CHAPTER 8
ACCOUNTING FOR LONG-TERM ASSETS

Key Terms and Concepts to Know

Long-term assets:

- Determine the cost of the asset
- Salvage or residual value
- Useful life
- Tangible assets
- Intangible assets
- Betterments vs. extraordinary repairs vs. ordinary repairs expense

Depreciation/Depletion/Amortization Methods:

- Straight-line method
- Units-of-production method
- Double-declining balance method
- Full year vs. partial year depreciation expense
- Changes in estimates for depreciation

Disposal of Long-term assets:

- Discard
- Sale
- Gain/loss vs. revenue /expense

Leases:

- Lessor – owner of the property
- Lessee – user of the property
- Leasehold – rights in the property granted by the lessor via the lease document to the lessee
- Leasehold improvements are the additions or changes the lessee makes to the leased property. Leasehold improvements are an asset to the lessee and are amortized over the remaining life of the lease.

Key Topics to Know

Principles of Depreciation

Depreciation is:
- The allocation of the cost of an asset to the periods it is used.
- **Not** an attempt to track the market value of the asset.
- Required because physical deterioration and/or obsolescence cause all fixed assets to lose their usefulness.
- Land is not depreciated because it does not lose its usefulness.
- Recorded, for income statement purposes, as an expense to match revenues generated by using the asset with the expenses incurred to produce the revenue.
- Recorded, for balance sheet purposes, in a contra account called Accumulated Depreciation. The fixed asset account is not directly reduced because depreciation is only an estimate of how much of its usefulness has expired.
- Recorded for the period the asset is owned, typically every month but certainly at the end of each fiscal year. Depreciation expense may have to be adjusted in the year of acquisition and/or the year of disposal to reflect the actual number of months the asset was owned.

Depreciation Methods

Straight-Line Method
- Allocates the cost of the asset to expense evenly over years asset is used.
- The life of the asset is measured in years.
- Formula is: (Cost – Residual Value) / Estimated Life = Annual Depreciation

Example #1: Company F purchased a machine that cost $50,000 and will last 5 years. A salvage value was not assigned to the asset. Determine the annual depreciation expense using the straight-line method and prepare the journal entry to record the expense.

Solution #1:

$50,000 / 5 years = $10,000 per year
$10,000 = portion of cost to be expensed for each full year of use

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

Depreciation Expense-Machinery	10,000	
Accumulated Depreciation- Machinery		10,000

Practice Problem #1

Company Q purchased a piece of equipment that cost $250,000 on January 1, 2011. The equipment will last 8 years and have a residual value of $10,000. On October 1, 2011, the company purchased another piece of equipment identical to the first. Calculate the depreciation expense for 2011 for each piece of equipment.

Units-of-Production Method

- Allocates the cost of the asset to expense based on a measure of how much the asset was used each period.
- The life of an asset is measured in units of activity, i.e. miles, or hours used.
- Formula is: (Cost – Residual Value) / Estimated Life in Units = Depreciation Expense Per Unit
- Depreciation Expense Per Unit x units used in the period = Depreciation Expense for the period

Example #2: Company F purchased a machine that cost $50,000 and will be able to produce 500,000 units of product before wearing out. Expected production by year will be: year 1 – 80,000 units; year 2 – 100,000; year 3 – 100,000; year 4 – 110,000 and year 5 – 110,000. A salvage value was not assigned to the asset. Determine the annual depreciation expense using the units-of-production method and prepare the journal entry to record the expense.

Solution #2:

$50,000 / 500,000 units = $.10 per unit
$.10 x 80,000 units produced = $8,000 depreciation expense for year 1

Depreciation Expense-Machinery	8,000	
Accumulated Depreciation- Machinery		8,000

Practice Problem #2

A company purchased machinery that cost $510,000. It is estimated that the machine will be operated for 100,000 hours over its useful life and have a residual value of $10,000.
Required:

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

- Allocates more of the cost of the asset to expense in the first years of the useful life and less in the later years.
- The life of the asset is measured in years.
- Formula is: (Cost – Accumulated Depreciation) * Declining Balance Rate
  OR
  Book Value * Declining Balance Rate
- Rate = Double the straight-line method rate: (100%/useful life) x 2
  OR
  200% / useful life
- Residual Value is not used in the calculation of annual depreciation until the last year. An asset may not be depreciated below its residual value.

Example #3: Company F purchased a machine that cost $50,000 and will last 5 years. A salvage value was not assigned to the asset. Determine the annual depreciation expense using the declining balance method and prepare the journal entry to record the expense.

Solution #3:

Year	Beginning book value	Depreciation rate	Depreciation expense	Ending book value	Accumulated depreciation
1	50,000	40%	20,000	30,000	20,000
2	30,000	40%	12,000	18,000	32,000
3	18,000	40%	7,200	10,800	39,200
4	10,800	40%	4,320	5,680	44,880
5	5,680	40%	2,272	3,408	47,152

Depreciation Expense-Machinery	20,000	
Accumulated Depreciation- Machinery		20,000

It is typical of the declining balance method that assets without a residual value are not fully depreciated. That is, at the end of their useful life, the book value is not zero. For this reason, many companies switch from the declining balance method to the straight-line method when depreciation expense for the declining balance method becomes less than under the straight line method.

Example #4: Purchased equipment for $70,000. This equipment has a 5 year life and an $8,000 residual value. Calculate depreciation for each of the five years using the declining balance method at twice the straight-line rate.

Solution #4:
Straight-line rate = 1/5 or 20%; Declining Rate = 40%
Maximum Depreciation allowed = $62,000

Year	Beginning book value	Depreciation rate	Depreciation expense	Ending book value	Accumulated depreciation
1	70,000	40%	28,000	42,000	28,000
2	42,000	40%	16,800	25,200	44,800
3	25,200	40%	10,080	15,120	54,880
4	15,120	40%	6,048	9,072	60,928
5*	9,072	40%	1,072	8,000	62,000

*In Year 5, the asset may not be depreciated beyond its residual value. That is, the net book value may not be less than the residual value. Applying the double declining balance method in year 5 calculates an expense of (70,000 – 60,928) * 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

For all disposals of plant assets:

- Accumulated depreciation and depreciation expense must be calculated and recorded in the general ledger through the date of disposal. That is, they must be brought up to date before recording the disposal.
- The book value or cost of the asset less its accumulated depreciation must be removed from the accounting records.
- If the asset is disposed of for more than its book value, the seller records a gain on disposal. If the asset is disposed of for less than its book value, the seller records a loss on disposal.

Discarding a Plant Asset

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

Example #5: On January 2 Company W discarded Machine #1, which originally cost $10,000 and has accumulated depreciation of $10,000. Prepare a journal entry to record the discarding of the machinery.

Solution #5:

Accumulated Depreciation- Machinery	10,000	
Machinery		10,000

Example #6: On January 2 Company W discarded Machine #2, which originally cost $25,000 and has accumulated depreciation of $20,000. Prepare a journal entry to record the discarding of the machinery.

Solution #6:

Accumulated Depreciation- Machinery	20,000	
Machinery		25,000
Loss on disposal	5,000	

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 Plant Asset

- Update depreciation to date of disposal.
- Remove the asset and its accumulated depreciation from the accounting records.
- If the asset is not fully depreciated, record a loss equal to its book value.
- Record a gain or loss: Gain if cash received exceeds book value OR
  Loss if book value exceeds cash received

Example #7: 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.

Solution #7:

- **$**5,000 * 9 months / 12 months = $3,750 depreciation expense for January thru September
- Accumulated depreciation at disposal date = $35,000 + $3,750 = $38,750

Depreciation Expense-Machinery	3,750	
Accumulated Depreciation- Machinery		3,750

- Gain on disposal:

Selling Price	$16,000	
-Book Value	11,250	(50,000 - 38,750)
Gain	4,750	

Cash	16,000	
Accumulated Depreciation- Machinery	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.

Required:

a) Journalize depreciation expense to the date of sale
b) Journalize the sale of the equipment

Depletion of Natural Resources

- Mining companies purchase rights to metal ore or mineral deposits. These rights are recorded in an asset account when they are purchased.
- As ore is mined, part of the cost must be removed from the asset account. This process is called depletion.
- The depletion method is the same as Units of Production Method.
- The accumulated depletion account is credited when the asset is amortized.

Amortization of Intangible Assets

- The periodic expensing of the cost of intangible assets.
- The Straight-line Method is used.
- Intangibles are amortized over their useful life, not to exceed 40 years.
- The accumulated amortization account is credited when the asset is amortized.

Sample True / False Questions

1. Long-term assets are recorded at cost less all expenditures necessary to get the asset ready for use.
   True False

2. Cash received from the sale of salvaged materials increases the total cost of land.
   True False

3. Land improvements are recorded separately from the land itself because, unlike land, these assets are subject to depreciation.
   True False

4. Purchased intangible assets are recorded at their original cost plus all other costs necessary to get the asset ready for use.
   True False

5. A patent is an exclusive right to a published work such as a song, film, or painting.
   True False

6. Repairs and maintenance expenditures are capitalized because they maintain a given level of benefits.
   True False

7. If a firm successfully defends an intangible right, it should expense the litigation costs as incurred.
   True False

8. Depreciation in accounting is the process of allocating to expense the cost of an asset over its service life.
   True False

9. Accumulated Depreciation is a liability account that is increased by credits.
   True False

10. Book value is equal to the original cost of the asset minus the current balance in Accumulated Depreciation.
    True False

11. The Accumulated Depreciation account allows us to reduce the carrying value of assets through depreciation, while maintaining the original cost of each asset in the accounting records.
    True False

12. When a change in estimate is required, the company changes depreciation in prior, current and future years.
    True False

13. Declining-balance depreciation will be lower than straight-line depreciation in earlier years, but higher in later years.
    True False

14. The cost of natural resources is allocated to expense through a process known as depletion.
    True False

15. Straight-line, declining-balance, and activity-based depreciation all are acceptable depreciation methods for both financial reporting and tax reporting.
    True False

16. Intangible assets with an indefinite useful life (goodwill and most trademarks) are not amortized.
    True False

17. A gain is recorded if an asset is sold for less than book value.
    True False

18. A loss is recorded if an asset is sold for less than book value.
    True False

19. Straight-line depreciation assumes that the benefits we derive from the use of an asset are the same each year.
    True False

20. Depreciation in accounting records the decrease in value of an asset.
    True False

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. Ordinary repairs are reported on
   a) Balance sheet
   b) Income statement
   c) Statement of retained earnings
   d) Statement of cash flows

3. 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

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 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

5. 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 deprecation 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

6. 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

7. Patents are reported on the balance sheet in the:
   a) Current assets section
   b) Intangible assets section
   c) Plant assets section
   d) Investments section

8. All things being equal except the net sales to average total assets, a lender would prefer to lend to a company whose ratio is
   a) 4.0
   b) 2.5
   c) 3.0
   d) 3.5

9. 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

10. 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

11. 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

12. 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

13. 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

14. 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

15. 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

16. 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

17. 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

18. Which of the following costs would not be included in the cost of the equipment?
    a) Insurance
    b) Installation
    c) Testing
    d) Freight

19. 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

First piece of equipment: (250,000 – 10,000) / 8 years = 30,000 expense for 2011
Second piece of equipment: (250,000 – 10,000) / 8 years = 30,000 for all of 2011
However, equipment was acquired on October 1, so it was used for 3 months in 2011: 30,000 x 3 months / 12 months = 7,500 for 2011

Practice Problem #2

(510,000 – 10,000) / 100,000 hours = $5 per hour
22,000 hours for the year * $5 per hour = $110,000

Depreciation Expense	110,000	
Accumulated Depreciation		110,000

Practice Problem #3

4 year life = ¼ or 25% per year under straight-line depreciation
Double rate to 50% for declining balance depreciation or 200%/4 years = 50%
Maximum depreciation allowed: 100,000 – 7,000 = 93,000

Year	Beginning book value	Depreciation rate	Depreciation expense	Ending book value	Accumulated depreciation
1	100,000	50%	50,000	50,000	50,000
2	50,000	50%	25,000	25,000	75,000
3	25,000	50%	12,500	12,500	87,500
4	12,500	50%	*5,500	7,000	93,000

*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

*8,750 * ½ year = $4,375 ; Accumulated Depreciation: 61,250 + 4,375 = $65,625*

Cash	4,000	
Accumulated Depreciation	65,625	
Loss on disposal	5,375	
Equipment		75,000

Solutions to True / false Questions

1. False - long-term assets are recorded at cost *plus* all expenditures necessary to get the asset ready for use.
2. False - cash received from the sale of salvaged materials decreases the total cost of land.
3. True
4. True
5. False - a patent is an exclusive right to manufacture a product or to use a process. A copyright is an exclusive right of protection given to the creator of a published work such as a song, film, painting, photograph, book, or computer software.
6. False - repairs and maintenance expenditures are expensed in the period incurred because they maintain a given level of benefits.
7. False - if a firm successfully defends an intangible right, it should capitalize the litigation costs and amortize them over the remaining useful life of the related intangible.
8. True
9. False - accumulated Depreciation is a contra-asset account; it reduces an asset account.
10. True
11. True
12. False - when a change in estimate is required, the company changes depreciation in current and future years, but not in prior periods.
13. False - declining-balance depreciation will be higher than straight-line depreciation in earlier years, but lower in later years.
14. True
15. False - these are acceptable methods for financial reporting, not tax reporting. Most companies use MACRS for income tax depreciation.
16. True
17. False - a gain is recorded if an asset is sold for more than book value.
18. True
19. True
20. False - Depreciation in accounting is the process of allocating to expense the cost of an asset over its service life.

Solutions to Multiple Choice Questions

1. B
2. B
3. D
4. C
5. C
6. B
7. B
8. A
9. A
10. A
11. D
12. B
13. C
14. B
15. A
16. A
17. D
18. A
19. D