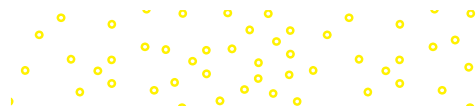


Practical Business Math Procedures





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PRACTICAL BUSINESS MATH PROCEDURES, FOURTEENTH EDITION

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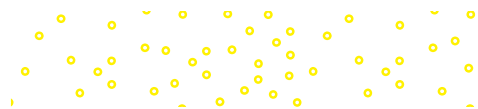
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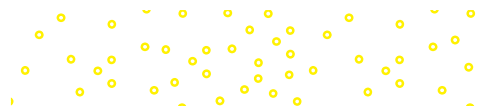


Dedication

To my loyal dogs Bernie and Fejji for fetching the *Wall Street Journal* for me so I could find new clips for this edition.
Love, Jeff

To Hanna, I could not be more proud.

Love, Sharon (Gma D)



Note to Students

ROADMAP TO SUCCESS

Step 1: Read “Your Guide to Successfully Completing This Chapter” at the beginning of each chapter. Each chapter is broken down into Learning Units. Read and master one Learning Unit at a time.

- How do I know whether I understand it?
- Try the Practice Quiz. All the worked-out solutions are provided. If you still have questions, watch the author videos in Connect, or get the information from your instructor and work each problem out.
 - Repeat the above until you understand.

Once you feel confident with the subject matter, go on to the next Learning Unit in the chapter.

Step 2: Review the Interactive Chapter Organizer at the end of the chapter.

- How do I know if I understand it?
- The third column, “You try it,” gives you the chance to do additional practice.

Step 3: Do assigned problems at the end of the chapter (or Appendix A). These may include discussion questions, drill, word problems, challenge problems, as well as projects from My Money and Kiplinger’s magazine.

- Can I check my homework?
- Appendix B has check figures for all the odd-numbered problems.

Step 4: Complete the “Interactive Video Worksheet” near the end of the chapter while completing the Summary Practice Test.

- Can I check my progress?
- Complete the Summary Practice Test. Check solutions from videos in Connect.
- What do I do if I do not match check figures?
- Review the video tutorial in Connect, or through information from your instructor—the authors work out each problem.

To aid you in studying the book, we have developed the following color code:

- Blue:** Movement, cancellations, steps to solve, arrows, blueprints
- Purple and yellow:** Formulas and steps
- Green:** Tables and forms
- Red:** Key items we are solving for

If you have difficulty with any text examples, pay special attention to the red and the blue. These will help remind you of what you are looking for as well as what the procedures are.

FEATURES

Blueprint Aid Boxes

For the first eight chapters (not in Chapter 4), blueprint aid boxes are available to help you map out a plan to solve a word problem. We know the hardest part of solving word problems is often figuring out where to start. Use the blueprint as a model to get started.

Business Math Handbook

This reference guide contains all the tables found in the text. It makes homework, exams, etc., easier to deal with than flipping back and forth through the text.

Interactive Chapter Organizer

At the end of each chapter is a quick reference guide called the Interactive Chapter Organizer, in which key points, formulas, and examples are provided. A list of vocabulary terms is also included. A column called “You try it” gives you a chance to do additional practice. And solutions are provided in Appendix B. (A complete glossary is found at the end of the text.) Think of the Interactive Chapter Organizer as your set of notes and use it as a reference when doing homework problems and reviewing before exams.



For **extra help** from your authors—Sharon and Jeff—see the videos in Connect.

Additionally, a series of author-created tutorial videos are available in Connect, or you can check with your instructor for more information. The videos cover all of the Learning Unit Practice Quizzes and Summary Practice Tests.

Your Guide to Successfully Completing This Chapter

Each chapter begins with a plan for you to follow to help you master the content.

Group Activity: Personal Finance, a Kiplinger Approach

In each chapter you can debate a business math issue based on a *Kiplinger’s Personal Finance* magazine article. This is great for critical thinking, as well as improving your writing skills.

Spreadsheet Templates

Excel® templates are available for selected end-of-chapter problems. You can run these templates as-is or enter your own data. The templates also include an interest table feature that enables you to input any percentage rate and any terms. The program then generates table values for you.

Cumulative Reviews

At the end of Chapters 3, 8, and 13 are word problems that test your retention of business math concepts and procedures. Check figures for *all* cumulative review problems are in Appendix B.

Vocabulary

Each chapter includes highlighted words covering the key terms in the chapter. The Interactive Chapter Organizer includes a list of the terms. There’s also a glossary at the end of the text.

Interactive Video Worksheet

At the end of each chapter is an interactive worksheet allowing you to work through the Summary Practice Test to success.

My Money

Each chapter has a personal finance page applying the concepts from the chapter toward personal finance success.

Money Tips

Throughout each chapter are tips applying the concepts from the chapter toward personal finance.

Interactive Calendar

In the front of the text is a 12-month calendar with daily personal recommendations: financial, health, personal and factoids.

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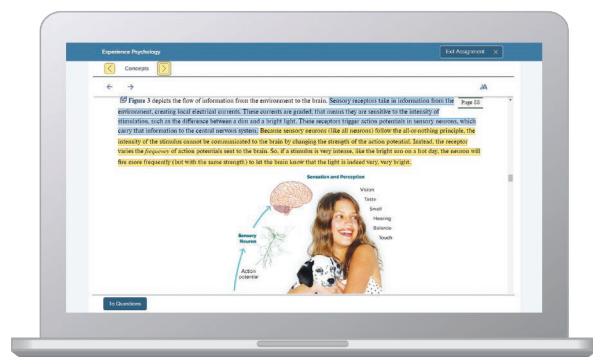


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"I really liked this app—it made it easy to study when you don't have your textbook in front of you."

- Jordan Cunningham,
Eastern Washington University



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Everything you need in one place

Your Connect course has everything you need—whether reading on your digital eBook or completing assignments for class, Connect makes it easy to get your work done.

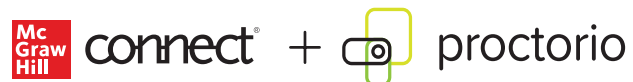
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Remote Proctoring & Browser-Locking Capabilities



New remote proctoring and browser-locking capabilities, hosted by Proctorio within Connect, provide control of the assessment environment by enabling security options and verifying the identity of the student.

Seamlessly integrated within Connect, these services allow instructors to control students' assessment experience by restricting browser activity, recording students' activity, and verifying students are doing their own work.

Instant and detailed reporting gives instructors an at-a-glance view of potential academic integrity concerns, thereby avoiding personal bias and supporting evidence-based claims.

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Company/Applications

Chapter 1

T-Mobile, Walmart—*Introduction*
Walt Disney—*Introduction; Multiplying and dividing whole numbers; Reading, writing and rounding whole numbers*

Chapter 2

Amazon—*Introduction; Types of fractions and conversion procedures*
M&Ms/Mars—*Fractions and multiplication*

Chapter 3

Lyft—*Introduction*
Netflix, Hulu—*Adding, subtracting, multiplying and dividing decimals*
Toyota, Sears—*Multiplication and division shortcuts for decimals*

Chapter 4

Ipswich Bank—*Checking account*

Chapter 5

Amazon—*Introduction*
Dunkin’ Donuts—*Solving word problems for the unknown*

Chapter 6

Clorox—*Introduction*
Hershey—*Application of percents-portion formula*
Hasbro, PepsiCo—*Rounding percents*
Proctor & Gamble—*Calculating percent increases and decreases*

Chapter 7

UPS, Wal-Mart, Amazon—*Introduction*
Michael’s—*Discounts*

Chapter 8

Gap—*Introduction*
Lululemon—*Markdowns and perishables*

Chapter 9

Hilton, Facebook—*Introduction*
IRS—*Computing payroll deductions*

Chapter 10

Consumer Federation of America—*Personal Finance: A Kiplinger Approach*

Chapter 11

JPMorgan, Wells Fargo—*Introduction*
The Gap—*Discounting an Interest-Bearing Note before Maturity*

Chapter 12

T. Rowe Price—*Personal Finance: A Kiplinger Approach*

Chapter 13

Boston Globe—*Introduction*
Fidelity—*Personal Finance: A Kiplinger Approach*

Chapter 14

Carvana—*Introduction*
Ford—*Amount financed, finance charge, and deferred payment*
Edmunds—*Truth in lending: APR defined and calculated*
Citibank—*Calculate finance charge on previous month’s balance*

Chapter 15

Federal Reserve—*Introduction*

Chapter 16

Kraft Heinz—*Introduction*
Marriott, Macy’s, Delta Airlines—*Ratio analysis*

Chapter 17

General Motors—*Introduction*

Chapter 18

Channel Capital Advisor—*Introduction*

Chapter 19

BDO U.S.A.—*Introduction*

Chapter 20

Zebra Insurance—*Personal Finance: A Kiplinger Approach*

Chapter 21

Tesla—*Introduction*
Hershey—*How to read stock quotations*
Franklin Templeton, Fidelity Investments—*How to read a mutual fund quotation*
GameStop—*End of chapter*

Chapter 22

National Small Business Association—*Introduction*
McKinsey—*Personal Finance: A Kiplinger Approach*

January

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 New Year's Day: Sit back, relax, enjoy start to new year
2 Review last year's goals/ accomplishments	3 Start new receipt file. Save receipts as proof of purchase for all high dollar items; Drink 8 glasses of water per day	4 Start year's tax spreadsheet; Think about what your ideal retirement looks like	5 Make a snow/ sand angel; Recognize "Stronger together"	6 Plan bulk purchases for year: TP, tissue	7 Buy online day!!!; Recycle	8 Make a plan for how to pay each debt off; Set annual goals: specific, quantifiable, realistic, with due dates
9 Create vision board from goals set; Pay down debt	10 Set a personal milestone; Stretch daily	11 Reconcile last month's bank statement; Search online for coupons and savings	12 Make all health and beauty appointments for year	13 Create study plan; Get 7-9 hours of sleep each night	14 Buy a variety of cards for the year: birthday, thank you, wedding, anniversary	15 Review your will. Create a letter of instruction and write letters to your loved ones and keep with your will.; Martin Luther King ("I Have a Dream" speech August 28, 1963) born 1929
16 Netflix begins video streaming 2007; Buy online day!!!	17 Review beneficiaries for investment accounts and insurance policies; Wear warm socks; Study	18 Contribute to 9-month emergency fund; Exercise 3 times a week for 30 minutes	19 Get repaired what needs to be repaired: hem pants, clean upholstery, wash walls and windows, etc.	20 Schedule automatic payment of bills for the year; Franklin Delano Roosevelt inaugurated to 4 th term	21 Eat a balanced diet; Set-up and contribute to investment account	22 Buy a stock of thank you gifts; One race: Human
23 Automate savings; Obtain free credit report from annualcreditreport. com for TransUnion	24 Build a credit score of greater than 740. Start today.; Winston Churchill died at 90 in 1965	25 Take your blood pressure; Recycle	26 Diversify your investment portfolio; Splurge!	27 Control your debt. Review your credit card's year-end summary; Mozart born in 1756	28 U.S. Space Shuttle Challenger exploded 1986	29 Buy online day!!!; Review each paystub
30 Manage your stress; Update budget for February	31 Review your credit card balances. Work to pay them off.; Jackie Robinson born 1919					

● "Financial" items

● "Health" items

● "Personal" items

● "Factoid" items

February



Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 The Space Shuttle Columbia broke apart sixteen minutes prior to landing 2003
2 Review budget and make necessary alterations	3 Pay down debt; The 15th Amendment was ratified guaranteeing the right for all citizens to vote 1870	4 Reconcile last month's bank statement; Study	5 Drink 8 glasses of water per day; Recycle	6 Princess Elizabeth becomes Queen Elizabeth II 1952	7 Make a video of the contents of your home for documentation and put this in a safe place offsite.; Charles Dickens born 1812	8 Buy online day!!!; Set a personal milestone.
9 Negotiate a large purchase saving you money	10 Stretch daily; Contribute to investment account	11 Nelson Mandela is released from prison at 71 after serving 27 years 1990	12 Abraham Lincoln born 1809	13 Do your part. Go Green. Recycle.	14 Review all insurance policies. Check you have the right coverages.; Don't text and drive.	15 Eat a balanced diet; Manage your stress
16 Drive carefully. Tickets and accidents greatly affect insurance premiums.; Buy online day!!!	17 Keep passwords safe and don't share; Apache Chief Geronimo dies in captivity 1909	18 Photograph VIN and serial #'s and keep on a memory card offsite.; Exercise 3 times a week for 30 minutes	19 Unplug electronics when they are not in use; Study	20 File your taxes early to prevent a scammer from collecting your refund.; Contribute to 9-month emergency fund	21 Protect against identity theft. Consider putting a freeze on your credit.	22 Always read thoroughly anything before signing. Read the fine print, too.
23 Review your financial institutions' interest rates and fees to ensure you have the best available	24 Get 7–9 hours of sleep each night	25 Take your blood pressure; Study	26 Recognize "Stronger together"	27 Buy online day!!!	28 Update budget for March; Review each paystub	29 Leap year: Buy online day bonus!!!

"Financial" items

"Health" items

"Personal" items

"Factoid" items

March



Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 Negativity is contagious, spend your valuable time with positive people; President John F. Kennedy established the Peace Corps in 1961
2 Social media hits 1 million users with My Space 2000	3 Drink 8 glasses of water per day	4 Reconcile last month's bank statement; Spanish Flu spreads to America 1918	5 Join suzeorman.com's email list; Stop overthinking	6 Earn your degree. It will pay off.; Michelangelo was born in 1475	7 Buy online day!!!; Study	8 Review vision board and goals set in January
9 Pay down debt; Recycle	10 Express gratitude; First issue of U.S. government paper money, \$5, \$10 and \$20 1862	11 Protect your children and dependents. Buy life insurance.	12 Share household work and child caregiving with your spouse.; Get 7–9 hours of sleep each night	13 Teach your kids about money management, the dangers of drugs and alcohol, and healthy eating and exercise habits.; Contribute to investment account	14 Recognize “Stronger together”; Albert Einstein born 1879 and was behind the “Manhattan Project”	15 Once your child turns 18 make certain to complete these two legal docs: a Financial Power of Attorney and a Durable Power of Attorney for Health Care.; Ruth Bader Ginsburg, Supreme Court Justice, born 1933
16 One race: Human; Study	17 Buy online day!!!	18 Exercise 3 times a week for 30 minutes	19 Consider a living revocable trust for tax purposes and ease of asset transfer.; Swallows of Capistrano return	20 Set a personal milestone; Recycle	21 Eat a balanced diet; Johann Sebastian Bach born 1685	22 Gather documentation for income taxes due next month
23 Patrick Henry ignited the American Revolution with his famous speech, “...give me liberty, or give me death!” 1775	24 Contribute to 9-month emergency fund	25 Take your blood pressure; British Parliament abolished slave trade 1807	26 Vietnam Veterans Memorial 1982; “If you've lost yourself in the relationship; find yourself in the heartbreak.” Unknown	27 Negotiate!!! 9 out of 10 who ask for a discount get it	28 Stretch daily; Manage your stress; Study	29 Buy online day!!!
30 Update budget for April; Vincent Van Gogh born 1853	31 Review each paystub; Boxing champion Jack Johnson born 1878					

● “Financial” items

● “Health” items

● “Personal” items

● “Factoid” items

April



Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 Contribute to 9-month emergency fund
2 First U.S. mint established in Philadelphia 1792	3 Pony Express began in 1860 delivering letters 2,000 miles away within 10 days for \$5 per ounce.	4 Drink 8 glasses of water per day; Study	5 “Plant trees under whose shade you do not plan to sit.” Nelson Henderson	6 First Olympics held in Athens, Greece 1896 after a 1,500 year break; Explorer Robert E. Peary reaches North Pole 1909	7 Buy online day!!!	8 Contribute the maximum amount you can to your retirement plans to defer taxes and save for retirement; Recycle
9 Study; Civil War ends 1865	10 Recognize “Stronger together”	11 Reconcile last month's bank statement; Civil Rights Act of 1968 signed into law; Apollo 13 launched, astronauts return safely to earth in lunar module: “Houston, we’ve had a problem here.” 1970	12 American Civil War began 1861 when Confederate troops opened fire on Fort Sumter	13 Pay down debt; Stretch daily	14 Review your W4. Are you having enough money withheld? Set a personal milestone	15 Submit income taxes; Titanic sinks at 2:27 am after hitting an iceberg 1912
16 Buy online day!!!	17 Review vision board and goals set	18 Exercise 3 times a week for 30 minutes; San Francisco Earthquake 1906	19 Study; Recycle	20 Contribute to investment account	21 Eat a balanced diet	22 Prepare or review your will, living revocable trust, advanced directive, durable power of attorney for healthcare, financial power of attorney
23 William Shakespeare born 1564	24 Check with your company to see if they match your investments in your 401(k) and if they offer flexible-spending accounts	25 Take your blood pressure; Get 7–9 hours of sleep each night	26 Nelson Mandela awarded Nobel Peace Prize 1993, elected president in South Africa 1994	27 Review all monthly subscription charges and determine if what you pay is worth what you are using; Manage your stress	28 Should you refinance your mortgage? If you can reduce your interest rate by at least 1.5% it may be a good financial idea.	29 Study; Buy online day!!!
30 Review each paystub; Update budget for May						

● “Financial” items

● “Health” items

● “Personal” items

● “Factoid” items

May



Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 You are what you think you are, think BIG!
2 Stretch daily; Study	3 Check out 1st time homebuyers programs; Recycle	4 Protect what you have with insurance; Kent State, 1970	5 Wall Street Crash of 1893	6 Contribute to investment account	7 Buy online day!!!	8 Harry S. Truman born 1884
9 Set a personal milestone; Study	10 Union Pacific and Central Pacific railway tracks linked at Promontory Point, UT 1869	11 Reconcile last month's bank statement	12 Drink 8 glasses of water per day	13 "You don't have to have to give." Unknown	14 Recognize "Stronger together"; First permanent English settlement in America was established at Jamestown, VA 1607; Lewis and Clark depart on their 6,000 mile exploration 1804	15 Obtain free credit report from annualcreditreport.com for Experian; Study
16 Buy online day!!!	17 Brown v. Board of Education: U.S. Supreme Court unanimous rule: racial segregation in public schools is unconstitutional 1954	18 Exercise 3 times a week for 30 minutes; Mt. St Helens erupts 1980	19 Forgive yourself	20 "Lucky Lindy" Charles Lindbergh, 25, lands in Paris after first solo non-stop trans-Atlantic flight 1927; Amelia Earhart first woman to fly solo across the Atlantic 1932	21 Study; Eat a balanced diet; Get 7-9 hours of sleep each night	22 Forgive others
23 Determine if you can pay more toward your mortgage or installment loans; Recycle	24 Contribute to 9-month emergency fund	25 Take your blood pressure; Manage your stress	26 Dunkirk evacuation 1940	27 At 50 get a colonoscopy; Golden Gate Bridge opens 1937	28 Amnesty International founded by London barrister Peter Berenson 1961	29 Buy online day!!!
30 Update budget for June; Lincoln Memorial dedicated in Washington, D.C. 1922	31 Review each paystub; Pay down debt					

"Financial" items

"Health" items

"Personal" items

"Factoid" items

June

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 "Fear does not prevent death, it prevents life." Buddha
2 Drink 8 glasses of water per day	3 Pay down debt; Stretch daily	4 Tiananmen Square in Beijing 1989	5 Adam Smith, "Wealth of Nations" born 1723	6 D-Day in Normandy 1944	7 Buy online day!!!	8 Have your cholesterol tested; Set a personal milestone
9 One race: Human	10 Recognize "Stronger together"	11 Reconcile last month's bank statement	12 Anne Frank born 1929	13 Get 7–9 hours of sleep each night	14 First commercial electronic computer unveiled 1951	15 Review vision board and goals set in January
16 Buy online day!!!; Recycle	17 Remind your executor where your estate planning documents are.; Contribute to investment account	18 Exercise 3 times a week for 30 minutes; Napoleon defeated after 23 years of warfare in Europe near Waterloo 1815	19 Manage your stress; Contribute to 9-month emergency fund	20 Review burial or life insurance	21 Eat a balanced diet; Recycle	22 Double check invoices: 9 out of 10 contain errors
23 Review your smartphone contract to ensure it is meeting your needs	24 Look at what expenses you can eliminate	25 Take your blood pressure	26 Same sex marriages legalized by U.S. Supreme Court 2015; Splurge!	27 Mildred J. Hill, musician who wrote the melody for "Happy Birthday to You" born 1859	28 Archduke Francis Ferdinand, Crown Prince of Austria, is assassinated in Sarajevo escalating into WWI 1914; Treaty of Versailles signed ending WWI 1919	29 Make 13 mortgage payments every year; Buy online day!!!
30 Review each paystub; Update budget for July						

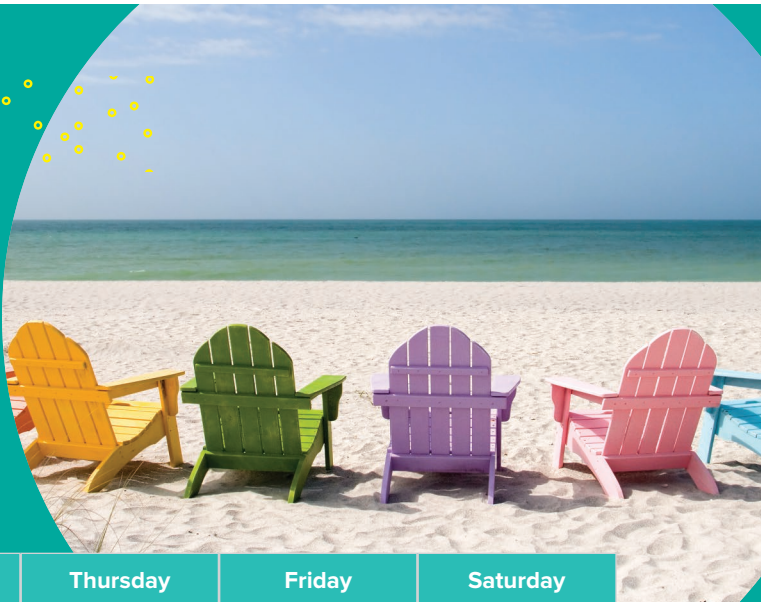
● "Financial" items

● "Health" items

● "Personal" items

● "Factoid" items

July



Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 Sovereignty of Hong Kong reverts to China from Britain 1997; President Lincoln signed into law the first income tax bill levying 3%-5% tax on annual incomes. 1862
2 Civil Rights Act of 1964 signed by Lyndon B. Johnson	3 Drink 8 glasses of water per day	4 The Declaration of Independence approved 1776	5 Set a personal milestone; Recycle	6 Louis Pasteur gave the first successful anti-rabies shot to a child 1885	7 Buy online day!!!	8 Plan your estate; Get 7–9 hours of sleep each night
9 One race: Human; Smile	10 Contribute to investment account	11 Reconcile last month's bank statement; Take your blood pressure	12 Stretch daily; Protect your identity	13 Contribute to 9-month emergency fund	14 Recognize “Stronger together”; Fall of the Bastille beginning the French Revolution 1789	15 Manage your stress; Pay down debt
16 Buy online day!!!; Apollo 11 liftoff for Lunar landing mission 1969	17 Check to see if you have 20% equity in your home and contact your PMI carrier to get rid of it.	18 Exercise 3 times a week for 30 minutes	19 Want a second income? Explore business ideas.	20 Astronaut Neil Armstrong, Apollo 11, walked on the moon 1969	21 Eat a balanced diet; Ernest Hemingway born 1899	22 Recycle; Read
23 Calculate your net worth. It should be close to: (Your age x Pre-tax income)/10	24 Track overhead expenses. Make adjustments where needed	25 Italian luxury liner <i>Andrea Doria</i> sank after colliding with <i>Stockholm</i> 1956	26 Splurge!	27 Manage your stress; Korean War ended 1953	28 Review your property tax assessment annually and appeal if it is too high.	29 Buy online day!!!
30 Update budget for August; Henry Ford born 1863	31 Review each paystub					

● “Financial” items

● “Health” items

● “Personal” items

● “Factoid” items

August



Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 One race: Human; Save 20% of all money received
2 Stretch daily; Read <i>The Richest Man in Babylon</i> by George S Clason	3 Contribute to investment account	4 Barack Obama born 1961, first African-American to become President	5 Recycle; Everything in moderation	6 Atomic bomb dropped over Hiroshima 1945; Alexander Fleming penicillin discoverer born 1881	7 Buy online day!!!; International spy Mata Hari born 1876	8 Contribute to 9-month emergency fund
9 Atomic bomb dropped over Nagasaki 1945; President Nixon resigns due to Watergate 1974	10 Set a personal milestone; take care of you	11 Reconcile last month's bank statement; <u>Roots</u> author Alex Haley born 1921	12 Drink 8 glasses of water per day	13 Recycle; Recognize how we spend our days is how we spend our lives	14 V-J (Victory over Japan) Day end of WWII: President Truman announced Japan surrendered 1945	15 Woodstock 1969
16 Buy online day!!!	17 Review vision board and goals set in January	18 Exercise 3 times a week for 30 minutes; 19th Amendment ratified giving women the right to vote 1920	19 Pay down debt; Study	20 Social media and mobile technology help develop the sharing economy- Airbnb launched 2008	21 Eat a balanced diet; Manage your stress	22 Recognize "Stronger together"
23 Create study plan	24 Mt. Vesuvius erupted destroying Pompeii 79 A.D.	25 Get 7–9 hours of sleep each night; Take your blood pressure	26 Splurge!	27 Study; Mother Teresa born 1910	28 Look into daveramsey. com's Financial Peace University	29 Buy online day!!!; Soviet Communist Party in Russia suspended 1991
30 Update budget for September	31 Review each paystub					

● “Financial” items

● “Health” items

● “Personal” items

● “Factoid” items

September

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 Study; Stretch daily
2 Recycle	3 The Treaty of Paris was signed ending the American Revolutionary War, 1783	4 Reconcile last month's bank statement	5 Set a personal milestone	6 Leningrad, named in honor of Lenin, was renamed Saint Petersburg 1991	7 Buy online day!!!	8 Get 7–9 hours of sleep each night
9 Obtain free credit report from annualcreditreport.com for Equifax	10 Recognize “Stronger together”	11 9/11 2001	12 Jesse Owens, 4-Olympic medal winner born 1913	13 Contribute to investment account	14 OPEC formed 1960	15 Contribute to 9-month emergency fund
16 Buy online day!!!; Mayflower set sail 1620 disembarking at Plymouth December 26	17 Study; Pay down debt	18 Exercise 3 times a week for 30 minutes	19 Keep the amount of all insurance policy deductibles in an interest-earning account with easy access.	20 Considering deferring/ suspending loan payments? Be aware this will affect your credit score.	21 Eat a balanced diet; Take your blood pressure	22 Recycle
23 Only financial advisors who operate as fiduciaries promise to always put the client's interest first.	24 Study; Cancel memberships you don't use.	25 Drink 8 glasses of water per day; Manage your stress	26 Splurge!	27 Continue to invest even when the stock market is falling. You can buy more shares for the price.	28 Buy online day!!!	29 Stock market crash-DJIA fell 777.68% 2008
30 Review each paystub; Update budget for October						

● “Financial” items

● “Health” items

● “Personal” items

● “Factoid” items

October



Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 Model T goes on sale for the first time 1908; Panama Canal is controlled by Panama instead of the U.S. for first time 1979
2 Thurgood Marshall sworn in as first African-American U.S. Supreme Court associate justice 1967; Mahatma Gandhi born 1869	3 Study; East and West Germany are reunited 1990	4 Space Age began with first satellite sent into orbit: Russia's 184 pound Sputnik I 1957	5 Pay down debt; Recycle	6 Contribute to investment account	7 Buy online day!!!	8 Get 7–9 hours of sleep each night
9 Contribute to 9-month emergency fund	10 Set a personal milestone; Recycle	11 Study; Reconcile last month's bank statement	12 Calculate your debt to income ratio: should be less than 36%	13 George Washington lays cornerstone of White House 1792 which was burned by British in 1812 reconstructed and reoccupied 1817	14 Stretch daily; Take your blood pressure	15 Consider using a personal finance app such as Mint.com
16 Buy online day!!!; Yale University founded 1701	17 Calculate how much you would owe in the event of a car accident with your current insurance coverage.	18 Exercise 3 times a week for 30 minutes; Manage your stress	19 British Army surrender to Americans at Yorktown 1781; "Black Monday" occurred on Wall Street 1987	20 Study; Review vision board and goals set in January	21 Eat a balanced diet; Minimize or eliminate smoking	22 Recognize "Stronger together"
23 Don't share personal information with anyone you do not know; Spend less than you earn.	24 United Nations founded 1945	25 Protect yourself from scams. Do your homework.; Drink 8 glasses of water per day	26 Splurge!	27 The New York City subway began running 1904	28 Harvard University founded 1636; Prohibition began 1919 lasting 14 years	29 Buy online day!!!; "Black Tuesday" stock market crash leading to the Great Depression 1929
30 Update budget for November; Rail tunnel under English Channel completed 1990	31 Study; Review each paystub					

● "Financial" items

● "Health" items

● "Personal" items

● "Factoid" items

November



Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 European Union created in Maastricht Treaty 1993
2 Study; Contribute to investment account	3 Reconcile last month's bank statement	4 Stretch daily; Manage your stress	5 Recognize "Stronger together"	6 Contribute to 9-month emergency fund	7 Buy online day!!!	8 Set a personal milestone; Recycle
9 The 27.9 mile Berlin Wall fell 1989	10 Minimize or eliminate alcohol intake; Pay down debt	11 Armistice ending WWI "the 11th hour of the 11th day of the 11th month" 1918; U.S. ended its participation in the Vietnam War 1972	12 Drink 8 glasses of water per day; Take your blood pressure	13 U.S. Supreme Court ruled racial segregation on public buses was unconstitutional 1956	14 Study; French painter Claude Monet born 1840	15 Do not overspend during the holidays. Give gifts you can afford.
16 Buy online day!!!	17 Suez Canal opened 1869; NAFTA approved 1993	18 Exercise 3 times a week for 30 minutes; Read "Millionaire Teacher" by Andrew Hallam	19 Study; Recycle	20 Buying a car? Consider a used car and never take a loan for more than 3 or 4 years.	21 Eat a balanced diet; Get 7-9 hours of sleep each night	22 Send your child to college with a credit card and help them build their credit. Monitor use.
23 Pass up purchases you don't need	24 Charles Darwin book on natural selection is published 1859 after a 5-year scientific expedition beginning in 1831	25 Wait until you are 70 to start collecting Social Security. You will receive 76% more than the benefit that you get if you claim at age 62.	26 Splurge!	27 Study; Conduct an annual review of your health insurance plan	28 Ensure you have overdraft protection for each checking or draft account	29 Buy online day!!!
30 Review each paystub; Update budget for December						

● "Financial" items

● "Health" items

● "Personal" items

● "Factoid" items

December

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 Rosa Parks was arrested in Montgomery, AL 1955
2 Contribute to investment account	3 Drink 8 glasses of water per day	4 Set a personal milestone	5 Study; Walt Disney born in Chicago, IL 1901	6 13 th Amendment was ratified abolishing slavery 1865	7 “A day that will live in infamy”, FDR. Pearl Harbor attacked 1941	8 U.S. and Britain declare war on Japan 1941; USSR ceases to exist 1991
9 Buy online day!!!	10 Reconcile last month’s bank statement	11 Italy and Germany declare war on the U.S. 1941	12 Protect against identity theft. Consider putting a freeze on your credit.; Stretch daily	13 Pay down debt; Recycle	14 Recognize “Stronger together”; Norwegian explorer Roald Amundsen is the first person to reach the South Pole 1911	15 GATT approved by 117 countries 1993; Visit holiday light displays carrying your favorite warm beverage
16 Ludwig van Beethoven born 1770; Jane Austen born 1775	17 Wilbur and Orville Wright first motor driven aircraft flight 1903	18 Exercise 3 times a week for 30 minutes	19 Buy online day!!!	20 Recycle	21 Eat a balanced diet	22 One race: Human
23 Splurge!	24 Contribute to 9-month emergency fund	25 Get 7–9 hours of sleep each night; Take your blood pressure	26 9.3 earthquake followed by tsunamis hit dozens of countries including Thailand 2004	27 International Monetary Fund, IMF established 1945	28 Manage your stress	29 Buy online day!!!
30 Review each paystub; Create annual budget for the new year broken down into months	31 New Year’s Eve! Celebrate all the year’s accomplishments.					

● “Financial” items

● “Health” items

● “Personal” items

● “Factoid” items

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Practical Business Math Procedures

CHAPTER 1

Whole Numbers: How to Dissect and Solve Word Problems

Corporations outline pandemic's impact, from pay increases to cleaning supplies

By INTI PACHECO

A food distributor has paid \$20 million for testing and plexiglass. **T-Mobile** US Inc. has spent \$50 million on extra cleaning and safety gear. **Walmart** Inc. and three other big retail chains have put more than \$3 billion into higher salaries, benefits and other Covid-19 measures.

Staying open during the pandemic wasn't cheap. Big companies say they spent anywhere from hundreds of thousands to almost a billion dollars in Covid-19-related costs. Some say they expect the costs to keep rising in coming quarters, even as they face uncertain demand from consumers.

Pacheco, Inti. "Staying Open." *The Wall Street Journal* (June 24, 2020).



LEARNING UNIT OBJECTIVES

LU 1–1: Reading, Writing, and Rounding Whole Numbers

- 1. Use place values to read and write numeric and verbal whole numbers.
- 2. Round whole numbers to the indicated position.
- 3. Use blueprint aid for dissecting and solving a word problem.

LU 1–2: Adding and Subtracting Whole Numbers

- 1. Add whole numbers; check and estimate addition computations.
- 2. Subtract whole numbers; check and estimate subtraction computations.

LU 1–3: Multiplying and Dividing Whole Numbers

- 1. Multiply whole numbers; check and estimate multiplication computations.
- 2. Divide whole numbers; check and estimate division computations.

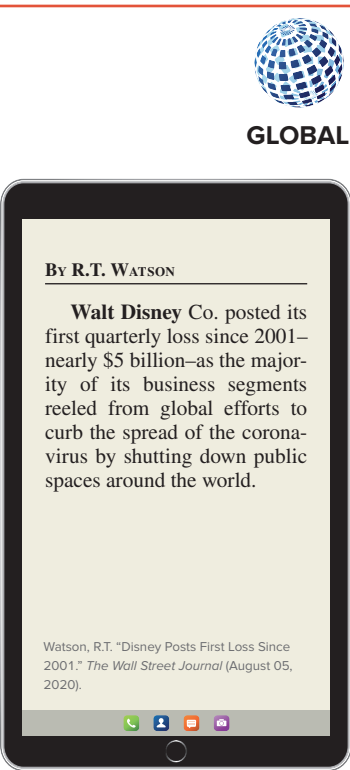
Your Guide to Successfully Completing This Chapter

Traditional book or ebook

Check box as you complete each step.

Steps

- ☐ Read learning unit.
 - ☐ Complete practice quiz at the end of the learning unit. (Video available in Connect.)
- ☐ Grade practice quiz using provided solutions. (For more help, watch the learning unit video in Connect and have a Study Session with the authors. Then complete the additional practice quiz in Connect.)
- ☐ Repeat above for each of the three learning units in Chapter 1.
 - ☐ Review chapter organizer.
 - ☐ Complete assigned homework.
 - ☐ Finish summary practice test. (Go to Connect via the ebook link and do the interactive video worksheet to grade.)
- ☐ Complete instructor’s exam.



The Wall Street Journal chapter opener discusses how expensive Covid-19 has been for retailers. WalMart and three other large retail chains have spent \$3 billion so far because of it. The *Wall Street Journal* clip to the left shows how the pandemic has affected Disney.

People of all ages make personal business decisions based on the answers to number questions. Numbers also determine most of the business decisions of companies. For example, go to the website of a company such as Disney and note the importance of numbers in the company’s business decision-making process.

Disney has to use numbers to see

- 1. The effect of closing parks.
- 2. Profits and losses.
- 3. The expenditures necessary for new-product development.
- 4. Ways to improve customer satisfaction.

Your study of numbers begins with a review of basic computation skills that focuses on speed and accuracy. You may think, “But I can use my calculator.” Even if your instructor allows you to use a calculator, you still must know the basic computation skills. You need these skills to know what to calculate, how to interpret your calculations, how to make estimates to recognize errors you made in using your calculator, and how to make calculations when you do not have a calculator.

The United States' numbering system is the **decimal system** or *base 10 system*. Your calculator gives the 10 single-digit numbers of the decimal system—0, 1, 2, 3, 4, 5, 6, 7, 8, and 9. The center of the decimal system is the **decimal point**. When you have a number with a decimal point, the numbers to the left of the decimal point are **whole numbers** and the numbers to the right of the decimal point are decimal numbers (discussed in Chapter 3). When you have a number *without* a decimal, the number is a whole number and the decimal is assumed to be after the number.

This chapter discusses reading, writing, and rounding whole numbers; adding and subtracting whole numbers; and multiplying and dividing whole numbers.

Learning Unit 1–1: Reading, Writing, and Rounding Whole Numbers

Let's begin our study of whole numbers.

Reading and Writing Numeric and Verbal Whole Numbers

The decimal system is a *place-value system* based on the powers of 10. Any whole number can be written with the 10 digits of the decimal system because the position, or placement, of the digits in a number gives the value of the digits.

To determine the value of each digit in a number, we use a place-value chart (Figure 1.1) that divides numbers into named groups of three digits, with each group separated by a comma. To separate a number into groups, you begin with the last digit in the number and insert commas every three digits, moving from right to left. This divides the number into the named groups (units, thousands, millions, billions, trillions) shown in the place-value chart. Within each group, you have a ones, tens, and hundreds place. Keep in mind that the leftmost group may have fewer than three digits.

In Figure 1.1, the numeric number 1,605,743,891,412 illustrates place values. When you study the place-value chart, you can see that the value of each place in the chart is 10 times the value of the place to the right. We can illustrate this by analyzing the last four digits in the number 1,605,743,891,412:

$$1,412 = (1 \times 1,000) + (4 \times 100) + (1 \times 10) + (2 \times 1)$$

So we can also say, for example, that in the number 745, the “7” means seven hundred (700); in the number 75, the “7” means 7 tens (70), and the “5” means 5 ones (5).

To read and write a numeric number in verbal form, you begin at the left and read each group of three digits as if it were alone, adding the group name at the end (except the last units group and groups of all zeros). Using the place-value chart in Figure 1.1, the number 1,605,743,891,412 is read as one trillion, six hundred five billion, seven hundred forty-three million, eight hundred ninety-one thousand, four hundred twelve. You do not read zeros. They fill vacant spaces as placeholders so that you can correctly state the number values. Also, the numbers twenty-one to ninety-nine must have a hyphen. And most important, when you read or write whole numbers in verbal form, do not use the word *and*. In the decimal system, *and* indicates the decimal, which we discuss in Chapter 3.

FIGURE 1.1

Whole number place-value chart

Trillions				Billions				Millions				Thousands				Units			
Hundred trillions	Ten trillions	Trillions	Comma	Hundred billions	Ten billions	Billions	Comma	Hundred millions	Ten millions	Millions	Comma	Hundred thousands	Ten thousands	Thousands	Comma	Hundreds	Tens	Ones (units)	Decimal Point
		1	.	6	0	5	.	7	4	3	.	8	9	1	.	4	1	2	



GLOBAL



By reversing this process of changing a numeric number to a verbal number, you can use the place-value chart to change a verbal number to a numeric number. Remember that you must keep track of the place value of each digit. The place values of the digits in a number determine its total value.

Before we look at how to round whole numbers, we should look at how to convert a number indicating parts of a whole number to a whole number. We will use the *Wall Street Journal* clip “‘Avengers’ Posts Record \$1.2 Billion Opening” as an example. This amount is 1 billion plus 200 million of an additional billion. The following steps explain how to convert decimal numbers into whole numbers.

CONVERTING PARTS OF A MILLION, BILLION, TRILLION, ETC.,
TO A REGULAR WHOLE NUMBER

- Step 1.** Drop the decimal point and insert a comma.
- Step 2.** Add zeros so the leftmost digit ends in the word name of the amount you want to convert. Be sure to add commas as needed.

EXAMPLE Convert 1.2 million to a regular whole number.

- Step 1.** 1.2 million
- ↓
- 1,2 Change the decimal point to a comma.
- ↓ ↓ ↓ ↓
- Step 2.** 1,200,000 Add zeros and commas so the whole number indicates million.

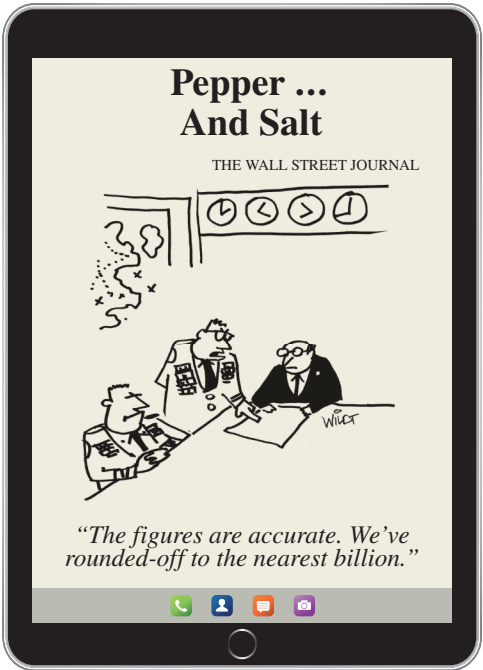
Rounding Whole Numbers

Many of the whole numbers you read and hear are rounded numbers. Government statistics are usually rounded numbers. The financial reports of companies also use rounded numbers. All rounded numbers are *approximate* numbers. The more rounding you do, the more you approximate the number.

Rounded whole numbers are used for many reasons. With rounded whole numbers you can quickly estimate arithmetic results, check actual computations, report numbers that change quickly such as population numbers, and make numbers easier to read and remember.

Numbers can be rounded to any identified digit place value, including the first digit of a number (rounding all the way). To round whole numbers, use the following three steps:

LO 2



Cartoon Collections

ROUNDING WHOLE NUMBERS

- Step 1.** Identify the place value of the digit you want to round.
- Step 2.** If the digit to the right of the identified digit in Step 1 is 5 or more, increase the identified digit by 1 (round up). If the digit to the right is less than 5, do not change the identified digit.
- Step 3.** Change all digits to the right of the rounded identified digit to zeros.

EXAMPLE 1 Round 9,362 to the nearest hundred.

- Step 1.** 9,362 The digit 3 is in the hundreds place value.
- Step 2.** The digit to the right of 3 is 5 or more (6). Thus, 3, the identified digit in Step 1, is now rounded to 4. You change the identified digit only if the digit to the right is 5 or more.
- ↓ ↓ ↓
- 9,462
- Step 3.** 9,400 Change digits 6 and 2 to zeros, since these digits are to the right of 4, the rounded number.

6 Chapter 1 Whole Numbers: How to Dissect and Solve Word Problems

By rounding 9,362 to the nearest hundred, you can see that 9,362 is closer to 9,400 than to 9,300.

Next, we show you how to round to the nearest thousand.

EXAMPLE 2 Round 67,951 to the nearest thousand.

Step 1. 67,951 The digit 7 is in the thousands place value.

Step 2. The digit to the right of 7 is 5 or more (9). Thus, 7, the identified digit in Step 1, is now rounded to 8.

68,951

Step 3. 68,000 Change digits 9, 5, and 1 to zeros, since these digits are to the right of 8, the rounded number.

By rounding 67,951 to the nearest thousand, you can see that 67,951 is closer to 68,000 than to 67,000.

Now let's look at **rounding all the way**. To round a number all the way, you round to the first digit of the number (the leftmost digit) and have only one nonzero digit remaining in the number.

EXAMPLE 3 Round 7,843 all the way.

Step 1. 7,843 Identified leftmost digit is 7.

Step 2. Digit to the right of 7 is greater than 5, so 7 becomes 8.

8,843

Step 3. 8,000 Change all other digits to zeros.

Rounding 7,843 all the way gives 8,000.

Remember that rounding a digit to a specific place value depends on the degree of accuracy you want in your estimate. For example, in the *Wall Street Journal* article “‘Avengers’ Posts Record \$1.2 Billion Opening,” 1.2 billion rounded all the way would be 1 billion. Note the digit to the right of the identified digit is less than 5 so the identified digit (1) is kept at 1.

1,200,000,000 —————> 1,000,000,000
 less than 5
 Identified digit

Before concluding this unit, let's look at how to dissect and solve a word problem.

How to Dissect and Solve a Word Problem

As a student, your author found solving word problems difficult. Not knowing where to begin after reading the word problem caused the difficulty. Today, students still struggle with word problems as they try to decide where to begin.

Solving word problems involves *organization* and *persistence*. Recall how persistent you were when you learned to ride a two-wheel bike. Do you remember the feeling of success you experienced when you rode the bike without help? Apply this persistence to word problems. Do not be discouraged. Each person learns at a different speed. Your goal must be to FINISH THE RACE and experience the success of solving word problems with ease.

To be organized in solving word problems, you need a plan of action that tells you where to begin—a blueprint aid. Like a builder, you will refer to this blueprint aid constantly until you know the procedure. The blueprint aid for dissecting and solving a word problem appears below. Note that the blueprint aid serves an important function—it **decreases your math anxiety**.



Remember to *RTDQ2*: Read the darn question and then read it again before trying to solve it.

Blueprint Aid for Dissecting and Solving a Word Problem

	The facts	Solving for?	Steps to take	Key points
BLUEPRINT				

LO 3



Sheila Fitzgerald/Shutterstock

Now let’s study this blueprint aid. The first two columns require that you *read* the word problem slowly. Think of the third column as the basic information you must know or calculate before solving the word problem. Often this column contains formulas that provide the foundation for the step-by-step problem solution. The last column reinforces the key points you should remember.

It’s time now to try your skill at using the blueprint aid for dissecting and solving a word problem.

The Word Problem On the 100th anniversary of Tootsie Roll Industries, the company reported sharply increased sales and profits. Sales reached one hundred ninety-four million dollars and a record profit of twenty-two million, five hundred fifty-six thousand dollars. The company president requested that you round the sales and profit figures all the way.

Study the following blueprint aid and note how we filled in the columns with the information in the word problem. You will find the organization of the blueprint aid most helpful. Be persistent! You *can* dissect and solve word problems! When you are finished with the word problem, make sure the answer seems reasonable.

	The facts	Solving for?	Steps to take	Key points
BLUEPRINT	<p><i>Sales:</i> One hundred ninety-four million dollars.</p> <p><i>Profit:</i> Twenty-two million, five hundred fifty-six thousand dollars.</p>	Sales and profit rounded all the way.	Express each verbal form in numeric form. Identify leftmost digit in each number.	Rounding all the way means only the leftmost digit will remain. All other digits become zeros.

MONEY tips

Do not carry your Social Security card in your wallet. Keep it and other important documents in a safe deposit box or fireproof container. Shred any document that contains personal information, such as anything with your Social Security number on it, old bank statements, applications for loans, and so on.

Steps to solving problem

1. Convert verbal to numeric.

One hundred ninety-four million dollars → \$194,000,000

Twenty-two million, five hundred fifty-six thousand dollars → \$ 22,556,000
2. Identify leftmost digit of each number.

\$194,000,000 \$22,556,000
3. Round.

\$200,000,000 \$20,000,000

Note that in the final answer, \$200,000,000 and \$20,000,000 have only one nonzero digit. Remember that you cannot round numbers expressed in verbal form. You must convert these numbers to numeric form.

Now you should see the importance of the information in the third column of the blueprint aid. When you complete your blueprint aids for word problems, do not be concerned if the order of the information in your boxes does not follow the order given in the text boxes. Often you can dissect a word problem in more than one way.

Your first Practice Quiz follows. Be sure to study the paragraph that introduces the Practice Quiz.

LU 1–1

PRACTICE QUIZ

Complete this Practice Quiz to see how you are doing.

At the end of each learning unit, you can check your progress with a Practice Quiz. If you had difficulty understanding the unit, the Practice Quiz will help identify your area of weakness. Work the problems on scrap paper. Check your answers with the worked-out solutions that follow the quiz. Ask your instructor about specific assignments and the videos available in Connect for each unit Practice Quiz.

1. Write in verbal form:
a. 7,948 b. 48,775 c. 814,410,335,414
2. Round the following numbers as indicated:

Nearest ten	Nearest hundred	Nearest thousand	Rounded all the way
a. 92	b. 745	c. 8,341	d. 4,752
3. Kellogg’s reported its sales as five million, one hundred eighty-one thousand dollars. The company earned a profit of five hundred two thousand dollars. What would the sales and profit be if each number were rounded all the way? (*Hint: You might want to draw the blueprint aid since we show it in the solution.*)



For **extra help** from your authors—Sharon and Jeff—see the videos in Connect.

- ✓ **Solutions**
1. a. Seven thousand, nine hundred forty-eight
b. Forty-eight thousand, seven hundred seventy-five
c. Eight hundred fourteen billion, four hundred ten million, three hundred thirty-five thousand, four hundred fourteen
2. a. 90 b. 700 c. 8,000 d. 5,000
3. Kellogg’s sales and profit:

	The facts	Solving for?	Steps to take	Key points
BLUEPRINT	Sales: Five million, one hundred eighty-one thousand dollars. Profit: Five hundred two thousand dollars.	Sales and profit rounded all the way.	Express each verbal form in numeric form. Identify leftmost digit in each number.	Rounding all the way means only the leftmost digit will remain. All other digits become zeros.

Steps to solving problem

1. Convert verbal to numeric.
Five million, one hundred eighty-one thousand → \$5,181,000
Five hundred two thousand → \$ 502,000
2. Identify leftmost digit of each number.

\$5,181,000	\$502,000
↓	↓
\$5,000,000	\$500,000
3. Round.

Learning Unit 1–2: Adding and Subtracting Whole Numbers

LO 1

In the *Wall Street Journal* clip “‘Avengers’ Posts Record \$1.2 Billion Opening” on the following page reprinted from Learning Unit 1–1, note ‘Avengers’ was the first movie to gross over \$1 billion in its debut. The amount of gross sales outside the U.S. and Canada was:

5-day sales	\$1,200,000,000
U.S. and Canada	–350,000,000
	<hr/>
	\$850,000,000

This unit teaches you how to manually add and subtract whole numbers. When you least expect it, you will catch yourself automatically using this skill.



GLOBAL

‘Avengers’ Posts Record \$1.2 Billion Opening

By ERICH SCHWARTZEL

LOS ANGELES—Walt Disney Co.’s superhero epic “Avengers: Endgame” became the first movie to gross more than \$1 billion in its debut at the world-wide box office.

The Marvel Studios block-buster, powered by record-setting hauls in the U.S. and China, collected an estimated \$1.2 billion in its first five days of release. An estimated \$350 million of that total came from the U.S. and Canada, an amount that blew past the previous opening-weekend record.

Schwartzel, Erich. “Avengers’ Posts Record \$1.2 Billion Opening.” *The Wall Street Journal* (April 29, 2020).

Coronavirus Daily Update

As of 9:32 p.m.
EDT MAY 13

1,390,361
U.S. cases

4,345,646
World-wide cases

84,118
U.S. deaths

297,108
World-wide deaths

243,430
U.S. recoveries

1,547,406
World-wide recoveries

Source: Johns Hopkins University Center for Systems Science and Engineering

“Coronavirus Daily Update.” *The Wall Street Journal* (May 14, 2020).

At time of writing, deaths from covid have reached nearly 700,000.54% of population has been vaccinated by the delta variant has cause a spike in new cases.

Addition of Whole Numbers

To add whole numbers, you unite two or more numbers called **addends** to make one number called a **sum**, **total**, or **amount**. The numbers are arranged in a column according to their place values—units above units, tens above tens, and so on. Then, you add the columns of numbers from top to bottom. To check the result, you re-add the columns from bottom to top. This procedure is illustrated in the steps that follow.

ADDING WHOLE NUMBERS

Step 1. Align the numbers to be added in columns according to their place values, beginning with the units place at the right and moving to the left.

Step 2. Add the units column. Write the sum below the column. If the sum is more than 9, write the units digit and carry the tens digit.

Step 3. Moving to the left, repeat Step 2 until all place values are added.

EXAMPLE

Adding top to bottom

↓

2 11

1,362

5,913

8,924

+ 6,594

22,793

↑

Checking bottom to top

Alternate check

Add each column as a separate total and then combine. The end result is the same.

1,362

5,913

8,924

+ 6,594

13

18

26

20

22,793

How to Quickly Estimate Addition by Rounding All the Way In Learning Unit 1–1, you learned that rounding whole numbers all the way gives quick arithmetic estimates. Using the *Wall Street Journal* clip “Coronavirus Daily Update” shown on the left, note how you can round each number all the way and the total will not be rounded all the way. Remember that rounding all the way does not replace actual computations, but it is helpful in making quick commonsense decisions.

Rounded all the way

1,000,000

4,000,000

80,000

300,000

200,000

+2,000,000

7,580,000

← Rounding all the way means each number has only one nonzero digit.

Note: The final answer could have more than one nonzero digit since the total is not rounded all the way.

LO 2

Subtraction of Whole Numbers

Subtraction is the opposite of addition. Addition unites numbers; subtraction takes one number away from another number. In subtraction, the top (largest) number is the **minuend**. The number you subtract from the minuend is the **subtrahend**, which gives you the **difference** between the minuend and the subtrahend. The steps for subtracting whole numbers follow.

SUBTRACTING WHOLE NUMBERS

Step 1.

Align the minuend and subtrahend according to their place values.

Step 2.

Begin the subtraction with the units digits. Write the difference below the column. If the units digit in the minuend is smaller than the units digit in the subtrahend, borrow 1 from the tens digit in the minuend. One tens digit is 10 units.

Step 3.

Moving to the left, repeat Step 2 until all place values in the subtrahend are subtracted.



Prostock-studio/Alamy Stock Photo

EXAMPLE The previous *Wall Street Journal* “Coronavirus Daily Update” clip illustrates the subtraction of whole numbers:

What is the difference between worldwide cases and U.S. cases? As shown below you can use subtraction to arrive at the **2,955,285** difference.

4,345,646

← Minuend (larger number)

−1,390,361

← Subtrahend

2,955,285

← Difference

Check

2,955,285

+1,390,361

4,345,646

Checking subtraction requires adding the difference (2,955,285) to the subtrahend (1,390,361) to arrive at the minuend (4,345,646).

How to Dissect and Solve a Word Problem

Accurate subtraction is important in many business operations. In Chapter 4 we discuss the importance of keeping accurate subtraction in your checkbook balance. Now let’s check your progress by dissecting and solving a word problem.

The Word Problem Hershey’s produced 25 million Kisses in one day. The same day, the company shipped 4 million to Japan, 3 million to France, and 6 million throughout the United States. At the end of that day, what is the company’s total inventory of Kisses? What is the inventory balance if you round the number all the way?

MONEY tips

College *is* worth it! College graduates earn substantially more money each year than high school graduates *and* that wage premium is increasing steadily—almost twice as much. Stay in school.

	The facts	Solving for?	Steps to take	Key points
BLUEPRINT	<i>Produced:</i> 25 million. <i>Shipped:</i> Japan, 4 million; France, 3 million; United States, 6 million.	Total Kisses left in inventory. Inventory balance rounded all the way.	Total Kisses produced − Total Kisses shipped = Total Kisses left in inventory.	Minuend − Subtrahend = Difference. Rounding all the way means rounding to last digit on the left.

Steps to solving problem

1. Calculate the total Kisses shipped.

4,000,000

3,000,000

+ 6,000,000

13,000,000

2. Calculate the total Kisses left in inventory.

25,000,000

−13,000,000

12,000,000

3. Rounding all the way.

Identified digit is 1. Digit to right of 1 is 2, which is less than 5. Answer: **10,000,000**.

The Practice Quiz that follows will tell you how you are progressing in your study of Chapter 1.

LU 1–2

PRACTICE QUIZ

Complete this Practice Quiz to see how you are doing.

1. Add by totaling each separate column:

8,974
6,439
+ 6,941
2. Estimate by rounding all the way (do not round the total of estimate) and then do the actual computation:

4,241
8,794
+ 3,872
3. Subtract and check your answer:

9,876
– 4,967
4. Jackson Manufacturing Company projected its year 2022 furniture sales at \$900,000. During 2022, Jackson earned \$510,000 in sales from major clients and \$369,100 in sales from the remainder of its clients. What is the amount by which Jackson over- or underestimated its sales? Use the blueprint aid, since the answer will show the completed blueprint aid.



✓ Solutions

1.

14
14
22
20
22,354

2.

Estimate	Actual
4,000	4,241
9,000	8,794
+ 4,000	+ 3,872
17,000	16,907

3.

8 18616
9,876
–4,967
4,909

Check
4,909
+ 4,967
9,876

4. Jackson Manufacturing Company over- or underestimated sales:

	The facts	Solving for?	Steps to take	Key points
BLUEPRINT	Projected 2022 sales: \$900,000. Major clients: \$510,000. Other clients: \$369,100.	How much were sales over- or underestimated?	Total projected sales – Total actual sales = Over- or underestimated sales.	Projected sales (minuend) – Actual sales (subtrahend) = Difference.

Steps to solving problem

1. Calculate total actual sales.

\$ 510,000
+ 369,100
\$ 879,100
2. Calculate overestimated or underestimated sales.

\$ 900,000
– 879,100
\$ 20,900 (overestimated)

LO

1



GLOBAL

Learning Unit 1–3: Multiplying and Dividing Whole Numbers

The *Wall Street Journal* clip on the following page reveals that Disney could lose \$175 million if their parks remain closed for two more months. The \$175 million figure divided by 2 averages an \$87,500,000 loss per month.

This unit will sharpen your skills in two important arithmetic operations—multiplication and division. These two operations frequently result in knowledgeable business decisions.



Multiplication of Whole Numbers—Shortcut to Addition

From calculating the sales for 2 months you know that multiplication is a *shortcut to addition*:

$$\$87,500,000 \times 2 = \$175,000,000$$

or
$$\$87,500,000 + \$87,500,000 = \$175,000,000$$

Before learning the steps used to multiply whole numbers with two or more digits, you must learn some multiplication terminology.

Note in the following example that the top number (number we want to multiply) is the **multiplicand**. The bottom number (number doing the multiplying) is the **multiplier**. The final number (answer) is the **product**. The numbers between the multiplier and the product are **partial products**. Also note how we positioned the partial product 2090. This number is the result of multiplying 418 by 50 (the 5 is in the tens position). On each line in the partial products, we placed the first digit directly below the digit we used in the multiplication process.

EXAMPLE

Partial products

418

$\times 52$

836

2090

21,736

Top number (multiplicand)

Bottom number (multiplier)

Product answer

$2 \times 418 = 836$

$50 \times 418 = 20,900$

$21,736$

We can now give the following steps for multiplying whole numbers with two or more digits:

MULTIPLYING WHOLE NUMBERS WITH TWO OR MORE DIGITS

Step 1.

Align the multiplicand (top number) and multiplier (bottom number) at the right. Usually, you should make the smaller number the multiplier.

Step 2.

Begin by multiplying the right digit of the multiplier with the right digit of the multiplicand. Keep multiplying as you move left through the multiplicand. Your first partial product aligns at the right with the multiplicand and multiplier.

Step 3.

Move left through the multiplier and continue multiplying the multiplicand. Your partial product right digit or first digit is placed directly below the digit in the multiplier that you used to multiply.

Step 4.

Continue Steps 2 and 3 until you have completed your multiplication process. Then add the partial products to get the final product.

Checking and Estimating Multiplication We can check the multiplication process by reversing the multiplicand and multiplier and then multiplying. Let's first estimate 52×418 by rounding all the way.

EXAMPLE

50

$\times 400$

20,000

52

$\times 418$

416

52

208

21,736

By estimating before actually working the problem, we know our answer should be about 20,000. When we multiply 52 by 418, we get the same answer as when we multiply 418×52 —and the answer is about 20,000. Remember, if we had not rounded all the way, our estimate would have been closer. If we had used a calculator, the rounded estimate would have

helped us check the calculator’s answer. Our commonsense estimate tells us our answer is near 20,000—not 200,000.

Before you study the division of whole numbers, you should know (1) the multiplication shortcut with numbers ending in zeros and (2) how to multiply a whole number by a power of 10.

MULTIPLICATION SHORTCUT WITH NUMBERS ENDING IN ZEROS

Step 1.

When zeros are at the end of the multiplicand or the multiplier, or both, disregard the zeros and multiply.

Step 2.

Count the number of zeros in the multiplicand and multiplier.

Step 3.

Attach the number of zeros counted in Step 2 to your answer.

EXAMPLE

65,000

×

420

65

×

42

130

260

27,300,000

3 zeros

+ 1 zero

4 zeros

No need to multiply rows of zeros

65,000

×

420

00 000

1 300 00

26 000 0

27,300,000

MULTIPLYING A WHOLE NUMBER BY A POWER OF 10

Step 1.

Count the number of zeros in the power of 10 (a whole number that begins with 1 and ends in one or more zeros such as 10, 100, 1,000, and so on).

Step 2.

Attach that number of zeros to the right side of the other whole number to obtain the answer. Insert comma(s) as needed every three digits, moving from right to left.

EXAMPLE

99 × 10 = 990 = 990

99 × 100 = 9,900 = 9,900

99 × 1,000 = 99,000 = 99,000

← Add 1 zero

← Add 2 zeros

← Add 3 zeros

When a zero is in the center of the multiplier, you can do the following:

EXAMPLE

658

×

403

1 974

263 2

265,174

3 × 658 = 1,974

400 × 658 = + 263,200

265,174

LO

2

Division of Whole Numbers

Division is the reverse of multiplication and a time-saving shortcut related to subtraction. For example, in the introduction of this learning unit you determined in the Disney example that lost sales for 2 months resulted in \$175,000,000. You multiplied $\$87,500,000 \times 2$ to get \$175,000,000. Since division is the reverse of multiplication you can also say that $\$175,000,000 \div 2 = \$87,500,000$.

Division can be indicated by the common symbols \div and $\overline{)}$, or by the bar — in a fraction and the forward slant / between two numbers, which means the first number is divided by the second number. Division asks how many times one number (**divisor**) is contained in another number (**dividend**). The answer, or result, is the **quotient**. When the divisor (number used to divide) doesn’t divide evenly into the dividend (number we are dividing), the result is a

partial quotient, with the leftover amount the **remainder** (expressed as fractions in later chapters). The following example reflecting how much is spent on coffee for 15 weeks illustrates *even division* (this is also an example of *long division* because the divisor has more than one digit).

EXAMPLE

18

← Quotient

Divisor → 15

270 ← Dividend

15

120

120

This example divides 15 into 27 once with 12 remaining. The 0 in the dividend is brought down to 12. Dividing 120 by 15 equals 8 with no remainder; that is, even division. The following example illustrates *uneven division with a remainder* (this is also an example of *short division* because the divisor has only one digit).

EXAMPLE

24 R1

← Remainder

7

169

14

29

28

1

Check

(7 × 24) + 1 = 169

Divisor × Quotient + Remainder = Dividend

Note how doing the check gives you assurance that your calculation is correct. When the divisor has one digit (short division) as in this example, you can often calculate the division mentally as illustrated in the following examples:

EXAMPLES

108

8

864

16 R6

7

118

Next, let’s look at the value of estimating division.

Estimating Division Before actually working a division problem, estimate the quotient by rounding. This estimate helps you check the answer. The example that follows is rounded all the way. After you make an estimate, work the problem and check your answer by multiplication.

EXAMPLE

36 R111

138

5,079

4 14

939

828

111

Estimate

50

100

5,000

Check

138

× 36

828

4 14

4,968

+ 111

5,079

← Add remainder

Now let’s turn our attention to division shortcuts with zeros.

Division Shortcuts with Zeros The steps that follow show a shortcut that you can use when you divide numbers with zeros.

DIVISION SHORTCUT WITH NUMBERS ENDING IN ZEROS

Step 1.

When the dividend and divisor have ending zeros, count the number of ending zeros in the divisor.

Step 2.

Drop the same number of zeros in the dividend as in the divisor, counting from right to left.

Note the following examples of division shortcuts with numbers ending in zeros. Since two of the symbols used for division are ÷ and $\overline{)}$, our first examples show the zero shortcut method with the ÷ symbol.

EXAMPLES

Dividend Divisor

One ending zero

Drop 1 zero in dividend

$95,000 \div 10 \longrightarrow 95,00\cancel{0} = 9,500$

$95,000 \div 100 \longrightarrow 95,00\cancel{0}\cancel{0} = 950$ Drop 2 zeros

$95,000 \div 1,000 \longrightarrow 95,00\cancel{0}\cancel{0}\cancel{0} = 95$ Drop 3 zeros

In a long division problem with the $\overline{)}$ symbol, you again count the number of ending zeros in the divisor. Then drop the same number of ending zeros in the dividend and divide as usual.

EXAMPLE

$6,500 \overline{)88,000}$ ← Drop 2 zeros

$13 \text{ R}35$

$$\begin{array}{r} 65 \overline{)880} \\ \underline{65} \\ 230 \\ \underline{195} \\ 35 \end{array}$$

You are now ready to practice what you learned by dissecting and solving a word problem.

How to Dissect and Solve a Word Problem

The blueprint aid presented in LU 1-1(3) will be your guide to dissecting and solving the following word problem.

The Word Problem Dunkin’ Donuts sells to four different companies a total of \$3,500 worth of doughnuts per week. What is the total annual sales to these companies? What is the yearly sales per company? (Assume each company buys the same amount.) Check your answer to show how multiplication and division are related.

MONEY tips

Be vigilant about sharing personal information. Change passwords often and do not share them.

	The facts	Solving for?	Steps to take	Key points
BLUEPRINT	<i>Sales per week:</i> \$3,500. <i>Companies:</i> 4.	Total annual sales to all four companies. Yearly sales per company.	Sales per week × Weeks in year (52) = Total annual sales. Total annual sales ÷ Total companies = Yearly sales per company.	Division is the reverse of multiplication.

Steps to solving problem

1. Calculate total annual sales.
- $3,500 \times 52 \text{ weeks} = 182,000$
2. Calculate yearly sales per company,
- $182,000 \div 4 = 45,500$
- Check
- $45,500 \times 4 = 182,000$

It’s time again to check your progress with a Practice Quiz.

LU 1–3

PRACTICE QUIZ

Complete this Practice Quiz to see how you are doing.

1. Estimate the actual problem by rounding all the way, work the actual problem, and check:

Actual Estimate Check

$$\begin{array}{r} 3,894 \\ \times 18 \\ \hline \end{array}$$

2. Multiply by shortcut method:

$$\begin{array}{r} 77,000 \\ \times 1,800 \\ \hline \end{array}$$

3. Multiply by shortcut method:

$95 \times 10,000$

4. Divide by rounding all the way, complete the actual calculation, and check, showing remainder as a whole number.
 $26 \overline{)5,325}$
5. Divide by shortcut method:
 $4,000 \overline{)96,000}$
6. Assume General Motors produces 960 Chevrolets each workday (Monday through Friday). If the cost to produce each car is \$6,500, what is General Motors' total cost for the year? Check your answer.



For **extra help** from your authors—Sharon and Jeff—see the videos in Connect.

✓ **Solutions**

1. **Estimate**
 $\begin{array}{r} 4,000 \\ \times 20 \\ \hline 80,000 \end{array}$

Actual
 $\begin{array}{r} 3,894 \\ \times 18 \\ \hline 31\ 152 \\ 38\ 94 \\ \hline 70,092 \end{array}$

Check
 $8 \times 3,894 = 31,152$
 $10 \times 3,894 = + 38,940$
 $\hline 70,092$
2. $77 \times 18 = 1,386 + 5 \text{ zeros} = 138,600,000$
3. $95 + 4 \text{ zeros} = 950,000$
4. **Rounding**
 $\begin{array}{r} 166\text{ R}20 \\ 30 \overline{)5,000} \\ \underline{3\ 0} \\ 2\ 00 \\ \underline{1\ 80} \\ 200 \\ \underline{180} \\ 20 \end{array}$

Actual
 $\begin{array}{r} 204\text{ R}21 \\ 26 \overline{)5,325} \\ \underline{5\ 2} \\ 125 \\ \underline{104} \\ 21 \end{array}$

Check
 $26 \times 204 = 5,304$
 $ + 21$
 $\hline 5,325$
5. Drop 3 zeros = $\frac{24}{4} \overline{)96}$
6. General Motors' total cost per year:

	The facts	Solving for?	Steps to take	Key points
BLUEPRINT	<i>Cars produced each workday: 960.</i> <i>Workweek: 5 days.</i> <i>Cost per car: \$6,500.</i>	Total cost per year.	Cars produced per week $\times 52 =$ Total cars produced per year. Total cars produced per year \times Total cost per car = Total cost per year.	Whenever possible, use multiplication and division short-cuts with zeros. Multiplication can be checked by division.

Steps to solving problem

1. Calculate total cars produced per week.
 $5 \times 960 = 4,800$ cars produced per week
2. Calculate total cars produced per year.
 $4,800 \text{ cars} \times 52 \text{ weeks} = 249,600$ total cars produced per year
3. Calculate total cost per year.
 $249,600 \text{ cars} \times \$6,500 = \$1,622,400,000$
(multiply 2,496 \times 65 and add zeros)
- Check**
 $\$1,622,400,000 \div 249,600 = \$6,500$
(drop 2 zeros before dividing)

INTERACTIVE CHAPTER ORGANIZER		
Topic/Procedure/Formula	Example	You try it*
Reading and writing numeric and verbal whole numbers Placement of digits in a number gives the value of the digits (Figure 1.1). Commas separate every three digits, moving from right to left. Begin at left to read and write number in verbal form. Do not read zeros or use <i>and</i> . Hyphenate numbers twenty-one to ninety-nine. Reverse procedure to change verbal number to numeric.	462 → Four hundred sixty-two 6,741 → Six thousand, seven hundred forty-one	Write in verbal form 571 → 7,943 →
Rounding whole numbers 1. Identify place value of the digit to be rounded. 2. If digit to the right is 5 or more, round up; if less than 5, do not change. 3. Change all digits to the right of rounded identified digit to zeros.	643 to nearest ten Thus, 643 rounds to 640.	Round to nearest ten 691
Rounding all the way Round to first digit of number. One nonzero digit remains. In estimating, you round each number of the problem to one nonzero digit. The final answer is not rounded.	468,451 → 500,000 The 5 is the only nonzero digit remaining.	Round all the way 429,685 →
Adding whole numbers 1. Align numbers at the right. 2. Add units column. If sum is more than 9, carry tens digit. 3. Moving left, repeat Step 2 until all place values are added. Add from top to bottom. Check by adding bottom to top or adding each column separately and combining.	 Checking sum of each digit	Add 76 +38
Subtracting whole numbers 1. Align minuend and subtrahend at the right. 2. Subtract units digits. If necessary, borrow 1 from tens digit in minuend. 3. Moving left, repeat Step 2 until all place values are subtracted. Minuend less subtrahend equals difference.	 Check	Subtract 629 -134
Multiplying whole numbers 1. Align multiplicand and multiplier at the right. 2. Begin at the right and keep multiplying as you move to the left. First partial product aligns at the right with multiplicand and multiplier. 3. Move left through multiplier and continue multiplying multiplicand. Partial product right digit or first digit is placed directly below digit in multiplier. 4. Continue Steps 2 and 3 until multiplication is complete. Add partial products to get final product. Shortcuts: (a) When multiplicand or multiplier, or both, end in zeros, disregard zeros and multiply; attach same number of zeros to answer. If zero is in center of multiplier, no need to show row of zeros. (b) If multiplying by power of 10, attach same number of zeros to whole number multiplied.	 a. 48,000 48 3 zeros 524 x 40 4 +1 zero x 206 1,920,000 ← 4 zeros 3 144 104 8 107,944 b. 14 x 10 = 140 (attach 1 zero) 14 x 1,000 = 14,000 (attach 3 zeros)	Multiply 491 x 28 Multiply by shortcut 13 x 10 = 13 x 1,000 =

(continues)

INTERACTIVE CHAPTER ORGANIZER			
Topic/Procedure/Formula		Example	You try it*
Dividing whole numbers 1. When divisor is divided into the dividend, the remainder is less than divisor. 2. Drop zeros from dividend right to left by number of zeros found in the divisor. Even division has no remainder; uneven division has a remainder; divisor with one digit is short division; and divisor with more than one digit is long division.		<div>5R6</div> <div>1. $\begin{array}{r} 14 \overline{)76} \\ \underline{70} \\ 6 \end{array}$</div> <div>2. $5,000 \div 100 = 50 \div 1 = 50$ $5,000 \div 1,000 = 5 \div 1 = 5$</div>	Divide 1. $16 \overline{)95}$ Divide by shortcut 2. $4,000 \div 100$ $4,000 \div 1,000$
KEY TERMS	Addends Decimal point Decimal system Difference Dividend Divisor	Minuend Multiplicand Multiplier Partial products Partial quotient Product	Quotient Remainder Rounding all the way Subtrahend Sum Whole number

*Worked-out solutions are in Appendix B.

Critical Thinking Discussion Questions with Chapter Concept Check

1. List the four steps of the decision-making process. Do you think all companies should be required to follow these steps? Give an example.

2. Explain the three steps used to round whole numbers. Pick a whole number and explain why it should not be rounded.

3. How do you check subtraction? If you were to attend a movie, explain how you might use the subtraction check method.

4. Explain how you can check multiplication. If you visit a local supermarket, how could you show multiplication as a shortcut to addition?
5. Explain how division is the reverse of multiplication. Using the supermarket example in question 4, explain how division is a timesaving shortcut related to subtraction.

6. **Chapter Concept Check.** Using all the math you learned in Chapter 1, compare the number of COVID-19 cases in your state to the entire country.

END-OF-CHAPTER PROBLEMS

McGraw Hill

connect

Check figures for odd-numbered problems in Appendix B.

Name

Date

DRILL PROBLEMS

Add the following:

LU 1-2(1)

- 1-1.

90

+15
- 1-2.

900

+ 250
- 1-3.

77

+ 77
- 1-4.

88

+ 75
- 1-5.

6,251

+ 7,329
- 1-6.

59,481

51,411

+ 70,821
- 1-7.

78,159

15,850

+ 19,681

Subtract the following:

LU 1-2(2)

- 1-8.

68

-19
- 1-9.

80

-42
- 1-10.

287

-199
- 1-11.

9,000

-5,400
- 1-12.

9,800

-8,900
- 1-13.

1,622

- 548

Multiply the following:

LU 1-3(1)

- 1-14.

50

× 6
- 1-15.

510

× 61
- 1-16.

800

× 200
- 1-17.

677

× 503
- 1-18.

309

× 850
- 1-19.

450

× 280

Divide the following by short division:

LU 1-3(2)

- 1-20.

4

1,600
- 1-21.

9

810
- 1-22.

4

164

Divide the following by long division. Show work and remainder.

LU 1-3(2)

- 1-23.

6

520
- 1-24.

62

8,915

Add the following without rearranging:

LU 1-2(1)

- 1-25.

95 + 310
- 1-26.

1,055 + 88
- 1-27.

666 + 950
- 1-28.

1,011 + 17

1–29. Add the following and check by totaling each column individually without carrying numbers: *LU 1-2(1)*

Check

$$\begin{array}{r} 8,539 \\ 6,842 \\ + 9,495 \\ \hline \end{array}$$

Estimate the following by rounding all the way and then do actual addition: $LU\ 1-1(2)$, $LU\ 1-2(1)$

	Actual
1-30.	7,700
	9,286
	+ 3,900

Estimate

	Actual
1-31.	6,980
	3,190
	+ 7,819

Estimate

Subtract the following without rearranging: $LU\ 1-2(2)$

1-32. 190 - 66

1-33. 950 – 870

1-34. Subtract the following and check answer: $LU\ 1-2(2)$

$$\begin{array}{r} 591,001 \\ -375,956 \\ \hline \end{array}$$

Multiply the following horizontally: $LU\ 1-3(1)$

1-35. 19×7

1-36. 84×8

1-37. 27×8

1-38. $19 \times 5 =$

Divide the following and check by multiplication: $LU\ 1-2(2)$

1–39. $45 \overline{)876}$

Check

1-40. $46 \overline{)1,950}$

Check

Complete the following: *LU 1-2(2)*

$$\begin{array}{r} \text{1-41.} \quad 9,200 \\ - 1,510 \\ \hline \\ - 700 \\ \hline \end{array}$$

$$\begin{array}{r} 1-42. \quad 3,000,000 \\ - 769,459 \\ \hline \\ - 68,541 \end{array}$$

1-43. Estimate the following problem by rounding all the way and then do the actual multiplication: $LU\ 1-1(2)$,
 $LU\ 1-3(1)$

$$\begin{array}{r} \text{Actual} \\ 870 \\ \times 81 \\ \hline \end{array}$$

Estimate

Divide the following by the shortcut method: $LU\ 1-3(2)$

1-44. $1,000 \overline{)950,000}$

1-45. $100 \overline{)70,000}$

- 1–46. Estimate actual problem by rounding all the way and do actual division: LU 1-1(2), LU 1-3(2)
- | Actual | Estimate |
|--------|----------|
|--------|----------|

695)8,950

WORD PROBLEMS

- 1–47. The Wall Street Journal reported that the cost for lightbulbs over a 10-year period at a local Walmart parking lot in Kansas would be \$248,134 if standard lightbulbs were used. If LED lightbulbs were used over the same period, the total cost would be \$220,396. What would Walmart save by using LED bulbs? LU 1-2(2)



- 1–48. An education can be the key to higher earnings. In a U.S. Census Bureau study, high school graduates earned \$30,400 per year. Associate’s degree graduates averaged \$38,200 per year. Bachelor’s degree graduates averaged \$52,200 per year. Assuming a 50-year work-life, calculate the lifetime earnings for a high school graduate, associate’s degree graduate, and bachelor’s degree graduate. What’s the lifetime income difference between a high school and associate’s degree? What about the lifetime difference between a high school and bachelor’s degree? LU 1-3(1), LU 1-2(2)

- 1–49. Assume season-ticket prices in the lower bowl for the Buffalo Bills will rise from \$480 for a 10-game package to \$600. Fans sitting in the best seats in the upper deck will pay an increase from \$440 to \$540. Don Manning plans to purchase two season tickets for either lower bowl or upper deck. (a) How much more will two tickets cost for lower bowl? (b) How much more will two tickets cost for upper deck? (c) What will be his total cost for a 10-game package for lower bowl? (d) What will be his total cost for a 10-game package for upper deck? LU 1-2(2), LU 1-3(1)

- 1–50. Some ticket prices for Lion King on Broadway were \$70, \$95, \$200, and \$250. For a family of four, estimate the cost of the \$95 tickets by rounding all the way and then do the actual multiplication: LU 1-1(2), LU 1-3(1)

- 1–51. Walt Disney World Resort and United Vacations got together to create a special deal. The air-inclusive package features accommodations for three nights at Disney’s All-Star Resort, hotel taxes, and a four-day unlimited Magic Pass. Prices are \$609 per person traveling from Washington, DC, and \$764 per person traveling from Los Angeles. (a) What would be the cost for a family of four leaving from Washington, DC? (b) What would be the cost for a family of four leaving from Los Angeles? (c) How much more will it cost the family from Los Angeles? LU 1-3(1)

- 1–52.** NTB Tires bought 910 tires from its manufacturer for \$36 per tire. What is the total cost of NTB's purchase? If the store can sell all the tires at \$65 each, what will be the store's gross profit, or the difference between its sales and costs (Sales – Costs = Gross profit)? *LU 1-3(1), LU 1-2(2)*

- 1–53.** What was the total average number of visits for these websites? *LU 1-2(1), LU 1-3(2)*

Website	Average daily unique visitors
1. Orbitz.com	1,527,000
2. Mypoints.com	1,356,000
3. Americangreetings.com	745,000
4. Bizrate.com	503,000
5. Half.com	397,000



My Money

- 1–54.** As of mid-September 2021, 229,552,716 worldwide cases of coronavirus were reported by www.worldometers.info. It was also reported 206,248,522 have recovered and 4,709,175 have died. How many cases are unaccounted for to date?

- 1–55.** A report from the Center for Science in the Public Interest—a consumer group based in Washington, DC—released a study listing calories of various ice cream treats sold by six of the largest ice cream companies. The worst treat tested by the group was 1,270 total calories. People need roughly 2,200 to 2,500 calories per day. Using a daily average, how many additional calories should a person consume after eating ice cream? *LU 1-2(1), LU 1-3(2)*

- 1–56.** At Rose State College, Alison Wells received the following grades in her online accounting class: 90, 65, 85, 80, 75, and 90. Alison's instructor, Professor Clark, said he would drop the lowest grade. What is Alison's average? *LU 1-2(1)*

- 1–57.** The Bureau of Transportation's list of the 10 most expensive U.S. airports and their average fares is given below. Please use this list to answer the questions that follow. *LU 1-2(1, 2)*

1. Houston, TX	\$477
2. Huntsville, AL	473
3. Newark, NJ	470
4. Cincinnati, OH	466
5. Washington, DC	465
6. Charleston, SC	460
7. Memphis, TN	449
8. Knoxville, TN	449
9. Dallas–Fort Worth, TX	431
10. Madison, WI	429

- a. What is the total of all the fares?
- b. What would the total be if all the fares were rounded all the way?
- c. How much does the actual number differ from the rounded estimate?

1–58. Ron Alf, owner of Alf’s Moving Company, bought a new truck. On Ron’s first trip, he drove 1,200 miles and used 80 gallons of gas. How many miles per gallon did Ron get from his new truck? On Ron’s second trip, he drove 840 miles and used 60 gallons. What is the difference in miles per gallon between Ron’s first trip and his second trip? *LU 1-3(2)*



My Money

1–59. For the first time in eight years, monthly credit card debt in the United States has dropped an average of 14% despite COVID-19, as reported by Experian. In 2019 the average individual’s monthly credit card balance was \$6,194. In 2020, this fell to \$5,315. How much did the average monthly credit card balance decrease?

1–60. Assume BarnesandNoble.com has 289 business math texts in inventory. During one month, the online bookstore ordered and received 1,855 texts; it also sold 1,222 on the web. What is the bookstore’s inventory at the end of the month? If each text costs \$59, what is the end-of-month inventory cost? *LU 1-2(1), LU 1-2(2)*

1–61. Assume Cabot Company produced 2,115,000 cans of paint in August. Cabot sold 2,011,000 of these cans. If each can cost \$18, what were Cabot’s ending inventory of paint cans and its total ending inventory cost? *LU 1-2(2), LU 1-3(1)*

1–62. A local community college has 20 faculty members in the business department, 40 in psychology, 26 in English, and 140 in all other departments. What is the total number of faculty at this college? If each faculty member advises 25 students, how many students attend the local college? *LU 1-2(1), LU 1-3(1)*

1–63. Hometown Buffet had 90 customers on Sunday, 70 on Monday, 65 on Tuesday, and a total of 310 on Wednesday to Saturday. How many customers did Hometown Buffet serve during the week? If each customer spends \$9, what were the total sales for the week? *LU 1-2(1), LU 1-3(1)*

If Hometown Buffet had the same sales each week, what were the sales for the year?



My Money

1–64. A good credit utilization ratio, measuring your credit card debt divided by your credit card limits, is 30% or less, according to Forbes.com. Surprisingly, the credit utilization ratio fell from 29% in 2019 to 25% in 2020 despite the coronavirus pandemic, as stated by one of the credit agencies, Experian. How many percentage points did the credit utilization ratio fall?



My Money

- 1–65.** Ryan Seary works at US Airways and earned \$71,000 last year before tax deductions. From Ryan's total earnings, his company subtracted \$1,388 for federal income taxes, \$4,402 for Social Security, and \$1,030 for Medicare taxes. What was Ryan's actual, or net, pay for the year? *LU 1-2(1, 2)*
- 1–66.** CompareCards.com lists credit card offers by such categories as low interest, no annual fee, cash back, and so on. A top card offers no interest payments for 18 months. If 11 credit card companies make this offer and 25,652 people are approved, on average how many new customers does each credit card company gain? *LU 1-3(2)*
- 1–67.** Roger Company produces beach balls and operates three shifts. Roger produces 5,000 balls per shift on shifts 1 and 2. On shift 3, the company can produce 6 times as many balls as on shift 1. Assume a 5-day workweek. How many beach balls does Roger produce per week and per year? *LU 1-2(1), LU 1-3(1)*
- 1–68.** Assume 6,000 children go to Disneyland today. How much additional revenue will Disneyland receive if it raises the cost of admission from \$31 to \$41? *LU 1-2(1), LU 1-3(1)*
- 1–69.** Moe Brink has a \$900 balance in his checkbook. During the week, Moe wrote the following checks: rent, \$350; telephone, \$44; food, \$160; and entertaining, \$60. Moe also made a \$1,200 deposit. What is Moe's new checkbook balance? *LU 1-2(1, 2)*
- 1–70.** A local Dick's Sporting Store, an athletic sports shop, bought and sold the following merchandise: *LU 1-2(1, 2)*

	Cost	Selling price
Tennis rackets	\$2,900	\$ 3,999
Tennis balls	70	210
Bowling balls	1,050	2,950
Sneakers	+8,105	+14,888

What was the total cost of the merchandise bought by Dick's Sporting Store? If the shop sold all its merchandise, what were the sales and the resulting gross profit (Sales – Costs = Gross profit)?

Excel

1–71. Rich Engel, the bookkeeper for Engel’s Real Estate, and his manager are concerned about the company’s telephone bills. Last year the company’s average monthly phone bill was \$32. Rich’s manager asked him for an average of this year’s phone bills. Rich’s records show the following: LU 1-2(1), LU 1-3(2)

January	\$ 34	July	\$ 28
February	60	August	23
March	20	September	29
April	25	October	25
May	30	November	22
June	59	December	41

What is the average of this year’s phone bills? Did Rich and his manager have a justifiable concern?

Excel

1–72. On Monday, a local True Value Hardware sold 15 paint brushes at \$3 each, six wrenches at \$5 each, seven bags of grass seed at \$3 each, four lawn mowers at \$119 each, and 28 cans of paint at \$8 each. What were True Value’s total dollar sales on Monday? LU 1-2(1), LU 1-3(1)

1–73. While redecorating, Lee Owens went to Carpet World and bought 150 square yards of commercial carpet. The total cost of the carpet was \$6,000. How much did Lee pay per square yard? LU 1-3(2)

Excel

1–74. Washington Construction built 12 ranch houses for \$115,000 each. From the sale of these houses, Washington received \$1,980,000. How much gross profit (Sales – Costs = Gross profit) did Washington make on the houses? LU 1-2(2), LU 1-3(1, 2)

The four partners of Washington Construction split all profits equally. How much will each partner receive?

CHALLENGE PROBLEMS

1–75. A mall in Lexington has 18 stores. The following is a breakdown of what each store pays for rent per month. The rent is based on square footage.

5 department/computer stores	\$1,250	2 bakeries	\$ 500
5 restaurants	860	2 drugstores	820
3 bookstores	750	1 supermarket	1,450

Calculate the total rent that these stores pay annually. What would the answer be if it were rounded all the way? How much more each year do the drugstores pay in rent compared to the bakeries? LU 1-2(2), LU 1-3(1)

1–76. Paula Sanchez is trying to determine her 2022 finances. Paula’s actual 2021 finances were as follows: LU 1-1, LU 1-2, LU 1-3



2021					
Income:			Assets:		
Gross income	\$69,000		Checking account	\$ 1,950	
Interest income	450		Savings account	8,950	
Total	\$69,450		Automobile	1,800	
Expenses:			Personal property	14,000	
Living	\$24,500		Total	\$26,700	
Insurance premium	350		Liabilities:		
Taxes	14,800		Note to bank	4,500	
Medical	585		Net worth	\$22,200	(\$26,700 – \$4,500)
Investment	4,000				
Total	\$44,235				

Net worth = Assets – Liabilities
(own) (owe)

Paula believes her gross income will double in 2022 but her interest income will decrease \$150. She plans to reduce her 2022 living expenses by one-half. Paula’s insurance company wrote a letter announcing that her insurance premiums would triple in 2022. Her accountant estimates her taxes will decrease \$250 and her medical costs will increase \$410. Paula also hopes to cut her investments expenses by one-fourth. Paula’s accountant projects that her savings and checking accounts will each double in value. On January 2, 2022, Paula sold her automobile and began to use public transportation. Paula forecasts that her personal property will decrease by one-seventh. She has sent her bank a \$375 check to reduce her bank note. Could you give Paula an updated list of her 2022 finances? If you round all the way each 2021 and 2022 asset and liability, what will be the difference in Paula’s net worth?

Classroom Notes