CHAPTER 11

Depreciation, Impairments, and Depletion

ANSWERS TO QUESTIONS

1. The differences among the terms depreciation, depletion, and amortization are that they imply a cost allocation of different types of assets. Depreciation is employed to indicate that tangible plant assets have decreased in carrying value. Where natural resources (wasting assets) such as timber, oil, coal, and lead are involved, the term depletion is used. The expiration of intangible assets such as patents or copyrights is referred to as amortization.

LO: 1, Bloom: K, Difficulty: Simple, Time: 3-5, AACSB: Communication, AICPA BB: None, AICPA FC: Reporting, AICPA PC: Communication

2. The factors relevant in determining the annual depreciation for a depreciable asset are the initial recorded amount (cost), estimated salvage value, estimated useful life, and depreciation method.

Assets are typically recorded at their acquisition cost, which is in most cases objectively determinable. But cost assignment in other cases—"basket purchases" and the selection of an implicit interest rate in asset acquisitions under deferred-payment plans—may be quite subjective, involving considerable judgment.

The salvage value is the estimated amount that a company will receive when the asset is sold or when the asset is retired from service. The estimate is based on judgment and is affected by the length of the useful life of the asset.

The useful life is also based on judgment. It involves selecting the "unit" of measure of service life and estimating the number of such units embodied in the asset based on the company's experience with such assets. Such units may be measured in terms of time periods or in terms of activity (for example, years or machine hours). When selecting the life, one should select the lower (shorter) of the physical life or the economic life. Physical life involves wear and tear and casualties; economic life involves such things as technological obsolescence and inadequacy.

Selecting the depreciation method is generally a judgment decision, but a method may be inherent in the definition adopted for the units of service life, as discussed earlier. For example, if such units are machine hours, the method is a function of the number of machine hours used during each period. A method should be selected that will best measure the portion of services expiring each period. Once a method is selected, it may be objectively applied by using a predetermined, objectively derived formula.

LO: 1, Bloom: K, Difficulty: Simple, Time: 5-7, AACSB: Communication, AICPA BB: None, AICPA FC: Measurement, Reporting, AICPA PC: Communication

3. Disagree. Accounting depreciation is defined as an accounting process of allocating the costs of tangible assets to expense in a systematic and rational manner to the periods expected to benefit from the use of the asset. Thus, depreciation is not a matter of valuation but a means of cost allocation.

LO: 1, Bloom: K, Difficulty: Simple, Time: 3-5, AACSB: Communication, AICPA BB: None, AICPA FC: Reporting, AICPA PC: Communication

4. The carrying value of a fixed asset is its cost less accumulated depreciation. If the company estimates that the asset will have an unrealistically long life, the result will be to lower periodic depreciation charges, and hence accumulated depreciation. As a result the carrying value of the asset will be higher.

LO: 1, Bloom: K, Difficulty: Simple, Time: 3-5, AACSB: Communication, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

5. A change in the amount of annual depreciation recorded does not change the facts about the decline in economic usefulness. It merely changes reported figures. Depreciation in accounting consists of allocating the cost of an asset over its useful life in a systematic and rational manner. Abnormal obsolescence, as suggested by the plant manager, would justify more rapid depreciation, but increasing the depreciation charge would not necessarily result in funds for replacement. It would not increase revenue but simply make reported income lower than it would have been, thus preventing overstatement of net income.

Questions Chapter 11 (Continued)

Recording depreciation on the books does not set aside any assets for eventual replacement of the depreciated assets. Fund segregation can be accomplished but it requires additional managerial action. Unless an increase in depreciation is accompanied by an increase in sales price of the product, or unless it affects management's decision on dividend policy, it does not affect funds.

Ordinarily higher depreciation will not lead to higher sales prices and thus to more rapid "recovery" of the cost of the asset, and the economic factors present would have permitted this higher price regardless of the excuse given or the particular rationalization used. The price could have been increased without a higher depreciation charge.

The funds of a firm operating profitably do increase, but these may be used as working capital policy may dictate. The measure of the increase in these funds from operations is not merely net income, but that figure plus charges to operations which did not require working capital, less credits to operations which did not create working capital. The fact that net income alone does not measure the increase in funds from profitable operations leads some non-accountants to the erroneous conclusion that a fund is being created and that the amount of depreciation recorded affects the fund accumulation.

Acceleration of depreciation for purposes of income tax calculation stands in a slightly different category, since this is not merely a matter of recordkeeping. Increased depreciation will tend to postpone tax payments, and thus temporarily increase funds (although the liability for taxes may be the same or even greater in the long run than it would have been) and generate gain to the firm to the extent of the value of use of the extra funds.

LO: 2, Bloom: K, Difficulty: Simple, Time: 5-10, AACSB: Communication, AICPA BB: None, AICPA FC: Reporting, AICPA PC: Communication

6. Assets are retired for one of two reasons: physical factors or economic factors—or a combination of both. Physical factors are the wear and tear, decay, and casualty factors which hinder the asset from performing indefinitely. Economic factors can be interpreted to mean any other constraint that develops to hinder the service life of an asset. Some accountants attempt to classify the economic factors into three groups: **inadequacy, supersession**, and **obsolescence**. **Inadequacy** is defined as a situation where an asset is no longer useful to a given enterprise because the demands of the firm have changed. **Supersession** is defined as a situation where the replacement of an asset occurs because another asset is more efficient and economical. **Obsolescence** is the catchall term that encompasses all other situations and is sometimes referred to as the major concept when economic factors are considered.

LO: 2, Bloom: K, Difficulty: Simple, Time: 3-5, AACSB: Communication, AICPA BB: None, AICPA FC: Reporting, AICPA PC: Communication

7. Before the amount of the depreciation charge can be computed, three basic questions must be answered:
(1) What is the depreciation base to be used for the asset?
(2) What is the asset's useful life?
(3) What method of cost apportionment is best for this asset?

LO: 1, Bloom: K, Difficulty: Simple, Time: 3-5, AACSB: None, AICPA BB: None, AICPA FC: Measurement, Reporting, AICPA PC: None

8.

Cost	$800,000	Cost	$800,000
Depreciation rate	X .30*	Depreciation for 2020	(240,000)
Depreciation for 2020	$240,000	Undepreciated cost in 2021	560,000
		Depreciation rate	X .30*
2020 Depreciation	$240,000	Depreciation for 2021	$168,000

2021 Depreciation	168,000
Accumulated depreciation at December 31, 2021	$408,000

*[(1 ÷ 5 years) X 150%]

LO: 1, Bloom: AP, Difficulty: Simple, Time: 3-5, AACSB: None, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

Questions Chapter 11 (Continued)

9. Depreciation base:

Cost	$162,000
Salvage	(15,000)
	$147,000

Straight-line, $147,000 ÷ 20 =	$ 7,350
Units-of-output, $147,000 X 20,000/84,000 =	$35,000
Working hours, $147,000 X 14,300/42,000 =	$50,050
Sum-of-the-years'-digits, $147,000 X 20/210* =	$14,000
Double-declining-balance, $162,000 X .10 =	$16,200

$*\frac{20(20+1)}{2} = 210$

**[(1 ÷ 20) X 2]

LO: 1, Bloom: AP, Difficulty: Simple, Time: 3-5, AACSB: None, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

10. From a conceptual point of view, the method which best matches revenue and expenses should be used; in other words, the answer depends on the decline in the service potential of the asset. If the service potential decline is faster in the earlier years, an accelerated method would seem to be more desirable. On the other hand, if the decline is more uniform, perhaps a straight-line approach should be used. Many firms adopt depreciation methods for more pragmatic reasons. Some companies use accelerated methods for tax purposes but straight-line for book purposes because a higher net income figure is shown on the books in the earlier years, but a lower tax is paid to the government. Others attempt to use the same method for tax and accounting purposes because it eliminates some recordkeeping costs. Tax policy sometimes also plays a role.

LO: 1, Bloom: K, Difficulty: Simple, Time: 3-5, AACSB: Communication, AICPA BB: None, AICPA FC: Reporting, AICPA PC: Communication

11. The composite method is appropriate for a company which owns a large number of heterogeneous plant assets and which would find it impractical to keep detailed records for them.

The principal advantage is that it is not necessary to keep detailed records for each plant asset in the group. The principal disadvantage is that after a period of time the book value of the plant assets may not reflect the proper carrying value of the assets. Inasmuch as the Accumulated Depreciation account is debited or credited for the difference between the cost of the asset and the cash received from the retirement of the asset (i.e., no gain or loss on disposal is recognized), the Accumulated Depreciation account is self-correcting over time.

LO: 2, Bloom: K, Difficulty: Simple, Time: 3-5, AACSB: Communication, AICPA BB: None, AICPA FC: Reporting, AICPA PC: Communication

12.

Cash	14,000	
Accumulated Depreciation—Plant Assets	36,000	
Plant Assets		50,000

No gain or loss is recognized under the composite method.

LO: 2, Bloom: AP, Difficulty: Simple, Time: 5-10, AACSB: None, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

13. Original estimate: $2,500,000 ÷ 50 = $50,000 per year
Depreciation to January 1, 2021: $50,000 X 14 = $700,000
Depreciation in 2021 ($2,500,000 – $700,000) ÷ 15 years = $120,000

LO: 2, Bloom: K, Difficulty: Simple, Time: 3-5, AACSB: None, AICPA BB: None, AICPA FC: Reporting, AICPA PC: Communication

Questions Chapter 11 (Continued)

14. No, depreciation does not provide cash; revenues do. The funds for the replacement of the assets come from the revenues; without the revenues no income materializes and no cash inflow results. A separate decision must be made by management to set aside cash to accumulate asset replacement funds. Depreciation is added to net income on the statement of cash flows (indirect method) because it is a noncash expense, not because it is a cash inflow.

LO: 2, Bloom: K, Difficulty: Simple, Time: 3-5, AACSB: None, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

15. 1.0 ÷ 4 years = 25% straight-line rate X 2 = 50%* double-declining rate
$8,000 X 50%* = $4,000 Depreciation for first full year.
$4,000 X 6/12 = $2,000 Depreciation for half a year (first year), 2020.
$6,000 ($8,000-$2,000) X 50%* = $3,000 Depreciation for 2021.

LO: 2, Bloom: AP, Difficulty: Simple, Time: 3-5, AACSB: None, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

16. The accounting standards require that if events or changes in circumstances indicate that the carrying amount of such assets may not be recoverable, then the carrying amount of the asset should be assessed. The assessment or review takes the form of a recoverability test that compares the sum of the expected future cash flows from the asset (undiscounted) to the carrying amount. If the cash flows are less than the carrying amount, the asset has been impaired. The impairment loss is measured as the amount by which the carrying amount exceeds the fair value of the asset. The fair value of assets is measured by their market value if an active market for them exists. If no market price is available, the present value of the expected future net cash flows from the asset may be used.

LO: 3, Bloom: K, Difficulty: Simple, Time: 3-5, AACSB: Communication, AICPA BB: None, AICPA FC: Reporting, AICPA PC: Communication

17. Under U.S. GAAP, impairment losses on assets held for use may not be restored.

LO: 3, Bloom: K, Difficulty: Simple, Time: 3-5, AACSB: Communication, AICPA BB: None, AICPA FC: Reporting, AICPA PC: Communication

18. An impairment is deemed to have occurred if, in applying the recoverability test, the carrying amount of the asset exceeds the expected future net cash flows from the asset. In this case, the expected future net cash flows of $705,000 exceed the carrying amount of the equipment of $700,000, so no impairment is assumed to have occurred; thus, no measurement of the loss is made or recognized even though the fair value is $590,000.

LO: 3, Bloom: K, Difficulty: Simple, Time: 3-5, AACSB: Communication, AICPA BB: None, AICPA FC: Reporting, AICPA PC: Communication

19. Impairment losses are reported as part of income from continuing operations, generally in the “Other expenses and losses” section. Impairment losses (and recovery of losses for assets to be disposed of) are similar to other costs that would flow through operations. Thus, gains (recoveries of losses) on assets to be disposed of should be reported as part of income from continuing operations in the “Other revenues and gains” section.

LO: 3, Bloom: K, Difficulty: Simple, Time: 3-5, AACSB: Communication, AICPA BB: None, AICPA FC: Reporting, AICPA PC: Communication

20. In a decision to replace or not to replace an asset, the undepreciated cost of the old asset is not a factor to be considered. Therefore, the decision to replace plant assets should not be affected by the amount of depreciation that has been recorded. The relative efficiency of new equipment as compared with that presently in use, the cost of the new facilities, the availability of capital for the new asset, etc., are the factors entering into the decision. Normally, the fact that the asset had been fully depreciated through the use of some accelerated depreciation method, although the

asset was still in use, should not cause management to decide to replace the asset. If the new asset under consideration for replacement was not any more efficient than the old, or if it cost a good deal more in relationship to its efficiency, it is illogical for management to replace it merely because all or the major portion of the cost had been charged off for tax and accounting purposes.

Questions Chapter 11 (Continued)

If depreciation rates were higher it might be true that a business would be financially more able to replace assets, since during the earlier years of the asset's use a larger portion of its cost would have been charged to expense, and hence during this period a smaller amount of income tax paid. By selling the old asset, which might result in a capital gain, and purchasing a new asset, the higher depreciation charge might be continued for tax purposes. However, if the asset were traded in, having taken higher depreciation would result in a lower basis for the new asset.

It should be noted that expansion (not merely replacement) might be encouraged by increased depreciation rates. Management might be encouraged to expand, believing that in the first few years when they are reasonably sure that the expanded facilities will be profitable, they can charge off a substantial portion of the cost as depreciation for tax purposes. Similarly, since a replacement involves additional capital outlays, the tax treatment may have some influence.

Also, because of the inducement to expand or to start new businesses, there may be a tendency in the economy as a whole for the accounting and tax treatment of the cost of plant assets to influence the retirement of old plant assets.

It should be noted that increased depreciation may cause management to alter its decision about replacement.

LO: 2, Bloom: K, Difficulty: Moderate, Time: 5-10, AACSB: Communication, Reflective Thinking, AICPA BB: None, AICPA FC: Reporting, AICPA PC: Communication

21. In lieu of recording depreciation on replacement costs, management might elect to make annual appropriations of retained earnings in contemplation of replacing certain facilities at higher price levels. Such appropriations might help to eliminate misunderstandings as to amounts available for distribution as dividends, higher wages, bonuses, or lower sales prices. The need for these appropriations can be explained by supplementary financial schedules, explanations, and footnotes accompanying the financial statements. (However, neither depreciation charges nor appropriations of retained earnings result in the accumulation of funds for asset replacement. Fund accumulation is a result of profitable operations and appropriate funds management.)

LO: 2, Bloom: K, Difficulty: Simple, Time: 3-5, AACSB: Communication, AICPA BB: None, AICPA FC: Reporting, AICPA PC: Communication

22. (a) Depreciation and cost depletion are similar accounting concepts in that:

1. The cost of the asset is the starting point from which computation of the amount of the periodic charge to operations is made.
2. The estimated life is based on economic or productive life.
3. The accumulated total of past charges to operations is deducted from the original cost of the asset on the balance sheet.
4. When output methods of computing depreciation charges are used, the formulas are essentially the same as those used in computing depletion charges.
5. Both represent an apportionment of cost under the process of matching costs with revenue.
6. Assets subject to either are reported in the same classification on the balance sheet.
7. Appraisal values are sometimes used for depreciation while discovery values are sometimes used for depletion.
8. Salvage value is properly recognized in computing the charge to operations.
9. Depreciation and depletion may be included in inventory if the related asset contributed to the production of the inventory.
10. The rates may be changed upon revision of the estimated productive life used in the original rate computations.

(b) Depreciation and cost depletion are dissimilar accounting concepts in that:

1. Depletion is almost always based on output whereas depreciation is usually based on time.
2. Many formulas are used in computing depreciation but only one is used to any extent in computing depletion.
3. Depletion applies to natural resources while depreciation applies to plant and equipment.

4. Depletion refers to the physical exhaustion or consumption of the asset while depreciation refers to the wear, tear, and obsolescence of the asset.
5. Under statutes that base the legality of dividends on accumulated earnings, depreciation is usually a required deduction but depletion is usually not a required deduction.
6. The computation of the depletion rate is usually much less precise than the computation of depreciation rates because of the greater uncertainty in estimating the productive life.
7. A difference that is temporary in nature arises from the timing of the recognition of depreciation under conventional accounting and under the Internal Revenue Code, and it results in the recording of deferred income taxes. On the other hand, the difference between cost depletion under conventional accounting and its counterpart, percentage depletion, under the Internal Revenue Code is permanent and does not require the recording of deferred income taxes.

LO: 4, Bloom: K, Difficulty: Simple, Time: 5-10, AACSB: Communication, AICPA BB: None, AICPA FC: Reporting, AICPA PC: Communication

23. Cost depletion is the procedure by which the capitalized costs, less residual land values, of a natural resource are systematically charged to operations. The purpose of this procedure is to match the cost of the resource with the revenue it generates. The usual method is to divide the total cost less residual value by the estimated number of recoverable units to arrive at a depletion charge for each unit removed. A change in the estimate of recoverable units will necessitate a revision of the unit charge.

Percentage depletion is the procedure, authorized by the Internal Revenue Code, by which a certain percentage of gross income is charged to operations in arriving at taxable income. Percentage depletion is not considered to be a generally accepted accounting principle because it is not related to the cost of the asset and is allowed even though the property is fully depleted under cost depletion accounting. Applicable rates, ranging from 5% to 22% of gross income, are specified for nearly all natural resources. The total amount deductible in a given year may not be less than the amount computed under cost depletion procedures, and it may not exceed 50% of taxable income from the property before the depletion deduction. Cost depletion differs from percentage depletion in that cost depletion is a function of production whereas percentage depletion is a function of income.

Percentage depletion has arisen, in part, from the difficulty of valuing the natural resource or determining the discovery value of the asset and of determining the recoverable units. Although other arguments have been advanced for maintaining percentage depletion, a primary argument is its value in encouraging the search for additional resources. It is deemed to be in the national interest to provide an incentive to the continuing search for natural resources. As noted in the textbook, percentage depletion is no longer permitted for many enterprises.

LO: 4, Bloom: K, Difficulty: Simple, Time: 5-10, AACSB: Communication, AICPA BB: None, AICPA FC: Reporting, AICPA PC: Communication

24. Percentage depletion does not necessarily measure the proper share of the cost of a natural resource to be charged to expense for depletion and, in fact, may ultimately exceed the actual cost of the property.

LO: 4, Bloom: K, Difficulty: Simple, Time: 3-5, AACSB: Communication, AICPA BB: None, AICPA FC: Reporting, AICPA PC: Communication

25. The maximum dividend permissible is the amount of accumulated net income (after depletion) plus the amount of depletion charged. This practice can be justified for companies that expect to extract natural resources and not purchase additional properties. In effect, such companies are distributing gradually to stockholders their original investments.

LO: 4, Bloom: K, Difficulty: Simple, Time: 3-5, AACSB: Communication, AICPA BB: None, AICPA FC: Reporting, AICPA PC: Communication

26. Reserve recognition accounting (RRA) is the method (a fair value approach) that was proposed by the SEC to account for oil and gas resources. Proponents of this approach argue that oil and gas should be valued at the date of discovery. The value of the reserve still in the ground is estimated and this amount, appropriately discounted, is reported on the balance sheet as "oil deposits."

Questions Chapter 11 (Continued)

The oil companies are concerned because the valuation issue is extremely tenuous. For example, to properly value the reserves, the following must be estimated: (1) amount of the reserves, (2) future production costs, (3) periods of expected disposal, (4) discount rate, and (5) the selling price.

LO: 4, Bloom: K, Difficulty: Simple, Time: 3-5, AACSB: Communication, AICPA BB: None, AICPA FC: Measurement Reporting, AICPA PC: Communication

27. Using full-cost accounting, the cost of unsuccessful ventures as well as those that are successful is capitalized, because a cost of drilling a dry hole is a cost that is needed to find the commercially profitable wells. Successful efforts accounting capitalizes only those costs related to successful projects. They contend that to measure cost and effort accurately for a single property unit, the only measure is in terms of the cost directly related to that unit. In addition, it is argued that full-cost is misleading because capitalizing all costs will make an unsuccessful company over a short period of time show no less income than does one that is successful.

LO: 4, Bloom: K, Difficulty: Simple, Time: 3-5, AACSB: Communication, AICPA BB: None, AICPA FC: Reporting, AICPA PC: Communication

28. Asset turnover:

$$\frac{\$71,879}{\$38,215} = 1.88 \text{ times}$$

Return on assets:

$$\frac{\$2,934}{\$38,215} = 7.68\%$$

LO: 5, Bloom: AP, Difficulty: Simple, Time: 3-5, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

***29.** The modified accelerated cost recovery system (MACRS) has been adopted by the Internal Revenue Service. It applies to depreciable assets acquired in 1987 and later. MACRS eliminates the need to determine each asset's useful life. The selection of a depreciation method and a salvage value is also unnecessary under MACRS. The taxpayer determines the recovery deduction for an asset by applying a statutory percentage to the historical cost of the property. MACRS was adopted to permit a faster write-off of tangible assets so as to provide additional tax incentives and to simplify the depreciation process. The simplification should end disputes related to estimated useful life, salvage value, and so on.

LO: 5, Bloom: K, Difficulty: Simple, Time: 3-5, AACSB: Communication, AICPA BB: None, AICPA FC: Reporting, AICPA PC: Communication

SOLUTIONS TO BRIEF EXERCISES

BRIEF EXERCISE 11.1

2020: $\frac{(\$50,000 - \$2,000) \times 23,000}{160,000} = \underline{\$6,900}$

2021: $\frac{(\$50,000 - \$2,000) \times 31,000}{160,000} = \underline{\$9,300}$

LO: 1, Bloom: AP, Difficulty: Simple, Time: 3-5, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

BRIEF EXERCISE 11.2

(a) $\frac{\$80,000 - \$8,000}{8} = \underline{\$9,000}$

(b) $\frac{\$80,000 - \$8,000}{8} \times 4/12 = \underline{\$3,000}$

LO: 1, Bloom: AP, Difficulty: Simple, Time: 3-5, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

BRIEF EXERCISE 11.3

(a) ($80,000 – $8,000) X 8/36* = <u>$16,000</u>

(b) [($80,000 – $8,000) X 8/36] X 9/12 = <u>$12,000</u>

*[8(8 + 1)] ÷ 2

LO: 1, Bloom: AP, Difficulty: Simple, Time: 3-5, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

BRIEF EXERCISE 11.4

(a) $80,000 X .25* = <u>$20,000</u>

(b) ($80,000 X .25) X 3/12 = <u>$5,000</u>

*(1/8 X 2)

LO: 1, Bloom: AP, Difficulty: Simple, Time: 3-5, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

BRIEF EXERCISE 11.5

Depreciable Base = ($28,000 + $200 + $125 + $500 + $475) – $3,000 = $26,300.

LO: 1, Bloom: AP, Difficulty: Simple, Time: 3-5, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

BRIEF EXERCISE 11.6

Asset	Depreciation Expense	
A	($70,000 – $7,000)/10 =	$ 6,300
B	($50,000 – $5,000)/5 =	9,000
C	($82,000 – $4,000)/12 =	6,500
	$202,000	$21,800

Composite rate = $21,800/$202,000 = 10.8%
Composite life = $186,000*/$21,800 = 8.5 years

***($63,000 + $45,000 + $78,000)**

LO: 2, Bloom: AP, Difficulty: Simple, Time: 5-7, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

BRIEF EXERCISE 11.7

Annual depreciation expense: ($8,000 – $1,000)/5 = $1,400
Book value, 1/1/21: $8,000 – (2 x $1,400) = $5,200*
Depreciation expense, 2021: ($5,200* – $500)/2 = $2,350

LO: 2, Bloom: AP, Difficulty: Simple, Time: 3-5, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

BRIEF EXERCISE 11.8

Recoverability test:
Future net cash flows ($500,000) < Carrying amount ($520,000*); therefore, the asset has been impaired.

Journal entry:

Loss on Impairment	**120,000**	
Accumulated Depreciation—Equipment ($520,000 – $400,000)		**120,000**

***($900,000 - $380,000)**

LO: 3, Bloom: AP, Difficulty: Simple, Time: 3-5, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

BRIEF EXERCISE 11.9

Inventory	**73,500****	
Coal Mine		**73,500**

$$\frac{(\$400{,}000 + \$100{,}000 + \$80{,}000 - \$160{,}000)}{4{,}000} = \underline{\$105^{*} \text{ per ton}}$$

$$700 \text{ X } \$105^{*} = \underline{\$73{,}500^{**}}$$

LO: 4, Bloom: AP, Difficulty: Simple, Time: 3-5, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

BRIEF EXERCISE 11.10

(a) Asset turnover:

$$\frac{\$7{,}890}{\frac{(\$7{,}837 + \$7{,}726)}{2}} = 1.0139^{*} \text{ times}$$

(b) Profit margin on sales:

$$\frac{\$887}{\$7{,}890} = 11.24\%$$

(c) Return on assets:

1. $1.0139 \text{ X } .1124 = 11.40\%$

2. $$\frac{\$887}{\frac{(\$7{,}837 + \$7{,}726)}{2}} = 11.40\%$$

LO: 5, Bloom: AP, Difficulty: Simple, Time: 3-5, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

*BRIEF EXERCISE 11.11

2020:	**$50,000 X 20%**	**=**	**$10,000**
2021:	**$50,000 X 32%**	**=**	**16,000**
2022:	**$50,000 X 19.2%**	**=**	**9,600**
2023:	**$50,000 X 11.52%**	**=**	**5,760**
2024:	**$50,000 X 11.52%**	**=**	**5,760**
2025:	**$50,000 X 5.76%**	**=**	**2,880**
			$50,000

LO: 6, Bloom: AP, Difficulty: Simple, Time: 3-5, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

SOLUTIONS TO EXERCISES

EXERCISE 11.1 (15–20 minutes)

(a) Straight-line method depreciation for each of Years 1 through 3 =

$$\frac{(\$469{,}000 - \$40{,}000)}{12} = \underline{\$35{,}750}$$

(b) Sum-of-the-Years'-Digits = $\frac{[12 \times (12+1)]}{2} = 78$

12/78 X ($469,000 – $40,000) = $66,000 depreciation Year 1
11/78 X ($469,000 – $40,000) = $60,500 depreciation Year 2
10/78 X ($469,000 – $40,000) = $55,000 depreciation Year 3

(c) Double-Declining Balance method = $\frac{1.0}{12} \times 2 = 16.67\%$
(depreciation rate)

$469,000 X .1667 = $78,182 depreciation Year 1
($469,000 – $78,182) X .1667 = $65,149 depreciation Year 2
($469,000 – $78,182 – $65,149) X .1667 = $54,289 depreciation Year 3

LO: 1, Bloom: AP, Difficulty: Simple, Time: 15-20, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

EXERCISE 11.2 (20–25 minutes)

(a) If there is any salvage value and the amount is unknown (as is the case here), the cost would have to be determined by looking at the data for the double-declining balance method.

$\frac{100\%}{5}$ **= 20% Straight-line rate; 20% X 2 = 40% Double declining balance rate**

Cost X 40% = $20,000
$20,000 ÷ .40 = $50,000 Cost of asset

(b) $50,000 cost [from (a)] – $45,000 total depreciation = $5,000 salvage value.

EXERCISE 11.2 (Continued)

(c) The highest charge to income for Year 1 will be yielded by the double-declining balance method, with depreciation expense of $20,000.

(d) The highest charge to income for Year 4 will be yielded by the straight-line method with depreciation expense of $9,000.

(e) The method that produces the highest book value at the end of Year 3 would be the method that yields the lowest accumulated depreciation at the end of Year 3, which is the straight-line method.

Computations:
St.-line = $50,000 – ($9,000 + $9,000 + $9,000) = $23,000 book value, end of Year 3.
S.Y.D. = $50,000 – ($15,000 + $12,000 + $9,000) = $14,000 book value, end of Year 3.
D.D.B. = $50,000 – ($20,000 + $12,000 + $7,200) = $10,800 book value, end of Year 3.

(f) The method that will yield the highest gain (or lowest loss) if the asset is sold at the end of Year 3 is the method which will yield the lowest book value at the end of Year 3, which is the double-declining balance method in this case.

LO: 1, Bloom: AP, Difficulty: Moderate, Time: 20-25, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

EXERCISE 11.3 (15–20 minutes)

(a) $\dfrac{[20\ (20 + 1)]}{2} = 210$

9/12 X 20/210 X ($711,000 – $60,000) = $46,500 for 2020

	3/12 X 20/210 X ($711,000 – $60,000)	=	$15,500	
+	9/12 X 19/210 X ($711,000 – $60,000)	=	44,175	
			$59,675	for 2021

EXERCISE 11.3 (Continued)

(b) $\frac{1.0}{20}$ **= 5% Straight-line rate; .05 X 2 = 10% Double declining balance rate**

9/12 X .10 X $711,000 = $53,325 for 2020

.10 X ($711,000 – $53,325) = $65,768 for 2021

LO: 1, Bloom: AP, Difficulty: Simple, Time: 15-20, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

EXERCISE 11.4 (15–25 minutes)

(a) $315,000 – $15,000 = $300,000* Depreciable base; $300,000 ÷ 10 yrs. = $30,000

(b) $300,000 ÷ 240,000 units = $1.25; 25,500 units X $1.25 = $31,875

(c) $300,000 ÷ 25,000 hours = $12.00 per hr.; 2,650 hrs. X $12.00 = 31,800

(d) $(10 + 9 + 8 + 7 + 6 + 5 + 4 + 3 + 2 + 1) = 55$ **OR** $\frac{n(n+1)}{2} = \frac{[10(10+1)]}{2} = 55$

$\frac{10}{55}$ **X $300,000 X 4/12 =**	**$18,182**
$\frac{9}{55}$ **X $300,000 X 8/12 =**	**32,727**
Total for 2021	**$50,909**

(e)

$315,000 X .20 X 4/12 =	**$21,000**
[$315,000 – ($315,000 X .20)] X .20 X 8/12 =	**33,600**
Total for 2021	**$54,600**

[May also be computed as .20 X [$315,000 – (8/12 X .20 X 315,000)]

[(1.0 ÷ 10) X 2] = 20% Double declining balance rate

LO: 1, Bloom: AP, Difficulty: Simple, Time: 15-20, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

EXERCISE 11.5 (20–25 minutes)

(a) $\frac{(\$117,900 - \$12,900)}{5}$ = $21,000/yr. = $21,000 X 5/12 = **$8,750**

2020 Depreciation—Straight line = $8,750

(b) $\frac{(\$117,900 - \$12,900)}{21,000}$ = $5.00/hr.

2020 Depreciation—Machine Usage = 800 X $5.00 = $4,000

(c)

Machine Year	Total	Allocated to 2020	Allocated to 2021
1	5/15 X $105,000* = $35,000	$14,583**	$20,417***
2	4/15 X $105,000 = $28,000		11,667****
	[5 x (5 + 1)] / 2	$14,583	$32,084

* $117,900 − $12,900
** $35,000 X 5/12 = $14,583
*** $35,000 X 7/12 = $20,417
**** $28,000 X 5/12 = $11,667

2021 Depreciation—Sum-of-the-Years'-Digits = $32,084

(d) **2020** .40 X ($117,900) X 5/12 = **$19,650**

2021 .40 X ($117,900 – $19,650) = **$39,300**

OR (1.0 ÷ 5 years) X 2 = D.D.B. Rate of 40%

1st full year (.40 X $117,900) = $47,160

2nd full year [.40 X ($117,900 – $47,160)] = $28,296

2020 Depreciation = 5/12 X $47,160 = $19,650

2021 Depreciation = 7/12 X $47,160 = $27,510
5/12 X $28,296 = 11,790
$39,300

LO: 1, Bloom: AP, Difficulty: Simple, Time: 20-25, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

EXERCISE 11.6 (20–30 minutes)

(a) 2020 Straight-line $\frac{\$212,000 - \$12,000}{8} = \$25,000/\text{year}$

3 months—Depreciation $6,250 = ($25,000 X 3/12)

(b) 2020 Output $\frac{\$212,000 - \$12,000}{40,000} = \$5.00/\text{output unit}$

1,000 units X $5.00 = $5,000

(c) 2020 Working hours $\frac{\$212,000 - \$12,000}{20,000} = \$10.00/\text{hour}$

525 hours X $10.00 = $5,250

(d) $(8 + 7 + 6 + 5 + 4 + 3 + 2 + 1) = 36$ OR $\frac{n\,(n + 1)}{2} = \frac{8(9)}{2} = 36$

			Allocated to		
Sum-of-the-years'-digits	**Total**	**2020**	**2021**	**2022**
Year 1	8/36 X $200,000 =	$44,444	$11,111[a]	$33,333[b]	
2	7/36 X $200,000 =	$38,889		9,722[c]	$29,167[d]
3	6/36 X $200,000 =	$33,333			8,333[e]
			$11,111	$43,055	$37,500

2022: $37,500 = (9/12 of 2nd year of machine's life plus 3/12 of 3rd year of machine's life)

[a] $44,444 X 3/12
[b] $44,444 X 9/12
[c] $38,889 X 3/12
[d] $38,889 X 9/12
[e] $33,333 X 3/12

(e) Double-declining balance 2021: 1.0/8 X 2 = 25%.

2020: .25 X $212,000 X 3/12 = $13,250

2021: .25 X ($212,000 – $13,250) = $49,688

EXERCISE 11.6 (Continued)

OR

1st full year (.25 X $212,000) = $53,000

2nd full year [.25 X ($212,000 – $53,000)] = $39,750

2020 Depreciation 3/12 X $53,000 = $13,250

2021 Depreciation 9/12 X $53,000 = $39,750
3/12 X $39,750 = 9,938
$49,688

LO: 1, Bloom: AP, Difficulty: Moderate, Time: 20-30, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

EXERCISE 11.7 (25–35 minutes)

(a) Methods of Depreciation

Description	Date Purchased	Cost	Salvage	Life	Method	Accum. Depr. to 2021	2022 Depr.
A	2/12/20	$142,500	$16,000	10	(a) SYD	$33,350	(b) $19,550
B	8/15/19	(c) 79,000	21,000	5	SL	29,000	(d) 11,600
C	7/21/18	75,400	23,500	8	DDB	(e) 47,567	(f) 4,333
D	(g) 10/15/20	219,000	69,000	5	SYD	70,000	(h) 35,000

Machine A—Testing the methods

Straight-Line Method for 2020	$ 6,325	[($142,500 – $16,000) ÷ 10] X 1/2
Straight-Line Method for 2021	$12,650	
Total Straight Line	$18,975	
Double-Declining Balance for 2020	$14,250	($142,500 X .2 (1/5 years) X 1/2)
Double-Declining Balance for 2021	$25,650	[($142,500 – $14,250) X .20]
Total Double Declining Balance	$39,900	
Sum-of-the-years-digits for 2020	$11,500	[($142,500 – $16,000) X 10/55 X 1/2]
Sum-of-the-years-digits for 2021	$21,850	($126,500 X 10/55 X 1/2) + ($126,500 X 9/55 X 1/2)
Total Sum-of-the-years-digits	$33,350	
(b) Method used must be	SYD	
Using SYD, 2022 Depreciation is	$19,550	($126,500 X 9/55 X 1/2) +

($126,500 X 8/55 X 1/2)

EXERCISE 11.7 (Continued)

(c) Machine B—Computation of the cost
Asset has been depreciated for 2 1/2 years using the straight-line method.
Annual depreciation is then equal to $29,000 divided by 2.5 or $11,600.
11,600 times 5 plus the salvage value is equal to the cost.
Cost is $79,000 [($11,600 X 5) + $21,000].

(d) Using SL, 2020 Depreciation is $11,600.

(e) Machine C—Using the double-declining balance method of depreciation

2018's depreciation is	$ 9,425	($75,400 X .25 X 1/2)
2019's depreciation is	$16,494	($75,400 – $9,425) X .25
2020's depreciation is	$12,370	($75,400 – $25,919) X .25
2021's depreciation is	$ 9,278	($75,400 – $38,289) X .25
	$47,567	

(f) Using DDB, 2022 Depreciation is $4,333 ($75,400 – $47,567 – $23,500)

(g) Machine D—Computation of Year Purchased

2020 - First Half Year using SYD =	$25,000	[($219,000 – $69,000) X 5/15 X 1/2]
2021 - Second Year using SYD =	$45,000	($150,000 X 5/15 X 1/2) + ($150,000 X 4/15 X 1/2)
	$70,000	

Thus, the asset must have been purchased on October 12, 2020

(h) Using SYD, 2022 Depreciation is $35,000 ($150,000 X 4/15 X .5) + ($150,000 X 3/15 X .5)

LO: 1, Bloom: AP, Difficulty: Simple, Time: 25-35, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

EXERCISE 11.8 (20–25 minutes)

Old Machine

June 1, 2018	**Purchase**	**$31,000**
	Freight	**200**
	Installation	**500**
	Total cost	**$31,700***

Annual depreciation charge: ($31,700* – $2,500) ÷ 10 = $2,920**

On June 1, 2019, debit the old machine for $1,980; the revised total cost is $33,680 ($31,700* + $1,980); thus the revised annual depreciation charge is: ($33,680 – $2,500 – $2,920) ÷ 9 = $3,140***.**

Book value, old machine, June 1, 2022:	
[$33,680 – $2,920 – ($3,140*** X 3)] =**	**$21,340**
Less: Fair value	**20,000[a]**
Loss on exchange	**1,340**
Cost of removal	**75**
Total loss	**$ 1,415**

(Note to instructor: The above computation is done to determine whether there is a gain or loss from the exchange of the old machine with the new machine and to show how the cost of removal might be reported. Also, if a gain occurs, the gain is not deferred (1) because the exchange has commercial substance and (2) the cost paid exceeds 25% of the total value of the property received.)

New Machine

Basis of new machine	**Cash paid ($35,000 – $20,000)**	**$15,000**
	Fair value of old machine	**20,000**
	Installation cost	**1,500**
	Total cost of new machine	**$36,500**

Depreciation for the year beginning June 1, 2022 = ($36,500 – $4,000) ÷ 10 = $3,250.

LO: 1, Bloom: AP, Difficulty: Moderate, Time: 20-25, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

EXERCISE 11.9 (15–20 minutes)

(a) Asset	Cost	Estimated Salvage	Depreciable Cost	Estimated Life	Depreciation per Year
A	$ 40,500	$ 5,500	$ 35,000	10	$ 3,500
B	33,600	4,800	28,800	9	3,200
C	36,000	3,600	32,400	9	3,600
D	19,000	1,500	17,500	7	2,500
E	23,500	2,500	21,000	6	3,500
	$152,600	$17,900	$134,700		$16,300

Composite life = $134,700 ÷ $16,300, or 8.26 years
Composite rate = $16,300 ÷ $152,600, or approximately 10.7%

(b)	Depreciation Expense	16,300	
	Accumulated Depreciation—Plant Assets		16,300
(c)	Cash	4,800	
	Accumulated Depreciation—Plant Assets	14,200	
	Plant Assets		19,000

LO: 1,2, Bloom: AP, Difficulty: Simple, Time: 15-20, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

EXERCISE 11.10 (10–15 minutes)

$$\text{Sum-of-the-years'-digits} = \frac{8 \times (8 + 1)}{2} = 36$$

Using Y to stand for the years of remaining life:

$$Y/36 \times (\$430{,}000 - \$70{,}000) = \$60{,}000$$

Multiplying both sides by 36:

$$\$360{,}000 \times Y = \$2{,}160{,}000$$
$$Y = \$2{,}160{,}000 \div \$360{,}000$$
$$Y = 6$$

The year in which there are six remaining years of life at the beginning of that given year is 2019 = [(8 – 6) = 2 + 2017].

LO: 1, Bloom: AP, Difficulty: Simple, Time: 10-15, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

EXERCISE 11.11 (10–15 minutes)

(a) No correcting entry is necessary because changes in estimate are handled in the current and prospective periods.

(b) Revised annual charge

Book value as of 1/1/2021 [$60,000 – ($7,000* X 5)] = $25,000
Remaining useful life, 5 years (10 years – 5 years)
Revised salvage value, $4,500
($25,000 – $4,500) ÷ 5 = $4,100

***($60,000 - $4,000) / 8 years = $7,000 Annual depreciation**

Depreciation Expense.....	**4,100**	
Accumulated Depreciation—Machinery.....		**4,100**

LO: 1,2, Bloom: AP, Difficulty: Simple, Time: 10-15, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

EXERCISE 11.12 (20–25 minutes)

(a) 1994–2003—($2,000,000 – $60,000) ÷ 40 = $48,500/yr.

(b) 2004–2021—Building ($2,000,000 – $60,000) ÷ 40 =	**$48,500/yr.**
Addition ($500,000 – $20,000) ÷ 30 =	**16,000/yr.**
	$64,500/yr.

(c) No entry required.

(d) Revised annual depreciation

Building

Book value: ($2,000,000 – $1,358,000*)	**$642,000**
Salvage value	**60,000**
	582,000
Remaining useful life	**÷ 32 years**
Annual depreciation	**$ 18,188**

***$48,500 X 28 years = $1,358,000**

EXERCISE 11.12 (Continued)

Addition	
Book value: ($500,000 – $288,000)**	**$ 212,000**
Less: Salvage value	**20,000**
	192,000
Remaining useful life	**÷ 32 years**
Annual depreciation	**$ 6,000**

****$16,000 X 18 years = $288,000**

Annual depreciation expense—building ($18,188 + $6,000) $24,188

LO: 1,2, Bloom: AP, Difficulty: Simple, Time: 20-25, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

EXERCISE 11.13 (15–20 minutes)

(a) $2,200,000 ÷ 40 = $55,000

(b)	**Loss on Disposal of Plant Assets ($160,000 - $80,000)**	**80,000**	
	Accumulated Depreciation—Buildings ($160,000 X 20 years /40 years)	**80,000**	
	Buildings		**160,000**
	Buildings	**300,000**	
	Cash		**300,000**

Note: The most appropriate entry would be to remove the old roof and record a loss on disposal, because the cost of the old roof is given. Another alternative would be to debit Accumulated Depreciation—Buildings on the theory that the replacement extends the useful life of the building. The entry in this case would be as follows:

Accumulated Depreciation—Buildings	**300,000**	
Cash		**300,000**

As indicated, this approach does not seem as appropriate as the first approach.

EXERCISE 11.13 (Continued)

(c) No entry necessary.

(d) (Assume the cost of the old roof is removed)

Buildings ($2,200,000 – $160,000 + $300,000)	$2,340,000
Less: Accumulated Depreciation ($55,000 X 20 – $80,000)	1,020,000
	1,320,000
Remaining useful life	÷ 25 years
Depreciation—2021	$ 52,800

OR

(Assume the cost of the new roof is debited to Accumulated Depreciation—Building)

Book value of the building prior to the replacement of roof $2,200,000 – ($55,000 X 20) =	$1,100,000
Cost of new roof	300,000
	$1,400,000
Remaining useful life	÷ 25 years
Depreciation—2021 ($1,400,000 ÷ 25)	$ 56,000

LO: 1,2, Bloom: AP, Difficulty: Simple, Time: 15-20, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

EXERCISE 11.14 (20–25 minutes)

(a)

Maintenance and Repairs Expense	500	
Equipment		500

(b) The proper ending balance in the asset account is:

January 1 balance		$134,750
Add: New equipment:		
Purchases	$32,000	
Freight	700	
Installation	2,700	35,400
Less: Cost of equipment sold		23,000
December 31 balance		$147,150

(1) Straight-line: $147,150 ÷ 10 = $14,715

EXERCISE 11.14 (Continued)

(2) Sum-of-the-years'-digits: (10 + 9 + 8 + 7 + 6 + 5 + 4 + 3 + 2 + 1) = 55

$$\text{OR } \frac{n(n+1)}{2} = \frac{10(10+1)}{2} = 55^*$$

For equipment purchased in 2019: $111,750 ($134,750 – $23,000) of the cost of equipment purchased in 2019, is still on hand.

8/55 X $111,750 =	$16,255
For equipment purchased in 2021: 10/55* X $35,400 =	6,436
Total	$22,691

LO: 1, Bloom: AP, Difficulty: Moderate, Time: 20-25, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

EXERCISE 11-15 (25–35 minutes)

(a)		2015		2016–2021 Incl.		2022		Total
(1)	$192,000 – $16,800 = $175,200							
	$175,200 ÷ 12 = $14,600							
	per yr. ($40 per day)							
	133*/365 of $14,600 =	$ 5,320						
	2016–2021 Include. (6 X $14,600)			$87,600				
	**68/365 of $14,600 =					$ 2,720		$ 95,640
(2)		0		87,600		14,600		102,200
(3)		14,600		87,600		0		102,200
(4)		7,300		87,600		7,300		102,200
(5)	4/12 of $14,600	4,867						
	2016–2021 Inc.			87,600				
	3/12 of $14,600					3,650		96,117
(6)		0		87,600		0		87,600

*(11 + 30 + 31 + 30 + 31) **(31 + 28 + 9)

(b) The most accurate distribution of cost is given by methods 1 and 5 if it is assumed that straight-line is satisfactory. Reasonable accuracy is normally given by 2, 3, or 4. The simplest of the applications are 6, 2, 3, 4, 5, and 1, in about that order. Methods 2, 3, and 4 combine reasonable accuracy with simplicity of application.

LO: 1, Bloom: AP, Difficulty: Moderate, Time: 25-35, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

EXERCISE 11.16 (10–15 minutes)

(a) **December 31, 2020**

Loss on Impairment	3,200,000*	
Accumulated Depreciation—Equipment		3,200,000

Cost	$9,000,000
Less: Accumulated depreciation	1,000,000
Carrying amount	8,000,000
Less: Fair value	4,800,000
Loss on impairment	$3,200,000*

Note: Expected undiscounted cash flows ($7,000,000) < carrying value ($8,000,000).

(b) **December 31, 2021**

Depreciation Expense	1,200,000	
Accumulated Depreciation—Equipment		1,200,000

New carrying amount	$4,800,000
Useful life	÷ 4 years
Depreciation per year	$1,200,000

(c) **No entry necessary. Restoration of any impairment loss is not permitted.**

LO: 3, Bloom: AP, Difficulty: Simple, Time: 10-15, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

EXERCISE 11.17 (15–20 minutes)

(a)

Loss on Impairment	3,220,000	
Accumulated Depreciation—Equipment		3,220,000

Cost	$9,000,000
Accumulated depreciation	1,000,000
Carrying amount	8,000,000
Less: Fair value	4,800,000
Plus: Cost of disposal	20,000
Loss on impairment	$3,220,000

EXERCISE 11.17 (Continued)

(b) No entry necessary. Depreciation is not taken on assets intended to be sold.

(c)

Accumulated Depreciation—Equipment	500,000	
Recovery of Loss from Impairment		500,000

Fair value	$5,300,000	
Less: Cost of disposal	20,000	$5,280,000
Less: Carrying amount		4,780,000
Recovery of loss on impairment		$ 500,000

LO: 3, Bloom: AP, Difficulty: Simple, Time: 15-20, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

EXERCISE 11.18 (15–20 minutes)

(a)

	December 31, 2020	
Loss on Impairment	270,000*	
Accumulated Depreciation—Equipment ..		270,000

Cost	$900,000
Less: Accumulated depreciation	400,000
Carrying amount	500,000
Less: Fair value	230,000
Loss on impairment	$270,000*

(b) It may be reported in the Other expenses and losses section or it may be highlighted as an unusual item in a separate section.

(c) No entry necessary. Restoration of any impairment loss is not permitted.

(d) Management first had to determine whether there was an impairment. To evaluate this step, management does a recoverability test. The recoverability test estimates the future cash flows expected from use of that asset and its eventual disposition. If the sum of the expected future net cash flows (undiscounted) is less than the carrying amount of the asset, an impairment results. If the recoverability test indicates that an impairment has occurred, a loss is computed. The impairment loss is the amount by which the carrying amount of the asset exceeds its fair value.

LO: 3, Bloom: AP, Difficulty: Simple, Time: 15-20, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

EXERCISE 11.19 (15–20 minutes)

(a) Depreciation Expense: $\frac{\$84,000}{30 \text{ years}} = \$2,800$ per year

Cost of Timber Sold: $1,400 – $400 = $1,000
$1,000 X 9,000 acres = $9,000,000 of value of timber
($9,000,000 ÷ 3,500,000 bd. ft.) X 700,000 bd. ft. = $1,800,000

(b) Cost of Timber Sold: $9,000,000 – $1,800,000 = $7,200,000
$7,200,000 + $100,000 = $7,300,000
($7,300,000 ÷ 5,000,000 bd. ft.) X 900,000 bd. ft. = $1,314,000

Note: The spraying costs as well as the costs to maintain the fire lanes and roads are expensed each period and are not part of the depletion base.

LO: 4, Bloom: AP, Difficulty: Simple, Time: 15-20, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

EXERCISE 11.20 (10–15 minutes)

Cost per barrel of oil:

Initial payment = $\frac{\$500,000}{250,000}$ =		$2.00
Rental = $\frac{\$31,500}{18,000}$ =		1.75
Premium = 5% of $55 =		2.75
Reconditioning of land = $\frac{\$30,000}{250,000}$ =		.12
Total cost per barrel		$6.62

LO: 4, Bloom: AP, Difficulty: Simple, Time: 10-15, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

EXERCISE 11.21 (15–20 minutes)

(a) $1,300 – $300 = $1,000 per acre for timber

$$\frac{\$1{,}000 \text{ X } 7{,}000 \text{ acres}}{8{,}000 \text{ bd. ft. X } 7{,}000 \text{ acres}} \text{ X } 850{,}000 \text{ bd. ft.} =$$

$$\frac{\$7{,}000{,}000}{56{,}000{,}000 \text{ bd. ft.}} \text{ X } 850{,}000 \text{ bd. ft.} = \$106{,}250.$$

(b) $$\frac{\$78{,}400}{56{,}000{,}000 \text{ bd. ft.}} \text{ X } 850{,}000 \text{ bd. ft.} = \$1{,}190.$$

(c) Forda should capitalize the cost of $70,000 ($20 X 3,500 trees) and adjust the depletion the next time the timber is harvested.

LO: 4, Bloom: AP, Difficulty: Simple, Time: 15-20, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

EXERCISE 11.22 (15–20 minutes)

Depletion base: $1,190,000 + $90,000 – $100,000 + $200,000 = $1,380,000

Depletion rate: $1,380,000 ÷ 60,000 = $23/ton*

(a) Per unit material cost: $23/ton
(b) 12/31/20 inventory: $23 X (30,000 tons – 22,000 tons) = $184,000
(c) Cost of goods sold 2020: $23 X 22,000 tons = $506,000

LO: 4, Bloom: AP, Difficulty: Simple, Time: 15-20, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

EXERCISE 11.23 (15–20 minutes)

(a) $$\frac{(\$970{,}000 + \$170{,}000 + \$40{,}000^* – \$100{,}000)}{12{,}000{,}000}$$ **= $.09 depletion per unit**

***Note to instructor:** The $40,000 should be depleted because it is an asset retirement obligation.

2,500,000 units extracted X $.09 = $225,000 depletion for 2020

(b) 2,100,000 units sold X $.09 = $189,000 charged to cost of goods sold for 2020

LO: 4, Bloom: AP, Difficulty: Simple, Time: 15-20, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

EXERCISE 11.24 (15–20 minutes)

(a) Asset turnover:

$$\frac{\$515.7}{\frac{(\$930.9 + \$920.1)}{2}} = .557 \text{ times}$$

(b) Return on assets:

$$\frac{\$80.7}{\frac{(\$930.9 + \$920.1)}{2}} = 8.72\%$$

(c) Profit margin on sales:

$$\frac{\$80.7}{\$515.7} = 15.65\%$$

(d) The asset turnover times the profit margin on sales provides the rate of return on assets computed for Tootsie Roll as follows:

Profit margin on sales	X	Asset Turnover		Return on Assets
15.65%		.557	=	8.72%

Note the answer 8.72% is the same as the rate of return on assets computed in (b) above.

LO: 5, Bloom: AP, Difficulty: Moderate, Time: 15-20, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

***EXERCISE 11.25 (20–25 minutes)**

		2020	2021
(a)	Revenues	$200,000	$200,000
	Operating expenses (excluding depreciation)	130,000	130,000
	Depreciation [($27,000 – $6,000) ÷ 7]	3,000	3,000
	Income before income taxes	$ 67,000	$ 67,000

		2020	2021
(b)	Revenues	$200,000	$200,000
	Operating expenses (excluding depreciation)	130,000	130,000
	Depreciation*	5,400	8,640
	Taxable income	$ 64,600	$ 61,360

*2020 $27,000 X .20 = $5,400
2021 $27,000 X .32 = $8,640

(c) Book purposes ($27,000 – $6,000) $21,000
Tax purposes (entire cost of asset) $27,000

(d) Differences will occur for the following reasons:
1. different depreciation methods.
2. half-year convention used for tax purposes.
3. estimated useful life and tax life different.
4. tax system ignores salvage value.

LO: 6, Bloom: AP, Difficulty: Moderate, Time: 20-25, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

***EXERCISE 11.26 (15–20 minutes)**

(a) (1) ($31,000 – $1,000) X 1/10 X 10/12 = $2,500 depreciation expense for book purposes.

(2) $31,000 X 1/5 X 1/2 = $3,100 depreciation for tax purposes.

(b) (1) $31,000 X .20* X 10/12 = $5,167 depreciation expense for book purposes. *(1 / 10 years X 2 = D.D.B. rate)

(2) $31,000 X .40 X 1/2 = $6,200 depreciation expense for tax purposes.

***EXERCISE 11.26 (Continued)**

(c) Differences will occur for the following reasons:

1. **half-year convention used for tax purposes.**
2. **estimated useful life and tax life different.**
3. **tax system ignores salvage value.**

LO: 6, Bloom: AP, Difficulty: Moderate, Time: 15-20, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

SOLUTIONS TO PROBLEMS

PROBLEM 11.1

(a) 1. Depreciation Base Computation:

Purchase price	$85,000
Less: Purchase discount (2%)	1,700
Plus: Freight-in.....	800
Installation	3,800
	87,900
Less: Salvage value	1,500
Depreciation base	$86,400

2020—Straight line: ($86,400 ÷ 8 years) X 8/12 year = $7,200

2. Sum-of-the-years'-digits for 2021

	Machine Year	Total Depreciation	2020	2021
1	8/36 X $86,400 =	$19,200	$12,800*	$ 6,400**
2	7/36 X $86,400 =	$16,800		11,200***
				$17,600

*** $19,200 X 8/12 (May – December) = $12,800**
**** $19,200 X 4/12 (January – April) = $ 6,400**
***** $16,800 X 8/12 (May – December) = $11,200**

3. Double-declining-balance for 2020
[$87,900 X .25* X 8/12 (May – December)] = $14,650

*** (1.0 ÷ 8) X 2 = 25%**

(b) An activity method should be recommended.

LO: 1, Bloom: AP, Difficulty: Simple, Time: 25-30, AACSB: Analytic, AICPA BB: None, AICPA FC: Measurement, Reporting, AICPA PC: None

PROBLEM 11.2

		Depreciation Expense 2020	2021
(a)	**Straight-line:**		
	($89,000 – $5,000) ÷ 7 = $12,000/yr.		
	2020: $12,000 X 7/12	**$7,000**	
	2021: 12/12× $12,000		**$12,000**
(b)	**Units-of-output:**		
	($89,000 – $5,000) ÷ 525,000 units = $.16/unit		
	2020: $.16 X 55,000	**8,800**	
	2021: $.16 X 48,000		**7,680**
(c)	**Working hours:**		
	($89,000 – $5,000) ÷ 42,000 hrs. = $2.00/hr.		
	2020: $2.00 X 6,000	**12,000**	
	2021: $2.00 X 5,500		**11,000**
(d)	**Sum-of-the-years'-digits:**		
	(1 + 2 + 3 + 4 + 5 + 6 + 7) = 28 or $\frac{n(n+1)}{2} = \frac{7(7+1)}{2} = 28$*		
	2020: 7/28* X $84,000 X 7/12	**12,250**	
	2021: 7/28* X $84,000 X 5/12 = $ 8,750		
	6/28* X $84,000 X 7/12 = 10,500		
		$19,250	**19,250**
(e)	**Declining-balance:**		
	Rate = (1.0 ÷ 7) X 2 = 28.57%**		
	2020: 7/12 X .2857 X $89,000**	**$14,833**	
	2021: .2857 X ($89,000 – $14,833) =**	**21,190**	

LO: 1, Bloom: AP, Difficulty: Simple, Time: 25-35, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

PROBLEM 11.3

(a)	**Depreciation Expense**	**3,900**	
	Accumulated Depreciation—Machinery (A) (5/55 X [$46,000 – $3,100])		**3,900**
	Accumulated Depreciation—Machinery (A) ($31,200 + $3,900)	**35,100**	
	Machinery (A) ($46,000 – $13,000)		**33,000**
	Gain on Disposal of Machinery		**2,100***
	***([$31,200 + $3,900] – $33,000 = $2,100)**		
(b)	**Depreciation Expense**	**6,720**	
	Accumulated Depreciation—Machinery (B) ([$51,000 – $3,000] ÷ 15,000) X 2,100		**6,720**
(c)	**Depreciation Expense**	**6,000**	
	Accumulated Depreciation—Machinery (C) ([$80,000 – $15,000 – $5,000] ÷ 10)		**6,000**
(d)	**Machinery (E)**	**28,000**	
	Retained Earnings		**28,000**
	Retained Earnings ($28,000 X .20*)	**5,600**	
	Accumulated Depreciation—Machinery (E)		**5,600**

***D.D.B. rate = (1.0 ÷ 10) X 2 = 20%**

LO: 1, Bloom: AP, Difficulty: Moderate, Time: 40-50, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

PROBLEM 11.4

	Per Company Books			As Adjusted				Net
	Trucks dr. (cr.)	Acc. Dep. Trucks dr. (cr.)	Retained Earnings dr. (cr.)	Trucks dr. (cr.)	Acc. Dep., Trucks dr, (cr.)	Retained Earnings dr, (cr.)		Income Overstated (Understated)
Balance	$ 94,000	$(30,200)		$94,000	$(30,200)			
Purchase Truck #5	22,000			40,000				
Trade Truck #3				(30,000)	9,000	$ 3,000	[1]	$ 3,000
Depreciation	_____	(21,000)	$21,000	_____	(19,800)	19,800	[2]	(1,200)
Balances	116,000	(51,200)	21,000	104,000	(41,000)	22,800		1,800
Sale of Truck #1	(3,500)			(18,000)	14,400	100	[3]	100
Depreciation	_____	(22,500)	22,500	_____	(17,200)	17,200	[4]	(5,300)
Balances	112,500	(73,700)	43,500	86,000	(43,800)	40,100		(3,400)
Purchase of Truck #6	42,000			42,000				
Disposal of Truck #4	(2,500)		(700)	(24,000)	14,400	6,400	[5]	7,100
Depreciation	_____	(25,050)	25,050	_____	(16,800)	16,800	[6]	(8,250)
Balances	152,000	(98,750)	67,850	104,000	(46,200)	63,300		(4,550)
Depreciation	_____	(30,400)	30,400	_____	(16,400)	16,400	[7]	(14,000)
Balances	$152,000	$(129,150)	$98,250	$104,000	$(62,600)	$79,700		$(18,550)
Income effect								
[1]Implied fair value of Truck #3 ($40,000 – $22,000)					$18,000			
[1]Book value of Truck #3 [$30,000 – ($30,000/5 X 1 ½ yrs.)] = $30,000 – $9,000					(21,000)			
Loss on Trade					$ 3,000			
[2]Truck #1: $18,000/5	= $3,600							
Truck #2: $22,000/5	= 4,400							
Truck #3: $30,000/5 X 1/2	= 3,000							
Truck #4:$24,000/5	= 4,800							
Truck #5: $40,000/5 X 1/2	= 4,000							
Total	$19,800							

(a)
1/1/18
7/1/18
12/31/18
12/31/18
1/1/19
12/31/19
12/31/19
7/1/20
7/1/20
12/31/20
12/31/20
12/31/21
12/31/21

PROBLEM 11.4 (Continued)

[3]Book value of Truck #1 [$18,000 – ($18,000/5 X 4 yrs.)] =
($18,000 – $14,400) ..... = $3,600
Cash received on sale ..... = 3,500
Loss on sale ..... $ 100

[4]Truck #2: $22,000/5 = $ 4,400
Truck #4: $24,000/5 = 4,800
Truck #5: $40,000/5 = 8,000
Total $17,200

[5]Book value of Truck #4 [$24,000 – ($24,000/5 X 3 yrs.)] =
($24,000 - $14,400)..... = $9,600
Cash received ($700 + $2,500) ..... = 3,200
Loss on disposal $6,400

[6]Truck #2: $22,000/5 X 1/2 = $ 2,200
Truck #4: $24,000/5 X 1/2 = 2,400
Truck #5: $40,000/5 8,000
Truck #6: $42,000/5 X 1/2 = 4,200
Total $16,800

[7]Truck #2: (fully dep.) = $ 0
Truck #5: $40,000/5 = 8,000
Truck #6: $42,000/5 = 8,400
Total $16,400

(b) Compound journal entry December 31, 2021:

Accumulated Depreciation—Trucks	66,550	
Trucks		48,000
Retained Earnings		4,550
Depreciation Expense		14,000

PROBLEM 11.4 (Continued)

Summary of Adjustments:

	Per Books	As Adjusted	Adjustment Dr. or (Cr.)
Trucks	$152,000	$104,000	$(48,000)
Accumulated Depreciation	$129,150	$ 62,600	$ 66,550
Prior Years' Income			
Retained Earnings, 2018	$ 21,000	$ 22,800	$ 1,800
Retained Earnings, 2019	22,500	17,300	(5,200)
Retained Earnings, 2020	24,350	23,200	(1,150)
Totals	$ 67,850	$ 63,300	$ (4,550)
Depreciation Expense, 2021	$ 30,400	$ 16,400	$(14,000)

LO: 1, Bloom: AP, Difficulty: Complex, Time: 45-60, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

PROBLEM 11.5

(a) Estimated depletion:

Depletion Base	Estimated Yield	Estimated Depletion Per Ton	Estimated Depletion 1ST & 11th Yrs.	Estimated Depletion Each of Yrs. 2-10 Incl.
$870,000*	120,000 tons	$7.25	$43,500**	$87,000***

*($900,000 – $30,000)
**($7.25 X 6,000)
***($7.25 X 12,000)

Estimated depreciation:

Asset	Cost	Per ton Mined	1st Yr.	Yrs. 2–5	6th Yr.	Yrs. 7–10	11th Yr.
Building	$36,000	$.30*	$1,800	$3,600	$3,600	$3,600	$1,800
Machinery (1/2)	30,000	.25**	1,500	3,000	3,000	3,000	1,500
Machinery (1/2)	30,000	.50***	3,000	6,000	3,000	0	0

*$36,000 ÷ 120,000 = $.30
**$30,000 ÷ 120,000 = $.25
***($30,000 ÷ [120,000 ÷ 2]) = $.50

(b) Depletion: $7.25 X 5,000 tons = $36,250

Depreciation:	Building	$.30 X 5,000 =	$1,500
	Machinery	$.25 X 5,000 =	1,250
	Machinery	$.50 X 5,000 =	2,500
	Total depreciation		$5,250

LO: 1, 4, Bloom: AP, Difficulty: Moderate, Time: 25-30, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

PROBLEM 11.6

(a)	**Original cost**	**$550 X 3,000 =**	**$1,650,000**
	Deduct residual value of land	**$200 X 3,000 =**	**600,000**
			1,050,000
	Cost of logging road		**150,000**
	Depletion base		**$1,200,000**

$$\frac{\$1,200,000}{500,000 \text{ ft.}} = \$2.40 \text{ depletion per board foot}$$

(b)	**Inventory**	**240,000**	
	Timber		**240,000**

Depletion, 2020: .20 X 500,000 bd. ft. = 100,000 bd. ft.;
100,000 bd. ft. X $2.40 = $240,000

(c)	**Loss of timber**		
	[$1,050,000 – ($1,050,000 X .20)]	**$ 840,000**	
	Cost of salvaging timber	**700,000**	
	Less: Recovery ($3 X 400,000 bd. ft.)	**1,200,000**	**$ 340,000**
	Loss of land value		**600,000**
	Loss of logging roads		
	[($150,000 – (.20 X $150,000)]		**120,000**
	Logging equipment		**300,000**
	Unusual loss due to the eruption		
	of Mt. Leno		**$1,360,000**

LO: 4, Bloom: AP, Difficulty: Moderate, Time: 25-30, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

PROBLEM 11.7

Instructors should note the changing depletion base in this problem.

2020

Computation of depletion base for 2020				
Timber				
Cost per acre	**$1,700**			
Land cost	**(800)**			
Timber cost	**$ 900**	**X**	**10,000 acres**	**$9,000,000**
Road cost				**250,000**
Total depletion base				**$9,250,000***

Estimated depletion for 2020	**$9,250,000***	
	X 0.08	**(540,000/6,750,000)**
Depletion expense for 2020	**$ 740,000**	

Depreciation of removable equipment		
Cost	**$ 225,000**	
Salvage value	**(9,000)**	
Depreciable base	**$ 216,000**	
Annual depreciation using SL ($216,000/15)	**$ 14,400**	
Depreciation expense for 2020	**$ 10,800**	**(9/12 X $14,400)**

2021

Depletion base for 2021		
Base for 2020	**$9,250,000**	
Less: Depletion for 2020	**740,000**	
Plus: Seedling Planting Costs	**120,000**	
Depletion base for 2021	**$8,630,000**	
Depletion base for 2021	**$8,630,000**	
Times	**X 0.12**	**(774,000/6,450,000)**
Depletion for 2021	**$1,035,600**	
Depreciation expense for 2021	**$ 14,400**	

PROBLEM 11.7 (Continued)

2022		
Depletion Base for 2022		
Base for 2021	**$ 8,630,000**	
Less: Depletion for 2021	**1,035,600**	
Plus: Seedling Planting Costs	**150,000**	
Depletion Base for 2022	**$ 7,744,400**	
Depletion Base for 2022	**$ 7,744,400**	
Times	**X .10**	**(650,000/6,500,000)**
Depletion for 2022	**$ 774,440**	
Depreciation Expense for 2022	**$ 14,400**	

Note to instructor: Results are the same if using per-unit costs rounded to four decimal points.

LO: 4, Bloom: AP, Difficulty: Moderate, Time: 25-35, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

PROBLEM 11.8

(a) The amounts to be recorded on the books of Darby Sporting Goods Inc. as of December 31, 2020, for each of the properties acquired from Encino Athletic Equipment Company are calculated as follows:

Cost Allocations to Acquired Properties

	Appraisal Value	Remaining Purchase Price Allocations	Renovations	Capitalized Interest	Total
(1) Land	$290,000				$290,000
(2) Buildings		$ 77,000[1]	$100,000	$21,000[2]	198,000
(3) Machinery		33,000[1]			33,000
Totals	$290,000	$110,000	$100,000	$21,000	$521,000

Supporting Calculations

[1]**Balance of purchase price to be allocated.**

Total purchase price	$400,000
Less: Land appraisal	290,000
Balance to be allocated	$110,000

	Appraisal Values	Ratios				Allocated Values
Buildings	$105,000	105/150	=	.70	X $110,000	$ 77,000
Machinery	45,000	45/150	=	.30	X $110,000	33,000
Totals	$150,000			1.00		$110,000

PROBLEM 11.8 (Continued)

[2]Capitalizable interest.

Expenditures		Capitalization	Weighted-Average
Date	Amount	Period	Accumulated Expenditures
1/1	$ 50,000	12/12	$ 50,000
4/1	120,000	9/12	90,000
10/1	140,000	3/12	35,000
12/31	190,000	0/12	–0–
	$500,000		$175,000

Weighted-Average Accumulated Expenditures		Interest Rate		Capitalized Interest
$175,000	X	.12	=	$21,000

Note to instructor: If the interest is allocated between the building and the machinery, $14,700 ($21,000 X 105/150) would be allocated to the building and $6,300 ($21,000 X 45/150) would be allocated to the machinery.

(b) Darby Sporting Goods Inc.'s 2021 depreciation expense, for book purposes, for each of the properties acquired from Encino Athletic Equipment Company is as follows:

1. Land: No depreciation.

2. Building: Depreciation rate = 1.50 X 1/15 = .10
2021 depreciation expense = Cost X Rate X 1/2 year
= $198,000 X .10 X 1/2
= $9,900

3. Machinery: Depreciation rate = 2.00 X 1/5 = .40
2021 depreciation expense = Cost X Rate X 1/2
= $33,000 X .40 X 1/2
= $6,600

PROBLEM 11.8 (Continued)

(c) Arguments for the capitalization of interest costs include the following.

1. **Diversity of practices among companies and industries called for standardization in practices.**
2. **Total interest costs should be allocated to enterprise assets and operations, just as material, labor, and overhead costs are allocated. That is, under the concept of historical costs, all costs incurred to bring an asset to the condition and location necessary for its intended use should be reflected as a cost of that asset.**

Arguments against the capitalization of interest include the following:

1. **Interest capitalized in a period would tend to be offset by amortization of interest capitalized in prior periods.**
2. **Interest cost is a cost of financing, not of construction.**

LO: 1, Bloom: AP, Difficulty: Moderate, Time: 25-35, AACSB: Analytic, AICPA BB: None, AICPA FC: Measurement, Reporting, AICPA PC: None

PROBLEM 11.9

(a) Carrying value of asset: $10,000,000 – $2,500,000* = $7,500,000.

***($10,000,000 ÷ 8) X 2**

Future cash flows ($6,300,000) < Carrying value ($7,500,000)

Impairment entry:

Loss on Impairment	**1,900,000***	
Accumulated Depreciation—Equipment		**1,900,000**

***$7,500,000 – $5,600,000**

(b)

Depreciation Expense	**1,400,000****	
Accumulated Depreciation—Equipment		**1,400,000**

****($5,600,000 ÷ 4)**

(c) No depreciation is recorded on impaired assets held for disposal. Recovery of impairment losses are recorded.

12/31/20	**Loss on Impairment**	**1,900,000**	
	Accumulated Depreciation—Equipment		**1,900,000**
12/31/21	**Accumulated Depreciation—Equipment**	**300,000**	
	Recovery of Loss from Impairment ($5,900,000 – $5,600,000)		**300,000**

LO: 3, Bloom: AP, Difficulty: Moderate, Time: 15-25, AACSB: Analytic, AICPA BB: None, AICPA FC: Measurement, Reporting, AICPA PC: None

PROBLEM 11.10

(1)	**$80,000**	**Allocated in proportion to appraised values (1/10 X $800,000) or [$90,000/($90,000 + $810,000) x $800,000].**
(2)	**$720,000**	**Allocated in proportion to appraised values (9/10 X $800,000) or [$810,000/($90,000 + $810,000) x $800,000].**
(3)	**Fifty years**	**Cost less salvage ($720,000 – $40,000) divided by annual depreciation ($13,600).**
(4)	**$13,600**	**Same as prior year since it is straight-line depreciation.**
(5)	**$91,000**	**[Number of shares (2,500) times fair value ($30)] plus demolition cost of existing building ($16,000).**
(6)	**None**	**No depreciation before use.**
(7)	**$40,000**	**Fair value.**
(8)	**$6,000**	**Cost ($40,000) times percentage (1/10 X 1.50).**
(9)	**$5,100**	**Cost ($40,000) less prior year's depreciation ($6,000) equals $34,000. Multiply $34,000 times (1/10 X 1.50).**
(10)	**$168,000[d]**	**Total cost ($182,900) less repairs and maintenance ($14,900).**
(11)	**$36,000**	**Cost less salvage ($168,000 – $6,000) times 8/36*.**
(12)	**$10,500**	**Cost less salvage ($168,000 – $6,000) times 7/36 times one-third (4/12) of a year.**

*** (1 + 2 + 3 + 4 + 5 + 6 + 7 + 8) or [8 x (8+1) / 2]**

(13) $52,000 **Annual payment ($6,000) times present value of annuity due at 8% for 11 years (7.710) plus down payment ($5,740). This can be found in an annuity due table since the payments are at the beginning of each year. Alternatively, to convert from an ordinary annuity to an annuity due factor, proceed as follows: For eleven payments use the present value of an ordinary annuity for 11 years (7.139) times 1.08. Multiply this factor (7.710) times $6,000 annual payment to obtain $46,260, and then add the $5,740 down payment.**

(14) $2,600 **Cost ($52,000) divided by estimated life (20 years).**

LO: 1, Bloom: AP, Difficulty: Complex, Time: 45-60, AACSB: Analytic, AICPA BB: None, AICPA FC: Measurement, Reporting, AICPA PC: None

PROBLEM 11.11

(a) (1) Straight-line Method: $\frac{\$90,000 - \$6,000}{5 \text{ years}}$ **= $16,800 a year for all 5 years**

(2) Activity Method: $\frac{\$90,000 - \$6,000}{100,000 \text{ hours}}$ **= $.84 per hour**

Year	2018	20,000 hrs. X $.84 =	$16,800
	2019	25,000 hrs. X $.84 =	21,000
	2020	15,000 hrs. X $.84 =	12,600
	2021	30,000 hrs. X $.84 =	25,200
	2022	10,000 hrs. X $.84 =	8,400

(3) Sum-of-the-Years'-Digits: (5 + 4 + 3 + 2 + 1) = 15 or [5 X (5 + 1)/2]

Year	2018	5/15 X ($90,000 – $6,000) =	$28,000
	2019	4/15 X ($90,000 – $6,000) =	22,400
	2020	3/15 X ($90,000 – $6,000) =	16,800
	2021	2/15 X ($90,000 – $6,000) =	11,200
	2022	1/15 X ($90,000 – $6,000) =	5,600

(4) Double-Declining-Balance Method: Each year is 20% (100% ÷ 5) of its total life. Double the rate to 40%.

Year	2018	.40 X $90,000 =	$36,000
	2019	.40 X ($90,000 – $36,000) =	21,600
	2020	.40 X ($90,000 – $57,600) =	12,960
	2021	.40 X ($90,000 – $70,560) =	7,776
	2022	Enough to reduce to salvage =	5,664*
		*($84,000 - $78,336)	

(b) (1) Straight-line Method:

Year	2018	$\frac{\$90,000 - \$6,000}{5 \text{ years}}$ X 9/12 =	$12,600
	2019	Full year	16,800
	2020	Full year	16,800
	2021	Full year	16,800
	2022	Full year	16,800
	2023	Full year X 3/12 year =	4,200

PROBLEM 11.11 (Continued)

(2) Sum-of-the-Years'-Digits Method:

2018	(5/15 X $84,000*) X 9/12 =		$21,000
2019	(5/15 X $84,000) X 3/12 =	$ 7,000	
	(4/15 X $84,000) X 9/12 =	16,800	23,800
2020	(4/15 X $84,000) X 3/12 =	5,600	
	(3/15 X $84,000) X 9/12 =	12,600	18,200
2021	(3/15 X $84,000) X 3/12 =	4,200	
	(2/15 X $84,000) X 9/12 =	8,400	12,600
2022	(2/15 X $84,000) X 3/12 =	2,800	
	(1/15 X $84,000) X 9/12 =	4,200	7,000
2023	(1/15 X $84,000*) X 3/12 =		1,400

*Depreciable Base = ($90,000 – $6,000)

(3) Double-Declining Balance Method:

Year	Cost	Accum. Depr. at beg. of year	Book Value at beg. of year	Depr. Expense	
2018	$90,000	—	$90,000	$27,000	(1)
2019	90,000	$27,000	63,000	25,200	(2)
2020	90,000	52,200	37,800	15,120	(3)
2021	90,000	67,320	22,680	9,072	(4)
2022	90,000	76,392	13,608	5,443	(5)
2023	90,000	81,835	8,165	2,165	(6)

(1) $90,000 X .40 X 9/12
(2) ($90,000 – $27,000) X .40
(3) ($90,000 – $52,200) X .40
(4) ($90,000 – $67,320) X .40
(5) ($90,000 – $76,392) X .40
(6) to reduce to $6,000 salvage value ($8,165 - $6,000).

LO: 1, Bloom: AP, Difficulty: Moderate, Time: 30-35, AACSB: Analytic, AICPA BB: None, AICPA FC: Reporting, AICPA PC: None

*PROBLEM 11.12

(a) The straight-line method would provide the highest total net income for financial reporting over the three years, as it reports the lowest total depreciation expense. These computations are provided below.

Computations of depreciation expense and accumulated depreciation under various assumptions:

(1) Straight-line:

$$\frac{\$1,260,000 - \$60,000}{5 \text{ years}} = \$240,000$$

Year	Depreciation Expense	Accumulated Depreciation
2019	$240,000*	$ 240,000
2020	240,000*	$ 480,000
2021	240,000*	$ 720,000
	$720,000	

(2) Double-declining-balance:

Year	Depreciation Expense		Accumulated Depreciation
2019	$504,000	(.40* X $1,260,000)	$ 504,000
2020	302,400	(.40 X $756,000)	$ 806,400
2021	181,440	(.40 X $453,600)	$ 987,840
	$987,840		

*[(1.0 ÷ 5) X 2] = 40%

(3) Sum-of-the-years'-digits:

Year	Depreciation Expense		Accumulated Depreciation
2019	$400,000	(5/15** X $1,200,000)	$ 400,000
2020	320,000	(4/15 X $1,200,000)	$ 720,000
2021	240,000	(3/15 X $1,200,000)	$ 960,000
	$960,000		

**[5(5 + 1) / 2] = 15

***PROBLEM 11.12 (Continued)**

(4) Units-of-output:

Year	Depreciation Expense		Accumulated Depreciation
2019	$288,000	($24*** X 12,000)	$288,000
2020	264,000	($24 X 11,000)	$552,000
2021	240,000	($24 X 10,000)	$792,000
	$792,000		

*** $1,200,000 ÷ 50,000 (total units) = $24 per unit

(b) General MACRS method:

	Total Cost		MACRS Rates (%)****		Annual Depreciation	Accumulated Depreciation
2019	$1,260,000	X	14.29	=	$180,054	$180,054
2020	1,260,000	X	24.49	=	308,574	$488,628
2021	1,260,000	X	17.49	=	220,374	$709,002
					$709,002	

**** Taken from the MACRS rates schedule.

Optional straight-line method:

	Total Cost		Depreciation Rate		Annual Depreciation	Accumulated Depreciation
2019	$1,260,000	X	(1/7 X 1/2)	=	$ 90,000	$ 90,000
2020	1,260,000	X	1/7	=	180,000	$270,000
2021	1,260,000	X	1/7	=	180,000	$450,000
					$450,000	

The general MACRS method would have higher depreciation expense ($709,002) than that of the optional straight-line method ($450,000) for the three-year period ending December 31, 2021. Therefore, the general MACRS method would minimize net income for income tax purposes for this period.

LO: 1, 6, Bloom: AP, Difficulty: Moderate, Time: 25-35, AACSB: Analytic, Communication, AICPA BB: None, AICPA FC: Reporting, AICPA PC: Communication