

SOLUTIONS**Learning Goal 19****Multiple Choice**

1. b
2. a
3. c
4. b However, the double-declining-balance method calculates the depreciation expense on the full asset cost until the final year of use.
5. d Total appraised value is \$800,000. Equipment is 10%, building is 81.25%, and truck is 8.75%. These percentages are then multiplied by the cost of \$600,000.
6. a $\$82,000 + \$5,330 + \$900 + \$2,700 + \$2,000 = \$92,930$
7. a
8. d
9. a $\$5,000,000 / 100,000 \text{ tons} = \50 per ton cost.
10. c Unearned revenue is a liability.
11. b *Note:* Intangible assets are amortized, not depreciated.
12. c
13. d
14. a

Discussion Questions and Brief Exercises

1. For long-term asset acquisitions, all expenditures normally required to acquire an asset and put it into initial normal operating condition are capitalized and become part of the cost of the asset.
2. A business does not have to do anything. It just keeps using the asset! What this means in terms of the matching principle is that the asset was depreciated too quickly. The estimate of the useful life was too low, so too much depreciation expense was charged each year of the asset's estimated useful life. The matching should have been spread over a longer period.
3. (1) Retire (discard) an asset. (2) Sell an asset. (3) Exchange an asset. Gain or loss is always calculated as the difference between the value of what is received and the value (on the books) of what is given up. In exchange transactions that do not have commercial substance, gain is not recorded.
4. A normal repair maintains an asset in its normal operating condition. An extraordinary repair materially improves the function or extends the life of a plant asset. An expenditure for a normal repair is recorded as an operating expense in the period the repair is made. An expenditure for an extraordinary repair is debited to the accumulated depreciation account for the related asset, thereby increasing its book value.

SOLUTIONS**Learning Goal 19, continued**

5. At the time of the expenditure, the accumulated depreciation was $(\$50,000/8) \times 4 = \$25,000$. The expenditure reduces the accumulated depreciation to \$10,000 and increases the total useful life to 12 years. Therefore, the new depreciation expense is $\$10,000/(12 - 4) = \$1,250$ per year.

	Account/Explanation	Post. Ref.	Dr.	Cr.
	Accumulated Depreciation—Computer		15,000	
	Cash			15,000
	Depreciation Expense—Computer		1,250	
	Accumulated Depreciation—Computer			1,250

6. Depreciation is the allocation of the cost of a plant and equipment asset to expense over the estimated useful life of the asset. Depreciation is an application of the matching principle.
7. Straight-line depreciation allocates an equal amount of asset cost to depreciation expense each time period of an asset's useful life. Double-declining balance is an accelerated method that allocates more cost into expense each time period early in an asset's life and less expense later in an asset's life. Units of production depreciation allocates cost into expense only as an asset is used, so obsolescence and the passing of time is not a significant issue.

As a manager I might be less interested in the best theoretical matching and more interested in the effects on the financial statements. Straight-line will have the same effect on net income each year. Double-declining depreciation will result in less net income in early years and more net income in later years because the depreciation expense is more in the early years. However, this method will result in greater tax savings (more deductible expense) in early years and less in later years. If obsolescence were not a factor and the asset would not be used at the same rate each period, units of production would be a good choice. However, the effect on the financial statements would depend on how much the asset was used.

8.

	Account/Explanation	Post. Ref.	Dr.	Cr.
	Accumulated Depreciation—Machinery		60,000	
	Loss on Retirement		40,000	
	Machinery			100,000

Accumulated depreciation: $(\$100,000 - \$10,000)/6 = \$15,000$ per year. $4 \times \$15,000 = \$60,000$.

9.

Method	Year 1	Year 2	Total
Straight-line	$(80,000 - 5,000)/10 = 7,500$	$(80,000 - 5,000)/10 = 7,500$	15,000
Double-declining	$80,000 \times .2 = 16,000$	$(80,000 - 16,000) \times .2 = 12,800$	28,800

SOLUTIONS**Learning Goal 19, continued**

10. (1) Calculate the total estimated cash flows from the asset. (2) If the value of the total cash flows is less than the asset's book value, the asset is impaired. (3) The value of the asset written off is the difference between its fair market value and book value. The journal entry debits an Impairment Loss account and credits the asset.
- Total estimated cash flows: \$225,000
 - Current book value: \$550,000. Future cash flows are less than book value. The asset is impaired.
 - Impairment loss: \$550,000 book value – \$400,000 fair value = \$150,000 impairment loss.

11.

	Account/Explanation	Post. Ref.	Dr.	Cr.
	Patent		2,000,000	
	Cash			2,000,000
	Amortization Expense		250,000	
	Patent			250,000

Use the shorter of legal life or estimated useful life for the amortization calculation.

12. No, this is not correct; however, it is a common misunderstanding. Accumulated depreciation (sometimes misleadingly called *reserve for depreciation*) is the cumulative amount of depreciation expense that has been recorded for a plant asset. Any cash reserve would appear as part of cash in the current asset section of the balance sheet.
13. Depreciation is the allocation of the cost of a plant and equipment asset into expense over its estimated useful life. Depletion is the allocation of the cost of a natural resource into expense as the resource is extracted and sold. Amortization is the allocation of the cost of an intangible asset into expense over the shorter of its legal life or estimated useful life.

14.

		Dr.	Cr.
Dec. 1	Computer Equipment (.05 × \$5,000,000)	250,000	
	Software (.75 × \$5,000,000)	3,750,000	
	Production Equipment (.20 × \$5,000,000)	1,000,000	
	Cash		1,000,000
	Notes Payable		4,000,000

Item	Appraised Value	%
Computer Equipment	\$300,000	5%
Software	4,500,000	75%
Production Equipment	<u>1,200,000</u>	20%
Total	<u>\$6,000,000</u>	<u>100%</u>

SOLUTIONS

Learning Goal 19, continued

Reinforcement Problems

LG 19-1.

- a. $(\$47,500 + \$2,900 + \$50 + \$740 + \$300 + \$1,265 + \$2,375 = \$55,130$ equipment cost)
Fire insurance is not capitalized because the insurance will cover the period after installation.
- b. $(\$752,000 + \$3,200 + \$41,500 + \$5,100 + \$22,500 + \$8,000 = \$832,300$ building cost)
Furniture is a separate asset with a different useful life. Loan interest is an expense unless the building is being constructed, but this is a purchase. Security is an ongoing expense, not directly related to the purchase in this case.
- c. Cost can be calculated as book value plus accumulated depreciation: $\$92,300 + \$183,600 = \$275,900$.

d.

Land	Land Improvements	Building	Current Expenses
\$ 12,500	\$18,000	\$810,200	Current property tax \$18,000
195,000	14,500	20,000	Fire damage loss \$25,000
5,850	15,000	40,500	<i>Note:</i> Uninsured losses are
<u>2,950</u>	16,750	<u>1,500</u>	not “normal” and are never
<u>\$216,300</u>	<u>15,000</u>	<u>\$872,200</u>	capitalized.
	<u>\$79,250</u>		

- e. Both cash and debt are part of the cost of property. $\$127,500 + \$38,000 = \$165,500$.
- f. Based on the appraised values, land is 35%, building is 45%, and equipment is 20%. Therefore, land cost is $.35 \times \$1,500,000 = \$525,000$; building cost is $.45 \times \$1,500,000 = \$675,000$; equipment cost is $.2 \times \$1,500,000 = \$300,000$.

LG 19-2. The original depreciation expense is $(\$275,000 - \$5,000)/8$ years = \$33,750 per year. At the end of the second year when the useful life is revised, the remaining life is now $6 - 2 = 4$ years. The asset’s book value is $\$275,000 - \$67,500 = \$207,500$. This book value (less residual) is then depreciated over the new remaining useful life: $(\$207,500 - \$5,000)/4$ years = \$50,625 per year. (Year 3 and remaining years.)

Depreciation Expense		50,625	
Accumulated Depreciation—Computer			50,625

SOLUTIONS**Learning Goal 19, continued****LG 19-3.**

Straight-line depreciation:

Period	Depreciation Expense	Accumulated Depreciation	Book Value
2017	\$4,000	\$4,000	\$17,000
2018	4,000	8,000	13,000
2019	4,000	12,000	9,000
2020	4,000	16,000	5,000
2021	4,000	20,000	1,000

Double-declining-balance depreciation:

Period	Depreciation Expense	Accumulated Depreciation	Book Value
2017	\$8,400	\$8,400	\$12,600
2018	5,040	13,440	7,560
2019	3,024	16,464	4,536
2020	1,814	18,278	2,722
2021	1,722	20,000	1,000

Comment: \$1,722 depreciation expense in the last year is calculated: \$2,722 – \$1,000.

Units-of-production depreciation:

Period	Depreciation Expense	Accumulated Depreciation	Book Value
2017	\$4,000	\$4,000	\$17,000
2018	7,000	11,000	10,000
2019	5,000	16,000	5,000
2020	3,000	19,000	2,000
2021	1,000	20,000	1,000

Comment: The depreciation expense per unit is \$20,000/10,000 hours = \$2 per hour.

SOLUTIONS

Learning Goal 19, continued

LG 19-4.

a.

	Depreciation Expense	Accumulated Depreciation	Book Value
2015	\$12,000	\$ 12,000	\$124,000 112,000
2016	24,000	36,000	88,000
2017	24,000	60,000	64,000
2018	24,000	84,000	40,000
2019	24,000	108,000	16,000
2020	12,000	120,000	4,000

b.

Loss on Sale		2,000	
Cash		62,000	
Accumulated Depreciation—Truck		60,000	
Truck			124,000

c.

	Depreciation Expense	Accumulated Depreciation	Book Value
2015	24,800	24,800	\$124,000 99,200
2016	39,680	64,480	59,520
2017	23,808	88,288	35,712
2018	14,285	102,573	21,427
2019	8,571	111,144	12,856
2020	8,856	120,000	4,000

Cash		62,000	
Accumulated Depreciation—Truck		88,288	
Truck			124,000
Gain on Sale			26,288

The accelerated depreciation method results in significantly greater depreciation expense the first two years of the asset's life and less in the last three years. For a sale in December 2017, the accelerated method resulted in a gain instead of loss as with straight-line. This is because the book value was lower with the accelerated method.

Calculation notes: (1) Because the asset was purchased on July 1, the first and last years' of the asset's useful life will have only a half-year of depreciation with straight-line. (2) With double-declining, the first year is a half year of expense and the final year of depreciation expense is $12,856 - 4,000 = 8,856$.

SOLUTIONS**Learning Goal 19, continued****LG 19-5.**

The annual depreciation expense is \$15,000, and the accumulated depreciation through the end of year 6 is $\$15,000 \times 6 = \$90,000$. The table below shows the details.

Year	Depreciation Expense	Accumulated Depreciation	Book Value
			\$130,000
1	\$15,000	\$15,000	\$115,000
2	\$15,000	\$30,000	\$100,000
3	\$15,000	\$45,000	\$85,000
4	\$15,000	\$60,000	\$70,000
5	\$15,000	\$75,000	\$55,000
6	\$15,000	\$90,000	\$40,000
Extraordinary	Repair	\$78,000	\$52,000
7	(a) \$8,400	\$86,400	(b) \$43,600

End of year 6: Book value before repair: \$40,000
 Add repair cost: 12,000
 New book value: \$52,000

Year 7 depreciation expense: $(\$52,000 - \$10,000)/5 \text{ years} = \$8,400 \text{ per year}$
 End of year 7 book value: $\$130,000 - \$86,400 = \$43,600$

Date	Account/Explanation	Post. Ref.	Dr.	Cr.
	Accumulated Depreciation		12,000	
	Cash			12,000
	Depreciation Expense—Truck		8,400	
	Accumulated Depreciation—Truck			8,400

SOLUTIONS**Learning Goal 19, continued****LG 19-6.**

a. Straight-line depreciation:

Year	Depreciation Expense	Accumulated Depreciation	Book Value
			\$35,000
2017	$[(35,000 - 1,000)/5] \times \frac{9}{12} = 5,100$	\$ 5,100	29,900
2018	$(35,000 - 1,000)/5 = 6,800$	11,900	23,100
2019	$(35,000 - 1,000)/5 = 6,800$	18,700	16,300

Double-declining-balance depreciation:

Year	Depreciation Expense	Accumulated Depreciation	Book Value
			\$35,000
2017	$(35,000 \times .4) \times \frac{9}{12} = 10,500$	\$10,500	24,500
2018	$24,500 \times .4 = 9,800$	20,300	14,700
2019	$14,700 \times .4 = 5,880$	26,180	8,820

b. Straight-line depreciation:

Year	Depreciation Expense	Accumulated Depreciation	Book Value
			\$27,000
2016	$[(27,000 - 0)/10] \times \frac{4}{12} = 900$	\$900	26,100
2017	$(27,000 - 0)/10 = 2,700$	3,600	23,400
2018	$[(27,000 - 0)/10] \times \frac{1}{12} = 225$	3,825	23,175

Double-declining-balance depreciation:

Year	Depreciation Expense	Accumulated Depreciation	Book Value
			\$27,000
2016	$(27,000 \times .2) \times \frac{4}{12} = 1,800$	\$1,800	25,200
2017	$(25,200 \times .2) = 5,040$	6,840	20,160
2018	$(20,160 \times .2) \times \frac{1}{12} = 336$	7,176	19,824

SOLUTIONS**Learning Goal 19, continued****LG 19-6, continued**

c. Straight-line depreciation:

Year	Depreciation Expense	Accumulated Depreciation	Book Value
			\$150,000
2017	$[(150,000 - 10,000)/8] \times \frac{6}{12} = 8,750$	\$8,750	141,250
2018	$(150,000 - 10,000)/8 = 17,500$	26,250	123,750
2019	$(150,000 - 10,000)/8 = 17,500$	43,750	106,250

Double-declining-balance depreciation:

Year	Depreciation Expense	Accumulated Depreciation	Book Value
			\$150,000
2017	$(150,000 \times .25) \times \frac{6}{12} = 18,750$	\$18,750	131,250
2018	$(131,250 \times .25) = 32,813$	51,563	98,437
2019	$(98,437 \times .25) = 24,609$	76,172	73,828

Comment: Notice that in c in the double-declining depreciation, it was perfectly acceptable to round amounts to the next dollar. This is because depreciation calculations are based on estimates and do not involve any transactions with outside parties.

SOLUTIONS

Learning Goal 19, continued

LG 19-7.

a.

Straight-Line Depreciation			
Year	Depreciation Expense	Accumulated Depreciation	Book Value
Asset Cost			\$196,000
2017	\$38,000	\$ 38,000	158,000
2018	38,000	76,000	120,000
2019	38,000	114,000	82,000
2020	38,000	152,000	44,000
2021	38,000	190,000	6,000
Double-Declining-Balance Depreciation			
Asset Cost			\$196,000
2017	\$78,400	\$78,400	117,600
2018	47,040	125,440	70,560
2019	28,224	153,664	42,336
2020	16,934	170,598	25,402
2021	19,402	190,000	6,000
Units-of-Production Depreciation			
Asset Cost			\$196,000
2017	\$19,000	\$19,000	177,000
2018	47,500	66,500	129,500
2019	47,500	114,000	82,000
2020	38,000	152,000	44,000
2021	38,000	190,000	6,000

Straight-line: $(\$196,000 - \$6,000)/5 \text{ year} = \$38,000 \text{ per year.}$

Double-declining balance: Rate is $\frac{1}{5} \times 2 = 40\%$. Final year expense: $\$25,402 - \$6,000 = \$19,402.$

Units-of-production: Rate is $(\$196,000 - \$6,000)/200,000 \text{ miles} = \$.95 \text{ per mile.}$

SOLUTIONS**Learning Goal 19, continued****LG 19-7, continued**

b.

For 2017	Straight-Line	Double-Declining Balance	Units-of-Production
Service revenue	\$585,000	\$585,000	\$585,000
Operating expenses except for depreciation	(415,000)	(415,000)	(415,000)
Depreciation expense	(38,000)	(78,400)	(19,000)
Operating income before tax	132,000	91,600	151,000

In the first year, the double-declining-balance method results in more than twice as much depreciation expense as straight-line (double the straight-line rate and cost is not reduced by residual value), resulting in lower income. Units-of-production depreciation depends on the miles used, and in the first year, the truck was not driven a great number of miles, so the depreciation expense is relatively low. This resulted in higher income.

c.

For 2017	Straight-Line	Double-Declining Balance	Units-of-Production
Operating income before tax	\$132,000	\$91,600	\$151,000
Income tax @ 40%	52,800	36,640	60,400

Double-declining results in greater cash flow because of a tax savings of \$16,160 greater than straight-line and \$23,760 greater than units-of-production. In early years, double-declining usually provides the greatest tax savings and best cash flow. However, this reverses in later years, when double-declining results in much less depreciation.

- d. Over the entire 5-year life of the truck, all the methods result in the same total depreciation, and the same amount of tax savings if the tax rate is constant. The different methods result in different timing of the expenses.

SOLUTIONS**Learning Goal 19, continued****LG 19-8.**

a.

Date	Account/Explanation	Post. Ref.	Dr.	Cr.
2017				
January 3	Office Furniture		10,000	
	Cash			7,000
	Accounts Payable			3,000
June 1	Depreciation Expense		216	
	Accumulated Depreciation			216
	Cash		2,100	
	Accumulated Depreciation—Office Equipment		11,216	
	Office Equipment			12,500
	Gain on Sale of Plant Assets			816
Sept. 1	Loss on Retirement of Plant Assets		400	
	Accumulated Depreciation—Computer Equipment		4,100	
	Computer Equipment			4,500
Nov. 30	Depreciation Expense		133	
	Accumulated Depreciation—Office Furniture			133
	Cash		3,500	
	Accumulated Depreciation—Office Furniture		183	
	Office Furniture			2,000
	Gain on Sale of Plant Assets			1,683
Dec. 31	Video Equipment		26,500	
	Cash			26,500

b.

Date	Account/Explanation	Post. Ref.	Dr.	Cr.
	Adjusting Entries			
Dec. 31	Depreciation Expense—Office Furniture		800	
	Accumulated Depreciation—Office Furniture			800

SOLUTIONS**Learning Goal 19, continued****LG 19-8, continued**

c.

Date	Account/Explanation	Post. Ref.	Dr.	Cr.
2018	Adjusting Entries			
Dec. 31	Depreciation Expense—Office Furniture		800	
	Accumulated Depreciation—Office Furniture			800
	Depreciation Expense—Video Equipment		3,643	
	Accumulated Depreciation—Video Equipment			3,643

LG 19-9.

Date	Account/Explanation	Post. Ref.	Dr.	Cr.
a.	Loss on Disposal		7,000	
	Accumulated Depreciation—Equipment		168,000	
	Equipment			175,000
b.	Cash		10,000	
	Accumulated Depreciation—Equipment		168,000	
	Equipment			175,000
	Gain on Sale			3,000
c.	Loss on Sale		2,000	
	Cash		5,000	
	Accumulated Depreciation—Equipment		168,000	
	Equipment			175,000
d.	Accumulated Depreciation—Equipment		168,000	
	Impairment Loss		4,900	
	Equipment			172,900

SOLUTIONS

Learning Goal 19, continued

LG 19-10.

a.

	General Journal			
Date	Account	Ref.	Dr.	Cr.
2018				
March 1	Depreciation Expense		1,500	
	Accumulated Depreciation—Equip.			1,500
	Cash		7,000	
	Notes Receivable		5,000	
	Accumulated Depreciation—Equip.		83,500	
	Equipment			90,000
	Gain on Sale			5,500
June 2	Patent		75,000	
	Cash			75,000
July 31	Depreciation Expense		1,750	
	Accumulated Depreciation—Equip.			1,750
	Accumulated Depreciation—Equip.		20,750	
	Loss on Asset Retirement		9,250	
	Equipment			30,000
Sept. 1	Equipment		65,400	
	Cash			10,000
	Notes Payable			55,400
Nov. 1	Depreciation Expense		5,000	
	Accumulated Depreciation			5,000
	Accumulated Depreciation—Equip.		36,400	
	Impairment Loss		14,600	
	Equipment			51,000

Notes

March 1: Depreciation needs to be updated for the two months owned in January and February before the sale. $(\$90,000/10) \times 2/12 = \$1,500$. Book value decreases to \$6,500 as accumulated depreciation increases to $(\$90,000 - \$8,000) + \$1,500 = \$83,500$.
Gain on sale is $\$12,000 - \$6,500 = \$5,500$.

July 31: The equipment and its accumulated depreciation need to be removed. The loss is the amount of the asset book value. Current year depreciation is $(\$30,000/10) \times 7/12 = \$1,750$. Book value at time of disposal is $(\$30,000 - \$19,000) - \$1,750 = \$9,250$.

SOLUTIONS**Learning Goal 19, continued****LG 19-10, continued**

Nov. 1: This equipment is impaired. Its loss of efficiency is an indicator, confirmed by cash flow of current sales value of \$9,000 plus future cash flows of \$10,000 = \$19,000 which is less than current book value of $(\$60,000 - \$36,400) = \$23,600$. Depreciation to November 1 is: $(\$60,000/10) \times 10/12 = \$5,000$. The impairment is recorded by removing the prior accumulated depreciation and reducing the asset to its current estimated fair market value. The loss is the difference between book value and fair market value: $\$23,600 - \$9,000 = \$14,600$

b. To record the current year 2018 depreciation expense, we need to view the assets in four categories:

- 1) Remaining balance of equipment from December 31, 2017
- 2) Equipment acquired during 2018 for a partial year of depreciation expense
- 3) Patent acquired during the year for a partial year of amortization expense
- 4) Remaining balance of buildings from December 31, 2017

To follow the equipment changes are determine final balances, we can use T accounts:

Equipment		
Jan. 1 Balance	780,000	
Mar. 1 Sale		90,000
July 31 Retirement		30,000
Sept. 1 Purchase	65,400	
Nov. 1 Impairment		51,000
Dec. 31 Balance	674,400	

Accumulated Depreciation— Equipment		
Jan. 1 Balance		312,000
Mar. 1 Update depreciation		1,500
Mar. 1 Sale	83,500	
July 31 Update depreciation		1,750
July 31 Retirement	20,750	
Nov. 1 Update depreciation		5,000
Nov. 1 Impairment	36,400	
Dec. 31 Balance before adjust.		179,600
Dec. 31 Adjustments		82,700
Dec. 31 Final balance		262,300

Depreciation and Amortization Expense Calculations:

- 1) Remaining equipment balance from December 31, 2017 (full year depreciation):
 $(\$674,400 - \$65,400)/10 = \$60,900$
- 2) Equipment acquired during 2018: $(\$65,400/10) \times 4/12 = \$21,800$
- 3) Patent acquired during 2018 (amortization): $(\$75,000/9) \times 7/12 = \$4,861$
- 4) Remaining buildings balance from December 31, 2017 (no change): $\$2,100,000/30 = \$70,000$

SOLUTIONS**Learning Goal 19, continued****LG 19-10, continued**

Year-end adjusting entries:

	General Journal			
Date	Account	Ref.	Dr.	Cr.
2018				
Dec. 31	Depreciation Expense		82,700	
	Accumulated depreciation—Equip.			82,700
	Amortization Expense		4,861	
	Patent			4,861
	Depreciation Expense		70,000	
	Accumulated depreciation—Bldg.			70,000

c.

Property, Plant, and Equipment

Equipment	\$ 674,400	
Less: Accumulated depreciation	<u>(262,300)</u>	\$ 412,100
Buildings	2,100,000	
Less: Accumulated depreciation	<u>(420,000)</u>	1,680,000
Land		<u>595,000</u>
Total property, plant, and equipment		2,687,100

Intangible Assets

Patent, net of \$4,861 amortization	70,130
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SOLUTIONS**Learning Goal 19, continued****LG 19-11.**

Date	Account/Explanation	Post. Ref.	Dr.	Cr.
a.	Amortization Expense		50,000	
	Patent			50,000
	(\$750,000/15 = \$50,000 per year)			
b.	Amortization Expense		9,800	
	Patent			9,800
	(\$68,600/7 years remaining life = \$9,800 per year)			
c.	Oil Inventory		17,500	
	Cost of Goods Sold		122,500	
	Accumulated Depletion—Oil Land			140,000
	(\$1,500,000 + \$250,000)/500,000 = \$3.50 per barrel			

LG 19-12.

- a. The new chairman of the board of directors is confused about the meaning of depreciation. For accounting and financial purposes, the word *depreciation* does NOT mean loss of value—this is the everyday, non-accounting meaning of the word. For accounting and financial purposes, depreciation is the process of allocating the cost of a long-term asset into expense over the asset's estimated useful life. This is an application of the matching principle. Depreciation does NOT mean putting money aside to replace an asset. If this were happening, there would be a separate and identifiable cash account existing for this purpose, and it would have nothing to do with depreciation. Sometimes companies use the phrase *reserve for depreciation* or *depreciation reserve*. This is very misleading.
- b. This situation illustrates the problem of how to determine the correct market value. The question gives no indication of the fair market value of either asset, so we really cannot record the exchange until we have better information. The GAAP rule is that, for transactions with commercial substance, the fair market value that is *most reliable* should control how the transaction is recorded. This can either be the fair market value of the new asset or the fair market value of the old asset. For example, in this question, if:
 - We know the fair market value of the old asset is \$5,000, then we assume that the value of the new asset is equivalent to this, so there is a \$2,000 gain because the new asset exceeds book value of the old asset by \$2,000.
 - We know that the fair market value of the new asset is \$2,000 and is more reliable, then this is less than the book value of the old asset, so there is a \$1,000 loss.
 - We know fair market values are equal, there will be no gain or loss.

SOLUTIONS**Learning Goal 19, continued****LG 19-13.**

2017			
Jan. 2	Furniture	10,000	
	Cash		8,000
	Accounts Payable		2,000
Jan. 3	Production Equipment	25,000	
	Notes Payable		25,000
April 5	Accumulated Depreciation—Production Equipment	9,000	
	Cash		9,000
June 1	Depreciation Expense—Office Equipment	192	
	Accumulated Depreciation—Office Equipment		192
	Cash	1,200	
	Loss on Sale	108	
	Accumulated Depreciation—Office Equipment	11,192	
	Office Equipment		12,500
Sept. 12	Accumulated Depreciation—Machinery	3,900	
	Loss on Retirement of Machinery	600	
	Machinery		4,500
Nov. 30	Depreciation Expense—Office Furniture	229	
	Accumulated Depreciation—Office Furniture		229
	Cash	3,500	
	Accumulated Depreciation—Office Furniture	229	
	Gain on Sale of Office Furniture		1,729
	Office Furniture		2,000
Dec. 31	Accumulated Depreciation—Computer System	7,500	
	Impairment Loss	11,400	
	Computer System (\$26,000 – \$7,100)		18,900
Adjusting Entries			
Dec. 31	Depreciation Expense—Office Furniture	1,000	
	Accumulated Depreciation—Office Furniture		1,000
Dec. 31	Depreciation Expense—Production Equipment	10,000	
	Accumulated Depreciation—Production Equipment		10,000

SOLUTIONS**Learning Goal 19, continued****LG 19-13, continued**

Dec. 31	Depreciation Expense—Production Equipment	2,057	
	Accumulated Depreciation—Production Equipment		2,057
Dec. 31	Depreciation Expense—Computer System	1,020	
	Accumulated Depreciation—Computer System		1,020
Dec. 31	Interest Expense	1,250	
	Interest Payable		1,250
	(To accrue note payable interest: $\$25,000 \times .05$)		

Calculations:

April 5: The asset's life is being extended, so the procedure is to debit accumulated depreciation for the cost of the renovation. Prior annual depreciation expense is $(\$32,000 - \$5,000/10 = \$2,700$. Prior book value: $\$32,000 - \$21,600 = \$10,400$. New book value: $\$32,000 - \$12,600 = \$19,400$.

June 1: At \$.02 per copy, the current depreciation is $\$.02 \times 9,600 = \192 . Accumulated depreciation is therefore $\$11,000 + \$192 = \$11,192$. Book value is $\$12,500 - \$11,192 = \$1,308$.

Sales price	\$1,200
Book value	<u>1,308</u>
Loss on sale	<u>(\$108)</u>

November 30: Selling \$2,000 of the furniture is $\$2,000/\$10,000 = 20\%$ of the cost. Current depreciation on the 20% portion at date of sale would be: $\$10,000/8 = \$1,250$ per year $\times .2 = \$250$. $\$250 \times 11/12 = \229 (rounded). Book value at date of sale is: $(\$10,000 \times .2) - \229 accumulated depreciation = $\$1,771$.

Sales price	\$3,500
Book value	<u>1,771</u>
Gain on sale	<u>\$1,729</u>

December 31 Impairment:

- Current book value: $\$26,000 - \$7,500^* = \$18,500$
- Undiscounted future cash flows: $(\$2,300 \times 5) + \$2,000 = \$13,500$
- Book value vs. cash flows: $\$18,500$ exceeds $\$13,500 =$ Asset is impaired.
- Amount of impairment loss: $\$18,500 - \$7,100 = \$11,400$

* $(\$26,000 - \$5,000)/7 = \$3,000 \times 2.5$ years = $\$7,500$ accumulated depreciation.

December 31 adjustments for depreciation:

- Office furniture: $(\$10,000 - \$2,000)/8 = \$1,000$.
- Production equipment: $\$25,000 \times (1/5 \times 2) = \$10,000$
- Production equipment: $(\$19,400 \text{ new depreciable basis} - \$5,000)/(2 + 7) = \$2,057$.
- Computer system: Use revised value after impairment loss $(\$7,100 - \$2,000)/5 = \$1,020$

SOLUTIONS

Learning Goal 19 Appendix, continued

LG A19-1 This is a transaction with commercial substance because a newer computer is replacing an older computer, which will have a shorter period of cash flow, and also probably be less efficient or less functional, affecting cash flow.

	A Co.	B Co.
Fair market value of old asset	\$11,000	\$18,000
Cash paid (received)	<u>7,000</u>	<u>(7,000)</u>
Cost of new asset	18,000	11,000
Less book value given up: \$6,000 + \$7,000 cash	13,000	
Less book value given up: \$16,000 – \$7,000 cash		<u>9,000</u>
Gain or (loss) recognized	<u>\$ 5,000</u>	<u>\$ 2,000</u>

Journal entry for A:

Computer (new)	18,000	
Accumulated Depreciation—Computer	4,000	
Computer (old)		10,000
Cash		7,000
Gain on Exchange		5,000

Total effect:				
A	↑	↓	=	L + SE↑
	18,000	7,000		5,000
		6,000		

Journal entry for B:

Cash	7,000	
Computer (new)	11,000	
Accumulated Depreciation—Computer	5,000	
Computer (old)		21,000
Gain on Exchange		2,000

Total effect:				
A	↑	↓	=	L + SE↑
	7,000	16,000		2,000
	11,000			

SOLUTIONS**Learning Goal 19 Appendix, continued**

LG A19-2 This is a transaction that lacks commercial substance. Both nonmonetary assets are held for investment and both have essentially the same qualities that affect future cash flow (similar in use, location, and zoning). No cash is involved, so no part of gain is recognized because there is no commercial substance. All losses are recognized.

	A Co.	B Co.
Fair market value of old asset	\$41,000	\$41,000
Cash paid (received)	<u>-0-</u>	<u>-0-</u>
Cost of new asset	41,000	19,000
		(Gain Eliminated)
Less book value given up:	(45,000)	
Less book value given up:		<u>19,000</u>
Gain or (loss) recognized	<u><u>(\$4,000)</u></u>	<u><u>-0-</u></u>

Journal entry for A:

Land (new)	41,000	
Loss on Exchange	4,000	
Land (old)		45,000

Total effect:

A	↑	↓	=	L	+	SE ↓
	41,000	45,000				4,000

Journal entry for B:

Land (new)	19,000	
Land (old)		19,000

Total effect:

A	↑	↓	=	L	+	SE
	19,000	19,000				

SOLUTIONS

Learning Goal 19 Appendix, continued

LG A19-3 This is a transaction with commercial substance because older fixtures are being exchanged for newer fixtures with different features. These qualities are likely to affect cash flow. The fair value of the B Company asset is determined by A Company asset fair value plus cash paid.

	A Co.	B Co.
Fair market value of old asset	\$100,000	\$145,000
Cash paid (received)	<u>45,000</u>	<u>(45,000)</u>
Cost of new asset	145,000	100,000
Less book value given up: \$40,000 + \$45,000 cash	85,000	
Less book value given up: \$74,000 – \$45,000 cash		<u>29,000</u>
Gain or (loss) recognized	<u>\$ 60,000</u>	<u>\$ 71,000</u>

Journal entry for A:

Fixtures (new)	145,000	
Accumulated Depreciation—Fixtures	150,000	
Fixtures (old)		190,000
Cash		45,000
Gain on Exchange		60,000

Total effect:				
A	↑	↓	=	L + SE ↑
	145,000	40,000		60,000
		45,000		

Journal entry for B:

Cash	45,000	
Fixtures (new)	100,000	
Accumulated Depreciation—Fixtures	15,000	
Fixtures (old)		89,000
Gain on Exchange		71,000

Total effect:				
A	↑	↓	=	L + SE ↑
	45,000	74,000		71,000
	100,000			

SOLUTIONS**Learning Goal 19 Appendix, continued**

LG A19-4 This is a transaction with commercial substance because a new van is being acquired in exchange for an old truck; also, asset uses are different. These differences will have an effect on future cash flows. The cash paid by Smith Company is the list price of the new van minus the trade in allowance for the old truck.

	Smith Co.	Dealer
Fair market value of old asset	\$3,000	\$59,000
Cash paid (received)	<u>56,000</u>	<u>(56,000)</u>
Cost of new asset	59,000	3,000
Less book value given up: \$8,000 + \$56,000 cash	64,000	
Less book value given up: \$50,000 – \$56,000 cash	<u> </u>	<u>6,000</u>
Gain or (loss) recognized	<u>(\$5,000)</u>	<u>\$ 9,000</u>

Journal entry for Smith Company:

Loss on Exchange	5,000	
Van	59,000	
Accumulated Depreciation—Truck	38,000	
Truck		46,000
Cash		56,000

Total effect:

A	↑	↓	=	L	+	SE	↓
	59,000	8,000				5,000	
		56,000					

Journal entry for Dealer:

Used Car Inventory	3,000	
Cash	56,000	
Cost of Goods Sold	50,000	
New Car Inventory		50,000
Sales		59,000

Total effect:

A	↑	↓	=	L	+	SE	↑	↓
	3,000	50,000				59,000	50,000	
	56,000							

SOLUTIONS

Learning Goal 19 Appendix, continued

LG A19-5 This is a transaction with commercial substance because a newer air conditioner is replacing an older one, which will have a shorter period of cash flow, and also probably be less efficient or less functional, affecting cash flow. (This is a somewhat unusual situation because one asset has such a low fair value and the other asset has such a high fair value. Also, in this case, the fair value of the old asset for B Company will have to be determined by the fair value of the asset received plus cash received. There is no fair value information for B.)

	A Co.	B Co.
Fair market value of old asset	\$15,000	\$125,000
Cash paid (received)	110,000	(110,000)
Cost of new asset	125,000	15,000
Less book value given up: \$2,000 + \$110,000 cash	112,000	
Less book value given up: \$79,000 – \$110,000 cash*		31,000
Gain or (loss) recognized	<u>\$13,000</u>	<u>\$ 46,000</u>

*Cash received exceeds equipment book value so this adds to gain. To verify B Company gain, subtract book value from fair value of old asset: \$125,000 – (\$185,000 – \$106,000) = \$46,000.

Journal entry for A:

Air Conditioning Equipment (new)	125,000	
Accumulated Depreciation—A/C Equip.	83,000	
Air Conditioning Equipment (old)		85,000
Cash		110,000
Gain on Exchange		13,000

Total effect:

A	↑		↓	=	L	+	SE	↑
	125,000		110,000				13,000	
			2,000					

Journal entry for B:

Cash	110,000	
Air Conditioning Equipment (new)	15,000	
Accumulated Depreciation—A/C Equip.	106,000	
Air Conditioning Equipment (old)		185,000
Gain on Exchange		46,000

Total effect:

A	↑		↓	=	L	+	SE	↑
	110,000		79,000				46,000	
	15,000							

SOLUTIONS**Learning Goal 19 Appendix, continued**

LG A19-6 This is a transaction that lacks commercial substance. Both cars have essentially the same features and are of the same age, to be used in the same manner. The value of car A is used to determine the value of B, because car A value is the only one available. No cash is involved, so no part of gain is recognized because there is no commercial substance. All losses are recognized.

	A Co.	B Co.
Fair market value of old asset	\$9,000	\$9,000
Cash paid (received)	<u>-0-</u>	<u>-0-</u>
Cost of new asset	5,000	9,000
	(Gain Eliminated)	
Less book value given up:	5,000	
Less book value given up:	<u> </u>	<u>11,000</u>
Gain or (loss) recognized	<u><u>-0-</u></u>	<u><u>(\$2,000)</u></u>

Journal entry for A:

Car (new)	5,000	
Accumulated Depreciation—Car	35,000	
Car (old)		40,000

Total effect:					
A	↑		↓	=	L + SE
	5,000		5,000		

Journal entry for B:

Loss on Exchange	2,000	
Car (new)	9,000	
Accumulated Depreciation—Car	32,000	
Car (old)		43,000

Total effect:					
A	↑		↓	=	L + SE ↓
	9,000		11,000		2,000