Transforming Financial Accounting with Data Analytics
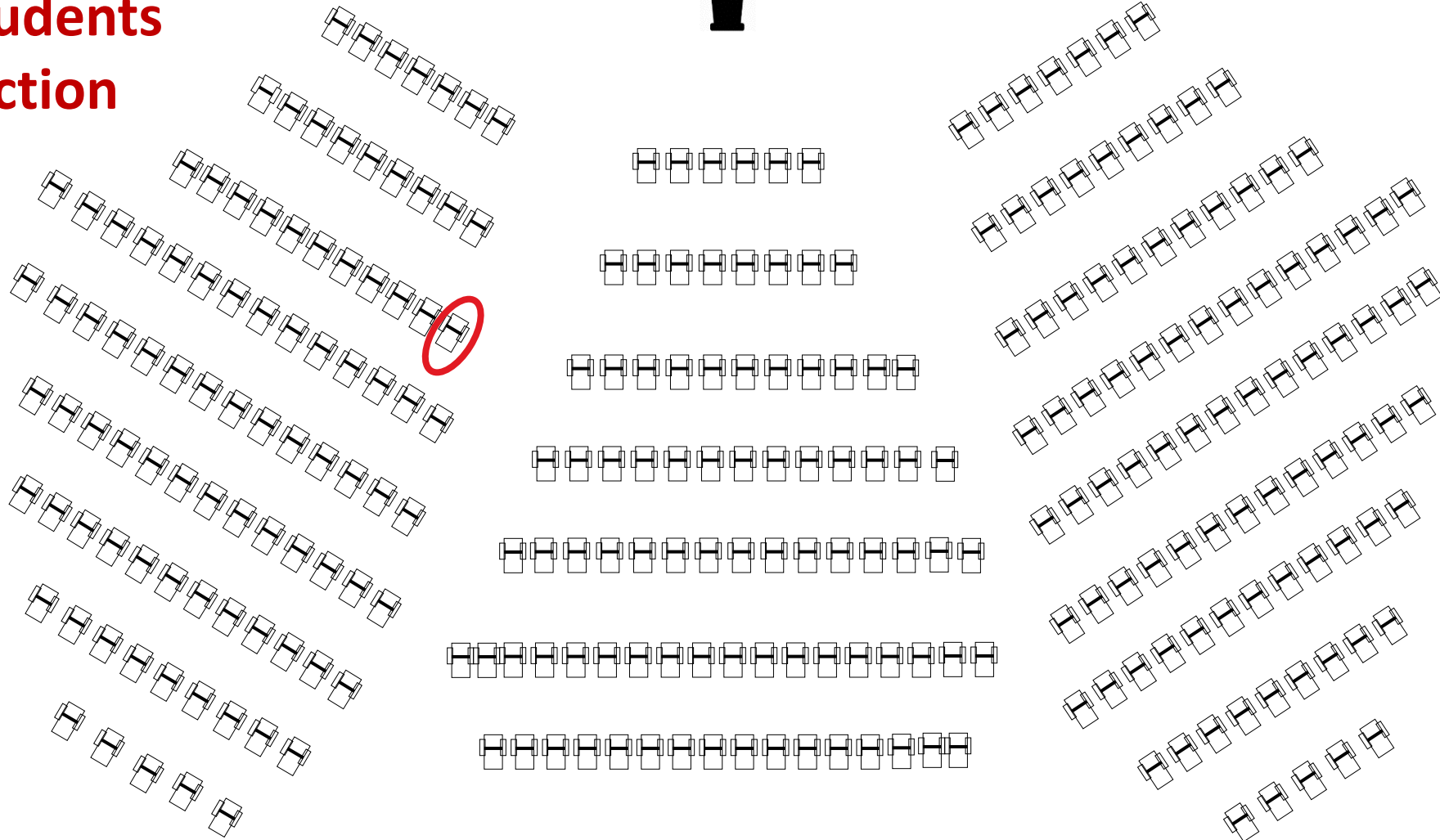
Wayne Thomas
University of Oklahoma

My Classroom

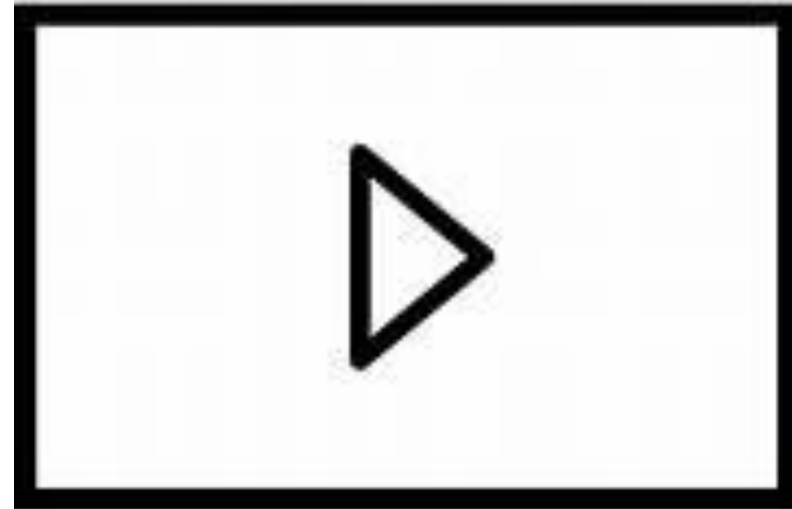275 students per section

Last fall my son

My Other "Classrooms"
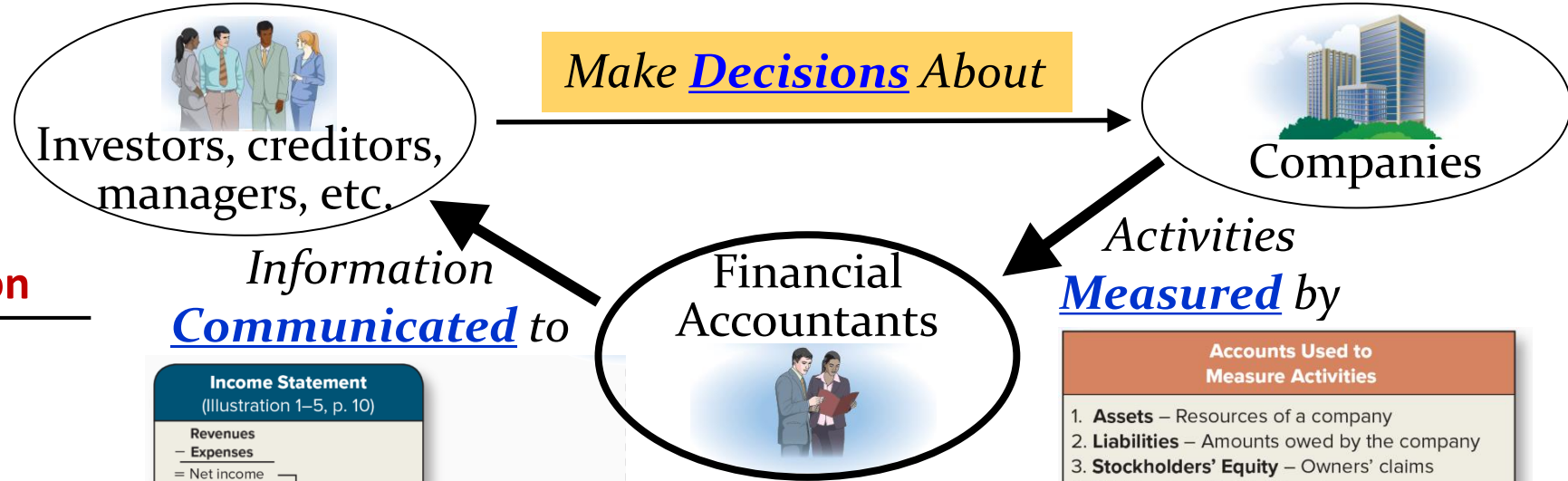
Synchronous

Asynchronous

Goals for Student Success

- **"Big Picture":** Measurement → Communication → Decision Making

- **Real-World**: Make the course seems relevant <u>to students</u>

- **Professional Judgment**: Financial analysis, career skills, ethics

- **Course Structure**: Help organize their learning

Increase their interest → **<u>without</u>** increasing the complexity

Framework for Financial Accounting

Make _Decisions_ About

Investors, creditors, managers, etc. → Companies

Organize Their Perception

- Build a framework
- Ac**counting** ≠ counting
- **Account**ing = telling a story
- Dynamic social science
- Motivate majors
- Appreciated by non-majors

Information **Communicated** _to_

Financial Accountants

Activities **Measured** _by_

Income Statement
(Illustration 1–5, p. 10)

Revenues
− Expenses
= Net income

Statement of Stockholders' Equity
(Illustration 1–6, p. 11)

Common Stock	+	Retained Earnings	=	Stockholders' Equity
Beginning balance + New issuances		Beginning balance		Beginning total + New issuances
		+ Net income − **Dividends**		+ Net income − Dividends
Ending balance	+	Ending balance	=	Ending total

Balance Sheet
(Illustration 1–7, p. 13)

Assets (including Cash) = Liabilities + **Stockholders' Equity**

Statement of Cash Flows
(Illustration 1–8, p. 15)

Cash flows from operating activities
+ Cash flows from investing activities
+ Cash flows from financing activities
= Change in Cash

Accounts Used to Measure Activities

1. **Assets** – Resources of a company
2. **Liabilities** – Amounts owed by the company
3. **Stockholders' Equity** – Owners' claims
4. **Dividends** – Distributions to owners
5. **Revenues** – Sales of products or services
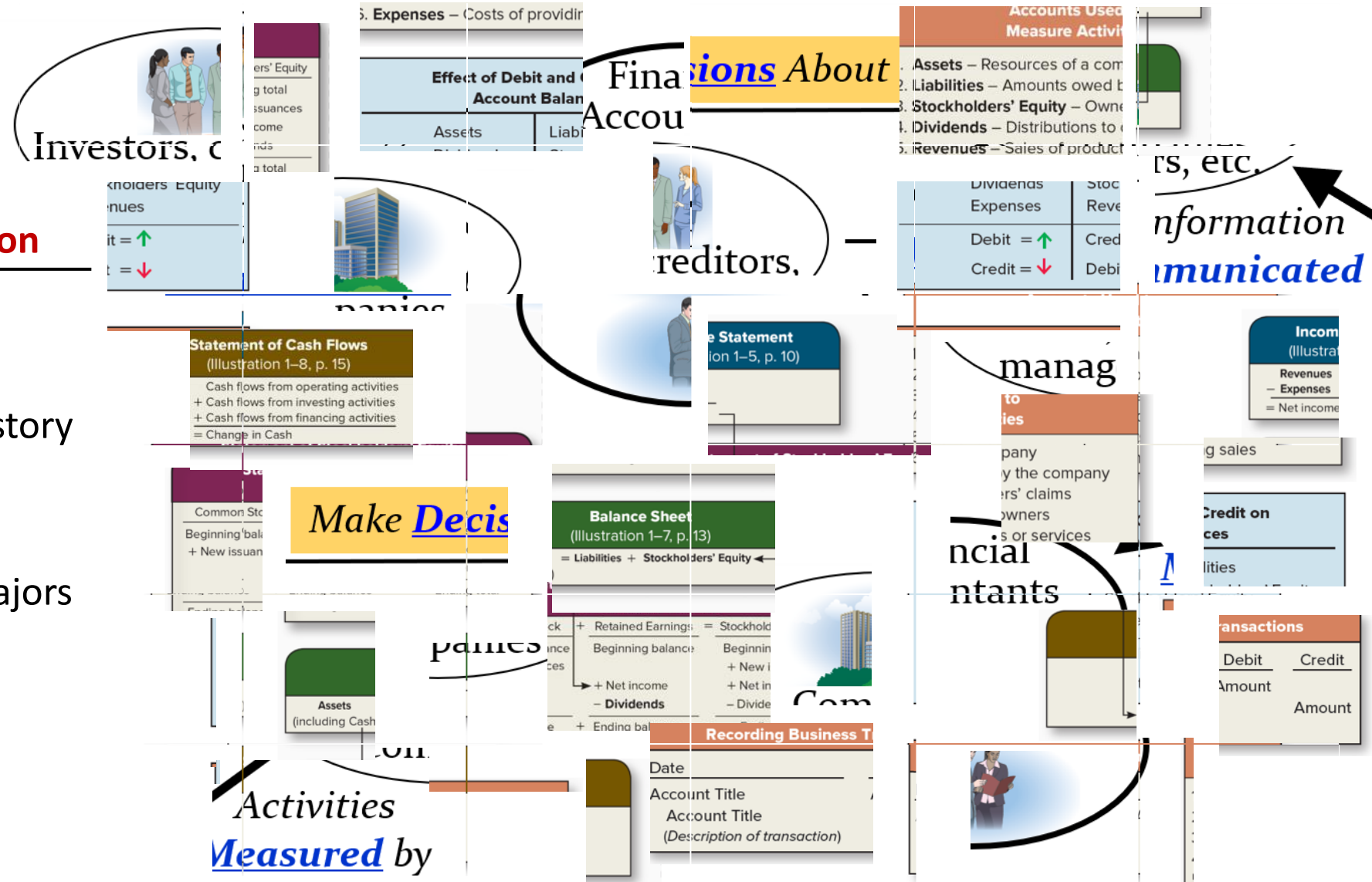6. **Expenses** – Costs of providing sales

Effect of Debit and Credit on Account Balances

Assets Dividends Expenses	Liabilities Stockholders' Equity Revenues
Debit = ↑	Credit = ↑
Credit = ↓	Debit = ↓

Recording Business Transactions

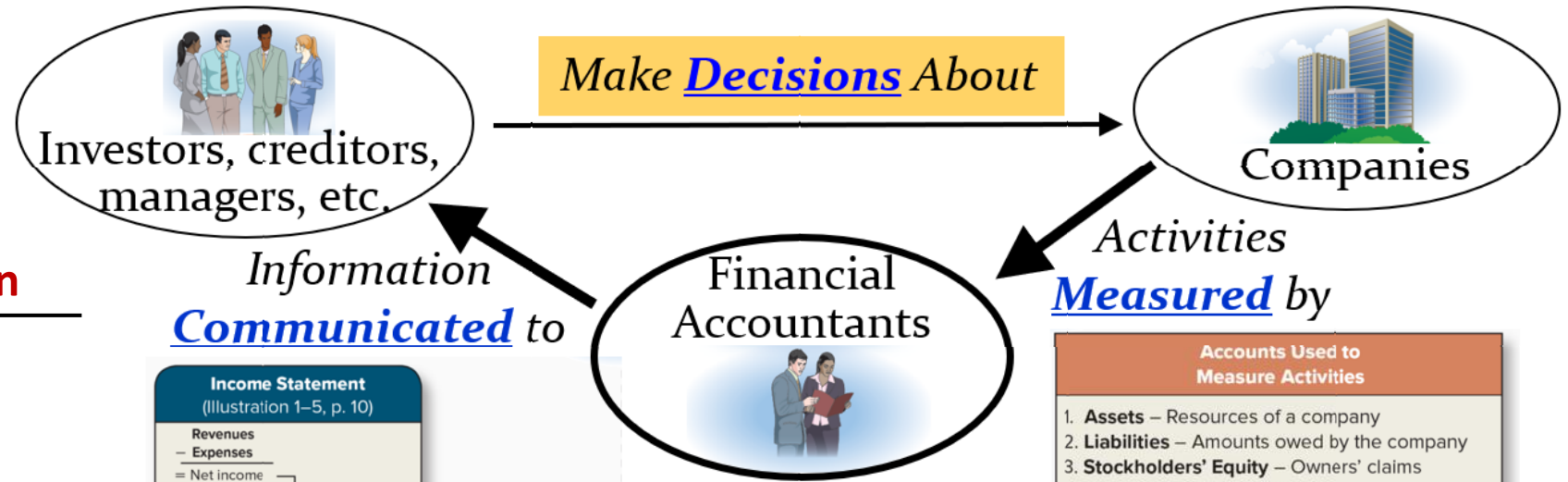| Date		Debit	Credit
Account Title		Amount	
Account Title			Amount
(_Description of transaction_)			

Framework for Financial Accounting

Organize Their Perception

- Build a framework
- Ac**counting** ≠ counting
- **Account**ing = telling a story
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Framework for Financial Accounting

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Make **Decisions** About

Investors, creditors, managers, etc.

Companies

Information **Communicated** to

Financial Accountants

Activities **Measured** by

Accounts Used to Measure Activities

1. **Assets** – Resources of a company
2. **Liabilities** – Amounts owed by the company
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5. **Revenues** – Sales of products or services
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Income Statement
(Illustration 1–5, p. 10)

Revenues
− Expenses
= Net income

Statement of Stockholders' Equity
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Common Stock	+	Retained Earnings	=	Stockholders' Equity
Beginning balance + New issuances		Beginning balance		Beginning total + New issuances
		+ Net income		+ Net income
		− **Dividends**		− Dividends
Ending balance	+	Ending balance	=	Ending total

Balance Sheet
(Illustration 1–7, p. 13)

Assets (including Cash) = Liabilities + Stockholders' Equity

Statement of Cash Flows
(Illustration 1–8, p. 15)

Cash flows from operating activities
+ Cash flows from investing activities
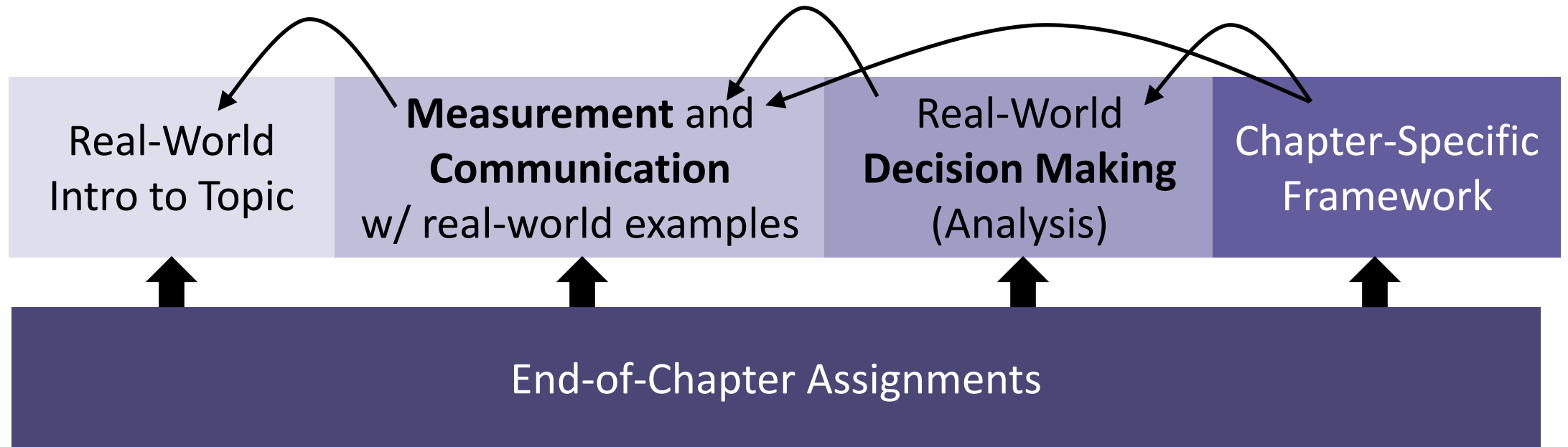+ Cash flows from financing activities
= Change in Cash

Effect of Debit and Credit on Account Balances

Assets Dividends Expenses	Liabilities Stockholders' Equity Revenues
Debit = ↑	Credit = ↑
Credit = ↓	Debit = ↓

Recording Business Transactions

Date	Debit	Credit
Account Title	Amount	
Account Title		Amount
(Description of transaction)		

Structure of Every Chapter

- **<u>Build</u> and <u>Reinforce</u> the Framework**

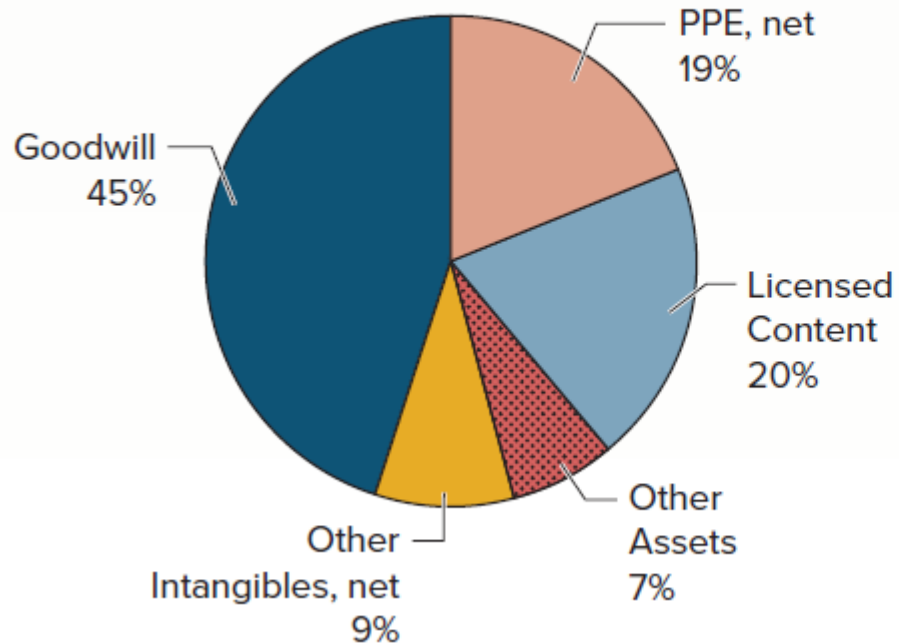| Real-World Intro to Topic | **Measurement** and **Communication** w/ real-world examples | Real-World **Decision Making** (Analysis) | Chapter-Specific Framework |

End-of-Chapter Assignments

How can Data Analytics support this approach?

My Assignment Variety – Old vs. New

Chapter 7 – Long-Term Assets	Old	New
Exercises (all topics)	✓	✓ (but fewer)
F/S Effects (BEs: Depreciation & Sale)		✓
Data Visuals (Acquisition, Depreciation)		✓
Dashboard (Depreciation)		✓
EDGAR Case (Meta)		✓
Earnings Management Case (Depreciation)		✓
General Ledger Software (Accounting cycle)		✓
Chapter Framework video/questions		✓
Assignments in other chapters: **Ethics Cases, Financial Analysis Cases, Integrated Excel**		✓

All Auto-graded

Real-World Visuals – Long-Term Assets

The Walt Disney Company Long-Term Assets

- PPE, net 19%
- Licensed Content 20%
- Other Assets 7%
- Other Intangibles, net 9%
- Goodwill 45%

Comcast Corporation Long-Term Assets

- PPE, net 23%
- Film and Television Costs 5%
- Other Assets 9%
- Other Intangibles, net 38%
- Goodwill 25%
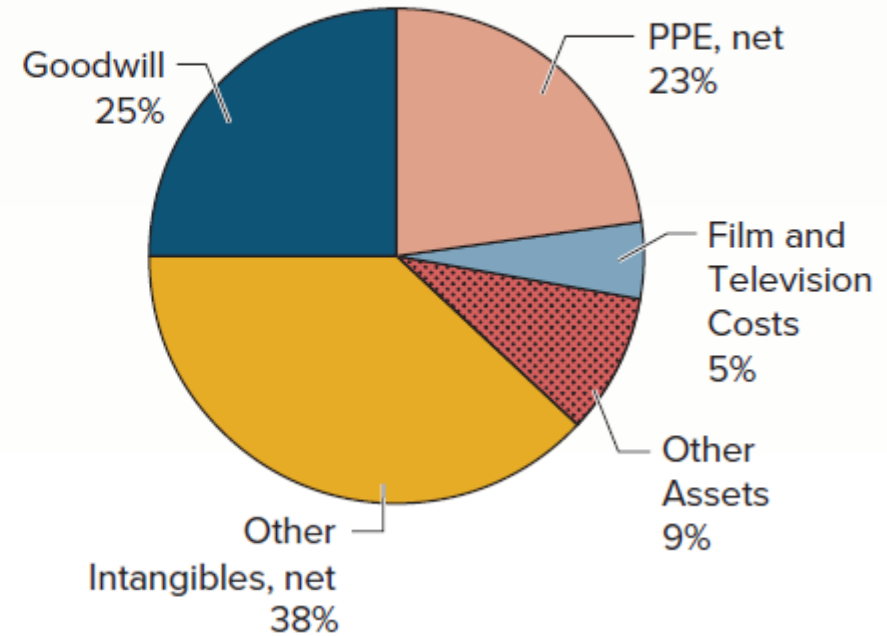
Real-World Visuals – Net Income and Stock Prices
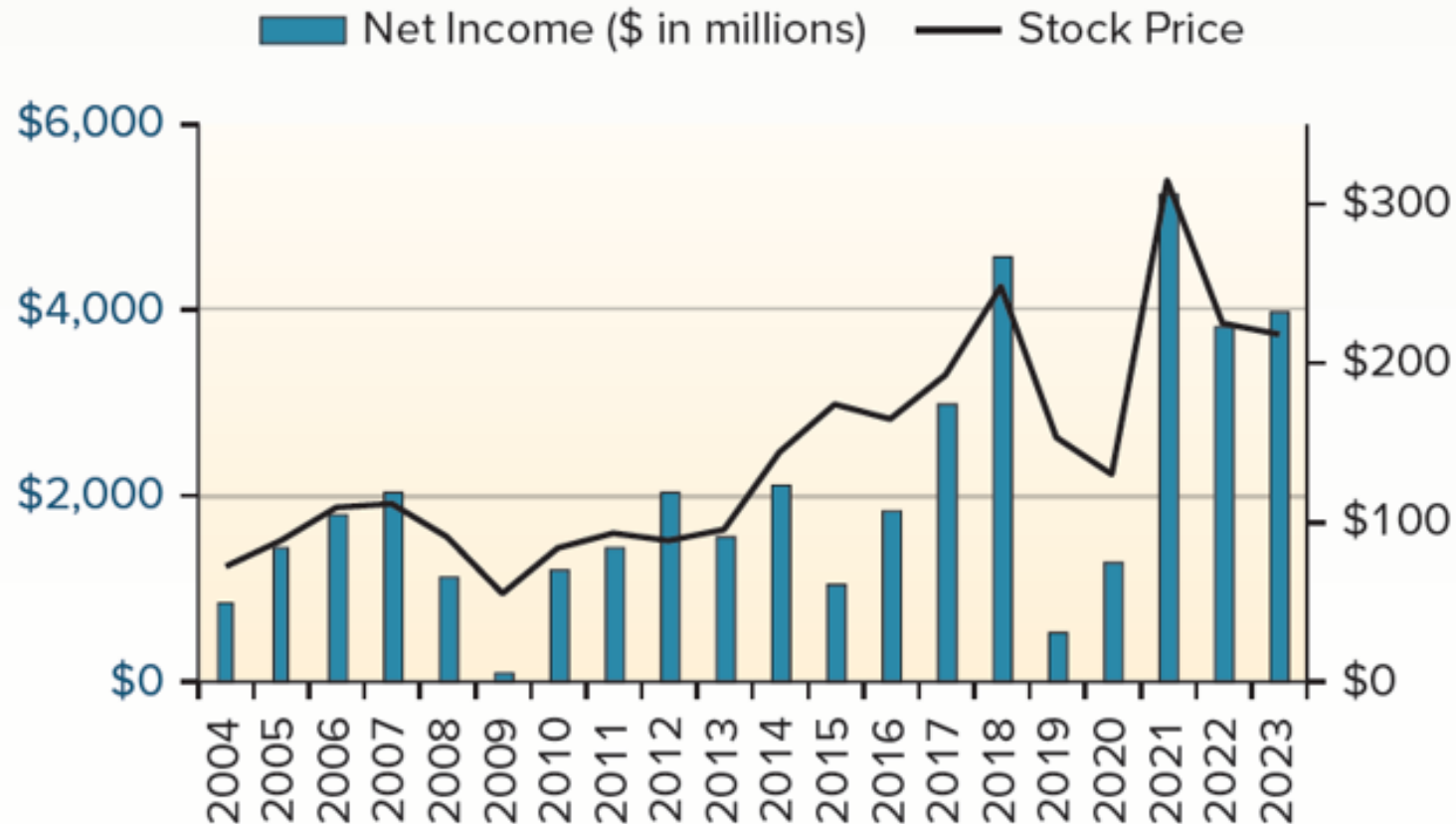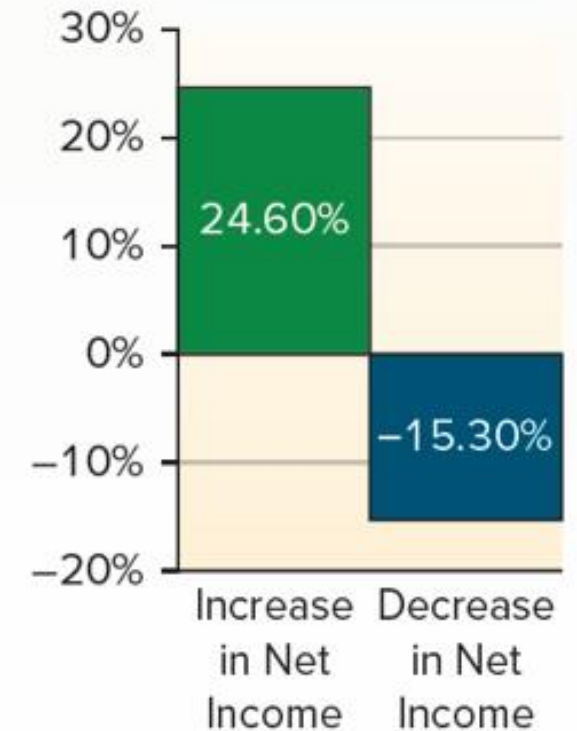
Real-World Visuals – Current Liabilities

What are some of the **current liabilities** reported by companies in the airline industry?
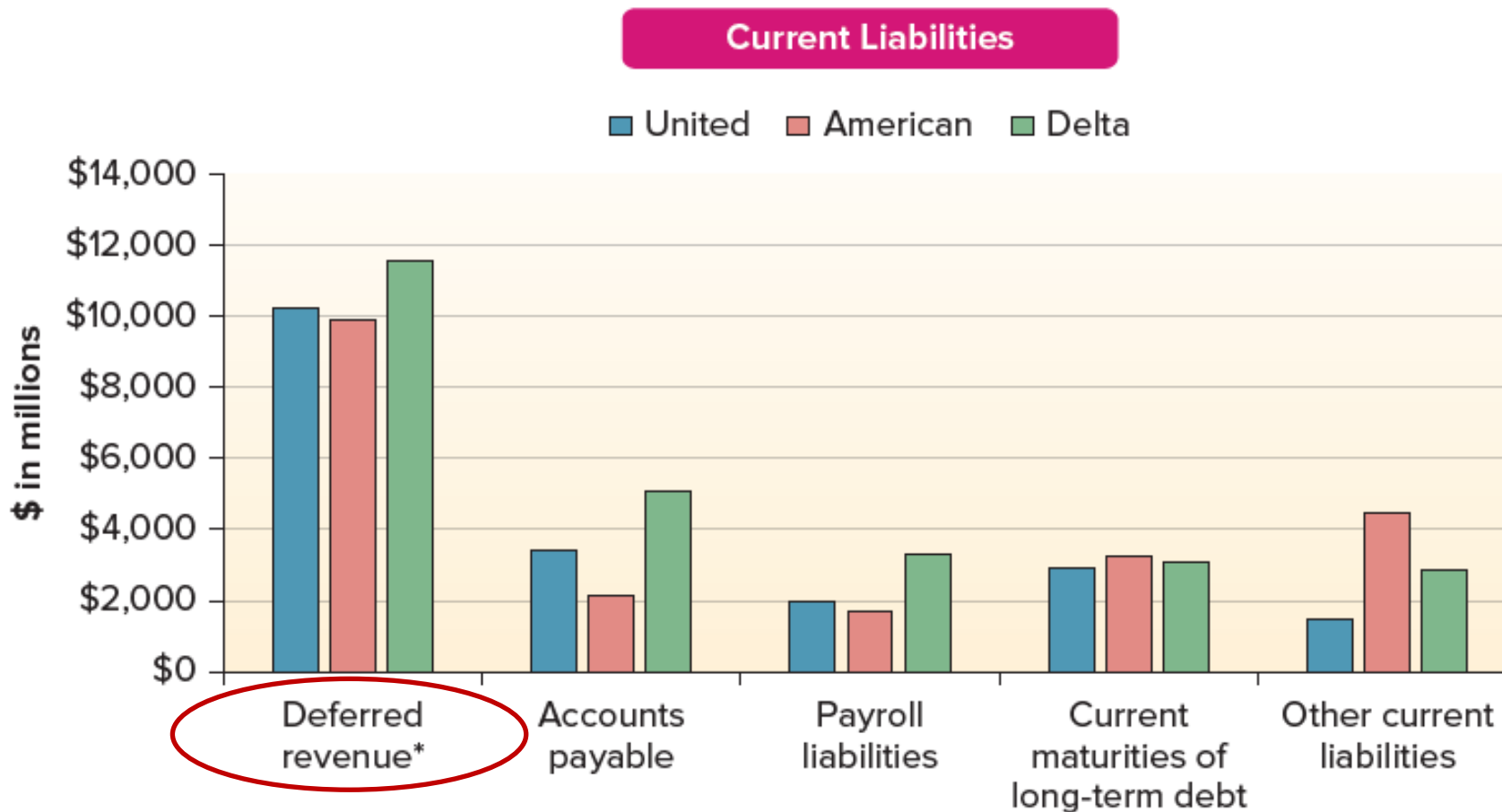
* **Deferred revenue** includes advanced ticket sales to customers and rewards earned through customer loyalty programs.

Real-World Visuals – Inventory

Best Buy
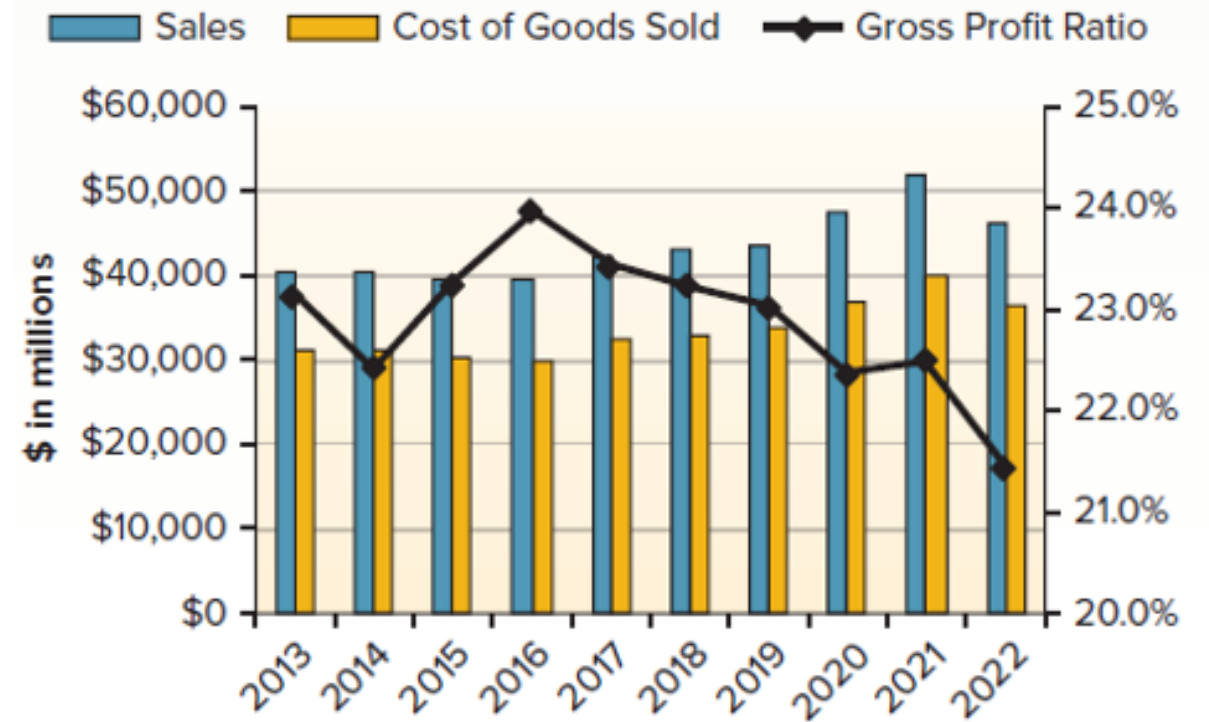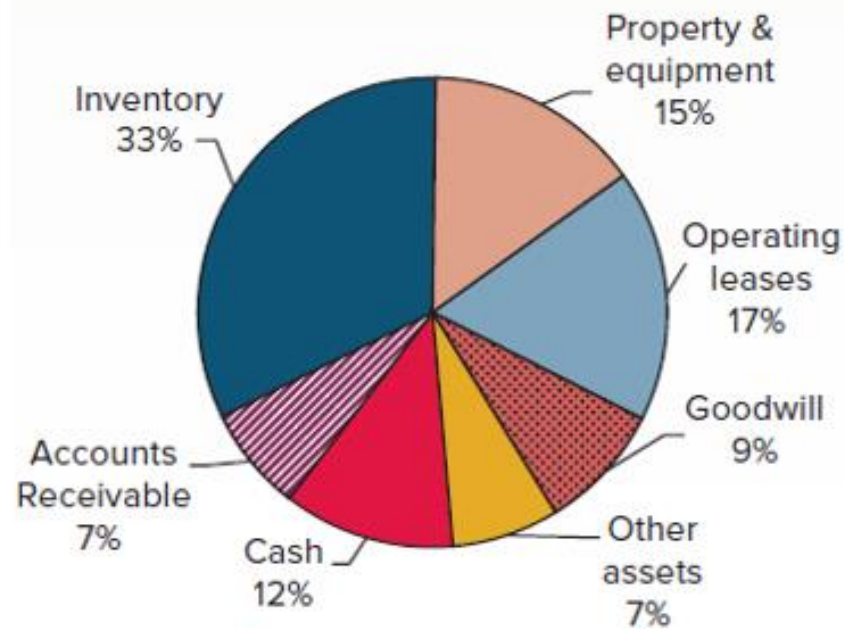
Dividends vs. Stock Repurchases (Treasury Stock)

Cash Dividends versus Stock Repurchases Each Year for the Largest 1,000 Listed Companies in the U.S. ($ in billions)
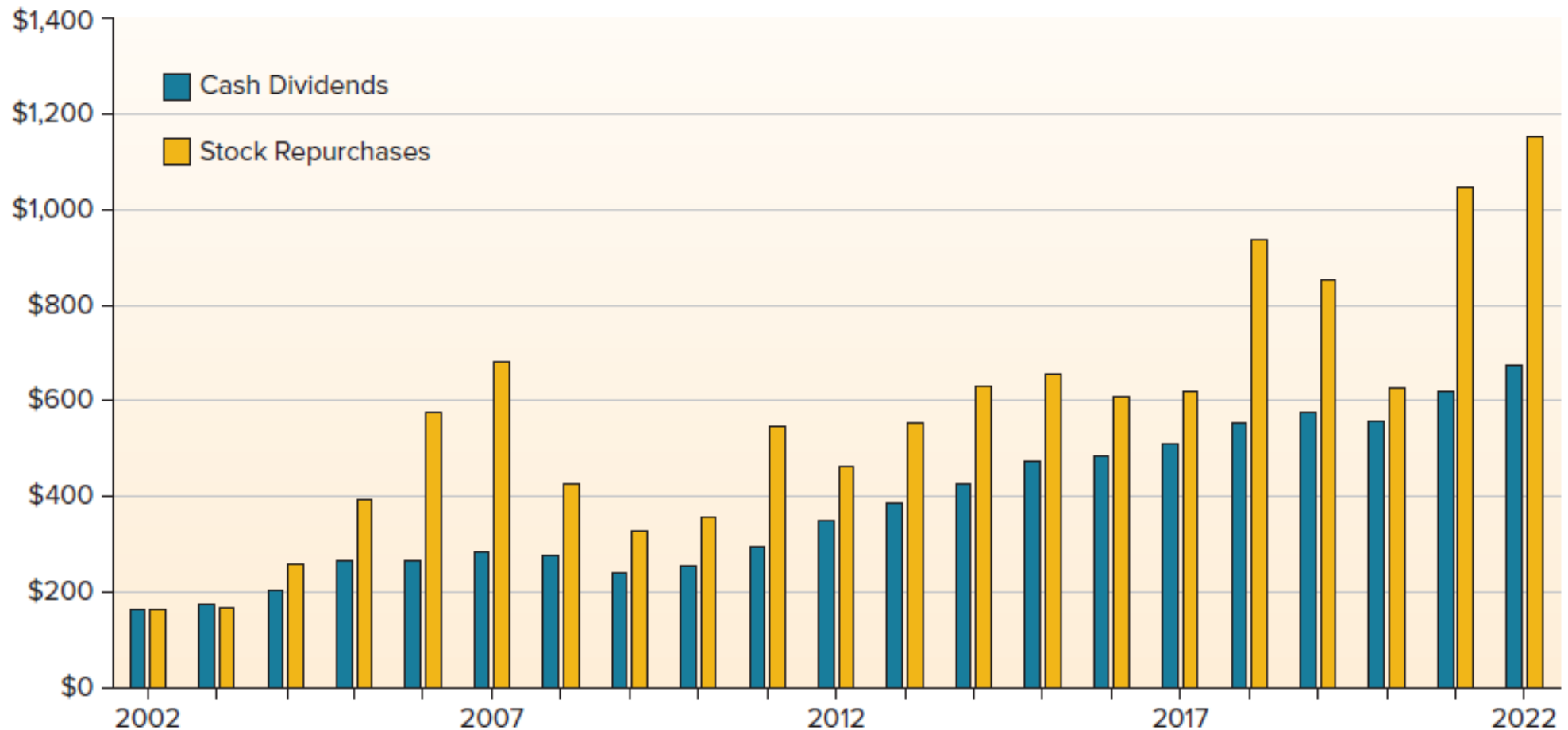
Legend:
- Cash Dividends
- Stock Repurchases

Journal Entries and Financial Statements
(Measurement and Communication)

Example. Assume a company pays $1,200 for equipment. The equipment is expected to have a service life of four years and no residual value.

Journal Entry

	Debit	Credit
Equipment	**1,200**	
Cash		**1,200**
(*Purchase equipment for cash*)		

Financial Statement Effects

Income Statement

R	−	E	=	NI

└─────── No effect ───────┘

Balance Sheet

A	=	L	+	SE

+1,200
Equipment

−1,200
Cash

Journal Entries and Financial Statements
(Measurement and Communication)

Example. Assume a company pays $1,200 for equipment. The equipment is expected to have a service life of four years and no residual value.

Journal Entry

	Debit	Credit
Depreciation Expense	**300**	
Accumulated Depreciation		**300**
(*Depreciate equipment*)		
(*$300 = $1,200 ÷ 4*)		

Reinforced using homework assignments that require both for a single transaction:
1. Journal entry
2. Financial statement effects

Financial Statement Effects

Income Statement

R	−	E	=	NI
		+300		−300
		Depr Exp.		

Balance Sheet

A	=	L	+	SE
−300				−300
Accum				
Depr ↑				

Ratio Analysis
(Decision Making)

($ in millions)

	Disney	Comcast
Net sales	$ 82,722	$121,427
Net income	3,145	5,370
Total assets, beginning	203,609	275,905
Total assets, ending	203,631	257,275

$$ROA = PM \times AT$$

($ in millions)	Net Income	÷	Net Sales	=	Profit Margin
Disney	$3,145	÷	$82,722	=	3.8%
Comcast	$5,370	÷	$121,427	=	4.4%

($ in millions)	Net Sales	÷	Average Total Assets	=	Asset Turnover
Disney	$ 82,722	÷	($203,609 + $203,631)/2	=	41 times
Comcast	$121,427	÷	($275,905 + $257,275)/2	=	46 times

Ratio Analysis
(Decision Making)

Decision Maker's Perspective: Profit margin and asset turnover for Amgen Inc. and Walgreens Boots Alliance Inc.

Question	• Which strategy is a company pursuing to maximize profits on assets employed?
Accounting Information	• Net income, net sales, and total assets.
Analysis	• A company's return on assets (ROA) = Profit margin (net income/net sales) × Asset turnover (net sales/average total assets).

Ratio Analysis
(Decision Making)

Profit Margin

Amgen   Walgreens

Asset Turnover

Amgen   Walgreens
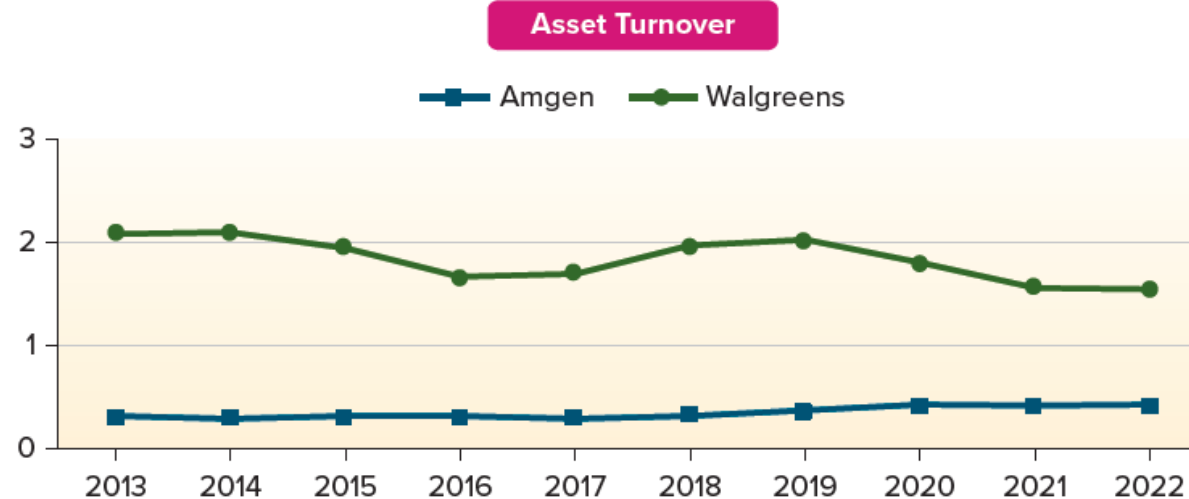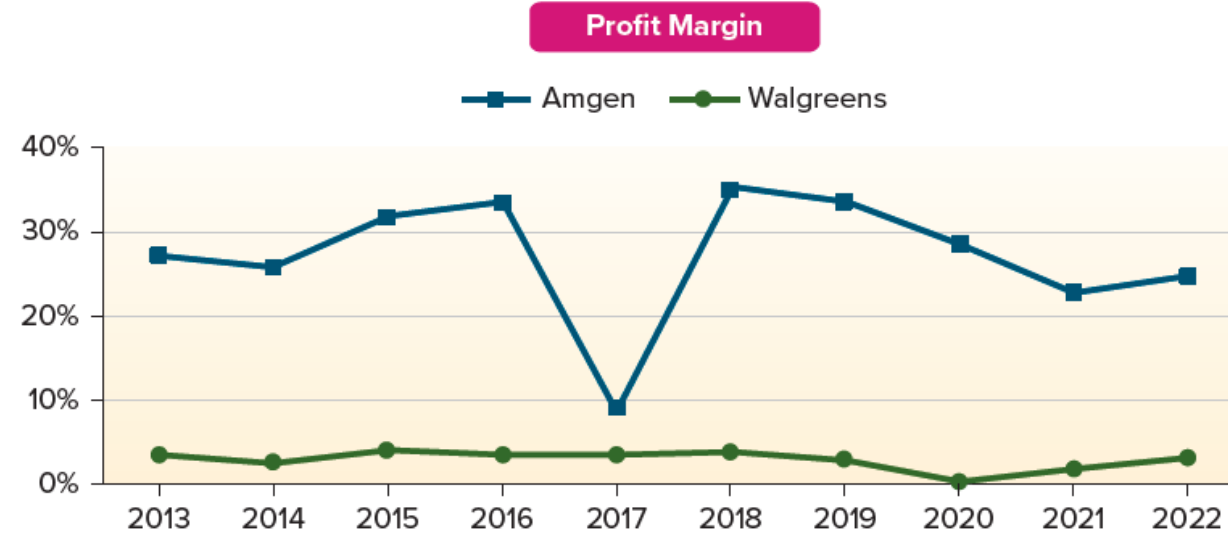
Ratio Analysis
(Decision Making)

Decision Maker's Perspective: Net property and equipment for McDonald's Corporation

Question	• What amount of property and equipment has been depreciated or "used up" over time?
Accounting Information	• The ratio of accumulated depreciation to total cost of property and equipment (excluding land).
Analysis	• The higher the ratio, the older the assets. Older assets often require additional maintenance, are less productive, and need replacement.

Ratio Analysis
(Decision Making)

$$\frac{\text{Accumulated depreciation}}{\text{Cost of property and equipment}} = \textbf{\color{red}50.3\%} \qquad (= \$17{,}264.0 \;/\; \$34{,}351.3)$$

McDonald's Corporation

Property and Equipment	($ in millions)
Buildings and improvements on owned land	$ 18,934.2
Buildings and improvements on leased land	12,492.0
Equipment, signs, and seating	2,498.6
Other	426.5
Total property and equipment, at cost	**34,351.3**
Less accumulated depreciation and amortization	**(17,264.0)**
Land	6,686.3
Net property and equipment	$ 23,773.6

Real-World Visuals – Retained Earnings

Question	• How much profit has the company made for its stockholders that has not been distributed back to them in dividends?
Accounting Information	• Balance of Retained Earnings.
Analysis	• The balance of Retained Earnings shows all net income less dividends since the company began operations.

ExxonMobil
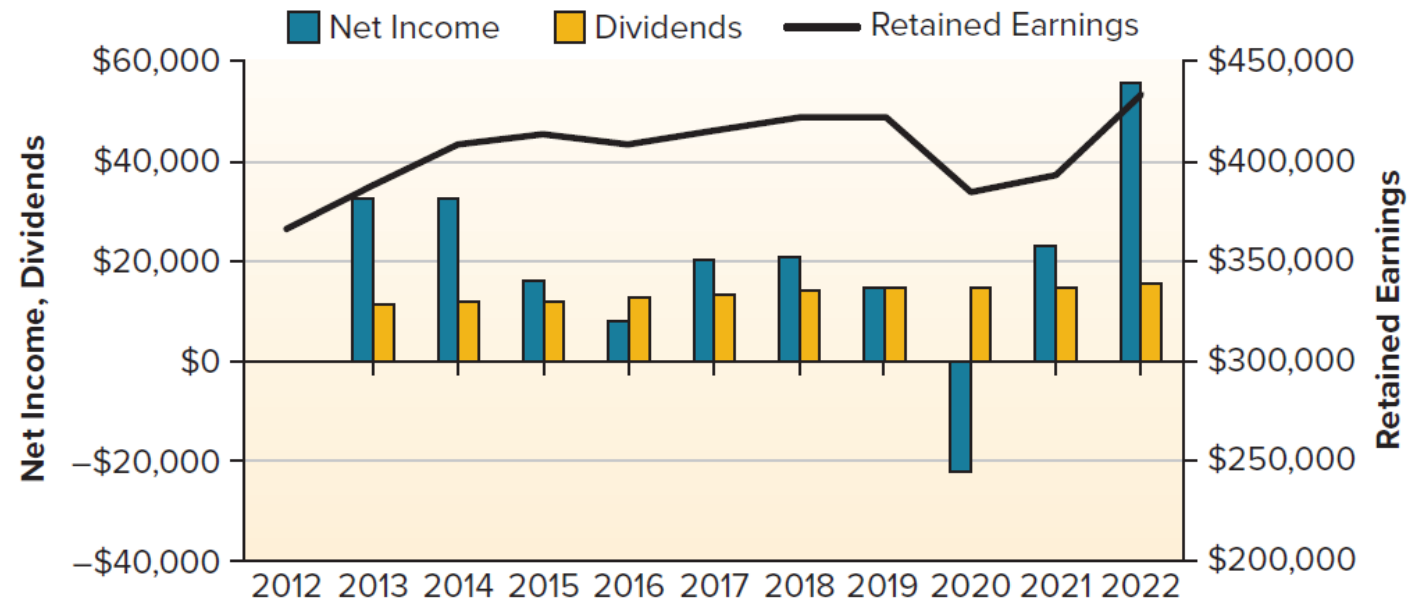
Real-World Visuals – Operating vs. Nonoperating Income

Question	• Which components of income do investors typically use to assess a company's current success and long-term profit potential?
Accounting Information	• Components of income in a multiple-step income statement.
Analysis	• Operating income measures the success of a company's core business that is most likely to continue. Nonoperating items are less likely to persist.

Amazon
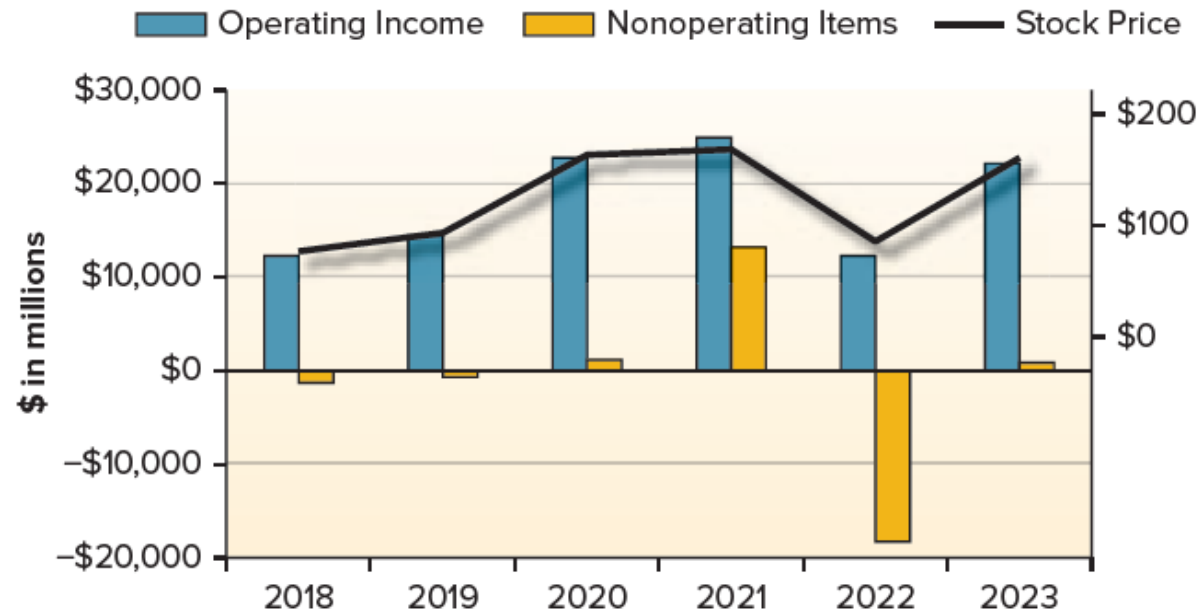
Real-World Visuals – Debt vs. Equity Financing

Question	• How do you determine a company's capital structure?
Accounting Information	• Balance sheet.
Analysis	• A debt-oriented capital structure has a higher proportion of liabilities, while an equity-oriented capital structure has a higher proportion of stockholders' equity.
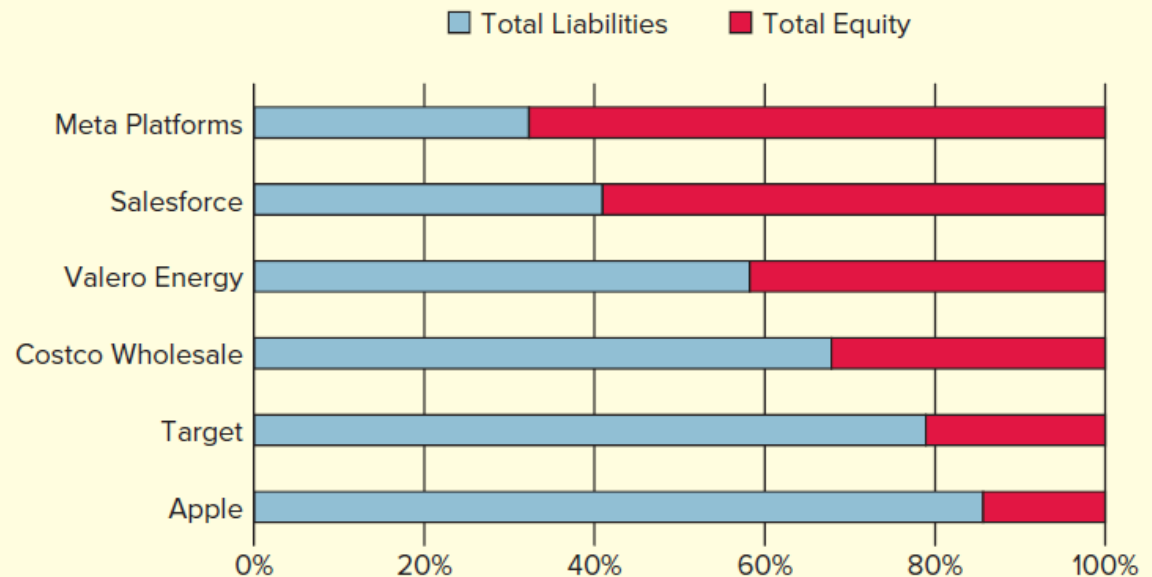
Assignments: Data Visualizations

Delivery Service Express (DSE) specializes in the delivery of refrigerated foods. The warehouse manager **purchased a delivery truck for $240,000.** Part of the job of the Chief Financial Officer (CFO) is to depreciate the delivery truck over its estimated useful life. The CFO is **considering three depreciation methods**: activity-based, straight-line, and double-declining-balance. The truck has an **estimated five-year useful life**.
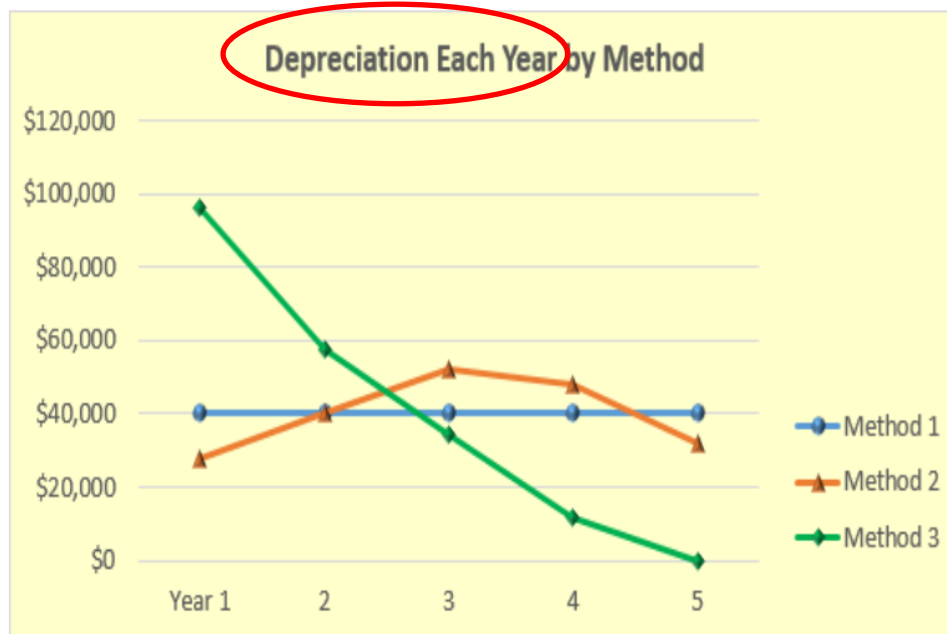
Different amounts each year
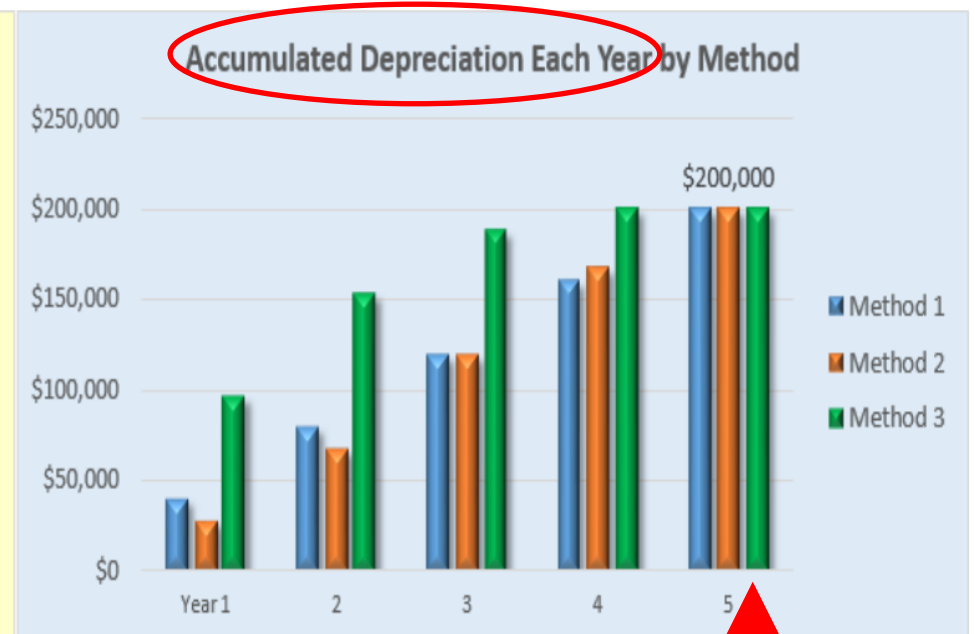
But equal over all years

Assignments: Data Visualizations

1. Which method is depicted by each option? **SL, DDB, Activity**

2A. Which depreciation method results in the most depreciation in the first year of the truck's five-year useful life? **Double-declining-balance**

2B. Which depreciation method results in the same amount of depreciation each year? **Straight-line**

3. Which depreciation method results in the most accumulated depreciation by the end of the truck's five-year useful life? **Same**

4. What is the truck's estimated residual value (Hint: Recall the purchase cost of the truck is $240,000)? **$40,000**

5A. By the end of Year 2, Accumulated Depreciation under Method 1 is $80,000. What would be the reported book value of the truck at that time? **$160,000**

5B. If the CFO instead uses Method 3, Accumulated Depreciation by the end of Year 2 would be $153,600. What would be the reported book value of the truck at the end of Year 2 using Method 3? **$86,400**
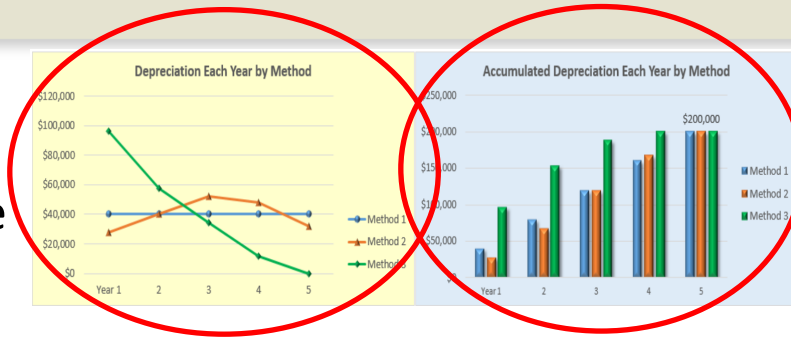
Data Visualizations – Retained Earnings
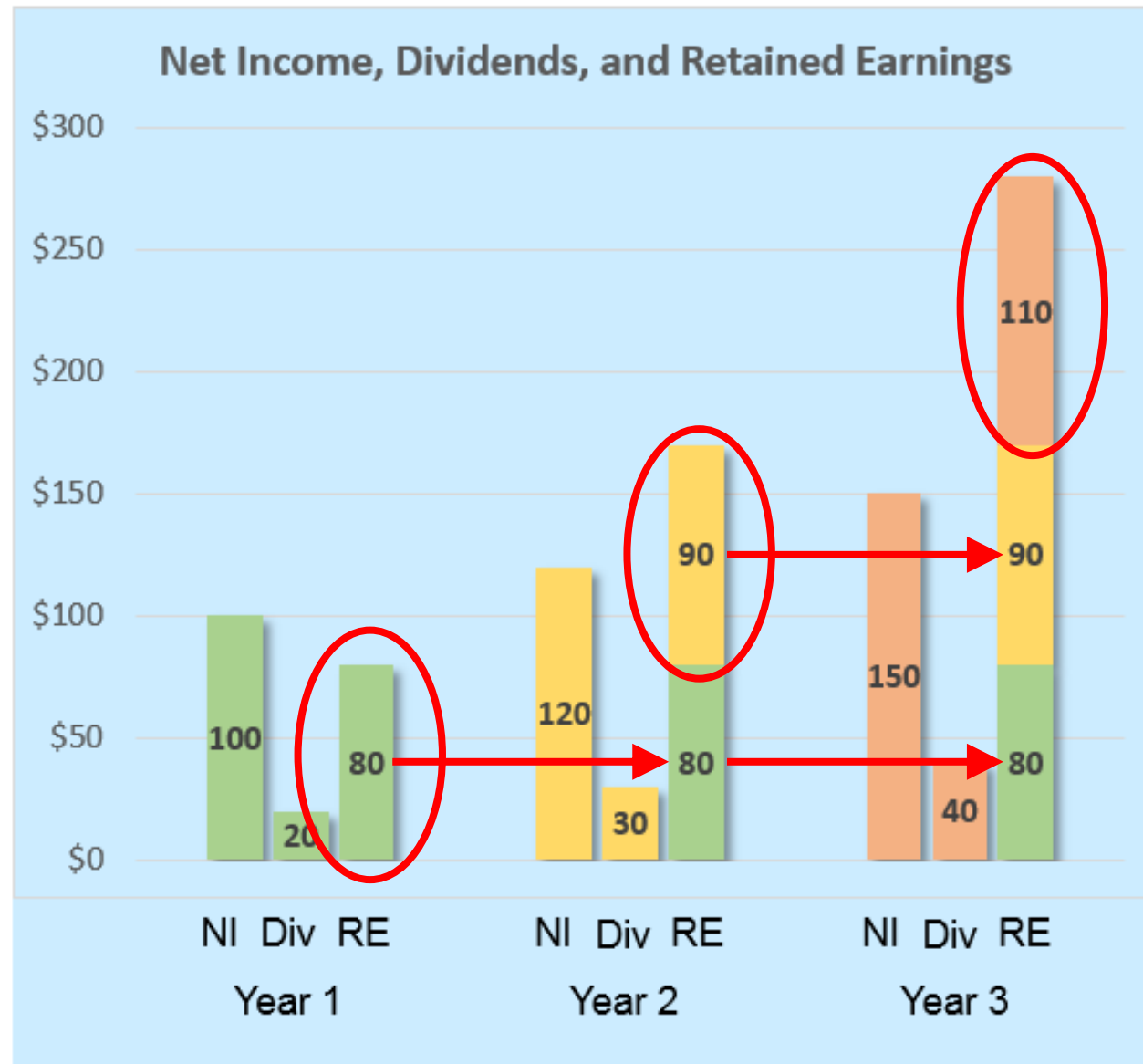
Data Visualizations – Retained Earnings

1. What is the amount of Retained Earnings at the end of Year 1? **$80**

2a. At the end of Year 2, the company reports Net Income of $120. This amount includes:

   Revenues minus expenses in Year 2 only

2b. What amount of Dividends did the company declare in Year 2? **$30**

2c. What is the ending balance of Retained Earnings in Year 2? **$170**

2d. The ending balance of Retained Earnings in Year 2 includes:

   Net Income minus dividends from Year 1 and Year 2

3a. What amount of Net Income did the company report in Year 3? **$150**

3b. What amount of Dividends did the company declare in Year 3? **$40**

3c. What is the ending balance of Retained Earnings in Year 3? **$280**

3d. The ending balance of Retained Earnings in Year 3 includes:

   Net Income minus dividends from Year 1, Year 2, and Year 3

Net Income, Dividends, and Retained Earnings
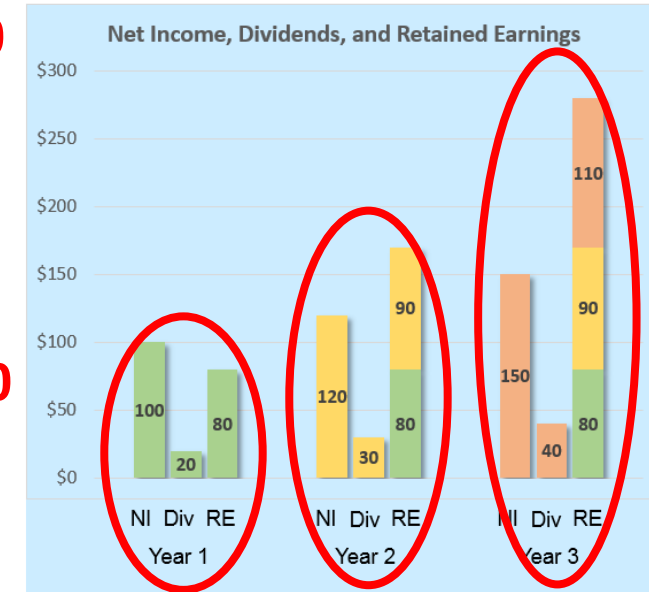
Assignments: Dashboards

1. What is the net amount of property, plant, and equipment reported in the balance sheet?

2. What is the net amount reported separately for buildings, equipment, and land?

3. Suppose the company decides to sell Building #203 for $425,000. What is the gain or loss on the sale reported in the income statement?

4. What is the gain or loss on the sale if the company sells Equipment #303 for $30,000?

5. Which piece of equipment is most likely to need replaced because it's nearest the end of its service life?
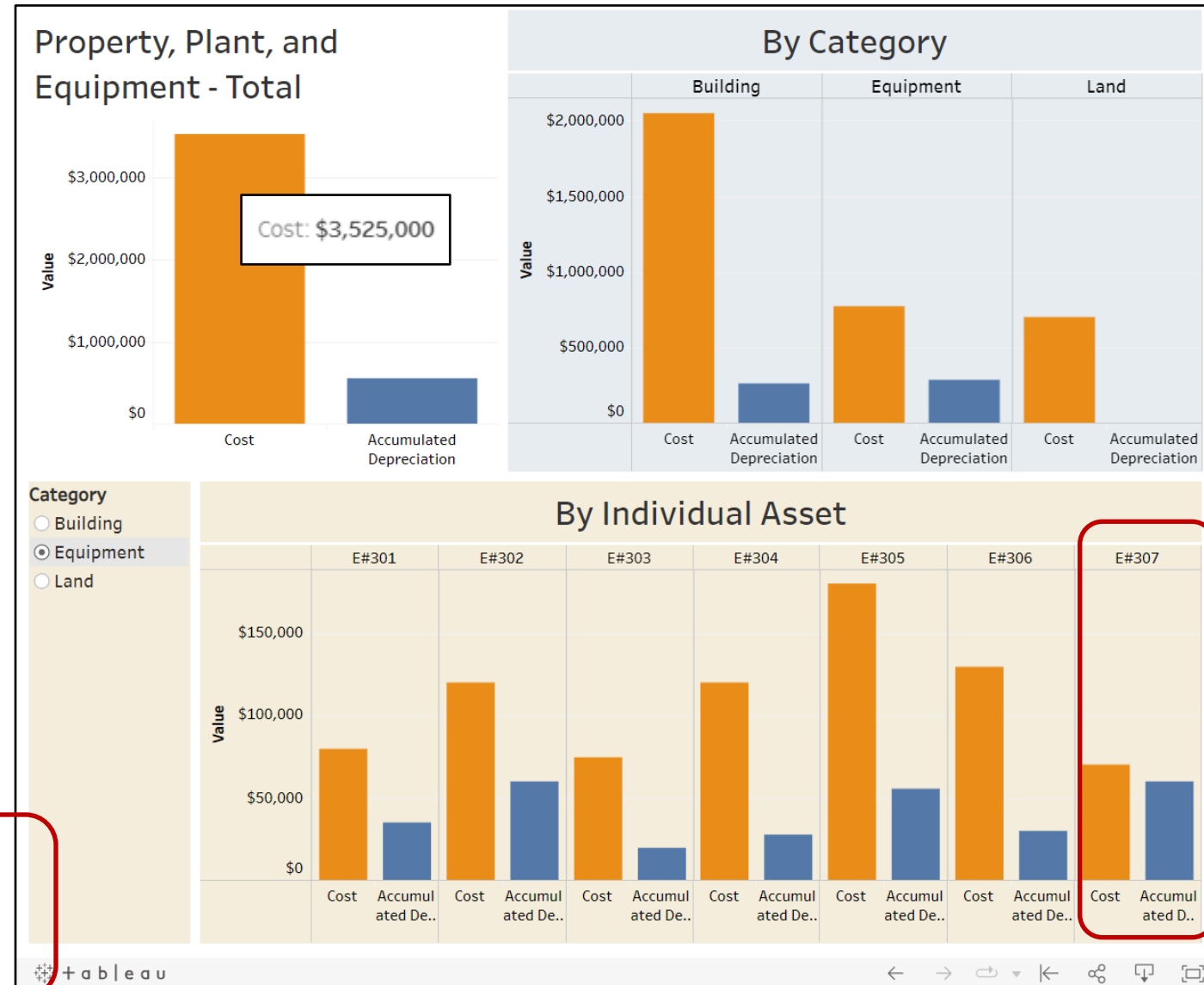
Assignments: EDGAR Cases

SEC's Electronic Data Gathering, Analysis, and Retrieval (EGAR) system

- Visit SEC website (www.sec.gov)

- Search for 10-K (annual report)

- Dropdown menu driven and searchable

- Includes Excel download

  ➢ Financial statements

  ➢ Financial statements and disclosure

  ➢ Comparative analysis (compare two companies)

EDGAR Case: Financial Statements and Disclosure

Visit **www.sec.gov** and use EDGAR to search for the **Meta** (ticker: META) annual report (10-K) for the year ended December 31, 2023. Locate the "Consolidated Statements of Income" (income statement) and "Consolidated Balance Sheet."

EDGAR Case: Financial Statements and Disclosure

Visit **www.sec.gov** and use EDGAR to search for the **Meta** (ticker: META) annual report (10-K) for the year ended December 31, 2023. Locate the "Consolidated Statements of Income" (income statement) and "Consolidated Balance Sheet."

1. What is the <u>net</u> balance in **property and equipment** in the most recent year shown?

2. What are the amounts reported for (a) **goodwill** and (b) **intangible assets net** in the most recent year shown?

3. What are the balances of (a) <u>gross</u> **property and equipment** and (b) **accumulated depreciation**? (Hint: Locate Note 7 on Property and Equipment.)

4. Which **depreciation method** is used? (Hint: Locate Note 1 on the Summary of Significant Accounting Policies and find the section on Property and Equipment.)

5. Calculate the **profit margin ratio** in the most recent year shown and the previous year. Is the company's profitability increasing or decreasing?

EDGAR Case: Financial Statements Only

Visit **www.sec.gov** and use EDGAR to search for the **McDonald's** (ticker: MCD) annual report (10-K) for the year ended **December 31, 2023**. Locate the "Consolidated Statement of Income" (income statement) and "Consolidated Balance Sheets."

1. Do the company's **revenues** exceed **expenses** in the most recent year shown? What is the amount of **net income**?

2. Did net income increase in the most recent year compared to the previous year?

3. What amounts are reported for **current assets** and **total assets** in the most recent year shown?

4. What amount is reported for **current liabilities** in the most recent year shown? Does the company have any **long-term liabilities**?

5. By how much did **retained earnings increase/decrease** in the most recent year compared to the previous year?

6. What is the amount of **dividends** paid to common stockholders in the most recent year shown? This information can be found in the statement of shareholders' equity or the statement of cash flows.

7. Does the **change in retained earnings** equal net income minus dividends?

EDGAR Case: Comparative Analysis

Visit **www.sec.gov** and use EDGAR to search for the **Coca-Cola** (ticker: KO) and **Pepsico** (ticker: PEP) annual reports (10-K) for the year ended December 31, 2023, and December 30, 2023, respectively. Locate the "Consolidated Statements of Income" (income statement) and "Consolidated Balance Sheets."

1. For each company, calculate the **gross profit ratio**, **inventory turnover ratio**, and **average days in inventory** in the most recent year shown.

2. Compare the management of each company's investment in inventory. Which company is **more profitable** and which company **sells its inventory more quickly** based on the ratios calculated in requirement 1?

Chapter Framework

- Every chapter

- One-page illustration

- Summarize for major topics:

    Measurement (during vs. end)

    Communication (I/S & B/S)

    Decision Making (Ratios & interp.)

Also:

- Video walk-through (2-4 min.)

- 10 MC Questions

Chapter Framework

Purposeful order:

Measurement (during the year)

↓

Measurement (end of the year)

↓

Communication (income statement)

↓

Communication (balance sheet)

↓

Decision Making (ratio analysis)

Chapter Framework Questions

1. **Measurement (during the year):** During the year, a company purchases equipment that is expected to be used for several years. The company records
   a. Debit Equipment; credit Cash.
   b. Debit Equipment Expense; credit Cash.
   c. Debit Cash; credit Equipment.
   d. Debit Cash; credit Equipment Expense.

2. **Measurement (end of the year):** At the end of the year, the adjusting entry to depreciate equipment involves
   a. Debit Accumulated Depreciation; credit Equipment.
   b. Debit Depreciation Expense; credit Accumulated Depreciation.
   c. Debit Depreciation Expense; credit Equipment.
   d. Debit Accumulated Depreciation; credit Depreciation Expense.

3. **Communication (income statement):** Depreciation of equipment each year has what effect on the income statement?
   a. Decrease expenses for the amount of depreciation for the current year only.
   b. Decrease expenses for the amount of depreciation since the asset was purchased.
   c. Increase expenses for the amount of depreciation for the current year only.
   d. Increase expenses for the amount of depreciation since the asset was purchased.

4. **Communication (balance sheet):** Which of the following is true about Accumulated Depreciation reported in the balance sheet related to equipment?
   a. An asset account that maintains a record of the equipment's original cost.
   b. A contra (or negative) asset account that represents depreciation of the equipment for the current year only.
   c. A liability account that represents total depreciation since the equipment was purchased.
   d. A contra (or negative) asset account that represents total depreciation since the equipment was purchased.

5. **Decision Making (ratio analysis):** A company that is less effective at using its assets to generate sales would have a _____ asset turnover ratio.
   a. Higher.
   b. Lower.

Integrated Excel

Sullivan Ranch Corporation has purchased a new tractor and has provided you with the information related to the purchase. The Controller has asked you to calculate the depreciation for the new piece of equipment using three different methods: Straight-Line depreciation, Units-of-Production depreciation, and Double-Declining-Balance depreciation.

Here are some tips for using Excel:

- **Cell Reference:** Allows you to refer to data from another cell in the worksheet. If you entered "=B5" into a blank cell, the formula would output the value from cell B5.
- **Basic Math Functions:** Allow you to use the basic math symbols to perform mathematical functions. You can use the following keys: + (plus sign to add), - (minus sign to subtract), * (asterisk sign to multiply), and / (forward slash to divide). For example, if you entered "=B4+B5" in a blank cell, the formula would add the values from those cells and output the result.
- **SUM Function:** Allows you to refer to multiple cells and adds all the values. You can add individual cell references or ranges. If you entered "=SUM(C4,C5,C6)" into a blank cell, the formula would output the result of adding those three separate cells. Similarly, if you entered "=SUM(C4:C6)", the formula would output the same result of adding those cells.
- **SLN Function:** Allows you to calculate the depreciation of an asset using the straight-line depreciation method. The syntax of the SLN function is "=SLN(cost,salvage,life)" and it outputs the depreciation for one period. The cost argument is the initial cost of the asset. The salvage argument is the salvage value at the end of the life of the asset. The life argument is the number of periods over which the asset is being depreciated, also called the useful life.
- **DDB Function:** Allows you to calculate the depreciation of an asset using the double-declining balance method. The syntax of the DDB function is "=DDB(cost,salvage,life,period,[factor])" and it outputs the depreciation for one period. The function must include the first four arguments, and it supports a fifth optional argument. The cost argument is the initial cost of the asset. The salvage argument is the salvage value at the end of the life of the asset. The life argument is the number of periods over which the asset is being depreciated, also called the useful life. The period argument is the period for which you want to calculate the depreciation and must use the same units as the life argument. The [factor] argument is the rate at which the balance declines; when omitted, the rate is assumed to be 2 (the double-declining balance method).

1. Use the **Open Excel in New Tab** button to launch this question.
2. When finished in Excel, use the **Save and Return to Assignment** button in the lower right to return to Connect.

OPEN EXCEL IN NEW TAB

Excel — McGraw Hill Excel Question - Saved

On January 1, Year 1, a company purchased equipment. The details of the equipment purchase are below.

Original Cost	$112,000
Estimated Residual Value	$28,000
Estimated Useful Life	6
Estimated Units	20,000

Actual Units:

Year 1	2,200
Year 2	4,200
Year 3	4,800
Year 4	4,400
Year 5	3,600
Year 6	2,800
	22,000

Required:

1. Based on the information above, calculate Depreciation Expense, Accumulated Depreciation and the Book Value of the equipment, as well as the journal entry for depreciation in Year 3:
(a) Using the Straight-line method
(b) Using the Double-Declining-Balance method
(c) Using the Activity-Based method

Requirement 1(a): Straight-Line Method
(Use cells A2 to B15 from the given information above to complete this question.)

Year	Depreciation Expense	Accumulated Depreciation	Book Value
1			
2			
3			
4			
5			
6			

My Assignments – Old vs. New
Example: Chapter 7

Chapter 7 – Long-Term Assets	Old	New
Exercises (all topics)	✔	✔ (but fewer)
F/S Effects (BEs: Depreciation & Sale)		✔
Data Visuals (Acquisition, Depreciation)		✔
Dashboard (Depreciation)		✔
EDGAR Case (Meta)		✔
Earnings Management Case (Depreciation)		✔
General Ledger Software (Accounting cycle)		✔
Chapter Framework video/questions		✔
Assignments in other chapters: **Ethics Cases, Financial Analysis Cases, Integrated Excel**		✔

All Auto-graded

Financial/Intermediate Accounting Series

"If you motivate me, without supporting me, you frustrate me."

All include:
- Real-world emphasis
- Data analytics assignments
- Integrated Excel
- Real-world (EDGAR) cases
- ESG/Sustainability cases
- Ethics/earnings mgmt cases
- General ledger software
- Multiple video banks
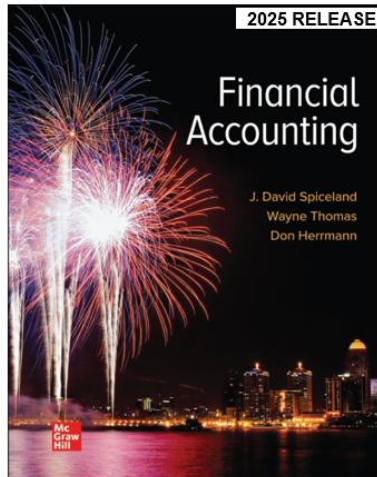
- Emphasis on organized learning framework
- Fundamentals
- Analysis/decision making
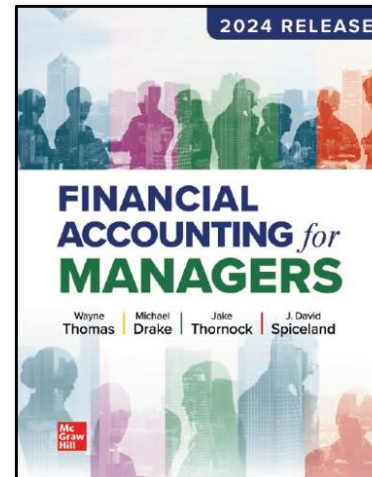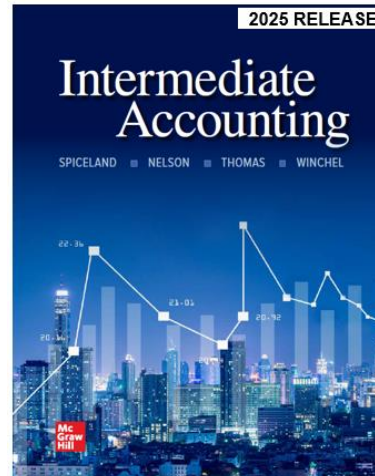
- Emphasis on financial statement effects
- Flexible dr/cr approach
- Modular chapter structure

Thank you!

Please feel free to contact me for more questions or discussion

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