

ACC101 – CHAPTER 8

Accounting for Long-Term Assets



Key Terms and Concepts to Know

Long-term assets:

- Cost
- Useful life
- Tangible
- Intangible
- Betterments

Depreciation/Depletion/Amortization Methods:

- Straight-line method
- Units-of-production method
- Double-declining-balance method

Disposals of Long-Term Assets:

- Discard
- Sale
- Exchange

Leases:

- Lessor
- Lessee
- Leasehold
- Leasehold Improvements

DEPRECIATION EXPENSE AND ACCUMULATED DEPRECIATION

1. The allocation of the cost of an asset to the periods it is used.
2. Depreciation **does not** attempt to track the market value of the asset.

EXAMPLE – A machine that cost \$50,000 and will last 5 years cost the company:

$$\$50,000 / 5 \text{ years} = \$10,000 \text{ per year}$$

\$10,000 = portion of cost to be expensed for each full year of use

3. Depreciation is required because physical deterioration and/or obsolescence cause all long-term assets, with the exception of land, to lose their usefulness.
4. When recording depreciation, we cannot directly reduce the long-term asset account because we are only estimating how much of its usefulness has expired.
5. Instead: A contra account called Accumulated Depreciation is used.

Depreciation Expense-Machinery	XXX	
Accumulated Depreciation- Machinery		XXX

STRAIGHT-LINE METHOD

Allocates cost evenly over years asset is used.

$$(\text{Cost} - \text{Residual Value}) / \text{Estimated Life} = \text{Annual Depreciation}$$

Practice Problem #1

- a. Calculate the annual depreciation on a piece of equipment that cost \$250,000. It has been estimated that the equipment will last 8 years and have a residual value of \$10,000. Make the journal entry to record one year's depreciation.
- b. Calculate the depreciation on the equipment from (a) above if the equipment was purchased on October 1 and the period ends on December 31. Make the journal entry to record depreciation.

UNITS-OF-PRODUCTION METHOD

1. Allocates cost based on an assets usage.
2. The life of an asset is measured in units of activity, i.e. miles, or hours used.

$(\text{Cost} - \text{Residual Value}) / \text{Estimated Life in Units} = \text{Depreciation Expense Per unit}$

3. To calculate depreciation, multiply rate per unit times the number of units consumed.

EXAMPLE: A machine has a units-of-production rate of \$2/hour.

If: 20,000 machine hours are used in year one

Then: Depreciation = $20,000 * 2 = \$40,000$

Practice Problem #2

A company purchased machinery that cost \$510,000. The machine will be operated for an estimated 100,000 hours over its useful life and have a residual value of \$10,000.

- a. What is the rate of depreciation per hour?
- b. Journalize the entry for annual depreciation if the machine had been operated for 22,000 hours.

DECLINING BALANCE METHOD

$(\text{Cost} - \text{Accumulated Depreciation}) * \text{Declining Balance Rate}$

OR

$\text{Book Value} * \text{Declining Balance Rate}$

1. Rate = Double the rate used under the straight-line method.
 - a. Calculate the rate for the straight-line method

5 year useful life = $1/5$ per year
 $1/5 = 20\%$
Double the rate: $20\% * 2 = 40\%$
May also be calculated as $200\% / \text{useful life}$
2. Use the formula to calculate the amount of depreciation. Note: Residual Value is not used in the calculation of annual depreciation until the last year. An asset may not be depreciated the asset below its residual value.

EXAMPLE: Equipment was purchased for \$70,000. This equipment has a 5 year life and an \$8,000 residual value.

- a. Calculate depreciation for each of the five years using the declining balance method at twice the straight-line rate.

Straight-line rate = $1/5$ or 20%

Declining Rate = 40% = 20% * 2 or 200%/5

Maximum Depreciation allowed = \$62,000

		<u>Annual Amt</u>	<u>Cumulative Amt</u>
Year 1	$\$70,000 * 40\% =$	\$28,000	28,000
Year 2	$(70,000 - 28,000) * 40\% =$	\$16,800	44,800
Year 3	$(70,000 - 44,800) * 40\% =$	\$10,080	54,880
Year 4	$(70,000 - 54,880) * 40\% =$	\$ 6,048	60,925
*Year 5	$62,000 - 60,925 =$	\$ 1,075	62,000

*In Year 5 asset may not be depreciated beyond its residual value. Applying the double declining balance method in year 5 calculates and expense of $(70,000 - 60,925) * 40\% = \$3,628.80$, which reduces the book value below the residual value.

Practice Problem #3

A company purchased a machine that cost \$100,000. The machine is expected to last 4 years and has a residual value of \$7,000. Calculate the depreciation expense to be recorded each year under the declining balance method.

DISPOSAL OF LONG-TERM ASSETS

In All Cases

1. Accumulated depreciation and depreciation expense must be brought up to date before recording the disposal.
2. The asset and its accumulated depreciation must be removed from the accounting records.
3. Book Value = Cost – Accumulated Depreciation

DISCARDING LONG-TERM ASSETS

1. Update depreciation to date of disposal.
2. Remove the asset and its accumulated depreciation from the accounting records.
3. If the asset is not fully depreciated, record a loss equal to its book value.

EXAMPLE: On January 2 discarded Machine #1, which originally cost \$10,000 and has accumulated depreciation of \$10,000.

Accumulated Depreciation	10,000	
Machinery		10,000

On January 2 discarded Machine #2, which originally cost \$25,000 and has accumulated depreciation of \$20,000.

Accumulated Depreciation	20,000	
Loss on Disposal	5,000	
Machinery		25,000

Practice Problem #4

Journalize the entry to discard equipment on January 2, originally costing \$50,000 and having accumulated depreciation on \$42,000.

SALE OF A LONG-TERM ASSET

1. Update depreciation to date of disposal.
2. Record the cash received.
3. Remove asset and its accumulated depreciation from records.
4. Record a gain or loss: gain if cash received exceeds book value or loss if book value exceeds cash received

EXAMPLE: On October 1, a machine that cost \$50,000 was sold for \$16,000. The accounting records revealed that accumulated depreciation as of January 1 was \$35,000 and annual depreciation is \$5,000.

1. Update Depreciation

$$5,000 * 9/12 = \$3,750$$

Depreciation Expense	3,750	
Accumulated Depreciation		3,750

New Balance of Accumulated Depreciation: $35,000 + 3,750 = \$38,750$

2. Calculate the gain or loss.

Selling Price	\$16,000
-Book Value	<u>11,250</u> (50,000 – 38,750)
Gain	4,750

Cash	16,000	
Accumulated Depreciation	38,750	
Machinery		50,000
Gain on Disposal		4,750

Practice Problem #5

On July 1 a machine, which cost \$75,000, was sold for \$4,000. The following information was obtained from the accounting records: accumulated depreciation on December 31, \$61,250; annual depreciation, \$8,750. Journalize the entries to record (a) depreciation up to the date of sale and (b) the sale of the machine.

EXCHANGE OF SIMILAR ASSETS

1. Update depreciation to the date of trade-in.
2. Remove the old asset and its accumulated depreciation from the records.
3. Determine gain or loss by comparing the Trade-In Allowance to the Book Value.
 - a. Gains are never recognized and not recorded.
 - b. Losses are recognized for financial reporting.
4. Record any cash paid.
5. Whenever a gain or loss is not recognized, the cost of the new asset acquired is adjusted.
 - a. Decrease asset's cost for amount of unrecognized gain.
 - b. Increase asset's cost for amount of unrecognized loss.

EXAMPLE #1: If a purchaser is given a \$3,000 trade-in allowance on a machine with a book value of \$5,000, what is the gain or loss?

Trade-In Allowance	\$3,000
Less: Book Value	<u>5,000</u>
Loss on Disposal	(\$2,000)

EXAMPLE #2: On January 1, equipment with a cost of \$100,000 and accumulated depreciation of \$92,000 is traded-in on a new machine with a cost of \$150,000. The seller agrees to \$140,000 cash plus the trade-in.

Trade-in Allowance	\$10,000	(150,000 selling price – 140,000 cash given)
Book Value	<u>8,000</u>	(100,000 cost – 92,000 Accumulated Depreciation)
Gain on Disposal	\$ 2,000	

The gain may not be recognized

Cost of new Asset is adjusted for the gain:	Cost	\$150,000
	-Gain	<u>-2,000</u>
	Adjusted Cost	\$148,000

<u>Entry:</u> Accumulated Depreciation-Equipment (old)	92,000
Equipment (new)	148,000
Equipment (old)	100,000
Cash	140,000

**Check: What is given up to obtain the new equipment?*

Cash	\$140,000
Old Machine	<u>8,000</u> (book value)
Cost of New	\$148,000

EXAMPLE #3: On July 1 a machine with a cost of \$270,000 is traded-in on a new machine with a cost of \$400,000. The seller agrees to \$390,000 in cash and the old machine. The following information was obtained from the accounting records; the balance of Accumulated Depreciation on January 1 was \$243,000 and the annual depreciation is \$27,000. Journalize the entries to (a) update depreciation and (b) record the trade-in.

Depreciation Expense	13,500
Accumulated Depreciation	13,500
27,000 * ½ year = 13,500	

Trade-In Allowance	\$10,000	(400,000 selling price – 385,000 cash)
Book Value	<u>13,500</u>	(270,000 cost – 256,500 Accumulated Depreciation)
Loss on Disposal	\$ 3,500	

Accumulated Depreciation – Equip. (old)	256,500	
Equipment (new)	400,000	
Loss on Disposal	3,500	
Equipment (old)		270,000
Cash		390,000

Practice Problem #6

1. On January 1, equipment with a cost of \$400,000 and accumulated depreciation of \$320,000 is traded-in on new equipment with a cost of \$450,000. The seller agrees to \$366,000 in cash and the old equipment. Make the journal entry for financial reporting.
2. On July 1, equipment with a cost of \$180,000 is traded-in on new equipment with a cost of \$250,000. The seller agrees to \$210,000 in cash plus the trade-in. The following information is obtained from the accounting records; accumulated depreciation as of January 1 was \$120,000 and annual depreciation is \$20,000. Make the journal entries for both financial reporting and tax reporting.

DEPLETION

1. Mining companies purchase rights to metal ore or mineral deposits. These rights are recorded in an asset account when they are purchased.
2. As ore is mined, part of the cost must be removed from the asset account. This process is called depletion.
3. The Units of Production Method is used.

Depletion Expense	XX	
Accumulated Depletion		XX

AMORTIZATION

1. The periodic expensing of the cost of intangible assets.
2. The Straight-line Method is used.
3. Intangibles are amortized over their useful life, not to exceed 40 years.
4. The intangible asset is credited when it is amortized.

Amortization Expense	XX	
Patents		XX

SAMPLE MULTIPLE CHOICE QUESTIONS

1. Undeveloped land acquired as a speculation is listed in the balance sheet as a(n):
 - a. Current asset
 - b. Investment
 - c. Plant asset
 - d. Intangible asset
2. Accumulated Depreciation
 - a. Is used to show the amount of cost expiration of intangibles
 - b. Is the same as Depreciation Expense
 - c. Is used to show the amount of cost expiration of natural resources
 - d. Is a contra asset
3. A machine with a cost of \$130,000 has an estimated residual value of \$10,000 and an estimated life of 4 years or 18,000 hours. What is the amount of depreciation for the second full year, using the declining-balance method at double the straight-line rate?
 - a. \$30,000
 - b. \$31,500
 - c. \$32,500
 - d. \$65,000
4. A machine with a cost of \$130,000 has an estimated residual value of \$10,000 and an estimated life of 4 years or 16,000 hours. Using the units-of-production method, what is the amount of depreciation for the second full year, during which the machine was used 4,000 hours?
 - a. \$26,000
 - b. \$24,000
 - c. \$30,000
 - d. \$32,500
5. Equipment with a cost of \$80,000 has an estimated residual value of \$5,000 and an estimated life of 4 years or 12,000 hours. It is to be depreciated by the straight-line method. What is the amount of depreciation for the first full year, during which the equipment was used 3,300 hours?
 - a. \$20,000
 - b. \$18,750
 - c. \$20,625
 - d. \$22,000

6. The depreciation method that does not use residual value in calculating the first year's depreciation expense is:
 - a. Straight-line
 - b. Declining balance
 - c. Units-of-production
 - d. None of the above
7. Expenditures that add to the utility of plant assets for more than one accounting period are:
 - a. Capital expenditures
 - b. Revenue expenditures
 - c. Current expenditures
 - d. Additional expenditures
8. A plant asset with a cost of \$60,000 is traded for a similar asset priced at \$80,000. Assuming accumulated depreciation of \$55,000 and a trade-in allowance of \$6,000, what is the cost basis of the new asset for financial reporting purposes?
 - a. \$75,000
 - b. \$79,000
 - c. \$86,000
 - d. \$80,000
9. A plant asset with a cost of \$15,000 is traded for a similar asset priced at \$20,000. Assuming accumulated depreciation of \$12,500 and a trade-in allowance of \$1,500, what is the cost basis of the new asset for financial reporting purposes?
 - a. \$20,000
 - b. \$15,000
 - c. \$21,500
 - d. \$12,500
10. All leases are classified as either:
 - a. Capital Leases or Operating Leases
 - b. Capital Leases or Long-Term Leases
 - c. Operating Leases or Current Leases
 - d. Long-Term Leases or Current Leases
11. Which one of the following is NOT an internal control procedure for plant assets?
 - a. Ensuring that plant assets are acquired at the lowest possible costs
 - b. Training employees to properly operate plant assets
 - c. Recording assets in the subsidiary ledger only at year end
 - d. Tagging assets as they are acquired

12. Expenditures for research and development are generally recorded as:
 - a. Current assets
 - b. Assets and amortized over their estimated useful life
 - c. Assets and amortized over 40 years
 - d. Current operating expenses
13. Patents are reported on the balance sheet in the:
 - a. Current assets section
 - b. Intangible assets section
 - c. Plant assets section
 - d. Investments section
14. All things being equal except the long-term assets to long-term liabilities ratio, a lender would prefer to lend to a company whose ratio is
 - a. 4.0
 - b. 2.5
 - c. 3.0
 - d. 3.5

15. A company has the following asset account balances:

Buildings & Equipment	\$9,200,000
Accumulated Depreciation	1,200,000
Patents	750,000
Land Improvements	1,000,000
Land	5,000,000

The total amount reported on the balance sheet under Property, Plant, & Equipment would be:

- a. \$14,000,000
 - b. \$13,000,000
 - c. \$12,800,000
 - d. \$13,550,000
16. A purchase of equipment for \$18,000 also involved freight charges of \$500 and installation costs of \$2,500. The estimated salvage value and useful life are \$2,000 and 4 years, respectively. Annual straight-line depreciation expense will be:
 - a. \$4,750
 - b. \$4,500
 - c. \$4,125
 - d. \$4,625

17. An asset purchased on January 1 for \$48,000 has an estimated salvage value of \$3,000. The current year's Depreciation Expense is \$5,000 and the balance of the Accumulated Depreciation account, after adjustment, is \$20,000. If the company uses the straight-line method, what is the asset's remaining useful life?
 - a. 9 years
 - b. 4 years
 - c. 8 years
 - d. 5 years
18. Book value is the same as market value.
 - a. True
 - b. False
19. Coronado Company purchased land for \$80,000. The company also paid \$12,000 in accrued taxes on the property, incurred \$5,000 to remove an old building, and received \$2,000 from the salvage of the old building. The land will be recorded at:
 - a. \$80,000
 - b. \$95,000
 - c. \$92,000
 - d. \$83,000
20. On April 1, 2001 La Presa Company sells some equipment for \$18,000. The original cost was \$50,000, the estimated salvage value was \$8,000, and the expected useful life was 6 years. On December 31, 2000 the Accumulated Depreciation account had a balance of \$29,400. The gain or loss on the sale was:
 - a. \$2,600 gain
 - b. \$300 gain
 - c. \$850 loss
 - d. \$5,400 gain
21. On January 1, 2000 Jamacha Company purchased some equipment for \$15,000. The estimated salvage value and useful life are \$3,000 and 4 years, respectively. On January 1, 2002, the company determines that the asset's remaining useful life is 3 years. What is the revised depreciation expense for 2002 if the company uses the straight-line method?
 - a. \$3,000
 - b. \$2,000
 - c. \$4,000
 - d. \$2,250

22. On March 1, 2002, Moreno Company purchased a patent from another company for \$90,000. The estimated useful life of the patent is 10 years, and its remaining legal life is 15 years. The Amortization Expense for 2002 is:
- a. \$9,000
 - b. \$7,500
 - c. \$6,000
 - d. \$5,000
23. On September 1, 2001, Dulzura Company purchased an asset for \$9,000, with a \$1,500 estimated salvage value, and a 4-year useful life. The 2001 depreciation expense using the straight-line method would be:
- a. \$625
 - b. \$750
 - c. \$1,875
 - d. \$2,250
24. Otay Company purchased land for \$70,000 on 12/31/01. As of 5/30/02, the land increased in value to \$71,500. On 12/31/02, the land was appraised for \$74,000. The Land account should be increased by:
- a. \$4,000
 - b. \$1,500
 - c. \$2,500
 - d. \$0
25. Revenue expenditures are expensed as incurred.
- a. True
 - b. False
26. Which of the following costs would not be included in the cost of the equipment?
- a. Insurance
 - b. Installation
 - c. Testing
 - d. Freight
27. Which of the following is not a depreciable asset?
- a. Land improvements
 - b. Equipment
 - c. Buildings
 - d. Land

SOLUTIONS TO PRACTICE PROBLEMS

Practice Problem #1

$(250,000 - 10,000) / 8 = \$30,000$ annual depreciation

Depreciation Expense	30,000	
Accumulated Depreciation		30,000

$\$30,000$ annual depreciation * 3/12 (3 months out of 12) = \$7,500

Depreciation Expense	7,500	
Accumulated Depreciation		7,500

Practice Problem #2

$(510,000 - 10,000) / 100,000 = \5 per hour

22,000 hours * \$5 per hour = \$110,000

Depreciation Expense	110,000	
Accumulated Depreciation		110,000

Practice Problem #3

4 year life = $\frac{1}{4}$ or 25% per year under straight-line depreciation

Double it to 50% for declining balance depreciation

Maximum depreciation allowed: $100,000 - 7,000 = 93,000$

	<u>Annual</u>	<u>Accumulated</u>
Year 1: $100,000 * 50\% =$	\$50,000	\$50,000
Year 2: $50,000 * 50\% =$	25,000	75,000
Year 3: $25,000 * 50\% =$	12,500	87,500
Year 4: $12,500 * 50\% =$	5,500*	93,000*

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*Maximum depreciation allowed in year 4 is \$5,500 which brings accumulated depreciation to \$93,000. The asset may not be depreciated below its residual value of \$7,000.

Practice Problem #4

Accumulated Depreciation	42,000	
Loss on Disposal	8,000	
Equipment		50,000

Practice Problem #5

Depreciation Expense	4,375	
Accumulated Depreciation		4,375
<i>8,750 * 1/2 year = \$4,375</i>		
<i>Accumulated Depreciation: 61,250 + 4,375 = \$65,625</i>		

Cash	4,000	
Loss on Disposal	5,375	
Accumulated Depreciation	65,625	
Equipment		75,000
<i>Book Value: 75,000 - 65,625 = 9,375</i>		
<i>Loss: 4,000 - 9,375 = \$5,375</i>		

Practice Problem #6

1. Trade-In Allowance	\$84,000	(450,000 - 366,000)
Book Value	<u>80,000</u>	(400,000 - 320,000)
Gain	\$ 4,000	

Gain may not be recognized; therefore the cost basis of the new equipment will be adjusted.

Cost of New Equipment	\$450,000
Less: Gain	<u>4,000</u>
Adjusted Cost of New	\$446,000

Equipment (new)	446,000	
Accumulated Depreciation	320,000	
Equipment (old)		400,000

Cash		366,000
2. Depreciation Expense	10,000	
Accumulated Depreciation		10,000
<i>(20,000 * ½ year = 10,000)</i>		

Trade-In Allowance	\$40,000	(250,000 – 210,000)
Book Value	<u>50,000</u>	(180,000 – 130,000)
Loss	\$10,000	

For financial reporting the loss may be recognized.

Equipment (new)	250,000	
Accumulated Depreciation	130,000	
Loss of Disposal	10,000	
Equipment (old)		180,000
Cash		210,000

SOLUTIONS TO MULTIPLE CHOICE QUESTIONS

1. B
2. D
3. C: 4-year life = 25% per year under straight-line * 2 = 50% declining rate
 Year 1: 130,000 * 50% = 65,000
 Year 2: 65,000 * 50% = 32,500
4. C: (130,000 – 10,000) / 16,000 hours = \$7.50 per hour
 4,000 hours * 7.50 per hour = \$30,000
5. B: (80,000 – 5,000) / 4 = \$18,750
6. B
7. A
8. B 60,000 cost – 55,000 Accumulated Depreciation = 5,000 book value
 6,000 trade-in - 5,000 book value = 1,000 gain
 Reduce cost by gain: 80,000 – 1,000 = 79,000

9. A $15,000 \text{ cost} - 12,500 \text{ Accumulated Depreciation} = 2,500 \text{ book value}$
 $1,500 \text{ trade-in} - 2,500 \text{ book value} = 1,000 \text{ loss}$
10. A
11. C
12. D
13. B
14. A The higher the ratio the less debt in comparison with long-term assets
15. A Do not include patents and deduct accumulated depreciation
16. A $18,000 \text{ cost} + 500 \text{ freight} + 2,500 \text{ installation} = \$21,000$
 $21,000 \text{ cost} - 2,000 \text{ salvage} = \$19,000 / 4 \text{ years} = \$4,750$
17. D Annual Depreciation: $(48,000 - 3,000) / \text{useful life in years} = 5,000$
Useful life = 9 years
Number of years passed: $20,000 \text{ accumulated depreciation} / 5,000$
Depreciation = 4 years
9-year useful life - 4 years passed = 5 years left
18. B
19. B $80,000 \text{ Land} + 12,000 \text{ Accrued Taxes} + 5,000 \text{ removal} - 2,000 \text{ received}$
 $= \$95,000$
20. C 1) Calculate Depreciation to date of sale
 $(50,000 - 8,000) / 6 = \$7,000 \text{ per year}$
 $7,000 * 3/12 \text{ Jan 1 to Apr 1} = \$1,750$
2) Update Accumulated Depreciation
 $29,400 + 1,750 = \$31,150$
3) Calculate gain or loss
 $50,000 \text{ cost} - 31,150 \text{ Accumulated Depreciation} = \$18,850 \text{ book value}$
 $18,000 \text{ selling price} - 18,850 \text{ book value} = -\850 loss
21. B Original Depreciation Schedule: $(15,000 - 3,000) / 4 \text{ years} = \$3,000/\text{year}$
After 2 years accumulated depreciation = $3,000 * 2 = \$6,000$
Book Value on Jan. 1: $15,000 - 6,000 = \$9,000$
Revised depreciation: $(9,000 \text{ book value} - 3,000 \text{ salvage}) / 3 \text{ years} = 2,000$
22. B $90,000 \text{ cost} / 10 \text{ year useful life} = 9,000 \text{ per year}$
 $9,000 * 10/12 \text{ (10 months)} = \$7,500$
23. A $(9,000 - 1,500) / 4 = \$1,875 \text{ per year} * 4/12 \text{ (4 months)} = \625
24. D
25. A
26. A
27. D