Chapter 9
Long-Term Liabilities

REVIEW QUESTIONS

Question 9-1 (LO 9-1)

Capital structure is the mixture of liabilities and stockholders' equity a business uses. Companies in the auto industry, like Ford, typically lean more toward liabilities for their financing, while companies in the computer industry, like Microsoft, use stockholders' equity to a greater extent in financing their asset growth.

Question 9-2 (LO 9-1)

One of the primary reasons a company chooses to borrow money rather than issue additional stock relates to taxes. Interest expense incurred when borrowing money is tax deductible, while dividends paid to stockholders is *not* tax deductible. Therefore, debt can be a less costly form of financing.

A second reason relates to control. If a company issues additional shares to investors, control in the company is shared with the new shareholders. If a company borrows funds, voting control in the company is retained.

Question 9-3 (LO 9-2)

Both interest expense and the carrying value of the note decrease over time. Interest expense decreases with each installment payment. In each of the following periods, the amount that goes to interest expense becomes less and the amount that goes to decreasing the carrying value becomes more. Interest expense decreases over time because the carrying value decreases over time, and interest is a constant percentage of carrying value.

Question 9-4 (LO 9-3)

A lease is a contractual arrangement by which the *lessor* (owner) provides the *lessee* (user) the right to use an asset for a specified period of time. In the balance sheet, a lease asset is reported for the right to use an asset, and a lease liability is reported for the obligation to make lease payments. The amount to report at the beginning of the lease is the present value of the lease payments.

Question 9-5 (LO 9-4)

Bond issue costs include underwriting services, legal, accounting, registration, and printing fees incurred to complete the bond issue. An underwriter is the investment house through which the bonds are sold like JPMorgan Chase, Citigroup, and Bank of America.

Answers to Review Questions (continued)

Question 9-6 (LO 9-4)

A company that borrows by issuing bonds is effectively by-passing the bank and borrowing directly from the investing public, usually at a lower interest rate than from a bank loan. However, issuing bonds entails significant bond issue costs that often exceed 5% of the amount borrowed. For smaller loans, the additional bond issue costs exceed the savings from a lower interest rate, making it more economical to borrow from a bank. For loans of $20 million or more, the interest rate savings often exceed the additional bond issuance costs, making a bond issue more attractive.

Question 9-7 (LO 9-4)

(a) Secured bonds are supported by assets pledged as collateral. Unsecured bonds, also referred to as debentures, are not backed by a specific asset. (b) Term bonds require payment of the full principal amount of the bond at a single maturity date. Serial bonds require payments in installments over a series of years. (c) Callable bonds allow the issuer to repay the bonds before their scheduled maturity date at a specified call price. Convertible bonds allow the investor to convert each bond into a specified number of shares of common stock.

Question 9-8 (LO 9-4)

Convertible bonds allow the investor to convert each bond into a specified number of shares of common stock. The investor benefits from the conversion feature if share prices rise above the fixed conversion rate. For instance, assume a $1,000 bond is convertible into 40 shares of common stock, when the stock is trading at $23 per share. If the stock rises above $25 ($1,000/40), the shareholder will benefit by converting the bond into 40 common shares of stock. The borrower also benefits. Convertible bonds sell at a higher price and require a lower interest rate than bonds without a conversion feature.

Question 9-9 (LO 9-5)

(a) The face amount is the amount that will be repaid at maturity. The carrying value is the balance in the Bonds Payable account minus any discount or plus any premium. For example a $100,000 bond that issues for $93,205 has a face value of $100,000 and a carrying value of $93,205 on the date of issue calculated as Bonds Payable of $100,000 less Discount on Bonds Payable of $6,795. The carrying value will increase from $93,205 to $100,000 over the life of the bond issue. (b) The stated interest rate is the rate used to determine the periodic interest payments paid by the borrower. The market interest rate represents the true interest rate used by investors to value the bond issue.

Answers to Review Questions (continued)

Question 9-10 (LO 9-5)

The bonds issue at a discount when the stated interest rate is less than the market interest rate. The bonds are paying less than the going rate and, therefore, issue at a discount.

Question 9-11 (LO 9-5)

The bonds issue at a premium when the stated interest rate is more than the market interest rate. The bonds are paying more than the going rate and, therefore, issue at a premium.

Question 9-12 (LO 9-5)

If bonds issue at a discount, the carrying value of the bonds and interest expense will increase over time. Recall that interest expense is calculated as the carrying value of the bond times the market interest rate. As carrying value increases, interest expense also increases.

Question 9-13 (LO 9-5)

If bonds issue at a premium, the carrying value of the bonds and interest expense will decrease over time. Recall that interest expense is calculated as the carrying value of the bond times the market interest rate. As carrying value decreases, interest expense also decreases.

Question 9-14 (LO 9-5)

Cash paid is calculated as the face amount of the bonds times the stated interest rate. Interest expense is the carrying value times the market rate. The difference between interest expense and the cash paid increases the carrying value of the bonds. At the maturity date, the carrying value will equal the face amount.

The amortization schedule is similar when bonds are issued at a premium, except that the difference between interest expense and the cash paid *decreases*, rather than increases, the carrying value of the bonds over time.

Question 9-15 (LO 9-6)

If interest rates decrease, a company may choose to buy back high interest rate bonds and reissue bonds at a lower interest rate. A company can help protect itself from decreases in interest rates by including a call feature allowing the company to repurchase bonds at a fixed price (like 2% over face amount). When interest rates decrease, companies with a call provision are more likely to repurchase higher-cost debt and then reissue debt at new lower interest rates.

Another incentive to repay debt early is to improve the company's debt and profitability ratios. Repurchasing debt can improve debt ratios. It can also improve profitability. If interest rates increase, bond prices go down and a company repurchasing the lower priced debt can report a gain on the income statement.

Answers to Review Questions (continued)

Question 9-16 (LO 9-6)

A loss of $50,000 is recorded by the issuer retiring the bonds as follows:

Bonds Payable	**250,000**	
Premium on Bonds Payable	**30,000**	
Loss	**50,000**	
Cash		**330,000**
(Retire bonds before maturity)		

Question 9-17 (LO 9-7)

We calculate the issue price of a bond as the present value of the principal (the face amount on the bond due at maturity) *plus* the present value of the periodic interest payments. It is not solely the present value of the principal; rather it is the present value of the principal plus the present value of the interest payments.

Question 9-18 (LO 9-7)

The cash payment every six months is $15,000 ($500,000 × .06 × 6/12). There will be 40 interest payments over the 20 years – one every six months.

Question 9-19 (LO 9-7)

(a) $562,757
(b) $500,000
(c) $446,612

(Note: These answers are based on a calculator/Excel. Answers using the present value tables may differ just a little due to rounding.)

Question 9-20 (LO 9-8)

Additional debt increases risk. Failure to repay debt or the interest associated with the debt on a timely basis may result in default and perhaps even bankruptcy. Other things being equal, the higher the debt, the higher the risk of bankruptcy. Additional debt also offers potential rewards. If a company earns a return in excess of the cost of borrowing the funds, shareholders are provided with a total return greater than what could have been earned with equity funds alone. Unfortunately, borrowing is not always favorable. Sometimes the cost of borrowing the funds exceeds the returns they generate.

BRIEF EXERCISES

Brief Exercise 9-1 (LO 9-2)

January 1, 2021		
Equipment	**30,000**	
Notes Payable		**30,000**
(Issue a note payable)		
January 31, 2021		
Interest Expense ($30,000 × 5% × 1/12)	**125.00**	
Notes Payable (difference)	**441.14**	
Cash (monthly payment)		**566.14**
(Pay monthly installment on note)		

Brief Exercise 9-2 (LO 9-2)

January 1, 2021		
Building	**600,000**	
Notes Payable		**600,000**
(Issue a note payable)		
January 31, 2021		
Interest Expense ($600,000 × 6% × 1/12)	**3,000.00**	
Notes Payable (difference)	**597.30**	
Cash (monthly payment)		**3,597.30**
(Pay monthly installment on note)		

Brief Exercise 9-3 (LO 9-3)

January 1, 2021		
Lease Asset	**100,000**	
Lease Payable		**100,000**
(Sign a lease)		

Brief Exercise 9-4 (LO 9-3)

	Assets	Liabilities	Stockholders' Equity
Balance before:	**$600,000**	**$400,000**	**$200,000**
Effect of lease:	**+ 40,000**	**+ 40,000**	
Balance after:	**$640,000**	**$440,000**	**$200,000**

Exercise 9-5 (LO 9-4)

Terms

__e___ 1. Sinking fund.
__g___ 2. Secured bond.
__c___ 3. Unsecured bond.
__f___ 4. Term bond.
__b___ 5. Serial bond.
__a___ 6. Callable bond.
__d___ 7. Convertible bond.
__h___ 8. Bond issue costs.

Definitions

a. Allows the issuer to pay off the bonds early at a fixed price.
b. Matures in installments.
c. Secured only by the "full faith and credit" of the issuing corporation.
d. Allows the investor to transfer each bond into shares of common stock.
e. Money set aside to pay debts as they come due.
f. Matures on a single date.
g. Supported by specific assets pledged as collateral by the issuer.
h. Includes underwriting, legal, accounting, registration, and printing fees.

Brief Exercise 9-6 (LO 9-5)

1.

January 1, 2021		
Cash	**70,000**	
Bonds Payable		**70,000**
(Issue bonds at face amount)		

2.

June 30, 2021		
Interest Expense	**2,450**	
Cash ($70,000 × 7% × ½)		**2,450**
(Pay semiannual interest)		

Brief Exercise 9-7 (LO 9-5)

1.

January 1, 2021		
Cash	**63,948**	
Discount on Bonds Payable	**6,052**	
Bonds Payable		**70,000**
(Issue bonds at a discount)		

2.

June 30, 2021		
Interest Expense ($63,948 × 8% × ½)	**2,558**	
Discount on Bonds Payable (difference)		**108**
Cash ($70,000 × 7% × ½)		**2,450**
(Pay semiannual interest)		

Brief Exercise 9-8 (LO 9-5)

1.

January 1, 2021		
Cash	**76,860**	
Bonds Payable		**70,000**
Premium on Bonds Payable		**6,860**
(Issue bonds at a premium)		

2.

June 30, 2021		
Interest Expense ($76,860 × 6% × ½)	**2,306**	
Premium on Bonds Payable (difference)	**144**	
Cash ($70,000 × 7% × ½)		**2,450**
(Pay semiannual interest)		

Brief Exercise 9-9 (LO 9-5)

1.

January 1, 2021		
Cash	**70,000**	
Bonds Payable		**70,000**
(Issue bonds at face amount)		

2.

December 31, 2021		
Interest Expense	**4,900**	
Cash ($70,000 × 7%)		**4,900**
(Pay annual interest)		

Brief Exercise 9-10 (LO 9-5)

1.

January 1, 2021		
Cash	**64,008**	
Discount on Bonds Payable	**5,992**	
Bonds Payable		**70,000**
(Issue bonds at a discount)		

2.

December 31, 2021		
Interest Expense ($64,008 × 8%)	**5,121**	
Discount on Bonds Payable (difference)		**221**
Cash ($70,000 x7%)		**4,900**
(Pay annual interest)		

Brief Exercise 9-11 (LO 9-5)

1.

January 1, 2021		
Cash	**76,799**	
Bonds Payable		**70,000**
Premium on Bonds Payable		**6,799**
(Issue bonds at a premium)		

2.

December 31, 2021		
Interest Expense ($76,799 × 6%)	**4,608**	
Premium on Bonds Payable (difference)	**292**	
Cash ($70,000 × 7%)		**4,900**
(Pay annual interest)		

Brief Exercise 9-12 (LO 9-5)

$2,653 ($88,443 × 6% × ½).

Brief Exercise 9-13 (LO 9-5)

Interest expense for the year ended December 31, 2021 would be $4,157. Interest expense for the first six months ended June 30, 2021 is $2,075 ($82,985 × 5% × ½). Interest expense for the next six months ended December 31, 2021 is $2,082 ([$82,985 + ($2,075 – $1,800)] × 5% × ½). Thus, the total interest expense for the year is $2,075 + $2,082 = $4,157.

Brief Exercise 9-14 (LO 9-5)

1.

Cash	**63,948**	
Discount on Bonds Payable	**6,052**	
Bonds Payable		**70,000**
(Issue bonds at a discount)		

2.

Interest Expense	**2,558**	
Discount on Bonds Payable		**108**
Cash		**2,450**
(Pay semiannual interest)		

3. Interest expense increases each period because the carrying value of the debt issued at a discount increases over time.

Brief Exercise 9-15 (LO 9-5)

1.

Cash	**76,860**	
Bonds Payable		**70,000**
Premium on Bonds Payable		**6,860**
(Issue bonds at a premium)		

2.

Interest Expense	**2,306**	
Premium on Bonds Payable	**144**	
Cash		**2,450**
(Pay semi-annual interest)		

3. Interest expense decreases each period because the carrying value of the debt issued at a premium decreases over time.

Brief Exercise 9-16 (LO 9-6)

Bonds Payable	**70,000**	
Loss	**3,832**	
Discount on Bonds Payable		**5,832**
Cash		**68,000**
(Retire bonds before maturity)		

Brief Exercise 9-17 (LO 9-6)

Bonds Payable	**70,000**	
Premium on Bonds Payable	**6,567**	
Gain		**4,567**
Cash		**72,000**
(Retire bonds before maturity)		

Brief Exercise 9-18 (LO 9-7)

If the market rate is 7%, the bonds will issue at $60,000 (face amount).

Calculator Input

Bond Characteristics	Key	Amount	
1. Face amount	FV	$60,000	
2. Interest payment	PMT	$2,100	= $60,000 × 7% × ½ year
3. Periods to maturity	N	20	= 10 years × 2 periods each year
4. Market interest rate	I	3.5%	= 7% / 2 periods each year

Calculator Output

Issue price	PV	$60,000

Brief Exercise 9-19 (LO 9-7)

If the market rate is 8%, the bonds will issue at $54,812 (a discount).

Calculator Input

Bond Characteristics	Key	Amount	
1. Face amount	FV	$60,000	
2. Interest payment	PMT	$2,100	= $60,000 × 7% × ½ year
3. Periods to maturity	N	30	= 15 years × 2 periods each year
4. Market interest rate	I	4%	= 8% / 2 periods each year

Calculator Output

Issue price	PV	$54,812	

Brief Exercise 9-20 (LO 9-7)

If the market rate is 6%, the bonds will issue at $66,934 (a premium).

Calculator Input

Bond Characteristics	Key	Amount	
1. Face amount	FV	$60,000	
2. Interest payment	PMT	$2,100	= $60,000 × 7% × ½ year
3. Periods to maturity	N	40	= 20 years × 2 periods each year
4. Market interest rate	I	3%	= 6% / 2 periods each year

Calculator Output

Issue price	PV	$66,934	

Brief Exercise 9-21 (LO 9-8)

1.

Total Liabilities		Stockholders' Equity		Debt to Equity Ratio
$628	÷	$99	=	6.34

2.

Net Income		Average Total Assets		Return on Assets Ratio
$66	÷	$722.5*	=	9.1%

*($718 + $727) / 2

3.

Net Income + Interest + Taxes		Interest		Times Interest Earned Ratio
$125	÷	$15	=	8.3

EXERCISES

Exercise 9-1 (LO 9-1)

Requirement 1

	Issue Note	Issue Stock
Operating income	$11,000,000	$11,000,000
Interest expense (note only)	2,450,000	
Income before tax	8,550,000	11,000,000
Income tax expense (35%)	2,992,500	3,850,000
Net income	$ 5,557,500	$ 7,150,000
# of shares	4,000,000	5,000,000
Earnings per share (Net income / # of shares)	$1.39	$1.43

Requirement 2

Issuing stock results in higher earnings per share. Issuing the note results in earnings per share of $1.39 compared with $1.43 for issuing stock.

Exercise 9-2 (LO 9-2)

January 1, 2021		
Cash	**50,000**	
Notes Payable		**50,000**
(Issue a note payable)		
January 31, 2021		
Interest Expense ($50,000 × 6% × 1/12)	**250.00**	
Notes Payable (difference)	**578.64**	
Cash (monthly payment)		**828.64**
(Pay monthly installment on note)		
February 28, 2021		
Interest Expense ([$50,000-578.64] × 6% × 1/12)	**247.11**	
Notes Payable (difference)	**581.53**	
Cash (monthly payment)		**828.64**
(Pay monthly installment on note)		

Exercise 9-3 (LO 9-2)

Requirement 1

January 1, 2021

Land	**800,000**	
Notes Payable		**800,000**
(Issue a note payable for land)		

Requirement 2

June 30, 2021

Interest Expense ($800,000 × 6% × 6/12)	**24,000.00**	
Notes Payable (difference)	**191,221.64**	
Cash (semiannual payment)		**215,221.64**
(Pay annual installment on note)		

December 31, 2021

Interest Expense ([$800,000−191,221.64] × 6% × 6/12)	**18,263.35**	
Notes Payable (difference)	**196,958.29**	
Cash (annual payment)		**215,221.64**
(Pay annual installment on note)		

Requirement 3

Notes Payable = $800,000 − $191,221.64 − $196,958.29 = $411,820.07

Interest Expense = $24,000.00 + $18,263.35 = $42,263.35

Exercise 9-4 (LO 9-3, LO 9-8)

Requirement 1

Assets	=	Liabilities	+	Stockholders' Equity
$25 million		$15 million		?

Stockholders' equity must be $10 million ($25 million − $15 million).

Requirement 2

Total Liabilities	÷	Stockholders' Equity	=	Debt to Equity Ratio
$15 million	÷	$10 million	=	1.50

Requirement 3

Total Liabilities	÷	Stockholders' Equity	=	Debt to Equity Ratio
$15 + $2 = $17 million	÷	$10 million	=	1.70

Requirement 4

Yes. A higher ratio typically indicates greater risk.

Exercise 9-5 (LO 9-3)

Requirement 1

PV of lease payments = $3,618.18 × 22.110544* = $80,000 (rounded)

* Present value of an annuity; n = 24; i = 8%/12

Requirement 2

June 1, 2021		
Lease Asset	**80,000**	
Lease Payable		**80,000**
(Record a 24-month lease)		

Exercise 9-6 (LO 9-3)

Requirement 1

PV of lease payments = $29,122.87 × 17.16864* = $500,000 (rounded)

* Present value of an annuity; n = 20; i = 6%/4 (Table 4)

Requirement 2

June 30, 2021		
Lease Asset	**500,000**	
Lease Payable		**500,000**
(Record a 20-quarter lease)		

Exercise 9-7 (LO 9-5)

January 1, 2021		
Cash	**500,000**	
Bonds Payable		**500,000**
(Issue bonds at face amount)		
June 30, 2021		
Interest Expense	**22,500**	
Cash ($500,000 × 9% × ½)		**22,500**
(Pay semiannual interest)		
December 31, 2021		
Interest Expense	**22,500**	
Cash ($500,000 × 9% × ½)		**22,500**
(Pay semiannual interest)		

Exercise 9-8 (LO 9-5)

Requirement 1

(1)	(2)	(3)	(4)	(5)
Date	Cash Paid Face Amount x 4.5% Stated Rate	Interest Expense Carrying Value x 5% Market Rate	Increase in Carrying Value (3) – (2)	Carrying Value Prior Carrying Value + (4)
1/ 1 /2021				$ 457,102
6/30/2021	$ 22,500	$ 22,855	$ 355	457,457
12/31/2021	22,500	22,873	373	457,830

Requirement 2

January 1, 2021

Cash	**457,102**	
Discount on Bonds Payable	**42,898**	
Bonds Payable		**500,000**
(Issue bonds at a discount)		

June 30, 2021

Interest Expense	**22,855**	
Discount on Bonds Payable (difference)		**355**
Cash ($500,000 × 9% × ½)		**22,500**
(Pay semiannual interest)		

December 31, 2021

Interest Expense	**22,873**	
Discount on Bonds Payable (difference)		**373**
Cash ($500,000 × 9% × ½)		**22,500**
(Pay semiannual interest)		

Exercise 9-9 (LO 9-5)

Requirement 1

(1)	(2)	(3)	(4)	(5)
Date	**Cash Paid** Face Amount x 4.5% Stated Rate	**Interest Expense** Carrying Value x 4% Market Rate	**Decrease in Carrying Value** (2) – (3)	**Carrying Value** Prior Carrying Value – (4)
1/ 1 /2021				$ 549,482
6/30/2021	$ 22,500	$ 21,979	$ 521	548,961
12/31/2021	22,500	21,958	542	548,419

Requirement 2

January 1, 2021

Cash	**549,482**	
Bonds Payable		**500,000**
Premium on Bonds Payable		**49,482**
(Issue bonds at a premium)		

June 30, 2021

Interest Expense	**21,979**	
Premium on Bonds Payable (difference)	**521**	
Cash ($500,000 × 9% × ½)		**22,500**
(Pay semiannual interest)		

December 31, 2021

Interest Expense	**21,958**	
Premium on Bonds Payable (difference)	**542**	
Cash ($500,000 × 9% × ½)		**22,500**
(Pay semiannual interest)		

Exercise 9-10 (LO 9-5)

January 1, 2021		
Cash	**600,000**	
Bonds Payable		**600,000**
(Issue bonds at face amount)		
June 30, 2021		
Interest Expense	**21,000**	
Cash ($600,000 × 7% × ½)		**21,000**
(Pay semiannual interest)		
December 31, 2021		
Interest Expense	**21,000**	
Cash ($600,000 × 7% × ½)		**21,000**
(Pay semiannual interest)		

Exercise 9-11 (LO 9-5)

Requirement 1

(1)	(2)	(3)	(4)	(5)
Date	Cash Paid Face Amount x 3.5% Stated Rate	Interest Expense Carrying Value x 4% Market Rate	Increase in Carrying Value (3) – (2)	Carrying Value Prior Carrying Value + (4)
1/ 1 /2021				$ 559,229
6/30/2021	$ 21,000	$ 22,369	$ 1,369	560,598
12/31/2021	21,000	22,424	1,424	562,022

Requirement 2

January 1, 2021

Cash	**559,229**	
Discount on Bonds Payable	**40,771**	
Bonds Payable		**600,000**
(Issue bonds at a discount)		

June 30, 2021

Interest Expense	**22,369**	
Discount on Bonds Payable (difference)		**1,369**
Cash ($600,000 x7% × ½)		**21,000**
(Pay semiannual interest)		

December 31, 2021

Interest Expense	**22,424**	
Discount on Bonds Payable (difference)		**1,424**
Cash ($600,000 × 7% × ½)		**21,000**
(Pay semiannual interest)		

Exercise 9-12 (LO 9-5)

Requirement 1

(1) Date	(2) Cash Paid Face Amount x 3.5% Stated Rate	(3) Interest Expense Carrying Value x 3% Market Rate	(4) Decrease in Carrying Value (2) – (3)	(5) Carrying Value Prior Carrying Value – (4)
1/ 1 /2021				$ 644,632
6/30/2021	$ 21,000	$ 19,339	$ 1,661	642,971
12/31/2021	21,000	19,289	1,711	641,260

Requirement 2

January 1, 2021

Cash	**644,632**	
Bonds Payable		**600,000**
Premium on Bonds Payable		**44,632**
(Issue bonds at a premium)		

June 30, 2021

Interest Expense	**19,339**	
Premium on Bonds Payable (difference)	**1,661**	
Cash ($600,000 × 7% × ½)		**21,000**
(Pay semi-annual interest)		

December 31, 2021

Interest Expense	**19,289**	
Premium on Bonds Payable (difference)	**1,711**	
Cash ($600,000 × 7% × ½)		**21,000**
(Pay semi-annual interest)		

Exercise 9-13 (LO 9-5)

January 1, 2021		
Cash	**600,000**	
Bonds Payable		**600,000**
(Issue bonds at face amount)		
December 31, 2021		
Interest Expense	**42,000**	
Cash ($600,000 × 7%)		**42,000**
(Pay annual interest)		
December 31, 2022		
Interest Expense	**42,000**	
Cash ($600,000 × 7%)		**42,000**
(Pay annual interest)		

Exercise 9-14 (LO 9-5)

Requirement 1

(1) Date	(2) Cash Paid Face Amount x 7% Stated Rate	(3) Interest Expense Carrying Value x 8% Market Rate	(4) Increase in Carrying Value (3) – (2)	(5) Carrying Value Prior Carrying Value + (4)
1/ 1 /2021				$ 559,740
12/31/2021	$ 42,000	$ 44,779	$ 2,779	562,519
12/31/2022	42,000	45,002	3,002	565,521

Requirement 2

January 1, 2021

Cash		**559,740**	
Discount on Bonds Payable		**40,260**	
Bonds Payable			**600,000**
(Issue bonds at a discount)			

December 31, 2021

Interest Expense		**44,779**	
Discount on Bonds Payable (difference)			**2,779**
Cash ($600,000 × 7%)			**42,000**
(Pay annual interest)			

December 31, 2022

Interest Expense		**45,002**	
Discount on Bonds Payable (difference)			**3,002**
Cash ($600,000 × 7%)			**42,000**
(Pay annual interest)			

Exercise 9-15 (LO 9-5)

Requirement 1

(1)	(2)	(3)	(4)	(5)
Date	**Cash Paid** Face Amount x 7% Stated Rate	**Interest Expense** Carrying Value x 6% Market Rate	**Decrease in Carrying Value** (2) – (3)	**Carrying Value** Prior Carrying Value – (4)
1/ 1 /2021				$ 644,161
12/31/2021	$ 42,000	$ 38,650	$ 3,350	640,811
12/31/2022	42,000	38,449	3,551	637,260

Requirement 2

January 1, 2021

Cash	**644,161**	
Bonds Payable		**600,000**
Premium on Bonds Payable		**44,161**
(Issue bonds at a premium)		

December 31, 2021

Interest Expense	**38,650**	
Premium on Bonds Payable (difference)	**3,350**	
Cash ($600,000 × 7%)		**42,000**
(Pay annual interest)		

December 31, 2022

Interest Expense	**38,449**	
Premium on Bonds Payable (difference)	**3,551**	
Cash ($600,000 × 7%)		**42,000**
(Pay annual interest)		

Exercise 9-16 (LO 9-6)

Requirement 1

(1) Date	(2) Cash Paid Face Amount x 4.5% Stated Rate	(3) Interest Expense Carrying Value x 5% Market Rate	(4) Increase in Carrying Value (3) – (2)	(5) Carrying Value Prior Carrying Value + (4)
1/ 1 /2021				$ 457,102
6/30/2021	$ 22,500	$ 22,855	$ 355	457,457
12/31/2021	22,500	22,873	373	457,830
6/30/2022	22,500	22,892	392	458,222
12/31/2022	22,500	22,911	411	458,633

Requirement 2

If the market rate drops to 7%, it will cost $601,452 to retire the bonds.

Calculator Input

Bond characteristics	Key	Amount	
1. Face amount	FV	$500,000	
2. Interest payment each period	PMT	$22,500	= $500,000 × 9% × ½ year
3. Periods to maturity	N	36	= 18 years × 2 periods each year
4. Market interest rate each period	I	3.5%	= 7% / 2 periods each year

Calculator Output

Issue price	PV	$601,452

December 31, 2022		
Bonds Payable	**500,000**	
Loss	**142,819**	
Discount on Bonds Payable		**41,367**
Cash		**601,452**
(Retire bonds before maturity)		

Exercise 9-17 (LO 9-6)

Requirement 1

(1) Date	(2) Cash Paid Face Amount x 3.5% Stated Rate	(3) Interest Expense Carrying Value x 3% Market Rate	(4) Decrease in Carrying Value (2) – (3)	(5) Carrying Value Prior Carrying Value – (4)
1/ 1 /2021				$ 644,632
6/30/2021	$ 21,000	$ 19,339	$ 1,661	642,971
12/31/2021	21,000	19,289	1,711	641,260
6/30/2022	21,000	19,238	1,762	639,498
12/31/2022	21,000	19,185	1,815	637,683
6/30/2023	21,000	19,130	1,870	635,813
12/31/2023	21,000	19,074	1,926	633,887

Requirement 2

If the market rate increases to 8%, it will cost $568,311 to retire the bonds.

Calculator Input

Bond Characteristics	Key	Amount	
1. Face amount	FV	$600,000	
2. Interest payment each period	PMT	$21,000	= $600,000 × 7% × ½ year
3. Periods to maturity	N	14	= 7 years × 2 periods each year
4. Market interest rate each period	I	4%	= 8% / 2 periods each year

Calculator Output

Issue price	PV	$568,311

December 31, 2023		
Bonds Payable	**600,000**	
Premium on Bonds Payable	**33,887**	
Gain		**65,576**
Cash		**568,311**
(Retire bonds before maturity)		

Exercise 9-18 (LO 9-7)

Requirement 1

Premium. The issue price is $45,057,519

Calculator Input

Bond Characteristics	Key	Amount	
1. Face amount	FV	$41,000,000	
2. Interest payment	PMT	$1,845,000	= $41,000,000 × 9% × ½ year
3. Periods to maturity	N	40	= 20 years × 2 periods each year
4. Market interest rate	I	4%	= 8% / 2 periods each year

Calculator Output

Issue price	PV	$45,057,519

Requirement 2

Face amount. The issue price is $41,000,000.

Calculator Input

Bond Characteristics	Key	Amount	
1. Face amount	FV	$41,000,000	
2. Interest payment	PMT	$1,845,000	= $41,000,000 × 9% × ½ year
3. Periods to maturity	N	40	= 20 years × 2 periods each year
4. Market interest rate	I	4.5%	= 9% / 2 periods each year

Calculator Output

Issue price	PV	$41,000,000

Requirement 3

Discount. The issue price is $37,482,387

Calculator Input

Bond Characteristics	Key	Amount	
1. Face amount	FV	$41,000,000	
2. Interest payment	PMT	$1,845,000	= $41,000,000 × 9% × ½ year
3. Periods to maturity	N	40	= 20 years × 2 periods each year
4. Market interest rate	I	5%	= 10% / 2 periods each year

Calculator Output

Issue price	PV	$37,482,387

Exercise 9-19 (LO 9-7)

Requirement 1

Premium. The issue price is $27,934,072.

Calculator Input

Bond Characteristics	Key	Amount	
1. Face amount	FV	$26,000,000	
2. Interest payment	PMT	$910,000	= $26,000,000 x7% × ½ year
3. Periods to maturity	N	20	= 10 years × 2 periods each year
4. Market interest rate	I	3%	= 6% / 2 periods each year

Calculator Output

Issue price	PV	$27,934,072

Requirement 2

Face amount. The issue price is $26,000,000.

Calculator Input

Bond Characteristics	Key	Amount	
1. Face amount	FV	$26,000,000	
2. Interest payment	PMT	$910,000	= $26,000,000 × 7% × ½ year
3. Periods to maturity	N	20	= 10 years × 2 periods each year
4. Market interest rate	I	3.5%	= 7% / 2 periods each year

Calculator Output

Issue price	PV	$26,000,000

Requirement 3

Discount. The issue price is $24,233,258.

Calculator Input

Bond Characteristics	Key	Amount	
1. Face amount	FV	$26,000,000	
2. Interest payment	PMT	$910,000	= $26,000,000 × 7% × ½ year
3. Periods to maturity	N	20	= 10 years × 2 periods each year
4. Market interest rate	I	4%	= 8% / 2 periods each year

Calculator Output

Issue price	PV	$24,233,258

Exercise 9-20 (LO 9-8)

Requirement 1

	Total Liabilities	÷	Stockholders' Equity	=	Debt to Equity Ratio
E-Travel	$4,254,475	÷	$3,182,681	=	1.34
Pricecheck	$486,610	÷	$1,607,614	=	0.30

E-Travel has a higher debt to equity ratio than Pricecheck.

Requirement 2

	Net Income + Interest + Taxes	÷	Interest	=	Times Interest Earned Ratio
E-Travel	$588,159	÷	$94,233	=	6.2
Pricecheck	$600,724	÷	$34,084	=	17.6

Pricecheck, with a times interest earned ratio of 17.6, is better able to meet interest payments as they become due than E-Travel with a ratio of only 6.2.

Exercise 9-21 (LO 9-2, LO 9-8)

Requirement 1

January 1	Debit	Credit
Cash	**100,000**	
Notes Payable (Long-term)		**100,000**
(Issue a long-term note payable)		

January 4	Debit	Credit
Cash	**31,000**	
Accounts Receivable		**31,000**
(*Receive cash on account*)		

January 11	Debit	Credit
Accounts Payable	**11,000**	
Cash		**11,000**
(*Pay cash on account*)		

January 15	Debit	Credit
Salaries Expense	**28,900**	
Cash		**28,900**
(*Pay for salaries*)		

January 30	Debit	Credit
Cash	**65,000**	
Accounts Receivable	**130,000**	
Sales Revenue		**195,000**
(*Sell inventory for cash and on account*)		
Cost of Goods Sold	**112,500**	
Inventory		**112,500**
(*Record cost of inventory sold*)		

January 31	Debit	Credit
Interest Expense	**583**	
Notes Payable (Long-term)	**1,397**	
Cash		**1,980**
(*Pay monthly installment on long-term note*)		
($583 = $100,000 × 7% × 1/12)		

Exercise 9-21 (continued)

Requirement 2

(a) January 31	Debit	Credit
Depreciation Expense	**800**	
Accumulated Depreciation		**800**
(Record depreciation for January)		
($800 = [$120,000−$24,000] / 120 months)		

(b) January 31	Debit	Credit
Bad Debt Expense	**2,300**	
Allowance for Uncollectible Accounts		**2,300**
(Adjust uncollectible accounts)		
($2,300 = [$3,000×50%]+[$130,000[a]×2%]−$1,800)		
[a] $130,000 = $34,000−$31,000+$130,000−$3,000		

(c) January 31	Debit	Credit
Salaries Expense	**26,100**	
Salaries Payable		**26,100**
(*Adjust salaries payable)*		

(d) January 31	Debit	Credit
Income Tax Expense	**8,000**	
Income Tax Payable		**8,000**
(*Adjust income taxes*)		

(e) January 31	Debit	Credit
Notes Payable (Long-term)	**17,411**	
Notes Payable (Current)		**17,411**
(*Reclassify current portion of note payable*)		

Exercise 9-21 (continued)

Requirement 3

Freedom Fireworks
Adjusted Trial Balance
January 31, 2021

Accounts	Debit	Credit
Cash	$165,320	
Accounts Receivable	133,000	
Allowance for Uncollectible Accounts		$ 4,100
Inventory	39,500	
Land	67,300	
Buildings	120,000	
Accumulated Depreciation		10,400
Accounts Payable		6,700
Salaries Payable		26,100
Income Tax Payable		8,000
Notes Payable (Current)		17,411
Notes Payable (Long-term)		81,192
Common Stock		200,000
Retained Earnings		155,400
Sales Revenue		195,000
Cost of Goods Sold	112,500	
Salaries Expense	55,000	
Bad Debt Expense	2,300	
Depreciation Expense	800	
Interest Expense	583	
Income Tax Expense	8,000	
Totals	$704,303	$704,303

Exercise 9-21 (continued)

Requirement 3 (continued)

Accounts	Ending Balance		Beginning balance in **bold**, entries during January in blue, and adjusting entries in red.
Cash	$165,320	=	**11,200**+100,000+31,000−11,000−28,900+65,000−1,980
Accounts Receivable	133,000	=	**34,000**−31,000+130,000
Allow for Uncoll Accts	4,100	=	**1,800**+2,300
Inventory	39,500	=	**152,000**−112,500
Land	67,300	=	**67,300**
Buildings	120,000	=	**120,000**
Accumulated Depreciation	10,400	=	**9,600**+800
Accounts Payable	6,700	=	**17,700**−11,000
Salaries Payable	26,100	=	26,100
Income Tax Payable	8,000	=	8,000
Notes Payable (Current)	17,411	=	17,411
Notes Payable (Long-term)	81,192	=	**100,000** – 1,397 -17,411
Common Stock	200,000	=	**200,000**
Retained Earnings	155,400	=	**155,400**
Sales Revenue	195,000	=	195,000
Cost of Goods Sold	112,500	=	112,500
Salaries Expense	55,000	=	28,900+26,100
Bad Debt Expense	2,300	=	2,300
Depreciation Expense	800	=	800
Interest Expense	583	=	583
Income Tax Expense	8,000	=	8,000

Exercise 9-21 (continued)

Requirement 4

Freedom Fireworks
Multiple-Step Income Statement
For the year month ended January 31, 2021

Sales revenue	$195,000	
Cost of goods sold	112,500	
Gross profit		$ 82,500
Salaries expense	55,000	
Bad debt expense	2,300	
Depreciation expense	800	
Total operating expenses		58,100
Operating income		24,400
Interest expense		583
Income before taxes		23,817
Income tax expense		8,000
Net income		$ 15,817

Requirement 5

Freedom Fireworks
Classified Balance Sheet
January 31, 2021

Assets			**Liabilities**		
Cash		$165,320	Accounts payable	$ 6,700	
Accounts receivable	133,000		Salaries payable	26,100	
Less: Allowance	(4,100)	128,900	Income tax payable	8,000	
Inventory		39,500	Notes payable (Current)	17,411	
Total current assets		333,720	Total current liabilities	58,211	
			Notes payable (Long-term)	81,192	
			Total liabilities	139,403	
Land		67,300	**Stockholders' Equity**		
Buildings		120,000	Common stock	200,000	
Less: Accumulated Depreciation		(10,400)	Retained earnings	171,217	*
			Total stockholders' equity	371,217	
Total assets		$510,620	Total liabilities and stockholders' equity	$510,620	

* Retained earnings = Beginning retained earnings + Net income − Dividends
= $155,400 + $15,817 − $0
= $171,217

Exercise 9-21 (concluded)

Requirement 6

January 31, 2021	Debit	Credit
Sales Revenue	195,000	
Retained Earnings		195,000
(*Close revenue accounts*)		
Retained Earnings	179,183	
Cost of Goods Sold		112,500
Salaries Expense		55,000
Bad Debt Expense		2,300
Depreciation Expense		800
Interest Expense		583
Income Tax Expense		8,000
(*Close expense accounts*)		

Requirement 7

(a) The debt to equity ratio is:

$$\text{Debt to Equity Ratio} = \frac{\text{Total Liabilities}}{\text{Stockholders' Equity}} = \frac{\$139{,}403}{\$371{,}217} = \mathbf{0.38}$$

Freedom Fireworks is **less** leveraged than the industry average. Freedom Fireworks has a lower proportion of liabilities in relation to stockholders' equity than the industry average of 1.0.

(b) The times interest earned ratio is:

$$\text{Times Interest Earned Ratio} = \frac{\text{Net Income + Interest Expense + Tax Expense}}{\text{Interest Expense}} = \frac{\$15{,}817 + \$583 + \$8{,}000}{\$583} = \mathbf{41.9}$$

Compared to the industry average of 20 times, Freedom Fireworks is **more** able to meet interest payments than other companies in the same industry.

(c) Based on the debt to equity ratio and the times interest earned ratio, ratio, Freedom Fireworks would more likely receive a **lower** interest rate than the average borrowing rate in the industry. Freedom Fireworks carries less debt than the industry average and is better able to meet interest payments than the average company in the industry.

PROBLEMS: SET A

Problem 9-1A (LO 9-2)

Requirement 1

January 1, 2021

Building	**360,000**	
Cash		**60,000**
Notes Payable		**300,000**
(Issue a mortgage note payable)		

Requirement 2

(1)	(2)	(3)	(4)	(5)
Date	**Cash Paid**	**Interest Expense**	**Decrease in Carrying Value**	**Carrying Value**
	Monthly Payment	Carrying Value x 0.07 × 1/12	(2) – (3)	Prior Carrying Value – (4)
1/1/2021				$ 300,000.00
1/31/2021	$3,483.25	$ 1,750.00	$ 1,733.25	298,266.75
2/28/2021	3,483.25	1,739.89	1,743.36	296,523.39

Requirement 3

January 31, 2021

Interest Expense ($300,000 × 7% × 1/12)	**1,750.00**	
Notes Payable (difference)	**1,733.25**	
Cash (monthly payment)		**3,483.25**
(Pay monthly installment on note)		

In the first monthly payment, $1,750.00 goes to interest expense and $1,733.25 goes to reducing the carrying value of the loan.

Requirement 4

Total payments on the loan are $417,990. Since actual payments on the loan are $300,000, the remainder of $117,990 is the amount paid for interest expense.

Problem 9-2A (LO 9-2)

Requirement 1

January 1, 2021

Cash	**2,000,000**	
Notes Payable		**2,000,000**
(Issue a note payable)		

Requirement 2

Date	Cash Paid	Interest Expense	Decrease in Carrying Value	Carrying Value
				2,000,000
12/31/2021	776,067	160,000	616,067	1,383,933
12/31/2022	776,067	110,715	665,352	718,581
12/31/2023	776,067	57,486	718,581	0

Requirement 3

December 31, 2021

Interest Expense	**160,000**	
Notes Payable	**616,067**	
Cash		**776,067**
(Pay annual installment on note)		

December 31, 2022

Interest Expense	**110,715**	
Notes Payable	**665,352**	
Cash		**776,067**
(Pay annual installment on note)		

December 31, 2023

Interest Expense	**57,486**	
Notes Payable	**718,581**	
Cash		**776,067**
(Pay annual installment on note)		

Problem 9-3A (LO 9-3, 9-8)

Requirement 1

Assets	=	Liabilities	+	Stockholders' Equity
$81 million		$11 + $41 = $52 million		?

Stockholders' equity must be $29 million ($81 million - $52 million).

Requirement 2

Total Liabilities	÷	Stockholders' Equity	=	Debt to Equity Ratio
$52 million	÷	$29 million	=	1.79

Requirement 3

($ in millions)

Lease Asset	**16**	
Lease Payable		**16**
(Record a lease)		

Requirement 4

Yes.

The revised debt to equity ratio of 2.34 is greater than the 2.0 ratio required in the bond agreement.

Total Liabilities	÷	Stockholders' Equity	=	Debt to Equity Ratio
$52 + 16 = 68 million	÷	$29 million	=	2.34

Problem 9-4A (LO 9-5)

Requirement 1

January 1, 2021

Cash	**600,000**	
Bonds Payable		**600,000**
(Issue bonds at face amount)		

June 30, 2021

Interest Expense	**24,000**	
Cash ($600,000 × 8% × ½)		**24,000**
(Pay semiannual interest)		

December 31, 2021

Interest Expense	**24,000**	
Cash ($600,000 × 8% × ½)		**24,000**
(Pay semiannual interest)		

Requirement 2

January 1, 2021

Cash	**544,795**	
Discount on Bonds Payable	**55,205**	
Bonds Payable		**600,000**
(Issue bonds at a discount)		

June 30, 2021

Interest Expense ($544,795 × 9% × ½)	**24,516**	
Discount on Bonds Payable (difference)		**516**
Cash ($600,000 × 8% × ½)		**24,000**
(Pay semiannual interest)		

December 31, 2021

Interest Expense ([$544,795+$516] × 9% × ½)	**24,539**	
Discount on Bonds Payable (difference)		**539**
Cash ($600,000 × 8% × ½)		**24,000**
(Pay semiannual interest)		

Requirement 3

January 1, 2021

Cash	**664,065**	
Bonds Payable		**600,000**
Premium on Bonds Payable		**64,065**
(Issue bonds at a premium)		

June 30, 2021

Interest Expense ($664,065 × 7% × ½)	**23,242**	
Premium on Bonds Payable (difference)	**758**	
Cash ($600,000 × 8% × ½)		**24,000**
(Pay semiannual interest)		

December 31, 2021

Interest Expense ([$664,065 – $758] × 7% × ½)	**23,216**	
Premium on Bonds Payable (difference)	**784**	
Cash ($600,000 × 8% × ½)		**24,000**
(Pay semiannual interest)		

Problem 9-5A (LO 9-5)

1. Discount
2. $37,281,935
3. $40,000,000
4. 7% ($1,400,000 cash paid ÷ $40,000,000 face value) × 2
5. 8% ($1,491,277 interest expense ÷ $37,281,935 carrying value) × 2
6. $28,000,000 ($1,400,000 × 20 payments)

Problem 9-6A (LO 9-5)

Requirement 1

(1)	(2)	(3)	(4)	(5)
Date	**Cash Paid** Face Amount x 4% Stated Rate	**Interest Expense** Carrying Value x 4.5% Market Rate	**Increase in Carrying Value** (3) – (2)	**Carrying Value** Prior Carrying Value + (4)
1/ 1 /2021				$ 841,464
6/30/2021	$ 36,000	$ 37,866	$ 1,866	843,330
12/31/2021	36,000	37,950	1,950	845,280

Requirement 2

January 1, 2021

Cash	**841,464**	
Discount on Bonds Payable	**58,536**	
Bonds Payable		**900,000**
(Issue bonds at a discount)		

Requirement 3

June 30, 2021

Interest Expense ($841,464 × 9% × ½)	**37,866**	
Discount on Bonds Payable (difference)		**1,866**
Cash ($900,000 × 8% × ½)		**36,000**
(Pay semiannual interest)		

December 31, 2021

Interest Expense ($843,330 × 9% × ½)	**37,950**	
Discount on Bonds Payable (difference)		**1,950**
Cash ($900,000 × 8% × ½)		**36,000**
(Pay semiannual interest)		

Problem 9-7A (LO 9-5, 9-7)

Requirement 1

Face amount. The issue price is $1,300,000.

Calculator Input

Bond Characteristics	Key	Amount	
1. Face amount	FV	$1,300,000	
2. Interest payment	PMT	$45,500	= $1,300,000 × 7% × ½ year
3. Periods to maturity	N	30	= 15 years × 2 periods each year
4. Market interest rate	I	3.5%	= 7% / 2 periods each year

Calculator Output

Issue price	PV	$1,300,000

(1) Date	(2) Cash Paid Face Amount x 3.5% Stated Rate	(3) Interest Expense Carrying Value x 3.5% Market Rate	(4) Increase in Carrying Value (3) – (2)	(5) Carrying Value Prior Carrying Value + (4)
1/ 1 /2021				$ 1,300,000
6/30/2021	$ 45,500	$ 45,500	$ 0	1,300,000
12/31/2021	45,500	45,500	0	1,300,000

Requirement 2

Discount. The issue price is $1,187,602.

Calculator Input

Bond Characteristics	Key	Amount	
1. Face amount	FV	$1,300,000	
2. Interest payment	PMT	$45,500	= $1,300,000 × 7% × ½ year
3. Periods to maturity	N	30	= 15 years × 2 periods each year
4. Market interest rate	I	4%	= 8% / 2 periods each year

Calculator Output

Issue price	PV	$1,187,602

(1) Date	(2) Cash Paid Face Amount x 3.5% Stated Rate	(3) Interest Expense Carrying Value x 4% Market Rate	(4) Increase in Carrying Value (3) – (2)	(5) Carrying Value Prior Carrying Value + (4)
1/ 1 /2021				$ 1,187,602
6/30/2021	$ 45,500	$ 47,504	$ 2,004	1,189,606
12/31/2021	45,500	47,584	2,084	1,191,690

Requirement 3

Premium. The issue price is $1,427,403.

Calculator Input

Bond Characteristics	Key	Amount	
1. Face amount	FV	$1,300,000	
2. Interest payment	PMT	$45,500	= $1,300,000 × 7% × ½ year
3. Periods to maturity	N	30	= 15 years × 2 periods each year
4. Market interest rate	I	3%	= 6% / 2 periods each year

Calculator Output

Issue price	PV	$1,427,403

(1)	(2)	(3)	(4)	(5)
Date	**Cash Paid** Face Amount x 3.5% Stated Rate	**Interest Expense** Carrying Value x 3% Market Rate	**Decrease in Carrying Value** (2) – (3)	**Carrying Value** Prior Carrying Value – (4)
1/ 1 /2021				$ 1,427,403
6/30/2021	$ 45,500	$ 42,822	$ 2,678	1,424,725
12/31/2021	45,500	42,742	2,758	1,421,967

Problem 9-8A (LO 9-8)

Requirement 1

($ in millions)	Total Liabilities	÷	Stockholders' Equity	=	Debt to Equity Ratio
Bahama Bay	$5,724	÷	$3,137	=	1.82
Caribbean Key	$2,819	÷	$4,821	=	0.58

Bahama Bay has a higher debt to equity ratio than Caribbean Key.

Requirement 2

($ in millions)	Net Income	÷	Average Total Assets	=	Return on Assets Ratio
Bahama Bay	$562	÷	$9,210.5*	=	6.1%
Caribbean Key	$88	÷	$7,573.5**	=	1.2%

*($8,861 + $9,560) / 2

**($7,640 + $7,507) / 2

Bahama Bay is more profitable than Caribbean Key.

Requirement 3

($ in millions)	Net Income + Interest + Taxes	÷	Interest	=	Times Interest Earned Ratio
Bahama Bay	$880	÷	$170	=	5.2
Caribbean Key	$166	÷	$70	=	2.4

Bahama Bay, with a times interest earned ratio of 5.2, is better able to meet interest payments as they become due than Caribbean Key with a ratio of only 2.4.

PROBLEMS: SET B

Problem 9-1B (LO 9-2)

Requirement 1

January 1, 2021

Building	**610,000**	
Cash		**110,000**
Notes Payable		**500,000**
(Issue a mortgage note payable)		

Requirement 2

(1)	(2)	(3)	(4)	(5)
Date	**Cash Paid**	**Interest Expense**	**Decrease in Carrying Value**	**Carrying Value**
	Monthly Payment	Carrying Value x 0.09 × 1/12	(2) – (3)	Prior Carrying Value – (4)
1/1/2021				$ 500,000.00
1/31/2021	$ 5,071.33	$ 3,750.00	$ 1,321.33	498,678.67
2/28/2021	5,071.33	3,740.09	1,331.24	497,347.43

Requirement 3

January 31, 2021

Interest Expense ($500,000 × 9% × 1/12)	**3,750.00**	
Notes Payable (difference)	**1,321.33**	
Cash (monthly payment)		**5,071.33**
(Pay monthly installment on note)		

In the first monthly payment, $3,750.00 goes to interest expense and only $1,321.33 goes to reducing the carrying value of the loan.

Requirement 4

Over the 15 year mortgage, $412,839 is interest expense and $500,000 goes to reducing the carrying value of the loan. Interest expense over the 15 year mortgage is calculated as the total payments of $912,839 minus the $500,000 carrying value of the loan.

Problem 9-2B (LO 9-2)

Requirement 1

January 1, 2021

Cash	**9,000,000**	
Notes Payable		**9,000,000**
(Issue a note payable)		

Requirement 2

Date	Cash Paid	Interest Expense	Decrease in Carrying Value	Carrying Value
				9,000,000
12/31/2021	2,657,053	630,000	2,027,053	6,972,947
12/31/2022	2,657,053	488,106	2,168,947	4,804,000
12/31/2023	2,657,053	336,280	2,320,773	2,483,227
12/31/2023	2,657,053	173,826	2,483,227	0

Requirement 3

December 31, 2021

Interest Expense	**630,000**	
Notes Payable	**2,027,053**	
Cash		**2,657,053**
(Pay annual installment on note)		

December 31, 2022

Interest Expense	**488,106**	
Notes Payable	**2,168,947**	
Cash		**2,657,053**
(Pay annual installment on note)		

December 31, 2023

Interest Expense	**336,280**	
Notes Payable	**2,320,773**	
Cash		**2,657,053**
(Pay annual installment on note)		

December 31, 2024

Interest Expense	**173,826**	
Notes Payable	**2,483,227**	
Cash		**2,657,053**
(Pay annual installment on note)		

Problem 9-3B (LO 9-3, 9-8)

Requirement 1

Assets	=	Liabilities	+	Stockholders' Equity
$201 million		$91 + $61 = $152 million		?

Stockholders' equity must be $49 million ($201 million - $152 million).

Requirement 2

Total Liabilities	÷	Stockholders' Equity	=	Debt to Equity Ratio
$152 million	÷	$49 million	=	3.10

Requirement 3

($ in millions)

Lease Asset	**26**	
Lease Payable		**26**
(Record a lease agreement)		

Requirement 4

Yes.

The revised debt to equity ratio of 3.63 is greater than the 3.25 ratio required in the bond agreement.

Total Liabilities	÷	Stockholders' Equity	=	Debt to Equity Ratio
$152 + 26 = 178 million	÷	$49 million	=	3.63

Problem 9-4B (LO 9-5)

Requirement 1

January 1, 2021

Cash	**3,000,000**	
Bonds Payable		**3,000,000**
(Issue bonds at face amount)		

June 30, 2021

Interest Expense	**135,000**	
Cash ($3,000,000 × 9% × ½)		**135,000**
(Pay semiannual interest)		

December 31, 2021

Interest Expense	**135,000**	
Cash ($3,000,000 × 9% × ½)		**135,000**
(Pay semiannual interest)		

Requirement 2

January 1, 2021

Cash	**2,813,067**	
Discount on Bonds Payable	**186,933**	
Bonds Payable		**3,000,000**
(Issue bonds at a discount)		

June 30, 2021

Interest Expense ($2,813,067 × 10% × ½)	**140,653**	
Discount on Bonds Payable (difference)		**5,653**
Cash ($3,000,000 × 9% × ½)		**135,000**
(Pay semiannual interest)		

December 31, 2021

Interest Expense ([$2,813,067+$5,653] x10% × ½)	**140,936**	
Discount on Bonds Payable (difference)		**5,936**
Cash ($3,000,000 × 9% × ½)		**135,000**
(Pay semiannual interest)		

Requirement 3

January 1, 2021

Cash	**3,203,855**	
Bonds Payable		**3,000,000**
Premium on Bonds Payable		**203,855**
(Issue bonds at a premium)		

June 30, 2021

Interest Expense ($3,203,855 × 8% × ½)	**128,154**	
Premium on Bonds Payable (difference)	**6,846**	
Cash ($3,000,000 × 9% × ½)		**135,000**
(Pay semiannual interest)		

December 31, 2021

Interest Expense ([$3,203,855 – $6,846] × 8% × ½)	**127,880**	
Premium on Bonds Payable (difference)	**7,120**	
Cash ($3,000,000 × 9% × ½)		**135,000**
(Pay semiannual interest)		

Problem 9-5B (LO 9-5)

1. Premium
2. $66,934,432
3. $60,000,000

4. 7% ($2,100,000 cash paid ÷ $60,000,000 face value) × 2
5. 6% ($2,008,033 interest expense ÷ $66,934,432 carrying value) × 2
6. $84,000,000 ($2,100,000 × 40 payments)

Problem 9-6B (LO 9-5)

Requirement 1

(1) Date	(2) Cash Paid Face Amount x 3.5% Stated Rate	(3) Interest Expense Carrying Value x 3% Market Rate	(4) Decrease in Carrying Value (2) – (3)	(5) Carrying Value Prior Carrying Value – (4)
1/ 1 /2021				$ 1,098,002
6/30/2021	$ 35,000	$ 32,940	$ 2,060	1,095,942
12/31/2021	35,000	32,878	2,122	1,093,820

Requirement 2

January 1, 2021

Cash	**1,098,002**	
Bonds Payable		**1,000,000**
Premium on Bonds Payable		**98,002**
(Issue bonds at a premium)		

Requirement 3

June 30, 2021

Interest Expense ($1,098,002 × 6% × ½)	**32,940**	
Premium on Bonds Payable (difference)	**2,060**	
Cash ($1,000,000 × 7% × ½)		**35,000**
(Pay semiannual interest)		

December 31, 2021

Interest Expense ($1,095,942 × 6% × ½)	**32,878**	
Premium on Bonds Payable (difference)	**2,122**	
Cash ($1,000,000 × 7% × ½)		**35,000**
(Pay semiannual interest)		

Problem 9-7B (LO 9-5, 9-7)

Requirement 1

Face amount. The issue price is $850,000.

Calculator Input

Bond Characteristics	Key	Amount	
1. Face amount	FV	$850,000	
2. Interest payment	PMT	$25,500	= $850,000 × 6% × ½ year
3. Periods to maturity	N	20	= 10 years × 2 periods each year
4. Market interest rate	I	3%	= 6% / 2 periods each year

Calculator Output

Issue price	PV	$850,000

(1) Date	(2) Cash Paid Face Amount x 3% Stated Rate	(3) Interest Expense Carrying Value x 3% Market Rate	(4) Increase in Carrying Value (3) – (2)	(5) Carrying Value Prior Carrying Value + (4)
1/ 1 /2021				$ 850,000
6/30/2021	$ 25,500	$ 25,500	$ 0	850,000
12/31/2021	25,500	25,500	0	850,000

Requirement 2

Discount. The issue price is $789,597.

Calculator Input

Bond Characteristics	Key	Amount	
1. Face amount	FV	$850,000	
2. Interest payment	PMT	$25,500	= $850,000 × 6% × ½ year
3. Periods to maturity	N	20	= 10 years × 2 periods each year
4. Market interest rate	I	3.5%	= 7% / 2 periods each year

Calculator Output

Issue price	PV	$789,597

(1) Date	(2) Cash Paid Face Amount x 3% Stated Rate	(3) Interest Expense Carrying Value x 3.5% Market Rate	(4) Increase in Carrying Value (3) – (2)	(5) Carrying Value Prior Carrying Value + (4)
1/ 1 /2021				$ 789,597
6/30/2021	$ 25,500	$ 27,636	$ 2,136	791,733
12/31/2021	25,500	27,711	2,211	793,944

Requirement 3

Premium. The issue price is $916,254.

Calculator Input

Bond Characteristics	Key	Amount	
1. Face amount	FV	$850,000	
2. Interest payment	PMT	$25,500	= $850,000 × 6% × ½ year
3. Periods to maturity	N	20	= 10 years × 2 periods each year
4. Market interest rate	I	2.5%	= 5% / 2 periods each year

Calculator Output

Issue price	PV	$916,254

(1) Date	(2) Cash Paid Face Amount x 3% Stated Rate	(3) Interest Expense Carrying Value x 2.5% Market Rate	(4) Decrease in Carrying Value (2) – (3)	(5) Carrying Value Prior Carrying Value – (4)
1/ 1 /2021				$ 916,254
6/30/2021	$ 25,500	$ 22,906	$ 2,594	913,660
12/31/2021	25,500	22,842	2,658	911,002

Problem 9-8B (LO 9-8)

Requirement 1

($ in millions)	Total Liabilities	÷	Stockholders' Equity	=	Debt to Equity Ratio
Surf City	$11,519	÷	$8,309	=	1.39
Paradise Falls	$15,232	÷	$23,929	=	0.64

Surf City has a higher debt to equity ratio than Paradise Falls.

Requirement 2

($ in millions)	Net Income	÷	Average Total Assets	=	Return on Assets Ratio
Surf City	$18	÷	$19,816*	=	0.1%
Paradise Falls	$1,298	÷	$38,899**	=	3.3%

*($19,828 + $19,804) / 2
**($39,161 + $38,637) / 2

Paradise Falls is more profitable than Surf City.

Requirement 3

($ in millions)	Net Income + Interest + Taxes	÷	Interest	=	Times Interest Earned Ratio
Surf City	$374	÷	$356	=	1.1
Paradise Falls	$1,638	÷	$336	=	4.9

Paradise Falls, with a times interest earned ratio of 4.9, is better able to meet interest payments as they become due than Surf City with a ratio of only 1.1.

ADDITIONAL PERSPECTIVES

Continuing Problem: Great Adventures

AP9-1

Requirement 1

(1)	(2)	(3)	(4)	(5)
Date	**Cash Paid** Monthly Payment	**Interest Expense** Carrying Value × 6% × 1/12	**Decrease in Carrying Value** (2) – (3)	**Carrying Value** Prior Carrying Value – (4)
11/ 1 /2022				$ 500,000
11/30/2022	$ 5,551	$ 2,500	$ 3,051	496,949
12/31/2022	5,551	2,485	3,066	493,883

Requirement 2

November 1, 2022

Land	**500,000**	
Notes Payable (long-term)		**500,000**
(Purchase land by issuing a note payable)		

Requirement 3

November 30, 2022

Interest Expense ($500,000 × 6% × 1/12)	**2,500**	
Notes Payable (difference)	**3,051**	
Cash (monthly payment)		**5,551**
(Pay monthly installment on note)		

December 31, 2022

Interest Expense ($496,949 × 6% × 1/12)	**2,485**	
Notes Payable (difference)	**3,066**	
Cash (monthly payment)		**5,551**
(Pay monthly installment on note)		

Balance as of December 31, 2022:

November 1 – Issuance	$500,000
November 30 – First payment	(3,051)
December 31 – Second payment	(3,066)
Balance	**$493,883**

Requirement 4

Current liability*	**$ 38,014**
Long-term liability	**455,869**
	$493,883

* Portion of note that will be paid within one year of the balance sheet date.

Additional Perspective 9-1 *(in General Ledger)*

Students will be given the following existing trial balance.

Great Adventures, Inc.
Trial Balance
December 31, 2022
(Prior to transactions in AP9-1)

Accounts	Debit	Credit
Cash	$ 89,070	
Accounts Receivable	50,000	
Allowance for Uncollectible Accounts		$ 2,400
Inventory	7,000	
Prepaid Insurance	900	
Land	-0-	
Equipment	62,000	
Accumulated Depreciation		25,250
Accounts Payable		20,800
Deferred Revenue		5,000
Warranty Liability		4,000
Contingent Liability		12,000
Income Tax Payable		14,500
Interest Payable		750
Notes Payable (current)		10,000
Notes Payable (long-term)		20,000
Common Stock		20,000
Retained Earnings		33,450
Service Revenue		44,500
Sales Revenue		120,000
Interest Revenue		120
Sales Discounts	350	
Cost of Goods Sold	38,500	
Depreciation Expense	17,250	
Insurance Expense	5,700	
Rent Expense	2,400	
Salaries Expense	24,000	
Supplies Expense	500	
Bad Debt Expense	2,400	
Repairs and Maintenance Expense	400	
Warranty Expense	4,000	

Loss	12,000	
Interest Expense	1,800	
Income Tax Expense	14,500	
Totals	$332,770	$332,770

Additional Perspective 9-1 (in General Ledger, continued)

November 1, 2022		
Land	**500,000**	
Notes Payable (long-term)		**500,000**
(Purchase land by issuing a note payable)		
November 30, 2022		
Interest Expense ($500,000 × 6% × 1/12)	**2,500**	
Notes Payable (long-term)	**3,051**	
Cash (monthly payment)		**5,551**
(Pay monthly installment on note)		
December 31, 2022		
Interest Expense ($496,949 × 6% × 1/12)	**2,485**	
Notes Payable (long-term)	**3,066**	
Cash (monthly payment)		**5,551**
(Pay monthly installment on note)		
December 31, 2022		
Notes Payable (long-term)	**38,014**	
Notes Payable (current)		**38,014**
(Reclassify portion of long-term note payable as current)		

Additional Perspective 9-1 (in General Ledger, continued)

Great Adventures, Inc. Income Statement For the period ended December 31, 2022		
Service revenue	$ 44,500	
Sales revenue	120,000	
Sales discounts	(350)	
Net sales	164,150	
Cost of goods sold	38,500	
Gross profit		$125,650
Depreciation Expense	17,250	
Insurance Expense	5,700	
Rent Expense	2,400	
Salaries Expense	24,000	
Supplies Expense	500	
Bad Debt Expense	2,400	
Repairs and Maintenance Expense	400	
Warranty Expense	4,000	
Loss	12,000	
Total operating expenses		68,650
Operating income (loss)		57,000
Interest revenue		120
Interest expense		(6,785)
Income before income taxes		50,335
Income tax expense		14,500
Net income		$ 35,835

Additional Perspective 9-1 (in General Ledger, continued)

Great Adventures, Inc.
Balance Sheet
December 31, 2022

Assets		**Liabilities**	
Current assets:		Current liabilities:	
Cash	$ 77,968	Accounts payable	$ 20,800
Accounts receivable	50,000	Deferred Revenue	5,000
Allow for Uncoll Accts	(2,400)	Warranty Liability	4,000
Inventory	7,000	Contingent Liability	12,000
Prepaid Insurance	900	Income tax payable	14,500
Total current assets	133,468	Interest payable	750
		Notes Payable (current)	48,014
		Total current liabilities	105,064
		Notes payable (long-term)	475,869
		Total liabilities	580,933
Long-term assets:			
Land	500,000	**Stockholders' Equity**	
Equipment	62,000	Common stock	20,000
Accumulated depreciation	(25,250)	Retained earnings	69,285
		Total stockholders' equity	89,285
Total assets	$670,218	Total liabilities and stockholders' equity	$670,218

Additional Perspective 9-1 (in General Ledger, concluded)

Dec. 31, 2022	Debit	Credit
Service Revenue	**44,500**	
Sales Revenue	**120,000**	
Interest Revenue	**120**	
Sales Discounts		**350**
Retained Earnings		**164,270**
(*Close revenue accounts*)		
Dec. 31, 2022		
Retained Earnings	**128,435**	
Cost of Goods Sold		**38,500**
Depreciation Expense		**17,250**
Insurance Expense		**5,700**
Rent Expense		**2,400**
Salaries Expense		**24,000**
Supplies Expense		**500**
Bad Debt Expense		**2,400**
Repairs and Maintenance Expense		**400**
Warranty Expense		**4,000**
Loss		**12,000**
Interest Expense		**6,785**
Income Tax Expense		**14,500**
(*Close expense accounts*)		

Financial Analysis: American Eagle

AP9-2

($ in thousands)

Requirement 1

	Total Liabilities	÷	Stockholders' Equity	=	Debt to Equity Ratio
2018	$569,522	÷	$1,246,791	=	0.46
2017	$578,091	÷	$1,204,569	=	0.48

The ratio **decreased** in the more recent year.

Requirement 2

	Net Income	÷	Average Total Assets	=	Return on Assets
2018	$204,163	÷	($1,816,313 + 1,782,660)/2	=	11.3%

This rate **exceeds** the approximate cost of borrowing.

Requirement 3

The bankruptcy risk of American Eagle is **low**. The company carries very little debt and has several large lines of credit that it could use to borrow in the future if necessary.

Financial Analysis: Buckle

AP9-3

($ in thousands)

Requirement 1

	Total Liabilities	÷	Stockholders' Equity	=	Debt to Equity Ratio
2018	$146,868	÷	$391,248	=	0.38
2017	$149,308	÷	$430,539	=	0.35

The ratio **increased** in the more recent year.

Requirement 2

	Net Income	÷	Average Total Assets	=	Return on Assets
2018	$89,707	÷	($538,116 + $579,847)/2	=	16.0%

This rate **exceeds** the approximate cost of borrowing.

Requirement 3

The bankruptcy risk of The Buckle is **low**. The company carries no bank borrowings and has an unsecured line of credit that it could use to borrow in the future if necessary.

Comparative Analysis: American Eagle vs. Buckle

AP9-4

($ in thousands)

Requirement 1

	Total Liabilities	÷	Stockholders' Equity	=	Debt to Equity Ratio
American Eagle	$569,522	÷	$1,246,791	=	0.46
Buckle	$146,868	÷	$391,248	=	0.38

American Eagle has a riskier (higher) debt to equity ratio. The ratios are both much **lower** than those for Coca-Cola and Pepsi reported in the chapter. The soft-drink industry maintains a higher debt to equity ratio than the retail clothing industry.

Requirement 2

	Net Income	÷	Average Total Assets	=	Return on Assets Ratio
American Eagle	$204,163	÷	($1,816,313 + 1,782,660)/2	=	11.3%
Buckle	$89,707	÷	($538,116 + $579,847)/2	=	16.0%

Buckle appears more profitable.

Ethics

AP9-5

1. Current liabilities are understated and long-term liabilities are overstated by $447,116.
Current liabilities are defined as debt that is due within one year of the balance sheet date. Because $447,116 of the principal will be paid in the following year, this portion of the long-term note should be classified as current.

2.

	Current Ratio		**Debt to Equity Ratio**	
	Current Assets/ Current Liabilities		Total Liabilities / Total Equity	
With Jim's suggestion	$3,100,000 / $2,700,000	= 1.15	$5,283,026 / $4,000,000	= 1.32
Without Jim's suggestion	$3,100,000 / $3,147,116	= 0.99	$5,283,026 / $4,000,000	= 1.32

3. Yes.
By misclassifying the current portion of the note as part of long-term liabilities, the current ratio is overstated. Thus, the company's ability to pay its debt in the following year is overstated. Lenders may not understand the company's true ability to pay debt. The expectation of using long-term profits to pay long-term debt is not a justification for the misclassification. There are no guarantees that those profits will exist, and to the extent the company cannot pay its debt in the following year, longer-term profits are not helpful. The debt to equity ratio does not reveal this misclassification because the numerator is total liabilities. Whether the debt is classified as current or long-term has no effect on the reported amount of total liabilities.

4. No.
The portion of the note that is due within one year of the balance sheet date ($447,116) should be reported as a current liability. The portion of the note due in more than one year should be classified as a long-term liability ($2,135,910 = $2,583,026 − $447,116).

Internet Research

AP9-6

This case provides an opportunity for students to learn more about credit ratings at Standard & Poor's. This case also allows students to access current items in the business press. Answers to the assignment will vary depending on the news items chosen.

Written Communication

AP9-7

Requirement 1

A company that borrows by issuing bonds is effectively by-passing the bank and borrowing directly from the investing public, usually at a lower interest rate than it would in a bank loan. However, issuing bonds entails significant bond issue costs for the underwriter, legal fees, and accounting costs. For smaller loans, the additional bond issuance costs exceed the savings from a lower interest rate, making it more economical to borrow from a bank. For loans of $20 million or more, the interest rate savings often exceed the additional bond issuance costs, making a bond issue more attractive.

Requirement 2

One of the primary reasons for issuing bonds over issuing common stock relates to taxes. Interest expense incurred when borrowing money is tax deductible, while dividends paid to stockholders are *not* tax deductible. Therefore, debt can be a less costly form of financing.

Requirement 3

The price of a bond is calculated as the present value of the principal (the face amount on the bond due at maturity) *plus* the present value of the periodic interest payments. The stated rate is used to calculate the periodic interest payment each period. The market rate is used to calculate the present value of the principal and periodic interest payments.

Earnings Management

AP9-8

Requirement 1

Calculator Input

Bond Characteristics	Key	Amount	
1. Face amount	FV	$100,000,000	
2. Interest payment	PMT	$3,000,000	= $100,000,000 × 6% × ½ year
3. Periods to maturity	N	30	= 15 years × 2 periods each year
4. Market interest rate	I	2.5%	= 5% / 2 periods each year

Calculator Output

Issue price	PV	$110,465,146

Requirement 2

Calculator Input

Bond Characteristics	Key	Amount	
1. Face amount	FV	$100,000,000	
2. Interest payment	PMT	$3,000,000	= $100,000,000 × 6% × ½ year
3. Periods to maturity	N	20	= 10 years × 2 periods each year
4. Market interest rate	I	2.5%	= 5% / 2 periods each year

Calculator Output

Issue price	PV	$107,794,581

Requirement 3

Bond Characteristics	Key	Calculator Input Amount	
1. Face amount	FV	$100,000,000	
2. Interest payment	PMT	$3,000,000	= $100,000,000 × 6% × ½ year
3. Periods to maturity	N	20	= 10 years × 2 periods each year
4. Market interest rate	I	4.5%	= 9% / 2 periods each year

Calculator Output			
Issue price	PV	$80,488,095	

Requirement 4

December 31, 2021

Bonds Payable	**100,000,000**	
Premium on Bonds Payable	**7,794,581**	
Gain		**27,306,486**
Cash		**80,488,095**
(Retire bonds before maturity)		

The transaction increases net income by the amount of the gain, $27,306,486.

Requirement 5

No.

Investors likely would not agree with David Plesko's plan. To report the $27 million gain on repurchase, the company must give up bonds costing only $6 million ($100 million times 6%) in interest each year and reissue new bonds requiring the payment of $9 million ($100 million times 9%) in interest each year. The additional interest cost of $3 million each year will reduce the company's cash flows.