SOLUTIONS MANUAL

to accompany

Fundamental Accounting Principles, Volume 2

15th Canadian Edition

by Larson/Jensen/Dieckmann

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**Chapter 9**  
**Property, Plant and Equipment and Intangibles**

**Chapter Opening Critical Thinking Challenge Questions***

You are asked by the CFO of YVR to evaluate the newest capital asset, the Airside Operations Building at YVR, and to break it into major components for depreciation purposes. Identify at least five major components and determine an expected life for each of those components.

Components of the Airside Operations Building could include:

<table>
<thead>
<tr>
<th>Component</th>
<th>Expected Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building exterior walls</td>
<td>40 years</td>
</tr>
<tr>
<td>Roofing</td>
<td>25 years</td>
</tr>
<tr>
<td>Pavement</td>
<td>15 years</td>
</tr>
<tr>
<td>Landscaping</td>
<td>10 years</td>
</tr>
<tr>
<td>Electrical Components</td>
<td>15 years</td>
</tr>
<tr>
<td>Flooring</td>
<td>15 years</td>
</tr>
<tr>
<td>Plumbing</td>
<td>15 years</td>
</tr>
<tr>
<td>Furniture and Fixtures</td>
<td>15 years</td>
</tr>
<tr>
<td>Fire Equipment</td>
<td>20 years</td>
</tr>
<tr>
<td>Snow Removal Equipment</td>
<td>20 years</td>
</tr>
</tbody>
</table>

*The Chapter 9 Critical Thinking Challenge questions are asked at the beginning of this chapter. Students are reminded at the conclusion of the chapter to refer to the Critical Thinking Challenge questions at the beginning of the chapter. The solutions to the Critical Thinking Challenge questions are available here in the Solutions Manual and accessible to students at Connect.*
Concept Review Questions

1. A property, plant and equipment asset is long-lived in that it has a service life of longer than one accounting period; it is used in the production or sale of products or services. It is different from other assets such as receivables or inventory in that the property, plant and equipment is used within the operations of business to generate profit, whereas inventory is purchased or manufactured for resale. Receivables represent the amounts due from customers based on past transactions.

2. Land held for future expansion is classified as a long-term investment. It is not a property, plant and equipment asset because it is not being used in the production or sale of other assets or services.

3. The cost of a property, plant and equipment asset includes all normal, reasonable, and necessary costs of getting the asset in place and ready to use. For example, cost includes such items as the invoice price paid, freight costs, non refundable sales taxes (PST, HST) and all costs incurred related to installing and testing an asset before it is put into use.

4. Land is an asset with an unlimited life and, therefore, is not subject to depreciation. Land improvements refer to items such as fencing, parking lots surfaces, landscape lighting and have limited lives and are depreciated over their useful lives.

5. No. The Accumulated Depreciation, Machinery account is a contra asset account with a credit balance that does not represent cash or any other funds. Funds available for buying machinery would be shown on the balance sheet as liquid assets with debit balances, such as the account Cash and Cash Equivalents. The balance of the Accumulated Depreciation, Machinery account shows the portion of the machinery's original cost that has been charged to depreciation expense, and gives some indication of how soon the asset will need to be replaced.

6. Revenue expenditures, such as repairs, are made to keep a plant and equipment asset in normal, good operating condition, and should be charged to expense of the current period. Capital expenditures are made to extend the service potential or the life of a plant and equipment asset beyond the original estimated life and are charged to the plant and equipment asset account. After incurring a capital expenditure, a depreciation policy also needs to be established. 7. Because the $75 cost of the plant and equipment asset is not likely to be material to the users of the financial statements, the materiality principle justifies charging it to expense.

8. Danier Leather did not report any gains or losses on disposal of assets for its year ended June 28, 2014. However, the corporation did have an Impairment loss on property and equipment of $663,000.

9. A company might sell or exchange an asset when it reaches the end of its useful life, or if it becomes inadequate or obsolete, or because the company has changed its business plans. An asset may also be damaged or destroyed by fire or some other accident.

10. An intangible asset has no physical existence. Its value comes from the unique legal and contractual rights held by its owner.
11. Types of intangible assets are patents, copyrights, leaseholds, drilling rights, and trademarks.

12. WestJet reported $60,623,000 as Intangible assets at December 31, 2014.

13. A business can only record goodwill when the price paid for a company being purchased exceeds the fair market value of this company’s net assets (assets minus liabilities) if purchased separately.


15. When an asset is constructed, such as the development of a new runway, all costs for construction-related materials and labour costs can be capitalized. Also any electricity and utilities consumed relating to the project, plus a reasonable amount for depreciation on any equipment used during construction. Other permitted costs include design fees, building materials and any interest charges on debt outstanding during the period of construction incurred to finance the project.
QUICK STUDY

Quick Study 9-1 (5 minutes)
$18,000 + $180,000 + $3,000 + $600 = $201,600

Quick Study 9-2 (10 minutes)
1.  (a) R
    (b) C
    (c) R
    (d) C

2.  (a) Mar. 15  Repairs Expense ......................... 120
    Accounts Payable ......................... 120
    To record repairs.

   (b) Mar. 15  Refrigeration Equipment .............. 40,000
    Accounts Payable ......................... 40,000
    To record capital expenditure.

   (c) Mar. 15  Repairs Expense ......................... 200
    Accounts Payable ......................... 200
    To record repairs.

   (d) Mar. 15  Office Building ......................... 175,000
    Accounts Payable ......................... 175,000
    To record capital expenditure.
Quick Study 9-3 (10 minutes)

<table>
<thead>
<tr>
<th>PPE Item</th>
<th>Appraised Values</th>
<th>(a) (\frac{\text{Individual Appraised Value}}{\text{Total Appraised Value}})</th>
<th>(b) (\frac{\text{(a)}}{\text{Total Appraised Value}})</th>
<th>Cost Allocation (c) ((b) \times \text{Total Actual Cost})</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land ......</td>
<td>$320,000</td>
<td>(\frac{320,000}{500,000} = .64) or 64%</td>
<td>$345,600(^1)</td>
<td></td>
</tr>
<tr>
<td>Building ...</td>
<td>$180,000</td>
<td>(\frac{180,000}{500,000} = .36) or 36%</td>
<td>194,400(^2)</td>
<td></td>
</tr>
<tr>
<td>Totals ......</td>
<td>$500,000</td>
<td></td>
<td>$540,000</td>
<td></td>
</tr>
</tbody>
</table>

1. \(64\% \times 540,000 = 345,600\)
2. \(36\% \times 540,000 = 194,400\)

2017
Apr. 14
Land ........................................................... 345,600
Building ..................................................... 194,400
Cash ...................................................... 85,000
Notes Payable....................................... 455,000
To record purchase of land and building.

Quick Study 9-4 (10 minutes)

TechCom
Partial Balance Sheet
October 31, 2017

Assets
Current assets:
Cash ................................................................. $ 9,000
Accounts receivable.......................................... $16,400
Less: Allowance for doubtful accounts ...........  800  15,600
Total current assets......................................... $ 24,600

Property, plant and equipment:
Land .................................................................. $48,000
Less: Accumulated depreciation .................. 13,800  48,200
Vehicles............................................................. $62,000
Equipment.......................................................... $25,000
Less: Accumulated depreciation .................  3,800  21,200
Total property, plant and equipment............ 117,400

Intangible assets:
Patent ............................................................. $20,100
Less: Accumulated amortization, patent .......  3,100  17,000
Total assets .................................................... $159,000
Quick Study 9-5 (10 minutes)

($55,900 – $1,900)/4 = $13,500/year

Quick Study 9-6 (10 minutes)

Rate per copy = ($45,000 – $5,000)/4,000,000 copies = $0.01/copy

<table>
<thead>
<tr>
<th>Year</th>
<th>Calculation</th>
<th>Annual Depreciation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>$.01 × 650,000</td>
<td>=$6,500</td>
</tr>
<tr>
<td>2018</td>
<td>$.01 × 798,000</td>
<td>= 7,980</td>
</tr>
<tr>
<td>2019</td>
<td>$.01 × 424,000</td>
<td>= 4,240</td>
</tr>
<tr>
<td>2020</td>
<td>$.01 × 935,000</td>
<td>= 9,350</td>
</tr>
<tr>
<td>2021</td>
<td>$.01 × 1,193,000</td>
<td>= 11,930</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$40,000</td>
</tr>
</tbody>
</table>

Quick Study 9-7 (10 minutes)

Annual rate of depreciation = 2/5 = .40 or 40% per year

<table>
<thead>
<tr>
<th>Year</th>
<th>Calculation</th>
<th>Annual Depreciation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>40% × $86,000</td>
<td>=$34,400</td>
</tr>
<tr>
<td>2018</td>
<td>40% × ($86,000 – $34,400)</td>
<td>= 20,640</td>
</tr>
<tr>
<td>2019</td>
<td>40% × ($86,000 – $34,400 – $20,640)</td>
<td>= 12,384</td>
</tr>
<tr>
<td>2020</td>
<td>40% × ($86,000 – $34,400 – $20,640 – $12,384)</td>
<td>= 2,576*</td>
</tr>
<tr>
<td>2021</td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

*$The calculation shows $7,430 of depreciation but that amount would cause accumulated depreciation to exceed the maximum allowed of cost less residual ($86,000 – $16,000 = $70,000). Therefore, the depreciation for 2020 must be adjusted to $2,576.
Quick Study 9-8 (10 minutes)

Computer panel:
$4,000/8\text{ years} = \underline{500}\text{ depreciation}

Dry-cleaning drum:
$70,000 - $5,000 = $65,000/400,000\text{ garments} = 0.1625/\text{garment} ;
0.1625/\text{garment} \times 62,000\text{ garments} = \underline{10,075}\text{ depreciation}

Stainless steel housing:
$85,000 - $10,000 = 75,000/20\text{ years} = \underline{3,750}\text{ depreciation}

Miscellaneous parts:
$26,000/2\text{ years} = \underline{13,000}\text{ depreciation}

Total depreciation on the dry cleaning equipment for 2017 = 500 + 10,075 + 3,750 + 13,000 = \underline{27,325}

Quick Study 9-9 (10 minutes)

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>$5,000</td>
<td>$6,000</td>
</tr>
<tr>
<td>b.</td>
<td>$3,000</td>
<td>$6,000</td>
</tr>
</tbody>
</table>

Calculations:

a. 60,000 - 0 = 6,000/\text{year} \times 10/12 = 5,000

b. 6,000/\text{year} \times 6/12 = 3,000

Quick Study 9-10 (10 minutes)

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>$10,000</td>
<td>$10,000</td>
</tr>
<tr>
<td>b.</td>
<td>$6,000</td>
<td>$10,800</td>
</tr>
</tbody>
</table>

Calculations:

a. 2/10 = .2 or 20%; 20% \times 60,000 = 12,000 \times 10/12 = 10,000\text{ for 2017}

20% \times (60,000 - 10,000) = 10,000\text{ for 2018}

b. 20% \times 60,000 = 12,000 \times 6/12 = 6,000\text{ for 2017}

20% \times (60,000 - 6,000) = 10,800\text{ for 2018}
Quick Study 9-11 (10 minutes)

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>10,000</td>
<td>14,000</td>
</tr>
<tr>
<td>b.</td>
<td>10,000</td>
<td>14,000</td>
</tr>
</tbody>
</table>

**Calculations:**

\[
75,000 - 15,000 = 60,000/120,000 = \$0.50 \text{ depreciation expense per unit produced}
\]

\[
\$0.50 \times 20,000 = \$10,000 \text{ for 2017}; \ $0.50 \times 28,000 = \$14,000 \text{ for 2018}
\]

**NOTE:** The units-of-production method is a usage-based method as opposed to a time-based method (such as straight-line and double-declining-balance) and therefore partial periods do not affect the calculations.

Quick Study 9-12 (10 minutes)

\[
\frac{\left(35,720 - \$11,820\right)}{2} \text{ years remaining} = \$3,190
\]

1. \(\frac{35,720 - 4,200}{8} = 3,940/\text{year} \times 3 \text{ years} = 11,820\)

2. \(10 - 3 = 7\)

Quick Study 9-13 (10 minutes)

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan. 3</td>
<td>Barbecue – Rotisserie................................. 1,000</td>
</tr>
<tr>
<td></td>
<td>Cash........................................... 1,000</td>
</tr>
<tr>
<td></td>
<td><em>To record the purchase of electronic rotisserie.</em></td>
</tr>
<tr>
<td>Dec. 31</td>
<td>Depreciation Expense, Barbecue......................... 1,560</td>
</tr>
<tr>
<td></td>
<td>Accumulated Depreciation, Barbecue............... 1,560</td>
</tr>
<tr>
<td></td>
<td><em>To record revised depreciation on the barbecue caused by the addition of a rotisserie; $7,000 - $200 = $6,800 \div 5 \text{ years} = $1,360 \text{ PLUS} $1,000 \div 5 \text{ years} = $200; Total depreciation = $1,360 + $200 = $1,560.</em></td>
</tr>
</tbody>
</table>
Quick Study 9-14 (10 minutes)

Impairment losses occurred on the computer and the furniture in the amounts of $1,500 and $21,000, respectively.

Calculations:

<table>
<thead>
<tr>
<th>Asset</th>
<th>Cost</th>
<th>Accumulated Depreciation</th>
<th>Book Value</th>
<th>Recoverable Amount</th>
<th>Impairment Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building</td>
<td>$1,200,000</td>
<td>$465,000</td>
<td>$735,000</td>
<td>$735,000</td>
<td>N/A</td>
</tr>
<tr>
<td>Computer</td>
<td>3,500</td>
<td>1,800</td>
<td>1,700</td>
<td>200</td>
<td>$1,500</td>
</tr>
<tr>
<td>Furniture</td>
<td>79,000</td>
<td>53,000</td>
<td>26,000</td>
<td>5,000</td>
<td>21,000</td>
</tr>
<tr>
<td>Land</td>
<td>630,000</td>
<td>0</td>
<td>630,000</td>
<td>790,000</td>
<td>N/A</td>
</tr>
<tr>
<td>Machine</td>
<td>284,000</td>
<td>117,000</td>
<td>167,000</td>
<td>172,000</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Quick Study 9-15 (10 minutes)

a. 2017
   Oct. 1  Accumulated Depreciation, Equipment .......... 39,000
    Cash ......................................................... 17,000
    Equipment ................................................... 56,000
    **To record sale of equipment.**

b. Oct. 1  Accumulated Depreciation, Machinery .......... 96,000
    Cash ........................................................... 27,000
    Machinery ................................................. 109,000
    Gain on Disposal ......................................... 14,000
    **To record sale of equipment.**

c. Oct. 1  Accumulated Depreciation, Truck ............... 33,000
    Cash ........................................................... 11,000
    Loss on disposal .......................................... 4,000
    Delivery truck ............................................. 48,000
    **To record sale of equipment.**

d. Oct. 1  Accumulated Depreciation, Furniture .......... 21,000
    Loss on disposal ............................................ 5,000
    Furniture .................................................... 26,000
    **To record disposal of equipment.**
Quick Study 9-16 (10 minutes)

2017
Dec 31  Accumulated Depreciation, Automobile .......... 13,500
        Computer* .......................................................... 5,800
        Automobile ......................................................... 15,000
        Cash ................................................................. 2,750
        Gain on Disposal ............................................... 1,550

To record exchange.

*Computer = FV of assets received= $5,800 as given

Quick Study 9-17 (15 minutes)

2017
Mar. 1  Accumulated Depreciation, Machine (old) .......... 36,000
        Machine (new) .................................................. 117,000
        Cash ................................................................. 63,000
        Machine (old) .................................................. 90,000

To record exchange of machines.

1. Cash paid = $123,000 - $60,000 = $63,000
2. Machine (new) = $63,000 cash paid + $54,000 book value of old = $117,000

Quick Study 9-18 (10 minutes)

2017
Jan. 4  Franchise ......................................................... 95,000
        Cash ................................................................. 95,000

To record purchase of franchise.

Dec. 31  Amortization Expense, Franchise ................. 9,500
        Accumulated Amortization, Franchise ............ 9,500

To record amortization of franchise;
$95,000/10 years = $9,500 per year
Quick Study 9-19 (10 minutes)

2017

Oct. 1 Mineral Rights 35,000,000
Water Rights 4,000,000
Cash 9,000,000
Long-Term Note Payable 30,000,000

To record the purchase of intangibles.

Dec. 31 Amortization Expense, Mineral Rights 875,000
Accumulated Amortization, Mineral Rights 875,000

To record amortization of mineral rights;
$35,000,000 ÷ 10 years = $3,500,000/year;
$3,500,000/year × 3/12 = $875,000.

31 Amortization Expense, Water Rights 100,000
Accumulated Amortization, Water Rights 100,000

To record amortization of water rights;
$4,000,000 ÷ 10 years = $400,000/year;
$400,000/year × 3/12 = $100,000.

*Quick Study 9-20 (20 minutes)

<table>
<thead>
<tr>
<th>Item</th>
<th>Calculation</th>
<th>Depreciation Expense</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor (old)</td>
<td>$45,000 - $5,000 = $40,000 ÷ 10 yrs × 8/12 =</td>
<td>$2,667</td>
</tr>
<tr>
<td>Motor (new)</td>
<td>$60,000 - $10,000 = $50,000 ÷ 8 yrs × 4/12 =</td>
<td>2,083</td>
</tr>
<tr>
<td>Metal housing</td>
<td>$68,000 - $15,000 = $53,000 ÷ 25 yrs =</td>
<td>2,120</td>
</tr>
<tr>
<td>Misc. parts</td>
<td>$15,000 ÷ 5 yrs =</td>
<td>3,000</td>
</tr>
<tr>
<td>Total depreciation expense to be recorded on the machine for 2017 =</td>
<td>$9,870</td>
<td></td>
</tr>
</tbody>
</table>
EXERCISES

Exercise 9-1 (10 minutes)

Invoice cost ........................................................... $15,000
Freight costs .......................................................... 260
Steel mounting ....................................................... 795
Assembly ................................................................. 375
Raw materials for testing......................................... 120
Less: discount ($15,000 × 2%) ................................. 300
   Total acquisition costs ...................................... $16,250

Note: The $190 repairs are an expense and therefore not capitalized.

Exercise 9-2 (15 minutes)

Cost of land:

Purchase price for land.......................... $1,200,000
Purchase price for old building .......... 480,000
Demolition costs for old building .......... 75,000
Levelling the lot .............................................. 105,000
   Total cost of land ....................................... $1,860,000

Cost of new building:

Construction costs ................................. $2,880,000
Less: Cost of land improvements* .............. 215,000
   Cost of new building ................................. $2,665,000

*The land improvements are a distinct PPE asset that depreciates at a different rate than the building. Therefore it should be debited to an account separate from the building.

Journal entry:

2017
Mar. 10   Land ......................................................... 1,860,000
          Land Improvements .............................. 215,000
          Building ............................................. 2,665,000
          Cash ................................................... 4,740,000

To record costs of plant assets.
Exercise 9-3 (15 minutes)

Allocation of total cost:

<table>
<thead>
<tr>
<th>PPE Asset</th>
<th>Appraised Values</th>
<th>(b) Ratio of Individual Appraised Value to Total Appraised Value</th>
<th>(c) Cost Allocation (b) x Total Actual Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
<td>$249,480</td>
<td>$249,480 ÷ 594,000 = .42 or 42%</td>
<td>$244,346²</td>
</tr>
<tr>
<td>Land Imprv.</td>
<td>83,160</td>
<td>83,160 ÷ 594,000 = .14 or 14%</td>
<td>81,448³</td>
</tr>
<tr>
<td>Building</td>
<td>261,360</td>
<td>261,360 ÷ 594,000 = .44 or 44%</td>
<td>255,981⁴</td>
</tr>
<tr>
<td>Totals</td>
<td>$594,000</td>
<td></td>
<td>$581,775¹</td>
</tr>
</tbody>
</table>

1. $552,375 + 29,400 = 581,775
2. 42% x 581,775 = 244,346
3. 14% x 581,775 = 81,448
4. 44% x 581,775 = 255,981

Journal entry:

2017
Apr. 12  Land ........................................................................ 244,346
         Land Improvements ................................................... 81,448
         Building ..................................................................... 255,981

Cash................................................................................. 581,775

To record costs of lump-sum purchase.
Exercise 9-4 (20 minutes)

2017
Jan. 1 Land ................................................................................ 1,296,000
Building ............................................................................... 1,512,000
Equipment ........................................................................ 1,123,200
Tools ................................................................................. 388,800
Cash .................................................................................... 1,104,000
Notes Payable .................................................................. 3,216,000

To record lump-sum purchase.

Calculations:

<table>
<thead>
<tr>
<th>PPE Asset</th>
<th>Appraised Values</th>
<th>Ratio of Individual Appraised Value to Total Appraised Value</th>
<th>Cost Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
<td>$1,152,000</td>
<td>$1,152,000 ÷ 3,840,000 = .30 or 30%</td>
<td>$1,296,000¹</td>
</tr>
<tr>
<td>Building</td>
<td>$1,344,000</td>
<td>$1,344,000 ÷ 3,840,000 = .35 or 35%</td>
<td>$1,512,000²</td>
</tr>
<tr>
<td>Equipment</td>
<td>$998,400</td>
<td>$998,400 ÷ 3,840,000 = .26 or 26%</td>
<td>$1,123,200³</td>
</tr>
<tr>
<td>Tools</td>
<td>$345,600</td>
<td>$345,600 ÷ 3,840,000 = .09 or 9%</td>
<td>$388,800⁴</td>
</tr>
<tr>
<td>Totals</td>
<td>$3,840,000</td>
<td></td>
<td>$4,320,000</td>
</tr>
</tbody>
</table>

1. 30% x 4,320,000 = 1,296,000
2. 35% x 4,320,000 = 1,512,000
3. 26% x 4,320,000 = 1,123,200
4. 9% x 4,320,000 = 388,800
Exercise 9-5 (10 minutes)

2017
Jan 1       Truck        63,000
              Cash        63,000

Calculation:
37,500 + 13,500 + 6,750 + 5,250 = 63,000

Jan 4       Prepaid insurance 3,600
             Gas expense     180
             Cash          3,780

2017
Dec. 31     Depreciation Expense, Truck 11,100
             Accumulated Depreciation, Truck 11,100

To record depreciation.

Calculation:
[(37,500 + 13,500 + 6,750 + 5,250) – 7,500] / 5 years = 11,100

Note: Insurance expense entries could also be made, to move from prepaid insurance, although not required in question.
### Exercise 9-6 (15 minutes)

<table>
<thead>
<tr>
<th>Year</th>
<th>Straight-line</th>
<th>Double-declining-balance (Rate = 2/4 = .50 or 50%)</th>
<th>Units-of-production (Rate = [(169,200 – 24,000)/181,500] = .80/unit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>36,300¹</td>
<td>50% × 169,200 = 84,600</td>
<td>30,640 (.80 × 38,300)</td>
</tr>
<tr>
<td>2018</td>
<td>36,300</td>
<td>50% × (169,200 – 84,600) = 42,300</td>
<td>32,920 (.80 × 41,150)</td>
</tr>
<tr>
<td>2019</td>
<td>36,300</td>
<td>$18,300²</td>
<td>42,080 (.80 × 52,600)</td>
</tr>
<tr>
<td>2020</td>
<td>36,300</td>
<td>0</td>
<td>39,560³</td>
</tr>
</tbody>
</table>

1. \((169,200 – 24,000)/4 = 36,300/\text{year})

2. Maximum depreciation is limited to $145,200 which is cost less residual \((169,200 – 24,000)\) therefore depreciation for 2019 is $18,300 calculated as $145,200 – $126,900 accumulated depreciation recorded to date.

3. Maximum depreciation is limited to $145,200 which is cost less residual \((169,200 – 24,000)\) therefore depreciation for 2020 is $39,560 calculated as $145,200 – $105,640 accumulated depreciation recorded to date.
Exercise 9-7 (15 minutes)

a. \( \frac{(238,400 - 46,400)}{5} = \$38,400 \)

b. \( \text{Rate} = \frac{2}{5} = .40 \text{ or } 40\% \)
\( 40\% \times 238,400 = \$95,360 \)

c. \( \text{Rate} = \frac{(238,400 - 46,400)}{240,000 \text{ km}} = \$0.80/\text{km} \)
\( \$0.80/\text{km} \times 38,000 \text{ km} = \$30,400 \)

Analysis component:
The units-of-production method will produce the highest profit in 2017 because it is the lowest depreciation expense for 2017.

Exercise 9-8 (30 minutes)

<table>
<thead>
<tr>
<th>Year</th>
<th>Straight-Line(^1) Depreciation Expense</th>
<th>Book Value at December 31</th>
<th>Double-Declining-Balance(^2) Depreciation Expense</th>
<th>Book Value at December 31</th>
<th>Units-of-Production(^3) Depreciation Expense</th>
<th>Book Value at December 31</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>21,250</td>
<td>104,000</td>
<td>50,100</td>
<td>75,150</td>
<td>16,875</td>
<td>108,375</td>
</tr>
<tr>
<td>2018</td>
<td>21,250</td>
<td>82,750</td>
<td>30,060</td>
<td>45,090</td>
<td>22,250</td>
<td>86,125</td>
</tr>
<tr>
<td>2019</td>
<td>21,250</td>
<td>61,500</td>
<td>18,036</td>
<td>27,054</td>
<td>30,000</td>
<td>56,125</td>
</tr>
<tr>
<td>2020</td>
<td>21,250</td>
<td>40,250</td>
<td>8,054</td>
<td>19,000</td>
<td>37,125</td>
<td>19,000</td>
</tr>
<tr>
<td>2021</td>
<td>21,250</td>
<td>19,000</td>
<td>0</td>
<td>19,000</td>
<td>0</td>
<td>19,000</td>
</tr>
</tbody>
</table>

Calculations:
1. \( 125,250 - 19,000 = 106,250/5 = 21,250 \)
2. \( \frac{2}{5} = .4 \text{ or } 40\%; .4 \times 125,250 = 50,100; .4 \times (125,250 - 50,100) = 30,060; \)
\( .4 \times (125,250 - 50,100 - 30,060) = 18,036; .4 \times (125,250 - 50,100 - 30,060 - 18,036) = 10,822; \) maximum = 8,054 calculated as cost less residual = 125,250 - 19,000 = 106,250 less total deprec. taken of 98,196 = 8,054.
3. \( 125,250 - 19,000 = 106,250/8,500 = \$12.50/\text{hour}; \)
\( 2017-12.50 \times 1,350 = 16,875; \)
\( 2018-12.50 \times 1,780 = 22,250; \)
\( 2019-12.50 \times 2,400 = 30,000; \)
\( 2020-12.50 \times 2,980 = 37,250; \) maximum = 37,125; calculated as cost less residual = 125,250 - 19,000 = 106,250 less total deprec. taken of 69,125 = 37,125.

Analysis component:
a. 2017– Units-of-production; 2020– Straight-line
Exercise 9-9 (30 minutes)

<table>
<thead>
<tr>
<th>PPE Asset</th>
<th>Appraised Values</th>
<th>Ratio of Individual Appraised Value to Total Appraised Value</th>
<th>Cost Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
<td>$ 700,000</td>
<td>$700,000 ÷ 2,100,000 = .33 or 33.33%</td>
<td>$ 840,000</td>
</tr>
<tr>
<td>Building</td>
<td>1,120,000</td>
<td>1,120,000 ÷ 2,100,000 = .533 or 53.33%</td>
<td>1,344,000</td>
</tr>
<tr>
<td>Equipment</td>
<td>210,000</td>
<td>210,000 ÷ 2,100,000 = .10 or 10%</td>
<td>252,000</td>
</tr>
<tr>
<td>Tools</td>
<td>70,000</td>
<td>70,000 ÷ 2,100,000 = .033 or 3.33%</td>
<td>84,000</td>
</tr>
<tr>
<td>Totals</td>
<td>$ 2,100,000</td>
<td></td>
<td>$ 2,520,000</td>
</tr>
</tbody>
</table>

1. \(33.33\% \times 2,520,000 = 840,000\)
2. \(53.33\% \times 2,520,000 = 1,344,000\)
3. \(10.00\% \times 2,520,000 = 252,000\)
4. \(3.33\% \times 2,520,000 = 84,000\)

<table>
<thead>
<tr>
<th>PPE Asset</th>
<th>Cost</th>
<th>2017 Depreciation</th>
<th>2018 Depreciation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
<td>$ 840,000</td>
<td>N/A(^6)</td>
<td>N/A(^6)</td>
</tr>
<tr>
<td>Building</td>
<td>1,344,000</td>
<td>1,344,000 × 2/10 = 268,800</td>
<td>(1,344,000 – 268,800) × 2/10 = 215,040</td>
</tr>
<tr>
<td>Equipment</td>
<td>252,000</td>
<td>252,000 × 2/5 = 100,800</td>
<td>(252,000 – 100,800) × 2/5 = 60,480</td>
</tr>
<tr>
<td>Tools</td>
<td>84,000</td>
<td>84,000 × 2/3 = 56,000</td>
<td>(84,000 – 56,000) × 2/3 = 18,667</td>
</tr>
</tbody>
</table>

5. Land is not depreciated as it has an unlimited life and is not consumed when used.

**Analysis component:**

We do not depreciate the cost of land as it has an unlimited life and is not consumed when used.
Exercise 9-10 (20 minutes)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Building</td>
<td>2 May 2011</td>
<td>S/L</td>
<td>$650,000</td>
<td>$250,000</td>
<td>10 yr.</td>
<td>$226,667</td>
<td>$40,000¹</td>
<td>$266,667²</td>
</tr>
<tr>
<td>Modular Furniture</td>
<td>2 May 2011</td>
<td>S/L</td>
<td>72,000</td>
<td>0</td>
<td>6 yr.</td>
<td>68,000</td>
<td>4,000³</td>
<td>72,000⁴</td>
</tr>
<tr>
<td>Truck</td>
<td>25 Jan 2014</td>
<td>DDB</td>
<td>80,000</td>
<td>10,000</td>
<td>8 yr.</td>
<td>45,313</td>
<td>8,672⁵</td>
<td>53,985⁶</td>
</tr>
</tbody>
</table>

1. \( (650,000 - 250,000)/10 = 40,000/\text{year} \)
2. \( 226,667 + 40,000 = 266,667 \)
3. \( (72,000 - 0)/6 = 12,000 \text{ per year}; \text{ however the maximum accumulated depreciation} = 72,000; \text{ 72,000 less total depreciation taken of 68,000}(8,000 \text{ in 2011})\]
   \[ (72,000 - 0)/6 = $12,000 \text{ per year} \times 8/12 \] \text{ plus 12,000 in years 2012–2016} \( = 4,000 \)
4. \( 68,000 + 4,000 = 72,000 \)
5. \( \text{Rate} = 2/8 = .25 \text{ or} 25\% \)
   \[ 25\% \times (80,000 - 45,313) = 8,672 \]
6. \( 45,313 + 8,672 = 53,985 \)

**Analysis component:**

Depreciation is the process of allocating an asset’s cost to expense over its useful life. It should be done using a rational and systematic manner. Dynamic uses the straight-line method and the double-declining balance method for its assets, which are both acceptable under GAAP. Dynamic has likely chosen different methods for depreciating its assets to better reflect the usage pattern of each asset, which is acceptable under GAAP.
Exercise 9-11 (15 minutes)

**DYNAMICEXPLORATION**
Partial Balance Sheet
December 31, 2016

**Assets**
- **Current assets**: ........................................................... $338,000
- **Property, plant and equipment:**
  - Furniture: ................................................................. $72,000
  - Less: Accumulated depreciation: ........................................................................... 68,000
  - Building: ................................................................. $650,000
  - Less: Accumulated depreciation: ........................................................................... 226,667
  - Truck: ................................................................. $  80,000
  - Less: Accumulated depreciation: ........................................................................... 45,313

**Total property, plant and equipment**: ............................................................ 462,020
**Total assets**: ............................................................... $800,020

Exercise 9-12 (15 minutes)

**a. Straight-line depreciation:**

<table>
<thead>
<tr>
<th>Year</th>
<th>Profit before depreciation</th>
<th>Depreciation expense¹</th>
<th>Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$171,000</td>
<td>73,080</td>
<td>$97,920</td>
</tr>
<tr>
<td>2</td>
<td>$171,000</td>
<td>73,080</td>
<td>$97,920</td>
</tr>
<tr>
<td>3</td>
<td>$171,000</td>
<td>73,080</td>
<td>$97,920</td>
</tr>
<tr>
<td>4</td>
<td>$171,000</td>
<td>73,080</td>
<td>$97,920</td>
</tr>
<tr>
<td>5</td>
<td>$171,000</td>
<td>73,080</td>
<td>$97,920</td>
</tr>
</tbody>
</table>

**5-Year Totals**: $855,000

**b. Double-declining-balance depreciation:**

<table>
<thead>
<tr>
<th>Year</th>
<th>Profit before depreciation</th>
<th>Depreciation expense²</th>
<th>Profit (loss)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$171,000</td>
<td>188,160</td>
<td>$(17,160)</td>
</tr>
<tr>
<td>2</td>
<td>$171,000</td>
<td>112,896</td>
<td>$58,104</td>
</tr>
<tr>
<td>3</td>
<td>$171,000</td>
<td>64,344</td>
<td>$106,656</td>
</tr>
<tr>
<td>4</td>
<td>$171,000</td>
<td>0</td>
<td>$171,000</td>
</tr>
<tr>
<td>5</td>
<td>$171,000</td>
<td>0</td>
<td>$171,000</td>
</tr>
</tbody>
</table>

**5-Year Totals**: $365,400

1. \((470,400 – 105,000)/5 = 73,080\)
2. Rate = 2/5 = .40 or 40%
   - Year 1: \(470,400 \times 40\% = 188,160\)
   - Year 2: \((470,400 – 188,160) \times 40\% = 112,896\)
   - Year 3: \(64,344 \text{ max. depreciation expense (calculated as 470,400 – 105,000 – 188,160 – 112,896 = 64,344)}\)
Analysis component:
Kenartha Oil will choose straight-line depreciation to depreciate the equipment if its goal is to show the highest value possible for the equipment on the Year 1 balance sheet. Straight-line will result in lower depreciation than double declining balance in Year 1. The lower the depreciation, the greater the net book value of the asset (cost less accumulated depreciation appearing in the balance sheet).

Exercise 9-13 (15 minutes)

<table>
<thead>
<tr>
<th>Year</th>
<th>Depreciation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Straight-Line</td>
</tr>
<tr>
<td>2017</td>
<td>7,200</td>
</tr>
<tr>
<td>2018</td>
<td>21,600</td>
</tr>
<tr>
<td>2019</td>
<td>21,600</td>
</tr>
</tbody>
</table>

1. 156,000 – 26,400 = 129,600/6 = 21,600 x 4/12 = 7,200
2. 156,000 – 26,400 = 129,600/200,000 = $0.648/unit;
   .648 x 31,000 = 20,088; .648 x 67,000 = 43,416; .648 x 52,000 = 33,696

Analysis component:
If depreciation is not recorded, expenses are understated and net income is overstated on the income statement and on the balance sheet, assets and equity would be overstated.
Exercise 9-14 (25 minutes)

<table>
<thead>
<tr>
<th>Year</th>
<th>Straight-Line¹</th>
<th>Double-Declining-Balance²</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>11,000</td>
<td>22,000</td>
</tr>
<tr>
<td>2018</td>
<td>22,000</td>
<td>35,200</td>
</tr>
<tr>
<td>2019</td>
<td>22,000</td>
<td>21,120</td>
</tr>
</tbody>
</table>

Calculations:
1. \(110,000/5 = 22,000 \times 6/12 = 11,000\)
2. \(2/5 = .4 \text{ or } 40\%; .4 \times 110,000 \times 6/12 = 22,000;\)
   \(.4 \times (110,000 – 22,000) = 35,200; .4 \times (110,000 – 22,000 – 35,200) = 21,120\)

Analysis component:
If the furniture had been debited to an expense account in 2017 when purchased instead of being recorded as a PPE asset, expenses would have been overstated and net income would have been understated on the income statement in 2017 while assets and equity would have been understated on the balance sheet for the same year.

Exercise 9-15 (10 minutes)

(a)

<table>
<thead>
<tr>
<th>Year</th>
<th>Straight-Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>((125,000 – 12,500)/5 = 22,500 \times 9/12 = 16,875)</td>
</tr>
<tr>
<td>2018</td>
<td>((125,000 – 12,500)/5 = 22,500)</td>
</tr>
</tbody>
</table>

(b)

<table>
<thead>
<tr>
<th>Year</th>
<th>Straight-Line</th>
<th>Double-Declining-Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>Rate = (2/5 = .40 \text{ or } 40%)</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>(125,000 \times 40% \times 9/12 = 37,500)</td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>((125,000 – 37,500) \times 40% = 35,000)</td>
<td></td>
</tr>
</tbody>
</table>

Exercise 9-16 (10 minutes)

1. \((43,500 – 5,000)/4 = 9,625/\text{year} \times 2 \text{ years} = 19,250 \text{ accumulated depreciation}\)
   Book value = 43,500 – 19,250 = \(24,250\)

2. \([(43,500 – 19,250) – 3,850]/3 = 6,800\)
Exercise 9-17 (15 minutes)

2020
Dec. 31	Depreciation Expense, Machine................................. 7,624
Accumulated Depreciation, Machine ......................... 7,624
To record depreciation.

Calculations:
Revised depreciation = \( \frac{(71,200 - 30,800) - 8,000}{7 - 2\frac{9}{12}} = 4.25 \text{ yrs} \)
\( \frac{(71,200 - 15,200)/5}{9/12} \)
\( 2017 \text{ depreciation} = 8,400 \)
\( 2018 \text{ depreciation} = 11,200 \)
\( 2019 \text{ depreciation} = 11,200 \)
Accumulated depreciation 30,800

Exercise 9-18 (20 minutes)

Part 1
2017
Jan. 5	Warehouse – Door................................. 25,500
Accounts Payable................................. 25,500
To record addition of door on East wall of warehouse.

Part 2
2017
Dec. 31	Depreciation Expense, Warehouse ................. 14,700
Accumulated Depreciation, Warehouse.... 14,700
To record revised depreciation on warehouse;
\( 292,500 - 90,000 = 202,500; \frac{202,500}{15 \text{ yrs}} = 13,500 \)
PLUS \( 25,500 - 7,500 = 18,000; \frac{18,000}{15 \text{ yrs}} = 1,200 \);
Total depreciation on the warehouse = 13,500 + 1,200 = 14,700.
Exercise 9-19 (30 minutes)

Part 1

<table>
<thead>
<tr>
<th>2017</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec. 31</td>
<td>Impairment Loss</td>
<td>13,500</td>
</tr>
<tr>
<td></td>
<td>Equipment</td>
<td>12,000</td>
</tr>
<tr>
<td></td>
<td>Office Building</td>
<td>1,500</td>
</tr>
</tbody>
</table>

*To record impairment loss on equipment and office building.*

Part 2

<table>
<thead>
<tr>
<th>2018</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec. 31</td>
<td>Depreciation Expense, Equipment</td>
<td>1,800</td>
</tr>
<tr>
<td></td>
<td>Accumulated Depreciation, Equipment</td>
<td>1,800</td>
</tr>
</tbody>
</table>

*To record revised depreciation on equipment.*

| 31            | Depreciation Expense, Furniture | 491 |
|---------------| Accumulated Depreciation, Furniture | 491 |

*To record depreciation on furniture.*

| 31            | Depreciation Expense, Office Building | 3,838 |
|---------------| Accumulated Depreciation, Office Building | 3,838 |

*To record depreciation on office building.*

| 31            | Depreciation Expense, Warehouse | 2,250 |
|---------------| Accumulated Depreciation, Warehouse | 2,250 |

*To record depreciation on warehouse.*

**Calculations:**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment</td>
<td>$40,000</td>
<td>$20,000</td>
<td>$20,000</td>
<td>$8,000</td>
<td>$12,000</td>
<td>1,800¹</td>
</tr>
<tr>
<td>Furniture</td>
<td>12,000</td>
<td>9,509</td>
<td>2,491</td>
<td>2,950</td>
<td>N/A</td>
<td>491²</td>
</tr>
<tr>
<td>Land</td>
<td>85,000</td>
<td>N/A</td>
<td>85,000</td>
<td>101,800</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Office Bldng</td>
<td>77,000</td>
<td>23,000</td>
<td>54,000</td>
<td>52,500</td>
<td>1,500</td>
<td>3,838³</td>
</tr>
<tr>
<td>Warehouse</td>
<td>55,000</td>
<td>12,938</td>
<td>42,062</td>
<td>45,100</td>
<td>N/A</td>
<td>2,250⁴</td>
</tr>
</tbody>
</table>

1. \[40,000 - 5,000)/7,000\] = $5.00/unit; 20,000 accum. dep. ÷ $5.00/unit = 4,000 units; 7,000 units in original useful life less 4,000 units depreciated to date equals 3,000 remaining units; 40,000 – 12,000 = 28,000 revised cost; 28,000 – 20,000 accum. dep. = 8,000 revised book value; 8,000 – 5,000 residual value = 3,000; 3,000 ÷ 3,000 remaining units = $1.00/unit revised depreciation rate; 1.00/unit × 1800 units = 1,800
2. \[12,000 – 9,509 = 2,491; 2,491 × 2/8 = 623 which exceeds maximum allowable; maximum allowable = 2,491 remaining book value – 2,000 residual = 491
3. 77,000 – 1,500 = 75,500 revised cost of office building; 75,500 – 23,000 = 52,500 remaining book value; (52,500 – 17,000) ÷ 9.25 yrs remaining useful life = 3,838
4. 55,000 – 10,000 = 45,000; 45,000 ÷ 20 yrs = 2,250
Exercise 9-20 (20 minutes)

a.

2017

Mar. 1  Accumulated Depreciation, Truck ......................... 21,850
        Cash ......................................................... 20,150
        Truck ....................................................... 42,000

To record the sale of the truck for $20,150.

b.

Mar. 1  Accumulated Depreciation, Truck ......................... 21,850
        Cash ......................................................... 21,600
        Truck ....................................................... 42,000
        Gain on Disposal ....................................... 1,450

To record the sale of the truck for $21,600.

c.

Mar. 1  Accumulated Depreciation, Truck ......................... 21,850
        Loss on Disposal ......................................... 950
        Cash ......................................................... 19,200
        Truck ....................................................... 42,000

To record the sale of the truck for $19,200.

d.

Mar. 1  Accumulated Depreciation, Truck ......................... 21,850
        Loss on Disposal ......................................... 20,150
        Truck ....................................................... 42,000

To record the sale of the truck for $0; it was scrapped.
Exercise 9-21 (15 minutes)

To record partial year’s depreciation in 2021:

<table>
<thead>
<tr>
<th>Date</th>
<th>Account Description</th>
<th>Debit</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 1</td>
<td>Depreciation Expense</td>
<td>21,200</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Accumulated Depreciation, Machine</td>
<td>21,200</td>
<td></td>
</tr>
</tbody>
</table>

To record partial year depreciation in year of disposal; \((296,800/7) \times 6/12 = 21,200\).

(a)

<table>
<thead>
<tr>
<th>Date</th>
<th>Account Description</th>
<th>Debit</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 1</td>
<td>Accumulated Depreciation, Machine</td>
<td>190,800*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cash</td>
<td>112,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Machine</td>
<td>296,800</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gain on Disposal</td>
<td>6,000</td>
<td></td>
</tr>
</tbody>
</table>

To record sale of machine for 112,000.

(b)

<table>
<thead>
<tr>
<th>Date</th>
<th>Account Description</th>
<th>Debit</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Accumulated Depreciation, Machine</td>
<td>190,800*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cash</td>
<td>96,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loss on Disposal</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Machine</td>
<td>296,800</td>
<td></td>
</tr>
</tbody>
</table>

To record receipt of $96,000 from insurance settlement.

*(296,800/7) \times 4.5 \text{ years} = 190,800

Exercise 9-22 (10 minutes)

a. \(190,000 - 105,000 = 85,000 \text{ book value}\)

b. Book value of the assets given up = \((85,000 + 164,000) = 249,000\)
   Less: Fair value of assets given up \((56,000 + 164,000) = 220,000\)
   Loss on exchange = 29,000

c. 220,000

d.

2017

Oct. 6  Tractor (new)* .......... 220,000
       Accumulated Depreciation, Tractor (old) .......... 105,000
       Loss on Exchange .................................. 29,000
       Cash ............................................. 164,000
       Tractor (old) .................................. 190,000

To record exchange of old tractor for a new one.

*$56,000 + $164,000 = $220,000.$
Exercise 9-23 (20 minutes)

a.

2017
Nov. 3  Accumulated Depreciation, Computer (old) ..........  65,000
    Computer (new)\(^1\) ..................................................  175,000
    Computer (old) ..................................................  150,000
    Cash .................................................................  90,000

To record exchange of computers.

1. Computer (new) = Cash paid + Book Value of asset given up
   = $90,000 + $85,000 = $175,000

b.

2017
Nov. 3  Accumulated Depreciation, Computer (old) ..........  65,000
    Computer (new)\(^1\) ..................................................  174,000
    Loss on Disposal\(^2\) .................................................  1,000
    Computer (old) ..................................................  150,000
    Cash .................................................................  90,000

To record exchange of computers.

1. Computer (new)  = Fair Value of Assets Received
   = $174,000
2. Loss on Disposal = Proceeds – Book Value of assets given up
   = $174,000 – [($150,000 – $65,000) + $90,000] = $1,000

Analysis component:
The dollar value that will be used to depreciate the new computer is $174,000 because
the Cost Principle requires that all transactions are to be recorded at their original cost.$174,000 was determined to be the cost.
Exercise 9-24 (25 minutes)

(a)

Jan. 2  Accumulated Depreciation, Machine ...................... 45,250
        Cash ................................................................. 32,500
        Loss on Disposal .............................................. 6,250
        Machine .......................................................... 84,000

To record sale of machine;

\[ 32,500 - (84,000 - 45,250) = 6,250 \text{ loss}. \]

(b)

Jan. 2  Accumulated Depreciation, Machine ...................... 45,250
        Tools ................................................................. 115,750
        Cash ................................................................. 77,000
        Machine .......................................................... 84,000

To record exchange of machine;

Value of assets given up = $77,000 cash + $38,750
book value of the old machine = $115,750.

(c)

Jan. 2  Accumulated Depreciation, Machine ...................... 45,250
        Van ................................................................. 104,000
        Loss on Disposal .............................................. 2,750
        Cash ................................................................. 68,000
        Machine .......................................................... 84,000

To record exchange of machine;

\[ 104,000 - (68,000 + 38,750) = 2,750 \text{ loss}. \]

(d)

Jan. 2  Accumulated Depreciation, Machine ...................... 45,250
        Land ................................................................. 75,000
        Machine .......................................................... 84,000
        Cash ................................................................. 25,000
        Gain on Disposal ............................................... 11,250

To record exchange;

\[ 75,000 - (25,000 + 38,750) = 11,250 \text{ gain}. \]
Exercise 9-25 (10 minutes)

2017
Jan. 1 Copyrights ......................................................... 177,480
Cash ................................................................. 177,480
To record purchase of copyright.

Dec. 31 Amortization Expense, Copyrights ............. 14,790
Accumulated Amortization, Copyrights .............. 14,790
To record amortization of copyright;
177,480/12 = 14,790

Exercise 9-26 (15 minutes)

Part 1

2017
Sept. 5 Timber Rights .................................................. 432,000
Cash ................................................................. 96,000
Long-Term Notes Payable ...................................... 336,000
To record purchase of timber rights.

27 Patent ................................................................. 148,000
Accounts Payable .................................................. 148,000
To record purchase of patent.

Part 2

2017
Dec. 31 Amortization Expense, Timber Rights 48,000
Accumulated Amort., Timber Rights 48,000
To record amortization of timber rights;
$432,000 ÷ 3 yrs = $144,000/year × 4/12 = $48,000.

31 Amortization Expense, Patent 3,700
Accumulated Amortization, Patent 3,700
To record amortization of patent;
$148,000 ÷ 10 yrs = $14,800/year × 3/12 = $3,700.

2018
Dec. 31 Amortization Expense, Timber Rights 144,000
Accumulated Amortization, Timber Rights 144,000
To record amortization of timber rights;
$432,000 ÷ 3 yrs = $144,000/year.

31 Amortization Expense, Patent 14,800
Accumulated Amortization, Patent 14,800
To record amortization of patent;
$148,000 ÷ 10 yrs = $14,800/year.
**Exercise 9-27 (25 minutes)**

Huang Resources  
**Balance Sheet**  
October 31, 2017

**Assets**

<table>
<thead>
<tr>
<th>Current assets:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$9,600</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>$27,200</td>
</tr>
<tr>
<td>Less: Allowance for doubtful accounts</td>
<td>$1,920</td>
</tr>
<tr>
<td>Total current assets</td>
<td>$34,880</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Property, plant and equipment:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
<td>$89,600</td>
</tr>
<tr>
<td>Building</td>
<td>$147,200</td>
</tr>
<tr>
<td>Less: Accumulated depreciation</td>
<td>$81,600</td>
</tr>
<tr>
<td>Equipment</td>
<td>$184,000</td>
</tr>
<tr>
<td>Less: Accumulated depreciation</td>
<td>$110,400</td>
</tr>
<tr>
<td>Total property, plant and equipment</td>
<td>$228,800</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intangible assets:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral rights</td>
<td>$57,600</td>
</tr>
<tr>
<td>Less: Accumulated amortization</td>
<td>$30,400</td>
</tr>
<tr>
<td>Trademark</td>
<td>$33,600</td>
</tr>
<tr>
<td>Less: Accumulated amortization</td>
<td>$22,400</td>
</tr>
<tr>
<td>Total intangible assets</td>
<td>$38,400</td>
</tr>
</tbody>
</table>

| Total assets | $302,080 |

**Liabilities**

<table>
<thead>
<tr>
<th>Current liabilities:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts payable</td>
<td>$18,400</td>
</tr>
<tr>
<td>Current portion of long-term note</td>
<td>34,000</td>
</tr>
<tr>
<td>Total current liabilities</td>
<td>$52,400</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Non-current liabilities:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Note payable, less current portion</td>
<td>$38,000</td>
</tr>
<tr>
<td>Total liabilities, less current portion</td>
<td>$90,400</td>
</tr>
</tbody>
</table>

**Equity**

Ave Huang, capital | $211,680

Total liabilities and equity | $302,080

**Calculations:**

1. $221,280 adjusted capital balance + $1,433,600 revenues − $1,443,200 expenses = $211,680 post-closing capital balance
Exercise 9-28 (35 minutes)

Montalvo Bionics
Balance Sheet
April 30, 2017

Assets
Current assets:
Cash .......................................................... $ 9,000
Accounts receivable ........................................ $16,200
Less: Allowance for doubtful accounts.............. 900 15,300
Prepaid rent ................................................. 1,080
Total current assets ......................................... $ 25,380
Property, plant and equipment:
Furniture ..................................................... $21,600
Less: Accumulated depreciation ...................... 14,400 $ 7,200
Machinery ..................................................... $48,600
Less: Accumulated depreciation ...................... 21,600 27,000
Total property, plant and equipment .................. 34,200
Intangible assets:
Patent .......................................................... $21,600
Less: Accumulated amortization ................. 720 20,880
Total intangible assets ...................................... $20,880
Total assets .................................................. $80,460

Liabilities
Current liabilities:
Accounts payable .......................................... $4,860
Unearned revenues ........................................... 5,760
Current portion of long-term note ................. 5,400
Total current liabilities ................................... $ 16,020
Non-current liabilities:
Note payable, less current portion ........... 8,100
Total liabilities ............................................ $24,120

Equity
Josh Montalvo, capital ................................... 56,340
Total liabilities and equity ............................... $80,460

Calculations:
1. 12,960 × 11/12 = 11,880 rent used; 12,960 – 11,880 = 1,080 remaining in Prepaid Rent
2. 21,600 ÷ 5 = 4,320; 4,320 + 10,080 = 14,400 accum. dep.
3. 48,600 – 20,088 = 28,512; 28,512 × 2/10 = 5,702; maximum depreciation is 48,600 –
27,000 = 21,600 therefore 2017 depreciation expense is 1,512 and accum. dep. is 20,088 +
1,512 = 21,600.
4. 21,600 ÷ 15 = 1,440/year; 1,440 × 6/12 = 720.
5. 22,572 unadjusted capital + 223,200 revenues – 82,800 withdrawals – 88,200 expenses –
4,320 dep. furniture – 1,512 dep. machinery – 720 amort. patent – 11,880 rent expense =
56,340 post-closing capital
Exercise 9-29

2015

April 1  Food Truck  52,000
       Oven  6,000
       Prepaid Insurance  3,600
       Cash  61,600

To record the purchase of food truck, oven and insurance.

Oct 1  Repairs Expense  1,800
       Cash  1,800

To record repairs for truck

Dec 31  Insurance Expense  2,700
       Prepaid Insurance  2,700

To record 9 months of insurance expense

Dec 31  Depreciation Expense, Truck  6,300
       Accumulated Depreciation, Truck  6,300

To record depreciation of truck;
Calculation:
\[
\frac{[(48,000 + 4,000) - 10,000]}{5 \text{ years}} = \frac{8,400 \times 9/12}{1} = \$6,300.
\]

31  Depreciation Expense, Oven  750
    Accumulated Depreciation, Oven  750

To record depreciation of oven;

\[
\frac{($6,000-1000)}{5 \text{ yrs}} = \frac{1,000/\text{year} \times 9/12}{1} = \$750.
\]

2016

April 1  Repair Expense  2,100
       Prepaid Insurance  3,600
       Cash  5,700

To record purchase of tires and insurance for year
Dec 31  Insurance Expense 3,600
      Prepaid Insurance 3,600
  To record 1 year of insurance expense.

Dec 31  Depreciation Expense, Truck 8,400
      Accumulated Depreciation, Truck 8,400
  To record depreciation of truck;
  Calculation:
  \[
  \frac{(48,000 + 4,000) - 10,000}{5 \text{ years}} = 8,400
  \]

31  Depreciation Expense, Oven 1,000
      Accumulated Depreciation, Oven 1,000
  To record depreciation of oven;
  \[
  \frac{($6,000 - 1000)}{5 \text{ yrs}} = $1,000/\text{year}
  \]

2017
Mar 31  Depreciation Expense 2,100
       Accumulated Depreciation, Truck 2,100
  To record partial year depreciation in
  year of disposal; 8,400 \times 3/12 = 2,100.

Mar 31  Depreciation Expense 250
       Accumulated Depreciation, Oven 250
  To record partial year depreciation in
  year of disposal; 1000 \times 3/12 = 250.

Mar 31  Accumulated Depreciation, Truck 16,800
        Accumulated Depreciation, Oven 2,000
        Cash 21,000
        Truck 52,000
        Oven 6,000
        Loss on Disposal 18,200
  To record loss on sale of truck;
  \[
  16,800 + 2,000 + 21,000 - 52,000 - 6,000 = 18,200
  \]
Exercise 9-30 (30 minutes)

Part 1
2017

Jul. 3  Truck – Tool Carrier.........................................................  9,600
       Cash.................................................................  9,600

To record installation of new component to truck.

Part 2

<table>
<thead>
<tr>
<th>Truck:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>Truck body</td>
</tr>
<tr>
<td>Motor</td>
</tr>
<tr>
<td>Tool Carrier</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Calculations:
1.  $28,000 ÷ 10 yrs = 2,800/yr
2.  $8,000 ÷ 10 yrs = 800/yr
3.  $9,600 ÷ 8 yrs = 1,200/yr × 6/12 = 600 for partial period in 2017

Part 3

Book value of truck at December 31, 2017:
$45,600 total cost – ($5,400 + $4,200 = $9,600) = $36,000

Book value of truck at December 31, 2018:
$36,000 - $4,800 = $31,200
**PROBLEMS**

**Problem 9-1A (25 minutes)**

**Part 1**

<table>
<thead>
<tr>
<th></th>
<th>Land</th>
<th>Building Two</th>
<th>Building Three</th>
<th>Land Impmnts. One</th>
<th>Land Impmnts. Two</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase price*</td>
<td>$2,867,200</td>
<td>$985,600</td>
<td></td>
<td>$627,200</td>
<td></td>
</tr>
<tr>
<td>Demolition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>676,160</td>
</tr>
<tr>
<td>Landscaping</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>267,520</td>
</tr>
<tr>
<td>New building</td>
<td></td>
<td></td>
<td>$3,230,400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New improvements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$252,800</td>
</tr>
<tr>
<td>Totals</td>
<td>$3,810,880</td>
<td>$985,600</td>
<td>$3,230,400</td>
<td>$627,200</td>
<td>$252,800</td>
</tr>
</tbody>
</table>

*Allocation of purchase price:*

<table>
<thead>
<tr>
<th></th>
<th>Appraised Value</th>
<th>Percent of Total</th>
<th>Apportioned Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
<td>$2,984,960</td>
<td>64%</td>
<td>$2,867,200</td>
</tr>
<tr>
<td>Building Two</td>
<td>1,026,080</td>
<td>22</td>
<td>985,600</td>
</tr>
<tr>
<td>Land Improvements One</td>
<td>652,960</td>
<td>14</td>
<td>627,200</td>
</tr>
<tr>
<td>Totals</td>
<td>$4,664,000</td>
<td>100%</td>
<td>$4,480,000</td>
</tr>
</tbody>
</table>

**Part 2**

Mar. 31

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
<td>3,810,880</td>
</tr>
<tr>
<td>Building Two</td>
<td>985,600</td>
</tr>
<tr>
<td>Building Three</td>
<td>3,230,400</td>
</tr>
<tr>
<td>Land Improvements One</td>
<td>627,200</td>
</tr>
<tr>
<td>Land Improvements Two</td>
<td>252,800</td>
</tr>
<tr>
<td>Cash</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8,906,880</td>
</tr>
</tbody>
</table>

To record costs of plant assets.
Problem 9-2A (25 minutes)

Derlak Enterprises
Balance Sheet
December 31

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current assets:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>$ 12,000</td>
<td>$ 28,800</td>
</tr>
<tr>
<td>Prepaid rent</td>
<td>40,000</td>
<td>48,000</td>
</tr>
<tr>
<td>Office supplies</td>
<td>2,400</td>
<td>2,320</td>
</tr>
<tr>
<td><strong>Total current assets</strong></td>
<td>$ 54,400</td>
<td>$ 79,120</td>
</tr>
<tr>
<td>Property, plant and equipment:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equipment</td>
<td>$184,000</td>
<td>$100,000</td>
</tr>
<tr>
<td>Less: Accumulated depreciation</td>
<td>72,800</td>
<td>111,200</td>
</tr>
<tr>
<td>Tools</td>
<td>$143,920</td>
<td>$100,800</td>
</tr>
<tr>
<td>Less: Accumulated depreciation</td>
<td>44,800</td>
<td>99,120</td>
</tr>
<tr>
<td>Vehicles</td>
<td>$252,800</td>
<td>$252,800</td>
</tr>
<tr>
<td>Less: Accumulated depreciation</td>
<td>108,800</td>
<td>144,000</td>
</tr>
<tr>
<td><strong>Total property, plant and equipment</strong></td>
<td>$354,320</td>
<td>248,800</td>
</tr>
<tr>
<td>Intangible assets:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Franchise</td>
<td>$ 41,600</td>
<td>$ 41,600</td>
</tr>
<tr>
<td>Less: Accumulated amortization</td>
<td>19,200</td>
<td>22,400</td>
</tr>
<tr>
<td>Patent</td>
<td>$ 16,000</td>
<td>$ 16,000</td>
</tr>
<tr>
<td>Less: Accumulated amortization</td>
<td>4,000</td>
<td>12,000</td>
</tr>
<tr>
<td><strong>Total intangible assets</strong></td>
<td>34,400</td>
<td>44,000</td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td>$443,120</td>
<td>$371,920</td>
</tr>
</tbody>
</table>

|                |             |             |
| **Liabilities**|             |             |
| Current liabilities: |         |             |
| Accounts payable | $ 56,800    | $ 9,600     |
| Salaries payable | 32,800      | 26,400      |
| **Total current liabilities** | $ 89,600    | $ 36,000    |
| Non-current liabilities: |       |             |
| Notes payable, due in 2023 | 240,000    | 129,600     |
| **Total liabilities** | $329,600    | $165,600    |
| **Equity**      |             |             |
| Lee Derlak, capital | 113,520    | *           |
| **Total liabilities and equity** | $443,120    | $371,920    |

*206,320 – 32,000 – 780,800 + 720,000 = 113,520

**Analysis component:**
Derlak’s assets are financed mainly by equity in 2016. In 2017, the assets are financed largely by debt. The change from 2016 to 2017 in how assets were mainly financed (from equity to debt) is unfavourable because the greater the debt the greater the risk associated with debt (is/will Derlak be in a position to pay the interest and principal as it comes due).
### Problem 9-3A (25 minutes)

1. Purchased January 1, 2017

<table>
<thead>
<tr>
<th>Year</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Double-declining-balance method</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Equipment</strong></td>
<td>$375,000</td>
<td>$375,000</td>
<td>$375,000</td>
</tr>
<tr>
<td><strong>Less: Accumulated depreciation</strong></td>
<td>93,750</td>
<td>164,063</td>
<td>216,797</td>
</tr>
<tr>
<td><strong>Year-end book value</strong></td>
<td>$281,250</td>
<td>$210,937</td>
<td>$158,203</td>
</tr>
<tr>
<td><strong>Depreciation expense for the year</strong></td>
<td>$93,750</td>
<td>$70,313</td>
<td>$52,734</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B. Straight-line method</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Equipment</strong></td>
<td>$375,000</td>
<td>$375,000</td>
<td>$375,000</td>
</tr>
<tr>
<td><strong>Less: Accumulated depreciation</strong></td>
<td>39,063</td>
<td>78,126</td>
<td>117,189</td>
</tr>
<tr>
<td><strong>Year-end book value</strong></td>
<td>$335,937</td>
<td>$296,874</td>
<td>$257,811</td>
</tr>
<tr>
<td><strong>Depreciation expense for the year</strong></td>
<td>$39,063</td>
<td>$39,063</td>
<td>$39,063</td>
</tr>
</tbody>
</table>

1. Rate = 2/8 = 0.25 or 25%
   - 2017: 0.25 × 375,000 = 93,750
   - 2018: 0.25 × (375,000 – 93,750) = 70,313
   - 2019: 0.25 × (375,000 – 93,750 – 70,313) = 52,734

2. \[(375,000 – 62,500)/8 = 39,063 \]

2. Purchased July 1, 2017

<table>
<thead>
<tr>
<th>Year</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Double-declining-balance method</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Equipment</strong></td>
<td>$375,000</td>
<td>$375,000</td>
<td>$375,000</td>
</tr>
<tr>
<td><strong>Less: Accumulated depreciation</strong></td>
<td>46,875</td>
<td>128,906</td>
<td>190,430</td>
</tr>
<tr>
<td><strong>Year-end book value</strong></td>
<td>$328,125</td>
<td>$246,094</td>
<td>$184,570</td>
</tr>
<tr>
<td><strong>Depreciation expense for the year</strong></td>
<td>$46,875</td>
<td>$82,031</td>
<td>$61,524</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B. Straight-line method</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Equipment</strong></td>
<td>$375,000</td>
<td>$375,000</td>
<td>$375,000</td>
</tr>
<tr>
<td><strong>Less: Accumulated depreciation</strong></td>
<td>19,532</td>
<td>58,594</td>
<td>97,657</td>
</tr>
<tr>
<td><strong>Year-end book value</strong></td>
<td>$355,468</td>
<td>$316,405</td>
<td>$277,342</td>
</tr>
<tr>
<td><strong>Depreciation expense for the year</strong></td>
<td>$19,532</td>
<td>$39,063</td>
<td>$39,063</td>
</tr>
</tbody>
</table>

3. Rate = 2/8 = 0.25 or 25%
   - 2017: 0.25 × 375,000 × 6/12 = 46,875
   - 2018: 0.25 × (375,000 – 46,875) = 82,031
   - 2019: 0.25 × (375,000 – 46,875 – 82,031) = 61,524

4. \[(375,000 – 62,500)/8 = 39,063 \times 6/12 = 19,532\]
Problem 9-4A (25 minutes)

<table>
<thead>
<tr>
<th>Year</th>
<th>Depreciation Method¹:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Straight-line</strong></td>
<td><strong>Double-declining balance</strong></td>
</tr>
<tr>
<td>2017</td>
<td>(828,000 – 192,000)/10 = 63,600/year × 10/12 = 53,000</td>
<td>Rate = 2/10 = .20 or 20% 828,000 × 20% × 10/12 = 138,000</td>
</tr>
<tr>
<td>2018</td>
<td>63,600</td>
<td>(828,000 – 138,000) × 20% = 138,000</td>
</tr>
<tr>
<td>2019</td>
<td>63,600</td>
<td>(828,000 – 138,000 – 138,000) × 20% = 110,400</td>
</tr>
</tbody>
</table>

1. Depreciation is calculated to the nearest month.
2. Assume actual hours of service were: 2017: 720; 2018: 1,780; 2019: 1,535.

Analysis component:
If you could ignore the matching principle, you might record the purchase of the boats as a revenue expenditure which means the entire cost of $828,000 would have been expensed in 2017, the year of purchase. This would have resulted in the net income being understated in 2017 and, because of depreciation expense not being recorded, net income would be overstated in the remaining years of the asset’s useful life as well. On the balance sheet, recording the purchase of the boats as a revenue expenditure would have caused assets and equity to be understated in each year of the asset’s life. It is interesting to note that the error would self-correct by the end of the asset’s life if it would have gone undetected.

Problem 9-5A (25 minutes)

<table>
<thead>
<tr>
<th>Year</th>
<th>Depreciation Method¹:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Straight-line</strong></td>
<td><strong>Double-declining balance</strong></td>
</tr>
<tr>
<td>2017</td>
<td>(828,000 – 192,000)/10 = 63,600/year × 6/12 = 31,800</td>
<td>Rate = 2/10 = .20 or 20% 828,000 × 20% × 6/12 = 82,800</td>
</tr>
<tr>
<td>2018</td>
<td>63,600</td>
<td>(828,000 – 82,800) × 20% = 149,040</td>
</tr>
<tr>
<td>2019</td>
<td>63,600</td>
<td>(828,000 – 82,800 – 149,040) × 20% = 119,232</td>
</tr>
</tbody>
</table>

1. Depreciation is calculated using the half-year convention.
2. Assume actual hours of service were: 2017: 720; 2018: 1,780; 2019: 1,535.
Problem 9-6A (15 minutes)

1.  
   2017  
Apr.  30  Depreciation Expense, Building ................. 65,000  
         Accumulated Depreciation, Building............... 65,000  
To record annual depreciation;  
975,000/15 = 65,000.

30  Depreciation Expense, Equipment .................. 86,400  
    Accumulated Depreciation, Equipment............... 86,400  
To record annual depreciation;  
Rate = 2/10 = .20 or 20%;  
432,000 × 20% = 86,400.

2.  

BigSkyFarms  
Partial Balance Sheet  
April 30, 2018

Property, plant and equipment:  
Land .............................................................. $650,000  
Building ....................................................... $975,000  
   Less: Accumulated depreciation............... 780,000 195,000  
Equipment ..................................................... 750,000  
   Less: Accumulated depreciation............... 404,400 345,600  
Total property, plant and equipment .......... $1,190,600
Problem 9-7A (50 minutes)

Part 1

<table>
<thead>
<tr>
<th></th>
<th>Market Value</th>
<th>Percentage of Total</th>
<th>Apportioned Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building</td>
<td>$652,800</td>
<td>48%</td>
<td>$604,800</td>
</tr>
<tr>
<td>Land</td>
<td>462,400</td>
<td>34%</td>
<td>428,400</td>
</tr>
<tr>
<td>Land improvements</td>
<td>68,000</td>
<td>5%</td>
<td>63,000</td>
</tr>
<tr>
<td>Vehicles</td>
<td>176,800</td>
<td>13%</td>
<td>163,800</td>
</tr>
<tr>
<td>Total</td>
<td>$1,360,000</td>
<td>100%</td>
<td>$1,260,000</td>
</tr>
</tbody>
</table>

2017

Mar. 1

Building .......................................................... 604,800
Land ............................................................... 428,400
Land Improvements .............................................. 63,000
Vehicles .......................................................... 163,800
Cash .............................................................. 1,260,000

To record asset purchases.

Part 2

2017 straight-line depreciation on building:

\[
\frac{($604,800 - $41,040)/15 \times 10/12}{10} = $31,320
\]

Part 3

2017 double-declining-balance depreciation on land improvements:

Rate = 2/5 = .40 or 40%

\[
$63,000 \times 40\% \times 10/12 = $21,000
\]

Analysis component:

If the assets purchased on March 1, 2017 were put into service on May 23, 2017, the depreciation expense calculated in parts 2 and 3 above would be based on 7 months instead of 10 months because straight-line and double-declining-balance depreciation are both based on the time the assets are actually USED during the period.
**Problem 9-8A (30 minutes)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Straight-Line $</th>
<th>Units-of-Production</th>
<th>Double-Declining-Balance $</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>$ 38,000</td>
<td>$ 20,544</td>
<td>$ 84,000</td>
</tr>
<tr>
<td>2018</td>
<td>114,000</td>
<td>117,504</td>
<td>210,000</td>
</tr>
<tr>
<td>2019</td>
<td>114,000</td>
<td>114,816</td>
<td>105,000</td>
</tr>
<tr>
<td>2020</td>
<td>114,000</td>
<td>113,472</td>
<td>52,500</td>
</tr>
<tr>
<td>2021</td>
<td>76,000</td>
<td>89,664</td>
<td>4,500</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>$456,000</strong></td>
<td><strong>$456,000</strong></td>
<td><strong>$456,000</strong></td>
</tr>
</tbody>
</table>

**a Straight-line:**

Cost per year = \((504,000 – 48,000)/4\) years = $114,000 per year × 4/12 = 38,000

**b Units-of-production:**

Cost per unit = \((504,000 – 48,000)/475,000\) units = $0.96 per unit

<table>
<thead>
<tr>
<th>Year</th>
<th>Units</th>
<th>Unit Cost</th>
<th>Depreciation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>21,400</td>
<td>$0.96</td>
<td>$ 20,544</td>
</tr>
<tr>
<td>2018</td>
<td>122,400</td>
<td>0.96</td>
<td>117,504</td>
</tr>
<tr>
<td>2019</td>
<td>119,600</td>
<td>0.96</td>
<td>114,816</td>
</tr>
<tr>
<td>2020</td>
<td>118,200</td>
<td>0.96</td>
<td>113,472</td>
</tr>
<tr>
<td>2021</td>
<td>102,000</td>
<td>0.96</td>
<td>89,664*</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$456,000</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Take only enough depreciation in Year 2021 to reach the maximum accumulated depreciation of $456,000 (which is cost less residual).

**c Double-declining-balance:**

Rate = 2/4 = .50 or 50%

2017: \(50\% \times 504,000 \times 4/12 = 84,000\)

2018: \(50\% \times (504,000 – 84,000) = 210,000\)

2019: \(50\% \times (504,000 – 84,000 – 210,000) = 105,000\)

2020: \(50\% \times (504,000 – 84,000 – 210,000 – 105,000) = 52,500\)

2021: \(456,000 – 451,500* = 4,500\)

*Take only enough depreciation in Year 2021 to reach the maximum accumulated depreciation of $456,000 (which is cost less residual).
Problem 9-9A (30 minutes)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Office equipment</td>
<td>March 27/14</td>
<td>Straight-line</td>
<td>$52,000</td>
<td>$14,000</td>
<td>10 yr.</td>
<td>14,250&lt;sup&gt;1&lt;/sup&gt;</td>
<td>3,800&lt;sup&gt;2&lt;/sup&gt;</td>
<td>18,050&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
<tr>
<td>Machinery</td>
<td>June 4/14</td>
<td>Double-declining balance</td>
<td>$275,000</td>
<td>$46,000</td>
<td>6 yr.</td>
<td>209,362&lt;sup&gt;4&lt;/sup&gt;</td>
<td>19,638&lt;sup&gt;5&lt;/sup&gt;</td>
<td>229,000&lt;sup&gt;6&lt;/sup&gt;</td>
</tr>
<tr>
<td>Truck</td>
<td>Nov. 13/17</td>
<td>Units-of-production</td>
<td>$113,000</td>
<td>$26,000</td>
<td>250,000 km.</td>
<td>4,872&lt;sup&gt;7&lt;/sup&gt;</td>
<td>23,664&lt;sup&gt;8&lt;/sup&gt;</td>
<td>28,536&lt;sup&gt;9&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

1. \( \frac{52,000 - 14,000}{10} = 3,800/\text{year} \times 3 \frac{9}{12} = 14,250 \)
2. \( \frac{52,000 - 14,000}{10} = 3,800/\text{year} \)
3. \( 14,250 + 3,800 = 18,050 \)
4. Rate = \( \frac{2}{6} = .3333 \) or 33.33%
   - 2014: \( 33.33\% \times 275,000 \times 7/12 = 53,472 \)
   - 2015: \( 33.33\% \times (275,000 - 53,472) = 73,843 \)
   - 2016: \( 33.33\% \times (275,000 - 53,472 - 73,843) = 49,228 \)
   - 2017: \( 33.33\% \times (275,000 - 53,472 - 73,843 - 49,228) = 32,819 \)
   - Accumulated depreciation at Dec. 31, 2017 = \( 209,362 \)
5. 2018: \( (275,000 - 46,000) 209,362 = 19,638 \)
6. \( 209,362 + 19,638 = 229,000 \)
7. Rate = \( \frac{113,000 - 26,000}{250,000} = 0.348/\text{km} \); \( 14,000 \times 0.348 = 4,872 \)
8. \( 68,000 \times 0.348 = 23,664 \)
9. \( 4,872 + 23,664 = 28,536 \)
Problem 9-10A (20 minutes)

2017

Mar.  26  Delivery Truck .............................................................. 102,900
       Cash ........................................................................ 102,900
       To record purchase of new truck;
       $97,075 plus $5,825 freight costs.

Dec.  31  Depreciation Expense, Delivery Truck ....................... 13,185
       Accumulated Depreciation, Delivery Truck .......... 13,185
       To record depreciation from Mar. 26 to

2018

Dec.  31  Depreciation Expense, Delivery Truck ....................... 22,220
       Accumulated Depreciation, Delivery Truck .......... 22,220
       To record depreciation.

1. \[(102,900 - 15,000)/5 \times 9/12 = 13,185\]

2. \[102,900 - 13,185 - 17,500 = 22,220\]
\[4 - 9/12 = 3.25\]

Problem 9-11A (30 minutes)

2018

Dec.  31  Depreciation Expense, Machinery ............................... 95,200
       Accumulated Depreciation, Machinery ................. 95,200
       To record annual depreciation.

31  Depreciation Expense, Office Furniture ....................... 11,733
       Accumulated Depreciation, Office Furniture ........... 11,733
       To record annual depreciation.

Calculations:

\[
\begin{array}{ccc}
\text{Cost} & \text{Accumulated Depreciation} & \text{Residual} \\
1. & 556,800 - & 246,400 - \\
& & 120,000 \\
& & 95,200 \\
2. & 89,600 - & 49,600 - \\
& & (11,200 - \\
& & 6,400) \\
& & 11,733 \\
& & 5 - 2 = 3
\end{array}
\]
Problem 9-12A (20 minutes)

Part 1

2017
Jan. 7 Machine #5027 – Blade (new) ........................................ 10,400
Accumulated Depreciation, Machine #5027 – Blade ...... 2,688
Loss on Disposal......................................................... 5,032
Machine #5027 – Blade (old) ........................................... 7,720
Cash............................................................................. 10,400

To record installation of replacement blade.

Calculations:
1. $7,720 – 1,000 = 6,720; 6,720 ÷ 5 yrs = 1,344 deprec. for 2015;
   1,344+ 1,344 deprec. for 2016= 2,688 accum. deprec. at Dec. 31, 2016.

Part 2

Metal
   44,000 – 8,000 = 36,000; 36,000 ÷ 15 yrs = 2,400 for
Housing
   2015 PLUS 2,400 for 2016= 4,800 accum. deprec. at Dec.
   31/2016;
   Revised deprec. = 44,000 – 4,800 = 39,200 book value;
   39,200 – 8,600 residual = 30,600 depreciable cost;
   $1,700
   $1,700
   30,600 ÷ 18 years* =

   *20 years – 2 yrs already depreciated = 18 yr remaining life

Motor
   2015: 26,000 × 2/10 = 5,200
   2016: 26,000 – 5,200 = 20,800 × 2/10 = 4,160
   2017: 20,800 – 4,160 = 16,640 × 2/10 = 3,328

Blade
   10,400 – 1,000 = 9,400; 9,400 ÷ 5 yrs =

Total depreciation expense to be recorded on Machine #5027 for 2017= $6,908
Problem 9-13A (40 minutes)

Part 1

2017

Oct. 31  Impairment Loss .................................................  24,200
           Equipment ....................................................  24,200
               To record impairment loss on equipment.

31      Impairment Loss .................................................  14,300
           Furniture ....................................................  14,300
               To record impairment loss on furniture.

*Calculations:

<table>
<thead>
<tr>
<th></th>
<th>Book Value</th>
<th>Recoverable Value</th>
<th>Impairment Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
<td>$105,600</td>
<td>$136,400</td>
<td>NA</td>
</tr>
<tr>
<td>Building</td>
<td>57,200</td>
<td>105,600</td>
<td>NA</td>
</tr>
<tr>
<td>Equipment</td>
<td>52,800</td>
<td>28,600</td>
<td>$24,200</td>
</tr>
<tr>
<td>Furniture</td>
<td>29,700</td>
<td>15,400</td>
<td>14,300</td>
</tr>
</tbody>
</table>
Problem 9-13A (concluded)
Part 2

<table>
<thead>
<tr>
<th>Safety-First Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balance Sheet</td>
</tr>
<tr>
<td>October 31, 2017</td>
</tr>
</tbody>
</table>

### Assets

**Current assets:**

- Cash .......................................................... $ 11,000
- Accounts receivable ................................ $ 19,800
  - Less: Allowance for doubtful accounts........... 880
  - Merchandise inventory ............................. 35,200
- Total current assets ................................ $ 65,120

**Property, plant and equipment:**

- Land ........................................................ $105,600
- Building .................................................. $136,400
  - Less: Accumulated depreciation ................. 79,200
- Equipment ............................................... $66,0001
  - Less: Accumulated depreciation ................. 37,400
  - Furniture ........................................... $36,3002
  - Less: Accumulated depreciation ................. 20,900
- Total property, plant and equipment .......... 206,800

**Total assets** ........................................... $271,920

### Liabilities

**Current liabilities:**

- Accounts payable ..................................... $ 11,220
- Unearned revenues ..................................... 7,920
- Current portion of long-term note ............... 26,400
- Total current liabilities ......................... $ 45,540

**Non-current liabilities:**

- Note payable, less current portion ............ 59,400

**Total liabilities** ................................... $104,940

### Equity

- Tarifa Sharma, capital ................................ 166,9803

**Total liabilities and equity** ..................... $271,920

### Calculations:

1. $90,200 - $24,200 impairment loss = 66,000
2. $50,600 - $14,300 impairment loss = 36,300
3. $62,480 adjusted capital balance + $904,200 sales - $761,200 expenses - $24,200 impairment loss, equip. - $14,300 impairment loss, furn. = $166,980 post-closing capital balance

### Analysis component:

An impairment loss causes net income to decrease on the income statement. On the balance sheet, an impairment loss causes total assets to decrease because of the decrease in property, plant and equipment. Equity also decreases on the balance sheet as a result of the decreased net income.
Problem 9-14A (30 minutes)

1. **2018**
   
   **Sept. 27**  
   Depreciation Expense, Building ................................... 4,950  
   Accumulated Depreciation, Building¹ ...................... 4,950  
   
   To record building depreciation for 2018.

   **27**  
   Cash ................................................................. 592,000  
   Accumulated Depreciation, Building² ....................... 398,550  
   Gain on Disposal .................................................. 67,350  
   Land ................................................................. 396,800  
   Building ........................................................... 526,400

   To record sale of land and building.

2. **Nov. 2**  
   Depreciation Expense, Equipment ......................... 16,133  
   Accumulated Depreciation, Equipment³ ................... 16,133  
   
   To record equipment depreciation for 2018.

   **2**  
   Cash ................................................................. 56,800  
   Accumulated Depreciation, Equipment⁴ .................... 90,533  
   Loss on Disposal .................................................. 23,867  
   Equipment ........................................................ 171,200

   To record sale of equipment.

1. Depreciation from Jan. 1, 2018 to Sept. 27, 2018
   
   \[(526,400 – 393,600) – 80,000\]/8 = 6,600/year × 9/12 = 4,950

2. Accumulated Depreciation, Building =
   
   4,950 + 393,600 = 398,550

3. Depreciation from Jan. 1, 2018 to Nov. 2, 2018
   
   Rate = 2/10 = .20 or 20%  
   171,200 – 74,400 = 96,800 × 20% = 19,360 × 10/12 = 16,133

4. Accumulated Depreciation, Equipment =
   
   16,133 + 74,400 = 90,533
Problem 9-15A (45 minutes)

1.

2017
Jan. 2  Machine ................................................................. 116,900
       Cash ................................................................. 116,900

To record purchase of machine.

3  Machine ................................................................. 4,788
   Cash ................................................................. 4,788

To record capital repairs on machine.

3  Machine ................................................................. 1,512
   Cash ................................................................. 1,512

To record installation of machine.

2.

2017
Dec. 31  Depreciation Expense, Machine ......................... 17,080
       Accumulated Depreciation, Machine .................. 17,080

To record depreciation;
\( \frac{123,200 - 20,720}{6} = 17,080 \).

2022
Sept. 30  Depreciation Expense, Machine ......................... 12,810
       Accumulated Depreciation, Machine .................. 12,810

To record partial year's depreciation;
\( 17,080 \times \frac{9}{12} = 12,810 \).

3(a).

30  Accumulated Depreciation, Machine\(^1\) .................. 98,210
    Cash ................................................................. 21,000
    Loss on Disposal\(^2\) .................................................. 3,990
    Machine ............................................................. 123,200

Sold machine for $21,000.

3(b).

30  Accumulated Depreciation, Machine ......................... 98,210
    Cash ................................................................. 27,300
    Machine ............................................................. 123,200
    Gain on Disposal\(^3\) ............................................... 2,310

Sold machine for $27,300.

3(c).

30  Accumulated Depreciation, Machine ......................... 98,210
    Cash ................................................................. 25,760
    Machine ............................................................. 123,200
    Gain on Disposal\(^4\) ............................................... 770

Received insurance settlement.
Problem 9-15A (continued)


1. Accumulated depreciation = (17,080 × 5 years) + 12,810 = **98,210**

2. Gain (Loss) = Cash Proceeds – Book Value
   = 21,000 – (123,200 – 98,210) = **(3,990)**

3. Gain (Loss) = Cash Proceeds – Book Value
   = 27,300 – (123,200 – 98,210) = **2,310**

4. Gain (Loss) = Cash Proceeds – Book Value
   = 25,760 – (123,200 – 98,210) = **770**

Problem 9-16A (15 minutes)

2017
2. July 5  Accumulated Depreciation, Truck ......................... 6,000
   Loss on Disposal* ................................................... 10,500
   Furniture .................................................................. 45,100
   Truck........................................................................ 36,000
   Cash....................................................................... 25,600
   To record exchange.

Dec. 31  Depreciation Expense, Furniture ......................... 3,236
   Accumulated Depreciation, Furniture.......................... 3,236
   To record depreciation;
   (45,100 – 6,268)/6 × 6/12 = **3,236**.

* Gain (Loss) = Proceeds – Book Value of Assets Given Up
   = 45,100 – [25,600 + (36,000 – 6,000)]
   = 45,100 – 55,600
   = (10,500)
Problem 9-17A (45 minutes)

a. Depreciation expense on first December 31 of each machine’s life

2017

Dec. 31 Depreciation Expense, Machine 1550 \(^1\) .................. 6,075
  Accumulated Depreciation, Machine 1550 6,075
To record depreciation.

2020

Dec. 31 Depreciation Expense, Machine 1795 \(^3\) .................. 22,646
  Accumulated Depreciation, Machine 1795 22,646
To record depreciation.

2021

Dec. 31 Depreciation Expense, Machine BT-311 \(^5\) .................. 77,810
  Accumulated Depreciation, Machine BT-311 ................................ 77,810
To record depreciation.

b. Purchase/exchange/disposal of each machine.

2017

Apr. 1 Machine 1550 ................................................................ 52,900
  Cash ........................................................................ 52,900
To record purchase of Machine 15-50.

2020

Mar. 29 Machine 1795 (= assets given up) .................. 60,390
  Accumulated Depreciation, Machine 1550 \(^2\) .................. 24,300
  Machine 1550 .................................................. 52,900
  Cash ........................................................................ 31,790
To record exchange of Machine 1550.

2021

Oct. 2 Machine BT-311 ................................................................ 537,000
  Accumulated Depreciation, Machine 1795 \(^4\) .................. 36,800
  Loss on Disposal .................................................. 3,590
  Machine 1795 .................................................. 60,390
  Cash ........................................................................ 517,000
To record exchange of Machine 1795.

2024

Aug. 21 Cash ........................................................................ 81,200
  Accumulated Depreciation, Machine BT-311 \(^6\) .................. 348,890
  Loss on Disposal .................................................. 106,910
  Machine BT-311 .................................................. 537,000
To record sale of Machine BT-311.
Problem 9-17A (continued)

Calculations:

1. \[52,900 - 4,300 = 8,100/\text{year} \times 9/12 = 6,075\]

2. Depreciation
   - 2017: 6,075
   - 2018: 8,100
   - 2019: 8,100
   - 2020: \[2,025 = (8,100 \times 3/12)\]

Accum. Deprec. \[24,300\]

Book Value \[52,900 - 24,300 = 28,600\]
Cash Paid \[62,000 - 30,210 = 31,790\]
Book Value 28,600 plus cash paid 31,790 = 60,390

3. Rate = 2/4 = .50 or 50%
   \[50\% \times 60,390 \times 9/12 = 22,646\] (deprec. for 2017)

4. \[50\% \times (60,390 - 22,646) \times 9/12 = 14,154\] (deprec. for 2021)
   \[+ 22,646\] (deprec. for 2020)
   \[36,800\] (accum. deprec.)

5. \[(537,000 - 35,000)/200,000 = 2.51/\text{unit}\]
   2021: \[31,000 \text{ units} \times 2.51/\text{unit} = 77,810\]

6. Depreciation for Jan. 1/2022 to August 21/2024
   \[= 108,000 \text{ units} \times 2.51/\text{unit} = 271,080\]
   \[+ 77,810\] (2021)
   \[348,890\] (accum. deprec.)

Problem 9-18A (10 minutes)

(a)  
2017
   Oct. 1 Copyright ................................................................. 288,000
   Cash ........................................................................ 288,000
   To record purchase of copyright.

(b)  
Dec. 31 Amortization Expense .............................................. 24,000
   Accumulated Amortization, Copyright .......................... 24,000
   To record amortization of copyright;
   \[288,000/3 \times 3/12 = 24,000\].
Problem 9-19A (30 minutes)

Part 1

2017
Dec. 31  Amortization Expense, Mineral Rights .......................... 13,000
        Accumulated Amortization, Mineral Rights ............. 13,000
        To record amortization on the mineral rights;
        $62,400 ÷ 4 years = $15,600/year × 10/12 = $13,000.

31  Depreciation Expense, Equipment ................................. 51,000
    Accumulated Depreciation, Equipment .................. 51,000
    To record depreciation on the equipment;
    $244,800 ÷ 4 years = $61,200/year × 10/12 = $51,000.

31  Depreciation Expense, Truck .................................. 19,875
    Accumulated Depreciation, Truck ..................... 19,875
    To record depreciation on the truck;
    $95,400 ÷ 4 years = $23,850/year × 10/12 = $19,875.

Part 2

2020
Oct. 31  Accumulated Amortization, Mineral Rights .......... 57,200
        Loss on Disposal ........................................... 5,200
        Mineral Rights ............................................. 62,400
        To record disposal of the mineral rights;
        $13,000 + $15,600 + $15,600 + 13,000 = $57,200
        accum. amortization.

31  Accumulated Depreciation, Equipment ...................... 224,400
    Loss on Disposal ............................................ 20,400
    Equipment ...................................................... 244,800
    To record disposal of the equipment;
    $51,000 + $61,200 + $61,200 + $51,000 = $224,400
    accum. depreciation.

31  Accumulated Depreciation, Truck ......................... 87,450
    Loss on Disposal ............................................. 7,950
    Truck ......................................................... 95,400
    To record disposal of the truck;
    $19,875 + $23,850 + $23,850 + $19,875 = $87,450
    accum. depreciation.
*Problem 9-20A (30 minutes)

Part 1

a.  
2017

Jun. 27  Depreciation Expense, Boat – Motor....................... 2,660
Accumulated Depreciation, Boat – Motor ..... 2,660

To update depreciation in 2017 regarding
motor being replaced.

27  Boat – Motor (new) ........................................ 63,000
Accumulated Depreciation, Boat – Motor .............. 43,890<sup>1</sup>
Loss on Disposal........................................ 9,310
Boat – Motor (old) ........................................ 53,200
Cash .......................................................... 63,000

To record replacement of motor.

b.  
Dec. 31  Depreciation Expense, Boat ....................... 3,113<sup>2</sup>
Accumulated Depreciation, Boat ....................... 3,113

To record revised depreciation for 2017 on the boat (boat body
plus motor).

Calculations:
1.  53,200 ÷ 10 years = 5,320/year; 5,320 × 9/12 = 3,990 depreciation for 2009; 5,320 × 7 years
for 2010thru 2016= 37,240; 5,320/ year × 6/12 = 2,660 deprec. from Jan. 1/17to June 27/17;
37,240 + 3,990 + 2,660 = 43,890 accumulated depreciation at June 27, 2017;

2.  Body:  Accumulated depreciation at Dec. 31, 2016:
23,800 – 7,000 = 16,800; 16,800 ÷ 15 years = 1,120/year; 1,120 ×
9/12 = 840 depreciation for 2009; 1,120 × 7 years (2010thru
2016) = 7,840; 7,840 + 840 = 8,680
Revised depreciation at Dec. 31, 2017(rounded):
23,800 – 8,680 – 7,000 = 8,120 remaining depreciable cost;
8,120 ÷ 12.25<sup>1</sup> years =  $ 663<sup>*</sup>

<sup>1</sup> 20 – 7 9/12 = 12 3/12 or 12.25 years remaining useful life

Motor:  63,000 – 4,200 = 58,800; 58,800 ÷ 12 years = 4,900/yr × 6/12 =

$3,113

*rounded to the nearest whole dollar since depreciation is based on estimates.

Part 2

Total 2017depreciation = $2,660 + $3,113 = $5,773
**Problem 9-1B (25 minutes)**

**Part 1**

<table>
<thead>
<tr>
<th></th>
<th>Land</th>
<th>Building B</th>
<th>Building C</th>
<th>Land Improvements B</th>
<th>Land Improvements C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase price*</td>
<td>$307,800</td>
<td>$183,600</td>
<td>$48,600</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demolition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$46,800</td>
</tr>
<tr>
<td>Landscaping</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$69,000</td>
</tr>
<tr>
<td>New building</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$542,400</td>
</tr>
<tr>
<td>New improvements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$40,500</td>
</tr>
<tr>
<td>Totals</td>
<td>$423,600</td>
<td>$183,600</td>
<td>$542,400</td>
<td>$48,600</td>
<td>$40,500</td>
</tr>
</tbody>
</table>

*Allocation of purchase price:

<table>
<thead>
<tr>
<th></th>
<th>Appraised Value</th>
<th>Percent of Total</th>
<th>Apportioned Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
<td>$317,034</td>
<td>57%</td>
<td>$307,800</td>
</tr>
<tr>
<td>Building B</td>
<td>189,108</td>
<td>34%</td>
<td>183,600</td>
</tr>
<tr>
<td>Land Improvements B</td>
<td>50,058</td>
<td>9%</td>
<td>48,600</td>
</tr>
<tr>
<td>Totals</td>
<td>$556,200</td>
<td>100%</td>
<td>$540,000</td>
</tr>
</tbody>
</table>

**Part 2**

<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 1</td>
<td>Land $423,600</td>
</tr>
<tr>
<td></td>
<td>Building B $183,600</td>
</tr>
<tr>
<td></td>
<td>Building C $542,400</td>
</tr>
<tr>
<td></td>
<td>Land Improvements B $48,600</td>
</tr>
<tr>
<td></td>
<td>Land Improvements C $40,500</td>
</tr>
<tr>
<td></td>
<td>Cash $1,238,700</td>
</tr>
</tbody>
</table>

*To record costs of plant assets.*
### Problem 9-2B (25 minutes)

**Xentel Interactive**  
**Balance Sheet**  
**September 30**  

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Current assets:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>$ 900</td>
<td>$ 2,700</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>1,800</td>
<td>4,320</td>
</tr>
<tr>
<td>Prepaid insurance</td>
<td><em><strong>-0-</strong></em></td>
<td><em><strong>1,530</strong></em></td>
</tr>
<tr>
<td><strong>Total current assets</strong></td>
<td>$ 2,700</td>
<td>$ 8,550</td>
</tr>
<tr>
<td><strong>Property, plant and equipment:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land</td>
<td>68,400</td>
<td>68,400</td>
</tr>
<tr>
<td>Machinery</td>
<td>$295,200</td>
<td>$115,200</td>
</tr>
<tr>
<td>Less: Accumulated depreciation</td>
<td>90,000</td>
<td>82,800</td>
</tr>
<tr>
<td>Building</td>
<td>$225,000</td>
<td>$225,000</td>
</tr>
<tr>
<td>Less: Accumulated depreciation</td>
<td>54,000</td>
<td>174,600</td>
</tr>
<tr>
<td><strong>Total property, plant and equipment</strong></td>
<td>444,600</td>
<td>275,400</td>
</tr>
<tr>
<td><strong>Intangible assets:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Copyright</td>
<td>$ 7,200</td>
<td>$ 7,200</td>
</tr>
<tr>
<td>Less: Accumulated amortization</td>
<td>1,080</td>
<td>540</td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td>$453,420</td>
<td>$290,610</td>
</tr>
<tr>
<td><strong>Liabilities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Current liabilities:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accounts payable</td>
<td>$ 4,320</td>
<td>$ 3,150</td>
</tr>
<tr>
<td>Unearned fees</td>
<td>82,800</td>
<td>5,580</td>
</tr>
<tr>
<td><strong>Total current liabilities</strong></td>
<td>$ 87,120</td>
<td>$ 8,730</td>
</tr>
<tr>
<td><strong>Non-current liabilities:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notes payable, due in 2022</td>
<td>230,220</td>
<td>55,800</td>
</tr>
<tr>
<td><strong>Total liabilities</strong></td>
<td>$317,340</td>
<td>$ 64,530</td>
</tr>
<tr>
<td><strong>Equity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mason Xentel, capital</td>
<td>136,080*</td>
<td>226,080</td>
</tr>
<tr>
<td><strong>Total liabilities and equity</strong></td>
<td>$453,420</td>
<td>$290,610</td>
</tr>
</tbody>
</table>

*226,080 – 72,000 + 540,000 – 558,000 = 136,080

**Analysis component:**  
Xentel's assets were mainly financed by equity in 2016. In 2017, Xentel's assets were mainly financed by debt. The increase in the debt financing has weakened the balance sheet as opposed to strengthening it.
Problem 9-3B (30 minutes)

Part 1. Purchase made on January 1, 2017

<table>
<thead>
<tr>
<th>Year</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Double-declining balance method</td>
<td>$588,000</td>
<td>$588,000</td>
<td>$588,000</td>
</tr>
<tr>
<td>Machinery</td>
<td>$588,000</td>
<td>$588,000</td>
<td>$588,000</td>
</tr>
<tr>
<td>Less: Accumulated depreciation</td>
<td>58,800</td>
<td>164,640</td>
<td>249,312</td>
</tr>
<tr>
<td>Year-end book value</td>
<td>$529,200</td>
<td>$423,360</td>
<td>$338,688</td>
</tr>
<tr>
<td>Depreciation expense for the year</td>
<td>$58,800</td>
<td>$105,840</td>
<td>$84,672</td>
</tr>
</tbody>
</table>

B. Straight-line method

<table>
<thead>
<tr>
<th>Year</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machinery</td>
<td>$588,000</td>
<td>$588,000</td>
<td>$588,000</td>
</tr>
<tr>
<td>Less: Accumulated depreciation</td>
<td>26,600</td>
<td>79,800</td>
<td>133,000</td>
</tr>
<tr>
<td>Year-end book value</td>
<td>$561,400</td>
<td>$508,200</td>
<td>$455,000</td>
</tr>
<tr>
<td>Depreciation expense for the year</td>
<td>$26,600</td>
<td>$53,200</td>
<td>$53,200</td>
</tr>
</tbody>
</table>

1. Rate = 2/10 = .20 or 20%

2017: \(20\% \times 588,000 \times 6/12 = 58,800\) note – using half year rule

2018: \(20\% \times (588,000 – 58,800) = 105,840\)

2019: \(20\% \times (588,000 – 58,800 – 105,840) = 84,672\)

2. \((588,000 – 56,000)/10 = 53,200 \times 6/12 = 26,600\)
Problem 9-3B (continued)

Part 2. Purchase made on April 1, 2017

<table>
<thead>
<tr>
<th>Year</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Double-declining balance method</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machinery</td>
<td>$588,000</td>
<td>$588,000</td>
<td>$588,000</td>
</tr>
<tr>
<td>Less: Accumulated depreciation</td>
<td>58,800</td>
<td>164,640</td>
<td>249,312</td>
</tr>
<tr>
<td>Year-end book value</td>
<td>$529,200</td>
<td>$423,360</td>
<td>$338,688</td>
</tr>
<tr>
<td>Depreciation expense for the year</td>
<td>$58,800</td>
<td>$105,840</td>
<td>$84,672</td>
</tr>
</tbody>
</table>

B. Straight-line method

<table>
<thead>
<tr>
<th>Year</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machinery</td>
<td>$588,000</td>
<td>$588,000</td>
<td>$588,000</td>
</tr>
<tr>
<td>Less: Accumulated depreciation</td>
<td>26,600</td>
<td>79,800</td>
<td>133,000</td>
</tr>
<tr>
<td>Year-end book value</td>
<td>$561,400</td>
<td>$508,200</td>
<td>$455,000</td>
</tr>
<tr>
<td>Depreciation expense for the year</td>
<td>$26,600</td>
<td>$53,200</td>
<td>$53,200</td>
</tr>
</tbody>
</table>

3. Rate = 2/10 = .20 or 20%
   2017: 20% \times 588,000 \times 6/12 = 58,800 (note – using half year rule)
   2018: 20% \times (588,000 – 58,800) = 105,840
   2019: 20% \times (588,000 – 58,800 – 105,840) = 84,672

4. \frac{(588,000 – 56,000)}{10} \times \frac{6}{12} = 26,600
## Problem 9-4B (30 minutes)

<table>
<thead>
<tr>
<th>Year</th>
<th>Depreciation Method:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Straight-line</td>
</tr>
<tr>
<td></td>
<td>(145,000 – 25,000)/5 = 24,000/year × 2/12 = 4,000</td>
</tr>
<tr>
<td>2017</td>
<td>24,000</td>
</tr>
<tr>
<td>2018</td>
<td>24,000</td>
</tr>
<tr>
<td>2019</td>
<td>24,000</td>
</tr>
<tr>
<td>2020</td>
<td>24,000</td>
</tr>
<tr>
<td>2021</td>
<td>24,000</td>
</tr>
<tr>
<td>2022</td>
<td>20,000</td>
</tr>
<tr>
<td>Totals</td>
<td>120,000</td>
</tr>
</tbody>
</table>

*Maximum allowed = $4,232 [($120,000 – ($9,667 + $54,133 + $32,480 + $19,488))]

**Maximum allowed = $7,524 [($120,000 – ($6,960 + $23,280 + $27,420 + $30,840 + $23,976))]
Problem 9-5B (30 minutes)

<table>
<thead>
<tr>
<th>Year</th>
<th>Straight-line</th>
<th>Double-declining balance</th>
<th>Units-of-production</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>(145,000 – 25,000)/5 = 24,000/year × 6/12 = 12,000</td>
<td>Rate = 2/5 = .40 or 40% 145,000 × 40% × 6/12 = 29,000</td>
<td>Same as Problem 9-4B; Units-of-production is usage based and not affected by time 6,960</td>
</tr>
<tr>
<td>2018</td>
<td>24,000</td>
<td>(145,000 – 29,000) × 40% = 46,400</td>
<td>1.20 × 19,400 = 23,280</td>
</tr>
<tr>
<td>2019</td>
<td>24,000</td>
<td>(145,000 – 29,000 – 46,400) × 40% = 27,840</td>
<td>1.20 × 22,850 = 27,420</td>
</tr>
<tr>
<td>2020</td>
<td>24,000</td>
<td>(145,000 – 29,000 – 46,400 – 27,840) × 40% = 16,704</td>
<td>1.20 × 25,700 = 30,840</td>
</tr>
<tr>
<td>2021</td>
<td>24,000</td>
<td>56*</td>
<td>1.20 × 19,980 = 23,976</td>
</tr>
<tr>
<td>2022</td>
<td>12,000</td>
<td>0</td>
<td>120,000 – 112,476 = 7,524**</td>
</tr>
<tr>
<td>Totals</td>
<td>120,000</td>
<td>120,000</td>
<td>120,000</td>
</tr>
</tbody>
</table>

* Maximum allowed = $56 [$120,000 – ($29,000 + $46,400 + $27,840 + $16,704)]

** Maximum allowed = $7,524 [$120,000 – ($6,960 + $23,280 + $27,420 + $30,840 + $23,976)]
Problem 9-6B (15 minutes)

Part 1.

2018

Dec. 31 Depreciation Expense, Machinery ......................... 55,000
   Accumulated Depreciation, Machinery .................. 55,000
   To record annual depreciation;
   \[ \frac{(500,000 - 60,000)}{8} = 55,000 \]

31 Depreciation Expense, Equipment ......................... 126,667
   Accumulated Depreciation, Equipment ......................... 126,667
   To record annual depreciation;
   Rate = \( \frac{2}{4} = .50 \) or 50%;
   \[ 50\% \times (1,280,000 - 1,026,667) = 126,667 \]

Part 2.

WESTFAIR FOODS
Partial Balance Sheet
December 31, 2018

Property, plant and equipment:
Machinery ......................................................... $500,000
   Less: Accumulated depreciation.......................... 385,000 $115,000

Equipment ......................................................... 1,280,000
   Less: Accumulated depreciation.......................... 1,153,334 126,666

Total property, plant and equipment ......................... $241,666
Problem 9-7B (30 minutes)

Part 1

<table>
<thead>
<tr>
<th></th>
<th>Market Value</th>
<th>Percentage of Total</th>
<th>Apportioned Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building</td>
<td>$ 663,300</td>
<td>55%</td>
<td>$574,200</td>
</tr>
<tr>
<td>Land</td>
<td>397,980</td>
<td>33</td>
<td>344,520</td>
</tr>
<tr>
<td>Land improvements</td>
<td>120,600</td>
<td>10</td>
<td>104,400</td>
</tr>
<tr>
<td>Truck</td>
<td>24,120</td>
<td>2</td>
<td>20,880</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$1,206,000</strong></td>
<td>100%</td>
<td><strong>$1,044,000</strong></td>
</tr>
</tbody>
</table>

2017

Sept. 30

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Building</td>
<td>$574,200</td>
<td></td>
</tr>
<tr>
<td>Land</td>
<td>344,520</td>
<td></td>
</tr>
<tr>
<td>Land Improvements</td>
<td>104,400</td>
<td></td>
</tr>
<tr>
<td>Truck</td>
<td>20,880</td>
<td></td>
</tr>
<tr>
<td><strong>Cash</strong></td>
<td><strong>1,044,000</strong></td>
<td><strong>1,044,000</strong></td>
</tr>
</tbody>
</table>

To record asset purchases.

Part 2

2017 straight-line depreciation on building:

\[ \frac{($574,200 - 45,000)}{15} \times \frac{3}{12} = 8,820 \]

Part 3

2017 double-declining-balance depreciation on land improvements:

Rate = $2/8 = .25 or 25%

\[ 104,400 \times 25\% \times \frac{3}{12} = 6,525 \]
Problem 9-8B (45 minutes)

<table>
<thead>
<tr>
<th>Year</th>
<th>Straight-Line</th>
<th>Units-of-Production</th>
<th>Double-Declining-Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>$31,304</td>
<td>$32,928</td>
<td>$72,800</td>
</tr>
<tr>
<td>2018</td>
<td>46,956</td>
<td>51,744</td>
<td>80,080</td>
</tr>
<tr>
<td>2019</td>
<td>46,956</td>
<td>47,040</td>
<td>48,048</td>
</tr>
<tr>
<td>2020</td>
<td>46,956</td>
<td>44,688</td>
<td>28,829</td>
</tr>
<tr>
<td>2021</td>
<td>46,956</td>
<td>37,240</td>
<td>5,023*</td>
</tr>
<tr>
<td>2022</td>
<td>15,652</td>
<td>21,140</td>
<td>0</td>
</tr>
<tr>
<td>Totals</td>
<td>$234,780</td>
<td>$234,780</td>
<td>$234,780</td>
</tr>
</tbody>
</table>

a Straight-line:
Cost per year = \((273,000 - 38,220)/5\) years = $46,956 per year \times 8/12 = $31,304 for 2017
= $46,956/year \times 4/12 = $15,652 for 2022

b Units-of-production:
Cost per unit = \((273,000 - 38,220)/168,000\) units = $1.40 per unit (rounded)

<table>
<thead>
<tr>
<th>Year</th>
<th>Units</th>
<th>Unit Cost</th>
<th>Depreciation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>23,520</td>
<td>$1.40</td>
<td>$32,928</td>
</tr>
<tr>
<td>2018</td>
<td>36,960</td>
<td>1.40</td>
<td>51,744</td>
</tr>
<tr>
<td>2019</td>
<td>33,600</td>
<td>1.40</td>
<td>47,040</td>
</tr>
<tr>
<td>2020</td>
<td>31,920</td>
<td>1.40</td>
<td>44,688</td>
</tr>
<tr>
<td>2021</td>
<td>26,600</td>
<td>1.40</td>
<td>37,240</td>
</tr>
<tr>
<td>2022</td>
<td>30,940</td>
<td>1.40</td>
<td>21,140*</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>$234,780</td>
</tr>
</tbody>
</table>

*Take only enough depreciation in Year 2022 to reach the maximum accumulated depreciation of $234,780.

c Double-declining-balance:
Rate = 2/5 = .40 or 40%
2017: 40% \times 273,000 \times 8/12 = 72,800
2018: 40% \times (273,000 - 72,800) = 80,080
2019: 40% \times (273,000 - 72,800 - 80,080) = 48,048
2020: 40% \times (273,000 - 72,800 - 80,080 - 48,048) = 28,829
2021: 234,780 - 229,757* = 5,023

*Take only enough depreciation in Year 2021 to reach the maximum accumulated depreciation of $234,780.
Problem 9-9B (40 minutes)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment</td>
<td>Oct. 3/14</td>
<td>Straight-line</td>
<td>$62,400</td>
<td>$16,800</td>
<td>20 yr.</td>
<td>$5,700(^1)</td>
<td>$2,280(^2)</td>
<td>$7,980(^3)</td>
</tr>
<tr>
<td>Machinery</td>
<td>Oct. 28/14</td>
<td>Units-of-production</td>
<td>540,000</td>
<td>180,000</td>
<td>100,000 units</td>
<td>73,332(^4)</td>
<td>38,124(^5)</td>
<td>111,456(^6)</td>
</tr>
<tr>
<td>Tools</td>
<td>Nov. 3/14</td>
<td>Double-declining balance</td>
<td>64,000</td>
<td>15,000</td>
<td>5 yr.</td>
<td>45,568(^7)</td>
<td>3,432(^8)</td>
<td>49,000(^9)</td>
</tr>
</tbody>
</table>

1. \((62,400 – 16,800)/20 = 2,280/\text{year} \times 2 \text{ 6/12} = 5,700\)
2. \((62,400 – 16,800)/20 = 2,280/\text{year}\)
3. \(5,700 + 2,280 = 7,980\)
4. Rate = \((540,000 – 180,000)/100,000 = 3.60/\text{unit}; \)
   - 2015: \(940 \times 3.60 = 3,384\)
   - 2016: \(10,150 \times 3.60 = 36,540\)
   - 2017: \(9,280 \times 3.60 = 33,408\)
   - 73,332
5. \(10,590 \times 3.60 = 38,124\)
6. \(73,332 + 38,124 = 111,456\)
7. Rate = \(2/5 = .40\) or 40%
   - 2015: \(40\% \times 64,000 \times 6/12 = 12,800\)
   - 2016: \(40\% \times (64,000 – 12,800) = 20,480\)
   - 2017: \(40\% \times (64,000 – 12,800 – 20,480) = 12,288\)
   - Accumulated depreciation at Apr. 30, 2017 = \$45,568
8. \(2018: (64,000 – 15,000) – 45,568 = 3,432\)
9. \(45,568 + 3,432 = 49,000\)
Problem 9-10B (20 minutes)

2017

June 26  Truck ................................................................. 71,820
          Cash ................................................................. 71,820
          *To record purchase of new truck;*
          *$68,400 + $3,420 freight costs.*

27  Truck ................................................................. 3,780
    Cash ................................................................. 3,780
    *To record installation of special racks.*

Dec. 31  Depreciation Expense, Truck\(^1\) ......................... 7,200
          Accumulated Depreciation, Truck ......................... 7,200
          *To record depreciation for half-year.*

2018

Jan. 5  No entry.

Mar. 15 Repair and Maintenance Expense ....................... 660
       Cash ................................................................. 660
       *To record repairs.*

Dec. 31  Depreciation Expense, Truck\(^2\) ......................... 10,600
          Accumulated Depreciation, Truck ......................... 10,600
          *To record revised depreciation*

1. \([(71,820 + 3,780) – 18,000]/4 \times 6/12 = 7,200\)

2. \([(71,820 + 3,780) – 7,200 – 10,100]/(6 – .5 = 5.5) = 10,600\)
Problem 9-11B (40 minutes)

2018

Dec. 31 Depreciation Expense, Building¹ .......................... 1,620
Accumulated Depreciation, Building ......................... 1,620
To record annual depreciation.

Dec. 31 Depreciation Expense, Equipment² ......................... 7,320
Accumulated Depreciation, Equipment ....................... 7,320
To record annual depreciation.

<table>
<thead>
<tr>
<th>Cost</th>
<th>Accumulated Depreciation</th>
<th>Residual</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 274,800 – 134,400 – 108,000 = 1,620</td>
<td>134,400</td>
<td>108,000</td>
</tr>
<tr>
<td>2. 117,600 – 38,400 – 6,000 = 7,320</td>
<td>38,400</td>
<td>6,000</td>
</tr>
</tbody>
</table>
Problem 9-12B (40 minutes)

2017
Jan. 3 Warehouse – Furnace (new) ........................................  39,000
Accumulated Depreciation, Warehouse – Furnace ....  18,153\(^1\)
Loss on Disposal ..........................................................  8,847
Warehouse – Furnace (old) ........................................  27,000
Accounts Payable ..........................................................  39,000

To record installation of new warehouse furnace.

Calculations:
1. 2012 Deprec.:  27,000 × 2/10 = 5,400;
2013Deprec.:  (27,000 – 5,400) × 2/10 = 4,320;
2014Deprec.:  (27,000 – 9,720) × 2/10 = 3,456;
2015Deprec.:  (27,000 – 13,176) × 2/10 = 2,765;
2016Deprec.:  (27,000 – 15,941) × 2/10 = 2,212;

Part 2

<table>
<thead>
<tr>
<th>Item</th>
<th>Calculation</th>
<th>Depreciation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows</td>
<td>51,750 ÷ 15 =</td>
<td>$ 3,450</td>
</tr>
<tr>
<td>Doors</td>
<td>105,000 ÷ 20 = 5,250/yr; 5,250/yr × 5 yrs = 26,250 Accum. Dep.; 105,000 – 26,250 = 78,750 book value; 78,750 – 23,100 = 55,650 revised depreciable value; 55,650 ÷ (12 yrs – 5 yrs = 7 yrs) =</td>
<td>7,950</td>
</tr>
<tr>
<td>Roofing</td>
<td>43,500 ÷ 10 =</td>
<td>4,350</td>
</tr>
<tr>
<td>Siding</td>
<td>54,000 ÷ 25 =</td>
<td>2,160</td>
</tr>
<tr>
<td>Framing/Walls</td>
<td>222,000 – 60,000 = 162,000; 162,000 ÷ 30 =</td>
<td>5,400</td>
</tr>
<tr>
<td>Furnace</td>
<td>39,000 × 2/16 =</td>
<td>4,875</td>
</tr>
<tr>
<td>Misc.</td>
<td>Maximum allowable depreciation reached(^1)</td>
<td>-0-</td>
</tr>
</tbody>
</table>

Total depreciation expense to be recorded on the warehouse for 2017= **$28,185**

1.  2012: 61,500 × 2/5 = 24,600;
2013:  (61,500 – 24,600) × 2/5 = 14,760;
2014:  (61,500 – 39,360) × 2/5 = 8,856;
2015:  (61,500 – 48,216) × 2/5 = 5,314;
2016:  (61,500 – 53,530) × 2/5 = 3,188 which exceeds max. allowable accumulated depreciation of 54,000 therefore the maximum that can be recorded in 2016 is 54,000 – 53,530 = 470 with no depreciation recorded in any subsequent years.
Problem 9-13B (40 minutes)

Part 1

2017

Mar. 31 Impairment Loss ........................................... 26,000
    Computer Equipment ....................................... 26,000

To record impairment loss on computer equipment.

31 Impairment Loss ............................................. 23,750
    Machinery ................................................... 23,750

To record impairment loss on machinery.

*Calculations:

<table>
<thead>
<tr>
<th></th>
<th>Book Value</th>
<th>Recoverable Value</th>
<th>Impairment Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer equipment</td>
<td>$ 32,250</td>
<td>$6,250</td>
<td>$26,000</td>
</tr>
<tr>
<td>Land</td>
<td>145,000</td>
<td>172,500</td>
<td>NA</td>
</tr>
<tr>
<td>Machinery</td>
<td>88,750</td>
<td>65,000</td>
<td>23,750</td>
</tr>
<tr>
<td>Warehouse</td>
<td>173,500</td>
<td>243,750</td>
<td>NA</td>
</tr>
</tbody>
</table>
Problem 9-13B (concluded)

Part 2

La Mancha Enterprises
Balance Sheet
March 31, 2017

**Assets**

**Current assets:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$35,000</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>$57,500</td>
</tr>
<tr>
<td>Less: Allowance for doubtful accounts</td>
<td>6,000</td>
</tr>
<tr>
<td>Office supplies</td>
<td>4,875</td>
</tr>
<tr>
<td><strong>Total current assets</strong></td>
<td><strong>$91,375</strong></td>
</tr>
</tbody>
</table>

**Property, plant and equipment:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
<td>$145,000</td>
</tr>
<tr>
<td>Warehouse</td>
<td>$460,000</td>
</tr>
<tr>
<td>Less: Accumulated depreciation</td>
<td>286,500</td>
</tr>
<tr>
<td>Machinery</td>
<td>$217,500</td>
</tr>
<tr>
<td>Less: Accumulated depreciation</td>
<td>152,500</td>
</tr>
<tr>
<td>Computer equipment</td>
<td>$46,500</td>
</tr>
<tr>
<td>Less: Accumulated depreciation</td>
<td>40,250</td>
</tr>
<tr>
<td><strong>Total property, plant and equipment</strong></td>
<td><strong>389,750</strong></td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td><strong>$481,125</strong></td>
</tr>
</tbody>
</table>

**Liabilities**

**Current liabilities:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts payable</td>
<td>$14,750</td>
</tr>
<tr>
<td>Salaries payable</td>
<td>33,750</td>
</tr>
<tr>
<td>Current portion of long-term mortgage</td>
<td>59,550</td>
</tr>
<tr>
<td><strong>Total current liabilities</strong></td>
<td><strong>$108,050</strong></td>
</tr>
</tbody>
</table>

**Non-current liabilities:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortgage payable, less current portion</td>
<td>34,200</td>
</tr>
<tr>
<td><strong>Total liabilities</strong></td>
<td><strong>$142,250</strong></td>
</tr>
</tbody>
</table>

**Equity**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joy La Mancha, capital</td>
<td>338,875</td>
</tr>
<tr>
<td><strong>Total liabilities and equity</strong></td>
<td><strong>$481,125</strong></td>
</tr>
</tbody>
</table>

**Calculations:**

1. $241,250 cost – 23,750 impairment loss = 217,500
2. $72,500 cost – 26,000 impairment loss = 46,500
3. $407,875 adjusted capital balance + $1,227,500 revenues – $1,246,750 expenses – 26,000 impairment loss, computer equip. – 23,750 impairment loss, machinery = $338,875 post-closing capital balance

**Analysis component:**

The recording of an impairment loss causes expenses to increase which in turn causes net income to decrease. Decreases in income cause equity on the balance sheet to decrease.
Problem 9-14B (45 minutes)

Part 1
2017

Mar.  2  Depreciation Expense, Van .......................................... 1,575
     Accumulated Depreciation, Van\(^1\) .................... 1,575
     \textit{To record depreciation on van for 2017.}

     2 Cash ................................................................. 17,920
     Accumulated Depreciation, Van\(^1\) .................... 42,175
     Loss on Disposal .................................................. 4,305
     Van ................................................................. 64,400
     \textit{To record sale of van.}

Part 2
Aug.  27  Depreciation Expense, Machinery .......................... 12,642
         Accumulated Depreciation, Machinery\(^2\) .......... 12,642
         \textit{To record depreciation on machinery for 2017.}

         27 Cash ................................................................. 95,718
         Accumulated Depreciation, Machinery\(^2\) ........ 33,082
         Machinery ......................................................... 128,800
         \textit{To record sale of machinery.}

Part 3
June 29  Depreciation Expense, Equipment ......................... 3,500
         Accumulated Depreciation, Equipment\(^3\) ....... 3,500
         \textit{To record depreciation on equipment for 2017.}

         29 Cash ................................................................. 27,720
         Accumulated Depreciation, Equipment\(^3\) ........ 48,300
         Gain on Disposal ............................................... 420
         Equipment ......................................................... 75,600
         \textit{To record sale of equipment.}

Calculations:
1. Depreciation from Feb. 1/17 to Mar. 2/17:
   \[
   \frac{64,400 - 40,600 - 9,800}{40,000} = \frac{1,575}{40,000} + \frac{40,600}{42,175}
   \]
   \textit{(calculations continued on next page)}
Problem 9-14B (concluded)

2. Depreciation from Feb. 1/17 to Aug. 27/17:
   \[
   128,800 - 20,440 = 108,360 \text{ Book Value} \\
   \text{Rate} = \frac{2}{10} = .20 \text{ or } 20\% \\
   108,360 \times 20\% \times \frac{7}{12} = 12,642 \\
   + 20,440 \\
   \boxed{33,082}
   \]

3. Depreciation from Feb. 1/17 to June 29/17:
   \[
   75,600 - 44,800 - \frac{5,600 \times 5}{12} = 3,500 \\
   + 44,800 \\
   \boxed{48,300}
   \]

Problem 9-15B (60 minutes)

Part 1

2017

Jan. 1 Machine ................................................................. 156,000
       Cash ........................................................................ 156,000
       To record purchase of machine.

2 Machine ................................................................. 4,068
       Cash ........................................................................ 4,068
       To record capital repairs on machine.

2 Machine ................................................................. 5,760
       Cash ........................................................................ 5,760
       To record installation of machine.

Part 2

Dec. 31 Depreciation Expense, Machine ......................... 20,604
       Accumulated Depreciation, Machine .................... 20,604
       To record depreciation;
       \(\frac{(165,828 - 21,600)}{7} = 20,604\)

2022

Apr. 1 Depreciation Expense, Machine ......................... 5,151
       Accumulated Depreciation, Machine ................. 5,151
       To record partial year’s depreciation;
       \(20,604 \times \frac{3}{12} = 5,151\).
Problem 9-15B (concluded)

Part 3(a)
Apr. 30  
Accumulated Depreciation, Machine \( ^1 \) .................. 108,171  
Cash ................................................................. 36,000  
Loss on Disposal \( ^2 \) ............................................. 21,657  
Machine .......................................................... 165,828  

*Sold machine for $36,000.*

Part 3(b)
30  
Accumulated Depreciation, Machine .................. 108,171  
Cash ................................................................. 60,000  
Machine .......................................................... 165,828  
Gain on Disposal \( ^3 \) .......................... 2,343  

*Sold machine for $60,000.*

Part 3(c)
30  
Accumulated Depreciation, Machine .................. 108,171  
Cash ................................................................. 24,000  
Loss on Disposal \( ^4 \) ............................................ 33,657  
Machine .......................................................... 165,828  

*Received insurance settlement.*

Calculations:

1. Accumulated depreciation = \((20,604 \times 5 \text{ years}) + 5,151\) = 108,171

2. Gain (Loss) = Cash Proceeds – Book Value  
   = 36,000 – (165,828 – 108,171) = (21,657)

3. Gain (Loss) = Cash Proceeds – Book Value  
   = 60,000 – (165,828 – 108,171) = 2,343

4. Gain (Loss) = Cash Proceeds – Book Value  
   = 24,000 – (165,828 – 108,171) = (33,657)
Problem 9-16B (20 minutes)

2017

Aug. 31  Accumulated Depreciation, Furniture 25,800  
         Computer Equipment 72,600  
         Furniture 42,000  
         Cash 56,400  

To record exchange.

Sept. 4  Computer Equipment 11,760  
         Cash 11,760  

Addition of capital expenditures.

Dec. 31  Depreciation Expense, Computer Equipment 7,240  
         Accumulated Depreciation, Computer Equipment 7,240  

To record depreciation;  
\[(72,600 + 11,760) – 19,200 \] /3 × 4/12.

* Assets Given up = Cash Paid+ Book Value of Assets Given Up  
\begin{align*}  
&= 56,400+\lfloor 42,000–25,800 \rfloor  
&= 56,400+16,200= 72,600
\end{align*}
Problem 9-17B (45 minutes)

1. Depreciation expense on first December 31 of each machine’s life

2017
Dec. 31 Depreciation Expense, Machine 6690\(^1\) .......................... 10,800
Accumulated Depreciation, Machine 6690............. 10,800
To record depreciation.

2019
Dec. 31 Depreciation Expense, Machine 6691\(^3\) .......................... 8,325
Accumulated Depreciation, Machine 6691............. 8,325
To record depreciation.

2022
Dec. 31 Depreciation Expense, Machine 6711\(^5\) .......................... 7,155
Accumulated Depreciation, Machine 6711............. 7,155
To record depreciation.

2. Purchase/exchange/disposal of each machine

2017
May 1 Machine 6690 ................................................................. 72,900
Cash ................................................................. 72,900
To record purchase of Machine 6690.

2019
Aug. 5 Machine 6691 (= to assets given up) ......................... 49,950
Accumulated Depreciation, Machine 6690\(^2\) ......... 36,450
Machine 6690 ............................................. 72,900
Cash ................................................................. 13,500
To record exchange of Machine 6690.

2022
Feb. 1 Cash ............................................................................. 13,500
Accumulated Depreciation, Machine 6691\(^4\) ........ 35,465
Loss on Disposal ...................................................... 985
Machine 6691 ........................................................... 49,950
To record sale of Machine 6691.

1 Machine 6711 ................................................................. 79,650
Cash ................................................................. 79,650
To record purchase of Machine 6711.

2023
Oct. 3 Cash ............................................................................. 54,000
Accumulated Depreciation, Machine 6711\(^6\) ........ 17,888
Loss on Disposal ...................................................... 7,762
Machine 6711 ........................................................... 79,650
To record sale of Machine 6711.
Problem 9-17B (continued)

Calculations:
1. $72,900 - 8,100 = 16,200$ /year $\times 8/12 = 10,800$

2. Depreciation 2017: 10,800
   2018: 16,200
   2019: 9,450 (16,200 $\times 7/12$)
   
   Accum. Deprec. 36,450

3. Rate = $2/5 = .40$ or 40%
   $40\% \times 49,950 \times 5/12 = 8,325$

4. 2019: 8,325
   2020: $40\% \times (49,950 - 8,325) =$ 16,650
   2021: $40\% \times (49,950- 8,325 - 16,650) =$ 9,990
   2022: $40\% \times (49,950 - 8,325 - 16,650 - 9,990) \times 1/12 =$ 500
   
   35,465

5. $(79,650 - 8,100)/75,000 = 0.954$/unit
   2022: $7,500$ units $\times 0.954$/unit = 7,155

   = $11,250$ units $\times 0.954$/unit = 10,733
   
   7,155
   
   Accum. Deprec. 17,888
Problem 9-18B (20 minutes)

Part 1
a.  
2017  
Feb. 3  
Patent ............................................................. 220,800  
Cash ............................................................. 220,800  
To record purchase of patent.

b.  
Dec. 31  
Amortization Expense, Patent ................. 40,480  
Accumulated Amortization, Patent ...... 40,480  
To record amortization on patent;  
220,800 \div 5 = 44,160/\text{year};  
44,160 \times \frac{11}{12} = 40,480.

Part 2

Secure Software Group  
Partial Balance Sheet  
December 31, 2017

Assets

Current assets:  
Cash ............................................................. $103,200  
Accounts receivable (net) ......................... 277,200  
Merchandise inventory ............................. 135,600  
Total current assets .................................. $ 516,000

Property, plant and equipment:  
Land ............................................................. $110,400  
Building ...................................................... $595,200  
Less: Accumulated depreciation, building 189,000 406,200  
Equipment ................................................... $477,600  
Less: Accumulated depreciation, equip. ...... 259,200 218,400  
Total property, plant and equipment ......... 735,000

Intangible assets:  
Patent ........................................................... $220,800  
Less: Accumulated amortization, patent.... 40,480 180,320  
Total assets ................................................ $1,431,320
Problem 9-19B (30 minutes)

Part 1

2017

Dec. 31  Amortization Expense, Patent .......................... 9,625

Accumulated Amortization, Patent ....................... 9,625

To record amortization on the patent;
$210,000 ÷ 20 years = $10,500/yr × 11/12 = $9,625.

31  Depreciation Expense, Equipment ....................... 16,170

Accumulated Depreciation, Equipment ................... 16,170

To record depreciation on the equipment;
$320,600 - $56,000 = $264,600;
$264,600 ÷ 15 years = $17,640/yr × 11/12 = $16,170.

31  Depreciation Expense, Computer ....................... 14,630

Accumulated Depreciation, Computer ................... 14,630

To record depreciation on the computer;
$79,800 ÷ 5 years = $15,960/yr × 11/12 = $14,630.

Part 2

2021

Jan. 27  Accumulated Amortization, Patent ............... 42,000

Loss on Disposal ........................................... 168,000

Patent ......................................................... 210,000

To record disposal of the patent;
4 yrs × $10,500/yr = $42,000 accum. amort.

27  Accumulated Depreciation, Equipment ............... 70,560

Cash ......................................................... 252,000

Gain on Disposal ........................................... 1,960

Equipment .................................................. 320,600

To record disposal of the equipment;
4 yrs × $17,640/yr = $70,560 accum. amort.

27  Accumulated Depreciation, Computer ............... 63,840

Loss on Disposal ........................................... 15,960

Computer .................................................... 79,800

To record disposal of the computer;
4 yrs × $15,960/yr = $63,840 accum. amort.
*Problem 9-20B (40 minutes)*

1.a. 2017  
Oct. 3  
**Depreciation Expense, Equipment – Fan** ..................  3,840  
**Accum. Deprec., Equipment – Fan** ..................  3,840  
To update depreciation on replaced fan from Jan 1/17 to Oct 3/17.  

3  
**Cash** ..........................................................  8,400  
**Accum. Deprec., Equipment – Fan** .................  28,800\(^1\)  
**Equipment – Fan (old)** .................................  32,400  
**Gain on Disposal** ........................................  4,800  
To record sale of replaced fan on the equipment.

3  
**Equipment – Fan (new)** .................................  36,000  
**Cash** ..........................................................  36,000  
To record purchase of replacement fan on equipment.

1.b. Dec. 31  
**Depreciation Expense, Equipment** ......................  22,370\(^2\)  
**Accum. Deprec., Equipment** ......................  22,370  
To record depreciation for 2017 on the equipment (sum of all components).

*Calculations:*

1. \[32,400 - 3,600 = 28,800\]; \(28,800 \div 5\) yrs = 5,760/yr;  
5,760 \(\times\) 4/12 = 1,920 deprec. for 2012;  
5,760/yr \(\times\) 4 yrs (2013 to 2016 inclusive) = 23,040;  
5,760/yr \(\times\) 8/12 (max depreciation to depreciate 5 years) = 3,840 deprec. from Jan. 1/17 to Oct. 3/17;  
1,920 + 23,040 + 3,840 = 28,800 accum. deprec. at Oct. 3/17.
Problem 9-20B (continued)

2. **Metal Frame**

\[
\begin{align*}
144,000 - 36,000 &= 108,000; \quad 108,000 \div 20 \text{ yrs} = 5,400/\text{yr}; \\
5,400/\text{yr} \times 4/12 &= 1,800 \text{ deprec. for 2012}; \\
5,400/\text{yr} \times 4 \text{ yrs} (2013 \text{ to } 2016 \text{ inclusive}) &= 21,600; \\
1,800 + 21,600 &= 23,400 \text{ accum. deprec. at Dec. } 31/16;
\end{align*}
\]

Revised deprec. = 144,000 – 23,400 accum. deprec. = 120,600 remaining book value; 120,600 – (36,000 – 12,000 = 24,000 residual value) = 96,600 remaining depreciable cost; 96,600 ÷ 20 yrs = $4,830

| Engine | 2012: 96,000 × 2/10 × 4/12 = 6,400 |
|        | 2013: 96,000 – 6,400 = 89,600 × 2/10 = 17,920 |
|        | 2014: 89,600 – 17,920 = 71,680 × 2/10 = 14,336 |
|        | 2015: 71,680 – 14,336 = 57,344 × 2/10 = 11,469 |
|        | 2016: 57,344 – 11,469 = 45,875 × 2/10 = 9,175 |
|        | 2017: 45,875 – 9,175 = 36,700 × 2/10 = 7,340 |
| New Fan | 36,000 – 4,800 = 31,200; 31,200 ÷ 5 yrs = 6,240 × 3/12 = 1,560 |
| Conveyor System | 126,000 – 39,600 = 86,400; 86,400 ÷ 10 yrs = 8,640 |
| Misc. Parts | 2012: 27,600 × 2/5 × 4/12 = 3,680 |
|            | 2013: 27,600 – 3,680 = 23,920 × 2/5 = 9,568 |
|            | 2014: 23,920 – 9,568 = 14,352 × 2/5 = 5,741 |
|            | 2015: 14,352 – 5,741 = 8,611 × 2/5 = 3,444 |
|            | 2016: 8,611 – 3,444 = 5,167 × 2/5 = 2,067 which exceeds max.; maximum that can be taken in 2016 is 5,167 – 4,800 = 367; therefore, no depreciation is taken in 2017 |

Part 2

**Total 2017 depreciation = $3,840 + $22,370 = $26,210**
ANALYTICAL AND REVIEW PROBLEMS

A&R Problem 9-1

The following points should be set out in the report:

1. Assets on which depreciation was charged were purchased for use in the business and not for resale. Therefore, the fact that they may be sold for more than cost is not relevant since, in keeping with the cost principle, PPE are maintained in the accounting records at cost.

2. Because these assets are subject to both physical and economic (obsolescence) deterioration, they have a limited useful life span, however long it may be, and their cost, less any residual value, must be allocated over their useful life.

3. Maintenance expenditures maintain these assets in a properly functioning order. They, however, do not eliminate the fact of physical and economic deterioration.

4. Not charging periodic depreciation is in violation of the matching principle and results in an understatement of expenses and overstatement of net income.

5. Depreciation is a process of allocation not of valuation.

ETHICS CHALLENGE

1. When managers acquire new assets a variety of decisions relative to depreciation must be made. The asset must be assigned a useful life and residual value, and a method of depreciation must be chosen.

2. It is true that managers can choose a useful life and residual value based on an estimate. However, the estimated life should be the manager’s realistic expectation of how long the asset will actually be used in the operations of the business. The estimated residual value should not be arbitrary; it should reflect expectations of the recoverable value of the asset at the end of its useful life to the business, even if it is zero. The depreciation method should reflect a systematic allocation of the asset’s cost based on how the asset is actually consumed by the business.

3. By selecting a useful life that is significantly greater than what is realistic in combination with an unreasonably high residual value, the profit margin will be overstated since depreciation expense will be greatly understated.
## FOCUS ON FINANCIAL STATEMENTS

### FFS9-1

#### a.

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
<td>July 3/14</td>
<td>n/a</td>
<td>$280,000</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Building</td>
<td>July 3/14</td>
<td>S/L</td>
<td>454,000</td>
<td>40,000</td>
<td>15 yr.</td>
<td>$69,000(^1)</td>
<td>$46,000(^2)</td>
<td>$115,000</td>
</tr>
<tr>
<td>Machinery</td>
<td>Mar 20/14</td>
<td>Units</td>
<td>150,000</td>
<td>30,000</td>
<td>250,000</td>
<td>72,960(^3)</td>
<td>31,200(^4)</td>
<td>104,160</td>
</tr>
<tr>
<td>Truck</td>
<td>Mar 01/14</td>
<td>S/L</td>
<td>298,800</td>
<td>30,000</td>
<td>7 yr.</td>
<td>108,800(^5)</td>
<td>38,400(^6)</td>
<td>147,200</td>
</tr>
<tr>
<td>Furniture</td>
<td>Feb 18/14</td>
<td>DDB</td>
<td>24,000</td>
<td>3,000</td>
<td>5 yr.</td>
<td>18,240(^7)</td>
<td>576(^8)</td>
<td>-0(^9)</td>
</tr>
<tr>
<td>Patent</td>
<td>Nov 7/15</td>
<td>S/L</td>
<td>103,800</td>
<td>-0-</td>
<td>5 yr.</td>
<td>24,220(^9)</td>
<td>20,760(^10)</td>
<td>44,980</td>
</tr>
<tr>
<td>Office Equip.</td>
<td>Apr 10/17</td>
<td>DDB</td>
<td>65,143(^11)</td>
<td>10,000</td>
<td>4 yr.</td>
<td>-0-</td>
<td>24,429(^12)</td>
<td>24,429</td>
</tr>
<tr>
<td>Furniture</td>
<td>Apr 10/17</td>
<td>DDB</td>
<td>48,857(^11)</td>
<td>4,000</td>
<td>5 yr.</td>
<td>-0-</td>
<td>14,657(^13)</td>
<td>14,657</td>
</tr>
</tbody>
</table>

### Calculations:

1. \( (454,000 - 40,000) / 15 = 27,600/\text{year} \times 6/12 = 13,800 \text{ for 2014} \)
   \[ 27,600 \text{ for 2015} \]
   \[ 27,600 \text{ for 2016} \]
   \[ 69,000 \text{ Accum. deprec. at Dec. 31/16} \]

2. \( (454,000 - 40,000 - 69,000) / (10 - 2.5 = 7.5) = 46,000 \text{ for 2017} \)

3. \( (150,000 - 30,000) / 250,000 = \$0.48/\text{unit} \times 45,000 = 21,600 \text{ for 2014} \)
   \[ \times 55,000 = 26,400 \text{ for 2015} \]
   \[ \times 52,000 = 24,960 \text{ for 2016} \]
   \[ 72,960 \text{ Accum. deprec. at Dec. 31/16} \]

4. \( \$0.48/\text{unit} \times 65,000 = 31,200 \text{ for 2017} \)

5. \( (298,800 - 30,000) / 7 = 38,400/\text{year} \times 10/12 = 32,000 \text{ for 2014} \)
   \[ 38,400 \text{ for 2015} \]
   \[ 38,400 \text{ for 2016} \]
   \[ 108,800 \text{ Accum. deprec. Dec. 31/16} \]

6. \( (298,800 - 30,000) / 7 = 38,400/\text{year} \text{ depreciation for 2017} \)
FFS 9-1 (continued)

7. \[24,000 \times \frac{2}{5} \times \frac{10}{12} = 8,000\] for 2014
   \[(24,000 - 8,000) \times \frac{2}{5} = 6,400\] for 2015
   \[24,000 - (8,000 + 6,400)] \times \frac{2}{5} = 3,840\] for 2016
   18,240 Accum. deprec. Dec. 31/16

8. \[24,000 - (8,000 + 6,400 + 3,840)] \times \frac{2}{5} \times \frac{3}{12} = 576\] for 2017

9. \[(103,800 - 0)/5 = 20,760/\text{year} \times \frac{2}{12} = 3,460\] for 2015
   20,760 for 2016
   24,220 Total dep. taken to Dec. 31/16

10. This has a -0- balance at December 31, 2014 because the asset was disposed of (donated to charity).

11. | Appraised Values | Ratio | Cost Allocation |
    |-----------------|-------|----------------|
    | Office Equipment| 96,000| 96/168 x 114,000 = 65,143 |
    | Furniture       | 72,000| 72/168 x 114,000 = 48,857  |
    | Totals          | 168,000| 114,000         |

12. 65,143 x 2/4 x 9/12 = 24,429 for 2017

13. 48,857 x 2/5 x 9/12 = 14,657 for 2017
b.  

Times TeleCom  
Income Statement  
For Year Ended December 31, 2017  

Revenues:  
Fees earned ........................................ $950,000  

Expenses:  
Salaries expense ...................................... $294,000  
Depreciation expense ................................ 155,262  
Amortization expense .................................. 20,760  
Insurance expense .................................... 30,000  
Loss on disposal of furniture ....................... 5,184  
Total expenses ........................................ 505,206  

Profit .................................................... $444,794  

Times TeleCom  
Statement of Changes in Equity  
For Year Ended December 31, 2017  

Susan Times, capital, January 1, 2017 ................. $421,180  
Add: Profit ............................................... 444,794  
Total ..................................................... 865,974  
Less: Withdrawals by owner ......................... 204,000  
Susan Times, capital, December 31, 2017 .............. $661,974  

FFS 9-1 (continued)
1. Times TeleCom
   Balance Sheet
   December 31, 2017

   Assets
   Current assets:
   - Cash .......................................................... $ 30,000
   - Accounts receivable ................................ 72,000
   - Prepaid insurance ..................................... 15,600
     Total current assets .................................... $ 117,600

   Property, plant and equipment:
   - Land ......................................................... $280,000
   - Building .................................................... $454,000
     Less: Accumulated depreciation ................. 115,000 339,000
   - Machinery ................................................ $150,000
     Less: Accumulated depreciation .................. 104,160 45,840
   - Truck ....................................................... $298,800
     Less: Accumulated depreciation ................. 147,200 151,600
   - Office equipment ...................................... $ 65,143
     Less: Accumulated depreciation .................. 24,429 40,714
   - Furniture .................................................. $ 48,857
     Less: Accumulated depreciation .................. 14,657 34,200
     Total property, plant and equipment .......... 891,354

   Intangible assets:
   - Patent ..................................................... $103,800
     Less: Accumulated Amortization ................. 44,980 58,820

   Total assets .............................................. $1,067,774

   Liabilities
   Current liabilities:
   - Accounts payable ..................................... $ 68,000
   - Unearned revenue ...................................  53,800
     Total current liabilities ......................... $ 121,800

   Non-current liabilities:
   - Notes payable, due 2020 .........................  284,000

   Total liabilities ......................................... $ 405,800

   Equity
   - Susan Times, capital ............................... 661,974

   Total liabilities and equity ....................... $1,067,774
FFS 9-2

Part 1

NOTE: Both Danier Leather and WestJet use the term ‘amortization’ instead of ‘depreciation’ in the statements referenced in this question. To be consistent with the textbook, the answers use the term ‘depreciation’.

a. The $16,826 (thousand) represents the book value of the PPE. The June 28, 2014, book value is the $46,166 (thousand) total cost of the PPE assets less the $28,161 (thousand) total accumulated depreciation of the PPE. (Note to instructor: Point out to students that this additional information — cost and accumulated depreciation — is found in Danier’s Note 6 of the financial statements.)

b. The full disclosure principle requires financial statements to report all relevant information about the operations and financial position of the entity. In conformance with the full disclosure principle, information in addition to the $16,826 (thousand) book value is reported in Note 1(k) (depreciation methods) and Note 6 (cost, accumulated depreciation, and book value).

c. The depreciation expense for the year ended June 28, 2014, was $3,517 (thousand). Although depreciation expense typically appears on the income statement, Danier does not detail it there but these amounts do appear on the statement of cash flows and in Note 6.

Part 2

a. WestJet’s property and equipment at December 31, 2014 is 60.11% of total assets calculated as ($2,793,194/$4,646,433) x 100.

b. Indigo’s property, plant and equipment at March 29, 2014 represent 11.41% of total assets calculated as ($58,476,000/$512,588,000) x 100.

c. WestJet and Indigo operate in different industries: WestJet is an airline while Indigo operates bookstores. As such, WestJet has relatively little inventory in comparison to Indigo. Indigo’s inventory at March 29, 2014 is $218,979 thousand or 42.72% of total assets (calculated as $218,979,000/$512,588,000 x 100). Indigo’s inventory represents close to half of its total assets while WestJet’s property and equipment represent over half of its assets. Indigo needs a large stock of inventory in order to operate. WestJet primarily needs property and equipment (planes) to operate its business. Therefore, it seems logical that the mix of assets would be different for each company.
2. CRITICAL THINKING MINI-CASE

CT 9-1

Note to instructor: Student responses will vary and therefore the answer here is only suggested and not inclusive of all possibilities; it is presented in point form for brevity.

Problem:
— Taking the perspective of both the external and internal auditors, there is a problem with how a number of revenue expenditures were recorded as capital expenditures.

Goal:*
— To identify which transactions were recorded incorrectly, correct them, and restate net income on the income statement and restate assets and equity on the balance sheet.
— Another goal, from the perspective of the auditor, would be to bring these issues to the attention of the board of directors for their action because there may be ethical concerns regarding the behaviour of the business manager (bonus is tied to income so he/she may be manipulating the recording of transactions to maximize income).

Principles:
— The matching principle has been violated; it requires costs to be allocated or matched to the period in which it helped generate revenues.
— The prudence principle was also violated; it states that assets and income should never be overstated.
— Another GAAP requires consideration: materiality. If the misstatements are not material in nature (not significant in dollar amount so that the decisions of shareholders would not have been affected), the conclusions are affected. Therefore, we must look at the numbers to determine whether materiality has been violated or not.
CT 9-1 (continued)

Facts:
as stated in the mini case

—The insurance was incorrectly debited to the Truck account; it should have been debited to a current asset account: Prepaid Insurance. The result of this error is an overstatement of net income in 2015 of $7,800 (36,000/24 months = 1,500/month insurance used x 10 months = 15,000 for 2015 vs. 36,000/5 yrs useful life = 7,200; 15,000 – 7,200 = 7,800). 2015 net income is not known but if it is assumed that it approximates 2016 net income as reported ($78,000), then the $7,800 overstatement of net income in 2015 is material in nature since it approximates 10%.

—The net income in 2016 would also have been materially overstated; by $10,800 (1,500 insurance expense per month x 12 months used = 18,000 – depreciation of 7,200 = 10,800). Net income in 2017 would have been understated by $4,200 (7,200 depreciation – 3,000 insurance used = 4,200).

—It is unclear from the information provided how the insurance renewal was treated: as a capital or revenue expenditure; this would have affected the impact of the misstatement in 2017.

—It is unclear from the information provided whether revised depreciation was calculated when the subsequent expenditures (motors) were debited to the truck account (which is correct assuming that the motors enhanced the trucks which is likely). We will assume that this was treated correctly (capital expenditure with resulting calculation of revised depreciation) given no information to the contrary. The $32,000 and $2,500 costs regarding the tires and brakes were capitalized in error; they should have been expensed when incurred in 2017. Therefore, net income in 2017 is overstated by a potential $34,500 (32,000 + 2,500) — I say potential because it is unclear whether revised depreciation was calculated on the truck; this additional depreciation would affect the amount of any misstatement in 2016 and 2017.

—There is also the issue of when the bonus was recorded; these were recorded in the incorrect accounting periods (recorded when paid as opposed to the period which triggered the cost — violation of matching and realization principles). In addition, because the bonuses were based on overstated net income amounts, the bonuses would have been overstated for 2015 and 2016 and potentially in 2017.

—It appears that the 2016 net income was overstated by almost 50%.
Conclusions/Consequences:

— To do ‘nothing’ would mean that shareholders/owners are making decisions based on inaccurate information.

— If the manager did, in fact, engage in unethical actions, a longer term implication from the perspective of the manager is that he/she may lose their job and future employability prospects in addition to damaging the credibility of the company and its share values assuming it is publicly held.

— The board of directors need to be made aware of the errors made in recording capital expenditures so that they can deal appropriately with the manager responsible and negative repercussions with shareholders/owners.

*The goal is highly dependent on perspective.
Instructor’s Manual
to accompany

Fundamental Accounting Principles,

Chapter 9,
15th edition,

By Larson/Jensen/Dieckmann

Prepared by:
Joe Pidutti CPA, CGA, Durham College
## CHAPTER 9
PROPERTY, PLANT AND EQUIPMENT AND INTANGIBLES

# Related Assignment Materials

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<tr>
<th>Student Learning Objectives</th>
<th>Quick Studies</th>
<th>Exercises</th>
<th>Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Explain and record impairment losses.</td>
<td>9-14</td>
<td>9-19</td>
<td>9-13A, 9-13B, 9-15B.</td>
</tr>
<tr>
<td>8. *Appendix 9A - Explain and calculate revised depreciation when there is a subsequent capital expenditure that creates a partial period depreciation.</td>
<td>9-20</td>
<td>9-29, 9-30</td>
<td>9-20A, 9-20B.</td>
</tr>
</tbody>
</table>
Chapter Outline

Property, plant and equipment (LO1)

Property, plant and equipment may be tangible or intangible. Assets used in the operations to help generate revenue and have a useful life of more than one accounting period are property, plant and equipment.

Cost of Property, plant and equipment
A. Consistent with cost principle, property, plant and equipment are recorded at cost. Cost includes all normal and reasonable expenditures necessary to get the asset in place and ready for its intended use.
B. Subsequent expenditures may be incurred after an asset is placed in service. Capital expenditures are costs of PPE that provide material benefits extending beyond the current period. They are debited to PPE accounts and appear on the balance sheet. Revenue expenditures are normal costs incurred to keep an asset in its normal running condition. They are expenses and would appear on the income statement.
C. Subsidiary ledgers may be kept for maintaining control of large numbers of assets. Low cost asset purchases are usually expensed under the materiality principle.
D. Low cost assets may be expensed (treated as revenue expenditures) under the materiality principle.
E. Land purchased as a building site—cost includes purchase price, commissions, title insurance, legal fees, accrued property taxes, surveying, clearing, landscaping, and local government assessments (current or future) for streets, sewers, etc. Also includes cost of removal of any existing structures (less proceeds from sale of residual material).
F. Land Improvements—Costs that increase the usefulness of the land.
   1. Examples: parking lot surfaces, driveways, fences, and lighting systems have limited useful lives.
   2. Costs are charged to a separate Land Improvement account.
   3. Costs are allocated to the periods they benefit through depreciation.
G. Buildings
   1. If purchased—Cost usually include its purchase price, brokerage fees, taxes, title fees, attorney costs, and all expenditures to make it ready for its intended use. (any necessary repairs or renovations such as wiring, lighting, flooring and wall coverings).
   2. If constructed for own use—Costs includes materials and labour plus a reasonable amount of indirect overhead cost (heat, lighting, power, and depreciation on machinery used to construct the asset). Cost also includes design fees, building permits, and insurance during construction.
H. Leasehold improvements are alterations or improvements made to leased property. Leasehold improvements become part of the property and revert to the lessor at the end of the lease. These amounts are depreciated over the life of the lease or life of the improvements, whichever is less.
I. Machinery and Equipment—costs include all normal and necessary expenditures to purchase them and prepare them for their intended use (purchase price, taxes, transportation charges, insurance while in transit, and the installing, assembling and testing of machinery and equipment).
J. Lump-Sum Purchase—a group of property, plant and equipment purchased with a single transaction for a lump-sum price. Individual asset cost determined by allocating the cost of the purchase among the different types of assets acquired based on their relative values.

**Depreciation (LO2)**

The process of allocating to expense the cost of a capital asset to the accounting periods benefiting from its use. Recorded as a debit to Depreciation Expense and a credit to Accumulated Depreciation.

**A. Factors in Computing Depreciation**

1. Cost—described above.
2. Residual value—(residual value) an estimate of the asset’s value at the end of its benefit period.
3. Useful life—(service life) length of time the asset is expected to be productively used in a company’s operations. Factors affecting useful life include:
   a) Inadequacy—a condition in which the capacity of property, plant and equipment becomes too small for the productive demands of the business.
   b) Obsolescence—a condition in which, because of new inventions and improvements, a capital asset can no longer be used to produce goods or services with a competitive advantage.

**B. Depreciation Methods**

1. Straight-line Method—charges the same amount to expense for each period of the asset’s useful life. **Calculation:**
   - Cost minus residual value (equals the cost to be depreciated) divided by the asset's useful life. (usually in years)

2. Units-of-Production Method—charges a varying amount to expense for each period of an asset’s useful life depending on its usage. Charges are based on the consumed capacity of the asset. Examples of capacity measurements: miles driven, product outputs, hours used. **Calculation:**
   - Cost minus residual value divided by the number of units to be produced equals the depreciation per unit.
   - Depreciation per unit X number of units consumed in period equals the period’s depreciation.

3. Declining-Balance Method—an accelerated depreciation method. Charges larger depreciation during the early years of an asset's life and smaller expenses in the later years. Double-declining balance method (DDB) is also referred to as being twice the straight line rate. **Calculation:**
   - Calculate the rate. 2/useful life = % (or 100%/useful life X 2)
   - Calculate annual depreciation as:
     Net Book Value X Rate

*Note: Depreciation is a method of allocation, not of valuation. The cost of a capital
asset, less estimated residual, is allocated over the estimated useful life in a systematic and rational manner. The amount of depreciation charged per year may vary with the different methods. However, the total depreciation over an asset’s life will be the same regardless of which method is used.

Depreciation for Tax Reporting—differences between financial and tax accounting systems are normal and expected.

1. Many companies use accelerated depreciation in computing taxable income because it postpone its tax payments by charging higher depreciation expense in the early years and lower amounts in the later years.

4. Federal income tax regulations require a company to depreciate assets according to the Capital Cost Allowance system (CCA)

5. The income tax regulations specify maximum CCA rates that businesses may claim but a business may decide to claim less than the maximum or claim none at all.

Partial Year Depreciation (LO3)

When an asset is purchased (or disposed of) at a time other than the beginning or end of an accounting period, depreciation is recorded for the part of the year the asset was in use. The two methods we will examine are:

1. Nearest whole month, depreciation is calculated if the asset was in use for more than half of the month of acquisition.

2. Half-Year Convention, six months depreciation is recorded for the partial year, regardless of when the asset was acquired.

Revising Depreciation Rates (LO4)

A. If estimated residual value and/or useful life is revised:

Depreciation expense calculations are revised by spreading the remaining cost to be depreciated over the revised useful life remaining.

Calculation:

\[
\text{Remaining Book value- Revised residual value} \\
\text{Revised remaining useful life}
\]

The revision is referred to as a change in an accounting estimate and is reflected in future financial statements. Past statements are not changed.

B. Subsequent Capital Expenditures:

Subsequent capital expenditures will change the book value of the asset. A revision to depreciation is required to reflect the change. The first step is to bring depreciation up to date at the time of the subsequent capital expenditure. (using the original rate) The capital expenditure may involve replacing a portion of an asset or adding to the asset without removing any portion. A journal entry is done to record the addition or the addition and removal of an old part. If an old part is removed there may be a loss recorded. Depreciation is then calculated at the revised rate.
Impairment of PPE Assets (LO5)

An impairment loss happens when a PPE item’s book value is greater than the amount to be recovered through the asset’s use or sale. Assets should be assessed for impairment annually. Technological, economic or legal factors can all cause impairments to occur. The journal entry to record impairment:

Date   Impairment loss        XX
Asset account                XX

The asset’s book value will be reduced. Depreciation would be revised to reflect this change.

Disposals of property, plant and equipment (LO6)

Assets may be discarded, sold, or exchanged due to wear and tear, obsolescence, inadequacy, or damage by fire or other accident.

A. In general, accounting for disposals requires the following steps:
   1. Record depreciation expense up to the date of disposal. This updates the accumulated depreciation account.
   2. Remove the balances of the disposed asset and related accumulated depreciation accounts.
   3. Record any cash (and other assets) received or paid in the disposal.
   4. Record any gain or loss resulting from comparing the asset's book value with the value received in the disposal.

B. Discarding Property, plant and equipment—follow general accounting procedure above.
   1. If fully depreciated—no loss (can never have a gain if discarding)
   2. If not fully depreciated—Record a loss (debit) equal to the book value.

C. Selling Property, plant and equipment—follow general accounting procedure above.
   Compare value received to book value to determine gain (receive value greater than book value) or loss (receive value less than book value).
   1. Sale is at a gain if value received exceeds book value.
   2. Sale is at a loss if value received is less than book value.

   Students frequently have difficulty in deriving the journal entry involving a gain or loss. It is very helpful to have them journalize the parts of the entry that they already know such as cash received, debit to accumulated depreciation and credit to the asset account. I usually leave a space between the debits and credits and show the calculation as being the difference between the two sides. A debit or credit can then be recorded with the entry still in the correct order. They just have to fill in the space!

D. Exchanging assets

Assets are often exchanged (traded-in) for new assets. The exchange is treated as a sale of the old asset and the purchase of a new asset. The cost and accumulated depreciation of the old asset is removed from the books. The cost of the new asset will be recorded at the fair value of the asset(s) received. If the fair value cannot be reliably determined, the new asset will be recorded at the carrying value of the assets given up. Any gains or losses realized on the exchange are recorded at the time of disposal.
**Intangible Assets (LO7)**

Intangible assets have no physical substance but provide future economic benefits. This is a difficult topic for students to grasp. Examples include patents, copyrights, leaseholds, drilling rights and trademarks. Accounting for intangibles is similar to accounting for PPE. Intangibles are recorded at cost when purchased. Cost is allocated to the asset over its useful life through amortization. The asset account itself is reduced. There is no accumulated account used. In this way intangibles will always be shown at net book value. Intangible assets are shown on the balance sheet separately from goodwill and property, plant and equipment.

**APPENDIX 9A (LO8)**

**Revised Depreciation When There Is a Subsequent Capital Expenditure That Creates Partial Period Depreciation**

In this case depreciation is calculated and recorded using the following steps:

1. Depreciation on the asset is updated to the date of the subsequent capital expenditure.
2. The subsequent capital expenditure is recorded.
3. If the subsequent capital expenditure is a replacement, the component being replaced is removed from the books and any resulting gain or loss is recorded.
4. Revised depreciation is calculated.
VISUAL #9-1

FORMULAE FOR DEPRECIATION METHODS

1. STRAIGHT LINE

\[
\text{Cost-Estimated Residual Value} = \text{Annual Estimated Useful Life (in years) Depreciation}
\]

2. UNITS OF PRODUCTION

\[
\text{a) Cost- Estimated Residual Value per Predicted units of production} = \text{Depreciation per Unit}
\]

\[
\text{b) Depreciation per unit x units produced} = \text{Depreciation for PERIOD}
\]

Depreciation should stop when book value is equal to residual value.

3. DOUBLEDECLINING BALANCE

Step 1: Calculate rate to be used----2/Estimated useful life

Step 2. Multiply Net Book Value by Rate

\[
\text{Net Book Value } = \text{Cost} - \text{Accumulated Depreciation to Date}
\]

Depreciation should stop when book value is equal to residual value.
Alternate Demo Problem Chapter 9

A new machine cost $100,000, has an estimated useful life of five years and an estimated residual value of $15,000 at the end of that time. It is expected that the machine can produce 170,000 widgets during its useful life.

The New Times Company purchases this machine on January 1, 2017, and uses it for exactly three years. During these years the annual production of widgets has been 80,000, 50,000, and 30,000 units, respectively. On January 1, 2017, the machine is sold for $45,000.

Required:

1. Calculate the depreciation expense for each of the first three years using
   a. straight-line
   b. units-of-production
   c. double-declining-balance

2. Prepare the proper journal entry for the sale of the machine under the three different depreciation methods.
Solution to Alternate Demo Problem Chapter 9

1a. Straight-line

The depreciation expense each year is equal to (cost - residual) / useful life. In this example the cost is $100,000, the residual is $15,000, and the useful life is 5 years. Therefore,

Annual depreciation = (100,000 - 15,000) / 5

= 17,000 each year

1b. Units-of-production

The depreciation expense each year is equal to a rate [(cost-residual) / total production] multiplied by the actual number of units produced that year. In this example the rate would be $0.50 per widget, (100,000 - 15,000) / 170,000, and the depreciation expense for each of the first three years would be:

2017 = .50 x 80,000 = 40,000
2018 = .50 x 50,000 = 25,000
2019 = .50 x 30,000 = 15,000

1c. Double-declining-balance

The depreciation expense each year is equal to a rate (twice the straight-line rate, or 2 / useful life) multiplied by the asset’s net book value (cost less accumulated depreciation) at the beginning of the year. In this example the rate would be 2/5, or 40%, and the depreciation expense for each of the first three years would be

2017 = .40 x 100,000 = 40,000
2018 = .40 x 60,000 = 24,000
2019 = .40 x 36,000 = 14,400
2. The journal entry for the sale of the asset will have the same general form regardless of the method of depreciation adopted, except that whether there is a gain or a loss on the sale may change according to the depreciation method used. The gain or loss on disposal of the asset is determined by comparing the sale price, in this case $45,000, with the net book value of the asset at the time of the sale.

Straight-line

Cash .......................................................... 45,000
Accumulated depreciation ....................... 51,000
Loss on sale of machine .......................... 4,000
Machine ................................................. 100,000

Units-of-production

Cash .......................................................... 45,000
Accumulated depreciation ....................... 80,000
Machine .................................................. 100,000
Gain on sale of machine ..................... 25,000

Double-declining-balance

Cash .......................................................... 45,000
Accumulated depreciation ....................... 78,400
Machine .................................................. 100,000
Gain on sale of machine ..................... 23,400
Alternate Demo Problem Chapter 9

A new machine cost $100,000, has an estimated useful life of five years and an estimated residual value of $15,000 at the end of that time. It is expected that the machine can produce 170,000 widgets during its useful life.

The New Times Company purchases this machine on January 1, 2017, and uses it for exactly three years. During these years the annual production of widgets has been 80,000, 50,000, and 30,000 units, respectively. On January 1, 2017, the machine is sold for $45,000.

Required:

1. Calculate the depreciation expense for each of the first three years using
   a. straight-line
   b. units-of-production
   c. double-declining-balance

2. Prepare the proper journal entry for the sale of the machine under the three different depreciation methods.
Solution to Alternate Demo Problem Chapter 9

1a. Straight-line

The depreciation expense each year is equal to (cost - residual) / useful life. In this example the cost is $100,000, the residual is $15,000, and the useful life is 5 years. Therefore,

Annual depreciation = \((100,000-15,000)/5\)

= 17,000 each year

1b. Units-of-production

The depreciation expense each year is equal to a rate \([(cost-residual) / total production]\) multiplied by the actual number of units produced that year. In this example the rate would be $0.50 per widget, \((100,000-15,000)/170,000\), and the depreciation expense for each of the first three years would be:

2017 = .50 x 80,000 = 40,000

2018 = .50 x 50,000 = 25,000

2019 = .50 x 30,000 = 15,000

1c. Double-declining-balance

The depreciation expense each year is equal to a rate (twice the straight-line rate, or \(2 / useful life\)) multiplied by the asset’s net book value (cost less accumulated depreciation) at the beginning of the year. In this example the rate would be 2/5, or 40%, and the depreciation expense for each of the first three years would be

2017 = .40 x 100,000 = 40,000

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2. The journal entry for the sale of the asset will have the same general form regardless of the method of depreciation adopted, except that whether there is a gain or a loss on the sale may change according to the depreciation method used. The gain or loss on disposal of the asset is determined by comparing the sale price, in this case $45,000, with the net book value of the asset at the time of the sale.

\[
\begin{align*}
\text{Cash} & \quad 45,000 \\
\text{Accumulated depreciation} & \quad 51,000 \\
\text{Loss on sale of machine} & \quad 4,000 \\
\text{Machine} & \quad 100,000 \\
\end{align*}
\]

\[
\begin{align*}
\text{Cash} & \quad 45,000 \\
\text{Accumulated depreciation} & \quad 80,000 \\
\text{Machine} & \quad 100,000 \\
\text{Gain on sale of machine} & \quad 25,000 \\
\end{align*}
\]

\[
\begin{align*}
\text{Cash} & \quad 45,000 \\
\text{Accumulated depreciation} & \quad 78,400 \\
\text{Machine} & \quad 100,000 \\
\text{Gain on sale of machine} & \quad 23,400 \\
\end{align*}
\]
Learning Objectives

1. Describe property, plant and equipment (PPE) and calculate their cost. (LO\textsuperscript{1})
2. Explain, record, and calculate depreciation using the methods of straight-line, units of production, and double-declining balance. (LO\textsuperscript{2})
3. Explain and calculate depreciation for partial years. (LO\textsuperscript{3})
Learning Objectives

4. Explain and calculate revised depreciation. (LO\(^4\))

5. Explain and record impairment losses. (LO\(^5\))

6. Account for asset disposal through discarding, selling, or exchanging an asset. (LO\(^6\))

7. Account for intangible assets and their amortization. (LO\(^7\))
Learning Objectives

8. Explain and calculate revised depreciation when there is a subsequent capital expenditure that creates partial period depreciation. Appendix 9A (LO8)
Vignette Video

YVR Builds State-of-the-Art Airside Operations Building: Vancouver Airport Authority is building a new state-of-the-art Airside Operations Building. The facility, scheduled to open in January 2015, will consolidate all airside operations into one airside building to support a heightened level of collaboration and cooperation.

https://www.youtube.com/watch?v=xS60bqgB8VM
Property, Plant and Equipment (PPE)

Characteristics:

- Non-current assets used in the operations of a business.
- Have a useful life greater than one accounting period.
- May be classified as Tangible or Intangible.
Property, Plant and Equipment (PPE)

- Also referred to as Fixed Assets.
- Examples: buildings, land, equipment, machinery, leasehold improvements, and vehicles.
Intangible Assets

- Lack physical substance.
- Examples: patents, trademarks, copyrights, leaseholds and drilling rights.
Issues in Accounting for PPE

EXHIBIT 9.1

Decline in book value over service life

- Acquisition: Calculate initial cost
- Use: Account for subsequent costs, Allocate cost to periods benefited
- Disposal: Record disposal
Cost of PPE

• PPE are recorded at cost, which includes all normal and reasonable expenditures necessary to get the asset in place and ready for its intended use.

• Examples: installation costs, design and engineering, legal and surveying fees.
Capital Expenditures

- Are costs of PPE that provide material benefits extending beyond the current period.
- Are reported on the balance sheet under PPE.
Revenue Expenditures

• Are costs that maintain an asset but do not materially increase the asset’s life or productive capabilities.
• Are reported on the income statement as expenses.
• Examples: supplies, lubricants, repair and maintenance costs.
Subsequent Expenditures

• Expenditures that make PPE more efficient or productive and/or extend the useful life of the PPE beyond original expectations.

• Examples: roofing replacement, plant expansion and major overhauls of machinery and equipment.
EXHIBIT 9.2

- Expenditure
  - Is it probable that future economic benefits will flow to the company because of the expenditure?
    - YES
      - Can the cost of the expenditure be measured reliably?
        - YES
          - Capital Expenditure
            - Debit to appropriate PPE account on the balance sheet
        - NO
          - Revenue Expenditure
            - Debit to appropriate expense account on the income statement
    - NO

*Both criteria must be met for an expenditure to be capital*
Land

- Is not subject to depreciation.
- Cost of land includes:
  - Purchase price
  - Legal fees
  - Real estate commissions
  - Accrued property taxes
  - Payments for surveying, grading, draining, and clearing the land
  - Assessments by local governments
Land Improvements

- Assets that increase the usefulness of the land but have a limited life.
- Costs are charged to a separate PPE account.
- Costs are allocated over the period they benefit.
- Cost examples include parking lot surfaces, driveways, fences and lighting systems.
Buildings

- Costs include all expenditures to make the building ready for its intended use.
- Costs are depreciated over the period they benefit.
- Cost examples include purchase price, brokerage fees, taxes, title fees and legal costs.
Leasehold Improvements

- Costs of alterations or improvements to leased property.
- Costs are depreciated over the life of the improvements or the life of the lease, whichever is shorter.
- Examples include interior modifications, flooring, painting and storefronts.
Machinery and Equipment

- Costs include all expenditures normal and necessary to purchase it and prepare it for its intended use.
- Costs are depreciated over the periods they benefit.
- Cost examples include purchase price, less discounts, plus non-refundable sales taxes, transportation charges, insurance while in transit.
Lump-Sum Asset Purchase

- PPE may be purchased in a group with a single transaction for a lump-sum price.
- The cost of the purchase is allocated to the various PPE based on their relative values.
Depreciation

- A process of matching (or allocating) the depreciable cost of an asset in a rational and systematic manner over the asset’s estimated useful life.
- Depreciation does not measure the decline in market value of an asset.
- Depreciation begins to be recorded when the asset is put into use.
Depreciation

- PPE help the organization earn revenues over several accounting periods.
- The cost of these PPE are depreciated (spread out) over these same periods.

\[
\text{Cost} \quad \frac{\text{Useful life}}{\text{Cost}}
\]
Depreciation

Factors relevant in determining depreciation:

1. Cost
2. Residual value
3. Useful (service) life
Depreciation Methods

The most commonly used methods are:

1. Straight-line
2. Units-of-production
3. Double-declining balance
Straight-Line Method

The same amount is expensed each period of the asset’s useful life.

\[
\text{Straight-line depreciation expense} = \frac{\text{Cost} - \text{Estimated residual value}}{\text{Estimated useful life in years}}
\]
A piece of shoe-production equipment is purchased on January 1, 2017. The relevant data is as follows:

- **Cost**: $10,000
- **Estimated residual value**: $-1,000
- **Cost to be depreciated**: $9,000

**Estimated useful life:**

- **Accounting periods**: 5 years
- **Units produced**: 36,000 shoes

EXHIBIT 9.7

\[
\frac{\text{Cost} - \text{Estimated residual value}}{\text{Estimated useful life in years}} = \frac{\$10,000 - \$1,000}{5 \text{ years}} = \$1,800 \text{ per year}
\]
The annual adjusting entry to record depreciation on this equipment would be:

Depreciation Expense 1,800
Accumulated Deprec. -Equipment 1,800

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment</td>
<td>$10,000</td>
<td>$10,000</td>
<td>$10,000</td>
<td>$10,000</td>
<td>$10,000</td>
</tr>
<tr>
<td>Less: Acc. Deprec.</td>
<td>1,800</td>
<td>3,600</td>
<td>5,400</td>
<td>7,200</td>
<td>9,000</td>
</tr>
<tr>
<td>Book Value</td>
<td>$8,200</td>
<td>$6,400</td>
<td>$4,600</td>
<td>$2,800</td>
<td>$1,000</td>
</tr>
</tbody>
</table>
Financial Statement Effects of Straight-Line Depreciation

EXHIBIT 9.10

1. Depreciation Expense (on Income Statement)

- Graph showing a constant depreciation expense from 2017 to 2021.

2. Book Value (on Balance Sheet)

- Graph showing a decreasing book value from 2017 to 2021.

For the year ended December 31

As of December 31
Units-of-Production Method

- This method is employed when the use of an asset varies greatly from one period to the next.
- The amount charged to expense is based on the usage of the asset.

\[
\text{Depreciation per unit} = \frac{\text{Cost} - \text{Estimated residual value}}{\text{Total estimated units of production}}
\]

\[
\text{Annual depreciation expense} = \text{Actual production} \times \text{depreciation per unit}
\]
Illustration:
Units-of-Production Method

**EXHIBIT 9.12**

**Step 1:**

Depreciation per unit = \( \frac{\text{Cost} - \text{Est. residual value}}{\text{Total est. units}} \) = Deprec. per unit

\[
\text{Depreciation per unit} = \frac{\text{Cost} - \text{Estimated residual value}}{\text{Total estimated units of production}} = \frac{\$10,000 - \$1,000}{36,000 \text{ units}} = \$0.25 \text{ per shoe}
\]

**Step 2:**

Depreciation expense = Depreciation per unit \times \text{Units produced in period}

\[
\$0.25 \text{ per shoe} \times 7,000 \text{ shoes} = \$1,750
\]

**EXHIBIT 9.13**

<table>
<thead>
<tr>
<th>Period</th>
<th>Number of Units</th>
<th>Depreciation Per Unit</th>
<th>Depreciation Expense</th>
<th>Accumulated Depreciation</th>
<th>Book Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>7,000</td>
<td>$0.25</td>
<td>$1,750</td>
<td>$1,750</td>
<td>8,250</td>
</tr>
<tr>
<td>2018</td>
<td>8,000</td>
<td>0.25</td>
<td>2,000</td>
<td>3,750</td>
<td>6,250</td>
</tr>
<tr>
<td>2019</td>
<td>9,000</td>
<td>0.25</td>
<td>2,250</td>
<td>6,000</td>
<td>4,000</td>
</tr>
<tr>
<td>2020</td>
<td>7,000**</td>
<td>0.25</td>
<td>1,750</td>
<td>7,750</td>
<td>2,250</td>
</tr>
<tr>
<td>2021</td>
<td>6,000***</td>
<td>0.25</td>
<td>1,250***</td>
<td>9,000</td>
<td>1,000</td>
</tr>
</tbody>
</table>

*Cost on January 1, 2017
**6,000 units were actually produced, but the maximum number of units on which depreciation can be calculated in 2021 is 5,000 [36,000 total estimated units less 31,000 units depreciated to date (7,000 + 8,000 + 9,000 + 7,000)]. Recall that an asset must not be depreciated below its residual value.
***5,000 \times \$0.25 = \$1,250
Illustration: Units-of-Production Method – Balance Sheet Presentation

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment</td>
<td>$10,000</td>
<td>$10,000</td>
<td>$10,000</td>
<td>$10,000</td>
<td>$10,000</td>
</tr>
<tr>
<td>Less: Acc. Deprec.</td>
<td>1,750</td>
<td>3,750</td>
<td>6,000</td>
<td>7,750</td>
<td>9,000</td>
</tr>
<tr>
<td>Book Value</td>
<td>$8,250</td>
<td>$6,250</td>
<td>$4,000</td>
<td>$2,250</td>
<td>$1,000</td>
</tr>
</tbody>
</table>
Declining-Balance Method

- This method provides higher depreciation expenses in the early years of an asset’s life and lower charges in later years.

- A depreciation rate, of up to twice the straight-line rate, is applied to the asset’s beginning-of-the-period book value.
Double-Declining Balance Method

Steps:

1. Calculate the double-declining balance rate.*
   \[ \text{rate} = \frac{2}{\text{Estimated years of useful life}} \]
2. Calculate depreciation expense by multiplying the rate by the asset’s beginning-of-period book value.
   \[ \text{(depreciation expense} = \text{rate} \times \text{book value}) \]

*Note: Residual value is not used in these calculations.
Illustration: Double-Declining Balance Method

Rate = \( \frac{2}{5} \) years \( \times \) 100\% = 40\% per year

<table>
<thead>
<tr>
<th>Period</th>
<th>Beginning-of-Period Book Value</th>
<th>Depreciation Rate</th>
<th>Depreciation Expense</th>
<th>Accumulated Depreciation</th>
<th>Book Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>$10,000</td>
<td>40%</td>
<td>$4,000</td>
<td>$4,000</td>
<td>$6,000</td>
</tr>
<tr>
<td>2018</td>
<td>6,000</td>
<td>40</td>
<td>2,400</td>
<td>6,400</td>
<td>3,600</td>
</tr>
<tr>
<td>2019</td>
<td>3,600</td>
<td>40</td>
<td>1,440</td>
<td>7,840</td>
<td>2,160</td>
</tr>
<tr>
<td>2020</td>
<td>2,160</td>
<td>40</td>
<td>864</td>
<td>8,704</td>
<td>1,296</td>
</tr>
<tr>
<td>2021</td>
<td>1,296</td>
<td>40</td>
<td>296**</td>
<td>9,000**</td>
<td>1,000</td>
</tr>
</tbody>
</table>

*Cost on January 1, 2017
**Year 2021 depreciation is $1,296 – $1,000 = $296. This is because maximum accumulated depreciation equals cost minus residual as we depreciate the asset only up to the residual value.
### Illustration: Double-Declining Balance Method – Balance Sheet Presentation

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Equipment</strong></td>
<td>$10,000</td>
<td>$10,000</td>
<td>$10,000</td>
<td>$10,000</td>
<td>$10,000</td>
</tr>
<tr>
<td><strong>Less: Acc. Deprec.</strong></td>
<td>4,000</td>
<td>6,400</td>
<td>7,840</td>
<td>8,704</td>
<td>9,000</td>
</tr>
<tr>
<td><strong>Book Value</strong></td>
<td>$6,000</td>
<td>$3,600</td>
<td>$2,160</td>
<td>$1,296</td>
<td>$1,000</td>
</tr>
</tbody>
</table>
### Comparison of Depreciation Methods

#### EXHIBIT 9.16

<table>
<thead>
<tr>
<th>Period</th>
<th>Straight-Line</th>
<th>Units-of-Production</th>
<th>Double-Declining-Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cost – Est. residual</td>
<td>Cost – Est. residual</td>
<td>Cost – Est. residual</td>
</tr>
<tr>
<td></td>
<td>Est. useful life</td>
<td>Total est. units of production</td>
<td>× Actual units produced in period</td>
</tr>
<tr>
<td>2017</td>
<td>$ 1,800</td>
<td>$ 1,750</td>
<td>$ 4,000</td>
</tr>
<tr>
<td>2018</td>
<td>1,800</td>
<td>2,000</td>
<td>2,400</td>
</tr>
<tr>
<td>2019</td>
<td>1,800</td>
<td>2,250</td>
<td>1,440</td>
</tr>
<tr>
<td>2020</td>
<td>1,800</td>
<td>1,750</td>
<td>864</td>
</tr>
<tr>
<td>2021</td>
<td>1,800</td>
<td>1,250</td>
<td>296</td>
</tr>
<tr>
<td></td>
<td><strong>$ 9,000</strong></td>
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Graphic Comparison of Depreciation Methods

EXHIBIT 9.17

[Diagram showing a comparison of depreciation methods over years 2017 to 2021, with lines for straight-line, units-of-production, and double-declining-balance methods.]
Partial-Year Depreciation

- Assets may be purchased or disposed of at any time during the year.
- Depreciation for a partial year is recorded when the purchase or disposal is made at a time other than the beginning or end of the accounting period.
Depreciation for Income Tax Reporting

- The Income Tax Act requires that companies use a declining-balance method called Capital Cost Allowance (CCA) for business tax reporting purposes.

- The Income Tax Act specifies the CCA rates for various groups of assets.
Partial-Year Depreciation

Methods:

1. Nearest whole month
   - If the asset was in use for more than half of the month, **depreciation is calculated** for the whole month.
   - If the asset was in use for less than half of the month, **depreciation is not calculated** for the month.

2. Half-year convention
   - Six months’ depreciation is recorded regardless when an asset is acquired or disposed of.
Mini-Quiz

Gamma Company purchased a computer costing $4,000 on April 18. It is expected to last for three years and then sell for $400.

Calculate depreciation* for the first year using the:

1. Straight-line method.
2. Double declining balance method.

*Use the nearest whole month method.
Gamma Company purchased a computer costing $4,000 on April 18. It is expected to last for three years and then sell for $400.

\[
\text{Straight-line depreciation expense} = \frac{\text{Cost} - \text{Estimated residual value}}{\text{Estimated useful life in years}} \times \text{Portion of year}
\]

\[
\begin{align*}
\text{Cost} & = $4,000 \\
\text{Estimated residual value} & = $400 \\
\text{Estimated useful life in years} & = 3 \\
\text{Portion of year} & = \frac{8}{12} \text{ year}
\end{align*}
\]

\[
\begin{align*}
\text{Depreciation expense} & = \frac{$4,000 - $400}{3} \times \frac{8}{12} \\
& = \frac{$3,600}{3} \times \frac{8}{12} \\
& = $800
\end{align*}
\]
Gamma Company purchased a computer costing $4,000 on April 18. It is expected to last for three years and then sell for $400.

\[
\text{DDB depreciation expense} = \text{DDB rate} \times \text{Cost} \times \text{Portion of year}
\]

\[
= (2 \times \frac{1}{3}) \times $4,000 \times \frac{8}{12}
\]

\[
= \$1,778 \text{ (rounded)}
\]
Depreciation rates for current and future periods may be revised if there is a change in an asset’s:

1. Estimated residual value and/or useful life.

or

2. Cost due to subsequent capital expenditures.
Changes in Estimated Residual Value and/or Estimated Useful Life

- The undepreciated cost of the asset is depreciated (allocated) over the remaining life of the asset.
- This is considered to be a change in an accounting estimate and not an error.
Changes in Estimated Residual Value and/or Estimated Useful Life

Example: Straight-line Method

Revised depreciation for remaining years = \[
\frac{\text{Remaining book value} - \text{Revised residual value}}{\text{Revised remaining useful life}}
\]
Revising Depreciation Rates When There is a Subsequent Capital Expenditure

- Subsequent capital expenditures cause the cost of an asset to change.
- These expenditures can be the addition of a component to an existing asset or the replacement or overhaul of a component.
Revising Depreciation Rates When There is a Subsequent Capital Expenditure

- Revised depreciation is calculated to reflect the new cost and/or changes in estimated life/residual value.
- When a subsequent expenditure results in a replacement of a component, the cost and accumulated depreciation of the component must be removed and a gain or loss is recorded.
Impairment of PPE Assets

• An impairment loss occurs when the book value of PPE is greater than the amount to be recovered through the asset’s use or sale.

• Impairments may result from:
  • A significant decline in the market value of the asset.
  • Technological, economic, or legal factors.
Impairment of PPE Assets

If an impairment loss occurs:

• The loss is recorded.

• Depreciation is revised for future periods.
Disposal of Capital Assets

Capital assets may be disposed of for a variety of reasons such as:

1. Obsolescence
2. Wear and tear
3. Damage
4. Changing business plans
Disposal of PPE

Accounting for disposal involves:

1. Record depreciation up to date of disposal.
2. Compare the asset’s book value with the net amount received/paid at disposal and record any resulting gain/loss.
3. Remove the balances of the disposed asset and related accumulated depreciation accounts.
4. Record any cash (and other assets) received or paid in the disposal.
Accounting for exchange involves:

1. Record depreciation up to date of exchange.
2. Compare the asset’s book value with the net amount received/paid on exchange and record any resulting gain/loss.
3. Remove the balances of the exchanged asset and related accumulated depreciation accounts.
4. Record the new asset and cash received or paid in the exchange.
Intangible Assets

- Have no physical substance.
- Are used in operations.
- Provide future economic benefits.
- Are recorded at cost when purchased.
- Examples include patents, copyrights, trademarks, drilling rights, trademarks and trade names, and leaseholds.
Intangible Assets

- Are recorded at cost when purchased.
- Cost is amortized* over estimated useful life.
- The straight-line method is usually used.
- Are shown on the balance sheet separately from PPE.

* Amortization is the systematic allocation of the cost of an intangible asset over its useful life
Goodwill

The amount by which the price paid for a company exceeds the fair market value of the company’s net assets if purchased separately.

- Is not an intangible asset.
- Is reported separately on the balance sheet.
- Is not amortized but may be decreased if it is impaired.
Review

Explain the difference between revenue and capital expenditures and how they are recorded in the accounting system.

- Revenue expenditures such as ordinary repairs expire in the current accounting period. They are debited to expense and are thus matched with current revenues.
- Capital expenditures provide material benefits extending beyond the current period. They are debited to PPE accounts and are matched with future periods through depreciation expense.
- Immaterial long-term expenditures are treated as current period expenses.
Revised Depreciation When There Is a Subsequent Capital Expenditure That Creates Partial Period Depreciation—Appendix 9A

Steps in Revising Depreciation:

1. Depreciation is updated to the date of the subsequent capital expenditure.
2. Record the subsequent capital expenditure and remove the component being replaced.
3. Calculate and record the revised depreciation on the capital asset.
Summary – Chapter 9

1. Describe property, plant and equipment (PPE) and calculate their cost.

2. Explain, record, and calculate depreciation using the methods of straight-line, units of production, and double-declining balance.

3. Explain and calculate depreciation for partial years.
4. Explain and calculate revised depreciation.

5. Explain and record impairment losses.

6. Account for asset disposal through discarding, selling, or exchanging an asset.

7. Account for intangible assets and their amortization.
Summary – Chapter 9

- Explain and calculate revised depreciation when there is a subsequent capital expenditure that creates partial period depreciation. Appendix 9A
End of Chapter