

Lesson 8

Long-Term Assets

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Property, Plant and Equipment

Intangible Assets

Natural Resources

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**Property, Plant and Equipment
(Fixed Assets)**

- Land
- Land improvements
- Buildings
- Equipment
- Machinery
- Vehicles
- Office equipment
- Furniture
- Etc.

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Problem 8-1

Review of Accounting for Property, Plant and Equipment

On 4/1/X1, Elder Company purchased a used truck for \$30,000 paying \$10,000 cash down and signing a note to pay the difference with interest over time. In addition, Elder paid a 6% sales tax on the total purchase price, overhauled the engine for \$1,200 and paid \$2,000 for a paint job deemed necessary before putting the truck in service. Elder also prepaid \$2,400 of insurance premiums for one year's coverage on the truck.

- A. What does it mean to "capitalize" an expenditure and what are the criteria for capitalization of costs incurred in the acquisition of property, plant and equipment? Prepare the 4/1/X1 journal entry or entries required for the purchase of the truck and all associated expenditures including insurance.
- B. Prepare the 12/31/X1 adjusting entry for the truck's 'X1 depreciation using the straight-line method and estimations of a \$5,000 salvage value at the end of a 5-year useful life. What kind of account is "Accumulated Depreciation" and where does it appear on a company's financial statements?

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Problem 8-1

- C. Prepare the journal entry in 'X2 to record a \$500 cash purchase of new tires for the truck. When does an expenditure qualify as an "improvement" that's to be capitalized as part of the cost of the truck?
- D. Prepare the 12/31/X2 adjusting entry for the truck's 'X2 depreciation.
- E. Determine the book value of the truck at 12/31/X2.
- F. Prepare the journal entry to record the sale of the truck at 12/31/X2 for \$28,000 cash. What would the entry be assuming the truck sold for \$20,000 cash? What would the entry be assuming the truck was simply used up and disposed of at 12/31/X2? Where would a gain or loss on the sale of an asset appear in the company's income statement?
- G. Recalculate the truck's 12/31/X1 depreciation using the units of production method under the following assumptions: 100,000 miles of anticipated usage, \$5,000 estimated salvage value, and 10,000 miles of actual usage from 4/1/X1 to 12/31/X1.

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Problem 8-1 - Answer

Review of Accounting for Property, Plant and Equipment

- A. What does it mean to "capitalize" an expenditure and what are the criteria for capitalization of costs incurred in the acquisition of property, plant and equipment?

Capitalization of an expenditure means to account for an expenditure as an asset or part of the cost of an asset rather than as an expense. In the case of property, plant and equipment, any cost incurred in acquiring or getting an asset ready for its original intended use is capitalized as part of the cost of the asset.

Prepare the 4/1/X1 journal entry or entries required for the purchase of the truck and all associated expenditures including insurance.

| | | | |
|-------------------|---------|--------|---------------------------------|
| Truck | 35,000* | | *Capitalized cost of the truck: |
| Cash | | 15,000 | Purchase price |
| Note Payable | | 20,000 | Sales tax (6% X \$30,000) |
| | | | Engine overhaul |
| | | | Paint job |
| Prepaid Insurance | 2,400 | | |
| Cash | | 2,400 | |
| | | | \$ 35,000 |

(The prepaid insurance is accounted for as a separate asset because it's the cost of future insurance coverage and not a cost incurred in acquiring the truck or getting it ready for its original intended use.)

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Problem 8-1 - Answer

B. Prepare the 12/31/X1 adjusting entry for the truck's 'X1 depreciation using the straight-line method and estimations of a \$5,000 salvage value at the end of a 5-year useful life.

| | | |
|--------------------------|--------|-------|
| Depreciation Expense | 4,500* | |
| Accumulated Depreciation | | 4,500 |

$$* \frac{\$35,000 - \$5,000}{5 \text{ years}} = \$6,000/\text{year} \times \frac{9}{12} \text{ of a year} = \$4,500$$

What kind of account is "Accumulated Depreciation" and where does it appear on a company's financial statements?

Answer: Accumulated depreciation is a contra-asset account that appears in a company's balance sheet as an offset to the capitalized cost of the asset being depreciated.

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Problem 8-1 - Answer

C. Prepare the journal entry in 'X2 to record a \$500 cash purchase of new tires for the truck.

| | | |
|-------------------------------|-----|-----|
| Repairs & Maintenance Expense | 500 | |
| Cash | | 500 |

When does an expenditure qualify as an "improvement" that's to be capitalized as part of the cost of the truck?

Answer: Expenditures are capitalized improvements when they either extend the originally estimated useful life of the asset or increase the asset's productivity. In this case, the purchase of new tires is not capitalized because tire replacement is part of the normal recurring maintenance of a vehicle and does not meet the criteria for capitalization. If, however, something like a refrigeration system were added to the truck, that cost would be capitalized given the change in the truck's function and productivity. When such improvements are made, depreciation from that point on must be recalculated given the asset's new capitalized cost.

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Problem 8-1 - Answer

D. Prepare the 12/31/X2 adjusting entry for the truck's 'X2 depreciation.

| | | |
|--------------------------|-------|-------|
| Depreciation Expense | 6,000 | |
| Accumulated Depreciation | | 6,000 |

(This reflects a full year's depreciation on the truck)

E. Determine the book value of the truck at 12/31/X2.

| | |
|--------------------------------|-----------------|
| Truck (capitalized cost) | \$35,000 |
| Less: Accumulated depreciation | (10,500) |
| Book value | \$24,500 |

| Accumulated Depreciation | | |
|--------------------------|---------------|-----------|
| | 4,500 | 'X1 entry |
| | 6,000 | 'X2 entry |
| | <u>10,500</u> | 12/31/X2 |

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Problem 8-1 - Answer

F. Prepare the journal entry to record the sale of the truck at 12/31/X2 for \$28,000 cash.

| | | |
|--------------------------|--------|--------|
| Cash | 28,000 | |
| Accumulated Depreciation | 10,500 | |
| Truck | | 35,000 |
| Gain on Sale | | 3,500 |

What would the entry be assuming the truck sold for \$20,000 cash?

| | | |
|--------------------------|--------|--------|
| Cash | 20,000 | |
| Accumulated Depreciation | 10,500 | |
| Loss on Sale | 4,500 | |
| Truck | | 35,000 |

What would the entry be assuming the truck was simply used up and disposed of at 12/31/X2?

| | | |
|--------------------------|--------|--------|
| Accumulated Depreciation | 10,500 | |
| Loss on Disposal | 24,500 | |
| Truck | | 35,000 |

Where would a gain or loss on the sale of an asset appear in the company's income statement?

Answer: Gains and losses on the sale of long-term assets are included in "other revenues and expenses" on a multi-step formatted income statement. Such sales are not part of a company's normal operating activities.

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Problem 8-1 - Answer

G. Recalculate the truck's 12/31/X1 depreciation using the units of production method under the following assumptions: 100,000 miles of anticipated usage, \$5,000 estimated salvage value, and 10,000 miles of actual usage from 4/1/X1 to 12/31/X1.

$$\frac{\$35,000 - \$5,000}{100,000 \text{ miles}} = \$.30/\text{mile} \times 10,000 \text{ miles} = \$3,000$$

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It's not uncommon for companies to acquire more than one asset in a single purchase.

Basket Purchases of Assets

The allocation of cost among the various assets purchased is typically done based on the relative current values of the assets involved based on recent appraisals.

Example: Assume that a building and the land its located on are purchased for \$1,000,000 cash.

| | | |
|----------|---|-----------|
| Land | ? | |
| Building | ? | |
| Cash | | 1,000,000 |

Assume a recent appraisal valued the land and building separately at \$200,000 and \$600,000, respectively.

| | Appraised Value | % of Total |
|--------------|------------------|-------------|
| Land | \$200,000 | 25% |
| Building | \$600,000 | 75% |
| Total | \$800,000 | 100% |

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Problem 8-2

Basket Purchase of Assets

In a recent liquidation sale, Horace, Inc. paid \$10,000 cash for all of the assets listed below at their pre-liquidation prices.

| | <u>Pre-Liquidation Prices</u> |
|------------------|-------------------------------|
| Office furniture | \$15,000 |
| Office equipment | \$30,000 |
| Supplies | \$ 5,000 |

Prepare the journal entry to record this purchase.

Why do you think management might wish to disproportionately allocate more cost in a basket purchase to land or longer-lived assets than to assets with shorter useful lives?

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Problem 8-2 - Answer

Basket Purchase of Assets

Journal entry to record the purchase:

| | | |
|------------------|-------|--------|
| Office Furniture | 3,000 | |
| Office Equipment | 6,000 | |
| Supplies | 1,000 | |
| Cash | | 10,000 |

| <u>Pre-Liquidation Prices</u> | <u>% of Total</u> | <u>Purchase Price</u> | <u>Allocated Price</u> |
|-------------------------------|-------------------|-----------------------|------------------------|
| \$15,000 | 30% X | \$10,000 | = \$ 3,000 |
| \$30,000 | 60% X | \$10,000 | = \$ 6,000 |
| <u>\$ 5,000</u> | <u>10%</u> X | <u>\$10,000</u> | <u>= \$ 1,000</u> |
| <u>\$50,000</u> | <u>100%</u> | | <u>\$10,000</u> |

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Problem 8-2 - Answer

Question: Why do you think management might wish to disproportionately allocate more cost in a basket purchase to land or longer-lived assets than to assets with shorter useful lives?

Answer: Since management is often evaluated based on a company's reported earnings, managers will sometimes push for accounting treatments that improve a company's net income.

In a basket purchase of assets, any costs allocated to depreciating assets will ultimately be accounted for as depreciation expense and will reduce the company's net income. If those costs can be allocated instead to a non-depreciating asset like land, then those costs are never expensed and reported net income will be higher. Likewise, if costs are allocated to assets with longer rather than shorter useful lives, the amount of annual depreciation expense will be lower as costs are spread out over a longer useful life. This will improve a company's net income in the early years but will ultimately be offset when depreciation expense is recorded in the later additional years of the longer-lived assets.

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Self-Constructed Assets

When companies choose to make or manufacture a fixed asset for their own future use, then all of the costs incurred in the construction or manufacturing process should be capitalized as part of the cost of that asset.

- Materials.
- Labor.
- Additional overhead costs (utilities, rent, depreciation of equipment and any other costs associated with the construction process).
- Interest on construction loans or interest that could have been saved if the company's own money used on construction had been applied to the payoff of other outstanding debts, should be capitalized as part of the cost of the building.

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Problem 8-3

Self-Constructed Assets

Respond to the following questions:

1. How does the capitalization of interest on a self-constructed asset comply with the matching principle?
2. What justifies the capitalization of interest that could have been saved if a company's own money, used in construction of an asset, had been applied to the payoff of other outstanding debts?
3. Which of the following do you think is most likely to have capitalized interest as a result of self-constructed assets?
 - Boat manufacturer
 - Public utility company
 - Clothing retailer

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Problem 8-3 - Answer

Self-Constructed Assets

Respond to the following questions:

1. How does the capitalization of interest on a self-constructed asset comply with the matching principle?

Answer: The matching principle requires the expensing of costs in the same period those costs help to produce a company's revenues. Frankly, assets under construction rarely contribute to the production of a company's revenues until they're completed and put to use. As a result, all costs of construction are properly deferred, and in this case, capitalized and then allocated to expense over the asset's productive or useful life. That's done through depreciation of the asset's capitalized costs, which properly include interest costs incurred on construction financing.

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2. What justifies the capitalization of interest that could have been saved if a company's own money, used in construction of an asset, had been applied to the payoff of other outstanding debts?

Answer: Under the historical cost principle, all costs incurred in constructing an asset, even costs incurred in financing that construction, should be capitalized as part of the cost of the asset. This includes not only direct costs of construction but also any costs that could have otherwise been avoided if the construction had not taken place. Interest costs incurred on debts that could have been paid off if no construction had occurred qualify as part of the legitimate historical cost of a self-constructed asset.

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3. Which of the following do you think is most likely to have capitalized interest as a result of self-constructed assets?

- Boat manufacturer
- Public utility company
- Clothing retailer

Answer: Public utilities are often involved in the construction of their own power generating equipment and facilities and will usually capitalize a considerable amount of their interest costs.

Although a boat manufacturer is involved in construction or manufacturing activities, those activities are directed to the building of boats for sale to customers. A boat manufacturer would rarely be involved in the construction of its own fixed assets. The same would be true of any merchandiser such as a clothing retailer.

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Operating Leases

(Typically documented in rental contracts or lease agreements that specify that the lessee is taking temporary possession of the lessor's property in exchange for periodic payments of rent.)

As lease payments are made:

| | | |
|--------------|-----|-----|
| Rent Expense | XXX | |
| Cash | | XXX |

These operating leases provide what is often referred to as off-balance sheet financing because they allow a company to, in effect, borrow and use a resource without having to record any related debt.

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Assume Herd Enterprises wants to buy a building and is willing to pay the seller's full \$800,000 asking price, requiring \$80,000 cash down and the signing of a \$720,000 30-year fully amortizing mortgage note payable. Given a fixed interest rate of 8% compounding monthly, the monthly payment of principal and interest on the note would amount to \$5,283.10.

As lease payments are made:

| | | |
|-----------------------|---------|---------|
| Building | 800,000 | |
| Cash | | 80,000 |
| Mortgage Note Payable | | 720,000 |

Also assume that Herd hopes to raise some additional equity financing over the next few years and is concerned that that mortgage note payable will make the company appear less attractive to investors. To avoid that, Herd offers to lease the property rather than buy it outright. The terms of his proposed lease include an initial up front payment of \$80,000 as a non-refundable deposit, with subsequent monthly rental payments of \$5,283.10 per month for 30-years. The lease would be non-cancelable and property ownership would automatically transfer to Herd at the end of the lease.

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Generally accepted accounting principles require that transactions be accounted for based on their actual economic substance rather than the legal form of the transaction.

Current accounting standards provide that if a lease is non-cancelable and meets any one of four criteria that are indicators of an effective purchase, then the leased property must be capitalized and accounted for as if it had actually been purchased with long-term debt.

Capital Lease

Four Criteria:

1. The lease provides the lessee with full ownership of the property at the end of the lease.
2. The lease provides the lessee with an option to buy the property at a bargain price at the end of the lease such that a transfer of ownership is virtually assured.
3. The lease term is equal to or greater than 75% of the estimated economic useful life of the property.
4. The present value of all amounts due under the lease is equal to or greater than 90% of the current fair market value of the property

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Present value of the proposed lease's anticipated payments:

| | Present Value |
|--|-------------------|
| Non-refundable deposit of \$80,000 | \$ 80,000 |
| Monthly rental payments of \$5,283.10 for 30-years | \$ 720,000 |
| | \$ 800,000 |

The interest rate to be used in determining the present value of those future payments is the rate that the lessee would have incurred to borrow the funds necessary to buy the property with repayment terms similar to the payment schedule called for under the lease. In this case that was 8%, the same rate provided for under the original mortgage note financing.

Under current accounting standards the capitalized cost of the leased asset is to be recorded at the combined PV of all anticipated payments under the lease, including any expected payments under a bargain purchase option.

| | | |
|-----------------|---------|---------|
| Leased Building | 800,000 | |
| Cash | | 80,000 |
| Lease Liability | | 720,000 |

The balance of any lease liability recorded under a capital lease should always be equal to the present value of any anticipated future payments to be made under the lease.

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Subsequent to the recording of this capitalized lease, the leased property is subject to depreciation just like any other property, plant, and equipment. That's recorded through an adjusting entry at the end of each accounting period:

| | | |
|--------------------------|-----|-----|
| Depreciation Expense | XXX | XXX |
| Accumulated Depreciation | | |

With each payment made under the lease, a portion of that payment represents the effective cost of borrowing, or the cost of interest, and the remainder is payment on the outstanding principal amount of the lease liability.

At the end of the first month:

| | | |
|------------------|----------|----------|
| Interest Expense | 4,800.00 | |
| Lease Liability | 483.10 | |
| Cash | | 5,283.10 |

Interest Calculation: $\$720,000 \times 8\% \times 1/12 = \$4,800.00$

At the end of the second month:

| | | |
|------------------|----------|----------|
| Interest Expense | 4,796.78 | |
| Lease Liability | 486.32 | |
| Cash | | 5,283.10 |

Interest Calculation: $719,516.90 (\$720,000 - \$483.10) \times 8\% \times 1/12 = \$4,796.78$

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Leases are capitalized when they meet any one of the four criteria that imply a purchase in economic substance. Leases that do not meet those criteria are accounted for as simple operating leases with rent expense recorded with each lease payment made. However, because these operating leases often involve significant long-term commitments, GAAP requires supplemental disclosure of any future amounts due in the notes to the financial statements.

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Problem 8-4
Lease Accounting

Zee Corporation wants to lease computer equipment and is considering alternative lease contracts for the same equipment. Both are non-cancelable and require payment of a \$1,000 up-front transaction fee. One calls for lease payments of \$1,000 at the end of each month over a two-year term, while the other is a five-year lease requiring payments of \$700 a month. The estimated economic life of the asset is 5 years. There is no automatic transfer of ownership or bargain purchase option at the end of either lease. The cost of purchasing the equipment in today's market would be \$37,000 with an 8% interest cost on any associated debt financing.

Assuming a 12/1/X5 starting date, prepare the required journal entries under each lease at 12/1/X5, 12/31/X5 and 1/31/X6. (For any capitalized lease equipment, depreciation is to be calculated using the straight-line method assuming a 5-year estimated useful life and a \$1,000 salvage value.)

Question: Why might the company choose to rent for two years even though it requires higher cash payments on a monthly basis?

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Problem 8-4 - Answer
Lease Accounting

Two-year lease: (This lease is accounted for as an operating lease because it does not meet any of the four criteria of a capital lease: (1) automatic transfer of ownership, (2) a bargain purchase option, (3) a lease term equal to or greater than 75% of the equipment's estimated economic life, or (4) a present value of the future lease payments equal to or greater than 90% of the equipment's current fair market value.)

12/1/X5:

| | | |
|------------------------|-------|-------|
| Equipment Rent Expense | 1,000 | 1,000 |
| Cash | | |

12/31/X5:

| | | |
|------------------------|-------|-------|
| Equipment Rent Expense | 1,000 | 1,000 |
| Cash | | |

1/31/X6:

| | | |
|------------------------|-------|-------|
| Equipment Rent Expense | 1,000 | 1,000 |
| Cash | | |

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Problem 8-4 - Answer

Five-year lease: (This lease is accounted for as capital lease given that its non-cancelable and the lease term of five years is greater than 75% of the equipment's estimated economic useful life which is also 5 years. In addition, the present value of the \$1,000 upfront fee and the future lease payments totals \$35,523* and is greater than 90% of the equipment's current fair market value of \$37,000.)

* PV of a \$700 annuity at the end of each month for 5 years at a rate of 8% compounding monthly (\$34,523 rounded), plus the PV of the \$1,000 up-front payment (\$1,000).

12/1/X5:

| | | |
|------------------|--------|--------|
| Leased Equipment | 35,523 | |
| Lease Liability | | 34,523 |
| Cash | | 1,000 |

12/31/X5:

| | | |
|------------------|------|-----|
| Interest Expense | 230* | |
| Lease Liability | 470 | |
| Cash | | 700 |

* Interest: $\$34,523 \times 8\% \times 1/12 = \230 rounded

| | | |
|--------------------------|------|-----|
| Depreciation Expense | 575* | |
| Accumulated Depreciation | | 575 |

* $(\$35,523 - \$1,000 \text{ salvage value}) \div 60 \text{ months} = \575 rounded

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Problem 8-4 - Answer

1/31/X6:

| | | |
|------------------|------|-----|
| Interest Expense | 227* | |
| Lease Liability | 473 | |
| Cash | | 700 |

* Interest: $\$34,053 \times 8\% \times 1/12 = \227 rounded

If Zee prepares monthly financial statements a monthly adjustment to record depreciation expense would be required:

| | | |
|--------------------------|-----|-----|
| Depreciation Expense | 575 | |
| Accumulated Depreciation | | 575 |

Question: Why might the company choose to rent for two years even though it requires higher cash payments on a monthly basis?

Advantages of the two-year lease include:

1. A shorter-term commitment, both financially and from a technology standpoint. When it comes to computers a short-term lease allows for greater flexibility if improved technology comes along.
2. From an accounting standpoint an operating lease is simpler and avoids the recording of debt that can negatively affect a company's reported financial position.

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Accelerated Depreciation Methods

- Sum-of-the-years'-digits method
- Declining-balance method

(They're referred to as accelerated methods because they both expedite the depreciation process allocating higher amounts to expense in the early years and smaller amounts in the later years of an asset's useful life.)

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Sum-of-the-Years'-Digits Method

Example: Jones Printing Company purchased and installed a new printing press on 1/1/X3 at a total capitalized cost of \$15,000. The press has a 5-year estimated useful life with a projected salvage value of \$3,000.

Depreciable cost = **\$12,000** (\$15,000 - \$3,000)

Straight-line method: \$12,000 ÷ 5 years = **\$2,400/yr**

Sum-of-the-years'-digits method:

| Annual Period | Depreciable Cost | Depreciation Fraction | Depreciation Expense | Book Value of Asset |
|---------------|------------------|-----------------------|----------------------|---------------------|
| 1 | \$12,000 | x 5/15* | = \$4,000 | \$11,000 |
| 2 | \$12,000 | x 4/15 | = \$3,200 | \$ 7,800 |
| 3 | \$12,000 | x 3/15 | = \$2,400 | \$ 5,400 |
| 4 | \$12,000 | x 2/15 | = \$1,600 | \$ 3,800 |
| 5 | \$12,000 | x 1/15 | = \$ 800 | \$ 3,000 |

* Sum of the year's digits given the asset's estimated 5-year useful life:
 $(1 + 2 + 3 + 4 + 5 = 15)$ or $n(n + 1)/2 = 5(5 + 1)/2 = 15$

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Let's assume this equipment was purchased on 4/1/X3 rather than 1/1/X3.

| Years | Partial Year Calculations | | | | Total | |
|--------------|---------------------------|---|---------|---|-----------------|----------|
| 'X3 | 9/12 | x | \$4,000 | = | \$3,000 | \$ 3,000 |
| 'X4 | 3/12 | x | \$4,000 | = | \$1,000 | \$ 3,400 |
| | 9/12 | x | \$3,200 | = | \$2,400 | |
| 'X5 | 3/12 | x | \$3,200 | = | \$ 800 | \$ 2,600 |
| | 9/12 | x | \$2,400 | = | \$1,800 | |
| 'X6 | 3/12 | x | \$2,400 | = | \$ 600 | \$ 1,800 |
| | 9/12 | x | \$1,600 | = | \$1,200 | |
| 'X7 | 3/12 | x | \$1,600 | = | \$ 400 | \$ 1,000 |
| | 9/12 | x | \$ 800 | = | \$ 600 | |
| 'X8 | 3/12 | x | \$ 800 | = | \$ 200 | \$ 200 |
| Total | | | | | \$12,000 | |

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Declining-Balance Method

Instead of a declining fraction applied to an asset's depreciable cost, this method applies a fixed fraction or rate of depreciation to an asset's declining book value to get its accelerated effect.

The fixed rate of depreciation used can vary depending upon the desired acceleration relative to each asset's straight-line rate of depreciation.

Straight-line rate of depreciation: The annual percentage of an asset's depreciable cost that's allocated evenly to expense each year under the straight-line method of depreciation. This rate depends on each individual asset's estimated useful life. For example, an asset with a:

5-year life = 1/5th or 20% straight-line rate of depreciation

10-year life = 1/10th or 10% straight-line rate of depreciation

15-year life = 1/15th or 6.67% straight-line rate of depreciation

Under the declining-balance method, the highest rate of depreciation used is 200% or double the straight-line rate of depreciation. That means that for an asset with a useful life of 5 years, the depreciation rate will be 40%, which is 200% or double the 20% straight-line rate.

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Double (or 200%) - declining - balance method:

| Annual Period | Beginning Book Value | Annual Rate of Depreciation | Depreciation Expense | Ending Book Value |
|---------------|----------------------|-----------------------------|----------------------|-------------------|
| 1 | \$15,000 | x 40%* | = \$6,000 | \$ 9,000 |
| 2 | \$ 9,000 | x 40% | = \$3,600 | \$ 5,400 |
| 3 | \$ 5,400 | x 40% | = \$2,160 | \$ 3,240 |
| 4 | \$ 3,240 | x | = \$ 240 | \$ 3,000 |
| 5 | \$ 3,000 | x | = | \$ 3,000 |

* Double the straight-line rate of depreciation given the asset's 5-year estimated useful life.

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150% - declining - balance method:

| Annual Period | Beginning Book Value | Annual Rate of Depreciation | Depreciation Expense | Ending Book Value |
|---------------|----------------------|-----------------------------|----------------------|-------------------|
| 1 | \$15,000 | x 30%* | = \$4,500 | \$10,500 |
| 2 | \$10,500 | x 30% | = \$3,150 | \$ 7,350 |
| 3 | \$ 7,350 | x 30% | = \$2,205 | \$ 5,145 |
| 4 | \$ 5,145 | x 30% | = \$1,544 | \$ 3,601 |
| 5 | \$ 3,601 | x | = \$ 601 | \$ 3,000 |

* 150% of the 20% straight-line rate of depreciation given the asset's 5-year estimated useful life.

Using 150%-declining-balance numbers and assuming an asset purchase on 4/1/X3 rather than 1/1/X3.

| Years | Partial Year Calculations | | | | Total | |
|-------|---------------------------|---|---------|---|---------|----------|
| 'X3 | 9/12 | x | \$4,500 | = | \$3,375 | \$ 3,375 |
| 'X4 | 3/12 | x | \$4,500 | = | \$1,125 | \$ 3,488 |
| | 9/12 | x | \$3,150 | = | \$2,363 | |
| 'X5 | 3/12 | x | \$3,150 | = | \$ 787 | \$ 2,441 |
| | 9/12 | x | \$2,205 | = | \$1,654 | |
| 'X6 | 3/12 | x | \$2,205 | = | \$ 551 | \$ 1,709 |
| | 9/12 | x | \$1,544 | = | \$1,158 | |
| 'X7 | 3/12 | x | \$1,544 | = | \$ 386 | \$ 837 |
| | 9/12 | x | \$ 601 | = | \$ 451 | |
| 'X8 | 3/12 | x | \$ 601 | = | \$ 150 | \$ 150 |

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Which of all these methods, including the straight-line and units of production methods, would be best for a company's financial reporting?

- Under GAAP all of these methods are acceptable. In fact, different methods can be used for different assets of the same company and the only requirement is that the method selected be consistently applied over the asset's depreciable life.
- Most publicly held companies use the straight-line method for all of their depreciation of property, plant and equipment. Its easy to use and even more importantly it has a leveling effect on a company's net income.
- Accelerated methods provide the best results from an income tax perspective.
- Under current income tax laws in the United States, companies are allowed to use different depreciation methods for tax and financial reporting purposes. In fact, current tax laws actually require the use of specified accelerated methods, with shorter designated lives and zero salvage values for assets falling into certain categories.

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A few final observations.

- The amount of depreciation expense reported on a company's income statement is a highly subjective number.
- It can be easily manipulated.
- Most analysts today simply ignore depreciation expense in their investment analysis.

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Problem 8-5

Accelerated Depreciation Methods

On 10/1/X7, Hansen, Inc. purchased equipment having a total capitalized cost of \$25,000. Assuming the equipment has a 7-year estimated useful life with an anticipated salvage value of \$5,000,

- A. Determine the equipment's book value at 12/31/X8 under (1) the sum-of-the-years'-digits, (2) the double-declining-balance, and (3) the 175%-declining-balance methods of depreciation. (Round all calculations to the nearest dollar.)**
- B. What is the equipment's book value at the end of its 7-year useful life under each of the methods used above?**

Question: Is there an ethical dilemma in a company's maintenance of a separate set of books (accounting records) for depreciation taken as a deduction for income tax purposes?

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Problem 8-5 - Answer

Accelerated Depreciation Methods

A. Sum-of-the-Years'-Digits Method:

| Annual Period | Depreciable Cost | Depreciation Fraction | Depreciation Expense |
|---------------|------------------|-----------------------|----------------------|
| 1 | \$20,000 | x 7/28* | = \$ 5,000 |
| 2 | \$20,000 | x 6/28 | = \$ 4,286 |

* Sum of the year's digits given the asset's estimated 7-year useful life: $7 + 6 + 5 + 4 + 3 + 2 + 1 = 28$, or $n(n + 1)/2 = 7(7 + 1)/2 = 28$

| Years | Partial Year Calculations | | | Total |
|-------|---------------------------|-----------|-----------|----------|
| 'X7 | 3/12 | x \$5,000 | = \$1,250 | \$ 1,250 |
| 'X8 | 9/12 | x \$5,000 | = \$3,750 | \$ 4,822 |
| | 3/12 | x \$4,286 | = \$1,072 | |

Accumulated depreciation \$ 6,072

Book value at 12/31/X8: \$25,000 - \$6,072 = \$18,928

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Problem 8-5 - Answer

Double-Declining-Balance Method:

| Annual Period | Beginning Book Value | Annual Rate of Depreciation | Depreciation Expense | Ending Book Value |
|---------------|----------------------|-----------------------------|----------------------|-------------------|
| 1 | \$25,000 | x 28.6%* | = \$7,150 | \$ 17,850 |
| 2 | \$17,850 | x 28.6% | = \$5,105 | |

* Double the 1/7th or 14.3 % straight-line rate of depreciation given the asset's 7-year estimated useful life.

| Years | Partial Year Calculations | | | Total |
|-------|---------------------------|-----------|-----------|----------|
| 'X7 | 3/12 | x \$7,150 | = \$1,788 | \$ 1,788 |
| 'X8 | 9/12 | x \$7,150 | = \$5,362 | \$ 6,639 |
| | 3/12 | x \$5,105 | = \$1,276 | |

Accumulated depreciation \$ 8,427

Book value at 12/31/X8: \$25,000 - \$8,427 = \$16,573

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Problem 8-5 - Answer

175%-Declining-Balance Method:

| Annual Period | Beginning Book Value | Annual Rate of Depreciation | Depreciation Expense | Ending Book Value |
|---------------|----------------------|-----------------------------|----------------------|-------------------|
| 1 | \$25,000 | x 25%* | = \$6,250 | \$ 18,750 |
| 2 | \$18,750 | x 25% | = \$4,688 | |

* 175% of the 1/7th or 14.3 % straight-line rate of depreciation given the asset's 7-year estimated useful life.

| Years | Partial Year Calculations | | | Total |
|-------|---------------------------|-----------|-----------|----------|
| 'X7 | 3/12 | x \$6,250 | = \$1,563 | \$ 1,563 |
| 'X8 | 9/12 | x \$6,250 | = \$4,687 | \$ 5,859 |
| | 3/12 | x \$4,688 | = \$1,172 | |

Accumulated depreciation \$ 7,422

Book value at 12/31/X8: \$25,000 - \$7,422 = \$17,578

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Problem 8-5 - Answer

B. What is the equipment's book value at the end of its 7-year useful life under each of the methods used above?

Answer: Under each of the methods the book value at the end of the 7-year useful life would be equal to the salvage value of \$5,000. (Any discrepancies due to rounding would be adjusted for in the last year of recorded depreciation)

Question: Is there an ethical dilemma in a company's maintenance of a separate set of books (accounting records) for depreciation taken as a deduction for income tax purposes?

Answer: Current tax law in the U.S. allows different depreciation methods to be used for financial statement reporting and income tax purposes. As a result it is ethical and common for companies to keep two sets of records for depreciation of property, plant and equipment.

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Problem 8-6

Change in Depreciation Estimates

On 1/1/X1, Scott Company purchased equipment at a cost of \$50,000 and calculated depreciation for 20X1 and 20X2 using the double-declining-balance method based on a 5-year estimated useful life and \$10,000 salvage value. Beginning in 20X3 the company revised its estimates for the equipment to a 12-year useful life (10 years remaining from 1/1/X3) and \$2,000 salvage value. Given these changing estimates, calculate the equipment's 20X3 depreciation expense.

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Problem 8-6 - Answer

Answer: \$3,600

| Annual Period | Beginning Book Value | Annual Rate of Depreciation | Depreciation Expense | Ending Book Value |
|---------------|----------------------|-----------------------------|----------------------|-------------------|
| 20X1 | \$50,000 | x 40%* | = \$20,000 | \$30,000 |
| 20X2 | \$30,000 | x 40% | = \$12,000 | \$18,000 |

* Double the 1/5th or 20 % straight-line rate of depreciation given the asset's 5-year estimated useful life.

Assuming a 1/1/X3 change in estimate that provides for a remaining 10-year useful life, the rate of depreciation for those 10 years is 20% (double the 1/10th or 10% straight-line rate of depreciation given a the 10-year remaining useful life).

| Annual Period | Beginning Book Value | Annual Rate of Depreciation | Depreciation Expense | Ending Book Value |
|---------------|----------------------|-----------------------------|----------------------|-------------------|
| 20X3 | \$18,000 | x 20% | = \$3,600 | \$14,400 |

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Accounting for Changing Values of Long-Term Assets

- The recording of any increase or appreciation in the value of long-term assets is deferred until the property is sold and the gain is realized.
- Any loss associated with impaired assets is to be recorded immediately.

(International standards aren't nearly as conservative in this area. Although they do require write-downs on impairment, they also allow for the recording of increased values when a gain can be established with reasonable assurance.)

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Impairment

Under U.S. GAAP, an asset is impaired when the sum of its expected future cash flows no longer covers the asset's current book value.

Accounting for impairment of a long-term asset is a two-step process:

1. Impairment must be established by comparing an asset's current book value with the sum of the expected net future cash flows without consideration for the time value of money.
2. Then the asset is written-down to its fair market value and the loss is recorded. (The fair market value of an asset is the price the asset would bring if sold in the current market place or, if that's not determinable, it's the present value of the expected net future cash flows of the asset.)

Once a loss due to impairment has been recorded, no subsequent increase in value or recovery of that loss is recorded until the asset's ultimate sale.

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Example: Assume a recently purchased hotel will not be nearly as profitable as originally thought due to the cancellation of plans for the development of a nearby amusement park.

Given the hotel's capitalized cost of \$10,000,000, accumulated depreciation to date totaling \$200,000, current fair market value of \$7,500,000 and the sum of projected net future cash flows of \$8,000,000 anticipated over a 10-year holding period, prepare the journal entry that's necessary to record the hotel's impairment.

1. Establish whether the standard for recording impairment has been met.

| Book Value | vs. | Sum of Expected Net Future Cash Flows |
|----------------------------|-----|---------------------------------------|
| \$9,800,000 | | \$8,000,000 |
| (\$10,000,000 - \$200,000) | | |

Impairment!

2. Record the write-down of the asset to its fair value. (\$7,500,000)

| | |
|---------------------|--------------------|
| Book value | \$9,800,000 |
| Less: Current value | (7,500,000) |
| Loss | \$2,300,000 |

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Journal entry to record this write-down:

| | | |
|--------------------------|-----------|-----------|
| Loss on Impairment | 2,300,000 | |
| Accumulated Depreciation | 200,000 | |
| Hotel | | 2,500,000 |

| | |
|--------------------------|-----------|
| Hotel | |
| 10,000,000 | 2,500,000 |
| 7,500,000 | |
| Accumulated Depreciation | |
| 200,000 | 200,000 |
| 200,000 | 0 |

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Problem 8-7

Accounting for Asset Impairment

Zircon Industries has decided to permanently cut back on the production of one of its products. As a result, the value of certain machinery and equipment used exclusively in the manufacture of that product has been greatly diminished.

Given the following information for this machinery and equipment:

| | |
|---|-----------|
| Capitalized cost | \$150,000 |
| Sum of the expected net future cash flows | \$ 40,000 |
| Accumulated depreciation | \$ 90,000 |
| Present value of the expected net future cash flows | \$ 25,000 |

- A. Prepare the journal entry required to record asset impairment.
- B. Prepare the entry if the sum of the expected net future cash flows was \$70,000 with a \$40,000 present value.

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Problem 8-7 - Answer

Accounting for Asset Impairment

A.

| | | |
|--------------------------|--------|---------|
| Loss on Impairment | 35,000 | |
| Accumulated Depreciation | 90,000 | |
| Machinery and Equipment | | 125,000 |

- B. *No entry would be made in this case. There is no impairment if the sum of the expected net future cash flows (\$70,000) is in excess of the book value of the asset (\$60,000). That's true even if the fair value of the asset or the present value of the expected net future cash flows is less than the asset's book value. This requirement imposes a higher standard of assurance that an impairment has taken place before its actually recorded.*

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**Long-Term Intangible Assets
and
Natural Resources**

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Problem 8-8

Accounting for Intangibles and Natural Resources

- A. Identify some of the more common intangible assets that might be classified with a company's long-term assets.
- B. Briefly describe the accounting for:
 - (1) Research and development, advertising and other costs incurred in the development or improvement of an intangible asset.
 - (2) Costs incurred in the purchase of an intangible asset from an unrelated third-party.
 - (3) The allocation of an intangible asset's capitalized cost to expense over time.
 - (4) Impairment of an intangible asset.
 - (5) Gains or losses on the sale of an intangible asset.
- C. Should \$20,000 in legal fees paid in actually applying for a patent and \$100,000 in legal fees paid in the prosecution of a patent infringement case be capitalized or expensed when incurred?

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Problem 8-8

- D. Define "goodwill." When is it recorded as an asset? Record the \$1,000,000 cash purchase of a business with assets having a combined fair market value of \$500,000 (book value on the seller's books of \$350,000) and liabilities to be assumed by the buyer in the amount of \$50,000. How should the recorded asset "Goodwill" be subsequently accounted for?
- E. Are capitalized costs incurred in the acquisition and improvement of natural resources ever recorded as an expense and if so, how?

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Accounting for Intangibles and Natural Resources

A. Identify some of the more common intangible assets that might be classified with a company's long-term assets.

Answer: Copyrights, Trademarks, Patents, Franchise Rights, License Rights, Goodwill

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B. Briefly describe the accounting for:

(1) Research and development, advertising and other costs incurred in the development or improvement of an intangible asset.

Answer: All costs incurred in the development or improvement of intangible assets, including R&D (research and development) and advertising costs are expensed when incurred. This accounting reflects the fact that it's impossible to know for sure whether such costs will ultimately benefit a company's future operating performance. As a result, the capitalization of such costs as assets is inappropriate.

Under IFRS the accounting is different in that research costs are expensed when incurred but any development costs are capitalized. In other words, once a company's research efforts to develop a new product, service or process reaches a point where its technological feasibility is established then all subsequent costs incurred in the actual development effort are capitalized as part of the cost of an asset to be reflected on the company's balance sheet. The cost of that asset is then amortized to expense over its anticipated useful life.

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(2) Costs incurred in the purchase of an intangible asset from an unrelated third-party.

Answer: All costs incurred in the purchase of an intangible asset are capitalized, or, in other words, they're accounted for as an asset.

(3) The allocation of an intangible asset's capitalized cost to expense over time.

Answer: Except in the case of goodwill, the capitalized costs of intangible assets are allocated or "amortized" to expense on a straight-line basis over the lesser of the legal or estimated useful life of the asset. Goodwill is never amortized.

The adjusting entry to record the periodic amortization of an intangible asset includes:

| | | |
|---------------------------|-----|-----|
| Amortization Expense | XXX | XXX |
| Accumulated Amortization* | | |

** The intangible asset account is often credited directly.*

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(4) Impairment of an intangible asset.

Answer: An intangible asset, like other long-term assets, becomes impaired when the sum of its expected net future cash flows falls below its book value. When that happens a loss is recorded as the asset is written-down to its fair value or the present value of its expected net future cash flows. Such losses are typically reflected with "other revenues and expenses" on a company's income statement. Any gains due to increasing asset values are deferred until the asset is actually sold.

(5) Gains or losses on the sale of an intangible asset.

Answer: Upon sale of an intangible asset, a gain or loss is recorded equal to the difference between the sales price and the asset's book value. Any such gain or loss is usually reported with a company's "other revenues and expenses" on its income statement.

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C. Should \$20,000 in legal fees paid in actually applying for a patent and \$100,000 in legal fees paid in the prosecution of a patent infringement case be capitalized or expensed when incurred?

Answer: If the patent application is approved, all legal costs and fees incurred in the process are capitalized as an intangible asset ("patent"). This is not a cost of patent development, it's a cost incurred to finalize a legal right arising from completed development. Legal costs incurred in a successful prosecution affirming patent rights are also capitalized; however, in the event of an unsuccessful prosecution, any associated legal costs should be expensed and the value of the patent may become impaired requiring a write-down of any previously capitalized costs.

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D. Define "goodwill." When is it recorded as an asset? Record the \$1,000,000 cash purchase of a business with assets having a combined fair market value of \$500,000 (book value on the seller's books of \$350,000) and liabilities to be assumed by the buyer in the amount of \$50,000. How should the recorded asset "Goodwill" be subsequently accounted for?

Answer: From an accounting standpoint, goodwill refers to the excess of a company's overall fair market value above the fair market value of its total assets less liabilities. This excess value may be attributable to favorable customer relations or other factors that allow the company to generate above-average profits on its assets. Under GAAP, the only time this excess value is recorded as an asset itself, is when it's purchased, or, in other words, when one company buys another and pays a price in excess of the fair market value of the assets purchased less any liabilities assumed.

| | | |
|--------------|---------|-----------|
| Assets* | 500,000 | |
| Goodwill | 550,000 | 50,000 |
| Liabilities* | | 1,000,000 |
| Cash | | |

** In actual practice, each asset purchased would be separately identified and recorded at its relative fair market value and, each liability would be separately identified and recorded.*

Important Note: *Up until 1/1/02, any goodwill recorded in the purchase of a business was subject to amortization over a period not to exceed 40 years. Now, no amortization is recorded and the FASB requires an annual re-evaluation of the "fair market value" of the business purchased with a loss recorded in the event the value of goodwill has decreased or become impaired. Subsequent gains in the value of goodwill are never recorded.*

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E. Are capitalized costs incurred in the acquisition and improvement of natural resources ever recorded as an expense and if so, how?

Answer: The capitalized costs of natural resources are accounted for as "depletion expense" over the asset's productive life using the units of production method. The entry to record this depletion is:

| | | |
|------------------------|-----|-----|
| Depletion Expense | XXX | XXX |
| Accumulated Depletion* | | |

** The natural resource asset account is often credited directly.*