to discuss the depreciation method to be used for income tax and stockholder reporting. The president of May has suggested the use of a new method, which he feels is more suitable than the straight-line method for the needs of the company during the period of rapid expansion of production and capacity that he foresees. The following is a schedule in which the proposed method is applied to a fixed asset with an original cost of \$32,000, an estimated useful life of five years, and a scrap value of approximately \$2,000.

| Year | Years of Life Used | Fraction Rate | Depreciation Expense | Accumulated Depreciation, Year-End | Book Value at Year-End |
|------|--------------------|---------------|----------------------|------------------------------------|------------------------|
| 1 | 1 | 1/15 | \$ 2,000 | \$ 2,000 | \$30,000 |
| 2 | 2 | 2/15 | 4,000 | 6,000 | 26,000 |
| 3 | 3 | 3/15 | 6,000 | 12,000 | 20,000 |
| 4 | 4 | 4/15 | 8,000 | 20,000 | 12,000 |
| 5 | 5 | 5/15 | 10,000 | 30,000 | 2,000 |

The president favors the new method because he has heard that:

1. It will increase the funds recovered during the years near the end of the asset's useful life when maintenance and replacement disbursements are high.
2. It will result in increased write-offs in later years, thereby reducing taxes.

Required

1. Explain the purpose and, hence, the nature of accounting for depreciation.
2. Is the president's proposal within the scope of generally accepted accounting principles? In making your decision, explain the circumstances, if any, under which the method would be reasonable and those, if any, under which it would not be reasonable.
3. The president wants your advice.
 - a. Explain whether depreciation recovers or creates funds.
 - b. Assume that the Internal Revenue Service accepts the proposed depreciation method in this particular case. If the proposed method were used for stockholder and tax reporting purposes, explain how it would affect the availability of funds generated by operations.

C11-9 Asset Writedowns

NBC paid \$401 million for the rights to televise the 1992 Summer Olympic Games, and it was widely reported that it had a loss of more than \$60 million. CBS purchased the rights to the 1992 and 1994 Winter Olympic Games for a combined \$543 million. CBS reported a \$322 million pretax loss on its baseball and football contracts in 1991.

Required

1. Under what conditions, if any, should NBC and CBS have written-down the value of their assets?
2. Does this situation allow opportunities for earnings management?

C11-10 Analyzing Coca-Cola's Property, Plant, and Equipment Disclosures

Refer to the financial statements and related notes of the Coca-Cola Company in Appendix A of this book.

Required

1. Which depreciation method does the company use? Why do you think the company selected this method?
2. Compute the estimated average age of the property, plant, and equipment.
3. Assuming the company estimates a residual value of 10% of the cost, compute the estimated average life of the property, plant, and equipment.
4. Recreate summary journal entries to record the transactions and events that affected property, plant, and equipment during 2004.



C11-11 Ethics and Depreciation Issues

You are auditing the financial records of a company and are reviewing the depreciation computations. Included in the assets are two buildings and numerous machines in each building. One of the buildings is used to manufacture components of toys and the other for assembly and packing, using the manufactured components as well as others purchased from suppliers. You see that the company uses straight-line depreciation over 40 years for the buildings and 20 years for the machinery. You decide to ask the CFO about these calculations, and he replies, "We use 40 years for the buildings because it is close to the 39 we use for tax. And our best guess is that we will replace the machines twice while we use the building. And the method is easy to use and most companies use it, don't they? Or have things changed that much since I was in college?" You feel as if you have annoyed the CFO with your questions, so you decide to leave. As you walk back to your office, you recall from earlier in the audit that the company uses FIFO and LIFO for different segments of its inventory and that all top-level managers receive bonuses based on reported income.

Required

From financial reporting and ethical perspectives, what depreciation methods and lives would you recommend?

RESEARCH SIMULATIONS

R11-1 Researching GAAP

Situation

The Magic Movie Company has been formed to produce films for showing in movie theaters. The president knows that there are some unusual accounting issues regarding asset valuation and income recognition and has asked for your advice.

Directions

1. Research the related generally accepted accounting principles and prepare a short memo to the president. Cite your references and applicable paragraph numbers.
2. Does this situation allow opportunities for earnings management?

R11-2 Researching GAAP

Situation

Scientific Software sells software to the oil industry. Its policy is to recognize revenue when it signs a licensing agreement for the software. It uses a 13-year amortization period for the software products it capitalizes. The president has asked you to evaluate these revenue recognition and amortization policies.

Directions

1. Research the related generally accepted accounting principles and prepare a short memo to the president. Cite your references and applicable paragraph numbers.
2. Why do you think the company might have selected a 13-year amortization period? (*Adapted from The Wall Street Journal, 11/6/90*)