The credit crisis starting in late 2008 has affected many financial and nonfinancial institutions. Many of the statistics related to this crisis are sobering, as noted below.

- In October 2008, the FTSE 100 in the United Kingdom suffered its biggest one-day fall since October 1987. The index closed at its lowest level since October 2004.
- The Dow Jones Industrial Average fell below the 8,000 level for the first time since 2003.
- Germany’s benchmark DAX tumbled after the collapse of the proposed rescue plan for Hypo Real Estate.
- Tightening credit and less disposable income led to Japanese electronic groups losing value; the Nikkei fell to its lowest point since February 2004.
- The Hong Kong Hang Seng dropped in line with the rest of Asia, closing below 17,000 points for the first time in two years in October and below 11,000 by November 2008.
- Governments have spent billions of dollars bailing out financial institutions.

Although some financial rebound has occurred since October 2008, it is clear that most economies of the world are now in a slower growth pattern. This slowdown raises many questions related to the proper accounting for many long-term assets, such as property, plant, and equipment; intangible assets; and many types of financial assets. One of the most difficult issues relates to the possibility of higher impairment charges related to these assets and the related disclosures that may be needed.

Below and on the next page is an example of a recent impairment charge taken by Fujitsu Limited.

**Impairment Losses (in part)**

Due to the worsening of the global business environment, Fujitsu recognized consolidated impairment losses of ¥58.9 billion in relation to property, plant, and equipment of businesses with decreased profitability. The main losses are as follows:

1. **Property, Plant, and Equipment of LSI Business**
   Impairment losses related to the property, plant, and equipment of the LSI business of Fujitsu Microelectronics Limited totaled 49.9 billion yen. In January, Fujitsu Microelectronics announced business reforms in response to a sharp downturn in customer demand that began last autumn.

2. **Property, Plant, and Equipment of Optical Transmission Systems and Other Businesses**
   Consolidated impairment losses of 8.9 billion yen were recognized in relation to the property, plant, and equipment of the optical transmission systems business, the electronic components business and other businesses due to their decreased profitability.
Impairment losses for property, plant, and equipment for many companies in the next few years will be substantial. Here are some of the questions that will need to be addressed regarding possible impairments.

1. How often should a company test for impairment?
2. What are key impairment indicators?
3. What disclosure are necessary for impairments?
4. How do companies match their cash flows to the asset that is potentially impaired?

Assessing whether a company has impaired assets is difficult. For example, in addition to the technical accounting issues, the environment can change quickly. Reduced spending by consumers, lack of confidence in global economic decisions, and higher volatility in both stock and commodity markets are factors to consider. Nevertheless, for investors and creditors to have assurance that the amounts reported on the balance sheet for property, plant, and equipment are relevant and representationally faithful, appropriate impairment charges must be reported on a timely basis.

Source: A portion of this discussion is taken from "Top 10 Tips for Impairment Testing," PricewaterhouseCoopers (December 2008).

As noted in the opening story, both U.S. and foreign companies are affected by impairment rules. These rules recognize that when economic conditions deteriorate, companies may need to write off an asset’s cost to indicate the decline in its usefulness. The purpose of this chapter is to examine the depreciation process and the methods of writing off the cost of property, plant, and equipment and natural resources. The content and organization of the chapter are as follows.
DEPRECIATION—A METHOD OF COST ALLOCATION

Most individuals at one time or another purchase and trade in an automobile. The automobile dealer and the buyer typically discuss what the trade-in value of the old car is. Also, they may talk about what the trade-in value of the new car will be in several years. In both cases, a decline in value is considered to be an example of depreciation.

To accountants, however, depreciation is not a matter of valuation. Rather, depreciation is a means of cost allocation. Depreciation is the accounting process of allocating the cost of tangible assets to expense in a systematic and rational manner to those periods expected to benefit from the use of the asset. For example, a company like Goodyear (one of the world’s largest tire manufacturers) does not depreciate assets on the basis of a decline in their fair value. Instead, it depreciates through systematic charges to expense.

This approach is employed because the value of the asset may fluctuate between the time the asset is purchased and the time it is sold or junked. Attempts to measure these interim value changes have not been well received because values are difficult to measure objectively. Therefore, Goodyear charges the asset’s cost to depreciation expense over its estimated life. It makes no attempt to value the asset at fair value between acquisition and disposition. Companies use the cost allocation approach because it matches costs with revenues and because fluctuations in fair value are uncertain and difficult to measure.

When companies write off the cost of long-lived assets over a number of periods, they typically use the term depreciation. They use the term depletion to describe the reduction in the cost of natural resources (such as timber, gravel, oil, and coal) over a period of time. The expiration of intangible assets, such as patents or copyrights, is called amortization.

Factors Involved in the Depreciation Process

Before establishing a pattern of charges to revenue, a company must answer three basic questions:

1. What depreciable base is to be used for the asset?
2. What is the asset’s useful life?
3. What method of cost apportionment is best for this asset?

The answers to these questions involve combining several estimates into one single figure. Note the calculations assume perfect knowledge of the future, which is never attainable.

Depreciable Base for the Asset

The base established for depreciation is a function of two factors: the original cost, and salvage or disposal value. We discussed historical cost in Chapter 10. Salvage value is the estimated amount that a company will receive when it sells the asset or removes it from service. It is the amount to which a company writes down or depreciates the asset during its useful life. If an asset has a cost of $10,000 and a salvage value of $1,000, its depreciation base is $9,000.
From a practical standpoint, companies often assign a zero salvage value. Some long-lived assets, however, have substantial salvage values.

Estimation of Service Lives
The service life of an asset often differs from its physical life. A piece of machinery may be physically capable of producing a given product for many years beyond its service life. But a company may not use the equipment for all that time because the cost of producing the product in later years may be too high. For example, the old Slater cotton mill in Pawtucket, Rhode Island, is preserved in remarkable physical condition as an historic landmark in U.S. industrial development, although its service life was terminated many years ago.¹

Companies retire assets for two reasons: physical factors (such as casualty or expiration of physical life) and economic factors (obsolescence). Physical factors are the wear and tear, decay, and casualties that make it difficult for the asset to perform indefinitely. These physical factors set the outside limit for the service life of an asset.

We can classify the economic or functional factors into three categories:

1. **Inadequacy** results when an asset ceases to be useful to a company because the demands of the firm have changed. An example would be the need for a larger building to handle increased production. Although the old building may still be sound, it may have become inadequate for the company's purpose.

2. **Supersession** is the replacement of one asset with another more efficient and economical asset. Examples would be the replacement of the mainframe computer with a PC network, or the replacement of the Boeing 767 with the Boeing 787.

3. **Obsolescence** is the catchall for situations not involving inadequacy and supersession.

Because the distinction between these categories appears artificial, it is probably best to consider economic factors collectively instead of trying to make distinctions that are not clear-cut.

To illustrate the concepts of physical and economic factors, consider a new nuclear power plant. Which is more important in determining the useful life of a nuclear power plant—physical factors or economic factors? The limiting factors seem to be (1) ecological considerations, (2) competition from other power sources, and (3) safety concerns. Physical life does not appear to be the primary factor affecting useful life. Although the plant's physical life may be far from over, the plant may become obsolete in 10 years.

For a house, physical factors undoubtedly are more important than the economic or functional factors relative to useful life. Whenever the physical nature of the asset primarily determines useful life, maintenance plays an extremely vital role. The better the maintenance, the longer the life of the asset.²

In most cases, a company estimates the useful life of an asset based on its past experience with the same or similar assets. Others use sophisticated statistical methods to establish a useful life for accounting purposes. And in some cases, companies select arbitrary service lives. In a highly industrial economy such as that of the United States, where research and innovation are so prominent, technological factors have as much effect, if not more, on service lives of tangible plant assets as physical factors do.


²The airline industry also illustrates the type of problem involved in estimation. In the past, aircraft were assumed not to wear out—they just became obsolete. However, some jets have been in service as long as 20 years, and maintenance of these aircraft has become increasingly expensive. As a result, some airlines now replace aircraft not because of obsolescence but because of physical deterioration.
Chapter 11 Depreciation, Impairments, and Depletion

Methods of Depreciation

The third factor involved in the depreciation process is the method of cost apportionment. The profession requires that the depreciation method employed be “systematic and rational.” Companies may use a number of depreciation methods, as follows.

1. Activity method (units of use or production).
2. Straight-line method.
3. Decreasing charge methods (accelerated):
   (a) Sum-of-the-years’-digits.
   (b) Declining-balance method.
4. Special depreciation methods:
   (a) Group and composite methods.
   (b) Hybrid or combination methods.  

To illustrate these depreciation methods, assume that Stanley Coal Mines recently purchased an additional crane for digging purposes. Illustration 11-2 contains the pertinent data concerning this purchase.

ILLUSTRATION 11-2
Data Used to Illustrate Depreciation Methods

<table>
<thead>
<tr>
<th>Cost of crane</th>
<th>$500,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated useful life</td>
<td>5 years</td>
</tr>
<tr>
<td>Estimated salvage value</td>
<td>$50,000</td>
</tr>
<tr>
<td>Productive life in hours</td>
<td>30,000 hours</td>
</tr>
</tbody>
</table>

ALPHABET DUPE

What do the numbers mean?

Some companies try to imply that depreciation is not a cost. For example, in their press releases they will often make a bigger deal over earnings before interest, taxes, depreciation, and amortization (often referred to as EBITDA) than net income under GAAP. They like it because it “dresses up” their earnings numbers. Some on Wall Street buy this hype because they don’t like the allocations that are required to determine net income. Some banks, without batting an eyelash, even let companies base their loan covenants on EBITDA.

For example, look at Premier Parks, which operates the Six Flags chain of amusement parks. Premier touts its EBITDA performance. But that number masks a big part of how the company operates—and how it spends its money. Premier argues that analysts should ignore depreciation for big-ticket items like roller coasters because the rides have a long life. Critics, however, say that the amusement industry has to spend as much as 50 percent of its EBITDA just to keep its rides and attractions current. Those expenses are not optional—let the rides get a little rusty, and ticket sales start to tail off. That means analysts really should view depreciation associated with the costs of maintaining the rides (or buying new ones) as an everyday expense. It also means investors in those companies should have strong stomachs.

What’s the risk of trusting a fad accounting measure? Just look at one year’s bankruptcy numbers. Of the 147 companies tracked by Moody’s that defaulted on their debt, most borrowed money based on EBITDA performance. The bankers in those deals probably wish they had looked at a few other factors. Investors should as well.


ACCOUNTING TRENDS AND TECHNIQUES—2010 reports that of its 500 surveyed companies, for reporting purposes, 488 used straight-line, 10 used declining-balance, 3 used sum-of-the-years’-digits, 17 used an accelerated method (not specified), 16 used units of production, and 10 used group/composite.
Activity Method

The activity method (also called the variable-charge or units-of-production approach) assumes that depreciation is a function of use or productivity, instead of the passage of time. A company considers the life of the asset in terms of either the output it provides (units it produces), or an input measure such as the number of hours it works. Conceptually, the proper cost association relies on output instead of hours used, but often the output is not easily measurable. In such cases, an input measure such as machine hours is a more appropriate method of measuring the dollar amount of depreciation charges for a given accounting period.

The crane poses no particular depreciation problem. Stanley can measure the usage (hours) relatively easily. If Stanley uses the crane for 4,000 hours the first year, the depreciation charge is:

\[
\text{Depreciation charge} = \frac{(\text{Cost} - \text{salvage}) \times \text{Hours this year}}{\text{Total estimated hours}} = \frac{\$500,000 - \$50,000 \times 4,000}{30,000} = \$60,000
\]

The major limitation of this method is that it is inappropriate in situations in which depreciation is a function of time instead of activity. For example, a building steadily deteriorates due to the elements (time) regardless of its use. In addition, where economic or functional factors affect an asset, independent of its use, the activity method loses much of its significance. For example, if a company is expanding rapidly, a particular building may soon become obsolete for its intended purposes. In both cases, activity is irrelevant. Another problem in using an activity method is the difficulty of estimating units of output or service hours received.

In cases where loss of services results from activity or productivity, the activity method does the best to record expenses in the same period as associated revenues. Companies that desire low depreciation during periods of low productivity, and high depreciation during high productivity, either adopt or switch to an activity method. In this way, a plant running at 40 percent of capacity generates 60 percent lower depreciation charges. Inland Steel, for example, switched to units-of-production depreciation at one time and reduced its losses by $43 million, or $1.20 per share.

Straight-Line Method

The straight-line method considers depreciation a function of time rather than a function of usage. Companies widely use this method because of its simplicity. The straight-line procedure is often the most conceptually appropriate, too. When creeping obsolescence is the primary reason for a limited service life, the decline in usefulness may be constant from period to period. Stanley computes the depreciation charge for the crane as follows.

\[
\text{Depreciation charge} = \frac{(\text{Cost less salvage})}{\text{Estimated service life}} = \frac{\$500,000 - \$50,000}{5} = \$90,000
\]

The major objection to the straight-line method is that it rests on two tenuous assumptions: (1) The asset’s economic usefulness is the same each year, and (2) the repair and maintenance expense is essentially the same each period.

One additional problem that occurs in using straight-line—as well as some others—is that distortions in the rate of return analysis (income/assets) develop.
Illustration 11-5 indicates how the rate of return increases, given constant revenue flows, because the asset’s book value decreases.

### Illustration 11-5

**Depreciation and Rate of Return Analysis—Crane Example**

<table>
<thead>
<tr>
<th>Year</th>
<th>Depreciation Expense</th>
<th>Undepreciated Asset Balance (book value)</th>
<th>Income (after depreciation expense)</th>
<th>Rate of Return (Income Assets)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$500,000</td>
<td>$500,000</td>
<td></td>
<td>24.4%</td>
</tr>
<tr>
<td>1</td>
<td>$90,000</td>
<td>410,000</td>
<td>$100,000</td>
<td>31.2%</td>
</tr>
<tr>
<td>2</td>
<td>90,000</td>
<td>320,000</td>
<td>100,000</td>
<td>43.5%</td>
</tr>
<tr>
<td>3</td>
<td>90,000</td>
<td>230,000</td>
<td>100,000</td>
<td>71.4%</td>
</tr>
<tr>
<td>4</td>
<td>90,000</td>
<td>140,000</td>
<td>100,000</td>
<td>200.0%</td>
</tr>
<tr>
<td>5</td>
<td>90,000</td>
<td>50,000</td>
<td>100,000</td>
<td></td>
</tr>
</tbody>
</table>

### Decreasing-Charge Methods

The **decreasing-charge methods** provide for a higher depreciation cost in the earlier years and lower charges in later periods. Because these methods allow for higher early-year charges than in the straight-line method, they are often called **accelerated depreciation methods**.

What is the main justification for this approach? The rationale is that companies should charge more depreciation in earlier years because the asset is most productive in its earlier years. Furthermore, the accelerated methods provide a constant cost because the depreciation charge is lower in the later periods, at the time when the repair and maintenance costs are often higher. Generally, companies use one of two decreasing-charge methods: the sum-of-the-years’-digits method, or the declining-balance method.

**Sum-of-the-Years’-Digits.** The **sum-of-the-years’-digits method** results in a decreasing depreciation charge based on a decreasing fraction of depreciable cost (original cost less salvage value). Each fraction uses the sum of the years as a denominator $(5 + 4 + 3 + 2 + 1 = 15)$. The numerator is the number of years of estimated life remaining as of the beginning of the year. In this method, the numerator decreases year by year, and the denominator remains constant $(5/15, 4/15, 3/15, 2/15, 1/15)$. At the end of the asset’s useful life, the balance remaining should equal the salvage value. Illustration 11-6 shows this method of computation.

#### Illustration 11-6

**Sum-of-the-Years’-Digits Depreciation Schedule—Crane Example**

<table>
<thead>
<tr>
<th>Year</th>
<th>Depreciation Base</th>
<th>Remaining Life in Years</th>
<th>Depreciation Fraction</th>
<th>Depreciation Expense</th>
<th>Book Value, End of Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$450,000</td>
<td>5</td>
<td>5/15</td>
<td>$150,000</td>
<td>$350,000</td>
</tr>
<tr>
<td>2</td>
<td>450,000</td>
<td>4</td>
<td>4/15</td>
<td>120,000</td>
<td>230,000</td>
</tr>
<tr>
<td>3</td>
<td>450,000</td>
<td>3</td>
<td>3/15</td>
<td>90,000</td>
<td>140,000</td>
</tr>
<tr>
<td>4</td>
<td>450,000</td>
<td>2</td>
<td>2/15</td>
<td>60,000</td>
<td>80,000</td>
</tr>
<tr>
<td>5</td>
<td>450,000</td>
<td>1</td>
<td>1/15</td>
<td>30,000</td>
<td>50,000&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>15/15</td>
<td></td>
<td>$450,000</td>
<td></td>
</tr>
</tbody>
</table>
<sup>a</sup>Salvage value.

What happens if the estimated service life of the asset is, let us say, 51 years? How would we calculate the sum-of-the-years’-digits? Fortunately, mathematicians have developed the following formula that permits easy computation:

\[
\frac{n(n + 1)}{2} = \frac{51(51 + 1)}{2} = 1,326
\]
Declining-Balance Method. The declining-balance method utilizes a depreciation rate (expressed as a percentage) that is some multiple of the straight-line method. For example, the double-declining rate for a 10-year asset is 20 percent (double the straight-line rate, which is 1/10 or 10 percent). Companies apply the constant rate to the declining book value each year.

Unlike other methods, the declining-balance method does not deduct the salvage value in computing the depreciation base. The declining-balance rate is multiplied by the book value of the asset at the beginning of each period. Since the depreciation charge reduces the book value of the asset each period, applying the constant-declining-balance rate to a successively lower book value results in lower depreciation charges each year. This process continues until the book value of the asset equals its estimated salvage value. At that time the company discontinues depreciation.

Companies use various multiples in practice. For example, the double-declining-balance method depreciates assets at twice (200 percent) the straight-line rate. Illustration 11-7 shows Stanley’s depreciation charges if using the double-declining approach.

Companies often switch from the declining-balance method to the straight-line method near the end of the asset’s useful life to ensure that they depreciate the asset only to its salvage value.5

Special Depreciation Methods

Sometimes companies adopt special depreciation methods. Reasons for doing so might be that a company’s assets have unique characteristics, or the nature of the industry. Two of these special methods are:

1. Group and composite methods.
2. Hybrid or combination methods.

Group and Composite Methods

Companies often depreciate multiple-asset accounts using one rate. For example, AT&T might depreciate telephone poles, microwave systems, or switchboards by groups.

Two methods of depreciating multiple-asset accounts exist: the group method and the composite method. The choice of method depends on the nature of the assets involved. Companies frequently use the group method when the assets are similar in nature and

5A pure form of the declining-balance method (sometimes appropriately called the “fixed percentage of book value method”) has also been suggested as a possibility. This approach finds a rate that depreciates the asset exactly to salvage value at the end of its expected useful life. The formula for determination of this rate is as follows:

\[
\text{Depreciation rate} = 1 - \sqrt[\text{Salvage value}}{\text{Acquisition cost}}\]

The life in years is \(n\). After computing the depreciation rate, a company applies it on the declining book value of the asset from period to period, which means that depreciation expense will be successively lower. This method is not used extensively in practice due to cumbersome computations. Further, it is not permitted for tax purposes.
have approximately the same useful lives. They use the composite approach when the assets are dissimilar and have different lives. The group method more closely approximates a single-unit cost procedure because the dispersion from the average is not as great. The computation for group or composite methods is essentially the same: find an average and depreciate on that basis.

Companies determine the composite depreciation rate by dividing the depreciation per year by the total cost of the assets. To illustrate, Mooney Motors establishes the composite depreciation rate for its fleet of cars, trucks, and campers as shown in Illustration 11-8.

<table>
<thead>
<tr>
<th>Asset</th>
<th>Original Cost</th>
<th>Residual Value</th>
<th>Depreciation Cost</th>
<th>Estimated Life (yrs.)</th>
<th>Depreciation per Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cars</td>
<td>$145,000</td>
<td>$25,000</td>
<td>$120,000</td>
<td>3</td>
<td>$40,000</td>
</tr>
<tr>
<td>Trucks</td>
<td>44,000</td>
<td>4,000</td>
<td>40,000</td>
<td>4</td>
<td>10,000</td>
</tr>
<tr>
<td>Campers</td>
<td>35,000</td>
<td>5,000</td>
<td>30,000</td>
<td>5</td>
<td>6,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$224,000</strong></td>
<td><strong>$34,000</strong></td>
<td><strong>$190,000</strong></td>
<td><strong>3.39 years</strong></td>
<td><strong>$56,000</strong></td>
</tr>
</tbody>
</table>

Composite depreciation rate = \( \frac{56,000}{224,000} = 25\% \)

Composite life = 3.39 years (\( \frac{190,000}{56,000} \))

If there are no changes in the asset account, Mooney will depreciate the group of assets to the residual or salvage value at the rate of $56,000 ($224,000 \times 25\%) a year. As a result, it will take Mooney 3.39 years to depreciate these assets. The length of time it takes a company to depreciate its assets on a composite basis is called the composite life.

We can highlight the differences between the group or composite method and the single-unit depreciation method by looking at asset retirements. If Mooney retires an asset before, or after, the average service life of the group is reached, it buries the resulting gain or loss in the Accumulated Depreciation account. This practice is justified because Mooney will retire some assets before the average service life and others after the average life. For this reason, the debit to Accumulated Depreciation is the difference between original cost and cash received. Mooney does not record a gain or loss on disposition.

To illustrate, suppose that Mooney Motors sold one of the campers with a cost of $5,000 for $2,600 at the end of the third year. The entry is:

<table>
<thead>
<tr>
<th>Account</th>
<th>Debit</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accumulated Depreciation</td>
<td>2,400</td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>2,600</td>
<td></td>
</tr>
<tr>
<td>Cars, Trucks, and Campers</td>
<td></td>
<td>5,000</td>
</tr>
</tbody>
</table>

If Mooney purchases a new type of asset (mopeds, for example), it must compute a new depreciation rate and apply this rate in subsequent periods.

Illustration 11-9 presents a typical financial statement disclosure of the group depreciation method for Ampco-Pittsburgh Corporation.

The group or composite method simplifies the bookkeeping process and tends to average out errors caused by over- or underdepreciation. As a result, gains or losses on disposals of assets do not distort periodic income.

On the other hand, the unit method has several advantages over the group or composite methods: (1) It simplifies the computation mathematically. (2) It identifies gains
and losses on disposal. (3) It isolates depreciation on idle equipment. (4) It represents the best estimate of the depreciation of each asset, not the result of averaging the cost over a longer period of time. As a consequence, companies generally use the unit method. Unless stated otherwise, you should use the unit method in homework problems.6

Hybrid or Combination Methods

In addition to the depreciation methods already discussed, companies are free to develop their own special or tailor-made depreciation methods. GAAP requires only that the method result in the allocation of an asset’s cost over the asset’s life in a systematic and rational manner.

For example, the steel industry widely uses a hybrid depreciation method, called the production variable method, that is a combination straight-line/activity approach. The following note from WHX Corporation’s annual report explains one variation of this method.

The Company utilizes the modified units of production method of depreciation which recognizes that the depreciation of steelmaking machinery is related to the physical wear of the equipment as well as a time factor. The modified units of production method provides for straight-line depreciation charges modified (adjusted) by the level of raw steel production. In the prior year, depreciation under the modified units of production method was $21.6 million or 40% less than straight-line depreciation, and in the current year it was $1.1 million or 2% more than straight-line depreciation.

DECELERATING DEPRECIATION

Which depreciation method should management select? Many believe that the method that best matches revenues with expenses should be used. For example, if revenues generated by the asset are constant over its useful life, select straight-line depreciation. On the other hand, if revenues are higher (or lower) at the beginning of the asset’s life, then use a decreasing (or increasing) method. Thus, if a company can reliably estimate revenues from the asset, selecting a depreciation method that best matches costs with those revenues would seem to provide the most useful information to investors and creditors for assessing the future cash flows from the asset.

Managers in the real estate industry face a different challenge when considering depreciation choices. Real estate managers object to traditional depreciation methods because in their view, real estate often does not decline in value. In addition, because real estate is highly debt-financed, most real estate concerns report losses in earlier years of operations when the sum of depreciation and interest exceeds the revenue from the real estate project. As a result, real estate companies, like Kimco Realty, argue for some form of increasing-charge method of depreciation (lower depreciation at the beginning and higher depreciation at the end). With such a method, companies would report higher total assets and net income in the earlier years of the project.7

6AcSEC has indicated in an exposure draft that companies should use the unit approach whenever feasible. In fact, it indicates that an even better way to depreciate property, plant, and equipment is to use component depreciation. Under component depreciation, a company should depreciate over its expected useful life any part or portion of property, plant, and equipment that can be separately identified as an asset. For example, a company could separate the various components of a building (e.g., roof, heating and cooling system, elevator, leasehold improvements) and depreciate each component over its useful life.

7In this regard, real estate investment trusts (REITs) often report (in addition to net income) an earnings measure, funds from operations (FFO), that adjusts income for depreciation expense and other noncash expenses. This method is not GAAP. There is mixed empirical evidence about whether FFO or GAAP income is more useful to real estate investment trust investors. See, for example, Richard Gore and David Stott, “Toward a More Informative Measure of Operating Performance in the REIT Industry: Net Income vs. FFO,” Accounting Horizons (December 1998); and Linda Vincent, “The Information Content of FFO for REITs,” Journal of Accounting and Economics (January 1999).
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Special Depreciation Issues

We still need to discuss several special issues related to depreciation:

1. How should companies compute depreciation for partial periods?
2. Does depreciation provide for the replacement of assets?
3. How should companies handle revisions in depreciation rates?

Depreciation and Partial Periods

Companies seldom purchase plant assets on the first day of a fiscal period or dispose of them on the last day of a fiscal period. A practical question is: How much depreciation should a company charge for the partial periods involved?

In computing depreciation expense for partial periods, companies must determine the depreciation expense for the full year and then prorate this depreciation expense between the two periods involved. This process should continue throughout the useful life of the asset.

Assume, for example, that Steeltex Company purchases an automated drill machine with a 5-year life for $45,000 (no salvage value) on June 10, 2011. The company’s fiscal year ends December 31. Steeltex therefore charges depreciation for only $6/12 months during that year. The total depreciation for a full year (assuming straight-line depreciation) is $9,000 ($45,000/5). The depreciation for the first, partial year is therefore:

\[
\frac{6\frac{2}{3}}{12} \times 9,000 = 5,000
\]

The partial-period calculation is relatively simple when Steeltex uses straight-line depreciation. But how is partial-period depreciation handled when it uses an accelerated method such as sum-of-the-years’-digits or double-declining-balance? As an illustration, assume that Steeltex purchased another machine for $10,000 on July 1, 2011, with an estimated useful life of five years and no salvage value. Illustration 11-11 shows the depreciation figures for 2011, 2012, and 2013.

**ILLUSTRATION 11-11**
Calculation of Partial-Period Depreciation, Two Methods

<table>
<thead>
<tr>
<th></th>
<th>Sum-of-the-Years’-Digits</th>
<th>Double-Declining-Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st full year</td>
<td>(5/15 \times 10,000) = 3,333.33</td>
<td>(40% \times 10,000) = 4,000</td>
</tr>
<tr>
<td>2nd full year</td>
<td>(4/15 \times 10,000) = 2,666.67</td>
<td>(40% \times 6,000) = 2,400</td>
</tr>
<tr>
<td>3rd full year</td>
<td>(3/15 \times 10,000) = 2,000.00</td>
<td>(40% \times 3,600) = 1,440</td>
</tr>
</tbody>
</table>

**Depreciation from July 1, 2011, to December 31, 2011**

\[
\frac{6}{12} \times 3,333.33 = 1,666.67 \\
\frac{6}{12} \times 4,000 = 2,000
\]

**Depreciation for 2012**

\[
\frac{6}{12} \times 3,333.33 = 1,666.67 \\
\frac{6}{12} \times 2,666.67 = 1,333.33 \\
\frac{6}{12} \times 2,400 = 1,200 \\
\frac{3,000.00}{\text{or } (10,000 - 2,000) \times 40\% = 3,200}
\]

**Depreciation for 2013**

\[
\frac{6}{12} \times 2,666.67 = 1,333.33 \\
\frac{6}{12} \times 2,400 = 1,200 \\
\frac{6}{12} \times 1,440 = 720 \\
\frac{2,333.33}{\text{or } (10,000 - 5,200) \times 40\% = 1,920}
\]

Sometimes a company like Steeltex modifies the process of allocating costs to a partial period to handle acquisitions and disposals of plant assets more simply. One variation is to take no depreciation in the year of acquisition and a full year’s depreciation.
in the year of disposal. Other variations charge one-half year’s depreciation both in the year of acquisition and in the year of disposal (referred to as the half-year convention), or charge a full year in the year of acquisition and none in the year of disposal.

In fact, Steeltex may adopt any one of these several fractional-year policies in allocating cost to the first and last years of an asset’s life so long as it applies the method consistently. However, unless otherwise stipulated, companies normally compute depreciation on the basis of the nearest full month.

Illustration 11-12 shows depreciation allocated under five different fractional-year policies using the straight-line method on the $45,000 automated drill machine purchased by Steeltex Company on June 10, 2011, discussed earlier.

<table>
<thead>
<tr>
<th>Machine Cost = $45,000</th>
<th>Depreciation Allocated per Period Over 5-Year Life*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Nearest fraction of a year.</td>
<td>$5,000*</td>
</tr>
<tr>
<td>2. Nearest full month.</td>
<td>5,250$</td>
</tr>
<tr>
<td>3. Half year in period of acquisition and disposal.</td>
<td>4,500</td>
</tr>
<tr>
<td>4. Full year in period of acquisition, none in period of disposal.</td>
<td>9,000</td>
</tr>
<tr>
<td>5. None in period of acquisition, full year in period of disposal.</td>
<td>–0–</td>
</tr>
</tbody>
</table>

*6.667/12 ($9,000)  $5,333/12 ($9,000)  7/12 ($9,000)  5/12 ($9,000)

Rounded to nearest dollar.

Depreciation and Replacement of Property, Plant, and Equipment

A common misconception about depreciation is that it provides funds for the replacement of fixed assets. Depreciation is like other expenses in that it reduces net income. It differs, though, in that it does not involve a current cash outflow.

To illustrate why depreciation does not provide funds for replacement of plant assets, assume that a business starts operating with plant assets of $500,000 that have a useful life of five years. The company’s balance sheet at the beginning of the period is:

| Plant assets | $500,000 | Stockholders’ equity | $500,000 |

If we assume that the company earns no revenue over the five years, the income statements are:

<table>
<thead>
<tr>
<th>Revenue</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$ –0–</td>
<td>$ –0–</td>
<td>$ –0–</td>
<td>$ –0–</td>
<td>$ –0–</td>
</tr>
<tr>
<td>Depreciation</td>
<td>(100,000)</td>
<td>(100,000)</td>
<td>(100,000)</td>
<td>(100,000)</td>
<td>(100,000)</td>
</tr>
<tr>
<td>Loss</td>
<td>$(100,000)</td>
<td>$(100,000)</td>
<td>$(100,000)</td>
<td>$(100,000)</td>
<td>$(100,000)</td>
</tr>
</tbody>
</table>

Total depreciation of the plant assets over the five years is $500,000. The balance sheet at the end of the five years therefore is:

| Plant assets | –0– | Stockholders’ equity | –0– |

This extreme example illustrates that depreciation in no way provides funds for the replacement of assets. The funds for the replacement of the assets come from the revenues (generated through use of the asset). Without the revenues, no income materializes and no cash inflow results.
Revision of Depreciation Rates

When purchasing a plant asset, companies carefully determine depreciation rates based on past experience with similar assets and other pertinent information. The provisions for depreciation are only estimates, however. They may need to revise them during the life of the asset. Unexpected physical deterioration or unforeseen obsolescence may decrease the estimated useful life of the asset. Improved maintenance procedures, revision of operating procedures, or similar developments may prolong the life of the asset beyond the expected period.³

For example, assume that International Paper Co. purchased machinery with an original cost of $90,000. It estimates a 20-year life with no salvage value. However, during year 6, International Paper estimates that it will use the machine for an additional 25 years. Its total life, therefore, will be 30 years instead of 20. Depreciation has been recorded at the rate of 1/20 of $90,000, or $4,500 per year by the straight-line method. On the basis of a 30-year life, International Paper should have recorded depreciation as 1/30 of $90,000, or $3,000 per year. It has therefore overstated depreciation, and understated net income, by $1,500 for each of the past 5 years, or a total amount of $7,500. Illustration 11-13 shows this computation.

³As an example of a change in operating procedures, General Motors (GM) used to write off its tools—such as dies and equipment used to manufacture car bodies—over the life of the body type. Through this procedure, it expensed tools twice as fast as Ford and three times as fast as Chrysler. However, it slowed the depreciation process on these tools and lengthened the lives on its plant and equipment. These revisions reduced depreciation and amortization charges by approximately $1.23 billion, or $2.55 per share, in the year of the change. In Chapter 22, we provide a more complete discussion of changes in estimates.
DEPRECIATION CHOICES

The amount of depreciation expense recorded depends on both the depreciation method used and estimates of service lives and salvage values of the assets. Differences in these choices and estimates can significantly impact a company’s reported results and can make it difficult to compare the depreciation numbers of different companies.

For example, when Willamette Industries extended the estimated service lives of its machinery and equipment by five years, it increased income by nearly $54 million.

An analyst determines the impact of these management choices and judgments on the amount of depreciation expense by examining the notes to financial statements. For example, Willamette Industries provided the following note to its financial statements.

<table>
<thead>
<tr>
<th>Note 4: Property, Plant, and Equipment (partial)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range of Useful Lives</td>
</tr>
<tr>
<td>Land</td>
</tr>
<tr>
<td>Buildings</td>
</tr>
<tr>
<td>Machinery &amp; equipment</td>
</tr>
<tr>
<td>Furniture &amp; fixtures</td>
</tr>
</tbody>
</table>

During the year, the estimated service lives for most machinery and equipment were extended five years. The change was based upon a study performed by the company’s engineering department, comparisons to typical industry practices, and the effect of the company’s extensive capital investments which have resulted in a mix of assets with longer productive lives due to technological advances. As a result of the change, net income was increased by $54,000,000.

IMPAIRMENTS

The general accounting standard of lower-of-cost-or-market for inventories does not apply to property, plant, and equipment. Even when property, plant, and equipment has suffered partial obsolescence, accountants have been reluctant to reduce the asset’s carrying amount. Why? Because, unlike inventories, it is difficult to arrive at a fair value for property, plant, and equipment that is not subjective and arbitrary.

For example, Falconbridge Ltd. Nickel Mines had to decide whether to write off all or a part of its property, plant, and equipment in a nickel-mining operation in the Dominican Republic. The project had been incurring losses because nickel prices were low and operating costs were high. Only if nickel prices increased by approximately 33 percent would the project be reasonably profitable. Whether a write-off was appropriate depended on the future price of nickel. Even if the company decided to write off the asset, how much should be written off?

Recognizing Impairments

As discussed in the opening story, the credit crisis starting in late 2008 has affected many financial and nonfinancial institutions. As a result of the global slump, many companies are considering write-offs of some of their long-lived assets. These write-offs are referred to as impairments.

Various events and changes in circumstances might lead to an impairment. Examples are:

a. A significant decrease in the fair value of an asset.

b. A significant change in the extent or manner in which an asset is used.
Chapter 11 Depreciation, Impairments, and Depletion

c. A significant adverse change in legal factors or in the business climate that affects the value of an asset.
d. An accumulation of costs significantly in excess of the amount originally expected to acquire or construct an asset.
e. A projection or forecast that demonstrates continuing losses associated with an asset.

These events or changes in circumstances indicate that the company may not be able to recover the carrying amount of the asset. In that case, a recoverability test is used to determine whether an impairment has occurred. [1]

To apply the first step of the recoverability test, a company like UPS estimates the future net cash flows expected from the use of that asset and its eventual disposition. If the sum of the expected future net cash flows (undiscounted) is less than the carrying amount of the asset, UPS considers the asset impaired. Conversely, if the sum of the expected future net cash flows (undiscounted) is equal to or greater than the carrying amount of the asset, no impairment has occurred.

The recoverability test therefore screens for asset impairment. For example, if the expected future net cash flows from an asset are $400,000 and its carrying amount is $350,000, no impairment has occurred. However, if the expected future net cash flows are $300,000, an impairment has occurred. The rationale for the recoverability test relies on a basic presumption: A balance sheet should report long-lived assets at no more than the carrying amounts that are recoverable.

Measuring Impairments

If the recoverability test indicates an impairment, UPS computes a loss. The impairment loss is the amount by which the carrying amount of the asset exceeds its fair value. How does UPS determine the fair value of an asset? It is measured based on the market price if an active market for the asset exists. If no active market exists, UPS uses the present value of expected future net cash flows to determine fair value.

To summarize, the process of determining an impairment loss is as follows.

1. Review events or changes in circumstances for possible impairment.
2. If the review indicates a possible impairment, apply the recoverability test. If the sum of the expected future net cash flows from the long-lived asset is less than the carrying amount of the asset, an impairment has occurred.
3. Assuming an impairment, the impairment loss is the amount by which the carrying amount of the asset exceeds the fair value of the asset. The fair value is the market price or the present value of expected future net cash flows.

Impairment—Example 1

M. Alou Inc. has equipment that, due to changes in its use, it reviews for possible impairment. The equipment’s carrying amount is $600,000 ($800,000 cost less $200,000 accumulated depreciation). Alou determines the expected future net cash flows (undiscounted) from the use of the equipment and its eventual disposal to be $650,000.

The recoverability test indicates that the $650,000 of expected future net cash flows from the equipment’s use exceed the carrying amount of $600,000. As a result, no impairment occurred. (Recall that the undiscounted future net cash flows must be less than the carrying amount for Alou to deem an asset to be impaired and to measure the impairment loss.) Therefore, M. Alou Inc. does not recognize an impairment loss in this case.
Impairment—Example 2
Assume the same facts as in Example 1, except that the expected future net cash flows from Alou’s equipment are $580,000 (instead of $650,000). The recoverability test indicates that the expected future net cash flows of $580,000 from the use of the asset are less than its carrying amount of $600,000. Therefore, an impairment has occurred.

The difference between the carrying amount of Alou’s asset and its fair value is the impairment loss. Assuming this asset has a fair value of $525,000, Illustration 11-15 shows the loss computation.

| Carrying amount of the equipment | $600,000 |
| Fair value of equipment          | (525,000) |
| Loss on impairment              | $ 75,000 |

M. Alou records the impairment loss as follows.
Loss on Impairment 75,000
Accumulated Depreciation—Equipment 75,000

M. Alou Inc. reports the impairment loss as part of income from continuing operations, in the “Other expenses and losses” section. Generally, Alou should not report this loss as an extraordinary item. Costs associated with an impairment loss are the same costs that would flow through operations and that it would report as part of continuing operations. Alou will continue to use these assets in operations. Therefore, it should not report the loss below “Income from continuing operations.”

A company that recognizes an impairment loss should disclose the asset(s) impaired, the events leading to the impairment, the amount of the loss, and how it determined fair value (disclosing the interest rate used, if appropriate).

Restoration of Impairment Loss
After recording an impairment loss, the reduced carrying amount of an asset held for use becomes its new cost basis. A company does not change the new cost basis except for depreciation or amortization in future periods or for additional impairments.

To illustrate, assume that Damon Company at December 31, 2011, has equipment with a carrying amount of $500,000. Damon determines this asset is impaired and writes it down to its fair value of $400,000. At the end of 2012, Damon determines that the fair value of the asset is $480,000. The carrying amount of the equipment should not change in 2012 except for the depreciation taken in 2012. Damon may not restore an impairment loss for an asset held for use. The rationale for not writing the asset up in value is that the new cost basis puts the impaired asset on an equal basis with other assets that are unimpaired.

Impairment of Assets to Be Disposed Of
What happens if a company intends to dispose of the impaired asset, instead of holding it for use? At one time, Kroger recorded an impairment loss of $54 million on property, plant, and equipment it no longer needed due to store closures. In this case, Kroger reports the impaired asset at the lower-of-cost-or-net realizable value (fair value less cost to sell). Because Kroger intends to dispose of the assets in a short period of time, it uses net realizable value in order to provide a better measure of the net cash flows that it will receive from these assets.

Kroger does not depreciate or amortize assets held for disposal during the period it holds them. The rationale is that depreciation is inconsistent with the notion of assets to be disposed of.
be disposed of and with the use of the lower-of-cost-or-net realizable value. In other 
words, assets held for disposal are like inventory; companies should report them at 
the lower-of-cost-or-net realizable value.

Because Kroger will recover assets held for disposal through sale rather than through 
operations, it continually revalues them. Each period, the assets are reported at the 
lower-of-cost-or-net realizable value. Thus, Kroger can write up or down an asset held 
for disposal in future periods, as long as the carrying value after the write-up never 
exceeds the carrying amount of the asset before the impairment. Companies 
should report losses or gains related to these impaired assets as part of income from 
continuing operations.

Illustration 11-16 summarizes the key concepts in accounting for impairments.

ILLUSTRATION 11-16  
Graphic of Accounting for Impairments

DEPLETION

Natural resources, often called wasting assets, include petroleum, minerals, and 
timber. They have two main features: (1) the complete removal (consumption) of 
the asset, and (2) replacement of the asset only by an act of nature. Unlike plant and 
equipment, natural resources are consumed physically over the period of use and 
do not maintain their physical characteristics. Still, the accounting problems associ-
ated with natural resources are similar to those encountered with fixed assets. The ques-
tions to be answered are:

1. How do companies establish the cost basis for write-off?
2. What pattern of allocation should companies employ?

Recall that the accounting profession uses the term depletion for the process of al-
locating the cost of natural resources.
Establishing a Depletion Base

How do we determine the depletion base for natural resources? For example, a company like ExxonMobil makes sizable expenditures to find natural resources, and for every successful discovery there are many failures. Furthermore, it encounters long delays between the time it incurs costs and the time it obtains the benefits from the extracted resources. As a result, a company in the extractive industries, like ExxonMobil, frequently adopts a conservative policy in accounting for the expenditures related to finding and extracting natural resources.

Computation of the depletion base involves four factors: (1) acquisition cost of the deposit, (2) exploration costs, (3) development costs, and (4) restoration costs.

Acquisition Costs

Acquisition cost is the price ExxonMobil pays to obtain the property right to search and find an undiscovered natural resource. It also can be the price paid for an already-discovered resource. A third type of acquisition cost can be lease payments for property containing a productive natural resource; included in these acquisition costs are royalty payments to the owner of the property.

Generally, the acquisition cost of natural resources is recorded in an account titled Undeveloped Property. ExxonMobil later assigns that cost to the natural resource if exploration efforts are successful. If the efforts are unsuccessful, it writes off the acquisition cost as a loss.

Exploration Costs

As soon as a company has the right to use the property, it often incurs exploration costs needed to find the resource. When exploration costs are substantial, some companies capitalize them into the depletion base. In the oil and gas industry, where the costs of finding the resource are significant and the risks of finding the resource are very uncertain, most large companies expense these costs. Smaller oil and gas companies often capitalize these exploration costs. We examine the unique issues related to the oil and gas industry on pages 624–625 (see “Continuing Controversy”).

Development Costs

Companies divide development costs into two parts: (1) tangible equipment costs and (2) intangible development costs. Tangible equipment costs include all of the transportation and other heavy equipment needed to extract the resource and get it ready for market. Because companies can move the heavy equipment from one extracting site to another, companies do not normally include tangible equipment costs in the depletion base. Instead, they use separate depreciation charges to allocate the costs of such equipment. However, some tangible assets (e.g., a drilling rig foundation) cannot be moved. Companies depreciate these assets over their useful life or the life of the resource, whichever is shorter.

Intangible development costs, on the other hand, are such items as drilling costs, tunnels, shafts, and wells. These costs have no tangible characteristics but are needed for the production of the natural resource. Intangible development costs are considered part of the depletion base.

Restoration Costs

Companies sometimes incur substantial costs to restore property to its natural state after extraction has occurred. These are restoration costs. Companies consider restoration costs part of the depletion base. The amount included in the depletion base is the fair value of the obligation to restore the property after extraction. A more complete discussion
of the accounting for restoration costs and related liabilities (sometimes referred to as asset retirement obligations) is provided in Chapter 13. Similar to other long-lived assets, companies deduct from the depletion base any salvage value to be received on the property.

**Write-Off of Resource Cost**

Once the company establishes the depletion base, the next problem is determining how to allocate the cost of the natural resource to accounting periods.

Normally, companies compute depletion (often referred to as cost depletion) on a **units-of-production method** (an activity approach). Thus, depletion is a function of the number of units extracted during the period. In this approach, the total cost of the natural resource less salvage value is divided by the number of units estimated to be in the resource deposit, to obtain a **cost per unit of product**. To compute depletion, the cost per unit is then multiplied by the number of units extracted.

For example, MaClede Co. acquired the right to use 1,000 acres of land in Alaska to mine for gold. The lease cost is $50,000, and the related exploration costs on the property are $100,000. Intangible development costs incurred in opening the mine are $850,000. Total costs related to the mine before the first ounce of gold is extracted are, therefore, $1,000,000. MaClede estimates that the mine will provide approximately 100,000 ounces of gold. Illustration 11-17 shows computation of the depletion cost per unit (depletion rate).

<table>
<thead>
<tr>
<th>Total cost</th>
<th>Salvage value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,000,000</td>
<td>$0</td>
</tr>
</tbody>
</table>

\[
\text{Depletion cost per unit} = \frac{\text{Total estimated units available} - \text{Salvage value}}{\text{Total estimated units available}} = \frac{1,000,000}{100,000} = $10 \text{ per ounce}
\]

If MaClede extracts 25,000 ounces in the first year, then the depletion for the year is $250,000 (25,000 ounces \times $10). It records the depletion as follows.

\[
\begin{align*}
\text{Inventory (gold)} & \quad 250,000 \\
\text{Gold Mine} & \quad 250,000
\end{align*}
\]

MaClede debits Inventory for the total depletion for the year and credits Gold Mine to reduce the carrying value of the natural resource. MaClede credits Inventory when it sells the inventory and debits Cost of Goods Sold. The amount not sold remains in inventory and is reported in the current assets section of the balance sheet.9

Sometimes companies use an Accumulated Depletion account. In that case, MaClede’s balance sheet would present the cost of the natural resource and the amount of accumulated depletion entered to date as follows.

<table>
<thead>
<tr>
<th>Gold mine (at cost)</th>
<th>$1,000,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less: Accumulated depletion</td>
<td>250,000</td>
</tr>
<tr>
<td></td>
<td>$750,000</td>
</tr>
</tbody>
</table>

For purposes of homework, credit depletion to the asset account.

9The tax law has long provided a deduction against revenue from oil, gas, and most minerals for the greater of cost or percentage depletion. The percentage (statutory) depletion allows some companies a write-off ranging from 5 percent to 22 percent (depending on the natural resource) of gross revenue received. As a result of this tax benefit, the amount of depletion may exceed the cost assigned to a given natural resource. An asset’s carrying amount may be zero, but the company may take a depletion deduction if it has gross revenue. The significance of the percentage depletion allowance is now greatly reduced, since Congress repealed it for most oil and gas companies.
MaClede may also depreciate on a units-of-production basis the tangible equipment used in extracting the gold. This approach is appropriate if it can directly assign the estimated lives of the equipment to one given resource deposit. If MaClede uses the equipment on more than one job, other cost allocation methods such as straight-line or accelerated depreciation methods would be more appropriate.

**Estimating Recoverable Reserves**

Sometimes companies need to change the estimate of recoverable reserves. They do so either because they have new information or because more sophisticated production processes are available. Natural resources such as oil and gas deposits and some rare metals have recently provided the greatest challenges. Estimates of these reserves are in large measure merely “knowledgeable guesses.”

This problem is the same as accounting for changes in estimates for the useful lives of plant and equipment. The procedure is to revise the depletion rate on a prospective basis: A company divides the remaining cost by the new estimate of the recoverable reserves. This approach has much merit because the required estimates are so uncertain.

**Liquidating Dividends**

A company often owns as its only major asset a property from which it intends to extract natural resources. If the company does not expect to purchase additional properties, it may gradually distribute to stockholders their capital investments by paying liquidating dividends, which are dividends greater than the amount of accumulated net income.

The major accounting problem is to distinguish between dividends that are a return of capital and those that are not. Because the dividend is a return of the investor’s original contribution, the company issuing a liquidating dividend should debit Paid-in Capital in Excess of Par for that portion related to the original investment, instead of debiting Retained Earnings.

To illustrate, at year-end, Callahan Mining had a retained earnings balance of $1,650,000, accumulated depletion on mineral properties of $2,100,000, and paid-in capital in excess of par of $5,435,493. Callahan’s board declared a dividend of $3 a share on the 1,000,000 shares outstanding. It records the $3,000,000 cash dividend as follows.

<table>
<thead>
<tr>
<th></th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retained Earnings</td>
<td>1,650,000</td>
</tr>
<tr>
<td>Paid-in Capital in Excess of Par—Common Stock</td>
<td>1,350,000</td>
</tr>
<tr>
<td>Cash</td>
<td>3,000,000</td>
</tr>
</tbody>
</table>

Callahan must inform stockholders that the $3 dividend per share represents a $1.65 ($1,650,000 ÷ 1,000,000 shares) per share return on investment and a $1.35 ($1,350,000 ÷ 1,000,000 shares) per share liquidating dividend.

**Continuing Controversy**

A major controversy relates to the accounting for exploration costs in the oil and gas industry. Conceptually, the question is whether unsuccessful ventures are a cost of those that are successful. Those who hold the full-cost concept argue that the cost of drilling a dry hole is a cost needed to find the commercially profitable wells. Others believe that companies should capitalize only the costs of successful projects. This is the successful-efforts concept. Its proponents believe that the only relevant measure for a project is the cost directly related to that project, and that companies should report any remaining costs as period charges. In addition, they argue that an unsuccessful company will end
up capitalizing many costs that will make it, over a short period of time, show no less income than does one that is successful.  

The FASB has attempted to narrow the available alternatives, with little success. Here is a brief history of the debate.

1. 1977—The FASB required oil and gas companies to follow successful-efforts accounting. Small oil and gas producers, voicing strong opposition, lobbied extensively in Congress. Governmental agencies assessed the implications of this standard from a public interest perspective and reacted contrary to the FASB’s position. 

2. 1978—In response to criticisms of the FASB’s actions, the SEC reexamined the issue and found both the successful-efforts and full-cost approaches inadequate. Neither method, said the SEC, reflects the economic substance of oil and gas exploration. As a substitute, the SEC argued in favor of a yet-to-be developed method, reserve recognition accounting (RRA), which it believed would provide more useful information. Under RRA, as soon as a company discovers oil, it reports the value of the oil on the balance sheet and in the income statement. Thus, RRA is a fair value approach, in contrast to full-costing and successful-efforts, which are historical cost approaches. The use of RRA would make a substantial difference in the balance sheets and income statements of oil companies. For example, Atlantic Richfield Co. at one time reported net producing property of $2.6 billion. Under RRA, the same properties would be valued at $11.8 billion.

3. 1979–1981—As a result of the SEC’s actions, the FASB issued another standard that suspended the requirement that companies follow successful-efforts accounting. Therefore, full costing was again permissible. In attempting to implement RRA, however, the SEC encountered practical problems in estimating (1) the amount of the reserves, (2) the future production costs, (3) the periods of expected disposal, (4) the discount rate, and (5) the selling price. Companies needed an estimate for each of these to arrive at an accurate valuation of existing reserves. Estimating the future selling price, appropriate discount rate, and future extraction and delivery costs of reserves that are years away from realization can be a formidable task.

4. 1981—The SEC abandoned RRA in the primary financial statements of oil and gas producers. The SEC decided that RRA did not possess the required degree of reliability for use as a primary method of financial reporting. However, it continued to stress the need for some form of fair value–based disclosure for oil and gas reserves. As a result, the profession now requires fair value disclosures for those natural resources.

Currently, companies can use either the full-cost approach or the successful-efforts approach. It does seem ironic that Congress directed the FASB to develop one method of accounting for the oil and gas industry, and when the FASB did so, the government chose not to accept it. Subsequently, the SEC attempted to develop a new approach.

---

10 Large international oil companies such as ExxonMobil use the successful-efforts approach. Most of the smaller, exploration-oriented companies use the full-cost approach. The differences in net income figures under the two methods can be staggering. Analysts estimated that the difference between full-cost and successful-efforts for ChevronTexaco would be $500 million over a 10-year period (income lower under successful-efforts).

11 The Department of Energy indicated that companies using the full-cost method at that time would reduce their exploration activities because of the unfavorable earnings impact associated with successful-efforts accounting. The Justice Department asked the SEC to postpone adoption of one uniform method of accounting in the oil and gas industry until the SEC could determine whether the information reported to investors would be enhanced and competition constrained by adoption of the successful-efforts method.
failed, and then urged the FASB to develop the disclosure requirements in this area. After all these changes, the two alternatives still exist.\footnote{One requirement of the full-cost approach is that companies can capitalize costs only up to a ceiling, which is the present value of company reserves. Companies must expense costs above that ceiling. When the price of oil fell in the mid-1980s, so did the present value of companies’ reserves, thus forcing expensing of costs beyond the ceiling. Companies lobbied for leniency, but the SEC decided that the write-offs had to be taken. \textit{Mesa Limited Partnerships} restated its $31 million profit to a $169 million loss, and \textit{Pacific Lighting} restated its $44.5 million profit to a $70.5 million loss.}

This controversy in the oil and gas industry provides a number of lessons. First, it demonstrates the strong influence that the federal government has in financial reporting matters. Second, the concern for economic consequences places pressure on the FASB to weigh the economic effects of any required standard. Third, the experience with RRA highlights the problems that accompany any proposed change from an historical cost to a fair value approach. Fourth, this controversy illustrates the difficulty of establishing standards when affected groups have differing viewpoints. Finally, it reinforces the need for a conceptual framework with carefully developed guidelines for recognition, measurement, and reporting, so that interested parties can more easily resolve issues of this nature in the future.

\begin{quote}
Recent cuts in the estimates of oil and natural gas reserves at \textit{Royal Dutch/Shell, El Paso Corporation}, and other energy companies highlight the importance of reserve disclosures. Investors appear to believe that these disclosures provide useful information for assessing the future cash flows from a company’s oil and gas reserves. For example, when Shell’s estimates turned out to be overly optimistic (to the tune of 3.9 billion barrels or 20 percent of reserves), Shell’s stock price fell.

The experience at Shell and other companies has led the SEC to look at how companies are estimating their “proved” reserves. \textit{Proved reserves} are quantities of oil and gas that can be shown “\ldots with reasonable certainty to be recoverable in future years. \ldots.” The phrase “reasonable certainty” is crucial to this guidance, but differences in interpretation of what is reasonably certain can result in a wide range of estimates.

In one case, for example, \textit{ExxonMobil}’s estimate was 29 percent higher than an estimate the SEC developed. ExxonMobil was more optimistic about the effects of new technology that enables the industry to retrieve more of the oil and gas it finds. Thus, to ensure the continued usefulness of RRA disclosures, the SEC may have to work on a measurement methodology that keeps up with technology changes in the oil and gas industry.

\end{quote}
segregate property, plant, and equipment not currently employed as producing assets in the business (such as idle facilities or land held as an investment) from assets used in operations.

When depreciating assets, a company credits a valuation account such as Accumulated Depreciation—Equipment. Using an accumulated depreciation account permits the user of the financial statements to see the original cost of the asset and the amount of depreciation that the company charged to expense in past years.

When depleting natural resources, some companies use an accumulated depletion account. Many, however, simply credit the natural resource account directly. The rationale for this approach is that the natural resources are physically consumed, making direct reduction of the cost of the natural resources appropriate.

Because of the significant impact on the financial statements of the depreciation method(s) used, companies should disclose the following.

a. Depreciation expense for the period.

b. Balances of major classes of depreciable assets, by nature and function.

c. Accumulated depreciation, either by major classes of depreciable assets or in total.

d. A general description of the method or methods used in computing depreciation with respect to major classes of depreciable assets. [2]

Special disclosure requirements relate to the oil and gas industry. Companies engaged in these activities must disclose the following in their financial statements: (1) the basic method of accounting for those costs incurred in oil and gas producing activities (e.g., full-cost versus successful-efforts), and (2) how the company disposes of costs relating to extractive activities (e.g., dispensing immediately versus depreciation and depletion). [3]

The 2009 annual report of International Paper Company in Illustration 11-19 shows an acceptable disclosure. It uses condensed balance sheet data supplemented with details and policies in notes to the financial statements.

ILIustration 11-19
Disclosures for Property, Plant, Equipment, and Natural Resources

<table>
<thead>
<tr>
<th>International Paper Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consolidated Balance Sheet (partial)</td>
</tr>
<tr>
<td>In millions at December 31</td>
</tr>
<tr>
<td><strong>Assets</strong></td>
</tr>
<tr>
<td>Total current assets</td>
</tr>
<tr>
<td>Plants, properties, and equipment, net</td>
</tr>
<tr>
<td>Forestlands</td>
</tr>
<tr>
<td>Investments</td>
</tr>
<tr>
<td>Goodwill</td>
</tr>
<tr>
<td>Deferred charges and other assets</td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
</tr>
</tbody>
</table>

[2] Some believe that companies should disclose the average useful life of the assets or the range of years of asset life to help users understand the age and life of property, plant, and equipment.

[3] Public companies, in addition to these two required disclosures, must include as supplementary information numerous schedules reporting reserve quantities; capitalized costs; acquisition, exploration, and development activities; and a standardized measure of discounted future net cash flows related to proved oil and gas reserve quantities. Given the importance of these disclosures, the SEC recently issued a new set of disclosures to help investors better understand the nature of oil and gas company operations. These rules provide updated guidance on (1) estimates of quantities of proved reserves, (2) estimates of future net revenues, and (3) disclosure of reserve information. See SEC Financial Reporting Release No. 78 (Release No. 33-8995), “Modernization of Oil and Gas Reporting” (December 31, 2008).
Analysis of Property, Plant, and Equipment

Analysts evaluate assets relative to activity (turnover) and profitability.

Asset Turnover Ratio

How efficiently a company uses its assets to generate sales is measured by the asset turnover ratio. This ratio divides net sales by average total assets for the period. The resulting number is the dollars of sales produced by each dollar invested in assets. To illustrate, we use the following data from the Tootsie Roll Industries 2009 annual report. Illustration 11-20 shows computation of the asset turnover ratio.

The asset turnover ratio shows that Tootsie Roll generated sales of $0.60 per dollar of assets in the year ended December 31, 2009.

Asset turnover ratios vary considerably among industries. For example, a large utility like Ameren has a ratio of 0.32 times. A large grocery chain like Kroger has a ratio of 2.73 times. Thus, in comparing performance among companies based on the asset
turnover ratio, you need to consider the ratio within the context of the industry in which
a company operates.

**Profit Margin on Sales Ratio**
Another measure for analyzing the use of property, plant, and equipment is the profit
margin on sales ratio (rate of return on sales). Calculated as net income divided by net
sales, this profitability ratio does not, by itself, answer the question of how profitably a
company uses its assets. But by relating the profit margin on sales to the asset turnover
during a period of time, we can ascertain how profitably the company used assets during
that period of time in a measure of the rate of return on assets. Using the Tootsie Roll
Industries data shown on page 627, we compute the profit margin on sales ratio and the
rate of return on assets as follows.

**ILLUSTRATION 11-22**
Profit Margin on Sales

<table>
<thead>
<tr>
<th>Profit margin on sales</th>
<th>Net income</th>
<th>Net sales</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$53.5</td>
<td>$495.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10.8%</td>
</tr>
</tbody>
</table>

Rate of return on assets = Profit margin on sales × Asset turnover

= 10.8% × .60

= 6.5%

**Rate of Return on Assets**
The rate of return a company achieves through use of its assets is the rate of return on
assets (ROA). Rather than using the profit margin on sales, we can compute it directly
by dividing net income by average total assets. Using Tootsie Roll’s data, we compute
the ratio as follows.

**ILLUSTRATION 11-22**
Rate of Return on Assets

<table>
<thead>
<tr>
<th>Rate of return on assets</th>
<th>Net income</th>
<th>Average total assets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$53.5</td>
<td>($838.2 + $813.5)/2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6.5%</td>
</tr>
</tbody>
</table>

The 6.5 percent rate of return computed in this manner equals the 6.5 percent rate
computed by multiplying the profit margin on sales by the asset turnover. The rate of
return on assets measures profitability well because it combines the effects of profit
margin and asset turnover.

You will want to read the IFRS INSIGHTS
on pages 653–663
for discussion of IFRS related to property, plant,
and equipment.
SUMMARY OF LEARNING OBJECTIVES

1 Explain the concept of depreciation. Depreciation allocates the cost of tangible assets to expense in a systematic and rational manner to those periods expected to benefit from the use of the asset.

2 Identify the factors involved in the depreciation process. Three factors involved in the depreciation process are: (1) determining the depreciation base for the asset, (2) estimating service lives, and (3) selecting a method of cost apportionment (depreciation).

3 Compare activity, straight-line, and decreasing-charge methods of depreciation. (1) Activity method: Assumes that depreciation is a function of use or productivity instead of the passage of time. The life of the asset is considered in terms of either the output it provides, or an input measure such as the number of hours it works. (2) Straight-line method: Considers depreciation a function of time instead of a function of usage. The straight-line procedure is often the most conceptually appropriate when the decline in usefulness is constant from period to period. (3) Decreasing-charge methods: Provides for a higher depreciation cost in the earlier years and lower charges in later periods. The main justification for this approach is that the asset is the most productive in its early years.

4 Explain special depreciation methods. Two special depreciation methods are: (1) Group and composite methods: The group method is frequently used when the assets are fairly similar in nature and have approximately the same useful lives. The composite method may be used when the assets are dissimilar and have different lives. (2) Hybrid or combination methods: These methods may combine straight-line/activity approaches.

5 Explain the accounting issues related to asset impairment. The process to determine an impairment loss is as follows: (1) Review events and changes in circumstances for possible impairment. (2) If events or changes suggest impairment, determine if the sum of the expected future net cash flows from the long-lived asset is less than the carrying amount of the asset. If less, measure the impairment loss. (3) The impairment loss is the amount by which the carrying amount of the asset exceeds the fair value of the asset.

After a company records an impairment loss, the reduced carrying amount of the long-lived asset is its new cost basis. Impairment losses may not be restored for assets held for use. If the company expects to dispose of the asset, it should report the impaired asset at the lower-of-cost-or-net realizable value. It is not depreciated. It can be continuously revalued, as long as the write-up is never to an amount greater than the carrying amount before impairment.

6 Explain the accounting procedures for depletion of natural resources. To account for depletion of natural resources, companies (1) establish the depletion base and (2) write off resource cost. Four factors are part of establishing the depletion base: (a) acquisition costs, (b) exploration costs, (c) development costs, and (d) restoration costs. To write off resource cost, companies normally compute depletion on the units-of-production method. Thus, depletion is a function of the number of units withdrawn during the period. To obtain a cost per unit of product, the total cost of the natural resource less salvage value is divided by the number of units estimated to be in the resource deposit, to obtain a cost per unit of product. To compute depletion, this cost per unit is multiplied by the number of units withdrawn.

7 Explain how to report and analyze property, plant, equipment, and natural resources. The basis of valuation for property, plant, and equipment and for natural resources should be disclosed along with pledges, liens, and other commitments related

KEY TERMS
accelerated depreciation methods, 610
activity method, 609
amortization, 606
asset turnover ratio, 627
composite approach, 612
decomposition rate, 612
cost depletion, 622
decomposition method, 611
decreasing-charge methods, 610
depletion, 606, 620
depreciation, 606
depreciation base, 606
development costs, 621
double-declining-balance method, 611
exploration costs, 621
full-cost concept, 623
group method, 611
impairment, 617
inadequacy, 607
liquidating dividends, 623
natural resources, 620
obsolescence, 607
percentage depletion, 622(n)
profit margin on sales ratio, 628
rate of return on assets (ROA), 628
recoverability test, 618
reserve recognition accounting (RRA), 624
restoration costs, 621
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successful-efforts concept, 623
sum-of-the-years’-digits method, 610
supersession, 607
Chapter 11 Depreciation, Impairments, and Depletion

to these assets. Companies should not offset any liability secured by property, plant, and equipment or by natural resources against these assets, but should report it in the liabilities section. When deprecating assets, credit a valuation account normally called Accumulated Depreciation. When depleting assets, use an accumulated depletion account, or credit the depletion directly to the natural resource account. Companies engaged in significant oil and gas producing activities must provide additional disclosures about these activities. Analysis may be performed to evaluate the asset turnover ratio, profit margin on sales, and rate of return on assets.

APPENDIX 11A

INCOME TAX DEPRECIATION

For the most part, a financial accounting course does not address issues related to the computation of income taxes. However, because the concepts of tax depreciation are similar to those of book depreciation, and because tax depreciation methods are sometimes adopted for book purposes, we present an overview of this subject.

Congress passed the Accelerated Cost Recovery System (ACRS) as part of the Economic Recovery Tax Act of 1981. The goal was to stimulate capital investment through faster write-offs and to bring more uniformity to the write-off period. For assets purchased in the years 1981 through 1986, companies use ACRS and its preestablished “cost recovery periods” for various classes of assets.

In the Tax Reform Act of 1986 Congress enacted a Modified Accelerated Cost Recovery System, known as MACRS. It applies to depreciable assets placed in service in 1987 and later. The following discussion is based on these MACRS rules. Realize that tax depreciation rules are subject to change annually.15

MODIFIED ACCELERATED COST RECOVERY SYSTEM

The computation of depreciation under MACRS differs from the computation under GAAP in three respects: (1) a mandated tax life, which is generally shorter than the economic life; (2) cost recovery on an accelerated basis; and (3) an assigned salvage value of zero.

Tax Lives (Recovery Periods)

Each item of depreciable property belongs to a property class. The recovery period (depreciable tax life) of an asset depends on its property class. Illustration 11A-1 presents the MACRS property classes.

---

15For example, in an effort to jump-start the economy following the September 11, 2001, terrorist attacks, Congress passed the Job Creation and Worker Assistance Act of 2002 (the Act). The Act allows a 30 percent first-year bonus depreciation for assets placed into service after September 11, 2001, but before September 11, 2004. A follow-up provision enacted in 2003 extended the tax savings to assets placed in service before January 1, 2005. And in 2010, Congress extended bonus depreciation for smaller companies. These laws encourage companies to invest in fixed assets because they can front-load depreciation expense, which lowers taxable income and amount of taxes companies pay in the early years of an asset’s life. Although the Act may be a good thing for the economy, it can distort cash flow measures—making them look artificially strong when the allowances are in place but reversing once the bonus depreciation expires. See D. Zion and B. Carcache, “Bonus Depreciation Boomerang,” Credit Suisse First Boston Equity Research (February 19, 2004).
Companies compute depreciation expense using the tax basis—usually the cost—of the asset. The depreciation method depends on the MACRS property class, as shown below.

### Illustration 11A-1

MACRS Property Classes

| 3-year property | Includes small tools, horses, and assets used in research and development activities |
| 5-year property | Includes automobiles, trucks, computers and peripheral equipment, and office machines |
| 7-year property | Includes office furniture and fixtures, agriculture equipment, oil exploration and development equipment, railroad track, manufacturing equipment, and any property not designated by law as being in any other class |
| 10-year property | Includes railroad tank cars, mobile homes, boilers, and certain public utility property |
| 15-year property | Includes roads, shrubbery, and certain low-income housing |
| 20-year property | Includes waste-water treatment plants and sewer systems |
| 27.5-year property | Includes residential rental property |
| 39-year property | Includes nonresidential real property |

### Illustration 11A-2

Depletion Method for Various MACRS Property Classes

<table>
<thead>
<tr>
<th>MACRS Property Class</th>
<th>Depreciation Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-, 5-, 7-, and 10-year property</td>
<td>Double-declining-balance</td>
</tr>
<tr>
<td>15- and 20-year property</td>
<td>150% declining-balance</td>
</tr>
<tr>
<td>27.5- and 39-year property</td>
<td>Straight-line</td>
</tr>
</tbody>
</table>

### Illustration 11A-3

IRS Table of MACRS Depreciation Rates, by Property Class

<table>
<thead>
<tr>
<th>Recovery Year</th>
<th>3-year (200% DB)</th>
<th>5-year (200% DB)</th>
<th>7-year (200% DB)</th>
<th>10-year (200% DB)</th>
<th>15-year (150% DB)</th>
<th>20-year (150% DB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>33.33</td>
<td>20.00</td>
<td>14.29</td>
<td>10.00</td>
<td>5.00</td>
<td>3.750</td>
</tr>
<tr>
<td>2</td>
<td>44.45</td>
<td>32.00</td>
<td>24.49</td>
<td>18.00</td>
<td>9.50</td>
<td>7.219</td>
</tr>
<tr>
<td>3</td>
<td>14.81*</td>
<td>19.20</td>
<td>17.49</td>
<td>14.40</td>
<td>8.55</td>
<td>6.677</td>
</tr>
<tr>
<td>4</td>
<td>7.41</td>
<td>11.52</td>
<td>12.49</td>
<td>11.52</td>
<td>7.70</td>
<td>6.177</td>
</tr>
<tr>
<td>5</td>
<td>11.52</td>
<td>8.93*</td>
<td>9.22</td>
<td>6.93</td>
<td>5.713</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>5.76</td>
<td>8.92</td>
<td>7.37</td>
<td>6.23</td>
<td>5.285</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>8.93</td>
<td>6.55*</td>
<td>5.90*</td>
<td>4.888</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>4.46</td>
<td>6.55</td>
<td>5.90</td>
<td>4.522</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>6.56</td>
<td>5.91</td>
<td>4.462*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>6.55</td>
<td>5.90</td>
<td>4.461</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>3.28</td>
<td>5.91</td>
<td>4.462</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>5.90</td>
<td>4.461</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>5.91</td>
<td>4.462</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>5.90</td>
<td>4.461</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>15</td>
<td>5.91</td>
<td>4.462</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>5.91</td>
<td>4.462</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>4.462</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>4.461</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>4.462</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>4.461</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>2.231</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Switch to straight-line depreciation.

---

The tax law requires mid-quarter and mid-month conventions for MACRS purposes in certain circumstances.
Example of MACRS

To illustrate depreciation computations under both MACRS and GAAP straight-line accounting, assume the following facts for a computer and peripheral equipment purchased by Denise Rode Company on January 1, 2011.

<table>
<thead>
<tr>
<th>Acquisition Date</th>
<th>January 1, 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>$100,000</td>
</tr>
<tr>
<td>Estimated useful life</td>
<td>7 years</td>
</tr>
<tr>
<td>Estimated salvage value</td>
<td>$16,000</td>
</tr>
<tr>
<td>MACRS class life</td>
<td>5 years</td>
</tr>
<tr>
<td>MACRS method</td>
<td>200% declining-balance</td>
</tr>
<tr>
<td>GAAP method</td>
<td>Straight-line</td>
</tr>
<tr>
<td>Disposal proceeds</td>
<td>January 2, 2018</td>
</tr>
<tr>
<td>disposal proceeds</td>
<td>$11,000</td>
</tr>
</tbody>
</table>

Using the rates from the MACRS depreciation rate schedule for a 5-year class of property, Rode computes depreciation as follows for tax purposes.

**ILLUSTRATION 11A-4**
Computation of MACRS Depreciation

<table>
<thead>
<tr>
<th>Year</th>
<th>MACRS Depreciation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>$100,000 \times .20 = $ 20,000</td>
</tr>
<tr>
<td>2012</td>
<td>$100,000 \times .32 = 32,000</td>
</tr>
<tr>
<td>2013</td>
<td>$100,000 \times .192 = 19,200</td>
</tr>
<tr>
<td>2014</td>
<td>$100,000 \times .1152 = 11,520</td>
</tr>
<tr>
<td>2015</td>
<td>$100,000 \times .1152 = 11,520</td>
</tr>
<tr>
<td>2016</td>
<td>$100,000 \times .0576 = 5,760</td>
</tr>
<tr>
<td><strong>Total depreciation</strong></td>
<td><strong>$100,000</strong></td>
</tr>
</tbody>
</table>

Rode computes the depreciation under GAAP straight-line method, with $16,000 of estimated salvage value and an estimated useful life of 7 years, as shown in Illustration 11A-5.

**ILLUSTRATION 11A-5**
Computation of GAAP Depreciation

\[
\text{GAAP Depreciation} = \frac{($100,000 - $16,000)}{7} = \frac{12,000}{7} \text{ annual depreciation} \\
\times 7 \text{ years} \\
\text{1/1/11–1/2/18} \quad $84,000 \text{ total depreciation}
\]

The MACRS depreciation recovers the total cost of the asset on an accelerated basis. But, a taxable gain of $11,000 results from the sale of the asset at January 2, 2018. Therefore, the net effect on taxable income for the years 2011 through 2018 is $89,000 ($100,000 depreciation − $11,000 gain).

Under GAAP, the company recognizes a loss on disposal of $5,000 ($16,000 book value − $11,000 disposal proceeds). The net effect on income before income taxes for the years 2011 through 2018 is $89,000 ($84,000 depreciation + $5,000 loss), the same as the net effect of MACRS on taxable income.

Even though the net effects are equal in amount, the deferral of income tax payments under MACRS from early in the life of the asset to later in life is desirable. The different amounts of depreciation for income tax reporting and financial GAAP reporting in each year are a matter of timing and result in temporary differences, which require interperiod tax allocation. (See Chapter 19 for an extended treatment of this topic.)
OPTIONAL STRAIGHT-LINE METHOD

An alternate MACRS method exists for determining depreciation deductions. Based on the straight-line method, it is referred to as the optional (elective) straight-line method. This method applies to the six classes of property described earlier. The alternate MACRS applies the straight-line method to the MACRS recovery periods. It ignores salvage value.

Under the optional straight-line method, in the first year in which the property is put in service, the company deducts half of the amount of depreciation that would be permitted for a full year (half-year convention). Use the half-year convention for homework problems.

TAX VERSUS BOOK DEPRECIATION

GAAP requires that companies allocate the cost of depreciable assets to expense over the expected useful life of the asset in a systematic and rational manner. Some argue that from a cost-benefit perspective it would be better for companies to adopt the MACRS approach in order to eliminate the necessity of maintaining two different sets of records.

However, the tax laws and financial reporting have different objectives: The purpose of taxation is to raise revenue from constituents in an equitable manner. The purpose of financial reporting is to reflect the economic substance of a transaction as closely as possible and to help predict the amounts, timing, and uncertainty of future cash flows. Because these objectives differ, the adoption of one method for both tax and book purposes in all cases is not in accordance with GAAP.

SUMMARY OF LEARNING OBJECTIVE FOR APPENDIX 11A

Describe income tax methods of depreciation. Congress enacted a Modified Accelerated Cost Recovery System (MACRS) in the Tax Reform Act of 1986. It applies to depreciable assets placed in service in 1987 and later. The computation of depreciation under MACRS differs from the computation under GAAP in three respects: (1) a mandated tax life, which is generally shorter than the economic life; (2) cost recovery on an accelerated basis; and (3) an assigned salvage value of zero.

KEY TERM

MODIFIED ACCELERATED COST RECOVERY SYSTEM (MACRS), 630

FASB CODIFICATION

FASB Codification References

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Exercises

If your school has a subscription to the FASB Codification, go to http://aaahq.org/asclogin.cfm to log in and prepare responses to the following. Provide Codification references for your responses.

CE11-1 Access the glossary (“Master Glossary”) to answer the following.
(a) What is the definition of amortization?
(b) What is the definition of impairment?
(c) What is the definition of recoverable amount?
(d) What are activities, as they relate to the construction of an asset?

CE11-2 Your client, Barriques Inc., is contemplating a restructuring of its operations, including the possibility of spinning off some of its assets to the original owners. However, management is unsure of the accounting for any impairment on the assets. What does the authoritative literature say about these types of impairments?

CE11-3 Your great-uncle, who is a CPA, is impressed that you are majoring in accounting, but based on his experience, he believes that depreciation is something that companies do based on past practice, not on the basis of any authoritative guidance. Provide the authoritative literature to support the practice of fixed-asset depreciation.

CE11-4 What is the nature of the SEC guidance concerning property, plant, and equipment disclosures?

An additional Codification case can be found in the Using Your Judgment section, on page 652.

Be sure to check the book’s companion website for a Review and Analysis Exercise, with solution.

WILEY PLUS Questions, Brief Exercises, Exercises, Problems, and many more resources are available for practice in WileyPLUS.

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

QUESTIONS

1. Distinguish among depreciation, depletion, and amortization.
2. Identify the factors that are relevant in determining the annual depreciation charge, and explain whether these factors are determined objectively or whether they are based on judgment.
3. Some believe that accounting depreciation measures the decline in the value of fixed assets. Do you agree? Explain.
4. Explain how estimation of service lives can result in unrealistically high carrying values for fixed assets.
5. The plant manager of a manufacturing firm suggested in a conference of the company’s executives that accountants should speed up depreciation on the machinery in the finishing department because improvements were rapidly making those machines obsolete, and a depreciation fund big enough to cover their replacement is needed. Discuss the accounting concept of depreciation and the effect on a business concern of the depreciation recorded for plant assets, paying particular attention to the issues raised by the plant manager.
6. For what reasons are plant assets retired? Define inadequacy, supersession, and obsolescence.
7. What basic questions must be answered before the amount of the depreciation charge can be computed?

8. Workman Company purchased a machine on January 2, 2012, for $800,000. The machine has an estimated useful life of 5 years and a salvage value of $100,000. Depreciation was computed by the 150% declining-balance method. What is the amount of accumulated depreciation at the end of December 31, 2013?

9. Silverman Company purchased machinery for $162,000 on January 1, 2012. It is estimated that the machinery will have a useful life of 20 years, salvage value of $15,000, production of 84,000 units, and working hours of 42,000. During 2012, the company uses the machinery for 14,300 hours, and the machinery produces 20,000 units. Compute depreciation under the straight-line, units-of-output, working hours, sum-of-the-years’-digits, and double-declining-balance methods.

10. What are the major factors considered in determining what depreciation method to use?

11. Under what conditions is it appropriate for a business to use the composite method of depreciation for its plant assets? What are the advantages and disadvantages of this method?

12. If Remmers, Inc. uses the composite method and its composite rate is 7.5% per year, what entry should it make when plant assets that originally cost $50,000 and have been used for 10 years are sold for $14,000?

13. A building that was purchased December 31, 1988, for $2,500,000 was originally estimated to have a life of 50 years with no salvage value at the end of that time. Depreciation has been recorded through 2012. During 2013, an examination of the building by an engineering firm discloses that its estimated useful life is 15 years after 2012. What should be the amount of depreciation for 2013?

14. Charlie Parker, president of Spinners Company, has recently noted that depreciation increases cash provided by operations and therefore depreciation is a good source of funds. Do you agree? Discuss.

15. Andrea Torbert purchased a computer for $8,000 on July 1, 2012. She intends to depreciate it over 4 years using the double-declining-balance method. Salvage value is $1,000. Compute depreciation for 2013.

16. Walkin Inc. is considering the write-down of its long-term plant because of a lack of profitability. Explain to the management of Walkin how to determine whether a write-down is permitted.

17. Last year, Wyeth Company recorded an impairment on an asset held for use. Recent appraisals indicate that the asset has increased in value. Should Wyeth record this recovery in value?

18. Toro Co. has equipment with a carrying amount of $700,000. The expected future net cash flows from the equipment are $705,000, and its fair value is $590,000. The equipment is expected to be used in operations in the future. What amount (if any) should Toro report as an impairment to its equipment?

19. Explain how gains or losses on impaired assets should be reported in income.

20. It has been suggested that plant and equipment could be replaced more quickly if depreciation rates for income tax and accounting purposes were substantially increased. As a result, business operations would receive the benefit of more modern and more efficient plant facilities. Discuss the merits of this proposition.

21. Neither depreciation on replacement cost nor depreciation adjusted for changes in the purchasing power of the dollar has been recognized as generally accepted accounting principles for inclusion in the primary financial statements. Briefly present the accounting treatment that might be used to assist in the maintenance of the ability of a company to replace its productive capacity.

22. List (a) the similarities and (b) the differences in the accounting treatments of depreciation and cost depletion.

23. Describe cost depletion and percentage depletion. Why is the percentage depletion method permitted?

24. In what way may the use of percentage depletion violate sound accounting theory?

25. In the extractive industries, businesses may pay dividends in excess of net income. What is the maximum permissible? How can this practice be justified?

26. The following statement appeared in a financial magazine: “RRA—or Rah-Rah, as it’s sometimes dubbed—has kicked up quite a storm. Oil companies, for example, are convinced that the approach is misleading. Major accounting firms agree.” What is RRA? Why might oil companies believe that this approach is misleading?

27. Shumway Oil uses successful-efforts accounting and also provides full-cost results as well. Under full-cost, Shumway Oil would have reported retained earnings of $42 million and net income of $4 million. Under successful-efforts, retained earnings were $29 million, and net income was $3 million. Explain the difference between full-costing and successful-efforts accounting.

28. Target Corporation in 2010 reported net income of $2.5 billion, net sales of $63.4 billion, and average total assets of $44.3 billion. What is Target’s asset turnover ratio? What is Target’s rate of return on assets?

29. What is a modified accelerated cost recovery system (MACRS)? Speculate as to why this system is now required for tax purposes.
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### BRIEF EXERCISES

**BE11-1** Fernandez Corporation purchased a truck at the beginning of 2012 for $50,000. The truck is estimated to have a salvage value of $2,000 and a useful life of 160,000 miles. It was driven 23,000 miles in 2012 and 31,000 miles in 2013. Compute depreciation expense for 2012 and 2013.

**BE11-2** Lockard Company purchased machinery on January 1, 2012, for $80,000. The machinery is estimated to have a salvage value of $8,000 after a useful life of 8 years. (a) Compute 2012 depreciation expense using the straight-line method. (b) Compute 2012 depreciation expense using the straight-line method assuming the machinery was purchased on September 1, 2012.

**BE11-3** Use the information for Lockard Company given in BE11-2. (a) Compute 2012 depreciation expense using the sum-of-the-years’-digits method. (b) Compute 2012 depreciation expense using the sum-of-the-years’-digits method assuming the machinery was purchased on April 1, 2012.

**BE11-4** Use the information for Lockard Company given in BE11-2. (a) Compute 2012 depreciation expense using the double-declining-balance method. (b) Compute 2012 depreciation expense using the double-declining-balance method assuming the machinery was purchased on October 1, 2012.

**BE11-5** Cominsky Company purchased a machine on July 1, 2013, for $28,000. Cominsky paid $200 in title fees and county property tax of $125 on the machine. In addition, Cominsky paid $500 shipping charges for delivery, and $475 was paid to a local contractor to build and wire a platform for the machine on the plant floor. The machine has an estimated useful life of 6 years with a salvage value of $3,000. Determine the depreciation base of Cominsky’s new machine. Cominsky uses straight-line depreciation.

**BE11-6** Dickinson Inc. owns the following assets.

<table>
<thead>
<tr>
<th>Asset</th>
<th>Cost</th>
<th>Salvage</th>
<th>Estimated Useful Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>$70,000</td>
<td>$7,000</td>
<td>10 years</td>
</tr>
<tr>
<td>B</td>
<td>$50,000</td>
<td>$5,000</td>
<td>5 years</td>
</tr>
<tr>
<td>C</td>
<td>$82,000</td>
<td>$4,000</td>
<td>12 years</td>
</tr>
</tbody>
</table>

Compute the composite depreciation rate and the composite life of Dickinson’s assets.

**BE11-7** Holt Company purchased a computer for $8,000 on January 1, 2011. Straight-line depreciation is used, based on a 5-year life and a $1,000 salvage value. In 2013, the estimates are revised. Holt now feels the computer will be used until December 31, 2014, when it can be sold for $500. Compute the 2013 depreciation.

**BE11-8** Jurassic Company owns machinery that cost $900,000 and has accumulated depreciation of $380,000. The expected future net cash flows from the use of the asset are expected to be $500,000. The fair value of the equipment is $400,000. Prepare the journal entry, if any, to record the impairment loss.

**BE11-9** Everly Corporation acquires a coal mine at a cost of $400,000. Intangible development costs total $100,000. After extraction has occurred, Everly must restore the property (estimated fair value of the obligation is $80,000), after which it can be sold for $160,000. Everly estimates that 4,000 tons of coal can be extracted. If 700 tons are extracted the first year, prepare the journal entry to record depletion.

**BE11-10** In its 2009 annual report, Campbell Soup Company reports beginning-of-the-year total assets of $6,474 million, end-of-the-year total assets of $6,056 million, total sales of $7,586 million, and net income of $736 million. (a) Compute Campbell’s asset turnover ratio. (b) Compute Campbell’s profit margin on sales. (c) Compute Campbell’s rate of return on assets (1) using asset turnover and profit margin and (2) using net income.

**BE11-11** Francis Corporation purchased an asset at a cost of $50,000 on March 1, 2012. The asset has a useful life of 8 years and a salvage value of $4,000. For tax purposes, the MACRS class life is 5 years. Compute tax depreciation for each year 2012–2017.

### EXERCISES

**E11-1** (Depreciation Computations—SL, SYD, DDB) Lansbury Company purchases equipment on January 1, Year 1, at a cost of $518,000. The asset is expected to have a service life of 12 years and a salvage value of $50,000.

**Instructions**

(a) Compute the amount of depreciation for each of Years 1 through 3 using the straight-line depreciation method.
(b) Compute the amount of depreciation for each of Years 1 through 3 using the sum-of-the-years’-digits method.

(c) Compute the amount of depreciation for each of Years 1 through 3 using the double-declining-balance method. (In performing your calculations, round constant percentage to the nearest one-hundredth of a point and round answers to the nearest dollar.)

2 3 E11-2 (Depreciation—Conceptual Understanding) Hasselback Company acquired a plant asset at the beginning of Year 1. The asset has an estimated service life of 5 years. An employee has prepared depreciation schedules for this asset using three different methods to compare the results of using one method with the results of using other methods. You are to assume that the following schedules have been correctly prepared for this asset using (1) the straight-line method, (2) the sum-of-the-years’-digits method, and (3) the double-declining-balance method.

<table>
<thead>
<tr>
<th>Year</th>
<th>Straight-Line</th>
<th>Sum-of-the-Years’-Digits</th>
<th>Double-Declining-Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$ 9,000</td>
<td>$ 15,000</td>
<td>$ 20,000</td>
</tr>
<tr>
<td>2</td>
<td>9,000</td>
<td>12,000</td>
<td>12,000</td>
</tr>
<tr>
<td>3</td>
<td>9,000</td>
<td>9,000</td>
<td>7,200</td>
</tr>
<tr>
<td>4</td>
<td>9,000</td>
<td>6,000</td>
<td>4,320</td>
</tr>
<tr>
<td>5</td>
<td>9,000</td>
<td>3,000</td>
<td>1,480</td>
</tr>
<tr>
<td>Total</td>
<td>$45,000</td>
<td>$45,000</td>
<td>$45,000</td>
</tr>
</tbody>
</table>

Instructions
Answer the following questions.

(a) What is the cost of the asset being depreciated?
(b) What amount, if any, was used in the depreciation calculations for the salvage value for this asset?
(c) Which method will produce the highest charge to income in Year 1?
(d) Which method will produce the highest charge to income in Year 4?
(e) Which method will produce the highest book value for the asset at the end of Year 3?
(f) If the asset is sold at the end of Year 3, which method would yield the highest gain (or lowest loss) on disposal of the asset?

2 3 E11-3 (Depreciation Computations—SYD, DDB—Partial Periods) Cosby Company purchased a new plant asset on April 1, 2012, at a cost of $774,000. It was estimated to have a service life of 20 years and a salvage value of $60,000. Cosby’s accounting period is the calendar year.

Instructions
(a) Compute the depreciation for this asset for 2012 and 2013 using the sum-of-the-years’-digits method.
(b) Compute the depreciation for this asset for 2012 and 2013 using the double-declining-balance method.

2 3 E11-4 (Depreciation Computations—Five Methods) Wenner Furnace Corp. purchased machinery for $279,000 on May 1, 2012. It is estimated that it will have a useful life of 10 years, salvage value of $15,000, production of 240,000 units, and working hours of 25,000. During 2013, Wenner Corp. uses the machinery for 2,650 hours, and the machinery produces 25,500 units.

Instructions
From the information given, compute the depreciation charge for 2013 under each of the following methods. (Round to the nearest dollar.)

(a) Straight-line.
(b) Units-of-output.
(c) Working hours.
(d) Sum-of-the-years’-digits.
(e) Double-declining-balance.

2 3 E11-5 (Depreciation Computations—Four Methods) Maserati Corporation purchased a new machine for its assembly process on August 1, 2012. The cost of this machine was $150,000. The company estimated that the machine would have a salvage value of $24,000 at the end of its service life. Its life is estimated at 5 years and its working hours are estimated at 21,000 hours. Year-end is December 31.

Instructions
Compute the depreciation expense under the following methods. Each of the following should be considered unrelated.

(a) Straight-line depreciation for 2012.
(b) Activity method for 2012, assuming that machine usage was 800 hours.
(c) Sum-of-the-years’-digits for 2013.
(d) Double-declining-balance for 2013.
Chapter 11 Depreciation, Impairments, and Depletion

E11-6 (Depreciation Computations—Five Methods, Partial Periods) Agazzi Company purchased equipment for $304,000 on October 1, 2012. It is estimated that the equipment will have a useful life of 8 years and a salvage value of $16,000. Estimated production is 40,000 units and estimated working hours are 20,000. During 2012, Agazzi uses the equipment for 525 hours and the equipment produces 1,000 units.

Instructions
Compute depreciation expense under each of the following methods. Agazzi is on a calendar-year basis ending December 31.

(a) Straight-line method for 2012.
(b) Activity method (units of output) for 2012.
(c) Activity method (working hours) for 2012.
(d) Sum-of-the-years’-digits method for 2014.

E11-7 (Different Methods of Depreciation) Jeeter Industries presents you with the following information.

<table>
<thead>
<tr>
<th>Description</th>
<th>Date Purchased</th>
<th>Cost</th>
<th>Salvage Value</th>
<th>Life in Years</th>
<th>Depreciation Method</th>
<th>Accumulated Depreciation to 12/31/12</th>
<th>Depreciation for 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine A</td>
<td>2/12/11</td>
<td>$159,000</td>
<td>$16,000</td>
<td>10</td>
<td>SL</td>
<td>$37,700</td>
<td></td>
</tr>
<tr>
<td>Machine B</td>
<td>8/15/10</td>
<td>21,000</td>
<td>28,500</td>
<td>5</td>
<td>SYD</td>
<td>29,000</td>
<td></td>
</tr>
<tr>
<td>Machine C</td>
<td>7/21/09</td>
<td>88,000</td>
<td>69,000</td>
<td>8</td>
<td>DDB</td>
<td>70,000</td>
<td></td>
</tr>
<tr>
<td>Machine D</td>
<td>10/12/09</td>
<td>219,000</td>
<td></td>
<td></td>
<td></td>
<td>70,000</td>
<td></td>
</tr>
</tbody>
</table>

Instructions
Complete the table for the year ended December 31, 2013. The company depreciates all assets using the half-year convention.

E11-8 (Depreciation Computation—Replacement, Nonmonetary Exchange) Goldman Corporation bought a machine on June 1, 2010, for $31,800, f.o.b. the place of manufacture. Freight to the point where it was set up was $200, and $500 was expended to install it. The machine’s useful life was estimated at 10 years, with a salvage value of $2,500. On June 1, 2011, an essential part of the machine is replaced, at a cost of $2,700, with one designed to reduce the cost of operating the machine. The cost of the old part and related depreciation cannot be determined with any accuracy.

On June 1, 2014, the company buys a new machine of greater capacity for $35,000, delivered, trading in the old machine which has a fair value and trade-in allowance of $20,000. To prepare the old machine for removal from the plant cost $75, and expenditures to install the new one were $1,500. It is estimated that the new machine has a useful life of 10 years, with a salvage value of $4,000 at the end of that time. The exchange has commercial substance.

Instructions
Assuming that depreciation is to be computed on the straight-line basis, compute the annual depreciation on the new equipment that should be provided for the fiscal year beginning June 1, 2014.

E11-9 (Composite Depreciation) Presented below is information related to Morrow Manufacturing Corporation.

<table>
<thead>
<tr>
<th>Machine</th>
<th>Cost</th>
<th>Estimated Salvage Value</th>
<th>Estimated Life (in years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>40,500</td>
<td>$5,500</td>
<td>10</td>
</tr>
<tr>
<td>B</td>
<td>33,600</td>
<td>4,800</td>
<td>9</td>
</tr>
<tr>
<td>C</td>
<td>36,000</td>
<td>3,600</td>
<td>8</td>
</tr>
<tr>
<td>D</td>
<td>19,000</td>
<td>1,500</td>
<td>7</td>
</tr>
<tr>
<td>E</td>
<td>23,500</td>
<td>2,500</td>
<td>6</td>
</tr>
</tbody>
</table>

Instructions
(a) Compute the rate of depreciation per year to be applied to the machines under the composite method.
(b) Prepare the adjusting entry necessary at the end of the year to record depreciation for the year.
(c) Prepare the entry to record the sale of Machine D for cash of $5,000. It was used for 6 years, and depreciation was entered under the composite method.

E11-10 (Depreciation Computations, SYD) Bosh Company purchased a piece of equipment at the beginning of 2009. The equipment cost $502,000. It has an estimated service life of 8 years and an expected salvage value of $70,000. The sum-of-the-years’-digits method of depreciation is being used. Someone has already correctly prepared a depreciation schedule for this asset. This schedule shows that $60,000 will be depreciated for a particular calendar year.
Instructions
Show calculations to determine for what particular year the depreciation amount for this asset will be $60,000.

E11-11 (Depreciation—Change in Estimate) Machinery purchased for $52,000 by Carver Co. in 2008 was originally estimated to have a life of 8 years with a salvage value of $4,000 at the end of that time. Depreciation has been entered for 5 years on this basis. In 2013, it is determined that the total estimated life should be 10 years with a salvage value of $4,500 at the end of that time. Assume straight-line depreciation.

Instructions
(a) Prepare the entry to correct the prior years’ depreciation, if necessary.
(b) Prepare the entry to record depreciation for 2013.

E11-12 (Depreciation Computation—Addition, Change in Estimate) In 1985, Abraham Company completed the construction of a building at a cost of $1,900,000 and first occupied it in January 1986. It was estimated that the building would have a useful life of 40 years and a salvage value of $60,000 at the end of that time.

Early in 1996, an addition to the building was constructed at a cost of $470,000. At that time, it was estimated that the remaining life of the building would be, as originally estimated, an additional 30 years, and that the addition would have a life of 30 years and a salvage value of $20,000.

In 2014, it is determined that the probable life of the building and addition will extend to the end of 2045 or 20 years beyond the original estimate.

Instructions
(a) Using the straight-line method, compute the annual depreciation that would have been charged from 1986 through 1995.
(b) Compute the annual depreciation that would have been charged from 1996 through 2013.
(c) Prepare the entry, if necessary, to adjust the account balances because of the revision of the estimated life in 2014.
(d) Compute the annual depreciation to be charged beginning with 2014.

E11-13 (Depreciation—Replacement, Change in Estimate) Peloton Company constructed a building at a cost of $2,400,000 and occupied it beginning in January 1993. It was estimated at that time that its life would be 40 years, with no salvage value.

In January 2013, a new roof was installed at a cost of $300,000, and it was estimated then that the building would have a useful life of 25 years from that date. The cost of the old roof was $180,000.

Instructions
(a) What amount of depreciation should have been charged annually from the years 1993 to 2012? (Assume straight-line depreciation.)
(b) What entry should be made in 2013 to record the replacement of the roof?
(c) Prepare the entry in January 2013, to record the revision in the estimated life of the building, if necessary.
(d) What amount of depreciation should be charged for the year 2013?

E11-14 (Error Analysis and Depreciation, SL and SYD) Kawasaki Company shows the following entries in its Equipment account for 2013. All amounts are based on historical cost.

<table>
<thead>
<tr>
<th>Equipment</th>
<th>2013</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan. 1</td>
<td>Balance</td>
<td>133,000</td>
</tr>
<tr>
<td>Aug. 10</td>
<td>Purchases</td>
<td>32,000</td>
</tr>
<tr>
<td>12</td>
<td>Freight on equipment purchased</td>
<td>700</td>
</tr>
<tr>
<td>25</td>
<td>Installation costs</td>
<td>2,500</td>
</tr>
<tr>
<td>Nov. 10</td>
<td>Repairs</td>
<td>500</td>
</tr>
</tbody>
</table>

|           | June 30 | Cost of equipment sold (purchased prior to 2013) | 23,000 |

Instructions
(a) Prepare any correcting entries necessary.
(b) Assuming that depreciation is to be charged for a full year on the ending balance in the asset account, compute the proper depreciation charge for 2013 under each of the methods listed below. Assume an estimated life of 10 years, with no salvage value. The machinery included in the January 1, 2013, balance was purchased in 2011.
(1) Straight-line.
(2) Sum-of-the-years’-digits.
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**E11-15 (Depreciation for Fractional Periods)** On March 10, 2014, No Doubt Company sells equipment that it purchased for $240,000 on August 20, 2007. It was originally estimated that the equipment would have a life of 12 years and a salvage value of $21,000 at the end of that time, and depreciation has been computed on that basis. The company uses the straight-line method of depreciation.

**Instructions**
(a) Compute the depreciation charge on this equipment for 2007, for 2014, and the total charge for the period from 2008 to 2013, inclusive, under each of the six following assumptions with respect to partial periods.
(1) Depreciation is computed for the exact period of time during which the asset is owned. (Use 365 days for the base.)
(2) Depreciation is computed for the full year on the January 1 balance in the asset account.
(3) Depreciation is computed for the full year on the December 31 balance in the asset account.
(4) Depreciation for one-half year is charged on plant assets acquired or disposed of during the year.
(5) Depreciation is computed on additions from the beginning of the month following acquisition and on disposals to the beginning of the month following disposal.
(6) Depreciation is computed for a full period on all assets in use for over one-half year, and no depreciation is charged on assets in use for less than one-half year.
(b) Briefly evaluate the methods above, considering them from the point of view of basic accounting theory as well as simplicity of application.

**E11-16 (Impairment)** Presented below is information related to equipment owned by Pujols Company at December 31, 2012.

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>$9,000,000</td>
</tr>
<tr>
<td>Accumulated depreciation to date</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Expected future net cash flows</td>
<td>7,000,000</td>
</tr>
<tr>
<td>Fair value</td>
<td>4,400,000</td>
</tr>
</tbody>
</table>

Assume that Pujols will continue to use this asset in the future. As of December 31, 2012, the equipment has a remaining useful life of 4 years.

**Instructions**
(a) Prepare the journal entry (if any) to record the impairment of the asset at December 31, 2012.
(b) Prepare the journal entry to record depreciation expense for 2013.
(c) The fair value of the equipment at December 31, 2013, is $5,100,000. Prepare the journal entry (if any) necessary to record this increase in fair value.

**E11-17 (Impairment)** Assume the same information as E11-16, except that Pujols intends to dispose of the equipment in the coming year. It is expected that the cost of disposal will be $20,000.

**Instructions**
(a) Prepare the journal entry (if any) to record the impairment at December 31, 2012.
(b) Prepare the journal entry (if any) to record depreciation expense for 2013.
(c) The asset was not sold by December 31, 2013. The fair value of the equipment on that date is $5,100,000. Prepare the journal entry (if any) necessary to record this increase in fair value. It is expected that the cost of disposal is still $20,000.

**E11-18 (Impairment)** The management of Sprague Inc. was discussing whether certain equipment should be written off as a charge to current operations because of obsolescence. This equipment has a cost of $900,000 with depreciation to date of $400,000 as of December 31, 2012. On December 31, 2012, management projected its future net cash flows from this equipment to be $300,000 and its fair value to be $280,000. The company intends to use this equipment in the future.

**Instructions**
(a) Prepare the journal entry (if any) to record the impairment at December 31, 2012.
(b) Where should the gain or loss (if any) on the write-down be reported in the income statement?
(c) At December 31, 2013, the equipment’s fair value increased to $300,000. Prepare the journal entry (if any) to record this increase in fair value.
(d) What accounting issues did management face in accounting for this impairment?

**E11-19 (Depletion Computations—Timber)** Hernandez Timber Company owns 9,000 acres of timberland purchased in 2001 at a cost of $1,400 per acre. At the time of purchase, the land without the timber was valued at $400 per acre. In 2002, Hernandez built fire lanes and roads, with a life of 30 years, at a cost of $87,000. Every year, Hernandez sprays to prevent disease at a cost of $5,000 per year and spends $7,000 to maintain the fire lanes and roads. During 2003, Hernandez selectively logged and sold 700,000 board feet
of timber, of the estimated 3,000,000 board feet. In 2004, Hernandez planted new seedlings to replace the trees cut at a cost of $100,000.

Instructions
(a) Determine the depreciation expense and the cost of timber sold related to depletion for 2003.
(b) Hernandez has not logged since 2003. If Hernandez logged and sold 900,000 board feet of timber in 2014, when the timber cruise (appraiser) estimated 5,000,000 board feet, determine the cost of timber sold related to depletion for 2014.

E11-20 (Depletion Computations—Oil) Federer Drilling Company has leased property on which oil has been discovered. Wells on this property produced 18,000 barrels of oil during the past year that sold at an average sales price of $65 per barrel. Total oil resources of this property are estimated to be 250,000 barrels.

The lease provided for an outright payment of $600,000 to the lessor (owner) before drilling could be commenced and an annual rental of $31,500. A premium of 5% of the sales price of every barrel of oil removed is to be paid annually to the lessor. In addition, Federer (lessee) is to clean up all the waste and debris from drilling and to bear the costs of reconditioning the land for farming when the wells are abandoned. The estimated fair value, at the time of the lease, of this clean-up and reconditioning is $30,000.

Instructions
From the provisions of the lease agreement, compute the cost per barrel for the past year, exclusive of operating costs, to Federer Drilling Company.

E11-21 (Depletion Computations—Timber) Jonas Lumber Company owns a 7,000-acre tract of timber purchased in 2005 at a cost of $1,300 per acre. At the time of purchase, the land was estimated to have a value of $300 per acre without the timber. Jonas Lumber Company has not logged this tract since it was purchased. In 2012, Jonas had the timber cruised. The cruise (appraiser) estimated that each acre contained 8,000 board feet of timber. In 2012, Jonas built 10 miles of roads at a cost of $8,400 per mile. After the roads were completed, Jonas logged and sold 3,500 trees containing 880,000 board feet.

Instructions
(a) Determine the cost of timber sold related to depletion for 2012.
(b) If Jonas depreciates the logging roads on the basis of timber cut, determine the depreciation expense for 2012.
(c) If Jonas plants five seedlings at a cost of $4 per seedling for each tree cut, how should Jonas treat the reforestation?

E11-22 (Depletion Computations—Mining) Henrik Mining Company purchased land on February 1, 2012, at a cost of $1,250,000. It estimated that a total of 60,000 tons of mineral was available for mining. After it has removed all the natural resources, the company will be required to restore the property to its previous state because of strict environmental protection laws. It estimates the fair value of this restoration obligation at $90,000. It believes it will be able to sell the property afterwards for $100,000. It incurred developmental costs of $200,000 before it was able to do any mining. In 2012, resources removed totaled 30,000 tons. The company sold 24,000 tons.

Instructions
Compute the following information for 2012.

(a) Per unit mineral cost.
(b) Total material cost of December 31, 2012, inventory.
(c) Total materials cost in cost of goods sold at December 31, 2012.

E11-23 (Depletion Computations—Minerals) At the beginning of 2012, Callaway Company acquired a mine for $850,000. Of this amount, $100,000 was ascribed to the land value and the remaining portion to the minerals in the mine. Surveys conducted by geologists have indicated that approximately 12,000,000 units of the ore appear to be in the mine. Callaway incurred $170,000 of development costs associated with this mine prior to any extraction of minerals. It also determined that the fair value of its obligation to prepare the land for an alternative use when all of the mineral has been removed was $40,000. During 2012, 2,500,000 units of ore were extracted and 2,200,000 of these units were sold.

Instructions
Compute the following.

(a) The total amount of depletion for 2012.
(b) The amount that is charged as an expense for 2012 for the cost of the minerals sold during 2012.


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E11-24 (Ratio Analysis) The 2009 Annual Report of McDonald’s Corporation contains the following information.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total assets</td>
<td>$30,225</td>
<td>$28,462</td>
</tr>
<tr>
<td>Net sales</td>
<td>22,745</td>
<td></td>
</tr>
<tr>
<td>Net income</td>
<td>4,551</td>
<td></td>
</tr>
</tbody>
</table>

Instructions

Compute the following ratios for McDonald’s for 2009.

(a) Asset turnover ratio.
(b) Rate of return on assets.
(c) Profit margin on sales.
(d) How can the asset turnover ratio be used to compute the rate of return on assets?

E11-25 (Book vs. Tax (MACRS) Depreciation) Annunzio Enterprises purchased a delivery truck on January 1, 2012, at a cost of $41,000. The truck has a useful life of 7 years with an estimated salvage value of $6,000. The straight-line method is used for book purposes. For tax purposes the truck, having an MACRS class life of 7 years, is classified as 5-year property; the MACRS tax rate tables are used to compute depreciation. In addition, assume that for 2012 and 2013 the company has revenues of $200,000 and operating expenses (excluding depreciation) of $130,000.

Instructions

(a) Prepare income statements for 2012 and 2013. (The final amount reported on the income statement should be income before income taxes.)
(b) Compute taxable income for 2012 and 2013.
(c) Determine the total depreciation to be taken over the useful life of the delivery truck for both book and tax purposes.
(d) Explain why depreciation for book and tax purposes will generally be different over the useful life of a depreciable asset.

E11-26 (Book vs. Tax (MACRS) Depreciation) Elwood Inc. purchased computer equipment on March 1, 2012, for $36,000. The computer equipment has a useful life of 10 years and a salvage value of $3,000. For tax purposes, the MACRS class life is 5 years.

Instructions

(a) Assuming that the company uses the straight-line method for book and tax purposes, what is the depreciation expense reported in (1) the financial statements for 2012 and (2) the tax return for 2012?
(b) Assuming that the company uses the double-declining-balance method for both book and tax purposes, what is the depreciation expense reported in (1) the financial statements for 2012 and (2) the tax return for 2012?
(c) Why is depreciation for tax purposes different from depreciation for book purposes even if the company uses the same depreciation method to compute them both?

See the book’s companion website, www.wiley.com/college/kieso, for a set of B Exercises.

PROBLEMS

P11-1 (Depreciation for Partial Period—SL, SYD, and DDB) Alladin Company purchased Machine #201 on May 1, 2012. The following information relating to Machine #201 was gathered at the end of May.

| Price | $85,000 |
| Credit terms | 2/10, n/30 |
| Freight-in costs | $800 |
| Preparation and installation costs | $3,800 |
| Labor costs during regular production operations | $10,500 |

It was expected that the machine could be used for 10 years, after which the salvage value would be zero. Alladin intends to use the machine for only 8 years, however, after which it expects to be able to sell it for $1,500. The invoice for Machine #201 was paid May 5, 2012. Alladin uses the calendar year as the basis for the preparation of financial statements.
Instructions

(a) Compute the depreciation expense for the years indicated using the following methods. (Round to the nearest dollar.)
   (1) Straight-line method for 2012.
   (2) Sum-of-the-years’-digits method for 2013.

(b) Suppose Kate Crow, the president of Alladin, tells you that because the company is a new organization, she expects it will be several years before production and sales reach optimum levels. She asks you to recommend a depreciation method that will allocate less of the company’s depreciation expense to the early years and more to later years of the assets’ lives. What method would you recommend?

P11-2 (Depreciation for Partial Periods—SL, Act., SYD, and DDB) The cost of equipment purchased by Charleston, Inc., on June 1, 2012, is $89,000. It is estimated that the machine will have a $5,000 salvage value at the end of its service life. Its service life is estimated at 7 years; its total working hours are estimated at 42,000; and its total production is estimated at 525,000 units. During 2012, the machine was operated 6,000 hours and produced 55,000 units. During 2013, the machine was operated 5,500 hours and produced 55,000 units.

Instructions

Compute depreciation expense on the machine for the year ending December 31, 2012, and the year ending December 31, 2013, using the following methods.

(a) Straight-line.
(b) Units-of-output.
(c) Working hours.
(d) Sum-of-the-years’-digits.
(e) Declining-balance (twice the straight-line rate).

P11-3 (Depreciation—SYD, Act., SL, and DDB) The following data relate to the Machinery account of Eshkol, Inc. at December 31, 2012.

<table>
<thead>
<tr>
<th>Machinery</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original cost</td>
<td>$46,000</td>
<td>$51,000</td>
<td>$80,000</td>
<td>$80,000</td>
</tr>
<tr>
<td>Year purchased</td>
<td>2007</td>
<td>2008</td>
<td>2009</td>
<td>2011</td>
</tr>
<tr>
<td>Useful life</td>
<td>10 years</td>
<td>15,000 hours</td>
<td>15 years</td>
<td>10 years</td>
</tr>
<tr>
<td>Salvage value</td>
<td>$ 3,100</td>
<td>$ 3,000</td>
<td>$ 5,000</td>
<td>$ 5,000</td>
</tr>
<tr>
<td>Depreciation method</td>
<td>Sum-of-the-years’-digits</td>
<td>Activity</td>
<td>Straight-line</td>
<td>Double-declining-balance</td>
</tr>
<tr>
<td>Accum. depr. through 2012*</td>
<td>$31,200</td>
<td>$35,200</td>
<td>$15,000</td>
<td>$16,000</td>
</tr>
</tbody>
</table>

*In the year an asset is purchased, Eshkol, Inc. does not record any depreciation expense on the asset. In the year an asset is retired or traded in, Eshkol, Inc. takes a full year’s depreciation on the asset.

The following transactions occurred during 2013.

(a) On May 5, Machine A was sold for $13,000 cash. The company’s bookkeeper recorded this retirement in the following manner in the cash receipts journal.

\[
\begin{array}{ll}
\text{Cash} & 13,000 \\
\text{Machinery (Machine A)} & 13,000 \\
\end{array}
\]

(b) On December 31, it was determined that Machine B had been used 2,100 hours during 2013.

(c) On December 31, before computing depreciation expense on Machine C, the management of Eshkol, Inc. decided the useful life remaining from January 1, 2013, was 10 years.

(d) On December 31, it was discovered that a machine purchased in 2012 had been expensed completely in that year. This machine cost $28,000 and has a useful life of 10 years and no salvage value. Management has decided to use the double-declining-balance method for this machine, which can be referred to as “Machine E.”

Instructions

Prepare the necessary correcting entries for the year 2013. Record the appropriate depreciation expense on the above-mentioned machines.

P11-4 (Depreciation and Error Analysis) A depreciation schedule for semi-trucks of Ichiro Manufacturing Company was requested by your auditor soon after December 31, 2013, showing the additions, retirements,
Chapter 11 Depreciation, Impairments, and Depletion

Depreciation, and other data affecting the income of the company in the 4-year period 2010 to 2013, inclusive. The following data were ascertained.

<table>
<thead>
<tr>
<th>Balance of Trucks account, Jan. 1, 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truck No. 1 purchased Jan. 1, 2007, cost $18,000</td>
</tr>
<tr>
<td>Truck No. 2 purchased July 1, 2007, cost $22,000</td>
</tr>
<tr>
<td>Truck No. 3 purchased Jan. 1, 2009, cost $30,000</td>
</tr>
<tr>
<td>Truck No. 4 purchased July 1, 2009, cost $24,000</td>
</tr>
<tr>
<td>Balance, Jan. 1, 2010 $94,000</td>
</tr>
</tbody>
</table>

The Accumulated Depreciation—Trucks account previously adjusted to January 1, 2010, and entered in the ledger, had a balance on that date of $30,200 (depreciation on the four trucks from the respective dates of purchase, based on a 5-year life, no salvage value). No charges had been made against the account before January 1, 2010.

Transactions between January 1, 2010, and December 31, 2013, which were recorded in the ledger, are as follows.

July 1, 2010 Truck No. 3 was traded for a larger one (No. 5), the agreed purchase price of which was $40,000. Ichiro Mfg. Co. paid the automobile dealer $22,000 cash on the transaction. The entry was a debit to Trucks and a credit to Cash, $22,000. The transaction has commercial substance.

Jan. 1, 2011 Truck No. 1 was sold for $3,500 cash; entry debited Cash and credited Trucks, $3,500.

July 1, 2012 A new truck (No. 6) was acquired for $42,000 cash and was charged at that amount to the Trucks account. (Assume truck No. 2 was not retired.)

July 1, 2012 Truck No. 4 was damaged in a wreck to such an extent that it was sold as junk for $700 cash. Ichiro Mfg. Co. received $2,500 from the insurance company. The entry made by the bookkeeper was a debit to Cash, $3,200, and credits to Miscellaneous Income, $700, and Trucks, $2,500.

Entries for depreciation had been made at the close of each year as follows: 2010, $21,000; 2011, $22,500; 2012, $25,050; 2013, $30,400.

Instructions

(a) For each of the 4 years, compute separately the increase or decrease in net income arising from the company’s errors in determining or entering depreciation or in recording transactions affecting trucks, ignoring income tax considerations.

(b) Prepare one compound journal entry as of December 31, 2013, for adjustment of the Trucks account to reflect the correct balances as revealed by your schedule, assuming that the books have not been closed for 2013.

Khamisah Mining Company has purchased a tract of mineral land for $900,000. It is estimated that this tract will yield 120,000 tons of ore with sufficient mineral content to make mining and processing profitable. It is further estimated that 6,000 tons of ore will be mined the first and last year and 12,000 tons every year in between. (Assume 11 years of mining operations.) The land will have a residual value of $30,000.

The company builds necessary structures and sheds on the site at a cost of $36,000. It is estimated that these structures can serve 15 years but, because they must be dismantled if they are to be moved, they have no salvage value. The company does not intend to use the buildings elsewhere. Mining machinery installed at the mine was purchased secondhand at a cost of $60,000. This machinery cost the former owner $150,000 and was 50% depreciated when purchased. Khamisah Mining estimates that about half of this machinery will still be useful when the present mineral resources have been exhausted but that dismantling and removal costs will just about offset its value at that time. The company does not intend to use the machinery elsewhere. The remaining machinery will last until about one-half the present estimated mineral ore has been removed and will then be worthless. Cost is to be allocated equally between these two classes of machinery.

Instructions

(a) As chief accountant for the company, you are to prepare a schedule showing estimated depletion and depreciation costs for each year of the expected life of the mine.

(b) Also compute the depreciation and depletion for the first year assuming actual production of 5,000 tons. Nothing occurred during the year to cause the company engineers to change their estimates of either the mineral resources or the life of the structures and equipment.

Conan O’Brien Logging and Lumber Company owns 3,000 acres of timberland on the north side of Mount Leno, which was purchased in 2000 at a cost of $550 per acre. In 2012, O’Brien began selectively logging this timber tract. In May of 2012, Mount Leno erupted, burying the timberland of O’Brien under a foot of ash. All of the timber on the O’Brien tract was downed. In addition, the logging roads, built at a cost of $150,000, were destroyed, as well as the logging equipment, with a net book value of $300,000.
At the time of the eruption, O’Brien had logged 20% of the estimated 500,000 board feet of timber. Prior to the eruption, O’Brien estimated the land to have a value of $200 per acre after the timber was harvested. O’Brien includes the logging roads in the depletion base.

O’Brien estimates it will take 3 years to salvage the downed timber at a cost of $700,000. The timber can be sold for pulp wood at an estimated price of $3 per board foot. The value of the land is unknown, but must be considered nominal due to future uncertainties.

Instructions
(a) Determine the depletion cost per board foot for the timber harvested prior to the eruption of Mount Leno.
(b) Prepare the journal entry to record the depletion prior to the eruption.
(c) If this tract represents approximately half of the timber holdings of O’Brien, determine the amount of the extraordinary loss due to the eruption of Mount Leno for the year ended December 31, 2012.

P11-7 (Natural Resources—Timber) Bronson Paper Products purchased 10,000 acres of forested timberland in March 2012. The company paid $1,700 per acre for this land, which was above the $800 per acre most farmers were paying for cleared land. During April, May, June, and July 2012, Bronson cut enough timber to build roads using moveable equipment purchased on April 1, 2012. The cost of the roads was $250,000, and the cost of the equipment was $225,000; this equipment was expected to have a $9,000 salvage value and would be used for the next 15 years. Bronson selected the straight-line method of depreciation for the moveable equipment. Bronson began actively harvesting timber in August and by December had harvested and sold 540,000 board feet of timber of the estimated 6,750,000 board feet available for cutting.

In March 2013, Bronson planted new seedlings in the area harvested during the winter. Cost of planting these seedlings was $120,000. In addition, Bronson spent $8,000 in road maintenance and $6,000 for pest spraying during calendar-year 2013. The road maintenance and spraying are annual costs. During 2013, Bronson harvested and sold 774,000 board feet of timber of the estimated 6,650,000 board feet available for cutting.

In March 2014, Bronson again planted new seedlings at a cost of $150,000, and also spent $15,000 on road maintenance and pest spraying. During 2014, the company harvested and sold 650,000 board feet of timber of the estimated 6,500,000 board feet available for cutting.

Instructions
Compute the amount of depreciation and depletion expense for each of the 3 years (2012, 2013, 2014). Assume that the roads are usable only for logging and therefore are included in the depletion base.

P11-8 (Comprehensive Fixed-Asset Problem) Darby Sporting Goods Inc. has been experiencing growth in the demand for its products over the last several years. The last two Olympic Games greatly increased the popularity of basketball around the world. As a result, a European sports retailing consortium entered into an agreement with Darby’s Roundball Division to purchase basketballs and other accessories on an increasing basis over the next 5 years.

To be able to meet the quantity commitments of this agreement, Darby had to obtain additional manufacturing capacity. A real estate firm located an available factory in close proximity to Darby’s Roundball manufacturing facility, and Darby agreed to purchase the factory and used machinery from Encino Athletic Equipment Company on October 1, 2011. Renovations were necessary to convert the factory for Darby’s manufacturing use.

The terms of the agreement required Darby to pay Encino $50,000 when renovations started on January 1, 2012, with the balance to be paid as renovations were completed. The overall purchase price for the factory and machinery was $400,000. The building renovations were contracted to Malone Construction at $100,000. The payments made, as renovations progressed during 2012, are shown below. The factory was placed in service on January 1, 2013.

<table>
<thead>
<tr>
<th></th>
<th>1/1</th>
<th>4/1</th>
<th>10/1</th>
<th>12/31</th>
</tr>
</thead>
<tbody>
<tr>
<td>Encino</td>
<td>$50,000</td>
<td>$90,000</td>
<td>$110,000</td>
<td>$150,000</td>
</tr>
<tr>
<td>Malone</td>
<td>30,000</td>
<td>30,000</td>
<td>40,000</td>
<td></td>
</tr>
</tbody>
</table>

On January 1, 2012, Darby secured a $500,000 line-of-credit with a 12% interest rate to finance the purchase cost of the factory and machinery, and the renovation costs. Darby drew down on the line-of-credit to meet the payment schedule shown above; this was Darby’s only outstanding loan during 2012.

Bob Sprague, Darby’s controller, will capitalize the maximum allowable interest costs for this project. Darby’s policy regarding purchases of this nature is to use the appraisal value of the land for book purposes and prorate the balance of the purchase price over the remaining items. The building had originally cost Encino $300,000 and had a net book value of $50,000, while the machinery originally cost $125,000 and had a net book value of $40,000 on the date of sale. The land was recorded on Encino’s books at $40,000. An appraisal, conducted by independent appraisers at the time of acquisition, valued the land at $290,000, the building at $105,000, and the machinery at $45,000.
Chapter 11 Depreciation, Impairments, and Depletion

Angie Justice, chief engineer, estimated that the renovated plant would be used for 15 years, with an estimated salvage value of $30,000. Darby estimated that the productive machinery would have a remaining useful life of 5 years and a salvage value of $3,000. Darby’s depreciation policy specifies the 200% declining-balance method for machinery and the 150% declining-balance method for the plant. One-half year’s depreciation is taken in the year the plant is placed in service and one-half year is allowed when the property is disposed of or retired. Darby uses a 360-day year for calculating interest costs.

Instructions
(a) Determine the amounts to be recorded on the books of Darby Sporting Goods Inc. as of December 31, 2012, for each of the following properties acquired from Encino Athletic Equipment Company.
(1) Land. (2) Buildings. (3) Machinery.
(b) Calculate Darby Sporting Goods Inc.’s 2013 depreciation expense, for book purposes, for each of the properties acquired from Encino Athletic Equipment Company.
(c) Discuss the arguments for and against the capitalization of interest costs.

(CMA adapted)

Roland Company uses special strapping equipment in its packaging business. The equipment was purchased in January 2011 for $10,000,000 and had an estimated useful life of 8 years with no salvage value. At December 31, 2012, new technology was introduced that would accelerate the obsolescence of Roland’s equipment. Roland’s controller estimates that expected future net cash flows on the equipment will be $6,300,000 and that the fair value of the equipment is $5,600,000. Roland intends to continue using the equipment, but it is estimated that the remaining useful life is 4 years. Roland uses straight-line depreciation.

Instructions
(a) Prepare the journal entry (if any) to record the impairment at December 31, 2012.
(b) Prepare any journal entries for the equipment at December 31, 2013. The fair value of the equipment at December 31, 2013, is estimated to be $5,900,000.
(c) Repeat the requirements for (a) and (b), assuming that Roland intends to dispose of the equipment and that it has not been disposed of as of December 31, 2013.

Kohlbeck Corporation, a manufacturer of steel products, began operations on October 1, 2011. The accounting department of Kohlbeck has started the fixed-asset and depreciation schedule presented on page 647. 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. Kohlbeck paid $800,000 for the land and building together. At the time of acquisition, the land had an appraised value of $90,000, and the building had an appraised value of $810,000.
3. Land B was acquired on October 2, 2011, in exchange for 2,500 newly issued shares of Kohlbeck’s common stock. At the date of acquisition, the stock had a par value of $5 per share and a fair value of $30 per share. During October 2011, Kohlbeck paid $16,000 to demolish an existing building on this land so it could construct a new building.
4. Construction of Building B on the newly acquired land began on October 1, 2012. By September 30, 2013, Kohlbeck had paid $320,000 of the estimated total construction costs of $450,000. It is estimated that the building will be completed and occupied by July 2014.
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 $40,000 and the salvage value at $3,000. Machinery A’s total cost of $182,900 includes installation expense of $600 and normal repairs and maintenance of $14,900. Salvage value is estimated at $6,000. Machinery A was sold on February 1, 2013.
6. Machinery B was acquired with a down payment of $5,740 and the remaining payments to be made in 11 annual installments of $6,000 each beginning October 1, 2012. The prevailing interest rate was 8%. The following data were abstracted from present value tables (rounded).

<table>
<thead>
<tr>
<th>Present value of $1.00 at 8%</th>
<th>Present value of an ordinary annuity of $1.00 at 8%</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 years .463</td>
<td>10 years 6.710</td>
</tr>
<tr>
<td>11 years .429</td>
<td>11 years 7.139</td>
</tr>
<tr>
<td>15 years .315</td>
<td>15 years 8.569</td>
</tr>
</tbody>
</table>
KOHLBECK CORPORATION
Fixed-Asset and Depreciation Schedule

<table>
<thead>
<tr>
<th>Assets</th>
<th>Acquisition Date</th>
<th>Cost</th>
<th>Salvage</th>
<th>Depreciation Method</th>
<th>Estimated Life in Years</th>
<th>Depreciation Expense Year Ended September 30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land A</td>
<td>October 1, 2011</td>
<td>(1)</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Building A</td>
<td>October 1, 2011</td>
<td>(2) $40,000</td>
<td>N/A</td>
<td>Straight-line</td>
<td>(3)</td>
<td>$13,600</td>
</tr>
<tr>
<td>Land B</td>
<td>October 2, 2011</td>
<td>(5) N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Straight-line</td>
<td>N/A</td>
</tr>
<tr>
<td>Building B</td>
<td>Under Construction</td>
<td>$320,000</td>
<td>N/A</td>
<td>Straight-line</td>
<td>30</td>
<td>—</td>
</tr>
<tr>
<td>Donated Equipment</td>
<td>October 2, 2011</td>
<td>(7) 3,000</td>
<td>N/A</td>
<td>150% declining-balance</td>
<td>10</td>
<td>(8)</td>
</tr>
<tr>
<td>Machinery A</td>
<td>October 2, 2011</td>
<td>(10) 6,000</td>
<td>N/A</td>
<td>Sum-of-the-years'-digits</td>
<td>8</td>
<td>(11)</td>
</tr>
<tr>
<td>Machinery B</td>
<td>October 1, 2012</td>
<td>(13) N/A</td>
<td>N/A</td>
<td>Straight-line</td>
<td>20</td>
<td>—</td>
</tr>
</tbody>
</table>

**Instructions**

For each numbered item on the schedule above, supply the correct amount. Round each answer to the nearest dollar.

**P11-11 (Depreciation for Partial Periods—SL, Act., SYD, and DDB)** On January 1, 2010, a machine was purchased for $90,000. The machine has an estimated salvage value of $6,000 and an estimated useful life of 5 years. The machine can operate for 100,000 hours before it needs to be replaced. The company closed its books on December 31 and operates the machine as follows: 2010, 20,000 hrs; 2011, 25,000 hrs; 2012, 15,000 hrs; 2013, 30,000 hrs; 2014, 10,000 hrs.

**Instructions**

(a) Compute the annual depreciation charges over the machine’s life assuming a December 31 year-end for each of the following depreciation methods.
(1) Straight-line method.
(2) Activity method.
(3) Sum-of-the-years’-digits method.
(4) Double-declining-balance method.

(b) Assume a fiscal year-end of September 30. Compute the annual depreciation charges over the asset’s life applying each of the following methods.
(1) Straight-line method.
(2) Sum-of-the-years’-digits method.
(3) Double-declining-balance method.

**P11-12 (Depreciation—SL, DDB, SYD, Act., and MACRS)** On January 1, 2011, Locke Company, a small machine-tool manufacturer, acquired for $1,260,000 a piece of new industrial equipment. The new equipment had a useful life of 5 years, and the salvage value was estimated to be $60,000. Locke estimates that the new equipment can produce 12,000 machine tools in its first year. It estimates that production will decline by 1,000 units per year over the remaining useful life of the equipment.

The following depreciation methods may be used: (1) straight-line; (2) double-declining-balance; (3) sum-of-the-years’-digits; and (4) units-of-output. For tax purposes, the class life is 7 years. Use the MACRS tables for computing depreciation.

**Instructions**

(a) Which depreciation method would maximize net income for financial statement reporting for the 3-year period ending December 31, 2013? Prepare a schedule showing the amount of accumulated depreciation at December 31, 2013, under the method selected. Ignore present value, income tax, and deferred income tax considerations.

(b) Which depreciation method (MACRS or optional straight-line) would minimize net income for income tax reporting for the 3-year period ending December 31, 2013? Determine the amount of accumulated depreciation at December 31, 2013. Ignore present value considerations.

(AICPA adapted)
Chapter 11 Depreciation, Impairments, and Depletion

CONCEPTS FOR ANALYSIS

CA11-1 (Depreciation Basic Concepts) Burnitz Manufacturing Company was organized January 1, 2012. During 2012, it has used in its reports to management the straight-line method of depreciating its plant assets.

On November 8, you are having a conference with Burnitz’s officers to discuss the depreciation method to be used for income tax and stockholder reporting. James Bryant, president of Burnitz, 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. Following is an example in which the proposed method is applied to a fixed asset with an original cost of $248,000, an estimated useful life of 5 years, and a salvage value of approximately $8,000.

<table>
<thead>
<tr>
<th>Year</th>
<th>Years of Life</th>
<th>Fraction</th>
<th>Accumulated Depreciation at End of Year</th>
<th>Book Value at End of Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1/15</td>
<td>$16,000</td>
<td>$232,000</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>2/15</td>
<td>32,000</td>
<td>200,000</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>3/15</td>
<td>48,000</td>
<td>152,000</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>4/15</td>
<td>64,000</td>
<td>88,000</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>5/15</td>
<td>80,000</td>
<td>8,000</td>
</tr>
</tbody>
</table>

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 assets’ useful lives when maintenance and replacement disbursements are high.
2. It will result in increased write-offs in later years and thereby will reduce taxes.

Instructions

(a) What is the purpose of accounting for depreciation?
(b) Is the president’s proposal within the scope of generally accepted accounting principles? In making your decision discuss the circumstances, if any, under which use of the method would be reasonable and those, if any, under which it would not be reasonable.
(c) The president wants your advice on the following issues.
   (1) Do depreciation charges recover or create funds? Explain.
   (2) Assume that the Internal Revenue Service accepts the proposed depreciation method in this case. If the proposed method were used for stockholder and tax reporting purposes, how would it affect the availability of cash flows generated by operations?

CA11-2 (Unit, Group, and Composite Depreciation) The certified public accountant is frequently called upon by management for advice regarding methods of computing depreciation. Of comparable importance, although it arises less frequently, is the question of whether the depreciation method should be based on consideration of the assets as units, as a group, or as having a composite life.

Instructions

(a) Briefly describe the depreciation methods based on treating assets as (1) units and (2) a group or as having a composite life.
(b) Present the arguments for and against the use of each of the two methods.
(c) Describe how retirements are recorded under each of the two methods.

(AICPA adapted)

CA11-3 (Depreciation—Strike, Units-of-Production, Obsolescence) Presented below and on page 649 are three different and unrelated situations involving depreciation accounting. Answer the question(s) at the end of each situation.

Situation I
Recently, Broderick Company experienced a strike that affected a number of its operating plants. The controller of this company indicated that it was not appropriate to report depreciation expense during this period because the equipment did not depreciate and an improper matching of costs and revenues would result. She based her position on the following points.

1. It is inappropriate to charge the period with costs for which there are no related revenues arising from production.
2. The basic factor of depreciation in this instance is wear and tear, and because equipment was idle, no wear and tear occurred.
Instructions
Comment on the appropriateness of the controller’s comments.

Situation II
Etheridge Company manufactures electrical appliances, most of which are used in homes. Company engineers have designed a new type of blender which, through the use of a few attachments, will perform more functions than any blender currently on the market. Demand for the new blender can be projected with reasonable probability. In order to make the blenders, Etheridge needs a specialized machine that is not available from outside sources. It has been decided to make such a machine in Etheridge’s own plant.

Instructions
(a) Discuss the effect of projected demand in units for the new blenders (which may be steady, decreasing, or increasing) on the determination of a depreciation method for the machine.
(b) What other matters should be considered in determining the depreciation method? Ignore income tax considerations.

Situation III
Haley Paper Company operates a 300-ton-per-day kraft pulp mill and four sawmills in Wisconsin. The company is in the process of expanding its pulp mill facilities to a capacity of 1,000 tons per day and plans to replace three of its older, less efficient sawmills with an expanded facility. One of the mills to be replaced did not operate for most of 2012 (current year), and there are no plans to reopen it before the new sawmill facility becomes operational.

In reviewing the depreciation rates and in discussing the residual values of the sawmills that were to be replaced, it was noted that if present depreciation rates were not adjusted, substantial amounts of plant costs on these three mills would not be depreciated by the time the new mill came on stream.

Instructions
What is the proper accounting for the four sawmills at the end of 2012?

CA11-4 (Depreciation Concepts) As a cost accountant for San Francisco Cannery, you have been approached by Phil Perriman, canning room supervisor, about the 2012 costs charged to his department. In particular, he is concerned about the line item “depreciation.” Perriman is very proud of the excellent condition of his canning room equipment. He has always been vigilant about keeping all equipment serviced and well oiled. He is sure that the huge charge to depreciation is a mistake; it does not at all reflect the cost of minimal wear and tear that the machines have experienced over the last year. He believes that the charge should be considerably lower.

The machines being depreciated are six automatic canning machines. All were put into use on January 1, 2012. Each cost $625,000, having a salvage value of $55,000 and a useful life of 12 years. San Francisco depreciates this and similar assets using double-declining-balance depreciation. Perriman has also pointed out that if you used straight-line depreciation the charge to his department would not be so great.

Instructions
Write a memo to Phil Perriman to clear up his misunderstanding of the term “depreciation.” Also, calculate year-1 depreciation on all machines using both methods. Explain the theoretical justification for double-declining-balance and why, in the long run, the aggregate charge to depreciation will be the same under both methods.

CA11-5 (Depreciation Choice—Ethics) Jerry Prior, Beeler Corporation’s controller, is concerned that net income may be lower this year. He is afraid upper-level management might recommend cost reductions by laying off accounting staff, including him.

Prior knows that depreciation is a major expense for Beeler. The company currently uses the double-declining-balance method for both financial reporting and tax purposes, and he’s thinking of selling equipment that, given its age, is primarily used when there are periodic spikes in demand. The equipment has a carrying value of $2,000,000 and a fair value of $2,180,000. The gain on the sale would be reported in the income statement. He doesn’t want to highlight this method of increasing income. He thinks, “Why don’t I increase the estimated useful lives and the salvage values? That will decrease depreciation expense and require less extensive disclosure, since the changes are accounted for prospectively. I may be able to save my job and those of my staff.”

Instructions
Answer the following questions.
(a) Who are the stakeholders in this situation?
(b) What are the ethical issues involved?
(c) What should Prior do?
Financial Reporting Problem

P&G

The Procter & Gamble Company (P&G)

The financial statements of P&G are presented in Appendix 5B or can be accessed at the book’s companion website, www.wiley.com/college/kieso.

Instructions

Refer to P&G’s financial statements and the accompanying notes to answer the following questions.

(a) What descriptions are used by P&G in its balance sheet to classify its property, plant, and equipment?

(b) What method or methods of depreciation does P&G use to depreciate its property, plant, and equipment?

(c) Over what estimated useful lives does P&G depreciate its property, plant, and equipment?

(d) What amounts for depreciation and amortization expense did P&G charge to its income statement in 2009, 2008, and 2007?

(e) What were the capital expenditures for property, plant, and equipment made by P&G in 2009, 2008, and 2007?

Comparative Analysis Case

The Coca-Cola Company and PepsiCo., Inc.

Instructions

Go to the book’s companion website and use information found there to answer the following questions related to The Coca-Cola Company and PepsiCo, Inc.

(a) What amount is reported in the balance sheets as property, plant, and equipment (net) of Coca-Cola at December 31, 2009, and of PepsiCo at December 26, 2009? What percentage of total assets is invested in property, plant, and equipment by each company?

(b) What depreciation methods are used by Coca-Cola and PepsiCo for property, plant, and equipment? How much depreciation was reported by Coca-Cola and PepsiCo in 2009, 2008, and 2007?

(c) Compute and compare the following ratios for Coca-Cola and PepsiCo for 2009.

   (1) Asset turnover.
   (2) Profit margin on sales.
   (3) Rate of return on assets.

(d) What amount was spent in 2009 for capital expenditures by Coca-Cola and PepsiCo? What amount of interest was capitalized in 2009?

Financial Statement Analysis Case

McDonald’s Corporation

McDonald’s is the largest and best-known global food service retailer, with more than 32,000 restaurants in 118 countries. On any day, McDonald’s serves approximately 1 percent of the world’s population. Presented on the next page is information related to McDonald’s property and equipment.
Using Your Judgment

McDonald’s Corporation
Summary of Significant Accounting Policies Section

Property and Equipment. Property and equipment are stated at cost, with depreciation and amortization provided using the straight-line method over the following estimated useful lives: buildings—up to 40 years; leasehold improvements—lesser of useful lives of assets or lease terms including option periods; and equipment—3 to 12 years.

In the notes to the financial statements:

Property and Equipment

Net property and equipment consisted of:

<table>
<thead>
<tr>
<th>(In millions)</th>
<th>December 31</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2009</td>
</tr>
<tr>
<td>Land</td>
<td>$ 5,048.3</td>
</tr>
<tr>
<td>Buildings and improvements on owned land</td>
<td>12,119.0</td>
</tr>
<tr>
<td>Buildings and improvements on leased land</td>
<td>11,347.9</td>
</tr>
<tr>
<td>Equipment, signs and seating</td>
<td>4,422.9</td>
</tr>
<tr>
<td>Other</td>
<td>502.4</td>
</tr>
<tr>
<td>Accumulated depreciation and amortization</td>
<td>(11,909.0)</td>
</tr>
<tr>
<td>Net property and equipment</td>
<td>$ 21,531.5</td>
</tr>
</tbody>
</table>

Depreciation and amortization expense related to continuing operations was (in millions):

2009—$1,160.8; 2008—$1,161.6; 2007—$1,145.0.

In its 6-year summary, McDonald’s provides the following information:

Cash Provided by Operations

<table>
<thead>
<tr>
<th>(dollars in millions)</th>
<th>2009</th>
<th>2008</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash provided by operations</td>
<td>$5,751</td>
<td>$5,917</td>
<td>$4,876</td>
</tr>
<tr>
<td>Capital expenditures</td>
<td>$1,952</td>
<td>$2,136</td>
<td>$1,947</td>
</tr>
<tr>
<td>Cash provided by operations as a percent of capital expenditures</td>
<td>295%</td>
<td>277%</td>
<td>250%</td>
</tr>
</tbody>
</table>

Instructions

(a) What method of depreciation does McDonald’s use?
(b) Does depreciation and amortization expense cause cash flow from operations to increase? Explain.
(c) What does the schedule of cash flow measures indicate?

Accounting, Analysis, and Principles

Electroboy Enterprises, Inc. operates several stores throughout the western United States. As part of an operational and financial reporting review in a response to a downturn in its markets, the company’s management has decided to perform an impairment test on five stores (combined). The five stores’ sales have declined due to aging facilities and competition from a rival that opened new stores in the same markets. Management has developed the following information concerning the five stores as of the end of fiscal 2011.

<table>
<thead>
<tr>
<th>Original cost</th>
<th>$36 million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accumulated depreciation</td>
<td>$10 million</td>
</tr>
<tr>
<td>Estimated remaining useful life</td>
<td>4 years</td>
</tr>
<tr>
<td>Estimated expected future annual cash flows (not discounted)</td>
<td>$4.0 million per year</td>
</tr>
<tr>
<td>Appropriate discount rate</td>
<td>5 percent</td>
</tr>
</tbody>
</table>
Chapter 11  Depreciation, Impairments, and Depletion

Accounting

(a) Determine the amount of impairment loss, if any, that Electroboy should report for fiscal 2011 and the book value at which Electroboy should report the five stores on its fiscal year-end 2011 balance sheet. Assume that the cash flows occur at the end of each year.

(b) Repeat part (a), but instead, assume that (1) the estimated remaining useful life is 10 years, (2) the estimated annual cash flows are $2,720,000 per year, and (3) the appropriate discount rate is 6 percent.

Analysis

Assume that you are a financial analyst and you participate in a conference call with Electroboy management in early 2012 (before Electroboy closes the books on fiscal 2011). During the conference call, you learn that management is considering selling the five stores, but the sale won’t likely be completed until the second quarter of fiscal 2012. Briefly discuss what implications this would have for Electroboy’s 2011 financial statements. Assume the same facts as in part (b) above.

Principles

Electroboy management would like to know the accounting for the impaired asset in periods subsequent to the impairment. Can the assets be written back up? Briefly discuss the conceptual arguments for this accounting.

BRIDGE TO THE PROFESSION

Professional Research: FASB Codification

Matt Holmes recently joined Klax Company as a staff accountant in the controller’s office. Klax Company provides warehousing services for companies in several midwestern cities.

The location in Dubuque, Iowa, has not been performing well due to increased competition and the loss of several customers that have recently gone out of business. Matt’s department manager suspects that the plant and equipment may be impaired and wonders whether those assets should be written down. Given the company’s prior success, this issue has never arisen in the past, and Matt has been asked to conduct some research on this issue.

Instructions

If your school has a subscription to the FASB Codification, go to http://aaahq.org/asclogin.cfm to log in and prepare responses to the following. Provide Codification references for your responses.

(a) What is the authoritative guidance for asset impairments? Briefly discuss the scope of the standard (i.e., explain the types of transactions to which the standard applies).

(b) Give several examples of events that would cause an asset to be tested for impairment. Does it appear that Klax should perform an impairment test? Explain.

(c) What is the best evidence of fair value? Describe alternate methods of estimating fair value.
Professional Simulation

In this simulation, you are asked to address questions regarding the accounting for property, plant, and equipment. Prepare responses to all parts.

Whitley Corporation purchased machinery on January 1, 2012, at a cost of $100,000. The estimated useful life of the machinery is 4 years, with an estimated salvage value of $10,000 at the end of that period. The company is considering different depreciation methods that could be used for financial reporting purposes.

(a) What is the purpose of depreciation?
(b) Identify the factors that are relevant in determining annual depreciation, and explain whether those factors are determined objectively or whether they are based on judgment.

(a) Which depreciation method would result in the highest reported 2012 income? Explain.
(b) Which method would result in the highest total reported earnings over the 4-year period? Explain.
(c) Which method would result in the highest 2012 cash flow? Explain.

Assume that the company sold the machinery on January 1, 2014, for $84,000 and that the company used the straight-line method. Prepare the journal entry to record the transaction.

GAAP adheres to many of the same principles of IFRS in the accounting for property, plant, and equipment. Major differences relate to use of component depreciation, impairments, and revaluations.

**RELEVANT FACTS**

- The definition of property, plant, and equipment is essentially the same under GAAP and IFRS.
- Under both GAAP and IFRS, changes in depreciation method and changes in useful life are treated in the current and future periods. Prior periods are not affected. GAAP recently conformed to IFRS in this area.
- The accounting for plant asset disposals is the same under GAAP and IFRS.
- The accounting for the initial costs to acquire natural resources is similar under GAAP and IFRS.
- Under both GAAP and IFRS, interest costs incurred during construction must be capitalized. Recently, IFRS converged to GAAP.
The accounting for exchanges of nonmonetary assets has recently converged between IFRS and GAAP. GAAP now requires that gains on exchanges of nonmonetary assets be recognized if the exchange has commercial substance. This is the same framework used in IFRS.

GAAP also views depreciation as allocation of cost over an asset’s life. GAAP permits the same depreciation methods (straight-line, diminishing-balance, units-of-production) as IFRS.

IFRS requires component depreciation. Under GAAP, component depreciation is permitted but is rarely used.

Under IFRS, companies can use either the historical cost model or the revaluation model. GAAP does not permit revaluations of property, plant, and equipment or mineral resources.

In testing for impairments of long-lived assets, GAAP uses a two-step model to test for impairments (details of the GAAP impairment test is presented in the About the Numbers discussion). As long as future undiscounted cash flows exceed the carrying amount of the asset, no impairment is recorded. The IFRS impairment test is stricter. However, unlike GAAP, reversals of impairment losses are permitted.

**ABOUT THE NUMBERS**

**Component Depreciation**

Under IFRS, companies are required to use component depreciation. IFRS requires that each part of an item of property, plant, and equipment that is significant to the total cost of the asset must be depreciated separately. Companies therefore have to exercise judgment to determine the proper allocations to the components. As an example, when a company like Nokia purchases a building, it must determine how the various building components (e.g., the foundation, structure, roof, heating and cooling system, and elevators) should be segregated and depreciated.

To illustrate the accounting for component depreciation, assume that EuroAsia Airlines purchases an airplane for $100,000,000 on January 1, 2012. The airplane has a useful life of 20 years and a residual value of $0. EuroAsia uses the straight-line method of depreciation for all its airplanes. EuroAsia identifies the following components, amounts, and useful lives, as shown in Illustration IFRS11-1.

<table>
<thead>
<tr>
<th>Components</th>
<th>Component Amount</th>
<th>Component Useful Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airframe</td>
<td>$60,000,000</td>
<td>20 years</td>
</tr>
<tr>
<td>Engine components</td>
<td>32,000,000</td>
<td>8 years</td>
</tr>
<tr>
<td>Other components</td>
<td>8,000,000</td>
<td>5 years</td>
</tr>
</tbody>
</table>

Illustration IFRS11-2 shows the computation of depreciation expense for EuroAsia for 2012.

<table>
<thead>
<tr>
<th>Components</th>
<th>Component Amount</th>
<th>Useful Life</th>
<th>Component Depreciation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airframe</td>
<td>$ 60,000,000</td>
<td>20</td>
<td>$3,000,000</td>
</tr>
<tr>
<td>Engine components</td>
<td>32,000,000</td>
<td>8</td>
<td>4,000,000</td>
</tr>
<tr>
<td>Other components</td>
<td>8,000,000</td>
<td>5</td>
<td>1,600,000</td>
</tr>
<tr>
<td>Total</td>
<td>$100,000,000</td>
<td></td>
<td>$8,600,000</td>
</tr>
</tbody>
</table>
As indicated, EuroAsia records depreciation expense of $8,600,000 in 2012 as follows.

Depreciation Expense 8,600,000
Accumulated Depreciation—Airplane 8,600,000

On the statement of financial position at the end of 2012, EuroAsia reports the airplane as a single amount. The presentation is shown in Illustration IFRS11-3.

<table>
<thead>
<tr>
<th>Non-current assets</th>
<th>$100,000,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airplane</td>
<td>8,600,000</td>
</tr>
<tr>
<td>Less: Accumulated depreciation—airplane</td>
<td>$91,400,000</td>
</tr>
</tbody>
</table>

In many situations, a company may not have a good understanding of the cost of the individual components purchased. In that case, the cost of individual components should be estimated based on reference to current market prices (if available), discussion with experts in valuation, or use of other reasonable approaches.

**Recognizing Impairments**

As discussed in the text, the credit crisis starting in late 2008 has affected many financial and nonfinancial institutions. As a result of this global slump, many companies are considering write-offs of some of their long-lived assets. These write-offs are referred to as impairments. The accounting for impairments is different under GAAP and IFRS.

A long-lived tangible asset is impaired when a company is not able to recover the asset’s carrying amount either through using it or by selling it. To determine whether an asset is impaired, on an annual basis, companies review the asset for indicators of impairments—that is, a decline in the asset’s cash-generating ability through use or sale. This review should consider internal sources (e.g., adverse changes in performance) and external sources (e.g., adverse changes in the business or regulatory environment) of information. If impairment indicators are present, then an impairment test must be conducted. This test compares the asset’s recoverable amount with its carrying amount. If the carrying amount is higher than the recoverable amount, the difference is an impairment loss. If the recoverable amount is greater than the carrying amount, no impairment is recorded.

**Recoverable amount** is defined as the higher of fair value less costs to sell or value-in-use. **Fair value less costs to sell** means what the asset could be sold for after deducting costs of disposal. **Value-in-use** is the present value of cash flows expected from the future use and eventual sale of the asset at the end of its useful life. Illustration IFRS11-4 highlights the nature of the impairment test.
Chapter 11 Depreciation, Impairments, and Depletion

If either the fair value less costs to sell or value-in-use is higher than the carrying amount, there is no impairment. If both fair value less costs to sell and value-in-use are lower than the carrying amount, a loss on impairment occurs.

**Example: No Impairment**

Assume that Cruz Company performs an impairment test for its equipment. The carrying amount of Cruz’s equipment is $200,000, its fair value less costs to sell is $180,000, and its value-in-use is $205,000. In this case, the value-in-use of Cruz’s equipment is higher than its carrying amount of $200,000. As a result, there is no impairment. (If a company can more readily determine value-in-use (or fair value less costs to sell) and it determines that no impairment is needed, it is not required to compute the other measure.)

**Example: Impairment**

Assume the same information for Cruz Company above except that the value-in-use of Cruz’s equipment is $175,000 rather than $205,000. Cruz measures the impairment loss as the difference between the carrying amount of $200,000 and the higher of fair value less cost to sell ($180,000) or value-in-use ($175,000). Cruz therefore uses the fair value less cost of disposal to record an impairment loss of $20,000 ($200,000 – $180,000). Cruz makes the following entry to record the impairment loss:

```
Loss on Impairment 20,000
Accumulated Depreciation—Equipment  20,000
```

The Loss on Impairment is reported in the income statement in the “Other income and expense” section. The company then either credits Equipment or Accumulated Depreciation—Equipment to reduce the carrying amount of the equipment for the impairment. For purposes of homework, credit accumulated depreciation when recording an impairment for a depreciable asset.

**Reversal of Impairment Loss**

After recording the impairment loss, the recoverable amount becomes the basis of the impaired asset. What happens if a review in a future year indicates that the asset is no longer impaired because the recoverable amount of the asset is higher than the carrying amount? In that case, the impairment loss may be reversed.

To illustrate, assume that Tan Company purchases equipment on January 1, 2012, for $300,000, with a useful life of three years, and no residual value. Its depreciation and related carrying amount over the three years is as follows.

<table>
<thead>
<tr>
<th>Year</th>
<th>Depreciation Expense</th>
<th>Carrying Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>$100,000 ($300,000/3)</td>
<td>$200,000</td>
</tr>
<tr>
<td>2013</td>
<td>$100,000 ($300,000/3)</td>
<td>$100,000</td>
</tr>
<tr>
<td>2014</td>
<td>$100,000 ($300,000/3)</td>
<td>0</td>
</tr>
</tbody>
</table>

At December 31, 2012, Tan determines it has an impairment loss of $20,000 and therefore makes the following entry:

```
Loss on Impairment 20,000
Accumulated Depreciation—Equipment  20,000
```

Tan's depreciation expense and related carrying amount after the impairment is as indicated in Illustration IFRS11-5.
At the end of 2013, Tan determines that the recoverable amount of the equipment is $96,000, which is greater than its carrying amount of $90,000. In this case, Tan reverses the previously recognized impairment loss with the following entry.

\[
\begin{align*}
\text{Accumulated Depreciation—Equipment} & \quad 6,000 \\
\text{Recovery of Impairment Loss} & \quad 6,000
\end{align*}
\]

The recovery of the impairment loss is reported in the “Other income and expense” section of the income statement. The carrying amount of Tan’s equipment is now $96,000 (at December 31, 2013. The general rule related to reversals of impairments is as follows: The amount of the recovery of the loss is limited to the carrying amount that would result if the impairment had not occurred. For example, the carrying amount of Tan’s equipment at the end of 2013 would be $100,000, assuming no impairment. The $6,000 recovery is therefore permitted because Tan’s carrying amount on the equipment is now only $96,000.

However, any recovery above $10,000 is not permitted. The reason is that any recovery above $10,000 results in Tan carrying the asset at a value above its historical cost.

Revaluations

Up to this point, we have assumed that companies use the cost principle to value long-lived tangible assets after acquisition. However, under IFRS companies have a choice: They may value these assets at cost or at fair value.

Recognizing Revaluations

Network Rail (a company in Great Britain) is an example of a company that elected to use fair values to account for its railroad network. Its use of fair value led to an increase of £4,289 million to its long-lived tangible assets. When companies choose to fair value their long-lived tangible assets subsequent to acquisition, they account for the change in the fair value by adjusting the appropriate asset account and establishing an unrealized gain on the revalued long-lived tangible asset. This unrealized gain is often referred to as revaluation surplus.

Revaluation—Land. To illustrate revaluation of land, assume that Siemens Group purchased land for $1,000,000 on January 5, 2012. The company elects to use revaluation accounting for the land in subsequent periods. At December 31, 2012, the land’s fair value is $1,200,000. The entry to record the land at fair value is as follows.

\[
\begin{align*}
\text{Land} & \quad 200,000 \\
\text{Unrealized Gain on Revaluation—Land} & \quad 200,000
\end{align*}
\]

The land is reported on the statement of financial position at $1,200,000, and the Unrealized Gain on Revaluation—Land increases other comprehensive income in the statement of comprehensive income. In addition, if this is the only revaluation adjustment to date, the statement of financial position reports accumulated other comprehensive income of $200,000.

Revaluation—Depreciable Assets. To illustrate the accounting for revaluations of depreciable assets, assume that Lenovo Group purchases equipment for $500,000 on January 2, 2012. The equipment has a useful life of five years, is depreciated using the straight-line method of depreciation, and its residual value is zero. Lenovo

<table>
<thead>
<tr>
<th>Year</th>
<th>Depreciation Expense</th>
<th>Carrying Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>$90,000 ((180,000/2))</td>
<td>$90,000</td>
</tr>
<tr>
<td>2014</td>
<td>$90,000 ((180,000/2))</td>
<td>0</td>
</tr>
</tbody>
</table>
658 Chapter 11 Depreciation, Impairments, and Depletion

chooses to revalue its equipment to fair value over the life of the equipment. Lenovo records depreciation expense of $100,000 ($500,000 ÷ 5) at December 31, 2012, as follows.

<table>
<thead>
<tr>
<th>Date</th>
<th>Account Description</th>
<th>Debit</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 31, 2012</td>
<td>Depreciation Expense</td>
<td>100,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Accumulated Depreciation—Equipment</td>
<td></td>
<td>100,000</td>
</tr>
<tr>
<td></td>
<td>(To record depreciation expense in 2012)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

After this entry, Lenovo’s equipment has a carrying amount of $400,000 ($500,000 – $100,000). Lenovo receives an independent appraisal for the fair value of equipment at December 31, 2012, which is $460,000. To report the equipment at fair value, Lenovo does the following.

1. Reduces the Accumulated Depreciation—Equipment account to zero.
2. Reduces the Equipment account by $40,000—it then is reported at its fair value of $460,000.
3. Records Unrealized Gain on Revaluation—Equipment for the difference between the fair value and carrying amount of the equipment, or $60,000 ($460,000 – $400,000).

The entry to record this revaluation at December 31, 2012, is as follows.

<table>
<thead>
<tr>
<th>Date</th>
<th>Account Description</th>
<th>Debit</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 31, 2012</td>
<td>Accumulated Depreciation—Equipment</td>
<td>100,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Equipment</td>
<td>40,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unrealized Gain on Revaluation—Equipment</td>
<td>60,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(To adjust the equipment to fair value and record revaluation increase)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The equipment is now reported at its fair value of $460,000 ($500,000 – $40,000). As an alternative to the one shown here, companies restate on a proportionate basis the cost and accumulated depreciation of the asset, such that the carrying amount of the asset after revaluation equals its revalued amount.

The increase in the fair value of $60,000 is reported on the statement of comprehensive income as other comprehensive income. In addition, the ending balance is reported in accumulated other comprehensive income on the statement of financial position in the equity section. Illustration IFRS11-6 shows the presentation of revaluation elements.

**ILLUSTRATION IFRS11-6**

Financial Statement Presentation—Revaluations

<table>
<thead>
<tr>
<th>On the statement of comprehensive income:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other comprehensive income</td>
</tr>
<tr>
<td>Unrealized gain on revaluation—equipment</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>On the statement of financial position:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-current assets</td>
</tr>
<tr>
<td>Equipment ($500,000 – $40,000)</td>
</tr>
<tr>
<td>Accumulated depreciation—equipment ($100,000 – $100,000)</td>
</tr>
<tr>
<td>Carrying amount</td>
</tr>
<tr>
<td>Equity</td>
</tr>
<tr>
<td>Accumulated other comprehensive income</td>
</tr>
</tbody>
</table>

As indicated, at December 31, 2012, the carrying amount of the equipment is now $460,000. Lenovo reports depreciation expense of $100,000 in the income statement and an Unrealized Gain on Revaluation—Equipment of $60,000 in “Other comprehensive income.” Assuming no change in the useful life of the equipment, depreciation in 2013 is $115,000 ($460,000 ÷ 4).
In summary, a revaluation increase generally goes to equity. A revaluation decrease is reported as an expense (as an impairment loss), unless it offsets previously recorded revaluation increases. If the revaluation increase offsets a revaluation decrease that went to expense, then the increase is reported in income. **Under no circumstances can the Accumulated Other Comprehensive Income account related to revaluations have a negative balance.**

**ON THE HORIZON**

With respect to revaluations, as part of the conceptual framework project, the Boards will examine the measurement bases used in accounting. It is too early to say whether a converged conceptual framework will recommend fair value measurement (and revaluation accounting) for property, plant, and equipment. However, this is likely to be one of the more contentious issues, given the long-standing use of historical cost as a measurement basis in GAAP.

**IFRS SELF-TEST QUESTIONS**

1. Mandall Company constructed a warehouse for $280,000 on January 2, 2012. Mandall estimates that the warehouse has a useful life of 20 years and no residual value. Construction records indicate that $40,000 of the cost of the warehouse relates to its heating, ventilation, and air conditioning (HVAC) system, which has an estimated useful life of only 10 years. What is the first year of depreciation expense using straight-line component depreciation under IFRS?
   (a) $28,000.
   (b) $14,000.
   (c) $16,000.
   (d) $4,000.

2. Francisco Corporation is constructing a new building at a total initial cost of $10,000,000. The building is expected to have a useful life of 50 years with no residual value. The building’s finished surfaces (e.g., roof cover and floor cover) are 5% of this cost and have a useful life of 20 years. Building services systems (e.g., electric, heating, and plumbing) are 20% of the cost and have a useful life of 25 years. The depreciation in the first year using component depreciation, assuming straight-line depreciation with no residual value, is:
   (a) $200,000.
   (b) $215,000.
   (c) $255,000.
   (d) None of the above.

3. Which of the following statements is correct?
   (a) Both IFRS and GAAP permit revaluation of property, plant, and equipment.
   (b) IFRS permits revaluation of property, plant, and equipment but not GAAP.
   (c) Both IFRS and GAAP do not permit revaluation of property, plant, and equipment.
   (d) GAAP permits revaluation of property, plant, and equipment but not IFRS.

4. Hilo Company has land that cost $350,000 but now a fair value of $500,000. Hilo Company decides to use the revaluation method specified in IFRS to account for the land. Which of the following statements is correct?
   (a) Hilo Company must continue to report the land at $350,000.
   (b) Hilo Company would report a net income increase of $150,000 due to an increase in the value of the land.
   (c) Hilo Company would debit Revaluation Surplus for $150,000.
   (d) Hilo Company would credit Revaluation Surplus by $150,000.
5. Under IFRS, value-in-use is defined as:
   (a) net realizable value.
   (b) fair value.
   (c) future cash flows discounted to present value.
   (d) total future undiscounted cash flows.

IFRS CONCEPTS AND APPLICATION

IFRS11-1 Walkin Inc. is considering the write-down of its long-term plant because of a lack of profitability. Explain to the management of Walkin how to determine whether a write-down is permitted.

IFRS11-2 Last year, Wyeth Company recorded an impairment on an asset held for use. Recent appraisals indicate that the asset has increased in value. Should Wyeth record this recovery in value?

IFRS11-3 Toro Co. has equipment with a carrying amount of $700,000. The value-in-use of the equipment is $705,000, and its fair value less costs of disposal is $590,000. The equipment is expected to be used in operations in the future. What amount (if any) should Toro report as an impairment to its equipment?

IFRS11-4 Explain how gains or losses on impaired assets should be reported in income.

IFRS11-5 Tanaka Company has land that cost $15,000,000. Its fair value on December 31, 2012, is $20,000,000. Tanaka chooses the revaluation model to report its land. Explain how the land and its related valuation should be reported.

IFRS11-6 Why might a company choose not to use revaluation accounting?

IFRS11-7 Ortiz purchased a piece of equipment that cost $202,000 on January 1, 2012. The equipment has the following components.

<table>
<thead>
<tr>
<th>Component</th>
<th>Cost</th>
<th>Residual Value</th>
<th>Estimated Useful Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>$70,000</td>
<td>$7,000</td>
<td>10 years</td>
</tr>
<tr>
<td>B</td>
<td>50,000</td>
<td>5,000</td>
<td>5 years</td>
</tr>
<tr>
<td>C</td>
<td>82,000</td>
<td>4,000</td>
<td>12 years</td>
</tr>
</tbody>
</table>

Compute the depreciation expense for this equipment at December 31, 2012.

IFRS11-8 Tan Chin Company purchases a building for $11,300,000 on January 2, 2012. An engineer’s report shows that of the total purchase price, $11,000,000 should be allocated to the building (with a 40-year life), $150,000 to 15-year property, and $150,000 to 5-year property. Compute depreciation expense for 2012 using component depreciation.

IFRS11-9 Brazil Group purchases a vehicle at a cost of $50,000 on January 2, 2012. Individual components of the vehicle and useful lives are as follows.

<table>
<thead>
<tr>
<th>Component</th>
<th>Cost</th>
<th>Useful Lives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tires</td>
<td>$6,000</td>
<td>2 years</td>
</tr>
<tr>
<td>Transmission</td>
<td>10,000</td>
<td>5 years</td>
</tr>
<tr>
<td>Trucks</td>
<td>34,000</td>
<td>10 years</td>
</tr>
</tbody>
</table>

Instructions

(a) Compute depreciation expense for 2012, assuming Brazil depreciates the vehicle as a single unit.

(b) Compute depreciation expense for 2012, assuming Brazil uses component depreciation.

(c) Why might a company want to use component depreciation to depreciate its assets?

IFRS11-10 Jurassic Company owns machinery that cost $900,000 and has accumulated depreciation of $380,000. The present value of expected future net cash flows from the machinery costs
use of the asset are expected to be $500,000. The fair value less costs of disposal of the equipment is $400,000. Prepare the journal entry, if any, to record the impairment loss.

**IFRS11-11** Presented below is information related to equipment owned by Pujols Company at December 31, 2012.

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost (residual value $0)</td>
<td>$9,000,000</td>
</tr>
<tr>
<td>Accumulated depreciation to date</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Value-in-use</td>
<td>5,500,000</td>
</tr>
<tr>
<td>Fair value less cost of disposal</td>
<td>4,400,000</td>
</tr>
</tbody>
</table>

Assume that Pujols will continue to use this asset in the future. As of December 31, 2012, the equipment has a remaining useful life of 8 years. Pujols uses straight-line depreciation.

**Instructions**

(a) Prepare the journal entry (if any) to record the impairment of the asset at December 31, 2012.

(b) Prepare the journal entry to record depreciation expense for 2013.

(c) The recoverable amount of the equipment at December 31, 2013, is $6,050,000. Prepare the journal entry (if any) necessary to record this increase.

**IFRS11-12** Assume the same information as in IFRS11-11, except that Pujols intends to dispose of the equipment in the coming year.

**Instructions**

(a) Prepare the journal entry (if any) to record the impairment of the asset at December 31, 2012.

(b) Prepare the journal entry (if any) to record depreciation expense for 2013.

(c) The asset was not sold by December 31, 2013. The fair value of the equipment on that date is $5,100,000. Prepare the journal entry (if any) necessary to record this increase. It is expected that the cost of disposal is $20,000.

**IFRS11-13** Falcetto Company acquired equipment on January 1, 2011, for $12,000. Falcetto elects to value this class of equipment using revaluation accounting. This equipment is being depreciated on a straight-line basis over its 6-year useful life. There is no residual value at the end of the 6-year period. The appraised value of the equipment approximates the carrying amount at December 31, 2011 and 2013. On December 31, 2012, the fair value of the equipment is determined to be $7,000.

**Instructions**

(a) Prepare the journal entries for 2011 related to the equipment.

(b) Prepare the journal entries for 2012 related to the equipment.

(c) Determine the amount of depreciation expense that Falcetto will record on the equipment in 2013.

**International Reporting Case**

**IFRS11-14** Companies following international accounting standards are permitted to revalue fixed assets above the assets’ historical costs. Such revaluations are allowed under various countries’ standards and the standards issued by the IASB. **Liberty International**, a real estate company headquartered in the United Kingdom (U.K.), follows U.K. standards. In a recent year, Liberty disclosed the following information on revaluations of its tangible fixed assets. The revaluation reserve measures the amount by which tangible fixed assets are recorded above historical cost and is reported in Liberty’s stockholders’ equity.
Liberty reported the following additional data. Amounts for Kimco Realty (which follows GAAP) in the same year are provided for comparison.

<table>
<thead>
<tr>
<th></th>
<th>Liberty</th>
<th>Kimco</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total revenues</td>
<td>£ 741</td>
<td>$ 517</td>
</tr>
<tr>
<td>Average total assets</td>
<td>5,577</td>
<td>4,696</td>
</tr>
<tr>
<td>Net income</td>
<td>125</td>
<td>297</td>
</tr>
</tbody>
</table>

Instructions

(a) Compute the following ratios for Liberty and Kimco.
   (1) Return on assets.
   (2) Profit margin.
   (3) Asset turnover.

   How do these companies compare on these performance measures?

(b) Liberty reports a revaluation surplus of £1,952. Assume that £1,550 of this amount arose from an increase in the net replacement value of investment properties during the year. Prepare the journal entry to record this increase.

(c) Under U.K. (and IASB) standards, are Liberty’s assets and equity overstated? If so, why? When comparing Liberty to U.S. companies, like Kimco, what adjustments would you need to make in order to have valid comparisons of ratios such as those computed in (a) above?

Professional Research

IFRS11-15 Matt Holmes recently joined Klax Company as a staff accountant in the controller’s office. Klax Company provides warehousing services for companies in several European cities. The location in Koblenz, Germany, has not been performing well due to increased competition and the loss of several customers that have recently gone out of business. Matt’s department manager suspects that the plant and equipment may be impaired and wonders whether those assets should be written down. Given the company’s prior success, this issue has never arisen in the past, and Matt has been asked to conduct some research on this issue.

Instructions

Access the IFRS authoritative literature at the IASB website (http://eifrs.iasb.org/). When you have accessed the documents, you can use the search tool in your Internet browser to respond to the following questions. (Provide paragraph citations.)

(a) What is the authoritative guidance for asset impairments? Briefly discuss the scope of the standard (i.e., explain the types of transactions to which the standard applies).

(b) Give several examples of events that would cause an asset to be tested for impairment. Does it appear that Klax should perform an impairment test? Explain.
(c) What is the best evidence of fair value? Describe alternate methods of estimating fair value.

International Financial Reporting Problem:
Marks and Spencer plc

Instructions
Refer to M&S’s financial statements and the accompanying notes to answer the following questions.

(a) What descriptions are used by M&S in its statement of financial position to classify its property, plant, and equipment?
(b) What method or methods of depreciation does M&S use to depreciate its property, plant, and equipment?
(c) Over what estimated useful lives does M&S depreciate its property, plant, and equipment?
(d) What amounts for depreciation and amortization expense did M&S charge to its income statement in 2010 and 2009?
(e) What were the capital expenditures for property, plant, and equipment made by M&S in 2010 and 2009?

ANSWERS TO IFRS SELF-TEST QUESTIONS
1. c  2. c  3. b  4. d  5. c

Remember to check the book’s companion website to find additional resources for this chapter.