Chapter 08

Reporting and Analyzing Long-Term Assets
Conceptual Learning Objectives

C1: Explain the cost principle for computing the cost of plant assets.

C2: Distinguish between revenue and capital expenditures, and account for them.

C3: Explain depreciation for partial years and changes in estimates.
A1: Compute total asset turnover and apply it to analyze a company’s use of assets.
Procedural Learning Objectives

P1: Compute and record depreciation using the straight-line, units-of-production, and declining-balance methods.

P2: Account for asset disposal through discarding or selling an asset.

P3: Account for natural resource assets and their depletion.

P4: Account for intangible assets.

P5: Appendix 8A – Account for asset exchanges (see text for details).
Plant Assets

- Tangible in Nature
- Actively Used in Operations
- Expected to Benefit Future Periods
- Called Property, Plant & Equipment
Plant Assets

- **Acquisition**
  1. Compute cost

- **Use**
  2. Allocate cost to periods benefited
  3. Account for subsequent expenditures

- **Disposal**
  4. Record disposal

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Decline in asset value over its useful life
Land and Buildings

Land is not a depreciable asset, but land improvements are.

The cost of buildings include many costs; the purchase price plus the following:

- Cost of purchase or construction
- Brokerage fees
- Title fees
- Attorney fees
- Taxes
Machinery and Equipment

- Purchase price
- Taxes
- Transportation charges
- Installing, assembling, and testing
- Insurance while in transit
On January 1, Matrix, Inc. purchased land and building for $200,000 cash. The appraised values are building, $162,500, and land, $87,500.

How much of the $200,000 purchase price will be charged to the building and land accounts?
## Lump-Sum Asset Purchase

<table>
<thead>
<tr>
<th>Asset</th>
<th>Appraised Value</th>
<th>% of Value</th>
<th>Purchase Price</th>
<th>Apportioned Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
<td>$87,500</td>
<td>35%</td>
<td>$200,000</td>
<td>$70,000</td>
</tr>
<tr>
<td>Building</td>
<td>$162,500</td>
<td>65%</td>
<td>$200,000</td>
<td>$130,000</td>
</tr>
<tr>
<td>Total</td>
<td>$250,000</td>
<td>100%</td>
<td></td>
<td>$200,000</td>
</tr>
</tbody>
</table>

* $87,500 ÷ $250,000 = 35%

* $162,500 ÷ $250,000 = 65%
Depreciation is the process of allocating the cost of a plant asset to expense in the accounting periods benefiting from its use.
The calculation of depreciation requires three amounts for each asset:

1. Cost
2. Salvage value
3. Useful life
Depreciation Methods

1. **Straight-line**
2. **Units-of-production**
3. **Declining-balance**
Straight-Line Method

Depreciation expense for period = \( \frac{\text{Cost} - \text{Salvage value}}{\text{Useful life}} \)

Depreciation expense per year = \( \frac{\$50,000 - \$5,000}{5 \text{ years}} \) = \$9,000

\[
\begin{array}{ccc}
\text{Dr.} & \text{Cr.} \\
\text{Depreciation Expense} & 9,000 \\
\text{Accumulated Depreciation - Equipment} & 9,000 \\
\end{array}
\]

To record annual depreciation
### Straight-Line Method

#### Depreciation Schedule

<table>
<thead>
<tr>
<th>Year</th>
<th>Depreciation Expense (debit)</th>
<th>Accumulated Depreciation (credit)</th>
<th>Accumulated Depreciation</th>
<th>Book Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>$ 9,000</td>
<td>$ 9,000</td>
<td>$ 9,000</td>
<td>$ 41,000</td>
</tr>
<tr>
<td>2012</td>
<td>9,000</td>
<td>9,000</td>
<td>18,000</td>
<td>32,000</td>
</tr>
<tr>
<td>2013</td>
<td>9,000</td>
<td>9,000</td>
<td>27,000</td>
<td>23,000</td>
</tr>
<tr>
<td>2014</td>
<td>9,000</td>
<td>9,000</td>
<td>36,000</td>
<td>14,000</td>
</tr>
<tr>
<td>2015</td>
<td>9,000</td>
<td>9,000</td>
<td>45,000</td>
<td>5,000</td>
</tr>
<tr>
<td></td>
<td>$ 45,000</td>
<td>$ 45,000</td>
<td></td>
<td>$ 50,000</td>
</tr>
</tbody>
</table>

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**Salvage Value**

**Depreciation Rate**

\[
\text{Depreciation Rate} = \frac{100\%}{5 \text{ years}} = 20\% \text{ per year}
\]

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**Straight-Line Method**

\[
\text{Depreciation Rate} = \frac{100\%}{5 \text{ years}} = 20\% \text{ per year}
\]
Units-of-Production Method

Step 1:
Depreciation per unit = \frac{\text{Cost - Salvage value}}{\text{Total units of production}}

Step 2:
Depreciation expense = \text{Depreciation per unit} \times \text{Number of units produced in the period}
On December 31, 2011, equipment was purchased for $50,000 cash. The equipment is expected to produce 100,000 units during its useful life and has an estimated salvage value of $5,000.

If 22,000 units were produced in 2011, what is the amount of depreciation expense?
Units-of-Production Method

**Step 1:**

Depreciation per unit = \( \frac{\$50,000 - $5,000}{100,000 \text{ units}} \) = \$0.45 per unit

**Step 2:**

Depreciation expense = \$0.45 per unit \times 22,000 \text{ units} = \$9,900
### Units-of-Production Method

<table>
<thead>
<tr>
<th>Year</th>
<th>Units</th>
<th>Depreciation Expense</th>
<th>Accumulated Depreciation</th>
<th>Book Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>22,000</td>
<td>$9,900</td>
<td>$9,900</td>
<td>$40,100</td>
</tr>
<tr>
<td>2012</td>
<td>28,000</td>
<td>12,600</td>
<td>22,500</td>
<td>27,500</td>
</tr>
<tr>
<td>2013</td>
<td>-</td>
<td>-</td>
<td>22,500</td>
<td>27,500</td>
</tr>
<tr>
<td>2014</td>
<td>32,000</td>
<td>14,400</td>
<td>36,900</td>
<td>13,100</td>
</tr>
<tr>
<td>2015</td>
<td>18,000</td>
<td>8,100</td>
<td>45,000</td>
<td>5,000</td>
</tr>
<tr>
<td></td>
<td>100,000</td>
<td>$45,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

No depreciation expense if the equipment is idle
Early years’ total expense approximates later years’ total expense.
**Double-Declining-Balance Method**

<table>
<thead>
<tr>
<th>Step 1:</th>
<th>Straight-line rate = $100% \div \text{Useful life} = 100% \div 5 = 20%$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2:</td>
<td>Double-declining-balance rate = $2 \times \text{Straight-line rate} = 2 \times 20% = 40%$</td>
</tr>
<tr>
<td>Step 3:</td>
<td>Depreciation expense = Double-declining-balance rate $\times$ Beginning period book value</td>
</tr>
<tr>
<td></td>
<td>$40% \times $50,000 = $20,000$ for 2011</td>
</tr>
</tbody>
</table>

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Double-Declining-Balance Method

2011 Depreciation:

\[40\% \times \$50,000 = \$20,000\]

2012 Depreciation:

\[40\% \times (\$50,000 - \$20,000) = \$12,000\]
### Double-Declining-Balance Method

<table>
<thead>
<tr>
<th>Year</th>
<th>Depreciation Expense</th>
<th>Accumulated Depreciation</th>
<th>Book Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>$20,000</td>
<td>$20,000</td>
<td>$30,000</td>
</tr>
<tr>
<td>2012</td>
<td>12,000</td>
<td>32,000</td>
<td>18,000</td>
</tr>
<tr>
<td>2013</td>
<td>7,200</td>
<td>39,200</td>
<td>10,800</td>
</tr>
<tr>
<td>2014</td>
<td>4,320</td>
<td>43,520</td>
<td>6,480</td>
</tr>
<tr>
<td>2015</td>
<td>2,592</td>
<td>46,112</td>
<td>3,888</td>
</tr>
</tbody>
</table>

Below salvage value

Total Depreciation Expense: $46,112
<table>
<thead>
<tr>
<th>Year</th>
<th>Depreciation Expense</th>
<th>Accumulated Depreciation</th>
<th>Book Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>$20,000</td>
<td>$20,000</td>
<td>$30,000</td>
</tr>
<tr>
<td>2012</td>
<td>12,000</td>
<td>32,000</td>
<td>18,000</td>
</tr>
<tr>
<td>2013</td>
<td>7,200</td>
<td>39,200</td>
<td>10,800</td>
</tr>
<tr>
<td>2014</td>
<td>4,320</td>
<td>43,520</td>
<td>6,480</td>
</tr>
<tr>
<td>2015</td>
<td>1,480</td>
<td>45,000</td>
<td>5,000</td>
</tr>
</tbody>
</table>

We usually must force depreciation expense in the last year so that book value equals salvage value.
Comparing Depreciation Methods

- **Annual SL Depreciation**
  - Year 1: $10,000
  - Year 2: $8,000
  - Year 3: $6,000
  - Year 4: $4,000
  - Year 5: $2,000

- **Annual Production Depreciation**
  - Year 1: $16,000
  - Year 2: $14,000
  - Year 3: $12,000
  - Year 4: $10,000
  - Year 5: $8,000

- **Annual DDB Depreciation**
  - Year 1: $20,000
  - Year 2: $15,000
  - Year 3: $10,000
  - Year 4: $5,000
  - Year 5: $0

*Life in Years: 1, 2, 3, 4, 5*
Most corporations use the Modified Accelerated Cost Recovery System (MACRS) for tax purposes.

MACRS depreciation provides for rapid write-off of an asset’s cost in order to stimulate new investment.
Calculate the straight-line depreciation on December 31, 2011, for equipment purchased on June 30, 2011. The equipment cost $75,000, has a useful life of 10 years and an estimated salvage value of $5,000.

Depreciation = \((75,000 - 5,000) \div 10\)

= $7,000 for all 2011

Depreciation = $7,000 \times \frac{6}{12} = $3,500 for 6 months
On January 1, 2011, equipment was purchased that cost $30,000, has a useful life of 10 years, and no salvage value. During 2014, the useful life was revised to eight years total (five years remaining).

<table>
<thead>
<tr>
<th>Change in Estimates for Depreciation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Book value at date of change</td>
</tr>
<tr>
<td>Salvage value at date of change</td>
</tr>
<tr>
<td>Remaining useful life at date of change</td>
</tr>
</tbody>
</table>

Calculate depreciation expense for the year ended December 31, 2011, using the straight-line method.
Change in Estimates for Depreciation

<table>
<thead>
<tr>
<th>Asset cost</th>
<th>$ 30,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accumulated depreciation, 12/31/2013 ([$3,000 per year × 3 years])</td>
<td>9,000</td>
</tr>
<tr>
<td>Remaining book value</td>
<td>$ 21,000</td>
</tr>
<tr>
<td>Divide by remaining life</td>
<td>÷ 5</td>
</tr>
<tr>
<td>Revised annual depreciation</td>
<td>$ 4,200</td>
</tr>
</tbody>
</table>

Dr. Cr.
Dec. 31 Depreciation Expense 4,200
Accumulated Depreciation - Equipment 4,200

To record depreciation for 2014
## Reporting Depreciation

Property, plant, and equipment:
- Land and buildings: $150,000
- Machinery and equipment: $200,000
- Office furniture and equipment: $175,000
- Land improvements: $50,000

Total: $575,000

Less Accumulated depreciation: (122,000)

Net property, plant, and equipment: $453,000
Additional Expenditures

If the amounts involved are not material, most companies expense the item.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Financial Statement Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Statement</td>
</tr>
<tr>
<td>Capital Expenditure</td>
<td>Balance sheet account debited</td>
</tr>
<tr>
<td>Revenue Expenditure</td>
<td>Income statement account debited</td>
</tr>
</tbody>
</table>
## Revenue and Capital Expenditures

<table>
<thead>
<tr>
<th>Type of Expenditure</th>
<th>Capital or Revenue</th>
<th>Identifying Characteristics</th>
</tr>
</thead>
</table>
| **Ordinary Repairs**             | Revenue            | 1. Maintains normal operating condition.  
                                  |                    | 2. Does not increase productivity.  
                                  |                    | 3. Does not extend life beyond original estimate.                                      |
| **Betterments and Extraordinary Repairs** | Capital               | 1. Major overhauls or partial replacements.  
                                  |                    | 2. Extends life beyond original estimate.                                                  |
Disposals of Plant Assets

Update depreciation to the date of disposal

Journalize disposal by:

Recording cash received (debit) or paid (credit)

Removing accumulated depreciation (debit)

Recording a gain (credit) or loss (debit)

Removing the asset cost (credit)
Discarding Plant Assets

If Cash > BV, record a gain (credit)
If Cash < BV, record a loss (debit)
If Cash = BV, no gain or loss

Recording cash received (debit) or paid (credit)
Removing accumulated depreciation (debit)
Recording a gain (credit) or loss (debit)
Removing the asset cost (credit)
On September 30, 2011, Evans Company sells a machine that originally cost $100,000 for $60,000 cash. The machine was placed in service on January 1, 2009. It was depreciated using the straight-line method with an estimated salvage value of $20,000 and a useful life of 10 years.

Annual depreciation ($100,000 - $20,000) ÷ 10 Yrs. = $8,000

Depreciation to September 30, 2011: 9/12 × $8,000 = $6,000

<table>
<thead>
<tr>
<th>Date</th>
<th>Account Description</th>
<th>Dr.</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sep. 30</td>
<td>Depreciation Expense</td>
<td>6,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Accumulated Depreciation - Machine</td>
<td></td>
<td>6,000</td>
</tr>
</tbody>
</table>

*To update depreciation to date of disposal*
Determine Book Value of Asset

Cost: $100,000

Accumulated depreciation:
   (3 yrs. × $8,000) + $6,000 = 30,000

Book value: $70,000
Determine Gain or Loss on Disposal

If Cash > BV, record a gain (credit)
If Cash < BV, record a loss (debit)
If Cash = BV, no gain or loss

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>$100,000</td>
</tr>
<tr>
<td>Accumulated depreciation</td>
<td>30,000</td>
</tr>
<tr>
<td>Book value</td>
<td>70,000</td>
</tr>
<tr>
<td>Cash received</td>
<td>60,000</td>
</tr>
<tr>
<td>Loss on disposal</td>
<td>$(10,000)</td>
</tr>
</tbody>
</table>
Record the Disposal in the Journal

<table>
<thead>
<tr>
<th>Date</th>
<th>Account Description</th>
<th>Dr.</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sep. 30</td>
<td>Cash</td>
<td>60,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Accumulated Depreciation - Machine</td>
<td>30,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loss on Disposal of Asset</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Machine</td>
<td></td>
<td>100,000</td>
</tr>
</tbody>
</table>

*To record disposal of equipment*
Natural Resources: Cost Determination and Depletion

**Step 1:**

Depletion per unit = \frac{\text{Cost} - \text{Salvage value}}{\text{Total units of capacity}}

**Step 2:**

Depletion expense = \text{Depletion per unit} \times \text{Units extracted and sold in period}
Apex Mining acquired a tract of land containing ore deposits. Total costs of acquisition and development were $1,000,000 and Apex estimates the land contained 40,000 tons of ore. During the first year of operations Apex extracted and sold 13,000 tons of ore.
Step 1:

Depletion per unit = $1,000,000 - $0

40,000 tons

= $25 per ton

Step 2:

Depletion expense = $25 per ton

× 13,000 units = $325,000
Intangible Assets

- Noncurrent assets without physical substance
- Useful life is often difficult to determine
- Usually acquired for operational use
- Often provide exclusive rights or privileges
Cost Determination and Amortization

- Patents
- Copyrights
- Leaseholds
- Leasehold improvements
- Franchises & licenses
- Goodwill
- Trademarks & trade names

Record at current cash equivalent cost, including purchase price, legal fees, and filing fees
Types of Intangibles

**Patents**

The exclusive right granted to its owner to manufacture and sell a patented item or use a process for 20 years. A patent is generally amortized, using the straight-line method, over its useful life, not to exceed 20 years.

Matrix, Inc. purchased a patent for $10,000. The patent is expected to have a useful life of 10 years.

<table>
<thead>
<tr>
<th>Dr.</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amortization Expense - Patents</td>
<td>1,000</td>
</tr>
<tr>
<td>Accumulated Amortization - Patents</td>
<td>1,000</td>
</tr>
</tbody>
</table>

*To amortize patent costs*
Types of Intangibles

**Copyrights**

The exclusive right to publish and sell a musical, literary, or artistic work during the life of the creator plus 70 years.

**Leaseholds**

The rights the lessor grants to the lessee under the terms of a lease. Most leases have a determinable life.
Types of Intangibles

**Leasehold Improvements**
A lessee may pay for alterations or improvements to the leased property such as partitions, painting, and storefronts. These costs are usually amortized over the term of the lease.

**Franchises and Licenses**
The right granted by a company or the government to deliver a product or service under specified conditions.

**Trademarks and Trade Names**
A symbol, name, phrase, or jingle identified with a company, product, or service.
Occurs when one company buys another company

Only purchased goodwill is an intangible asset

Goodwill is not amortized. It is tested each year to determine if there has been any impairment in carrying value.
Total Asset Turnover

Total asset turnover = \( \frac{\text{Net sales}}{\text{Average total assets}} \)

Provides information about a company’s efficiency in using its assets
End of Chapter 08