Thammasat University
Faculty of Economics
Bachelor of Economics (International Program)

AC201

Fundamental Accounting

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Course Materials

Topic:

Chapter 08 Reporting and Interpreting Property, Plant, and Equipment; Natural Resources; and Intangibles

Session:

Sessions #8

Instructor:

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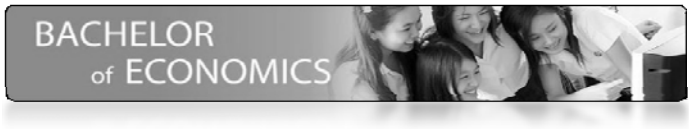

CHAPTER 8: REPORTING AND INTERPRETING PROPERTY, PLANT, AND EQUIPMENT; NATURAL RESOURCES; AND INTANGIBLES

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Understanding The Business

Insufficient capacity results in lost sales.

Costly excess capacity reduces profits.

Classifying Long-Lived Assets (1)

Actively Used in Operations

Expected to Benefit Future Periods

Tangible

Physical Substance

Intangible

No Physical Substance

Classifying Long-Lived Assets (2)

Land

Assets subject to *depreciation*
- Buildings and equipment
- Furniture and fixtures

Natural resource assets subject to *depletion*
- Mineral deposits & timber

Indefinite life:
- Trademarks
- Goodwill

Definite life:
- Patents
- Copyrights
- Franchises

Tangible

Physical Substance

Intangible

No Physical Substance

Fixed Asset Turnover

$$\text{Fixed Asset Turnover} = \frac{\text{Net Sales}}{\text{Average Net Fixed Assets}}$$

This ratio measures a company's ability to generate sales given an investment in fixed assets.

The FY2010 ratio for Singapore Airlines is (dollars in millions):

Operating Revenues $12,707.3 ÷ [($15,063.9 + $15,992.4) ÷ 2] = 0.82 times

COMPARISIONS OVER TIME**			COMPARISONS WITH COMPETITORS	
Singapore Airlines			Delta	British Airways
FY2007	FY2008	FY2009	2009	FY2010
.91	.97	.99	1.37	1.13

Measuring and Recording Acquisition Cost

Measuring and Recording Acquisition Cost (1)

Acquisition cost **INCLUDES** the purchase price and all expenditures needed to prepare the asset for its intended use.

Acquisition cost does **NOT** include financing charges and cash discounts.

Buildings:
- Purchase price
- Renovation and repair costs
- Legal and realty fees
- Title fees

Measuring and Recording Acquisition Cost (2)

Equipment:
- Purchase price
- Installation costs
- Modification to building necessary to install equipment
- Transportation costs

Land:
- Purchase price
- Real estate commissions
- Title insurance premiums
- Delinquent taxes
- Surveying fees
- Title search and transfer fees

Land is not depreciated

Measuring and Recording Acquisition Cost (3)

On January 1, Singapore Airlines purchased aircraft for $75,000,000 cash.

GENERAL JOURNAL				
Date		Description	Debit	Credit
Jan	1	Aircraft (+A)	75,000,000	
		Cash (-A)		75,000,000
		To record purchase of an aircraft.		

On January 14, Singapore Airlines purchased aircraft for $1,000,000 cash and a $74,000,000 note payable.

GENERAL JOURNAL				
Date		Description	Debit	Credit
Jan	14	Aircraft (+A)	75,000,000	
		Cash (-A)		1,000,000
		Note payable (+L)		74,000,000
		To record purchase of an aircraft.		

Acquisition for Noncash Consideration

Record at the current market value of the consideration given, or the current market value of the asset acquired, whichever is more clearly evident.

On July 7, Singapore gave Boeing 1,000,000 shares of $1.00 par value common stock with a market value of $50 per share plus $25,000,000 in cash for aircraft.

GENERAL JOURNAL				
Date		Description	Debit	Credit
Jan	7	Aircraft (+A)	75,000,000	
		Common stock (+SE)		1,000,000
		Additional Paid-in Capital (+SE)		49,000,000
		Cash (-A)		25,000,000
		To record purchase of an aircraft.		

Acquisition by Construction

Asset cost includes:

All materials and labor traceable to the construction.

A reasonable amount of overhead.

Interest on debt incurred during the construction.

Repairs, Maintenance, and Additions

Type of Expenditure	Capital or Revenue Expenditure	Identifying Characteristics
Ordinary repairs & maintenance	Revenue Expenditure	1. Maintains normal operating condition 2. Does not increase productivity 3. Does not extend life beyond original estimate 4. Recurring in nature and involve small amounts of money at each occurrence
Additions & Improvement	Capital Expenditure	1. Major overhauls or partial replacements 2. Usually occur infrequently 3. Increases efficiency 4. May extend useful life 5. Involve large amounts of money

Depreciation

Depreciation Concepts (1)

Depreciation is a cost allocation process that systematically and rationally matches acquisition costs of operational assets with periods benefited by their use.

Balance Sheet		Income Statement
Acquisition Cost (Unused)	Cost Allocation →	Expense (Used)
Depreciation Expense	Depreciation for the current year →	Income Statement
Accumulated Depreciation	Total of depreciation to date on an asset →	Balance Sheet

Depreciation Concepts (2)

The calculation of depreciation requires three amounts for each asset:

1. Acquisition cost.
2. Estimated useful life.
3. Estimated residual value.

Alternative depreciation methods:

1. Straight-line
2. Units-of-production
3. Accelerated Method: Declining balance

Straight-Line Method (1)

$$\text{Depreciation Expense per year} = \frac{\text{Cost - Residual Value}}{\text{Useful Life in Years}}$$

At the beginning of the year, Singapore purchased ground equipment for $62,500 cash. The equipment has an estimated useful life of 3 years and an estimated residual value of $2,500.

$$\text{Depreciation Expense per year} = \frac{\$62{,}500 - \$2{,}500}{3 \text{ years}}$$

$$\text{Depreciation Expense per year} = \textbf{\$20,000}$$

Straight-Line Method (2)

Year	Depreciation Expense (debit)	Accumulated Depreciation (credit)	Accumulated Depreciation Balance	Undepreciated Balance (book value)
				$ 62,500
1	$ 20,000	$ 20,000	$ 20,000	42,500
2	20,000	20,000	40,000	22,500
3	20,000	20,000	60,000	2,500
	$ 60,000	$ 60,000		

Residual Value

SL

More companies use the straight-line method in their financial reports than all other methods combined.

Units-of-Production Method (1)

Step 1

$$\text{Depreciation Rate} = \frac{\text{Cost - Residual Value}}{\text{Life in Units of Production}}$$

Step 2

$$\text{Depreciation Expense} = \text{Depreciation Rate} \times \text{Number of Units Produced for the Year}$$

At the beginning of the year, Singapore purchased ground equipment for $62,500 cash. The equipment has a 100,000 mile useful life and an estimated residual value of $2,500.

If the equipment is used 30,000 miles in the first year, what is the amount of depreciation expense?

Units-of-Production Method (2)

Step 1

$$\text{Depreciation Rate} = \frac{\$62,500 - \$2,500}{100,000 \text{ miles}} = \$0.60 \text{ per mile}$$

Step 2

$$\text{Depreciation Expense} = \$0.60 \text{ per mile} \times 30,000 \text{ miles} = \$18,000$$

Year	Miles	Depreciation Expense	Accumulated Depreciation Balance	Undepreciated Balance (book value)
				$ 62,500
1	30,000	$ 18,000	$ 18,000	44,500
2	50,000	30,000	48,000	14,500
3	20,000	12,000	60,000	2,500
	100,000	$ 60,000		

Residual Value

Accelerated Depreciation

Accelerated depreciation matches higher depreciation expense with higher revenues in the early years of an asset's useful life when the asset is more efficient.

	Depreciation Expense	Repair Expense
Early Years	**High**	**Low**
Later Years	**Low**	**High**

Declining-Balance Method (1)

Cost – Accumulated Depreciation

Declining balance rate of 2 is double-declining-balance (DDB) rate.

$$\text{Depreciation Expense} = \text{Net Book Value} \times \frac{2}{\text{Useful Life in Years}}$$

Annual computation ignores residual value.

At the beginning of the year, Singapore purchased equipment for $62,500 cash. The equipment has an estimated useful life of 3 years and an estimated residual value of $2,500.

Calculate the depreciation expense for the first two years.

Declining-Balance Method (2)

$$\text{Annual Depreciation Expense} = \text{Net Book Value} \times \frac{2}{\text{Useful Life in Years}}$$

Year 1 Depreciation

$$\$62{,}500 \times \frac{2}{3 \text{ years}} = \$41{,}667$$

Year 2 Depreciation

$$(\$62{,}500 - \$41{,}667) \times \frac{2}{3 \text{ years}} = \$13{,}889$$

Declining-Balance Method (3)

Year	Depreciation Expense (debit)	Accumulated Depreciation Balance	Undepreciated Balance (book value)
			$ 62,500
1	$ 41,667	$ 41,667	20,833
2	13,889	55,556	6,944
3	4,629	60,185	2,315
	$ 60,185		

Below Residual Value

Year 3 Depreciation

$$(\$62{,}500 - \$55{,}556) \times \frac{2}{3 \text{ years}} = \$4{,}629$$

Declining-Balance Method (4)

Year	Depreciation Expense (debit)	Accumulated Depreciation Balance	Undepreciated Balance (book value)
			$ 62,500
1	$ 41,667	$ 41,667	20,833
2	13,889	55,556	6,944
3	4,444	60,000	2,500
	$ 60,000		

Residual Value

Year 3 Depreciation

$$\$6{,}944 - \$2{,}500 = \$4{,}444$$

Year 3 depreciation expense is limited to the amount that reduces book value to the estimated residual value of $2,500.

Measurement

International Perspective - IFRS

Measurement Basis for Property, Plant and Equipment

US GAAP and IFRS differ with respect to the measurement basis for property, plant and equipment on the balance sheet.

Under GAAP, revaluation of property, plant, and equipment to fair value is prohibited.

IFRS permit companies to value property, plant, and equipment at historical cost or to revalue them to their fair value as of the balance sheet date.

Measuring Asset Impairment

Impairment is the loss of a significant portion of the utility of an asset through…

- Casualty
- Obsolescence
- Lack of demand for the asset's services

The impaired asset should be written down resulting in a loss being recognized.

Disposal of Property, Plant and Equipment

Disposal of Property, Plant and Equipment (1)

Voluntary disposals:
- Sale
- Trade-in
- Retirement

Involuntary disposals:
- Fire
- Flood
- Accident

Disposal of Property, Plant and Equipment (2)

❶ Update depreciation to the date of disposal.

❷ Journalize disposal by:

- Recording cash received (debit) or cash paid (credit).
  - Writing off accumulated depreciation (debit).
- Recording a gain (credit) or a loss (debit).
  - Writing off the asset cost (credit).

Disposal of Property, Plant and Equipment (3)

If Cash > BV, record a gain (credit).
If Cash < BV, record a loss (debit).
If Cash = BV, no gain or loss.

Singapore Airlines sold flight equipment for $11,000,000 cash at the end of its 17th year of use.
The flight equipment originally cost $30,000,000 and was depreciated using the straight-line method with zero residual value and a useful life of 25 years.

Let's answer the following questions.

Disposal of Property, Plant and Equipment (4)

The amount of depreciation expense recorded at the end of the 17th year to bring depreciation up to date is:

a. $0.
b. $1,200,000.
c. $1,500,000.
d. $2,000,000.

Annual Depreciation:
= ($30,000,000 - $0) ÷ 25 Years
= $1,200,000

Disposal of Property, Plant and Equipment (5)

After updating the depreciation, the equipment's book value at the end of the 17th year is:

a. $9,600,000.
b. $20,400,000.
c. $12,800,000.
d. $6,600,000.

Accumulated Depreciation
= (17yrs. × $1,200,000)
= $20,400,000
BV = Cost - Accumulated Depreciation
BV = $30,000,000 - $20,400,000
= $9,600,000

Disposal of Property, Plant and Equipment (6)

The equipment's sale resulted in:

a. a gain of $1,400,000.
b. a gain of $6,200,000.
c. a gain of $3,800,000.
d. a loss of $1,700,000.

Gain = Cash Received - Book Value
Gain = $11,000,000 - $9,600,000 = $1,400,000

Disposal of Property, Plant and Equipment (7)

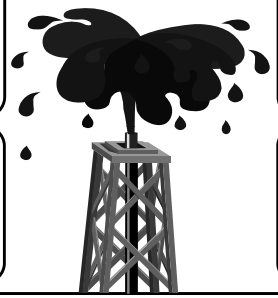
Prepare the journal entry to record Singapore's sale of the flight equipment at the end of the 17th year.

GENERAL JOURNAL				
Date		Description	Debit	Credit
		Cash (+A)	11,000,000	
		Accumulated depreciation (+XA)	20,400,000	
		Gain on Sale (+Gain, +SE)		1,400,000
		Aircraft (-A)		30,000,000
		To record sale of the flight equipment.		

Natural Resources

Acquisition and Depletion of Natural Resources (1)

Extracted from the natural environment.



A noncurrent asset presented at cost less **accumulated depletion**.

Total cost of asset is the cost of acquisition, exploration, and development.

Total cost is allocated over periods benefited by means of **depletion**.

Examples: oil, coal, gold

Depletion is like units-of-production depreciation.

Acquisition and Depletion of Natural Resources (2)

The unit depletion rate is calculated as follows:

Step 1

$$\text{Unit Depletion Rate} = \frac{\text{Acquisition and Development Cost} - \text{Residual Value}}{\text{Estimated Recoverable Units}}$$

Depletion cost for a period is:

Step 2

$$\text{Depletion Cost} = \text{Unit Depletion Rate} \times \text{Number of Units Extracted during the Period}$$

Depletion cost → Inventory for sale → Cost of goods sold / Unsold Inventory

Intangible Assets

Acquisition and Amortization of Intangible Assets (1)

Noncurrent assets without physical substance.

Intangible Assets

Often provide exclusive rights or privileges.

Useful life is often difficult to determine.

Usually acquired for operational use.

Record at current cash equivalent cost, including purchase price, legal fees, and filing fees.

Acquisition and Amortization of Intangible Assets (2)

Definite Life:
- Amortize over shorter of economic life or legal life, subject to rules specified by GAAP.
- Use straight-line method.

Indefinite Life:
- Not amortized.
- Tested at least annually for possible impairment, and book value is reduced to fair value if impaired.

Amortization is a cost allocation process similar to depreciation and depletion.

Acquisition and Amortization of Intangible Assets (3)

Goodwill

Occurs when one company buys another company.

Only purchased goodwill is an intangible asset.

The amount by which the purchase price exceeds the fair market value of net assets acquired.

Goodwill is NOT amortized. Its value must be reviewed at least annually for possible impairment, and the book value is reduced to fair value if impaired.

Acquisition and Amortization of Intangible Assets (4)

Arpec Company paid $2,000,000 to purchase all of Utek Company's assets and assumed liabilities of $400,000. The acquired assets were appraised at a fair value of $1,800,000.

What amount of goodwill should be recorded on Arpec Company books?

a. $200,000.
b. $400,000.
c. $600,000.
d. $800,000.

FMV of Assets	$ 1,800,000
Debt Assumed	400,000
FMV of Net Assets	1,400,000
Purchase Price	2,000,000
Goodwill	$ 600,000

Acquisition and Amortization of Intangible Assets (5)

Trademarks :
- A symbol, design, or logo associated with a business.
- An exclusive legal right to use a name, image or slogan.
- Purchased trademarks are recorded at cost.

Copyrights :
- The exclusive right to publish, use, and sell a literary, musical, or artistic work.
- Legal life is life of creator plus 70 years.
- Amortize cost over the period benefited.

Acquisition and Amortization of Intangible Assets (6)

Patents :

- Exclusive right granted by the federal government to sell or manufacture an invention.
- Cost is purchase price plus legal cost to defend.
- Amortize cost over the shorter of useful life or 20 years.
- Research and development costs that might result in a patent are normally expensed as incurred.

Technology :

- A category of intangible assets that includes a company's website and any computer programs written by its employees.

Acquisition and Amortization of Intangible Assets (7)

Franchises:

- Legally protected right purchased by a franchisee to sell products or provide services for a specified period and purpose.
- Purchase price is an intangible asset that is amortized.

Licenses and Operating Rights:

- Limited permissions to use a product or service according to specific terms and conditions.
- You may be using computer software that is made available to you through a campus licensing agreement.

International Perspective - IFRS

Measurement Basis for Property, Plant and Equipment

US GAAP and IFRS differ with respect to the treatment of development costs.

Under GAAP, all research and development costs must be reported as an expense.

IFRS require that research expenditures be reported as an expense, but development costs be capitalized as an asset after technical and commercial feasibility of the resulting product or service have been established.

End of Chapter 8

EXERCISE 8 – 1

DEPRECIATION METHODS AND GAIN/LOSS ON SALE

Joel Harvey Florists acquired a truck on January 1, 2007. The company paid $11,000 for the truck, $500 for destination charges, and $250 to paint the company name on the side of the truck. The company's accounting manager estimates the truck to have a five-year useful life and a residual value of $1,750. The truck is expected to be driven 100,000 miles in five years. It is actually driven 15,000 miles in 2007, 25,000 miles in 2008, 30,000 miles in 2009, 25,000 miles in 2010, and 5,000 miles in 2011.

Part 1
On January 1, 2007, how much should Joel Harvey Florist capitalize for the cost of the truck?

GENERAL JOURNAL			
Date	Description	Debit	Credit
2007			

Part 2
How much depreciation expenses that would be recorded for the years 2007 through 2011 using each of the following methods?

a. Straight-line

GENERAL JOURNAL			
Date	Description	Debit	Credit
2007			

GENERAL JOURNAL			
Date	Description	Debit	Credit
2008			

b. Unit-of-production

Year	Miles	Depreciation Rate	Depreciation Expense
2007			
2008			
2009			
2010			
2011			

GENERAL JOURNAL			
Date	Description	Debit	Credit
2007			

GENERAL JOURNAL			
Date	Description	Debit	Credit
2008			

c. Declining-balance

Year	Computation	Depreciation Expense	Accumulated Depreciation Balance	Net Book Value

GENERAL JOURNAL			
Date	Description	Debit	Credit
2007			

GENERAL JOURNAL			
Date	Description	Debit	Credit
2008			

Part 3

On December 31, 2011, Joel Harvey sold the truck for $3,000 cash. Compute the gain or loss on sale.

GENERAL JOURNAL			
Date	Description	Debit	Credit
2011			