

Property, Plant and Equipment

- are long lived assets/ resources that a company controls, has physical substance, used in operations and are not intended for sale to customers
- current assets are used and consumed
- property, plant and equipment provides benefit over a couple years
- used for production/sale of goods or services to customers, for rental or admin purposes
- property, plant and equipment determines the company's production capacity affecting customer satisfaction

Determining the Cost of Property, Plant and Equipment

- most companies record property, plant and equipment at cost including the following
 - the purchase price, including certain types of taxes and duties **less** discounts or rebates
 - expenditures necessary to bring assets to its required location and make it ready for intended use
- costs are **capitalized** instead of expensed
 - recorded as property, plant and equipment
 - why? only if it is probable that the company will receive future economic benefit from the asset and if the benefit can be measured
- which costs to include and exclude in property, plant and equipment?
 - generally, costs benefiting the current period are expensed
 - **operating expenditures**
 - costs benefiting future periods are included in a long lived asset account
 - **capital expenditures**
- operating expenditures benefit the current period
 - required to maintain an asset in its normal operating condition
 - replacing tires on a truck is an example
 - debit to an expense account (Repairs and Maintenance Expense)
- After acquisition, capital expenditures include costs which increase the life of an asset, productivity or efficiency
 - costs tend to be larger than operating expenditures

- occur less frequently
- debit to asset accounts
- The subdivided classes of property, plant and equipment
 - **Land** the building site
 - **Land Improvements** driveways, parking lots, fences, underground sprinkler systems
 - **Buildings** stores, offices, factories, warehouses
 - **Equipment** checkout counters, cash registers, computers, office furniture, factory machinery and delivery equipment

Land

- costs related to the purchase of land include costs like
 - surgery and legal fees
- these costs are added to the Land account
- additional work that may be required to prepare the land (clearing, grading, filling) are recorded as capital expenditures in the Land account
- demolition and removal costs less any proceeds from salvages materials are also added to the Land account
- all costs incurred up to the time of excavation for the new building are considered part of costs necessary to prepare the land for its use

Cash price of property	\$100,000
Net cost of removing warehouse	6,000
Legal fees	1,000
Cost of land	<u>\$107,000</u>

- when the acquisition is recorded
 - land is debited for \$107,000
 - cash credited for \$107,000
- when land is ready for use, recurring costs such as annual property tax are recorded as operating expenditures
 - costs are match against revenues which help the land generate
- **land has an unlimited useful life**
- **the cost of land is not depreciated**

Land Improvements

- are considered as structural additions made to land (driveways, sidewalks, etc)
- land improvements decline in service potential over time

- they require maintenance and replacement
- land improvements are recorded separately from land - is depreciated over their useful lives
- removing buildings or grading are **not** improving the land

Buildings

- costs which are directly related to its purchase or construction
- a building that is purchased -> purchase price, closing costs and all costs to make the building ready for intended use are costs that are included
 - includes expenditures for remodelling rooms and offices, replacing or repairing roofs, floors or electrical wiring
 - costs are capitalized to the Building account
- when a building is constructed
 - costs include the contract price + payments made for architect fees, building permits, excavation costs
 - interest costs (a loan obtained to finance the construction project) are included as well
 - ONLY up to the date that it is ready for use

Equipment

- can include delivery equipment, office equipment, machinery, vehicles etc.
- cost of equipment includes
 - the purchase price and all costs necessary to get the equipment ready for intended use
 - freight charges, insurance during transit paid by the purchaser and expenditures required for assembling, installing and testing equipment are all costs charged to the Equipment Account
- are recurring expenditures
 - does not benefit future periods
 - annual costs (licenses, insurance) are treated as operating expenditures when they are incurred

Cash price	\$32,500
Painting and lettering	500
Cost of delivery van	<u>\$33,000</u>

Vehicles (\$ 32,500 + \$ 500)	33,000	
Licence Expense	80	
Prepaid Insurance	1,600	
Cash (\$ 33,000 + \$ 80 + \$ 1,600)		34,680
(To record purchase of delivery van and related expenditures)		

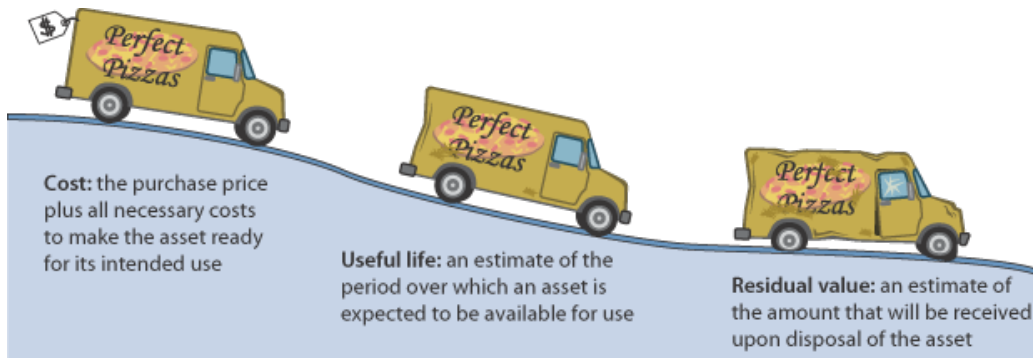
Depreciation

- two models when accounting property, plant and equipment
 - cost model
 - revaluation model
- **cost model** records property, plant and equipment at cost when acquired
 - depreciation is recorded each period and assets are carried at cost - accumulated depreciation
- **depreciation is the systematic allocation of the cost of property, plant and equipment over the asset's useful life**
- the cost is allocated to expense over the asset's useful life so that expenses are matched with the expected use of the asset's future economic benefits
- **depreciation is a process of cost allocation instead of a process of determining an asset's fair value**
- under the cost model, increase in the asset's current fair value is not relevant
 - property, plant and equipment are not held for resale
- carrying amount of property, plant and equipment may be different from fair value
- **depreciation neither uses up nor provides cash to replace the asset**
- balance in accumulated depreciation
 - represents the total amount of the asset's cost that's been allocated to expense to date
 - not a cash fund
 - cash is not increased or decreased by the adjusting entry to record depreciation

Factors in Calculating Depreciation

- way we calculated the cost of depreciation previously

- dividing the cost of depreciable asset by its useful life assuming that the residual value is zero
- 3 Factors affecting the calculation of depreciation
 - **Cost** are costs which affect the cost of a depreciable asset and includes the purchase price + costs necessary to get the asset ready for use
 - may also include asset retirement costs if any
 - **Useful Life** expressed as
 - the period of time over which an asset is expected to be available for use or
 - the number of units of production or units of output that are expected to be obtained from an asset
 - Useful life is an estimate based on factors like the intended use of the asset and how vulnerable the asset is to wearing out or becoming obsolete
 - **Residual Value** is an estimate of the amount that a company would obtain from the disposal of the asset at the end of its useful life
 - is not depreciated because the amount is expected to be recovered at the end of the asset's useful life



- ASPE
 - difference between a depreciable asset's cost and its residual value is known as the **depreciable amount**
 - the total amount to be depreciated over the useful life
 - under ASPE, amortization is used instead of depreciation
 - the depreciable amount is then called the **amortizable cost**

Depreciation Methods

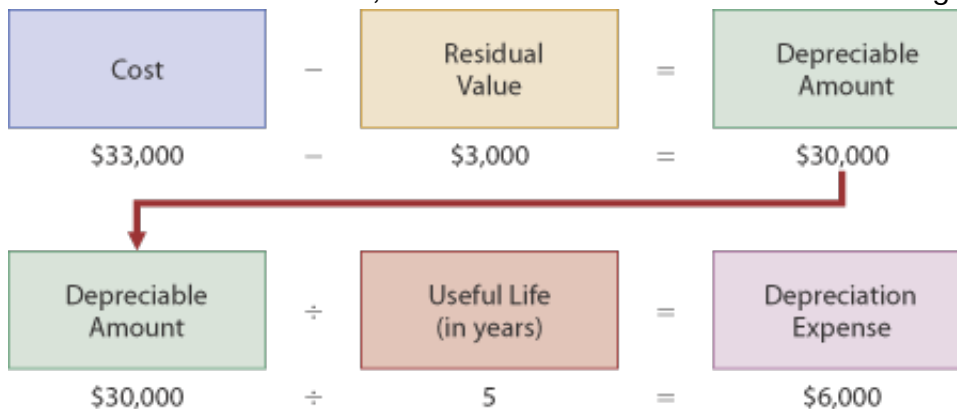
- three methods

- straight line
- diminishing balance
- units of production
- straight line is widely used
- How to choose which method to use?
 - choose a method that will best reflect the pattern in which the assets future economic benefits are expected to be consumed
 - depreciation methods are reviewed once each year
 - changing the depreciation method is disclosed in notes to the financial statements

Cost	\$33,000
Estimated residual value	\$3,000
Estimated useful life (in years)	5
Estimated useful life (in kilometres)	100,000

- **Straight Line**

- **straight line method** requires two steps. depreciable amount is determined through deducting the residual value from the cost of the asset
 - the depreciable amount is divided by the assets useful life to calculate the annual depreciation expense
- if the asset was in use for part of the year, corresponding portions of annual depreciation expense 'f is recorded
- depreciation expense will be the same each year of the useful life if
 - the cost, useful life and residual value do not change



PERFECT PIZZAS LTD. Straight-Line Depreciation Schedule							
Year	Depreciable Amount	×	Depreciation Rate	=	Depreciation Expense	End of Year	
						Accumulated Depreciation	Carrying Amount
2012	\$30,000		20%		\$ 6,000	\$ 6,000	\$33,000
2013	30,000		20%		6,000	12,000	27,000
2014	30,000		20%		6,000	18,000	21,000
2015	30,000		20%		6,000	24,000	15,000
2016	30,000		20%		6,000	30,000	9,000
					<u>6,000</u>		
					<u>\$30,000</u>		

- What happens when an asset is purchased during the year rather than on Jan 1
 - necessary to prorate the annual depreciation for the part of the year when the asset is available for use
- **Diminishing Balance**
 - **diminishing balance method** produces a decreasing annual depreciation expense over the asset's useful life known as the diminishing balance
 - because periodic depreciation is calculated using the asset's carrying amount -> diminishes each year as accumulated depreciation increases
 - annual depreciation expense is calculated by multiplying the carrying amount at the beginning of the year by the depreciation rate
 - depreciation rate is constant year to year
 - carrying amount which rate is applied to declines each year
 - carrying amount for the first year is the **cost of the asset**
 - because balance in Accumulated Depreciation at the beginning of asset's useful life is zero
 - after the first year, carrying amount is the difference between cost and accumulated depreciation at the beginning of the year
 - **because the diminishing balance method uses the assets carrying amount instead of the depreciable amount to calculate the depreciation**
 - **the residual value is not used in determining the amount that the diminishing balance rate is applied to**
 - residual value limits total depreciation that can be recorded
 - depreciation stops when the assets carrying amount equals the expected residual value

- when using this method, the assets carrying amount is equal to residual value at the end of it's useful life
- rates used that result in varying speeds of depreciation
 - single, double and triple
 - double the straight line rate is known as the **double diminishing balance method**

Carrying Amount at Beginning of Year	×	Depreciation Rate (Straight-Line Rate × Multiplier)	=	Depreciation Expense
\$33,000	×	20% × 2	=	\$13,200

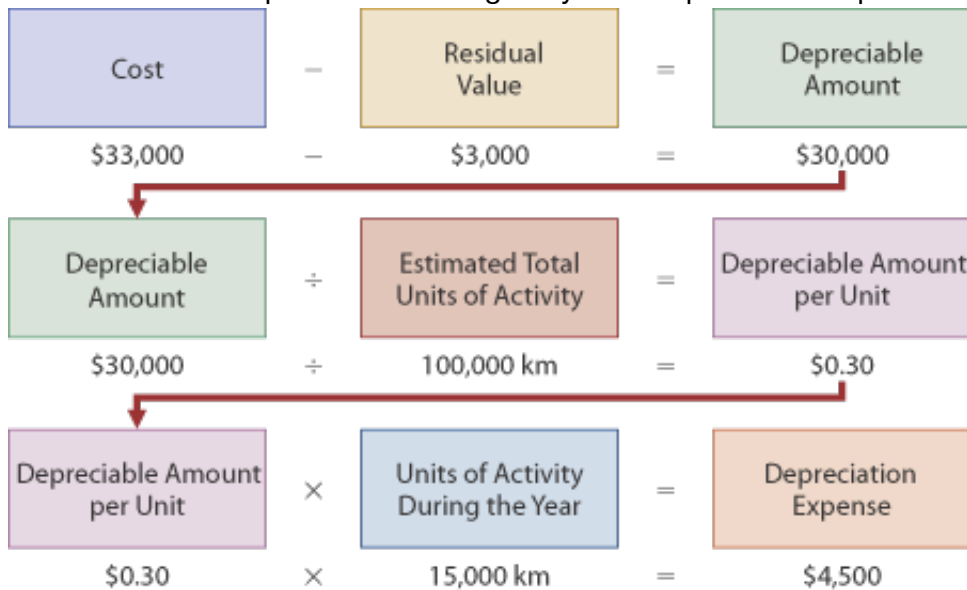
PERFECT PIZZAS LTD. Diminishing-Balance Depreciation Schedule						
Year	Carrying Amount Beginning of Year	×	Depreciation Rate	=	Depreciation Expense	End of Year
						Accumulated Depreciation
						\$33,000
2012	\$33,000		40%		\$13,200	\$13,200
2013	19,800		40%		7,920	21,120
2014	11,880		40%		4,752	25,872
2015	7,128		40%		2,851	28,723
2016	4,277		40%		1,277*	30,000
					\$30,000	

*The calculation of \$1,711 (\$4,277 × 40%) is adjusted to \$1,277 so that the carrying amount will equal the residual value.

- prorating the diminishing balance depreciation in the first year - based on time
 - $\$33,000 \times 0.4 \times 9/12 = \$9,900$
 - carrying amount for calculating depreciation in 2013 becomes $\$33,000 - \$9,900 = \$23,100$
 - 2013 depreciation changes to $\$23,100 \times 0.4 = \$9,240$
- methods that produce higher depreciation expense in the early years than in the later years are known as **accelerated depreciation methods** such as the diminishing balance method
- this method is used if the company receives more economic benefit in the early years of the asset's useful life than in later years
 - if the asset has a higher revenue producing ability in its early years
 - or if the asset is expected to become less useful over time
- **Units of Production**
 - **units of production method** useful life is expressed using a measure of output
 - units produced or a measure of use (machine hours)

worked)

- works well for factory machinery where production can be measured
 - as well as motor vehicles
 - not suitable for assets like buildings or furniture as activity levels are hard to measure
- units of production in total for the entire useful life is estimated
 - is then divided into the depreciable amount (cost less residual value)
 - this determines the depreciable amount per unit
 - depreciable amount per unit is multiplied by the units of production during the year = depreciation expense



PERFECT PIZZAS LTD. Units-of-Production Depreciation Schedule					
Year	Units of Production	Depreciable Amount/Unit	Depreciation Expense	End of Year	
				Accumulated Depreciation	Carrying Amount
					\$33,000
2012	15,000	\$0.30	\$ 4,500	\$ 4,500	28,500
2013	30,000	0.30	9,000	13,500	19,500
2014	20,000	0.30	6,000	19,500	13,500
2015	25,000	0.30	7,500	27,000	6,000
2016	10,000	0.30	3,000	30,000	3,000
	<u>100,000</u>		<u>\$30,000</u>		

- straight line depreciation results in the same amount of expense each year on the income statement

- diminishing balance results in higher expenses -> lower profit
 - in later years results in lower expenses and higher profit
- total depreciation and total profit are the same for the five year period

Other Depreciation Issues

Impairments

- carrying amount is asset's cost less accumulated depreciation
 - is rarely the same as the fair value
 - cost model assumes that fair value is not relevant because PPE are not purchased for real
- long lived assets (PPE) can be undervalued but it is not appropriate for them to be overvalued
- PPE are considered impaired if the asset's carrying amount exceeds its recoverable amount
- **recoverable amount** is an amount that can be determined by **fair value - selling costs of similar assets**
 - information not available: value in use of the asset (based on future cash flows) can be used
 - if fair value - selling costs and value in use are unknown
 - the greater of the two amounts is used
- **impairment loss** when long lived assets are impaired, an impairment loss is recorded
 - equal to the amount by which the asset's carrying amount exceeds its recoverable amount
- ASPE
 - impairment tests are done in two steps
 - first step - measure cash flows expected to be received from the asset - compare with the carrying value
 - if cash flows are less than the carrying value, calculating impairment loss would be done in the second step
- companies are required to determine the indicators of impairment
 - if indicators are not present the test does not need to be done
 - if indicators are present, impairment test must be done
- equipment costs \$800,000
 - accumulated depreciation of \$200,000
 - equipments recoverable amount \$550,000
 - amount of impairment loss is determined by comparing asset's carrying amount with its recoverable amount

Carrying amount (\$ 800,000 – \$ 200,000)	\$600,000
Recoverable amount	550,000
Impairment loss	<u>\$ 50,000</u>

- journal entry for impairment loss

Impairment Loss	50,000	
Accumulated Depreciation—Equipment		50,000
(To record impairment loss on equipment)		

- impairment loss is recorded on the income statement
 - part of the operating income from continuing operations
 - is not a non operating item in other expenses and losses
 - often combined and reported with depreciation expense on the income statement
 - accumulated depreciation is credited for the impairment loss
- asset's carrying amount is the cost of the asset less accumulated depreciation
 - will now include any impairment losses
- Under ASPE companies are not allowed to reverse impairment losses
- IFRS allows the reversal of previously recorded impairment losses
 - only to the extent that the reversal returns the carrying amount to what it would have been had it never occurred
- example
 - straight line depreciation and purchase equipment with no residual value costing \$100, 5 year useful life
 - one year old: carrying amount of \$80
 - at the end of the second year: carrying amount of \$60
 - recoverable amount \$68 and the end of the first year
 - compare with carrying amount of \$80, company must record an impairment loss of \$12 at the end of the first year
 - in the second year, depreciation would be based on the impaired carrying amount of \$68 -> therefore is \$17
 - \$68 carrying amount divided by four remaining years
 - carrying amount would be \$51 (\$68-\$17) at the end of the second year of use
 - how much of an impairment loss could be reversed if the

recoverable amount at the time was \$90

- only enough to return the carrying amount of \$60 -> the amount would be if the impairment never occurred
- impairment loss reversal of \$9
 - difference between \$51 carrying amount with impairment and \$60 carrying amount without impairment

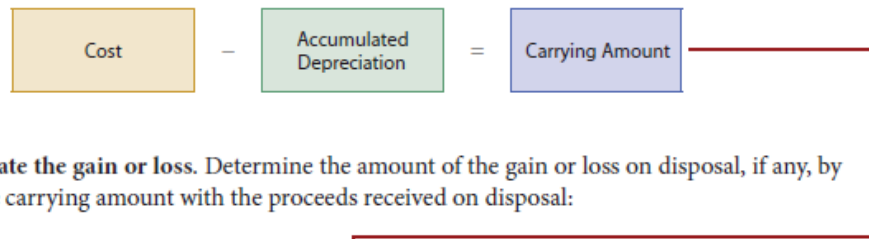
Accumulated Depreciation—Equipment	9
Impairment Loss	9
(To record impairment loss reversal on equipment)	

Disposals of Property, Plant and Equipment

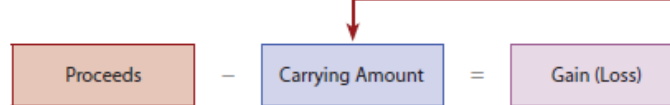
- companies dispose of property, plant and equipment that is no longer useful to them



- four steps to record the sale, retirement or exchange of property, plant or equipment
- **Step 1** Update Depreciation
 - depreciation should be recorded over the entire period of time that it is available for use
 - when disposal occurs in the middle of an accounting period, depreciation should be updated for the fraction of the year that passed since adjusting entries were recorded up to the date of disposal
 - update period will not exceed one year
 - adjusting entries are made at least annually
- **Step 2** Calculate the carrying amount
 - calculate the carrying amount at the time of disposal after updating the accumulated depreciation for any partial year depreciation recorded in step 1



Step 3: Calculate the gain or loss. Determine the amount of the gain or loss on disposal, if any, by comparing the carrying amount with the proceeds received on disposal:



- if proceeds of the sale are more than the carrying amount of the property, plant or equipment there is a **gain on disposal**
- if proceeds of the sale are less than the asset's carrying amount, there is a **loss on disposal**
- **Step 4 Record the Disposal**
 - record the disposal removing the cost of the asset disposed and the accumulated depreciation relating to the disposed asset
 - asset account is decreased with a credit equal to the cost of the asset disposed
 - Accumulated depreciation account is decreased with a debit for the portion of the account pertaining to the disposed asset
 - the total amount of depreciation and any impairment losses that have been recorded for the asset up to its disposal date

Sale of Property, Plant and Equipment

- sale of equipment using straight line depreciation
- **Gain on Disposal**
 - equipment sold for \$25,000 cash
 - equipment purchased 3 1/2 years ago at a cost of \$60,000
 - estimated residual value of \$5,000 and useful life of 5 years
 - first step - update any unrecorded depreciation
 - using the annual depreciation straight line method -> \$11,000 [(\$60,000-\$5000) /5]
 - depreciation would be recorded already along with other adjusting entries for each of the calendar year ends

July 1	Depreciation Expense (\$ 11,000 × 6 / 12)	5,500	
	Accumulated Depreciation—Equipment		5,500
	(To record depreciation expense for the first six months of 2012)		

- second step - calculate the carrying amount on July 1 2012

- december 31 2011 year end accumulated depreciation of equipment of \$33,000 ($\$11,000 \times 3$ years)
- after the balance has been updated on July 1 2012 to \$38,500 ($\$33,000 + \$5,000$)
 - carrying amount is \$21,500
 - cost of \$60,000 - accumulated depreciation \$38,500
- third step - calculate the gain or loss on disposal
 - \$3,500 gain

Proceeds from sale	\$25,000
Less: Carrying amount at date of disposal	21,500
Gain on disposal	<u>\$ 3,500</u>

- fourth step - record sale of equipment

July 1	Cash	25,000	
	Accumulated Depreciation—Equipment	38,500	
	Equipment		60,000
	Gain on Disposal		3,500
	(To record sale of equipment at a gain)		

- gain on disposal reported as a reduction of operating expenses on the income statement
- **Loss on Disposal**
 - assume that instead of selling equipment for \$25,000, it is sold for \$20,000
 - a loss of \$1,500 is calculated

Proceeds from sale	\$20,000
Less: Carrying amount at date of disposal	21,500
Loss on disposal	<u>\$ (1,500)</u>

- record the sale of equipment

July 1	Cash	20,000	
	Accumulated Depreciation—Equipment	38,500	
	Loss on Disposal	1,500	
	Equipment		60,000
	(To record sale of equipment at a loss)		

Retirement of Property, Plant and Equipment

- when assets aren't sold, they are retired at the end of their useful lives
- retirement of assets is recorded like a sale
 - there are no proceeds
 - depreciation is updated first, carrying amount second
 - if the asset is retired before it is fully depreciated there is a loss on disposal
 - equal to asset's carrying amount
 - because there are no proceeds received in retirement -> gains will never occur
- carrying amounts will often equal zero
 - journal entries are still required to remove accounts related to the retired asset
 - accumulated depreciation is decreased (debited) for the balance in the account related to the retired asset
 - retired asset account is increased (credited) for its balance
 - loss on disposals are recorded as a debit
- what happens if a company is still using a fully depreciated asset?
 - the asset and accumulated depreciation continue to be reported on the statement of financial position until the asset is retired
- reporting the asset and related depreciation on the statement of financial position informs readers of
 - financial statements that the asset is still being used by the company
- once the asset is fully depreciated no additional depreciation should be taken
- **accumulated depreciation on an asset can't be more than its cost less its residual value**

Exchanges of Property, Plant and Equipment

- in exchange of assets a new asset is typically purchased by trading in

an old asset

- **trade-in allowance** is given toward the purchase price of the new asset
- additional cash payments are required
 - for the difference between the trade in allowance and purchase price of the new asset
- the old asset is sold for a trade in allowance on the purchase of the new asset
 - instead of being sold for cash

Statement Presentation of Long Lived Assets

Statement of Financial Position

- costs of major classes of assets are disclosed
- accumulated depreciation pertaining to tangible assets must be disclosed
- must specify which depreciation methods are used
 - as well as useful lives or rates in the notes
- IFRS
 - companies must disclose if they are using the cost or revaluation model for each class of assets
 - must show the following for each class of long lived assets
 - additions
 - disposals
 - depreciation/amortization
 - impairment losses
 - reversals of impairment losses

WESTJET AIRLINES LTD. Balance Sheet (partial) December 31, 2010 (in millions)			
Property and equipment (Note 5)			\$2,227
Intangible assets (Note 6)			13
Note 5. Property and equipment	<u>Cost</u>	<u>Accumulated Depreciation</u>	<u>Net</u>
Aircraft	\$2,472	\$623	\$1,849
Ground property and equipment	122	62	60
Spare engines and parts	106	28	78
Buildings	136	13	123
Leasehold improvements	10	3	7
Assets under capital leases	4	1	3
Development costs and other assets	107	-	107
	<u>\$2,957</u>	<u>\$730</u>	<u>\$2,227</u>

Income Statement

- depreciation expense, gains and losses on disposal, impairment losses are presented in the operating section of the income statement

Statement of Cash Flows

- cash flows from the purchase and sale of long lived assets are reported in the investing activities

WESTJET AIRLINES LTD. Statement of Cash Flows (partial) Year Ended December 31, 2010 (in thousands)	
Investing activities	
Aircraft additions	\$(29,884)
Other property and equipment and intangible additions	(18,675)
Cash used in investing activities	(48,559)

Analyzing Assets

Return on Assets

- **return on assets** ratio measures overall profitability
- RETURN ON ASSETS = PROFIT / AVERAGE TOTAL ASSETS
- indicates the amount of profit generated by each dollar invested in assets
- **higher the return on assets, the more profitable the company is**

	2010	2009
Net sales	\$2,405	\$2,068
Profit	137	98
Total assets	3,563	3,494

RETURN ON ASSETS = $\frac{\text{PROFIT}}{\text{AVERAGE TOTAL ASSETS}}$		
(\$ in millions)	2010	2009
WestJet	$\frac{\$137}{(\$3,563 + \$3,494) \div 2} = 3.9\%$	$\frac{\$98}{(\$3,494 + \$3,269) \div 2} = 2.9\%$
Air Canada	1.0%	(0.1)%
Industry average	2.3%	(1.4)%

Asset Turnover

- **asset turnover ratio** indicates how efficiently a company uses its assets
- how many dollars of sales are generated by each dollar invested in assets
- $\text{ASSET TURNOVER} = \text{NET SALES} / \text{AVERAGE TOTAL ASSETS}$
- when comparing asset turnover ratios of two companies, the company with the higher turnover ratio is generally perceived to be operating more efficiently
 - because it is generating more sales for every dollar invested in assets
- we assume that the age of the depreciable assets is about the same for each company

ASSET TURNOVER = $\frac{\text{NET SALES}}{\text{AVERAGE TOTAL ASSETS}}$		
(\$ in millions)	2010	2009
WestJet	$\frac{\$2,405}{(\$3,563 + \$3,494) \div 2} = 0.7 \text{ times}$	$\frac{\$2,068}{(\$3,494 + \$3,269) \div 2} = 0.6 \text{ times}$
Air Canada	1.0 times	0.9 times
Industry average	0.8 times	0.7 times

Profit Margin Revisited

- profit margin = profit/ net sales
- tells us how effective a company is in turning its sales into profit
- how much profit is generated by each dollar of sales

PROFIT MARGIN × ASSET TURNOVER = RETURN ON ASSETS				
$\frac{\text{Profit}}{\text{Net Sales}}$	×	$\frac{\text{Net Sales}}{\text{Average Total Assets}}$	=	$\frac{\text{Profit}}{\text{Average Total Assets}}$
$\frac{\$137}{\$2,405} = 5.7\%$		$\frac{\$2,405}{(\$3,563 + \$3,494) \div 2} = 0.7 \text{ times}$		$\frac{\$137}{(\$3,563 + \$3,494) \div 2} = 3.9\%$