R22 Long-Lived Assets

Version 1.0

1. Introduction & Acquisition of Property, Plant and Equipment

1.1 Introduction

Long-lived assets are defined as those assets that are expected to provide future economic benefits extending more than one year.

These assets include:

- **Tangible assets** also known as fixed assets or property, plant, and equipment. Examples include land, buildings, furniture, machinery, etc.
- **Intangible assets** lack physical substance. Examples include patents, trademarks, etc.
- **Financial assets** include investments in equity or debt securities issued by other entities.

There are two important questions in accounting for a long-lived asset:

- What cost should be shown on the balance sheet?
- How should this cost be allocated over the life of an asset?

1.2 Acquisition of Long-Lived Assets

Upon acquisition, long-term tangible assets such as property, plant, and equipment are recorded on the balance sheet at cost, which is the same as fair value. An asset's cost might include expenditures in addition to purchase price. The question is how should these costs be treated – expensed or capitalized?

If the expenditure on an asset is expected to provide benefits beyond one year in the future, the costs are usually **capitalized**. The costs are **expensed** if they are not expected to provide benefits in future periods.

1.3 Property, Plant, and Equipment

Property, plant, and equipment are recorded at cost at acquisition. In addition to the purchase price, the cost includes all expenditures necessary to get the asset ready for intended use. For instance, readying the factory for installation of a machine is included in the cost. But if any training is required for the staff to operate the machine, that is expensed and not capitalized. Subsequent costs are capitalized if they are expected to provide benefits beyond one year, otherwise they are expensed. Companies might have different approaches towards expensing/capitalizing costs. An analyst should understand the impact of expensing/capitalizing decisions on financial statements and ratios. All the capitalized costs related to the long-lived assets are recorded in the balance sheet.

Example

Acme Inc. purchased a machine for $ 10,000. In addition, the following costs were incurred:

- $200 for delivery.
- $300 for installation.
- $100 to train staff on using the machine.

- $1,000 to reinforce floor to support machine.
- $500 to paint the factory.

1. Which costs will be capitalized and which will be expensed?
2. How will the treatment of these expenditures affect the company's financial statements?

Solution to 1:

Capitalized amount = purchase price + costs that are involved in extending asset's life or getting it ready to use = $10,000 + $200 + $300 + $1000 = $11,500.

Training cost is expensed because if the trained staff leaves the company, then it doesn't provide a long-term benefit to the business. Expensed costs = $100 + $500 = $600.

Solution to 2:

Balance sheet: PP&E increases by $11,500 and cash decreases by $11,500.

Income statement: An expense of $600 towards training staff and painting. Also a depreciation expense spread over the useful life of the asset appears on the income statement.

Cash flow statement: CFI decreases by $11,500 and CFO decreases by $600.

2. Acquisition of Intangible Assets

Intangible assets lack physical substance. Classic examples include software, customer lists, patents, copyrights, and trademarks. Accounting for an intangible asset depends on how it is acquired.

Acquired in a Business Combination

This refers to a situation where one company buys another company and, in the process, acquires intangible assets.

- Both IFRS and US GAAP require the use of acquisition method in accounting for business combinations. (This method will be studied in detail at Level II.)
- Under the acquisition method, identifiable intangible assets such as patents, copyrights, and trademarks are recorded at their fair value.
- Goodwill is an intangible asset that cannot be identified separately. It is recorded when one business acquires another business. If the purchase price exceeds the fair value of the net identifiable assets (both the tangible assets and the identifiable intangible assets, minus liabilities) acquired. For example, Tan Hospitals Inc. acquires Man Equipments Inc. for $100 million. The fair value of Man Equipments' net assets equal $95 million. In this case, the excess of $5 million will be recorded as goodwill.

Purchased in Situations Other than Business Combinations

This refers to a situation where an identifiable intangible asset is purchased. The identifiable intangible asset is recorded at fair value.

Developed Internally

Costs to internally develop intangible assets are generally expensed when incurred, although there are exceptions. The differences in whether the costs are capitalized or expensed affect financial statement ratios as outlined below:

- Balance sheet: A company that develops intangible assets internally will expense costs and record lower assets compared to a company that acquires such assets through purchase.
- Statement of cash flows: The costs of internally developing intangible assets are classified as operating cash flows, while the cost of acquiring intangible assets is classified as investing cash flows.

For internally developed intangible assets, there are two phases: the research phase and the development phase.

Research phase refers to the period during which commercial feasibility of an intangible asset is yet to be established. It is defined as "original and planned investigation undertaken with the prospect of gaining new scientific or technical knowledge and understanding."

Development phase refers to the period during which the technical feasibility of completing an intangible asset has been established with the intent of either using or selling the asset.

The treatment for the two phases varies slightly under IFRS and US GAAP as outlined below:

Under IFRS:

- Research costs are expensed.
- Development costs can be capitalized if technical feasibility and the intent to sell the asset are established.

Under US GAAP:

- Both research and development costs are expensed, but there are exceptions for software development.
- Software for sale: Costs incurred to develop a software product for sale are expensed until the product's feasibility is established, and capitalized after the product's feasibility has been established. Determining feasibility involves judgment.
- Software for internal use: All development costs should be capitalized.

Example

Acme Inc. starts an internal software development project on January 1, 2012. It incurs expenditures of $10,000 per month during the fiscal year ended December 31, 2012. By March 31, it is clear that the product will be developed successfully and will be used as intended. How are the software development costs recorded before and after March 31 according to IFRS and US GAAP?

Solution:

IFRS: Under IFRS all costs are expensed until feasibility is established if the software is

developed for internal use. So, $30,000 (period from January 1 to March 31, 2012) is expensed and $90,000 is capitalized (from April 1 to December 31, 2012).

U.S GAAP: The entire cost of $120,000 should be capitalized.

3. Capitalization versus Expensing: Impact on Financial Statements and Ratios

Capitalizing: In general, when a company acquires a long-lived tangible or intangible asset, its cost is capitalized if the asset is expected to provide economic benefits beyond a year. The company records an asset in an amount equal to the acquisition cost plus any other cost to get the asset ready for its intended use.

Capitalizing results in spreading the cost of acquiring an asset over a specified period of time instead of immediately expensing it. All other costs to make the asset ready for intended use are also capitalized. Capitalizing leads to higher profitability in the period when the asset is purchased. The effect of capitalizing an expenditure on the financial statements is summarized below:

Effect of capitalization on financial statements	
Initially when an expenditure is capitalized.	Balance sheet: non-current assets increase by the capitalized amount.
	Statement of cash flows: investing cash flow decreases.
Subsequent periods over the asset's useful life.	Income statement: depreciation or amortization expense. Net income decreases.
	Balance sheet: non-current assets (carrying value of the asset) decreases. Retained earnings decreases. Equity decreases.

Expensing: The cost of an asset is expensed if it has uncertain or no impact on future earnings and provides economic benefit only in the current period. Immediate recognition of an asset's cost as an expense on the income statement results in lower profitability in the current period and higher profits in the future.

Effect of expensing on financial statements	
When an expenditure is expensed.	Income statement: Net income decreases by the after-tax amount of the expenditure. No depreciation/amortization expense.
	Balance sheet: No asset is recorded. Lower retained earnings due to lower net income.
	Statement of cash flow: Operating cash flow decreases.

The table below summarizes the effects of capitalizing versus expensing on various financial statement items.

	Capitalizing	Expensing
Total assets	Higher	Lower
Equity	Higher	Lower
Income variability	Lower	Higher
Net income (1st year)	Higher	Lower
Net income (later)	Lower	Higher
CFO	Higher	Lower
CFI	Lower	Higher
D/E	Lower	Higher
Interest coverage (initially)	Higher	Lower
Interest coverage (later)	Lower	Higher
ROA and ROE (initially)	Higher	Lower
ROA and ROE (later)	Lower	Higher

4. Capitalization of Interest Costs

When an asset requires a long period of time to get ready for its intended use, the interest costs associated with constructing or acquiring the asset are capitalized. Capitalized interest is reported as part of the asset's cost on the balance sheet; in the future, it is reported as part of the asset's depreciation expense in the income statement.

For constructed assets, interest costs during construction are capitalized as part of the asset cost

- Use rate on borrowing related to construction; if no construction debt is outstanding, interest rate is based on existing unrelated debt.
- Capitalized interest is not reported as interest expense on I/S.
- IFRS: Interest on short-term lending offsets capitalized costs (not allowed in U.S. GAAP).

Effect of Capitalized Interest on Financial Statements:

- Higher net income and greater interest coverage ratios during the period of capitalization.
- Higher asset values and depreciation lead to lower net income, EBIT and interest coverage ratio in the subsequent periods.

Instructor's Note: Section 5 'Capitalization of Interest and Internal Development Costs' is not testable and hence not covered.

6. Depreciation of Long-Lived Assets: Methods and Calculation

Under the cost model of reporting long-lived assets, the capitalized cost of a tangible (intangible) long-lived asset is expensed through a process called depreciation (amortization).

6.1 Depreciation Methods and Calculation of Depreciation Expense

Depreciation methods are:

- **Straight-line** – The cost of an asset is evenly distributed over the asset's useful life.
- **Accelerated methods** – A higher depreciation expense is recorded in the early years and lower depreciation expense is recorded in the later years of an asset's life.
- **Units-of-production** – Cost allocated is based on the actual use of an asset in a particular period.

Formulae

Straight-line depreciation expense = depreciable cost / estimated useful life

DDB depreciation expense = 2 x straight-line rate x beginning book value

Units-of-Production depreciation expense per unit = depreciable cost/useful life in units

Carrying amount = historical cost – accumulated depreciation
Depreciable cost = historical cost – estimated residual value

Example

Consider three companies with names based on their depreciation method:

1. Straight Line (SL) Inc.
2. Double Declining Balance (DDB) Inc.
3. Units of Production (UOP) Inc.

Each company purchases identical equipment for 10,000 and makes similar assumptions; estimated useful life = 4 years; residual value = 1,000; productive capacity = 1,000 units. Production over 4 years is 400, 300, 200, and 100 respectively. Complete the table below for each company.

	Beginning Net Book Value	Depreciation Expense	Accumulated Depreciation	Ending Net Book Value
Year 1				
Year 2				
Year 3				
Year 4				

Solution:

Straight-Line Method:

$$\text{Depreciation expense} = \frac{\text{Depreciable cost}}{\text{Estimated useful life}} = \frac{10{,}000 - 1{,}000}{4} = 2{,}250$$

Straight-line Method				
	Beginning Net Book Value	Depreciation Expense	Accumulated Depreciation	Ending Net Book Value
Year 1	10,000	2,250	2,250	7,750
Year 2	7,750	2,250	4,500	5,500

Year 3	5,500	2,250	6,750	3,250
Year 4	3,250	2,250	9,000	1,000

Double-Declining Method (DDM)

The rate of depreciation in double-declining method (DDM) is twice that of straight-line method. It is 25% for straight-line method (100% in 4 years = 25%). The rate of decline for DDM is 50%. Depreciation expense for first year = 0.25 x 2 x 10,000 = 5,000 and so on for the subsequent years. Once the net book value is equal to the residual value there is no further depreciation.

Double-declining balance method				
	Beginning Net Book Value	Depreciation Expense	Accumulated Depreciation	Ending Net Book Value
Year 1	10,000	5,000	5,000	5,000
Year 2	5,000	2,500	7,500	2,500
Year 3	2,500	1,250	8,750	1,250
Year 4	1,250	250	9,000	1,000

Units-of-Production Method:

$$\text{Depreciation expense} = \frac{\text{Depreciable cost}}{\text{Useful life in units}} \text{ x Units produced in period}$$

Depreciation expense in first year = $\left(\frac{9,000}{1,000}\right)$ x 400 = 3,600

Note that we use the depreciable cost of 9,000 which is the original cost (10,000) minus the residual value (1,000).

Units of production method				
	Beginning Net Book Value	Depreciation Expense	Accumulated Depreciation	Ending Net Book Value
Year 1	10,000	3,600	3,600	6,400
Year 2	6,400	2,700	6,300	3,700
Year 3	3700	1,800	8,100	1,900
Year 4	1900	900	9,000	1,000

Some points to be noted:

- The beginning book value is the same for all the three methods.
- The total depreciation over 4 years for all three companies (or under three depreciation methods) should be the same.

Impact of Depreciation Methods on Financial Statements

The choice of depreciation method affects the amounts reported for assets, operating and net income, which in turn, affect the financial ratios. The relationships indicated in the table below are for the early years of an asset's life.

	Straight-Line (SL)	Accelerated (DDB)	Interpretation
Depreciation Expense	Lower	Higher	Compared to SL, the rate of depreciation for DDB is double, making the depreciation expense higher in the initial years.
Net Income	Higher	Lower	Compared to SL, depreciation expense is higher in initial years for DDB making net income lower.
Assets	Higher	Lower	Compared to SL, depreciation and accumulated depreciation are higher for DDB making the net book value of assets lower in the initial years.
Equity	Higher	Lower	Equity = assets – liabilities. Liabilities are not affected. Since assets are lower for DDB, equity is also lower.
Return on Assets (NI/Assets)	Higher	Lower	Compared to SL, ROA for DDB is lower in earlier years because percentage impact on the numerator (net income) is more than the percentage impact on the denominator (assets). Percentage impact on assets is lower because equipment is generally a small percentage of assets.
Return on Equity	Higher	Lower	Compared to SL, ROE for DDB is lower in earlier years because percentage impact on net income is more than the percentage impact on equity.
Asset Turnover	Lower	Higher	Revenue is not impacted by the choice of depreciation method. Net book value of assets is lower for the DDB method making asset turnover higher.
Operating Profit Margin	Higher	Lower	Revenue is not impacted. EBIT is lower for DDB in the initial years, which makes operating profit margin lower.

The above relationships are for the initial years of an asset. These reverse in the later years if the firm's capital expenditure declines.

Component Method of Depreciation

In this method, individual components or parts of an asset are depreciated separately at different rates. For example, in an aircraft it may be prudent to depreciate engine, frame, and interior furnishings separately.

- IFRS requires companies to use the component method of depreciation, i.e., depreciate each component separately.

- US GAAP allows component depreciation but the method is often not used in practice.

Impact of Estimates Used in Calculating Depreciation

Significant estimates used while calculating depreciation include: useful life of the asset and its expected residual value. A longer useful life and a higher expected residual value decrease the amount of annual depreciation. Whereas, a shorter useful life and a lower expected residual value increase the amount of annual depreciation. Analysts should review these estimates to ensure that they are reasonable.

7. Amortization of Long-Lived Assets: Methods and Calculation

Amortization is similar in concept to depreciation. The term amortization applies to intangible assets, and term depreciation applies to tangible assets.
Amortization methods for intangible assets with finite lives are the same as those used in depreciation:

- Straight-line
- Accelerated
- Units-of-production

The calculation of amortization expense is also similar to that of depreciation expense (covered earlier).

8. The Revaluation Model

What we have seen so far is the cost model of accounting where an asset is recorded originally at cost. This value is then depreciated every year. An alternative to cost model is the revaluation model. Under the revaluation model, assets are revalued periodically. The carrying value of an asset after revaluation becomes the fair value. The method is used when the fair value of an asset can be easily determined and is subject to judgment.

IFRS permits the use of either the cost model or the revaluation model for the valuation and reporting of long-lived assets, but the revaluation model is not allowed under US GAAP.

Impact of revaluation on financial statements
The impact of revaluation on financial statements depends on whether the revaluation initially increased or decreased the asset class' carrying amount. Let us consider both the cases.

Downward revaluation
When a revaluation initially decreases the carrying amount of an asset:

- The decrease is recognized as loss in the income statement.
- Later, if the asset's carrying amount increases, the increase is recognized as a gain on the income statement to the extent that it reverses the revaluation decrease previously recognized for the same asset class.

- Any increase in excess of the reversal amount will not be recognized in the income statement, but will be recorded directly to equity as a revaluation surplus.

Upward revaluation

When a revaluation initially increases the carrying amount of the asset class:

- An increase in the carrying value of the asset class bypasses the income statement and is recorded directly under equity as a revaluation surplus.
- A subsequent decrease in the carrying amount first decreases the revaluation surplus and any excess beyond the reversal amount is recorded as a loss on the income statement.

Example

Upward Corp, a hypothetical manufacturing company, has elected to use the revaluation model for its machinery. Assume for simplicity that the company owns a single machine, which it purchased for $20,000 on the first day of its fiscal period, and that the measurement date occurs simultaneously with the company's fiscal period end.

1. At the end of the first fiscal period after acquisition, assume that the fair value of the machine is determined to be $22,000. How will the company's financial statements reflect the asset?
2. At the end of the second fiscal period after acquisition, assume that the fair value of the machine is determined to be $15,000. How will the company's financial statements reflect the asset?

Solution to 1:

At the end of the first fiscal period, the company's balance sheet will show the asset at a value of $22,000. The $2,000 increase in the value of the asset will appear in other comprehensive income and be accumulated in equity under the heading of revaluation surplus.

Note: Gains do not go through income statement and instead go directly to equity under revaluation surplus. In case of loss, part of the decrease is shown as loss in income statement.

Solution to 2:

At the end of the second fiscal period, the company's balance sheet will show the asset at a value of $15,000. The total decrease in the carrying amount of the asset is $7,000 ($22,000 – $15,000). Of the $7,000 decrease in the carrying amount, $2,000 will reduce the amount previously accumulated in equity under the heading of revaluation surplus. This does not go through the income statement. The other $5,000 will be shown as a loss on the income statement.

Example

Downward Corp, a hypothetical manufacturing company, has elected to use the revaluation model for its machinery. Assume for simplicity that the company owns a single machine, which it purchased for $20,000 on the first day of its fiscal period, and that the measurement date occurs simultaneously with the company's fiscal period end.

1. At the end of the first fiscal period after acquisition, assume the fair value of the machine is determined to be $15,000. How will the company's financial statements reflect the asset?
2. At the end of the second fiscal period after acquisition, assume the fair value of the machine is determined to be $22,000. How will the company's financial statements reflect the asset?

Solution to 1:

At the end of the first fiscal period, the company's balance sheet will show the asset at a value of $15,000. The $5,000 decrease in the value of the asset will appear as a loss on the company's income statement.

Solution to 2:

At the end of the second fiscal period, the company's balance sheet will show the asset at a value of $22,000. The total increase in the carrying amount of the asset is an increase of $7,000 ($22,000 – $15,000). Of the $7,000 increase, $5,000 goes towards reversal of a previously reported loss and will be reported as a gain on the income statement. The other $2,000 will bypass profit or loss and be reported as other comprehensive income and be accumulated in equity under the heading of revaluation surplus.

9. Impairment of Assets

Impairment charges reflect an unexpected decline in the fair value of an asset to an amount lower than its carrying amount (Whereas depreciation and amortization charges allocate the cost of a long-lived asset over its useful life.)

Under IFRS

- An asset is impaired when its carrying value exceeds the recoverable amount.
- The recoverable amount is the greater of (fair value less selling costs) and the (present value of expected cash flows from the asset, i.e., the value in use).
- If impaired, the asset is written down to the recoverable amount.
- Subsequent loss recoveries are allowed, but they cannot exceed the historical cost.

Under US GAAP,

- An asset is impaired if its carrying value is greater than the asset's undiscounted future cash flows.
- If impaired, the asset is written down to the fair value.
- Subsequent loss recoveries are not allowed.

Impact of Financial Statements

When an asset is impaired the impact in that period is:

- The value of the asset is written down.
- Activity ratios such as sales/assets are higher.
- Income is lower due to impairment expense.
- Therefore, profitability ratios are lower.
- Cash flows are not impacted (ignoring taxes).

The impact in subsequent periods is:

- Higher income because of reduced depreciation expense.
- Therefore, profitability ratios are higher.
- Activity ratios such as sales/assets are higher.

Example

Given the following data, what is the reported value under IFRS and US GAAP:

- Carrying amount = $8,000
- Undiscounted expected future cash flows = $9,000
- Present value of expected future cash flows = $6,000
- Fair value if sold = $7,000
- Costs to sell = $200

Solution:

IFRS: Recoverable amount = greater of ($7,000 - $200, $ 6,000) = $6,800

Impairment loss = $8,000- $6,800 = $1,200

Write down the value of asset from $8,000 to $6,800 in the balance sheet and record a loss of $1,200 in the income statement.

US GAAP: Is the asset impaired? No, since the carrying amount of $8,000 is less than the undiscounted future cash flows of $9,000.

Other Impairment Scenarios

Impairment of Intangible Assets with Indefinite Lives: Intangible assets with indefinite lives are not amortized. They are carried on the balance sheet at historical cost, but they are tested annually for impairment.

Impairment of Long–Lived Assets Held for Sale: A long-lived asset is reclassified as held for sale, if the management's intent is to sell it and its sale is highly probable. For example, if a company owns a machine with the intent of using it but now intends to sell it, then it should be reclassified as held for sale. Held-for-sale assets are not depreciated or amortized. At the time of reclassification, the asset should be tested for impairment and any impairment loss should be recognized.

The impairment loss can be reversed under IFRS and US. GAAP if the value of the asset recovers in the future. However, this reversal is limited to the original impairment loss. Therefore, the carrying value of the asset after reversal cannot exceed the carrying value before the impairment was recognized.

10. Derecognition

A company derecognizes an asset (i.e., removes it from the financial statements) when the asset is disposed of or is expected to provide no future benefits from either use or disposal.

The three ways in which an asset can be derecognized (removed from a company's financial statements) are as follows:

- **Selling the asset**: The difference between the sales proceeds and the carrying value of the asset is reported as a gain or loss on the income statement.
- **Abandoning the asset**: The carrying value of the asset is removed from the balance sheet and a loss is recognized in that amount in the income statement.
- **Exchanging the asset**: The carrying value of the old asset is compared to the fair value of the new asset and a gain or loss is reported.
- **Distributed to owners in a spin-off:** In a spin-off, typically, an entire cash generating unit of a company with all its assets is spun off and does not result in any gain or loss.

Impact on Financial Statements

A derecognition can result in either a gain or loss on the income statement.

- A loss will lead to lower net income and assets.
- A gain will lead to higher net income and assets.

11. Presentation and Disclosure Requirements

Under IFRS, for each class of property, plant, and equipment, a company must disclose the measurement bases, the depreciation method, the useful lives (or, equivalently, the depreciation rate) used, the gross carrying amount, the accumulated depreciation at the beginning and end of the period, and a reconciliation of the carrying amount at the beginning and end of the period.

Under U.S. GAAP, the requirements are less exhaustive. A company must disclose the depreciation expense for the period, the balances of major classes of depreciable assets, accumulated depreciation by major classes or in total, and a general description of the depreciation method(s) used in computing depreciation expense with respect to the major classes of depreciable assets.

The disclosures related to impairment losses also differ under IFRS and US GAAP. Under IFRS, a company must disclose for each class of assets the following:

- The amounts of impairment losses and reversals of impairment losses recognized in the period and where those are recognized on the financial statements.

- The main classes of assets affected by impairment losses and reversals of impairment losses and the main events and circumstances leading to recognition of these impairment losses and reversals of impairment losses.

Under US GAAP, reversal of impairment losses for assets held for use is not permitted. The company must disclose the following:

- The description of the impaired asset, what led to the impairment;
- The method of determining fair value;
- The amount of the impairment loss, and where the loss is recognized on the financial statements.

12. Using Disclosures in Analysis

Assuming straight-line depreciation and no salvage value, we can state the following relationships:

Estimated total useful life = Time elapsed since purchase (Age) + Estimated remaining life

Estimated total useful life = Historical cost ÷ annual depreciation expense

Historical cost = Accumulated depreciation + Net PPE

The information presented in a company's disclosures and these relationships can be used to conduct an analysis on the company's long-lived assets.

13. Investment Property

Investment property is defined as property that is owned (or, in some cases, leased under a finance lease) for the purpose of earning rentals, capital appreciation, or both.

Under IFRS, companies are allowed to value investment properties using either a cost model or a fair value model. The cost model is identical to the cost model used for property, plant, and equipment, but the fair value model differs from the revaluation model used for property, plant, and equipment. Under the fair value model, all changes in the fair value of investment property affect net income.

Under U.S. GAAP, investment properties are generally measured using the cost model.

Summary

LO.a: Identify and contrast costs that are capitalized and costs that are expensed in the period in which they are incurred.

If an asset is expected to provide benefits only for the current period, its cost is expensed on the income statement for that period.

If an asset is expected to provide benefits over multiple periods, its cost is capitalized on the balance sheet and spread over the life of the asset.

LO.b: Compare the financial reporting of the following types of intangible assets: purchased, internally developed, acquired in a business combination.

Purchased intangible assets

- The cost of a finite-lived intangible asset is amortized over its useful life.
- Indefinite-lived intangible assets are not amortized. They are tested for impairment at least annually.

Internally developed intangible assets

- Under IFRS, research costs are expensed but development costs may be capitalized.
- Under US GAAP, both research and development costs are expensed. (Except in the case of software created for sale to others.)

Intangible assets acquired in a business combination

- Acquired intangible assets such as patents, copyrights, and trademarks are recorded at their fair value; similar to long-lived tangible assets.

LO.c: Explain and evaluate how capitalizing versus expensing costs in the period in which they are incurred affect financial statements and ratios.

	Capitalizing	**Expensing**
Total assets	Higher	Lower
Equity	Higher	Lower
Income variability	Lower	Higher
Net income (1st year)	Higher	Lower
Net income (later)	Lower	Higher
CFO	Higher	Lower
CFI	Lower	Higher
D/E	Lower	Higher
Interest coverage (initially)	Higher	Lower
Interest coverage (later)	Lower	Higher
ROA and ROE (initially)	Higher	Lower
ROA and ROE (later)	Lower	Higher

LO.d: Describe the different depreciation methods for property, plant, and equipment and calculate depreciation expense.

Three types of depreciation are:

1. Straight-Line – The cost of an asset is distributed evenly over the asset's useful life.
2. Accelerated methods – A commonly used accelerated method is the Double-Declining-Balance method in which cost allocated is greater in the earlier years.
3. Units-of-Production – The allocation of cost is equal to the actual use of an asset in a particular period.

Calculating depreciation expense

Carrying amount = historical cost – accumulated depreciation
Depreciable cost = historical cost – estimated residual value
Straight-line: depreciation expense = depreciable cost / estimated useful life
DDB: depreciation expense = 2 * straight-line rate * beginning book value
Units-of-Production: depreciation expense per unit = depreciable cost/useful life in units

LO.e: Describe how the choice of depreciation method and assumptions concerning useful life and residual value affect depreciation expense, financial statements, and ratios.

The effect of depreciation method on financial statements and ratios is summarized in the table below.

	Straight-Line (SL)	Accelerated (DDB)
Depreciation Expense	Lower	Higher
Net Income	Higher	Lower
Assets	Higher	Lower
Equity	Higher	Lower
Return on Assets (NI/Assets)	Higher	Lower
Return on Equity	Higher	Lower
Asset Turnover	Lower	Higher
Operating Profit Margin	Higher	Lower

Assumptions concerning useful life and residual value:

- Estimates required for depreciation and amortization calculations include the useful life of the equipment and its expected residual value at the end of that useful life.
- A longer useful life and higher expected residual value result in a smaller amount of annual depreciation relative to a shorter useful life and lower expected residual value.

LO.f: Describe the different amortization methods for intangible assets with finite lives and calculate amortization expense.

Amortization methods for intangible assets with finite lives are same as those used in depreciation:

- Straight-line
- Accelerated

- Units-of-production

The calculation of amortization expense is also similar to that of depreciation expense (covered earlier).

LO.g: Describe how the choice of amortization method and assumptions concerning useful life and residual value affect amortization expense, financial statements, and ratios.

The choice of amortization method affects expenses, assets, equity, and financial ratios in exactly the same way as the choice of depreciation method does.

LO.h: Describe the revaluation model.

Under the revaluation model, carrying amounts are the fair values at the date of revaluation less any consequent accumulated depreciation or amortization.

IFRS permits the use of either the cost model or the revaluation model for the valuation and reporting of long-lived assets, but the revaluation model is not allowed under US GAAP.

If initial revaluation resulted in a loss

- The initial loss is recognized in the income statement and any subsequent gain is recognized on the income statement only to the extent of the previously reported loss.
- Revaluation gains beyond the initial loss do not flow through the income statement. They are directly recognized in shareholder's equity as a revaluation surplus.

If the initial revaluation resulted in a gain

- The initial gain would bypass the income statement and be reported directly as a revaluation surplus.
- Any subsequent loss would then first reduce the revaluation surplus and later flow into the income statement.

LO.i: Explain the impairment of property, plant, and equipment and intangible assets.

Under IFRS

- An asset is impaired when its carrying value exceeds the recoverable amount.
- The recoverable amount is the greater of (fair value less selling costs) and the present (value of expected cash flows from the asset i.e. the value in use).
- If impaired, the asset is written down to the recoverable amount.
- Subsequent loss recoveries are allowed, but they cannot exceed the historical cost.

Under US GAAP,

- An asset is impaired if its carrying value is greater than the asset's undiscounted future cash flows.
- If impaired, the asset is written down to the fair value.
- Subsequent loss recoveries are not allowed.

LO.j: Explain the derecognition of property, plant, equipment, and intangible assets.

The three ways in which an asset can be derecognized (removed from a company's financial statements) are:

- Selling the asset: The difference between the sales proceeds and the carrying value of the asset is reported as a gain or loss on the income statement.
- Abandoning the asset: The carrying value of the asset is removed from the balance sheet and a loss is recognized in that amount in the income statement.
- Exchanging the asset: The carrying value of the old asset is compared to the fair value of the new asset and a gain or loss is reported.
- Distributed to owners in a spin-off: In a spin-off, typically, an entire cash generating unit of a company with all its assets is spun off and does not result in any gain or loss.

LO.k: Explain and evaluate how impairment, revaluation, and derecognition of property, plant, equipment, and intangible assets affect financial statements and ratios.

Impairment

When an asset is impaired the impact in that period is:

- The value of the asset is written down.
- Activity ratios such as sales/assets are higher.
- Income is lower due to impairment expense.
- Therefore, profitability ratios are lower.
- Cash flows are not impacted (ignoring taxes).

The impact in subsequent periods is:

- Higher income because of reduced depreciation expense.
- Therefore, profitability ratios are higher.
- Activity ratios such as sales/assets are higher.

Revaluation

- An upward revaluation will increase assets and equity.
- Therefore, debt to assets and debt to equity ratios are lower.
- A downward revaluation will have the opposite effects.
- The impact on net income and profitability ratios depend on whether the revaluation is to a value above or below cost.

Derecognition

- This can result in either a gain or loss on the income statement.
- A loss will lead to lower net income and assets.
- A gain will lead to higher net income and assets.

LO.l: Describe the financial statement presentation of and disclosures relating to property, plant, equipment, and intangible assets.

IFRS presentation guidelines

- For each class of property, plant, and equipment, a company must disclose the measurement bases, the depreciation method, the useful lives, the gross carrying amount and the accumulated depreciation at the beginning and end of the period, and a reconciliation of the carrying amount at the beginning and end of the period.
- Each class of intangible assets must disclose whether useful lives are finite or infinite.
- Impairment losses and reversal of impairment losses recognized for every asset during the period.

U.S. GAAP presentation guidelines

- A company must disclose the depreciation expense for the period, the balances of major classes of depreciable assets, accumulated depreciation by major classes or in total, and a general description of the depreciation method(s) used in computing depreciating expense with respect to the major classes of depreciable assets.

LO.m: Analyze and interpret financial statement disclosures regarding property, plant, equipment, and intangible assets

An analyst can use financial statement disclosures to calculate the following:

Average age = accumulated depreciation/ annual depreciation expense.

Total useful life = historical cost/ annual depreciation expense.

Remaining useful life = ending PP&E/ annual depreciation expense.

LO.n: Compare the financial reporting of investment property with that of property, plant, and equipment.

Under IFRS, companies are allowed to value investment properties using either a cost model or a fair value model. Cost model is similar to the cost model used for property, plant, and equipment. Under the fair value model, all changes in the fair value of the asset affect net income.

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Practice Questions

1. Company A expenses assets purchased, while company B capitalizes them. All else equal, as compared to company B, company A will have:
   A. smoother earnings.
   B. higher asset turnover.
   C. lower cash flow from investing.

2. A company recently purchased a warehouse property and related equipment for $30 million. The company incurred the following additional costs:
   - $2.5 million for repairs to the building's roof
   - $1.0 million on an orientation and training session for employees to familiarize them with the facility
   - $0.5 million to modify the interior layout to meet their needs (moving walls and doors, inserting and removing partitions, etc.)

   The cost to be capitalized (in millions) for accounting purposes is *closest* to:
   A. $30.00.
   B. $33.50.
   C. $34.00.

3. The information on a company's financing for construction of a manufacturing facility is given below:
   - Borrowed USD 10,000,000 at a rate of 8%
   - Issued USD 1,500,000 of preferred shares with a cumulative dividend rate of 6.5%
   - Temporarily invested USD 800,000 of the loan proceeds for the first three months of construction and earned 9.5% on that account

   Under IFRS, the amount of financing costs to be capitalized in the first year is *closest* to:
   A. USD 724,000.
   B. USD 781,000.
   C. USD 878,500.

4. Expensing expenditures rather than capitalizing them results in:
   A. results in lower profitability in the initial years and higher profitability in subsequent years.
   B. results in higher profitability in the initial years and lower profitability in subsequent years.
   C. No difference in the profitability.

5. On the statement of cash flows, the cost of an acquired intangible asset will most likely be classified as a(n):

A. operating cash flow.
B. investing cash flow.
C. financing cash flow.

6. An analyst gathered the following information about an equipment's expected production life and use. The equipment was purchased for $10,000 and is expected to have 0 salvage value at the end of its useful life.

	Year 1	Year 2	Year 3	Year 4	Year 5
Units produced	1,000	1,100	900	500	500

Compared with the units-of-production method of depreciation, if the straight-line method is used to depreciate the equipment, the depreciation expense in Year 1 will *most likely* be:
A. lower.
B. higher.
C. the same.

7. In the early years of an asset's life, as compared to straight-line depreciation, accelerated depreciation *least likely* results in:
A. higher depreciation expense.
B. lower retained earnings.
C. higher return on equity.

8. Which of the following will cause a company to show a higher amount of amortization of intangible assets under the straight-line method?
A. A lower residual value.
B. A higher residual value.
C. A longer useful life.

9. Two years ago, Company ABC purchased machinery for $10,000. At the end of last year, the fair value of the machinery was $9,000. The fair value of the machinery at the end of the current year is $11,000. If the company uses the revaluation model, what amount would be recognized in its net income this year?
A. $0.
B. $1,000.
C. $2,000.

10. Which of the following assets will *most likely* be tested for impairment at least annually?
A. Land.
B. A patent with a legal life of 20 years.
C. A trademark with an indefinite life.

11. An analyst gathered the following information about a manufacturing equipment of XYZ, Inc.

Fair value	$160,000
Costs to sell	$8,000
Value in use	$140,000
Net carrying amount	$190,000

The amount of impairment loss on XYZ's income statement related to this equipment is *closest* to:

A. $26,000.
B. $34,000.
C. $38,000.

12. Company A follows IFRS. Which of the following disclosures about property, plant, and equipment would *least likely* be found in its financial statements and footnotes?

A. Acquisition dates.
B. Useful lives.
C. Disposal amounts.

13. Company ABC sells an intangible asset with a historical acquisition cost of $10 million and an accumulated depreciation of $1 million and reports a loss on the sale of $2 million. Which of the following amounts is *most likely* the sales price of the asset?

A. $7 million.
B. $8 million.
C. $9 million.

14. ABC Inc. reported end-of-year gross PP&E and accumulated depreciation of $200 million and $60 million respectively. Its annual depreciation expense for the current year is $10 million. The estimated remaining useful life of ABC's PP&E is *closest* to:

A. 6 years.
B. 14 years.
C. 20 years.

15. An investment property is *most likely* to:

A. earn rent.
B. be held for resale.
C. be used in the production of goods and services.

Solutions

1. B is correct. Company A will have lower assets. Thus, asset turnover = revenue/average assets will be higher for company A.

2. B is correct. The capitalized amount = purchase price + costs that are involved in extending asset's life or getting it ready to use = 30 + 2.5 + 1.0 = 33.5. Orientation and training costs are expensed during the period.

3. B is correct. Under IFRS, any amounts earned by temporarily investing funds are deducted from the interest cost. The costs related to the preferred shares cannot be capitalized. Total capitalized costs = Interest cost – Interest income = (10,000,000 * 8%) – (800,000 *((9.5%/12)*3)) = 781,000.

4. A is correct. Expensing expenditures rather than capitalizing them, results in lower reported profitability in the initial years and higher profitability in subsequent years. This is because when the cost is expensed, the net income is lower in that period than it would have been if the cost had been capitalized. However, over subsequent periods, this expense is not depreciated, resulting in higher profitability in subsequent years.

5. B is correct. The cost of an acquired intangible asset is classified as an investing cash flow while the cost of an internally developed intangible asset is classified as an operating cash flow.

6. A is correct.
   Straight-line method:
   $$\text{Depreciation expense} = \frac{\text{original cost} - \text{salvage value}}{\text{depreciable life}}$$
   Depreciation expense = $10,000/5 = $2000.
   Units of production method:
   $$\text{Depreciation expense} = (\text{original cost} - \text{salvage value}) \times \frac{\text{Output during period}}{\text{Total output}}$$
   Depreciation expense = $10,000 x 1,000/4,000 = $2,500

7. C is correct. In the early years of an asset's life, as compared to straight-line depreciation, accelerated depreciation results in a lower return on equity.

8. A is correct. A lower residual value results in higher total depreciable cost and, therefore, a higher amount of amortization in the first year after acquisition.

9. B is correct. Under the revaluation model, the company will report the asset on its balance sheet at fair value. At the end of last year, a loss of $1,000 was recorded on the income statement. If the asset subsequently recovers in value, then any recovery to the extent of the loss is recorded in the income statement and the excess is recognized as a revaluation surplus in shareholder's equity. Therefore, at the end of the current year, $1,000 will be recorded in the income statement and $1,000 would be recorded in shareholder's equity.

10. C is correct. Intangible assets with indefinite lives need to be tested for impairment at least annually. PP&E (including land) and intangibles with finite lives are only tested if there has been a significant change or other indication of impairment.

11. C is correct.
    Impairment = max (Recoverable amount; Value in use) – Net carrying amount
    Impairment = max ($160,000 - $8,000; $140,000) – 190,000
    = -38,000

12. A is correct. IFRS do not require acquisition dates to be disclosed.

13. A is correct.
    Gain or loss on sale = Sale proceeds – Carrying amount
    = Sale proceeds – (Acquisition cost – accumulated depreciation)
    Sale proceeds = Gain or loss on sale + (Acquisition cost – accumulated depreciation)
    Sale proceeds = -$2 million + ($10 million - $1million) = $7 million

14. B is correct.
    $$\text{Remaining useful life} = \frac{\text{ending net PP\&E}}{\text{annual depreciation expense}}$$
    Remaining useful life = ($200 - $60)/ $10 = 14 years.

15. A is correct. Investment property earns rent. Inventory is held for resale. Property, plant, and equipment are used in the production of goods and services.