Solutions for Fundamental Accounting Principles Volume 2 17th Edition by Larson

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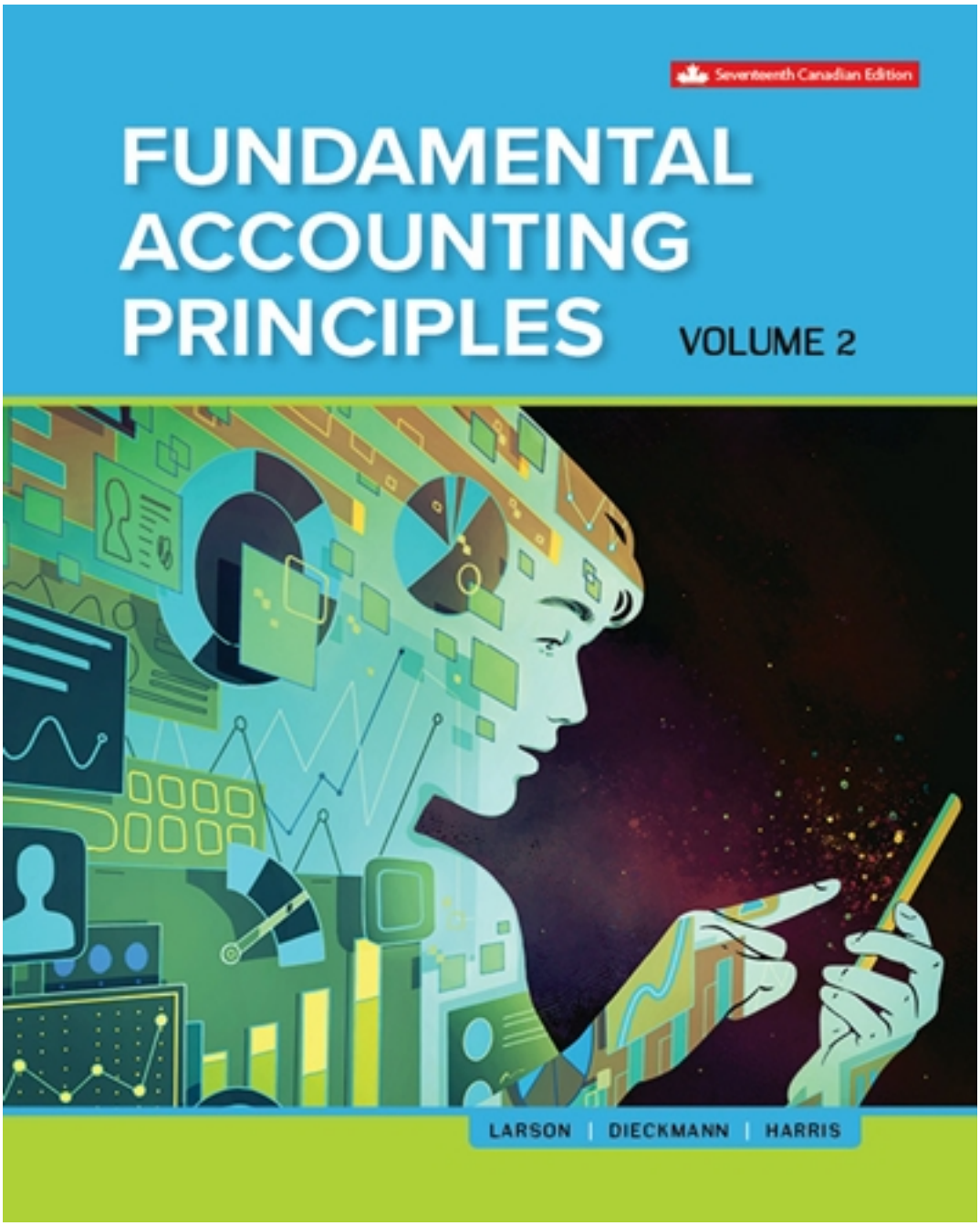


Solutions

Instructor's Manual

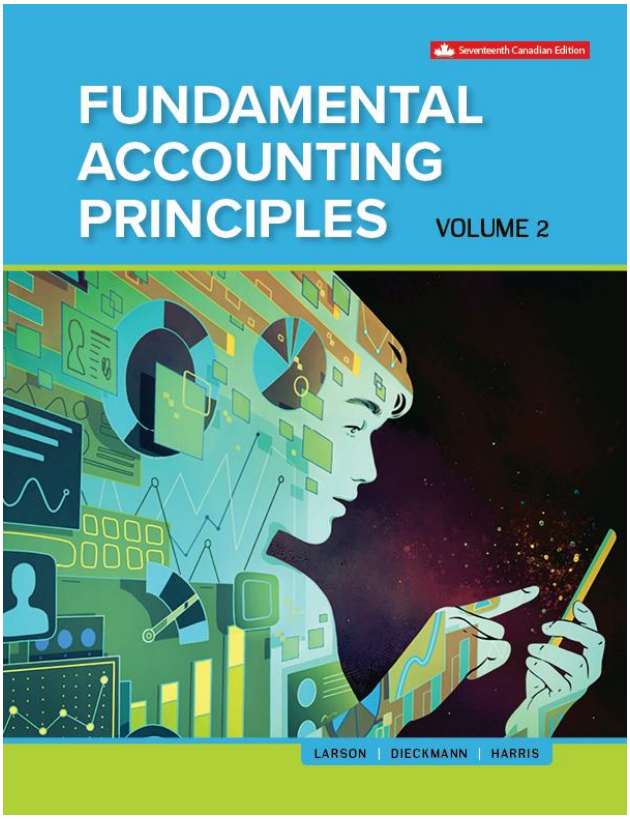
to accompany

Fundamental Accounting Principles,

Chapter 9,

17th edition,

By Larson/Dieckmann/Harris



Prepared by: Don Smith, Georgian College

CHAPTER 9: PROPERTY, PLANT AND EQUIPMENT AND INTANGIBLES

Related Assignment Materials				
Student Learning Objectives	*Quick Studies*	*Exercises*	*Problems*	*Tableau Dashboard Activities*
1. Describe property, plant and equipment (PPE) and calculate their cost.	9-1, 9-2, 9-3,9-4.	9-1, 9-2, 9-3, 9-4, 9-5, 9-9.	9-1A, 9-8A, 9-11A, 9-14A, 9-16A 9-1B, 9-8B, 9-11B, 9-14B, 9-16B.	
2. Explain, record and calculate depreciation using the methods of straight-line, units-of-production and double-declining-balance.	9-5, 9-6, 9-7, 9-8, 9-9, 9-10, 9-11, 9-12, 9-13.	9-5, 9-6, 9-7, 9-8, 9-9, 9-10, 9-11, 9-12, 9-20, 9-21, 9-22, 9-24, 9-31, 9-32, 9-33, 9-34, 9-35, 9-36.	9-2A, 9-3A, 9-4A, 9-5A, 9-6A, 9-7A, 9-8A, 9-9A, 9-10A, 9-11A,9-13A, 9-14A, 9-15A, 9-16A, 9-17A, 9-18A, 9-20A, 9-21A, 9-22A. 9-2B, 9-3B, 9-4B, 9-5B, 9-6B, 9-7B, 9-8B, 9-9B, 9-10B, 9-11B,9-13B, 9-14B, 9-15B, 9-16B, 9-17B, 9-18B,9-20B, 9-21B, 9-22B.	DA 9-1, DA 9-2, DA 9-3
3. Explain and calculate depreciation for partial years.	9-11, 9-12, 9-13.	9-13, 9-14, 9-15, 9-24, 9-31, 9-32, 9-34, 9-35, 9-36.	9-4A, 9-5A, 9-6A, 9-8A, 9-9A, 9-10A, 9-13A, 9-14A, 9-15A, 9-16A, 9-17A, 9-18A, 9-20A, 9-21A, 9-22A. 9-4B, 9-5B, 9-6B, 9-8B, 9-9B, 9-10B, 9-13B, 9-14B, 9-15B, 9-16B, 9-17B, 9-18B,9-20B, 9-21B, 9-22B.	
4. Explain and calculate revised depreciation.	9-14, 9-15, 9-16.	9-16, 9-17, 9-18, 9-19, 9-20, 9-21.	9-11A, 9-12A, 9-22A 9-11B, 9-12B, 9-13B,9-17B, 9-21B, 9-22B.	
5. Explain and record impairment losses.	9-17	9-22	9-14A, 9-14B, 9-16B.	
6. Account for asset disposal through discarding, selling or exchanging an asset.	9-18, 9-19, 9-20, 9-21.	9-23, 9-24, 9-25, 9-26, 9-27, 9-35.	9-15A, 9-16A, 9-17A, 9-18A,, 9-20A, 9-21A.9-15B, 9-17B, 9-18B, 9-20B.	
7. Account for intangible assets and their amortization.	9-22, 9-23, 9-24	9-28, 9-29, 9-30, 9-31, 9-32, 9-33, 9-34	9-19A, 9-20A, 9-21A 9-19B,9-20B	
8. *Appendix 9A - Explain and calculate revised depreciation when there is a betterment that creates partial-period depreciation.	9-25	9-36	9-22A 9-21B, 9-22B.	

Additional Information on Related Assignment Material available in Connect®

See Chapter 1 of the Instructor's Resource Manual for more information on materials for this text available in Connect.

Connect

Available on the instructor's course-specific website, Connect:

- All numerical Quick Studies, all Exercises and Problems. Connect also provides algorithmic versions for Quick Study, Exercises, and Problems.
- Test Bank Algorithmic and Static
- Tableau Dashboard Activities
- Accounting Integrated Excel
- Applying Excel
- SmartBook 2.0
- Online Focus on Financial Statement
- Extend Your Knowledge
- What You Really Need to Know
- Help Me Solve It Tutorial Videos
- Excel Templates
- Practice Problems
- Practice Tests

Need-to-Know Videos

LO	Need-to-Know	Title	Time
LO1	9-1	Cost Determination	1:51
LO2	9-2	Depreciation Computations	9:16
LO6	9-3	Additional Expenditures and Asset Disposals	4:22
LO7	9-4	Depletion Accounting	1:53
LO7	9-5	Accounting for Intangibles	2:35
COMPREHENSIVE	9-6	Acquisition, Cost Allocation, and Disposal of Tangible and Intangible Assets	
		Req. 1	2:16
		Req. 2a	1:43
		Req. 2b	1:55
		Req. 2c	1:35
		Req. 3	2:07
		Req. 4	1:15
		Req. 5	2:15

Concept Overview Videos

LO	Title	Time
LO1	Compute the cost of plant assets.	
	Features of Plant Assets	1:46
	Cost Determination	0:56
	Purchases of Equipment and Buildings	1:15
	Purchase of Land	1:27
	Lump-Sum Purchase	0:55
LO2	Explain depreciation for partial years and changes in estimates.	
	Partial-Year Depreciation	1:59
	Changes in Estimates	2:13
LO3	Compute and record depreciation using straight-line, units-of-production, and declining-balance methods.	
	Factors in Computing Depreciation	1:50
	Deprecation Methods- Straight-Line Method	2:17
	Book Value	2:22
	Units-of-Production Method	2:03
	Declining-Balance Method	1:05
	Declining-Balance Method – Last Year Computation	1:19
	Comparing Depreciation Methods	1:24
LO6	Account for asset disposal through discarding or selling an asset.	
	Disposals of Plant Assets	0:47
	Discarding Plant Assets	2:19
	Selling Plant Assets	2:57
LO7	Account for natural resource assets and their depletion.	
	Natural Resources; Cost and Depletion	3:12
LO7	Account for intangible assets.	
	Types of Intangibles	4:24
	Amortization of Intangibles	0:41

Learning Objectives:

Property, Plant, and Equipment (PPE) (LO1)

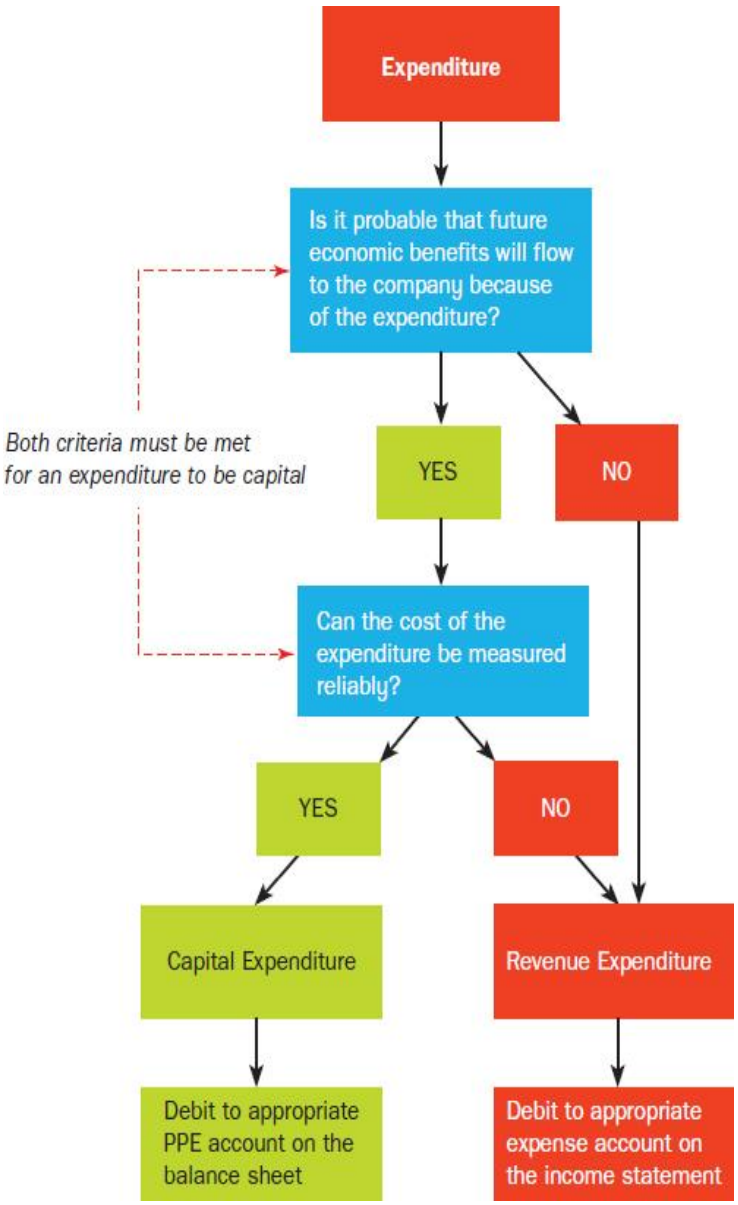
A. Non-current assets that are used in the operations of a business and have a useful life of more than one accounting period are divided into three groups:

1. Tangible assets known as property, plant, and equipment
2. Intangible assets
3. Goodwill

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.

B. Cost of PPE is 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.

C. 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.



D. Subsidiary ledgers may be kept for maintaining control of large numbers of assets. Low-cost asset purchases are usually expensed under the materiality principle.

E. Low-cost assets may be expensed (treated as revenue expenditures) under the *materiality principle.*

F. 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

G. 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.

H. 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.

I. 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.

J. 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).

K. 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 (See Visual #9-1)
    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 postpones its tax payments by charging higher depreciation expense in the early years and lower amounts in the later years.
2. Federal income tax regulations require a company to depreciate assets according to the Capital Cost Allowance system (CCA)
3. 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.

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. Revising Depreciation Rates When There Is a Change in the Estimated Residual Value and/or Estimated Useful Life

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

Calculation:

$$\frac{\text{Remaining Book value - Revised residual value}}{\text{Revised remaining useful life}}$$

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. Revising Depreciation Rates When There Is a Betterment

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 PPE (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. Calculate depreciation expense up to the date of disposal.
    2. Record journal entry to record depreciation expense up to the date of disposal updating the accumulated depreciation account.
    3. Compare the asset's book value with the net amount received or paid at disposal and record any resulting gain or loss. *
    4. Remove the balances of the disposed asset and related accumulated depreciation accounts. *Why? If the asset is gone, all accounts related to the asset (the asset account and its related accumulated depreciation) must be taken off the book as well. **
    5. Record and cash (and other assets) received or paid in the disposal.

*Step 3, 4, and 5 are recorded in one journal entry.

B. Discarding PPE—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 PPE—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 PPE

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. Examples include patents, copyrights, leaseholds, drilling rights and trademarks. Accounting for intangibles is like 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.

1. Depreciation is the systematic allocation of the cost of plant and equipment over its useful life.
2. Amortization is the systematic allocation of the cost of an intangible asset over its useful life.

Goodwill
Goodwill arises because of a business acquisition and reflects the amount paid for a business that exceeds the fair market value of the company's net assets (assets minus liabilities) if purchased separately. It is accounted for separately from other identifiable intangible assets on the financial statements.

At this point of student learning it is good to mention the concept of Goodwill and that it will be further discussed and learned in future accounting courses.

Appendix 9A Revised Depreciation When There Is a Betterment That Creates Partial-Period Depreciation (LO8)

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

1. Update depreciation on the equipment to the date of the betterment.
2. Record the betterment and remove the component being replaced.
3. Calculate and record revised depreciation on the equipment from date of betterment to end of Year.

VISUAL #9-1

FORMULAE FOR DEPRECIATION METHODS

1. STRAIGHT LINE

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

---

2. UNITS OF PRODUCTION

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

b) Depreciation per unit x units produced = Depreciation for PERIOD

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

3. DOUBLE DECLINING BALANCE

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

Step 2. Multiply Net Book Value by Rate

Net Book Value =Cost – 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, 2022 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, 2019, 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:

2022	=	.50	x	80,000	=	40,000
2023	=	.50	x	50,000	=	25,000
2024	=	.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

2022	=	.40	x	100,000	=	40,000
2023	=	.40	x	60,000	=	24,000
2024	=	.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

Last revised: September 2021

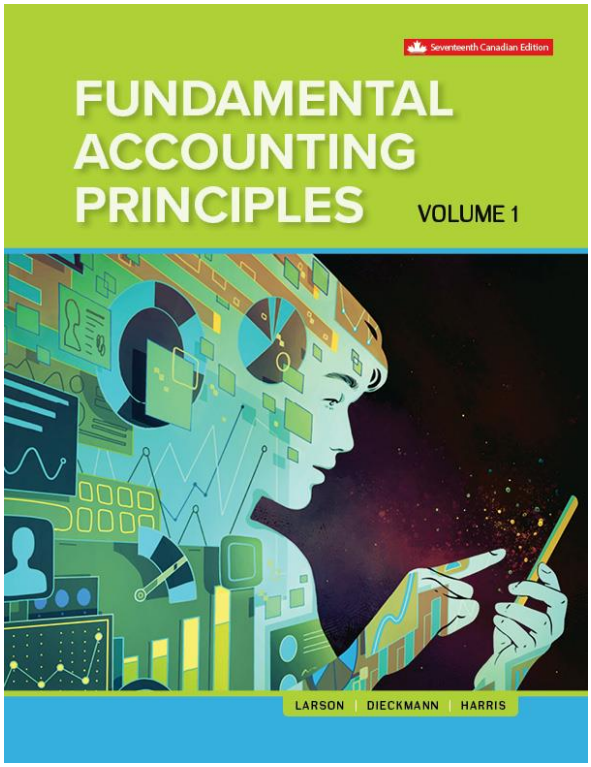
SOLUTIONS MANUAL

to accompany

Fundamental Accounting Principles

17th Canadian Edition

by Larson/Dieckmann/Harris



Revised for the 17th Edition by:

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Last revised: September 2021

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:

1. Building exterior walls	40 years
2. Roofing	25 years
3. Pavement	15 years
4. Landscaping	10 years
5. Electrical Components	15 years
6. Flooring	15 years
7. Plumbing	15 years
8. Furniture and Fixtures	15 years
9. Fire Equipment	20 years
10. Snow Removal Equipment	20 years

*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 in the print and ebooks.

Knowledge Check-Up Questions

1. a)	2. d)	3. d)	4. d)	5. c)
6. c)	7. b)	8. d)	9. c)	10. c)

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. 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. Repairs and maintenance expenses decrease profit on the income statement in the current period. Betterments 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 betterment, 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. Spin Master had Depreciation and amortization of 103 and 84.6 (millions) in 2020 and 2019 as seen on the Consolidated statements of Cash flows.

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. Indigo reported $24,571,000 as Intangible assets at March 28, 2020.

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.

14. Recipe reported Goodwill at December 31, 2020 of $198,313,000.

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)

Invoice cost	$11,000
Freight costs	280
Steel mounting	815
Assembly	4,055
Less: discount ($11,000 × 2%)	(220)
Total acquisition costs	$15,925

Note: The $50 gloves are an expense and therefore not capitalized.

Quick Study 9-3 (10 minutes)

1. (a) Repairs & Maintenance Expense
   (b) Betterment
   (c) Repairs & Maintenance Expense
   (d) Betterment

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 a betterment.		
(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 a betterment.		

Quick Study 9-4 (10 minutes)

PPE Item	*(a)* Appraised Values	*(b)* Ratio of Individual Appraised Value to Total Appraised Value *(a) ÷ Total Appraised Value*	*(c)* Cost Allocation *(b) x Total Actual Cost*
Land	$ 320,000	320,000 ÷ 500,000 = .64 or 64%	$ 345,600[1]
Building	180,000	180,000 ÷ 500,000 = .36 or 36%	194,400[2]
Totals	$ 500,000		$ 540,000

1. *64% x 540,000 = 345,600*
2. *36% x 540,000 = 194,400*

2023				
Apr. 14	Land	345,600		
	Building	194,400		
	Cash			85,000
	Notes Payable			455,000
	To record purchase of land and building.			

Quick Study 9-5 (10 minutes)

TechCom
Partial Balance Sheet
October 31, 2023

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	
Vehicles	$62,000		
Less: Accumulated depreciation	13,800	48,200	
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 9-6 (10 minutes)

($55,900 – $1,900)/4 = $13,500/year

Quick Study 9-7 (10 minutes)

1. Straight-line depreciation for the first year.

   [($140,000 - $20,000) / 6 years] x 3/12 = $ 5,000

2. Straight-line depreciation for the second year.

   ($140,000 - $20,000) / 6 years = $20,000

Quick Study 9-8 (10 minutes)

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

Year	Calculation		Annual Depreciation
2023	$.01 × 650,000	=	$6,500
2024	$.01 × 798,000	=	7,980
2025	$.01 × 424,000	=	4,240
2026	$.01 × 935,000	=	9,350
2027	$.01 × 1,193,000	=	11,930
			$40,000

Quick Study 9-9 (10 minutes)

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

Year	Calculation	Annual Depreciation
2023	40% × $86,000 =	$34,400
2024	40% × ($86,000 – $34,400) =	20,640
2025	40% × ($86,000 – $34,400 – $20,640) =	12,384
2026	40% × ($86,000 – $34,400 – $20,640 – $12,384) =	2,576*
2027		0
		$70,000

*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 2026 must be adjusted to $2,576.

Quick Study 9-10 (10 minutes)

Computer panel:
$4,000/8 years = $500 depreciation

Dry-cleaning drum:
$70,000 - $5,000 = $65,000/400,000 garments = $0.1625/garment;
$0.1625/garment × 62,000 garments = $10,075 depreciation

Stainless steel housing:
$85,000 - $10,000 = $75,000/20 years = $3,750 depreciation

Miscellaneous parts:
$26,000/2 years = $13,000 depreciation
Total depreciation on the dry-cleaning equipment for 2023= $500 + $10,075 + $3,750 + $13,000 = $27,325

Quick Study 9-11 (10 minutes)

	2023	2024
a.	$5,000	$6,000
b.	$3,000	$6,000

Calculations:

a. $\frac{60,000 - 0}{10 \text{ years}}$ = 6,000/year x 10/12 = 5,000

b. 6,000/year x 6/12 = 3,000

Quick Study 9-12 (10 minutes)

	2023	2024
a.	$10,000	$10,000
b.	$6,000	$10,800

Calculations:

a. 2/10 = .2 or 20%; 20% x 60,000 = 12,000 x 10/12 = 10,000 for 2023
20% x (60,000 – 10,000) = 10,000 for 2024

b. 20% x 60,000 = 12,000 x 6/12 = 6,000 for 2023
20% x (60,000 – 6,000) = 10,800 for 2024

Quick Study 9-13 (10 minutes)

	2023	2024
a.	10,000	14,000
b.	10,000	14,000

Calculations:
75,000 – 15,000 = 60,000/120,000 = $0.50 depreciation expense per unit produced
$0.50 x 20,000 = $10,000 for 2023; $0.50 x 28,000 = $14,000 for 2024

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 9-14 (10 minutes)

[($35,720 – $11,820[1]) – $1,570]/ 7[2] years remaining = $3,190

1.($35,720 – $4,200)/8 = $3,940/year × 3 years = $11,820
2.10 – 3 = 7

Quick Study 9-15 (10 minutes)

2023			
Jan. 3	Barbecue – Rotisserie……	1,000	
	Cash……..		1,000
	To record the purchase of electronic rotisserie.		
Dec. 31	Depreciation Expense, Barbecue……	1,560	
	Accumulated Depreciation, Barbecue……		1,560
	To record revised depreciation on the barbecue caused by the addition of a rotisserie; $7,000 - $200 = $6,800 ÷ 5 years = $1,360 PLUS $1,000 ÷ 5 years = $200; Total depreciation = $1,360 + $200 = $1,560.		

Quick Study 9-16 (10 minutes)

$65,800	Cost
- 15,950	Accumulated depreciation (first year)
49,850	Book value at point of revision
- 2,000	Salvage value
47,850	Remaining depreciable cost
÷ 2	Years of life remaining
$23,925	Depreciation per year for years 2 and 3

Quick Study 9-17 (10 minutes)

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

Calculations:

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

Quick Study 9-18 (10 minutes)

a.

2023			
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 machinery.		

c.

Oct. 1	Accumulated Depreciation, Truck	33,000	
	Cash	11,000	
	Loss on Disposal	4,000	
	Delivery Truck		48,000
	To record sale of delivery truck.		

d.

Oct. 1	Accumulated Depreciation, Furniture	21,000	
	Loss on Disposal	5,000	
	Furniture		26,000
	To record disposal of furniture.		

Quick Study 9-19 (15 minutes)

Book value of old equipment = $76,800 - $40,800 = $36,000

1.	Cash	47,000	
	Accumulated depreciation	40,800	
	Equipment		76,800
	Gain on sale of equipment*		11,000
	*Record sale of equipment. *(Gain = $47,000 - $36,000)*		
2.	Cash	36,000	
	Accumulated depreciation	40,800	
	Equipment		76,800
	Record sale of equipment.		
3.	Cash	31,000	
	Accumulated depreciation	40,800	
	Loss on sale of equipment*	5,000	
	Equipment		76,800
	*Record sale of equipment. *(Loss = $31,000 - $36,000)*		

Quick Study 9-20 (10 minutes)

2023			
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 9-21 (15 minutes)

2023			
Mar. 1	Accumulated Depreciation, Machine (old)	36,000	
	Machine (new)[2]	117,000	
	Cash[1]		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 9-22 (10 minutes)

2023			
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 9-23 (10 minutes)

2023			
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 9-24 (10 minutes)

Jan.1	Iron Ore Mine.....	1,400,000	
	Cash.....		1,400,000
Record purchase of iron ore mine			
Jan.1	Iron Ore Mine.....	400,000	
	Cash.....		400,000
Record purchase of iron ore mine access costs			
Dec. 31	Depreciation Expense—iron ore mine…….288,000		
	Accumulated Depreciation— iron ore mine.....……..288,000		
	Record depreciation [$(1,800,000-$200,000)/1,000,000 tons= $1.60 per ton; 180,000 tons x $1.60 = $288,000].		

***Quick Study 9-25 (20 minutes)**

Motor (old)	$45,000 - $5,000 = $40,000 ÷ 10 yrs × 8/12 =	$ 2,667
Motor (new)	$60,000 - $10,000 = $50,000 ÷ 8 yrs × 4/12 =	2,083
Metal housing	$68,000 - $15,000 = $53,000 ÷ 25 yrs =	2,120
Misc. parts	$15,000 ÷ 5 yrs =	3,000
Total depreciation expense to be recorded on the machine for 2023 =		$ 9,870

EXERCISES

Exercise 9-1 (10 minutes)

Invoice cost	$28,000
Freight costs	450
Steel mounting	985
Assembly	660
Raw materials for testing	310
Less: discount ($28,000 × 1%)	(280)
Total acquisition costs	$30,125

Note: The $380 repairs are an expense and therefore not capitalized.
Note: The special insurance is 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:

2023			
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:

PPE Asset	*(a)* Appraised Values	*(b)* Ratio of Individual Appraised Value to Total Appraised Value *(a) ÷ Total Appraised Value*	*(c)* Cost Allocation *(b) x Total Actual Cost*
Land	$249,480	249,480 ÷ 594,000 = .42 or 42%	$ 244,346[2]
Land Imprv.	83,160	83,160 ÷ 594,000 = .14 or 14%	81,448[3]
Building	261,360	261,360 ÷ 594,000 = .44 or 44%	255,981[4]
Totals	$594,000		$ 581,775[1]

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:

2023			
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)

2023				
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:

PPE Asset	*(a)* Appraised Values	*(b)* Ratio of Individual Appraised Value to Total Appraised Value *(a) ÷ Total Appraised Value*	*(c)* Cost Allocation *(b) x Total Actual Cost*
Land	$ 1,152,000	1,152,000 ÷ 3,840,000 = .30 or 30%	$ 1,296,000[1]
Building	1,344,000	1,344,000 ÷ 3,840,000 = .35 or 35%	1,512,000[2]
Equipment	998,400	998,400 ÷ 3,840,000 = .26 or 26%	1,123,200[3]
Tools	345,600	345,600 ÷ 3,840,000 = .09 or 9%	388,800[4]
Totals	$ 3,840,000		$ 4,320,000

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)

2023

Jan. 1	Truck		87,000	
	Cash			87,000

Calculation:
52,500 + 21,000 + 7,500 + 6,000 = 87,000

Jan. 4	Prepaid Insurance		5,100	
	Gas Expense		225	
	Cash			5,325

2023

Dec 31	Depreciation Expense, Truck		15,600	
	Accumulated Depreciation, Truck			15,600
	To record depreciation.			

Calculation:
[(52,500 + 21,000 + 7,500 + 6,000) – 9,000] / 5 years = 15,600

Note: Insurance expense entries could also be made, to move from prepaid insurance, although not required in question.

Exercise 9-6 (15 minutes)

Year	a. Straight-Line	b. Double-Declining-Balance	c. Units-of-Production
2021	$32,550	$75,100	$26,880
2022	$32,550	$37,550	$28,910
2023	$32,550	$17,550	$36,890
2024	$32,550		$37,520
Total	$130,200	$130,200	$130,200

Explanation:

a.
($150,200 – $20,000)/4 = $32,550/year

b.
Double-declining-balance (Rate = 2/4 = 0.50 or 50%):
50% × $150,200 = $75,100
50% × ($150,200 – $75,100) = $37,550
Maximum depreciation is limited to $130,200 which is cost less residual ($150,200 – $20,000) therefore depreciation for 2023 is $17,550 calculated as $130,200 – $112,650 accumulated depreciation recorded to date.

c.
Units-of-production: (Rate = [($150,200 – $20,000)/186,000] = $0.70/unit)
$26,880 ($0.70 × 38,400)
$28,910 ($0.70 × 41,300)
$36,890 ($0.70 × 52,700)
Maximum depreciation is limited to $130,200 which is cost less residual ($150,200 – $20,000) therefore depreciation for 2024 is $37,520 calculated as $130,200 – $92,680 accumulated depreciation recorded to date.

Exercise 9-7 (15 minutes)

a. ($305,200 – $52,400)/5 = $50,560

b. Rate = 2/5 = .40 or 40% 40% × $305,200 = $122,080

c.
Rate = ($305,200 – $52,400)/320,000 km = $0.79/km
$0.79/km × 30,000 km = $23,700

Analysis component:

The units-of-production method will produce the highest profit in 2023 because it is the lowest depreciation expense for 2023.

Exercise 9-8 (30 minutes)

	Straight-Line[1]		Double-Declining-Balance[2]		Units-of-Production[3]	
Year	Depreciation Expense	Book Value at December 31	Depreciation Expense	Book Value at December 31	Depreciation Expense	Book Value at December 31
2023	21,250	104,000	50,100	75,150	16,875	108,375
2024	21,250	82,750	30,060	45,090	22,250	86,125
2025	21,250	61,500	18,036	27,054	30,000	56,125
2026	21,250	40,250	8,054	19,000	37,125	19,000
2027	21,250	19,000	0	19,000	0	19,000

Calculations:

1. 125,250 – 19,000 = 106,250/5 = 21,250
2. 2/5 = .4 or 40%; .4 x 125,250 = 50,100; .4 x (125,250 – 50,100) = 30,060;
   .4 x (125,250 – 50,100 – 30,060) = 18,036;
   .4 x (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/hour;
   2023– 12.50 x 1,350 = 16,875;
   2024– 12.50 x 1,780 = 22,250;
   2025– 12.50 x 2,400 = 30,000;
   2026– 12.50 x 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. 2023– Units-of-production; 2026– Straight-line
b. 2023– Double-declining-balance; 2026– Units-of-production

Exercise 9-9 (30 minutes)

PPE Asset	*(a)* Appraised Values	*(b)* Ratio of Individual Appraised Value to Total Appraised Value *(a) ÷ Total Appraised Value*	*(c)* Cost Allocation *(b) x Total Actual Cost*
Land	$ 700,000	700,000 ÷ 2,100,000 = .33 or 33.33%	$ 840,000[1]
Building	1,120,000	1,120,000 ÷2,100,000 = .533 or 53.33%	1,344,000[2]
Equipment	210,000	210,000 ÷ 2,100,000 = .10 or 10%	252,000[3]
Tools	70,000	70,000 ÷ 2,100,000 = .033 or 3.33%	84,000[4]
Totals	$ 2,100,000		$ 2,520,000

1. *33.33% x 2,520,000 = 840,000*
2. *53.33% x 2,520,000 = 1,344,000*
3. *10.00% x 2,520,000 = 252,000*
4. *3.33% x 2,520,000 = 84,000*

PPE Asset	Cost	2023 Depreciation	2024 Depreciation
Land	$ 840,000	N/A[5]	N/A[5]
Building	1,344,000	1,344,000 × 2/10 = 268,800	(1,344,000 – 268,800) × 2/10 = 215,040
Equipment	252,000	252,000 × 2/5 = 100,800	(252,000 – 100,800) × 2/5 = 60,480
Tools	84,000	84,000 × 2/3 = 56,000	(84,000 – 56,000) × 2/3 = 18,667

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)

Cost Information						Depreciation		
Description	Date of Purchase	Depreciation Method	Cost	Residual	Life	Balance of Accum. Deprec. Dec. 31, 2022	Depreciation Expense for 2023	Balance of Accum. Deprec. Dec. 31, 2023
Building	2 May 2017	S/L	$650,000	$250,000	10 yr.	$226,667	$40,000[1]	$266,667[2]
Modular Furniture	2 May 2017	S/L	72,000	0	6 yr.	68,000	4,000[3]	72,000[4]
Truck	25 Jan 2020	DDB	80,000	10,000	8 yr.	45,313	8,672[5]	53,985[6]

1. (650,000 – 250,000)/10 = 40,000/year
2. 226,667 + 40,000 = 266,667
3. (72,000 – 0)/6 = 12,000 per year; however, the maximum accumulated depreciation = 72,000; 72,000 less total depreciation taken of 68,000(8,000 in 2017 [(72,000 – 0)/6 = $12,000 per year X 8/12] plus 12,000 in years 2018 – 2022) = 4,000
4. 68,000 + 4,000 = 72,000
5. Rate = 2/8 = .25 or 25%
   25% × (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)

DYNAMIC EXPLORATION
Partial Balance Sheet
December 31, 2022

Assets			
Current assets			$338,000
Property, plant and equipment:			
Furniture	$72,000		
Less: Accumulated depreciation	68,000	$4,000	
Building	$650,000		
Less: Accumulated depreciation	226,667	423,333	
Truck	$ 80,000		
Less: Accumulated depreciation	45,313	34,687	
Total property, plant and equipment			462,020
Total assets			$800,020

Exercise 9-12 (15 minutes)

a. Straight-line depreciation:

	Year 1	Year 2	Year 3	Year 4	Year 5	5-Year Totals
Profit before depreciation	$180,000	$180,000	$180,000	$180,000	$180,000	$900,000
Depreciation expense[1]	73,980	73,980	73,980	73,980	73,980	369,900
Profit	$106,020	$106,020	$106,020	$106,020	$106,020	$530,100

b. Double-declining-balance depreciation:

	Year 1	Year 2	Year 3	Year 4	Year 5	5-Year Totals
Profit before depreciation	$180,000	$180,000	$180,000	$180,000	$180,000	$900,000
Depreciation expense[2]	193,560	116,136	60,204	0	0	369,900
Profit (loss)	$(13,560)	$63,864	$119,796	$180,000	$180,000	$530,100

a. ($483,900 – $114,000)/5 = $73,980
b. Rate = 2/5 = .40 or 40%
Depreciation expenses:
Year 1: $483,900 × 40% = $193,560
Year 2: ($483,900 – $193,560) × 40% = $116,136
Year 3: $60,204 max. depreciation expense (calculated as $483,900 – $114,000 – $193,560 – $116,136 = $60,204)

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)

	Depreciation	
Year	Straight-Line[1]	Units-of-Production[3]
2021	7,800	23,220
2022	23,400	42,660
2023	23,400	34,560

1. Straight-Line:
$168,000 – $27,600 = $140,400/6 = $23,400 × 4/12 = $7,800
2. Units-of-Production:
$168,000 – $27,600 = $140,400/260,000 = $0.540/unit;
$0.540 × 43,000 = $23,220;
$0.540 × 79,000 = $42,660;
$0.540 × 64,000 = $34,560.

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)

	Depreciation	
Year	Straight-Line[1]	Double-Declining-Balance[2]
2022	11,000	22,000
2023	22,000	35,200
2024	22,000	21,120

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

Analysis component:
If the furniture had been debited to an expense account in 2022 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 2022 while assets and equity would have been understated on the balance sheet for the same year.

Exercise 9-15 (10 minutes)

	(a)	(b)
Year	Straight-Line	Double-Declining-Balance
2023	(125,000 – 12,500)/5 = 22,500 x 9/12 = 16,875	Rate = 2/5 = .40 or 40% 125,000 × 40% × 9/12 = 37,500
2024	(125,000 – 12,500)/5 = 22,500	(125,000 – 37,500) × 40% =35,000

Exercise 9-16 (10 minutes)

Dec. 31	Depletion Expense—Mineral Deposit	405,528	
	Accumulated Depletion—Mineral Deposit		405,528
	Record depletion [$3,721,000/1,525,000 tons = $2.44 per ton; 166,200 tons x $2.44 = $405,528].		
Dec. 31	Depreciation Expense—Machinery	23,268	
	Accumulated Depreciation—Machinery.....		23,268
	Record depreciation [$213,500/1,525,000 tons= $0.14 per ton; 166,200 tons x $0.14 = $23,268].		

Exercise 9-17 (10 minutes)

Part 1

Jan.1	Iron Ore Mine	760,000	
	Cash		760,000
Record purchase of iron ore mine			
Jan.1	Iron Ore Mine	60,000	
	Cash		60,000
Record purchase of iron ore mine access costs			

Part 2

Dec. 31	Depletion Expense—iron ore mine…….144,000		
	Iron Ore Inventory…… 16,000		
	Accumulated Depletion – Iron Ore mine……..160,000		

Record depletion [$(820,000-$20,000)/100,000 tons= $8 per ton; 18,000 tons x $8 = $144,000]. Record inventory not yet sold [(20,000 – 18,000) tons x $8 per ton = $16,000]

Exercise 9-18 (10 minutes)

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

2. [(43,500 – 19,250) – 3,850]/3 = 6,800

Exercise 9-19 (15 minutes)

2026			
Dec. 31	Depreciation Expense, Machine	7,624	
	Accumulated Depreciation, Machine		7,624
	To record depreciation.		

Calculations:

Revised depreciation = (71,200 – 30,800*) – 8,000 = 7,624/year
7 – 2 9/12 = 4.25 yrs

*2023 depreciation = 8,400 (71,200 – 15,200)/5 = 11,200 × 9/12
2024 depreciation = 11,200
2025 depreciation = 11,200
Accumulated depreciation 30,800

Exercise 9-20 (20 minutes)

Part 1

2023			
Jan. 5	Warehouse – Door……	25,500	
	Accounts Payable……		25,500
	To record addition of door on East wall of warehouse.		

Part 2

2023			
Dec. 31	Depreciation Expense, Warehouse ……	14,700	
	Accumulated Depreciation, Warehouse….		14,700
	To record revised depreciation on warehouse;		
	$292,500 – $90,000 = $202,500; $202,500 ÷ 15 yrs = $13,500		
	PLUS $25,500 - $7,500 = $18,000; $18,000 ÷ 15 yrs = $1,200;		
	Total depreciation on the warehouse = $13,500 + $1,200 = $14,700.		

Exercise 9-21 (15 minutes)

1.	Original cost of machine	$ 23,860
	Less two years' accumulated depreciation [($23,860 - $2,400) / 4 years] x 2 years	(10,730)
	Book value at end of second year	$ 13,130
2.	Book value at end of second year	$ 13,130
	Less revised salvage value	(2,000)
	Remaining depreciable cost	$ 11,130

Revised annual depreciation = $11,130 / 3 years = $3,710

Exercise 9-22 (30 minutes)

Part 1

2023			
Dec. 31	Impairment Loss	13,500	
	Equipment		12,000
	Office Building		1,500
	To record impairment loss on equipment and office building.		

Part 2

2024			
Dec. 31	Depreciation Expense, Equipment	1,800	
	Accumulated Depreciation, Equipment		1,800
	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:

Asset	Cost	Accum. Deprec.	Book Value	Recoverable Amount	Impairment Loss	2024 Dep. Exp.
Equipment	$40,000	$20,000	$20,000	$ 8,000	$12,000	1,800[1]
Furniture	12,000	9,509	2,491	2,950	N/A	491[2]
Land	85,000	N/A	85,000	101,800	N/A	N/A
Office Building	77,000	23,000	54,000	52,500	1,500	3,838[3]
Warehouse	55,000	12,938	42,062	45,100	N/A	2,250[4]

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 × 1,800 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 9-23 (20 minutes)

a.

2023				
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	
		Cash	19,200	
		Loss on Disposal	950	
		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 9-24 (15 minutes)

To record partial year's depreciation in 2021:

2024			
July 1	Depreciation Expense	21,200	
	Accumulated Depreciation, Machine		21,200
	To record partial year depreciation in year of disposal; (296,800/7) × 6/12 = 21,200.		

(a)

July 1	Accumulated Depreciation, Machine	190,800*	
	Cash	112,000	
	Machine		296,800
	Gain on Disposal		6,000
	To record sale of machine for 112,000.		

(b)

1	Accumulated Depreciation, Machine	190,800*	
	Cash	96,000	
	Loss on Disposal	10,000	
	Machine		296,800
	To record receipt of $96,000 from insurance settlement.		

*(296,800/7) × 4.5 years = 190,800

Exercise 9-25 (10 minutes)

a. $202,000 − $111,000 = $91,000 book value

b.

Book value of the assets given up = ($91,000 + $170,000)	= $261,000
Less: Fair value of assets given up ($68,000 + $170,000)	= $238,000
Loss on exchange	$23,000

c. & d. Tractor (new) = $68,000 + $170,000 = $238,000

d.

2023			
Oct. 6	Tractor (new)*	238,000	
	Accumulated Depreciation, Tractor (old)	111,000	
	Loss on Exchange	23,000	
	Cash		170,000
	Tractor (old)		202,000
	To record exchange of old tractor for a new one.		

Exercise 9-26 (20 minutes)

a.

2023			
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.

2023			
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 9-27 (25 minutes)

(a)

Jan. 2	Accumulated Depreciation, Machine	50,450	
	Cash	44,500	
	Loss on Disposal	1,050	
	Machine		96,000
	To record sale of machine;		
	44,500 – (96,000 – 50,450) = 1,050 loss.		

(b)

Jan. 2	Accumulated Depreciation, Machine	50,450	
	Tools	134,550	
	Cash		89,000
	Machine		96,000
	To record exchange of machine;		
	Value of assets given up = $89,000 cash + $45,550 book value of the old machine = $134,550.		

(c)

Jan. 2	Accumulated Depreciation, Machine	50,450	
	Van	116,000	
	Loss on Disposal	9,550	
	Cash		80,000
	Machine		96,000
	To record exchange of machine;		
	116,000 – (80,000 + 45,550) = 9,550 loss.		

(d)

Jan. 2	Accumulated Depreciation, Machine	50,450	
	Land	87,000	
	Machine		96,000
	Cash		37,000
	Gain on Disposal		4,450
	To record exchange;		
	87,000 – (37,000 + 45,550) = 4,450 gain.		

Exercise 9-28 (15 minutes)

1.	Equipment	22,000	
	Cash		22,000
	Record betterment.		
2.	Repairs Expense	6,250	
	Cash		6,250
	Record ordinary repairs.		
3.	Equipment	14,870	
	Cash		14,870
	Record extraordinary repairs.		

Exercise 9-29 (25 minutes)

1. Annual depreciation = $572,000 / 20 years = $28,600 per year

   Age of the building = Accumulated depreciation / Annual depreciation
   = $429,000 / $28,600 = 15 years

2. Entry to record the extraordinary repairs

Building	68,350	
Cash		68,350
Record extraordinary repairs.		

3. Cost of building

Before repairs	$572,000	
Add cost of repairs	68,350	$640,350
Less accumulated depreciation		429,000
Revised book value of building		$211,350

4.

Revised book value of building (part 3)	$211,350
New estimate of useful life (20 - 15 + 5)	10 years
Revised annual depreciation	$ 21,135

1. Journal entry

Depreciation Expense	21,135	
Accumulated Depreciation–Building		21,135
Record depreciation.		

Exercise 9-30 (10 minutes)

2023				
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 9-31 (15 minutes)

Part 1

2023				
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

2023				
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.		
2024				
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 9-32 (20 minutes)

Note: Book value of machine = $250,000 - $182,000 = $68,000

1. Disposed at no value

Jan.	1	Loss on Disposal of Machine	68,000	
		Accumulated Depreciation—Machine	182,000	
		Machine		250,000
		Record disposal of machine.		

2. Sold for $35,000 cash

Jan.	1	Cash	35,000	
		Loss on Sale of Machine	33,000	
		Accumulated Depreciation—Machine	182,000	
		Machine		250,000
		Record cash sale of machine.		

3. Sold for $68,000 cash

Jan.	1	Cash	68,000	
		Accumulated Depreciation—Machine	182,000	
		Machine		250,000
		Record cash sale of machine.		

4. Sold for $80,000 cash

Jan.	1	Cash	80,000	
		Accumulated Depreciation—Machine	182,000	
		Gain on Sale of Machine		12,000
		Machine		250,000
		Record cash sale of machine.		

Exercise 9-33 (25 minutes)

Huang Resources
Balance Sheet
October 31, 2023

Assets			
Current assets:			
Cash		$ 9,600	
Accounts receivable	$ 27,200		
Less: Allowance for doubtful accounts	1,920	25,280	
Total current assets			$ 34,880
Property, plant and equipment:			
Land		$ 89,600	
Building	$ 147,200		
Less: Accumulated depreciation	81,600	65,600	
Equipment	$184,000		
Less: Accumulated depreciation	110,400	73,600	
Total property, plant and equipment			228,800
Intangible assets:			
Mineral rights	$ 57,600		
Less: Accumulated amortization	30,400	$ 27,200	
Trademark	$ 33,600		
Less: Accumulated amortization	22,400	11,200	
Total intangible assets			38,400
Total assets			$302,080
Liabilities			
Current liabilities:			
Accounts payable	$18,400		
Current portion of long-term note	34,000		
Total current liabilities		$ 52,400	
Non-current liabilities:			
Note payable, less current portion		38,000	
Total liabilities			$ 90,400
Equity			
Sally Huang, capital			211,680[1]
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 9-34 (35 minutes)

Montalvo Bionics
Balance Sheet
April 30, 2023

Assets			
Current assets:			
Cash		$ 10,100	
Accounts receivable	$17,300		
Less: Allowance for doubtful accounts	1,010	16,290	
Prepaid rent		1,355[1]	
Total current assets			$ 27,745
Property, plant and equipment:			
Furniture	$22,700		
Less: Accumulated depreciation	14,730[2]	$ 7,970	
Machinery	$50,800		
Less: Accumulated depreciation	22,700[3]	28,100	
Total property, plant and equipment			36,070
Intangible assets:			
Patent		$24,900	
Less: Accumulated amortization		830[4]	24,070
Total assets			$87,885
Liabilities			
Current liabilities:			
Accounts payable	$5,080		
Unearned revenues	5,870		
Current portion of long-term note	6,500		
Total current liabilities		$ 17,450	
Non-current liabilities:			
Note payable, less current portion		8,100	
Total liabilities			$25,550
Equity			
Josh Montalvo, capital			62,335[5]
Total liabilities and equity			$87,885

Calculations:

1. $16,260 ×11/12 = $14,905 rent used; $16,260 – $14,905 = $1,355 remaining in Prepaid Rent.
2. $22,700 ÷ 5 = $4,540; $4,540 + $10,190 = $14,730 accum. dep.
3. $50,800 – $20,200 = $30,600; $30,600 × 2/10 = $6,120; maximum depreciation is $50,800 – $28,100 = $22,700 therefore 2023 depreciation expense is $2,500 and accum. dep. is $20,200 + $2,500 = $22,700.
4. $24,900 ÷ 15 = $1,660/year; $1,660 × 6/12 = $830.
5. $32,910 unadjusted capital + $225,400 revenues – $83,900 withdrawals – $89,300 expenses – $4,540 dep. furniture – $2,500 dep. machinery – $830 amort. patent – $14,905 rent expense = $62,335 post-closing capital.

Exercise 9-35 (30 minutes)

2021			
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: [(48,000 + 4,000) – 10,000] / 5 years = 8,400 × *9/12 = $6,300.*		
31	Depreciation Expense, Oven	750	
	Accumulated Depreciation, Oven		750
	To record depreciation of oven;		
	($6,000-1000) ÷ 5 yrs = $1,000/year × 9/12 = $750.		
2022			
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: [(48,000 + 4,000) – 10,000] / 5 years = 8,400		
31	Depreciation Expense, Oven	1,000	
	Accumulated Depreciation, Oven		1,000
	To record depreciation of oven; ($6,000-1000) ÷ 5 yrs = $1,000/year		
2023			
Mar 31	Depreciation Expense, Truck	2,100	
	Accumulated Depreciation, Truck		2,100
	To record partial year depreciation in year of disposal; 8,400 × 3/12 = 2,100.		
Mar 31	Depreciation Expense, Oven	250	
	Accumulated Depreciation, Oven		250
	To record partial year depreciation in year of disposal; 1000 × 3/12 = 250.		
Mar 31	Accumulated Depreciation, Truck	16,800	
	Accumulated Depreciation, Oven	2,000	
	Cash	21,000	
	Loss on Disposal	18,200	
	Truck		52,000
	Oven		6,000
	To record loss on sale of truck; 16,800+2,000+21,000-52,000-6,000=18,200		

***Exercise 9-36 (30 minutes)**

Part 1

2023

Jul. 3 Truck – Tool Carrier 9,600

Cash 9,600

To record installation of new component to truck.

Part 2

Truck:							
Component	Date of Purchase	Cost	Est. Resid.	Est. Life	Accum. Dep. at Dec 31/22	Dep. Exp. Dec 31/23	Dep. Exp. Dec 31/24
Truck body	Jul 7/21	$ 28,000	-0-	10 yr	$ 4,200	$ 2,800[1]	$ 2,800[1]
Motor	Jul 7/21	8,000	-0-	10 yr	1,200	800[2]	800[2]
Tool Carrier	Jul 3/23	9,600	-0-	8 yr	-0-	600[3]	1,200[3]
		$ 45,600			$ 5,400	$4,200	$4,800

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 2023

Part 3

Book value of truck at December 31, 2023:
$45,600 total cost – ($5,400 + $4,200 = $9,600) = $36,000

Book value of truck at December 31, 2024:
$36,000 - $4,800 = $31,200

PROBLEMS

Problem 9-1A (25 minutes)

Part 1

	Land	*Building Two*	*Building Three*	*Land Impmnts. One*	*Land Impmnts. Two*
Purchase price*	$2,924,800	$1,051,100		$594,100	
Demolition	703,160				
Landscaping	272,020				
New building			$2,476,000		
New improvements					$254,600
Totals	$3,899,980	$1,051,100	$2,476,000	$594,100	$254,600

*Allocation of purchase price:

	Appraised Value	*Percent of Total*	*Apportioned Cost*
Land	$2,990,720	64%	$2,924,800
Building Two	1,074,790	23	1,051,100
Land Improvements One	607,490	13	594,100
Totals	$4,673,000	100%	$4,570,000

Part 2

Mar. 31	Land	3,899,980	
	Building Two	1,051,100	
	Building Three	2,476,000	
	Land Improvements One	594,100	
	Land Improvements Two	254,600	
	Cash		8,275,780
	To record costs of plant assets.		

Problem 9-2A (25 minutes)

Derlak Enterprises
Balance Sheet
December 31

	2023		2022	
Assets				
Current assets:				
Cash	$ 12,000		$ 28,800	
Prepaid rent	40,000		48,000	
Office supplies	2,400		2,320	
Total current assets		$ 54,400		$ 79,120
Property, plant and equipment:				
Equipment	$184,000		$100,000	
Less: Accumulated depreciation	72,800	111,200	64,800	35,200
Tools	$143,920		$100,800	
Less: Accumulated depreciation	44,800	99,120	42,400	58,400
Vehicles	$252,800		$252,800	
Less: Accumulated depreciation	108,800	144,000	97,600	155,200
Total property, plant and equipment		354,320		248,800
Intangible assets:				
Franchise	$ 41,600		$ 41,600	
Less: Accumulated amortization	19,200	22,400	11,200	30,400
Patent	$ 16,000		$ 16,000	
Less: Accumulated amortization	4,000	12,000	2,400	13,600
Total intangible assets		34,400		44,000
Total assets		$443,120		$371,920
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 *		206,320
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 2022. In 2023, the assets are financed largely by debt. The change from 2022 to 2023 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)

Year	a. Straight-Line	b. Double-Declining-Balance	c. Units-of-Production
2021	$33,250	$84,000	$27,930
2022	$33,250	$42,000	$30,485
2023	$33,250	$7,000	$37,940
2024	$33,250		$36,645
Total	$133,000	$133,000	$133,000

Explanation:
a.
($168,000 – $35,000)/4 = $33,250/year

b.
Double-declining-balance (Rate = 2/4 = 0.50 or 50%):
50% × $168,000 = $84,000
50% × ($168,000 – $84,000) = $42,000
Maximum depreciation is limited to $133,000 which is cost less residual ($168,000 – $35,000) therefore depreciation for 2023 is $7,000 calculated as $133,000 – $126,000 accumulated depreciation recorded to date.

c.
Units-of-production: (Rate = [($168,000 – $35,000)/190,000] = $0.70/unit)
$27,930 ($0.70 × 39,900)
$30,485 ($0.70 × 43,550)
$37,940 ($0.70 × 54,200)
Maximum depreciation is limited to $133,000 which is cost less residual ($168,000 – $35,000) therefore depreciation for 2024 is $36,645 calculated as $133,000 – $96,355 accumulated depreciation recorded to date.

Problem 9-4A (25 minutes)

1. Purchased January 1, 2023	2023	2024	2025
A. Double-declining-balance method			
Equipment	$415,000	$415,000	$415,000
Less: Accumulated depreciation	83,000	149,400	202,520
Year-end book value	$332,000	$265,600	$212,480
Depreciation expense for the year[1]	$83,000	$66,400	$53,120
B. Straight-line method			
Equipment	$415,000	$415,000	$415,000
Less: Accumulated depreciation	39,000	78,000	117,000
Year-end book value	$376,000	$337,000	$298,000
Depreciation expense for the year	$39,000[2]	$39,000	$39,000

1. Rate = 2/10 = 0.20 or 20%
   2023: 0.20 × 415,000 = 83,000
   2024: 0.20 × (415,000 – 83,000) = 66,400
   2025: 0.20 × (415,000 – 83,000 – 66,400) = 53,120

2. (415,000 – 25,000)/10 = 39,000

2. Purchased July 1, 2023	2023	2024	2025
A. Double-declining-balance method			
Equipment	$415,000	$415,000	$415,000
Less: Accumulated depreciation	41,500	116,200	175,960
Year-end book value	$373,500	$298,800	$239,040
Depreciation expense for the year[3]	$41,500[4]	$74,700	$59,760
B. Straight-line method			
Equipment	$415,000	$415,000	$415,000
Less: Accumulated depreciation	19,500	58,500	97,500
Year-end book value	$395,500	$356,500	$317,500
Depreciation expense for the year	$19,500[4]	$39,000	$39,000

3. Rate = 2/10 = 0.20 or 20%
   2023: 0.20 × 415,000 × 6/12 = 41,500
   2024: 0.20 × (415,000 – 41,500) = 74,700
   2025: 0.20 × (415,000 – 41,500 – 74,700) = 59,760

4. (415,000 – 25,000)/10 = 39,000 × 6/12 = 19,500

Problem 9-5A (25 minutes)

Year	Depreciation Method[1]:		
	Straight-line	Double-declining balance	Units-of-production[2]
2023	(828,000 – 192,000)/10 = 63,600/year × 10/12 = 53,000	Rate = 2/10 = .20 or 20% 828,000 × 20% × 10/12 = 138,000	Rate = (828,000 – 192,000)/13,250 = 48/hour 48 × 720 = 34,560
2024	63,600	(828,000 – 138,000) × 20% = 138,000	48 × 1,780 = 85,440
2025	63,600	(828,000 – 138,000 – 138,000) × 20% = 110,400	48 × 1,535 = 73,680

1. *Depreciation is calculated to the nearest month.*
2. *Assume actual hours of service were: 2023: 720; 2024: 1,780; 2025: 1,535.*

Analysis component:
If you could ignore the matching principle, you might record the purchase of the boats as boat expense which means the entire cost of $828,000 would have been expensed in 2023, the year of purchase. This would have resulted in the net income being understated in 2023 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 boat expense 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 9-6A (25 minutes)

Year	Depreciation Method[1]:		
	Straight-line	Double-declining balance	Units-of-production[2]
2023	(828,000 – 192,000)/10 = 63,600/year × 6/12 = 31,800	Rate = 2/10 = .20 or 20% 828,000 × 20% × 6/12 = 82,800	Same as Problem 9-4A; Units-of-production is usage based and not affected by time 34,560
2024	63,600	(828,000 – 82,800) × 20% = 149,040	85,440
2025	63,600	(828,000 – 82,800 – 149,040) × 20% = 119,232	73,680

1. *Depreciation is calculated using the half-year convention.*
2. *Assume actual hours of service were: 2023: 720; 2024: 1,780; 2025: 1,535.*

Problem 9-7A (15 minutes)

1.

	2024				
Apr.	30	Depreciation Expense, Building		53,000	
		Accumulated Depreciation, Building			53,000
		To record annual depreciation;			
		742,000/14 = 53,000.			
	30	Depreciation Expense, Equipment		77,184	
		Accumulated Depreciation, Equipment			77,184
		To record annual depreciation;			
		Rate = 2/10 = .20 or 20%;			
		385,920 × 20% = 77,184.			

2.

Big Sky Farms
Partial Balance Sheet
April 30, 2024

Property, plant and equipment:		
Land		$730,000
Building	$742,000	
Less: Accumulated depreciation	636,000	106,000
Equipment	670,000	
Less: Accumulated depreciation	361,264	308,736
Total property, plant and equipment		$1,144,736

Problem 9-8A (50 minutes)

Part 1

	Market Value	*Percentage of Total*	*Apportioned Cost*
Building	$652,800	48%	$604,800
Land	462,400	34	428,400
Land improvements	68,000	5	63,000
Vehicles	176,800	13	163,800
Total	$1,360,000	100%	$1,260,000

2023				
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 2023 straight-line depreciation on building:
($604,800 – $41,040)/15 × 10/12 = $31,320

Part 3 2023 double-declining-balance depreciation on land improvements:
Rate = 2/5 = .40 or 40%
$63,000 × 40% × 10/12 = $21,000

Analysis component:
If the assets purchased on March 1, 2023 were put into service on May 23, 2023 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 9-9A (30 minutes)

Year	*Straight-Line*[a]	*Units-of-Production*[b]	*Double-Declining-Balance*[c]
2023	$ 38,000	$ 20,544	$ 84,000
2024	114,000	117,504	210,000
2025	114,000	114,816	105,000
2026	114,000	113,472	52,500
2027	76,000	89,664	4,500
Totals	$456,000	$456,000	$456,000

[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

Year	*Units*	*Unit Cost*	*Depreciation*
2023	21,400	$0.96	$ 20,544
2024	122,400	0.96	117,504
2025	119,600	0.96	114,816
2026	118,200	0.96	113,472
2027	102,000	0.96	89,664*
Total			$456,000

**Take only enough depreciation in Year 2027 to reach the maximum accumulated depreciation of $456,000 (which is cost less residual).*

[c]Double-declining-balance:

Rate = 2/4 = .50 or 50%

2023: 50% × 504,000 × 4/12 = 84,000

2024: 50% × (504,000 – 84,000) = 210,000

2025: 50% × (504,000 – 84,000 – 210,000) = 105,000

2026: 50% × (504,000 – 84,000 – 210,000 – 105,000) = 52,500

2027: 456,000 – 451,500* = 4,500

**Take only enough depreciation in Year 2027 to reach the maximum accumulated depreciation of $456,000 (which is cost less residual).*

Problem 9-10A (30 minutes)

Cost Information						Depreciation		
Description	Date of Purchase	Depreciation Method	Cost	Residual	Life	Balance of Accum. Deprec. Dec. 31, 2023	Deprec. Expense for 2024	Balance of Accum. Deprec. Dec. 31, 2024
Office Equipment	March 27/20	Straight-line	$52,000	$14,000	10 yr.	14,250[1]	3,800[2]	18,050[3]
Machinery	June 4/20	Double-declining balance	$275,000	$46,000	6 yr.	209,362[4]	19,638[5]	229,000[6]
Truck	Nov. 13/23	Units-of-production	$113,000	$26,000	250,000 km.	4,872[7]	23,664[8]	28,536[9]

1. [($52,000 − $14,000)/10 = $3,800/year × 3] + [(($52,000 − $14,000)/10)*9/12] = $14,250
2. (52,000 – 14,000)/10 = 3,800/year
3. 14,250 + 3,800 = 18,050
4. Rate = 2/6 = .3333 or 33.33%

   2020: 33.33% × 275,000 × 7/12 = 53,472
   2021: 33.33% × (275,000 – 53,472) = 73,843
   2022: 33.33% × (275,000 – 53,472 – 73,843) = 49,228
   2023: 33.33% × (275,000 – 53,472 – 73,843 – 49,228) = 32,819
   Accumulated depreciation at Dec. 31, 2023= $209,362
5. 2024: (275,000 – 46,000) 209,362 = $19,638
6. $209,362 + $19,638 = 229,000
7. Rate = (113,000 – 26,000)/250,000 = $0.348/km; 14,000 × 0.348 = 4,872
8. 68,000 × 0.348 = 23,664
9. 4,872 + 23,664 = 28,536

Problem 9-11A (20 minutes)

2023				
Mar.	26	Delivery Truck	96,200	
		Cash		96,200
		To record purchase of new truck;		
		$92,000 plus $4,200 freight costs.		
Dec.	31	Depreciation Expense, Delivery Truck[1]	12,930	
		Accumulated Depreciation, Delivery Truck		12,930
		To record depreciation from Mar. 26 to		
		Dec. 31, 2023.		
2024				
Dec.	31	Depreciation Expense, Delivery Truck[2]	21,160	
		Accumulated Depreciation, Delivery Truck		21,160
		To record depreciation.		

1. (96,200 – 10,000)/5 × 9/12 = 12,930

2. $\frac{96{,}200 - 12{,}930 - 14{,}500}{4 - 9/12 = 3.25} = 21{,}160$

Problem 9-12A (30 minutes)

2024				
Dec.	31	Depreciation Expense, Machinery[1]	95,200	
		Accumulated Depreciation, Machinery		95,200
		To record annual depreciation.		
	31	Depreciation Expense, Office Furniture[2]	11,733	
		Accumulated Depreciation, Office Furniture		11,733
		To record annual depreciation.		

Calculations:

1. $\frac{\text{Cost} - \text{Accumulated Depreciation} - \text{Residual}}{2} = \frac{556{,}800 - 246{,}400 - 120{,}000}{2} = 95{,}200$

2. $\frac{\text{Cost} - \text{Accumulated Depreciation} - \text{Residual}}{\textbf{5 – 2 = 3}} = \frac{89{,}600 - 49{,}600 - (11{,}200 - 6{,}400)}{\textbf{5 – 2 = 3}} = 11{,}733$

Problem 9-13A (20 minutes)

Part 1

2023			
Jan. 7	Machine #5027 – Blade (new)	10,400	
	Accumulated Depreciation, Machine #5027 – Blade	2,688[1]	
	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 2021;
   1,344 + 1,344 deprec. for 2022= 2,688 accum. deprec. at Dec. 31, 2022.

Part 2

Metal Housing	44,000 – 8,000 = 36,000; 36,000 ÷ 15 yrs = 2,400 for 2021 *PLUS* 2,400 for 2022= 4,800 accum. deprec. at Dec. 31/2022; Revised deprec. = 44,000 – 4,800 = 39,200 book value; 39,200 – 8,600 residual = 30,600 depreciable cost; 30,600 ÷ 18 years* =	$1,700
	**20 years – 2 yrs already depreciated = 18 yr remaining life*	
Motor	2021: 26,000 × 2/10 = 5,200 2022: 26,000 – 5,200 = 20,800 × 2/10 = 4,160 2023: 20,800 – 4,160 = 16,640 × 2/10 =	3,328
Blade	10,400 – 1,000 = 9,400; 9,400 ÷ 5 yrs =	1,880
Total depreciation expense to be recorded on Machine #5027 for 2023=		$6,908

Problem 9-14A (40 minutes)

Part 1

2023				
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:*

	Book Value	Recoverable Value	Impairment Loss
Land	$105,600	$136,400	NA
Building	57,200	105,600	NA
Equipment	52,800	28,600	$24,200
Furniture	29,700	15,400	14,300

Problem 9-14A (*concluded*)

Part 2

Safety-First Company
Balance Sheet
October 31, 2023

Assets			
Current assets:			
Cash		$ 11,000	
Accounts receivable	$ 19,800		
Less: Allowance for doubtful accounts	880	18,920	
Merchandise inventory		35,200	
Total current assets			$ 65,120
Property, plant and equipment:			
Land		$105,600	
Building	$136,400		
Less: Accumulated depreciation	79,200	57,200	
Equipment	$66,000[1]		
Less: Accumulated depreciation	37,400	28,600	
Furniture	$36,300[2]		
Less: Accumulated depreciation	20,900	15,400	
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			166,980[3]
Total liabilities and equity			$271,920

Calculations:

1. 90,200 cost – 24,200 impairment loss = 66,000
2. 50,600 cost – 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 9-15A (30 minutes)

1.

2024				
Sept.	27	Depreciation Expense, Building	4,950	
		Accumulated Depreciation, Building[1]		4,950
		To record building depreciation for 2024.		
	27	Cash	592,000	
		Accumulated Depreciation, Building[2]	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, Equipment[3]		16,133
		To record equipment depreciation for 2024.		
	2	Cash	56,800	
		Accumulated Depreciation, Equipment[4]	90,533	
		Loss on Disposal	23,867	
		Equipment		171,200
		To record sale of equipment.		

1. Depreciation from Jan. 1, 2021 to Sept. 27, 2024
   [(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, 2021 to Nov. 2, 2024
   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 9-16A (45 minutes)

1.

2023				
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.

2023				
Dec.	31	Depreciation Expense, Machine	17,080	
		Accumulated Depreciation, Machine		17,080
		To record depreciation;		
		(123,200 – 20,720)/6 = 17,080.		
2028				
Sept.	30	Depreciation Expense, Machine	12,810	
		Accumulated Depreciation, Machine		12,810
		To record partial year's depreciation;		
		17,080 × 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 9-16A *(continued)*

	Deprec. for 2023, 2024, 2025, 2026, and 2027.	Accum. Deprec. for 2028.

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 9-17A (15 minutes)

2023				
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 9-18A (45 minutes)

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

2023				
Dec.	31	Depreciation Expense, Machine 1550[1]	6,075	
		Accumulated Depreciation, Machine 1550		6,075
		To record depreciation.		
2026				
Dec.	31	Depreciation Expense, Machine 1795[3]	22,646	
		Accumulated Depreciation, Machine 1795		22,646
		To record depreciation.		
2027				
Dec.	31	Depreciation Expense, Machine BT-311[5]	77,810	
		Accum Depreciation, Machine BT-311		77,810
		To record depreciation.		

b. Purchase/exchange/disposal of each machine.

2023				
Apr.	1	Machine 1550	52,900	
		Cash		52,900
		To record purchase of Machine 1550.		
2026				
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.		
2027				
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.		
2030				
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 9-18A *(continued)*

Calculations:

1. $\frac{52,900 - 4,300}{6}$ = 8,100/year × 9/12 = 6,075

2. Depreciation 2023: 6,075
   2024: 8,100
   2025: 8,100
   2026: 2,025 (8,100× 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% × 60,390 × 9/12 = 22,646 (deprec. for 2026)

4. 50% × (60,390 – 22,646) × 9/12 = 14,154 (deprec. for 2027)
   + 22,646 (deprec. for 2026)
   36,800 (accum. deprec.)

5. (537,000 – 35,000)/200,000 = 2.51/unit
   2027: 31,000 units × 2.51/unit = 77,810

6. Depreciation for Jan. 1/2028 to August 21/2030
   = 108,000 units × 2.51/unit = 271,080
   +77,810 (2027)
   348,890 (accum. deprec.)

Problem 9-19A (10 minutes)

(a)

2023					
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 × 3/12 = 24,000.			

Problem 9-20A (30 minutes)

Part 1

2023			
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

2026			
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 9-21A (40 minutes)

Year 1				
Jan.	1	Trucks	22,000	
		Cash		22,000
		Record cost of truck ($20,515 + $1,485).		
Dec.	31	Depreciation Expense—Trucks	4,000	
		Accumulated Depreciation—Trucks		4,000
		Record depreciation [($22,000 - $2,000)/5].		
Year 2				
Dec.	31	Depreciation Expense—Trucks	5,200*	
		Accumulated Depreciation—Trucks		5,200
		Record depreciation.		

*Year 2 depreciation	
Total cost	$ 22,000
Less accumulated depreciation (from Year 1)	4,000
Book value	18,000
Less revised salvage value	2,400
Remaining cost to be depreciated	$ 15,600
Revised useful life	4 yrs.
Less one year used in Year 1	1 yrs.
Revised remaining useful life	3 yrs.
Total depreciation for Year 2 ($15,600/3)	$ 5,200

Year 3				
Dec.	31	Depreciation Expense—Trucks	5,200	
		Accumulated Depreciation—Trucks		5,200
		Record annual depreciation.		
Dec.	31	Cash	5,300	
		Accumulated Depreciation—Trucks	14,400**	
		Loss on Disposal of Trucks	2,300***	
		Trucks		22,000
		Record sale of truck.		

**Accumulated depreciation on truck at 12/31/Year 3	
Year 1	$ 4,000
Year 2	5,200
Year 3	5,200
Total	$14,400
***Book value of truck at 12/31/Year 3	
Total cost	$22,000
Less accumulated depreciation	(14,400)
Book value	$ 7,600
Loss ($5,300 cash received - $7,600 book value)	$ 2,300

***Problem 9-22A (30 minutes)**

Part 1

a.

2023				
Jun. 27	Depreciation Expense, Boat – Motor		2,660	
	Accumulated Depreciation, Boat – Motor			2,660
	To update depreciation in 2023 regarding motor being replaced.			
27	Boat – Motor (new)		63,000	
	Accumulated Depreciation, Boat – Motor		43,890[1]	
	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[2]	
	Accumulated Depreciation, Boat			3,113
	To record revised depreciation for 2023 on the boat (boat body plus motor).			

Calculations:

1. 53,200 ÷ 10 years = 5,320/year; 5,320 × 9/12 = 3,990 depreciation for 2015; 5,320 × 7 years for 2016 thru 2022= 37,240; 5,320/ year × 6/12 = 2,660 deprec. from Jan. 1/23 to June 27/23; 37,240 + 3,990 + 2,660 = 43,890 accumulated depreciation at June 27, 2023;

2. Body: Accumulated depreciation at Dec. 31, 2022:
23,800 – 7,000 = 16,800; 16,800 ÷ 15 years = 1,120/year; 1,120 × 9/12 = 840 depreciation for 2015; 1,120 × 7 years (2016 thru 2022) = 7,840; 7,840 + 840 = 8,680
Revised depreciation at Dec. 31, 2023 (rounded):
23,800 – 8,680 – 7,000 = 8,120 remaining depreciable cost; 8,120 ÷ 12.25[1] years = $ 663*

[1] *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 = 2,450

$3,113

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

Part 2

Total 2023 depreciation = $2,660 + $3,113 = $5,773

ALTERNATE PROBLEMS

Problem 9-1B (25 minutes)

Part 1

	Land	*Building B*	*Building C*	*Land Imprmnts. B*	*Land Imprmnts. C*
Purchase price*	$307,800	$183,600		$48,600	
Demolition	46,800				
Landscaping	69,000				
New building			$542,400		
New improvements					$40,500
Totals	$423,600	$183,600	$542,400	$48,600	$40,500

*Allocation of purchase price:

	Appraised Value	*Percent of Total*	*Apportioned Cost*
Land	$317,034	57%	$307,800
Building B	189,108	34	183,600
Land Improvements B	50,058	9	48,600
Totals	$556,200	100 %	$540,000

Part 2

June 1	Land	423,600	
	Building B	183,600	
	Building C	542,400	
	Land Improvements B	48,600	
	Land Improvements C	40,500	
	Cash		1,238,700
	To record costs of plant assets.		

Problem 9-2B (25 minutes)

Xentel Interactive
Balance Sheet
September 30

	2023		2022	
Assets				
Current assets:				
Cash	$ 900		$ 2,700	
Accounts receivable	1,800		4,320	
Prepaid insurance	-0-		1,530	
Total current assets		$ 2,700		$ 8,550
Property, plant and equipment:				
Land		68,400		68,400
Machinery	$295,200		$115,200	
Less: Accumulated depreciation	90,000	205,200	82,800	32,400
Building	$225,000		$225,000	
Less: Accumulated depreciation	54,000	171,000	50,400	174,600
Total property, plant and equipment		444,600		275,400
Intangible assets:				
Copyright	$ 7,200		$ 7,200	
Less: Accumulated amortization	1,080	6,120	540	6,660
Total assets		$453,420		$290,610
Liabilities				
Current liabilities:				
Accounts payable	$ 4,320		$ 3,150	
Unearned fees	82,800		5,580	
Total current liabilities		$ 87,120		$ 8,730
Non-current liabilities:				
Notes payable, due in 2027		230,220		55,800
Total liabilities		$317,340		$ 64,530
Equity				
Mason Xentel, capital		136,080*		226,080
Total liabilities and equity		$453,420		$290,610

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

Analysis component:
Xentel's assets were mainly financed by equity in 2022. In 2023, 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 (25 minutes)

Year	(a) Straight-line	(b) Double-declining-balance (Rate = 2/4 = .50 or 50%)	(c) Units-of-production (Rate = [(169,200 – 24,000)/181,500] = .80/unit)
2021	36,300[1]	50% × 169,200 = 84,600	30,640 (.80 × 38,300)
2022	36,300	50% × (169,200 – 84,600) = 42,300	32,920 (.80 × 41,150)
2023	36,300	$18,300[2]	42,080 (.80 × 52,600)
2024	36,300	0	39,560[3]

1. (169,200 – 24,000)/4 = 36,300/year
2. Maximum depreciation is limited to $145,200 which is cost less residual ($169,200 – $24,000) therefore depreciation for 2023 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 2024 is $39,560 calculated as $145,200 – $105,640 accumulated depreciation recorded to date.

Problem 9-4B (30 minutes)

Part 1. Purchase made on January 1, 2023	2023	2024	2025
A. Double-declining balance method			
Machinery	$588,000	$588,000	$588,000
Less: Accumulated depreciation	58,800	164,640	249,312
Year-end book value	$529,200	$423,360	$338,688
Depreciation expense for the year[1]	$58,800	$105,840	$84,672
B. Straight-line method			
Machinery	$588,000	$588,000	$588,000
Less: Accumulated depreciation	26,600	79,800	133,000
Year-end book value	$561,400	$508,200	$455,000
Depreciation expense for the year[2]	$26,600	$53,200	$53,200

1. Rate = 2/10 = .20 or 20%
   2023: 20% × 588,000 × 6/12 = 58,800 note – using half year rule
   2024: 20% × (588,000 – 58,800) = 105,840
   2025: 20% × (588,000 – 58,800 – 105,840) = 84,672

2. (588,000 – 56,000)/10 = 53,200 × 6/12 = 26,600

Problem 9-4B (continued)

Part 2. Purchase made on April 1, 2023	2023	2024	2025
A. Double-declining balance method			
Machinery	$588,000	$588,000	$588,000
Less: Accumulated depreciation	58,800	164,640	249,312
Year-end book value	$529,200	$423,360	$338,688
Depreciation expense for the year[1]	$58,800	$105,840	$84,672
B. Straight-line method			
Machinery	$588,000	$588,000	$588,000
Less: Accumulated depreciation	26,600	79,800	133,000
Year-end book value	$561,400	$508,200	$455,000
Depreciation expense for the year[2]	$26,600	$53,200	$53,200

3. Rate = 2/10 = .20 or 20%
   2023: 20% × 588,000 × 6/12 = 58,800 (note – using half year rule)
   2024: 20% × (588,000 – 58,800) = 105,840
   2025: 20% × (588,000 – 58,800 – 105,840) = 84,672

4. (588,000 – 56,000)/10 = 53,200 × 6/12 = 26,600

Problem 9-5B (30 minutes)

Year	Depreciation Method:		
	Straight-line	Double-declining balance	Units-of-production
2023	(145,000 – 25,000)/5 = 24,000/year × 2/12 = 4,000	Rate = 2/5 = .40 or 40% 145,000 × 40% × 2/12 = 9,667	Rate = (145,000 – 25,000)/100,000 = 1.20/km 1.20 × 5,800 = 6,960
2024	24,000	(145,000 – 9,667) × 40% = 54,133	1.20 × 19,400 = 23,280
2025	24,000	(145,000 – 9,667 – 54,133) × 40% = 32,480	1.20 × 22,850 = 27,420
2026	24,000	(145,000 – 9,667 – 54,133 – 32,480) × 40% = 19,488	1.20 × 25,700 = 30,840
2027	24,000	4,232*	1.20 × 19,980 = 23,976
2028	20,000	0	120,000 – 112,476 = 7,524**
Totals	120,000	120,000	120,000

*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 9-6B (30 minutes)

Year	Depreciation Method:		
	Straight-line	Double-declining balance	Units-of-production
2023	(145,000 – 25,000)/5 = 24,000/year × 6/12 = 12,000	Rate = 2/5 = .40 or 40% 145,000 × 40% × 6/12 = 29,000	Same as Problem 9-4B; Units-of-production is usage based and not affected by time 6,960
2024	24,000	(145,000 – 29,000) × 40% = 46,400	1.20 × 19,400 = 23,280
2025	24,000	(145,000 – 29,000 – 46,400) × 40% = 27,840	1.20 × 22,850 = 27,420
2026	24,000	(145,000 – 29,000 – 46,400 – 27,840) × 40% = 16,704	1.20 × 25,700 = 30,840
2027	24,000	56*	1.20 × 19,980 = 23,976
2028	12,000	0	120,000 – 112,476 = 7,524**
Totals	120,000	120,000	120,000

* 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 9-7B (15 minutes)

Part 1.

2024				
Dec.	31	Depreciation Expense, Machinery	55,000	
		Accumulated Depreciation, Machinery		55,000
		To record annual depreciation;		
		(500,000 – 60,000)/8 = 55,000		
	31	Depreciation Expense, Equipment	126,667	
		Accumulated Depreciation, Equipment		126,667
		To record annual depreciation;		
		Rate = 2/4 = .50 or 50%;		
		50% × (1,280,000 – 1,026,667) = 126,667		

Part 2.

WESTFAIR FOODS
Partial Balance Sheet
December 31, 2024

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 9-8B (30 minutes)

Part 1

	Market Value	*Percentage of Total*	*Apportioned Cost*
Building	$ 663,300	55%	$574,200
Land	397,980	33	344,520
Land improvements	120,600	10	104,400
Truck	24,120	2	20,880
Total	$1,206,000	100%	$1,044,000

2023				
Sept. 30	Building		574,200	
	Land		344,520	
	Land Improvements		104,400	
	Truck		20,880	
		Cash		1,044,000
	To record asset purchases.			

Part 2 2023 straight-line depreciation on building:

($574,200 – 45,000)/15 × 3/12 = $8,820

Part 3 2023 double-declining-balance depreciation on land improvements:

Rate = 2/8 = .25 or 25%
$104,400 × 25% × 3/12 = $6,525

Problem 9-9B (45 minutes)

Year	*Straight-Line*[a]	*Units-of-Production*[b]	*Double-Declining-Balance*[c]
2023	$ 31,304	$32,928	$ 72,800
2024	46,956	51,744	80,080
2025	46,956	47,040	48,048
2026	46,956	44,688	28,829
2027	46,956	37,240	5,023*
2028	15,652	21,140	0
Totals	$234,780	$234,780	$234,780

[a]Straight- line:

Cost per year = (273,000 – 38,220)/5 years = $46,956 per year × 8/12 = $31,304 for 2023

= $46,956/year × 4/12 = $15,652 for 2028

[b]Units-of-production:

Cost per unit = (273,000 – 38,220)/168,000 units = $1.40 per unit (rounded)

Year	*Units*	*Unit Cost*	*Depreciation*
2023	23,520	$1.40	$32,928
2024	36,960	1.40	51,744
2025	33,600	1.40	47,040
2026	31,920	1.40	44,688
2027	26,600	1.40	37,240
2028	30,940	1.40	21,140*
Total			$234,780

*Take only enough depreciation in Year 2028 to reach the maximum accumulated depreciation of $234,780.

[c]Double-declining-balance:

Rate = 2/5 = .40 or 40%
2023: 40% × 273,000 × 8/12 = 72,800
2024: 40% × (273,000 – 72,800) = 80,080
2025: 40% × (273,000 – 72,800 – 80,080) = 48,048
2026: 40% × (273,000 – 72,800 – 80,080 – 48,048) = 28,829
2027: 234,780 – 229,757* = 5,023

*Take only enough depreciation in Year 2027 to reach the maximum accumulated depreciation of $234,780.

Problem 9-10B (40 minutes)

Cost Information						Depreciation		
Description	Date of Purchase	Depreciation Method	Cost[1]	Residual	Life	Balance of Accum. Deprec. Apr. 30, 2023	Depreciation Expense for 2024	Balance of Accum. Deprec. Apr. 30, 2024
Equipment	Oct. 3/20	Straight-line	$ 62,400	$ 16,800	20 yr.	$ 5,890[1]	$ 2,280[2]	$ 8,170[3]
Machinery	Oct. 28/20	Units-of-production	540,000	180,000	100,000 units	73,332[4]	38,124[5]	111,456[6]
Tools	Nov. 3/20	Double-declining balance	64,000	15,000	5 yr.	45,568[7]	3,432[8]	49,000[9]

1. (62,400 – 16,800)/20 = 2,280/year × 2 7/12 = 5,890
2. (62,400 – 16,800)/20 = 2,280/year
3. 5,890 + 2,280 = 8,170
4. Rate = (540,000 – 180,000)/100,000 = 3.60/unit;
   2021: 940 × 3.60 = 3,384
   2022: 10,150 × 3.60 = 36,540
   2023: 9,280 × 3.60 = 33,408
   73,332
5. 10,590 × 3.60 = 38,124
6. 73,332 + 38,124 = 111,456
7. Rate = 2/5 = .40 or 40%

2021: 40% × 64,000 × 6/12 =	12,800
2022: 40% × (64,000 – 12,800) =	20,480
2023: 40% × (64,000 – 12,800 – 20,480) =	12,288
Accumulated depreciation at Apr. 30, 2023=	$45,568

8. 2024: (64,000 – 15,000) – 45,568 = 3,432
9. 45,568 + 3,432 = 49,000

Problem 9-11B (20 minutes)

2023				
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 to nearest whole month.		
2024				
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 × 6/12 = 7,200

2. [(71,820 + 3,780) – 7,200 – 10,100]/(6 – .5 = 5.5) = 10,600

Problem 9-12B (40 minutes)

2024				
Dec.	31	Depreciation Expense, Building[1]	1,620	
		Accumulated Depreciation, Building.....		1,620
		To record annual depreciation.		
	31	Depreciation Expense, Equipment[2].....	7,320	
		Accumulated Depreciation, Equipment.....		7,320
		To record annual depreciation.		

1. $\dfrac{\text{Cost} - \text{Accumulated Depreciation} - \text{Residual}}{20} = \dfrac{274{,}800 - 134{,}400 - 108{,}000}{20} = 1{,}620$

2. $\dfrac{\text{Cost} - \text{Accumulated Depreciation} - \text{Residual}}{10} = \dfrac{117{,}600 - 38{,}400 - 6{,}000}{10} = 7{,}320$

Problem 9-13B (40 minutes)

2023				
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. 2018 Deprec.: 27,000 × 2/10 = 5,400;
   2019 Deprec.: (27,000 – 5,400) × 2/10 = 4,320;
   2020 Deprec.: (27,000 – 9,720) × 2/10 = 3,456;
   2021 Deprec.: (27,000 – 13,176) × 2/10 = 2,765;
   2022 Deprec.: (27,000 – 15,941) × 2/10 = 2,212;
   Accum. Deprec. Dec. 31, 2022 = 5,400 + 4,320 + 3,456 + 2,765 + 2,212 = 18,153.

Part 2

Windows	51,750 ÷ 15 =	$ 3,450
Doors	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) =	7,950
Roofing	43,500 ÷ 10 =	4,350
Siding	54,000 ÷ 25 =	2,160
Framing/Walls	222,000 – 60,000 = 162,000; 162,000 ÷ 30 =	5,400
Furnace	39,000 × 2/16 =	4,875
Misc.	Maximum allowable depreciation reached[1]	-0-
Total depreciation expense to be recorded on the warehouse for 2023=		$28,185

1. 2018: 61,500 × 2/5 = 24,600;
   2019: (61,500 – 24,600) × 2/5 = 14,760;
   2020: (61,500 – 39,360) × 2/5 = 8,856;
   2021: (61,500 – 48,216) × 2/5 = 5,314;
   2022: (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 2022 is 54,000 – 53,530 = 470 with no depreciation recorded in any subsequent years.

Problem 9-14B (40 minutes)

Part 1

2023				
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:*

	Book Value	Recoverable Value	Impairment Loss
Computer equipment	$ 32,250	$6,250	$26,000
Land	145,000	172,500	NA
Machinery	88,750	65,000	23,750
Warehouse	173,500	243,750	NA

Problem 9-14B (*concluded*)

Part 2

La Mancha Enterprises
Balance Sheet
March 31, 2023

Assets			
Current assets:			
Cash		$ 35,000	
Accounts receivable	$ 57,500		
Less: Allowance for doubtful accounts	6,000	51,500	
Office supplies		4,875	
Total current assets			$ 91,375
Property, plant and equipment:			
Land		$145,000	
Warehouse	$ 460,000		
Less: Accumulated depreciation	286,500	173,500	
Machinery	$217,500[1]		
Less: Accumulated depreciation	152,500	65,000	
Computer equipment	$46,500[2]		
Less: Accumulated depreciation	40,250	6,250	
Total property, plant and equipment			389,750
Total assets			$481,125
Liabilities			
Current liabilities:			
Accounts payable	$ 14,750		
Salaries payable	33,750		
Current portion of long-term mortgage	59,550		
Total current liabilities		$108,050	
Non-current liabilities:			
Mortgage payable, less current portion		34,200	
Total liabilities			$142,250
Equity			
Joy La Mancha, capital			338,875[3]
Total liabilities and equity			$481,125

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 9-15B (45 minutes)

Part 1

2023				
Mar.	2	Depreciation Expense, Van	1,575	
		Accumulated Depreciation, Van[1]		1,575
		To record depreciation on van for 2023.		
	2	Cash	17,920	
		Accumulated Depreciation, Van[1]	42,175	
		Loss on Disposal	4,305	
		Van		64,400
		To record sale of van.		

Part 2

Aug.	27	Depreciation Expense, Machinery	12,642	
		Accumulated Depreciation, Machinery[2]		12,642
		To record depreciation on machinery for 2023.		
	27	Cash	95,718	
		Accumulated Depreciation, Machinery[2]	33,082	
		Machinery		128,800
		To record sale of machinery.		

Part 3

June	29	Depreciation Expense, Equipment	3,500	
		Accumulated Depreciation, Equipment[3]		3,500
		To record depreciation on equipment for 2023.		
	29	Cash	27,720	
		Accumulated Depreciation, Equipment[3]	48,300	
		Gain on Disposal		420
		Equipment		75,600
		To record sale of equipment.		

Calculations:

1. Depreciation from Feb. 1/23 to Mar. 2/23:

$$\frac{64{,}400 - 40{,}600 - 9{,}800}{40{,}000} = \$0.35/\text{km} \times 4{,}500\ \text{km} = 1{,}575$$

$$+\ 40{,}600$$

$$42{,}175$$

(calculations continued on next page)

Problem 9-15B (*concluded*)

2. Depreciation from Feb. 1/23 to Aug. 27/23:
   128,800 – 20,440 = 108,360 Book Value
   Rate = 2/10 = .20 or 20%
   108,360 × 20% × 7/12 = 12,642
   + 20,440
   33,082

3. Depreciation from Feb. 1/23 to June 29/23:
   $\frac{75,600 - 44,800 - 5,600}{3} \times 5/12 =$ 3,500
   + 44,800
   48,300

Problem 9-16B (60 minutes)

Part 1

2023				
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;		
		(165,828 – 21,600)/7 = 20,604		
2028				
Apr.	1	Depreciation Expense, Machine	5,151	
		Accumulated Depreciation, Machine		5,151
		To record partial year's depreciation;		
		20,604 × 3/12 = 5,151.		

Problem 9-16B (*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:

Depreciation

	Deprec. for 2023, 2024, 2025, 2026, 2027	**Deprec. for 2028**	
1. Accumulated depreciation =	(20,604 × 5 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 9-17B (20 minutes)

2023				
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 upgrade, betterment.			
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
= 56,400+[42,000–25,800]
= 56,400+16,200= 72,600

Problem 9-18B (45 minutes)

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

2023			
Dec. 31	Depreciation Expense, Machine 6690[1]	10,800	
	Accumulated Depreciation, Machine 6690		10,800
	To record depreciation.		
2025			
Dec. 31	Depreciation Expense, Machine 6691[3]	8,325	
	Accumulated Depreciation, Machine 6691		8,325
	To record depreciation.		
2028			
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

2023			
May 1	Machine 6690	72,900	
	Cash		72,900
	To record purchase of Machine 6690.		
2025			
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.		
2028			
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.		
2029			
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 9-18B *(continued)*

Calculations:

1. $\frac{72{,}900 - 8{,}100}{4} = 16{,}200/\text{year} \times 8/12 = 10{,}800$

2. Depreciation 2023: 10,800
   2024: 16,200
   2025: 9,450 (16,200 × 7/12)
   Accum. Deprec. 36,450

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

4. 2025: 8,325
   2026: 40% × (49,950 – 8,325) = 16,650
   2027: 40% × (49,950 – 8,325 – 16,650) = 9,990
   2028: 40% × (49,950 – 8,325 – 16,650 – 9,990) × 1/12 = 500
   35,465

5. (79,650 – 8,100)/75,000 = $0.954/unit

   2028: 7,500 units × 0.954/unit = 7,155

6. Depreciation for Jan. 1/2029 to Oct. 3/2029:
   = 11,250 units × 0.954/unit = 10,733
   7,155
   Accum. Deprec. 17,888

Problem 9-19B (20 minutes)

Part 1

a.

2023			
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 ÷ 5 = 44,160/year;		
	44,160 x 11/12 = 40,480.		

Part 2

Secure Software Group
Partial Balance Sheet
December 31, 2023

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 9-20B (30 minutes)

Part 1

2023				
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

2027				
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. deprec.			
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. deprec.			

***Problem 9-21B (40 minutes)**

Year 1				
Jan. 1	Machinery		114,270	
	Cash			114,270

Record costs of machinery ($107,800 +$6,470).

Dec. 31	Depreciation Expense—Machinery	17,425	
	Accumulated Depreciation—Machinery		17,425

Record depreciation [($114,270-$9,720)/6].

Year 2

Dec. 31	Depreciation Expense—Machinery	27,500*	
	Accum. Depreciation—Machinery		27,500

Record depreciation.

*Year 2 depreciation:	
Total cost	$114,270
Less accumulated depreciation (from Year 1)	17,425
Book value	96,845
Less revised salvage value	14,345
Remaining cost to be depreciated	$ 82,500
Revised useful life	4 yrs.
Less 1 year in Year 1	1 yrs.
Revised remaining useful life	3 yrs.
Total depreciation for Year 2 ($82,500/ 3 yrs)	$ 27,500

Year 3

Dec. 31	Depreciation Expense—Machinery	27,500	
	Accumulated Depreciation—Machinery		27,500

Record depreciation.

Dec. 31	Cash	25,240	
		72,425**	
	Accumulated Depreciation—Machinery		
	Loss on Disposal of Machinery	16,605***	
	Machinery		114,270

Record sale of machine.

**Accumulated depreciation on machine at 12/31/Year 3:	
Year 1	$ 17,425
Year 2	27,500
Year 3	27,500
Total	$ 72,425
***Book value of machine at 12/31/Year 3:	
Total cost	$114,270
Less accumulated depreciation	(72,425)
Book value	$ 41,845
Loss ($25,240 cash received - $41,845 book value)	$ 16,605

***Problem 9-22B (40 minutes)**

1.a. 2023

Oct. 3	Depreciation Expense, Equipment – Fan		4,320	
	Accum. Deprec., Equipment – Fan			4,320
	To update depreciation on replaced fan from Jan 1/23 to Oct 3/23.			
3	Cash		8,400	
	Accum. Deprec., Equipment – Fan		29,280[1]	
	Equipment – Fan (old)			32,400
	Gain on Disposal			5,280
	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 - Fan		22,370[2]	
	Accum. Deprec., Equipment - Fan			22,370
	To record depreciation for 2023 on the equipment (sum of all components).			

Calculations:

1. 32,400 – 3,600 = 28,800; 28,800 ÷ 5 yrs = 5,760/yr;
5,760 × 4/12 = 1,920 deprec. for 2018;
5,760/yr × 4 yrs (2019 to 2022 inclusive) = 23,040;
5,760/yr × 9/12 (max depreciation to depreciate 5 years) = 4,320 deprec. from Jan. 1/23 to Oct. 3/23;
1,920 + 23,040 + 4,320 = 29,280 accum. deprec. at Oct. 3/23.

***Problem 9-21B (*continued*)**

2.	Metal Frame	144,000 – 36,000 = 108,000; 108,000 ÷ 20 yrs = 5,400/yr; 5,400/yr × 4/12 = 1,800 deprec. for 2018 ; 5,400/yr × 4 yrs (2019 to 2022 inclusive) = 21,600; 1,800 + 21,600 = 23,400 accum. deprec. at Dec. 31/22; 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	2018: 96,000 × 2/10 × 4/12 = 6,400 2019: 96,000 – 6,400 = 89,600 × 2/10 = 17,920 2020: 89,600 – 17,920 = 71,680 × 2/10 = 14,336 2021: 71,680 – 14,336 = 57,344 × 2/10 = 11,469 2022: 57,344 – 11,469 = 45,875 × 2/10 = 9,175 2023: 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	2018: 27,600 × 2/5 × 4/12 = 3,680 2019: 27,600 – 3,680 = 23,920 × 2/5 = 9,568 2020: 23,920 – 9,568 = 14,352 × 2/5 = 5,741 2021: 14,352 – 5,741 = 8,611 × 2/5 = 3,444 2022: 8,611 – 3,444 = 5,167 × 2/5 = 2,067 which exceeds max.; maximum that can be taken in 2022 is 5,167 – 4,800 = 367; therefore, no depreciation is taken in 2023	-0-
			$22,370

Part 2
Total 2023 depreciation = $4,320 + $22,370 = $26,690

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

FFS 9-1

a.

Cost Information						Depreciation/Amortization		
Description	Date of Purchase	Deprec. Method	Original Cost	Residual	Life	Accum. Balance Dec. 31, 2022	Expense for 2023	Accum. Balance
Land	July 3/20		$280,000			n/a	n/a	n/a
Building	July 3/20	S/L	454,000	$40,000	15 yr.	$ 69,000[1]	$46,000[2]	$115,000
Machinery	Mar 20/20	Units	150,000	30,000	250,000	72,960[3]	31,200[4]	104,160
Truck	Mar 01/20	S/L	298,800	30,000	7 yr.	108,800[5]	38,400[6]	147,200
Furniture	Feb 18/20	DDB	24,000	3,000	5 yr.	18,240[7]	576[8]	-0-[10]
Patent	Nov 7/21	S/L	103,800	-0-	5 yr.	24,220[9]	20,760[9]	44,980
Office Equip.	Apr 10/23	DDB	65,143[11]	10,000	4 yr.	-0-	24,429[12]	24,429
Furniture	Apr 10/23	DDB	48,857[11]	4,000	5 yr.	-0-	14,657[13]	14,657

Calculations:

1. (454,000 – 40,000)/15 = 27,600/year x 6/12 = 13,800 for 2020
   27,600 for 2021
   27,600 for 2022
   69,000 Accum. deprec. at Dec. 31/22

2. (454,000 – 40,000 – 69,000)/(10 – 2.5 = 7.5) = 46,000 for 2023

3. (150,000 – 30,000)/250,000 = $0.48/unit x 45,000 = 21,600 for 2020
   x 55,000 = 26,400 for 2021
   x 52,000 = 24,960 for 2022
   72,960 Accum. deprec. at Dec. 31/22

4. $0.48/unit x 65,000 = 31,200 for 2023

5. (298,800 – 30,000)/7 = 38,400/year x 10/12 = 32,000 for 2020
   38,400 for 2021
   38,400 for 2022
   108,800 Accum. deprec. Dec. 31/22

6. (298,800 – 30,000)/7 = 38,400/year depreciation for 2023

FFS 9-1 (*continued*)

7. 24,000 x 2/5 x 10/12 = 8,000 for 2020
(24,000 – 8,000) x 2/5 = 6,400 for 2021
24,000 – (8,000 + 6,400)] x 2/5 = 3,840 for 2022
18,240 Accum. deprec. Dec. 31/22

8. [24,000 – (8,000 + 6,400 + 3,840)] x 2/5 x 3/12 = 576 for 2023

9. (103,800 – 0)/5 = 20,760/year x 2/12 = 3,460 for 2021
20,760 for 2022
24,220 Total dep. taken to Dec. 31/22

10. This has a -0- balance at December 31, 2023 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 2023

13. 48,857 x 2/5 x 9/12 = 14,657 for 2023

FFS 9-1 (*continued*)

b.

Times TeleCom
Income Statement
For Year Ended December 31, 2023

Revenues:		
Revenue 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, 2023

Susan Times, capital, January 1, 2023	$421,180
Add: Profit	444,794
Total	865,974
Less: Withdrawals by owner	204,000
Susan Times, capital, December 31, 2023	$661,974

FFS 9-1 (*continued*)

1.

Times TeleCom
Balance Sheet
December 31, 2023

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 2026		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 Spin Master and Recipe use the term 'amortization and depreciation' in the statements referenced in this question. To be consistent with the textbook, the answers use the term 'depreciation'.

a.

The $53,400 (thousand) represents the book value of the PPE. The December 31, 2020, book value is the $238,800 (thousand) total cost of the PPE assets less the $185,400 (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 Spin Masters Note 13 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 $53,400 (thousand) book value is reported in Note 2(l) (depreciation methods) and Note 13 (cost, accumulated depreciation, and net carrying amount).

c. The depreciation expense for the year ended December 31, 2020, was $35,700 (thousand). Although depreciation expense typically appears on the income statement, Spin Master does not detail it there but these amounts do appear on the statement of cash flows and in Notes 7, 13 and 14.

Part 2

a. Recipe's property, plant and equipment at December 27, 2020 is 25.5% of total assets calculated as ($538,276,000/$2,109,071,000) x 100.

b. Indigo's property, plant and equipment at March 28, 2020 represent 10.33% of total assets calculated as ($91,215,000/$882,970,000) x 100.

c. Recipe and Indigo operate in different industries: Recipe is an food service/production while Indigo operates bookstores. As such, Recipe has relatively little inventory in comparison to Indigo. Recipe's inventory at December 27, 2020 is $44,921 thousand or 2.1% of total assets (calculated as $44,921,000/$2,109,071,000 x 100). Indigo's inventory for 2020 is $241,821 thousand or 27.4% of total assets (calculated as $241,812,000/$882,970,000 x 100). Indigo needs a large stock of inventory in order to operate. R food service operations require inventory to move quickly through operations as it is perishable. 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 truck expenditures were recorded to the capital asset account.

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 2021 of $7,800 (36,000/24 months = 1,500/month insurance used x 10 months = 15,000 for 2021 vs. 36,000/5 yrs useful life = 7,200; 15,000 – 7,200 = 7,800). 2021 net income is not known but if it is assumed that it approximates 2022 net income as reported ($78,000), then the $7,800 overstatement of net income in 2021 is material in nature since it approximates 10%.

—The net income in 2022 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 2023 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 an addition to Truck asset account, or as Prepaid Insurance; this would have affected the impact of the misstatement in 2023.

—It is unclear from the information provided whether revised depreciation was calculated when the 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 (A betterment 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 2022. Therefore, net income in 2022 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 2022 and 2023.

—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 2021 and 2022 and potentially in 2023.

—It appears that the 2022 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 repairs and maintenance expenses and betterments so that they can deal appropriately with the manager responsible and negative repercussions with shareholders/owners.

*The goal is highly dependent on perspective.