

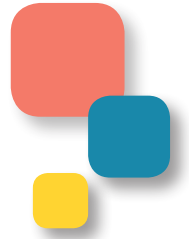
MATH BASICS

for the Health Care Professional | Fifth Edition



Michele Benjamin **LESMEISTER**





MATH BASICS

for the Health Care Professional | Fifth Edition

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*Renton Technical College
Renton, Washington*



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Library of Congress Cataloging-in-Publication Data

Names: Benjamin-Lesmeister, Michele, author.
Title: Math basics for the health care professional / Michele Benjamin Lesmeister, MA.
Description: Fifth edition. | Renton, Washington : Renton Technical College, [2017] | Includes index.
Identifiers: LCCN 2017020614 | ISBN 9780134703695
Subjects: LCSH: Medicine—Mathematics. | Mathematics. | Medical sciences.
Classification: LCC R853.M3 B46 2017 | DDC 610.1/5195—dc23
LC record available at <https://lcn.loc.gov/2017020614>

 Dedication

Special appreciation to Albert Lesmeister for supporting my academic endeavors to help students.

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Contents



Preface for Educators and Learners ix
Health Occupations Matrix of Math Skills and Pre-Test xv
Math for Health Care Professionals Pre-Test xvii

Unit 1 **Whole Number Review 1**

Pre-Test 1
Whole Numbers 3
 Integers 7
Symbols and Number Statements 7
Addition 8
Subtraction 10
Multiplication 12
Prime Factorization 13
Division 15
Solving for the Unknown Number with Basic
 Mathematics 18
Rounding 20
Estimation 21
Basics of Statistical Analysis 22
 Arithmetic Mean or Average 22
 Median 24
 Mode 25
 Range 26
Time in Allied Health 27
 How to Convert to Universal Time 28
Critical Thinking with Whole Numbers 29
Whole Number Post-Test 30

Unit 2 **Fractions 32**

Pre-Test 32
Part-to-Whole Relationships 34
 Understanding the Numerator to Denominator
 Relationship 36
Equivalent Fractions 37

Reducing to Lowest or Simplest Terms 39
 Multiplication Method 39
 Division Method 39
Improper Fractions 42
Adding Fractions with Like Denominators 43
Finding the Common Denominator 45
 Difficult Common Denominators 48
Ordering Fractions 51
Subtraction of Fractions 52
 Borrowing in Subtraction of Fractions 53
Multiplication of Fractions 57
 Multiplying a Fraction by a Whole Number 58
 Reducing Before You Multiply as a Timesaver 59
Multiplication of Mixed Numbers 61
Division of Fractions 65
Converting Temperatures Using Fraction
 Formulas 68
Complex Fractions 70
 Measurement in Fractions 73
Critical Thinking with Fractions 76
Fraction Post-Test 79

Unit 3 **Decimals 81**

Pre-Test 81
Decimals 83
Rounding Decimals 86
Comparing Decimals 87
Addition of Decimals 90
Subtraction of Decimals 91
Multiplication of Decimals 93
Division of Decimals 95
 Zeros as Placeholders in Decimal Division 96

Simplified Multiplication and Division of Decimals 98

Simplified Multiplication 98

Simplified Division 100

Changing Decimals to Fractions 101

Changing Fractions to Decimals 104

Temperature Conversions with Decimals 105

Decimal Conversion Formula 105

Solving Mixed Fraction and Decimal Problems 107

Critical Thinking Using Decimals 109

Decimal Post-Test 111

Unit 4 The Metric System 112

Pre-Test 112

Using the Metric Symbols 115

Changing Unit Measures 117

Critical Thinking Using the Metric System 124

Metric System Post-Test 126

Unit 5 Ratio and Proportion 128

Pre-Test 128

Ratio 130

Ratios in Health Care 132

Unit Rates 134

Proportion 134

Solving for x 135

*Using Proportions and Metric Units to Measure
Dental Stone* 140

Word Problems Using Proportions 142

Solving for x in More Complex Problems Using
Proportion 144

Nutritional Application of Proportions 146

Practice with Food Labels 148

Critical Thinking with Ratio and Proportion 151

Ratio and Proportion Post-Test 152

Unit 6 Measurement Conversion 154

Pre-Test 154

Converting with Measurements 157

Household or Standard Measurement 158

Standard Units of Measure 159

Apothecary System Units 159

More Combined Applications 163

Critical Thinking for Converting among Measurement
Systems 166

Measurement Conversions Post-Test 168

Unit 7 Percents 171

Pre-Test 171

Percent-to-Decimal Conversion 173

Decimal-to-Percent Conversion 174

Using Proportion to Solve Percent Problems 175

Percent Problems in Health Care 176

Complex Percent Problems 177

Percent Change 179

Percent Strength of Solutions 181

Using Proportion to Convert Solutions 182

Critical Thinking in Percent 185

Percent Post-Test 187

Unit 8 Combined Applications 189

Pre-Test 189

Conversions among Fractions, Decimals, Ratios,
and Percents 190

*Converting to Fractions, Decimals, Ratios,
and Percents* 192

Critical Thinking with Combined Applications 195

Combined Applications Post-Test 197

Unit 9 Pre-Algebra Basics 199

Pre-Test 199

Integers 200

Absolute Value 202

Integer Operations 203

Adding Integers with Like Signs 203

Adding Integers with Unlike Signs 204

Subtracting Integers 206

Multiplication of Integers 207

Division of Integers 208

Exponential Notation 209

Square Roots 210

Order of Operations 210

Algebraic Expressions 212

Expressions 212

Writing Expressions from Word Problems 216

Solving Equations 217

Writing Equations from Word Problems 218
 Critical Thinking with Pre-Algebra Basics 220
 Pre-Algebra Basics Post-Test 222

Unit 10 Reading Drug Labels, Medicine Cups, Syringes, and Intravenous Fluid Administration Bags 223

Pre-Test 223
 Medication Labels 226
 Medicine Cups 232
 Syringes 233
 IV Bags 237
 Critical Thinking with Reading Drug Labels,
 Medicine Cups, Syringes, and IV Fluid
 Administration Bags 238
 Reading Drug Labels, Medicine Cups, Syringes,
 and IV Fluid Administration Bags Post-Test 240

Unit 11 Apothecary Measurement and Conversion 243

Pre-Test 243
 Apothecary Measurement and Conversions 245
 Multiple Conversions 249
 Converting Liquid Equivalents 251
 Rounding in Dosage Calculations 255
 Critical Thinking in Apothecary System 257
 Apothecary System Post-Test 260

Unit 12 Dosage Calculations 262

Pre-Test 262
 Performing Dosage Calculations 264
 Dimensional Analysis 267
 Using Drug Labels to Calculate Dosages 271
 Critical Thinking in Dosage Calculations 274
 Dosage Calculations Post-Test 277

Unit 13 Parenteral Dosage 280

Pre-Test 280
 Injections 283

Syringes 283
IM Injection Guidelines 284
Units of Measures 284
 Critical Thinking in Parenteral Dosages 289
 Parenteral Dosage Post-Test 292

Unit 14 The Basics of Intravenous Fluid Administration 295

Pre-Test 295
 IV Infusion Sets 297
 Calculating IV Infusion Rates with a Formula 298
 Working Through the Formula 299
 *Calculating IV Infusion Rates with Dimensional
 Analysis* 299
 Modified Setup 302
 Infusion Duration 304
 Calculating Total Volume 306
 Critical Thinking with Intravenous Fluid
 Administration 308
 The Basics of Intravenous Fluid Administration
 Post-Test 309

Unit 15 Basic Dosage by Body Weight 311

Pre-Test 311
 Conversion to Kilograms 313
 Using Dimensional Analysis 313
 Converting Pounds and Ounces 314
 Calculating Dosage 315
 Using Special Formulas for Dosage by Weight 320
 Critical Thinking with Basic Dosage by
 Body Weight 322
 Basic Dosage by Body Weight Post-Test 324

Appendix A: Comprehensive Post-Test 326
 Answers for the Post-Test 332
Appendix B: Practice Tests Units 1–15 334
 Answers Key for Practice Exams 1–15 363
Appendix C: Answer Key 369
Appendix D: Dimensional Analysis 397
 Answers Key for Appendix D 418
Appendix E: Student Resources for Math 414
Index 433

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Preface for Educators and Learners



Math Basics for the Health Care Professional was written to serve a large population of learners preparing for careers within health occupations as well as those working toward employment upgrades in the field. Suggested specific applications of this work text are high school vocational programs; adult education programs that prepare students for health fields; self-study by individuals preparing for workplace transitions, upgrades, or changes; pre-nursing studies; in-house or on-the-job training programs; and a general brush-up for work in the health care professions. The work text was designed with student success in mind. The context is geared toward allied health students, and this contextualization helps students appreciate the value of learning math for success in their future health care careers.

The text begins with a comprehensive pre-test to gauge students' abilities and areas where remediation is required. The 15 units in the text cover the following topics: whole number review; fractions; decimals; metric measurement; ratio and proportion; measurement conversions; percents; combined applications; pre-algebra basics; reading drug labels, medicine cups, syringes, and intravenous fluid administration bags; apothecary measurement and conversion; dosage calculations; parenteral dosages; basic intravenous fluid administration; and basic dosage by body weight. Each unit provides a 15-question pre-test for additional practice in self-assessment, followed by a concept review and instruction, examples, practice problems, critical thinking questions, and a post-test. Students will find the answers to the odd-numbered practice problems in Appendix C. In addition, extra practice units are included in Appendix B, and Appendix A contains a comprehensive post-test.

A Focus on Adult Learners

The materials in this work text have been successfully applied to help students prepare for a wide variety of health care training fields at a technical college. Students' feedback and input have played a prominent role in the design and sequencing of the content, teaching methods, and presentation. Thus, the text's organization is central to students' success. The students who have worked through these materials have been successful in their vocational training and workplace upgrading because they have reached a mastery level in the fundamental concepts, making them ready to learn the additional concepts and applications of their specific training areas.

This work text focuses on the needs of adult learners and features the following learner-based tools for success:

- Sequential skill building on basic math skills
- Ties between the application of the skill and each math concept
- Mnemonic devices to build memory of the basic skills
- A variety of practice opportunities with occupation-based examples and problems
- Mixed applications to build on basic skills and promote critical thinking

- Post-tests to promote confidence and skill building
- Critical thinking applications to increase application and skill building
- White space in the design for thinking and working through the problems



New to This Edition

This fifth edition continues to provide a basic mathematics approach as well as dimensional analysis for all the application units. An appendix that is focused exclusively on dimensional analysis provides students further instruction on and examples of this sometimes challenging concept. Another appendix includes student resources, such as graphic organizers and other tools that provide additional support and strategies for learning and working in math.

The fifth edition of this work text has been updated to include the following features and changes:

- Updated unit (chapter) organization now places metric measurement content after decimal content for improved flow
- New information on the different classes or schedules of drugs
- Reduced use of apothecary measurements such as minims and units
- Large illustrations to help students visualize and solve problems
- New location of the metric conversions and additional graphics to assist in memorizing the conversions
- New unit on measurement conversions
- Updated drug labels to meet industry standards and changes
- Addition of Clark's, Young's and Fried's Rules to the Basic Dosage by Body Weight unit
- Full-color design that includes room for students to work out math problems



About the Author

Michele Benjamin Lesmeister has more than 40 years of experience teaching a wide variety of adults including second-language learners, industry experts, college preparatory students, public agency personnel, and other faculty. She embraces the attitude that all students can learn math. Furthermore, she believes that a student's success is often tied to the presentation of materials. Therefore, the colloquial quality of this text's explanations of math processes creates a can-do approach to and image of math. In health care, math is a necessary job skill; math proficiency, in turn, will lead to more job opportunities.



Supplements

The *Instructor's Resource Manual* has reproducible tests that accompany the work text as a ready test bank on which instructors can rely. The unit tests (two per unit) ask the student to perform math calculations similar to those in the units. These unit tests each require 25 answers; thus, the tests do not overwhelm the student, but promote self-reliance and confidence-building in math.

Two post-tests, which ask students to supply a total of 50 answers, are included.

Pearson's MyLab for Health Professions (access code required) is a comprehensive online program that gives the student the opportunity to test his or her understanding of information and concepts and allows the instructor to see how well the student knows the material. From the test results, MyLab builds a self-paced, personalized study plan unique to the student's needs. The student can work through the program until the study plan is complete and he or she has mastered the content.

TestGen allows instructors to design customized quizzes and exams. The TestGen wizard guides instructors through the steps to create a simple test with drag-and-drop or point-and-click transfer. Instructors can select test questions either manually or randomly and use online spell-checking and other tools to quickly polish the test content and presentation. Instructors can save the test in a variety of formats both locally and on a network, print up to 25 variations of a single test, and publish the tests in an online course.

PowerPoint lectures contain key discussion points, along with color images, for each chapter. This feature provides dynamic, fully designed, integrated lectures that are ready to use and allows instructors to customize the materials to meet their specific course needs. These ready-made lectures will save instructors time and ease the transition into use of this resource.



Reviewers

I would like to thank the reviewers of this book for their suggestions, comments, and encouragement, all of which are greatly appreciated. These reviewers include:

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Health Occupations Matrix of Math Skills and Pre-Test



Each health care field has its own emphasis on and requirements for math skills. Many successful adults search out materials that serve their immediate learning needs because their studies are just one part of their busy days. This work text has been designed to help you measure your readiness for additional math training in and for your specific field.

To assist individuals new to health occupations, a matrix of skills has been developed to answer the question: What math do I need to know to be a ____? Refer to the matrix to obtain a general idea of the math skills necessary for your program preparation or workplace upgrade. These skills will form the core of your math abilities, and you will build on them in more specific ways within your specific field of study.

Once you understand what math skills you need for success in the program, you are ready to take the self-assessment. This tool is divided into categories that match the work text content to help you work independently or with your classmates; it also allows you to begin at your own comfort or skill level. The idea behind the self-assessment is to provide enough review and practice so that you are able to solve the problems for your program accurately and efficiently. Use the scoring sheet to prepare an individualized study plan for yourself or as a sheet to refer to when these units are covered to ensure that you have mastered the material.

By completing this work text, you will be ready for the specific math training that you will receive in your program of study or in the workplace.

A final word about calculators: Calculators are wonderful tools. However, calculator use may be limited to certain class situations, and calculator use may or may not be allowed on exams. For these reasons, mental math is a valuable skill to review. When you put your calculator away before you work through these materials, two things will result: Your proficiency will increase, and your self-confidence will soar, as you become an efficient math problem-solver.

	MATRIX OF SKILLS										
	Certified Nursing Assistant	Hospital Nursing Assistant	Massage Therapist	Dental Assistant	Pharmacy Technician	Surgical Technologist	Medical Assistant	Licensed Practical Nurse	Registered Nurse	Medical Lab Technician	Your Program
Practice Pre-Test	X	X	X	X	X	X	X	X	X	X	X
Unit 1: Whole Number Review	X	X	X	X	X	X	X	X	X	X	X
Unit 2: Fractions	X	X	X	X	X	X	X	X	X	X	X
Unit 3: Decimals	X	X	X	X	X	X	X	X	X	X	X
Unit 4: Metric Measurement	X	X	X	X	X	X	X	X	X	X	X
Unit 5: Ratio and Proportion	X	X	X	X	X	X	X	X	X	X	X
Unit 6: Measurement Conversions	X	X	X	X	X	X	X	X	X	X	X
Unit 7: Percents	X	X	X	X	X	X	X	X	X	X	X
Unit 8: Combined Applications	X	X	X	X	X	X	X	X	X		
Unit 9: Pre-Algebra Basics	X	X	X	X	X	X	X	X	X	X	X
Unit 10: Reading Drug Labels, Medicine Cups, Syringes, and Intravenous Fluid Administration Bags	X	X	X	X	X	X	X	X	X	X	X
Unit 11: Apothecary Measurement and Conversion					X		X	X	X		
Unit 12: Dosage Calculations					X		X	X	X		
Unit 13: Parenteral Dosage					X		X	X	X		
Unit 14: The Basics of Intravenous Fluid Administration					X		X	X	X		
Unit 15: Basic Dosage by Body Weight					X		X	X	X		
Practice Post-Test	X	X	X	X	X	X	X	X	X	X	X

The *Math Basics for the Health Care Professional* Pre-Test is provided on the next several pages. The pre-test is designed to highlight the major points in each of the 15 units. Some of these skills may be familiar to you, while others may be new topics that you'll need to study.



Math Basics for the Health Care Professional Pre-Test

Whole Number Skills

1. Find the mean of the set of numbers: 16, 10, 5, 9, 10, 7, 3, 20 _____
2. $609 + \underline{\hspace{2cm}} + 37 = 812$
3. $1876 - 618 = \underline{\hspace{2cm}}$
4. $34 \times 97 = \underline{\hspace{2cm}}$
5. $26 \overline{)324} = \underline{\hspace{2cm}}$
6. The heights of Michele's family members are 67 inches, 81 inches, 69 inches, 70 inches, and 68 inches. Find the range in height of Michele's family members. _____
7. Convert 3:15 P.M. Standard time to Universal time. _____

Fraction Skills

8. Order the fractions from smallest to largest: $\frac{7}{8}, \frac{5}{6}, \frac{1}{4}, \frac{3}{4}$ _____
9. $30\frac{3}{5} + 12 + 3\frac{5}{6} = \underline{\hspace{2cm}}$
10. $46\frac{1}{3} - 8\frac{7}{12} = \underline{\hspace{2cm}}$
11. $3\frac{4}{5} \times \frac{3}{7} \times 5 = \underline{\hspace{2cm}}$
12. $7\frac{1}{6} \div \frac{1}{2} = \underline{\hspace{2cm}}$
13. Solve: $\frac{\frac{1}{20}}{\frac{1}{4}} = \underline{\hspace{2cm}}$

Decimal Skills

14. Express as a fraction: 8.022 _____

15. Express as a decimal: $6\frac{7}{8}$ _____

16. $10.6 + 0.5 + 9 =$ _____

17. $59.3 - 5.65 =$ _____

18. $0.6 \times 31.2 =$ _____

19. $228.06 \div 0.4 =$ _____

Metric Measurement Skills

20. 129.45 micrograms = _____ milligrams

21. 94 grams = _____ kilogram. Round to the nearest tenth.

Ratio and Proportion Skills

22. A container holds 54 milliliters of medication. How many full 1.25 milliliter doses can be administered from this container? _____

23. Solve: $6 : 75 :: 2.5 : x$ $x =$ _____

24. Solve: $7 : x :: 42 : 200$ $x =$ _____
Write the answer as a mixed number.

25. Solve: $\frac{1}{4} : 8 :: x : 72$ $x =$ _____

26. Solve: $\frac{1}{50} : 5 :: \frac{10}{250} : x$ $x =$ _____

27. Simplify the ratio to its lowest terms: $2\frac{1}{2} : 3$ _____

Measurement Conversion

28. $3\frac{1}{4}$ feet = _____ inches
29. _____ quarts = 12 pints
30. 15 pounds = _____ kilograms
31. _____ teaspoons = 30 milliliters

Percent Skills

32. What is $11\frac{3}{4}\%$ of 55? _____ Round to the nearest tenth.
33. What percent is 22 of 144? _____ Round to the nearest hundredth.
34. Sixteen percent of 140 is what number? _____
35. The original price of a new nursing jacket is \$42.50. Add 9.8% tax to the cost of the jacket. What is the total cost? _____
36. There are 5 grams of pure drug in 65 mL of solution. What is the percent strength of the solution? _____

Combined Applications Skills

37. Convert 0.5% to a fraction. _____
38. Convert $3\frac{1}{2}$ to a percent. _____
39. Convert 18 to a percent. _____
40. Write 1.001 as a fraction. _____
41. Write 0.07% as a decimal. _____

Pre-Algebra Skills

42. $45 + (-10) =$ _____

43. $-12 - 42 =$ _____

44. $-63 \div 9 =$ _____

45. $-128 \times (-4) =$ _____

46. $32 + \sqrt{144} =$ _____

47. $(5^2 - 3^2) \div 5 =$ _____

Reading Drug Labels, Medicine Cups, and Syringes

48. Complete the table for this drug label. If the information is not provided, write *Not shown*.

LOT NO. 0456140201
EXP. DATE 3/04

neбивол

100 Tablets

2.5 mg/tablet

Rx only

100 Tablets | NOC 0456-1402-01

PL Pharmaceuticals

Each tablet contains: neбивол hydrochloride equivalent to 2.5 mg neбивол. the reach of children.

Keep this and all drugs out of the reach of children.

Dispense in tight, light-resistant container as defined in the USP, using a child-resistant closure.

Store at 20° to 25 °C (68° to 77 °F). [see USP for Controlled Room Temperature.]

See package insert for dosing and full Prescribing information.

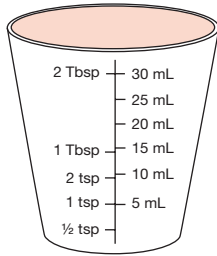
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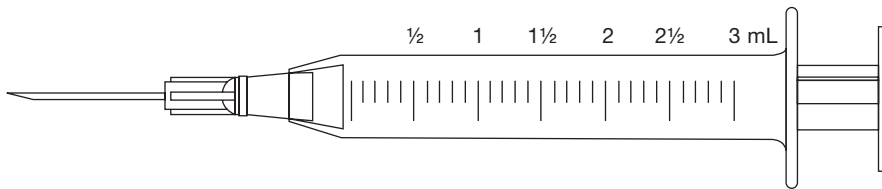
Practice Label

Generic name	_____
Trade name	_____
Manufacturer	_____
National Drug Code (NDC) number	_____
Lot number (control number)	_____
Drug form	_____
Dosage strength	_____
Usual adult dose	_____
Total amount in vial, packet, box	_____
Prescription warning	_____
Expiration date	_____

49. The medical assistant was asked to dispense 14 milliliters of a liquid medication. Shade the medicine cup to indicate this dosage.



50. The physician has ordered an intramuscular (IM) injection of 1.8 milliliters. Shade the syringe to indicate this volume of medication.



Apothecary Measurement Skills

51. fluid ounces 18 = _____ milliliters
52. 16 teaspoons = _____ milliliters
53. 3 pints = _____ milliliters
54. 0.5 milligrams = grain _____
55. grain $\frac{1}{300}$ = _____ milligrams
56. 3 grams = grains _____
57. $3\frac{1}{2}$ teaspoons = _____ milliliters

Oral Medication Skills

58. Desired: Aspirin 1.5 grams every 4 hours
 Available: Aspirin 500 milligram scored tablets
 Give: _____

59. The patient is prescribed Vistaril 20 milligrams orally every 6 hours for nausea relief. You have on hand Vistaril oral suspension 5 milligrams in 2.5 milliliters.
You administer _____.

Dosage Calculation Skills

60. Ordered: Zocor 40 milligrams
Have: Zocor 20 milligrams per tablet
Give: _____
61. The doctor has ordered Zylprim 0.25 gram orally twice a day. On hand is Zylprim 100 milligram scored tablets. The nurse should give _____.
62. The client receives an order for Augmentin 250 milligrams. The Augmentin label reads 125 milligrams in 5 milliliters. The client will be given _____.

Parenteral Dosage Skills

63. The physician orders megestrol acetate 800 milligrams per day. The megestrol acetate label reads oral suspension 40 milligrams per milliliter.
Give: _____.
64. Give Dilaudid 0.5 milligram IM from a vial that is labeled 4 milligrams per milliliter. Give: _____. Round to the nearest hundredth.
65. Ordered: Atropine sulfate 0.5 milligram IM
Have: Atropine sulfate 0.3 milligram per milliliter
Give: _____. Round to the nearest hundredth.
66. The doctor prescribes heparin 3500 units sub-Q four times a day. You have heparin 2500 units per milliliter. You give _____.
67. Ordered: Quinidine 0.4 grams orally every 4 hours. Quinidine is supplied in 200 milligram tablets. How many tablets will you give? _____

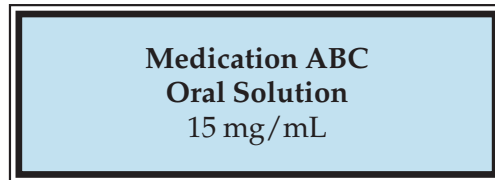
Calculating IV Dosage Skills

- 68.** The patient with oliguria has an order for 75 milliliters of 0.9% Normal Saline (NS) over 2 hours. The drop factor is 15 drops per milliliter (gtts/mL). How many drops per minute should be given? _____
- 69.** The nurse receives an order that reads 1200 milliliters 5% dextrose water (D₅W) intravenous (IV) at 150 milliliters per hour. The nurse should infuse for _____.
- 70.** The nurse will administer an IV solution at 115 milliliters per hour for 12 hours. What will the total volume infused be? _____

Basic Dosage by Body Weight Skills

Perform the calculations to determine whether the following prescription is a therapeutic dosage for this child:

Ordered medication: ABC 5 milligrams orally every 12 hours for a child weighing 14 pounds. You have medication ABC 15 milligrams per milliliter. The recommended daily oral dosage for a child is 2.5 milligrams per kilogram per day in divided doses every 12 hours.



- 71.** This child's weight is _____ kilograms.
- 72.** What is the recommended dosage for this child? _____ milligrams per day
- | | |
|-------------------------------------|-------------------------------------|
| Weight: | 34 pounds 6 ounces |
| Ordered dosage: | 1.4 milligrams per kilogram per day |
| Recommended dosage from drug label: | 3 milligrams every 8 hours |
- 73.** What is the daily dose? _____
- 74.** What is the individual dose? _____
- 75.** Does the ordered dose match the recommended dosage? _____

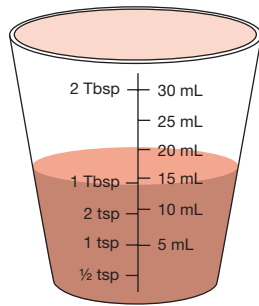
Answers to Pre-Test

1. 10
2. 166
3. 1258
4. 3298
5. 12.46 or 12 R 12 or $12\frac{6}{13}$
6. 14
7. 1515
8. $\frac{1}{4}, \frac{3}{4}, \frac{5}{6}, \frac{7}{8}$
9. $46\frac{13}{30}$
10. $37\frac{3}{4}$
11. $8\frac{1}{7}$
12. $14\frac{1}{3}$ or 14 R 1 or 14.33
13. $\frac{1}{5}$
14. $8\frac{11}{500}$
15. 6.875
16. 20.1
17. 53.65
18. 18.72
19. 570.15
20. 0.12945 mg
21. 0.1 mg
22. 43
23. 31.25
24. $33\frac{1}{3}$
25. 2.25
26. 10
27. 5 : 6
28. 39
29. 6
30. 6.8
31. 6
32. 6.5
33. 15.28
34. 22.4
35. \$46.67
36. 7.7%
37. $\frac{1}{200}$
38. 350%
39. 1800%
40. $1\frac{1}{1000}$
41. 0.0007
42. 35
43. -54
44. -7
45. 512
46. 44
47. 3.2 or $3\frac{1}{5}$

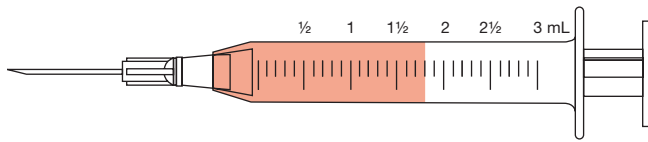
48.

Generic name	nebivolol
Trade name	Not shown
Manufacturer	PL Pharmaceuticals, Inc.
National Drug Code (NDC) number	0456-1402-01
Lot number (control number)	Not shown
Drug form	Tablets
Dosage strength	2.5 milligrams
Usual adult dose	Not shown; see package insert
Total amount in vial, packet, box	100 tablets
Prescription warning	Rx only
Expiration date	Not shown

49. 14 milliliters of a liquid medication



50. 1.8 milliliters. Shade the syringe to indicate this volume of medication.



51. 540
52. 80
53. 1500
54. $\frac{1}{200}$

55. 0.2
56. 50
57. 17.5
58. 3 tablets
59. 10 milliliters
60. 2 tablets
61. $2\frac{1}{2}$ tablets
62. 10 milliliters
63. 20 milliliters
64. 0.13 milliliter
65. 1.67 milliliters
66. 1.4 milliliters
67. 2 tablets
68. 9 drops per minute
69. 8 hours
70. 1380 milliliters
71. 6.36
72. 15.9
73. 21.88 milligrams per day
74. 7.29 milligrams per dose
75. No, the physician should be contacted for clarification.

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Whole Number Review

Student Learning Outcomes

After completing the tasks in this unit, you will be able to:

- 1-1** Use symbols to complete a math statement
- 1-2** Write number statements
- 1-3** Find the sum of whole numbers
- 1-4** Subtract whole numbers
- 1-5** Multiply whole numbers
- 1-6** Factor whole numbers
- 1-7** Divide whole numbers
- 1-8** Solve for the unknown in whole number operations
- 1-9** Round to specific place value
- 1-10** Estimate using whole numbers
- 1-11** Calculate an arithmetic mean, median, mode, and range
- 1-12** Convert between standard time and military time
- 1-13** Apply whole numbers to critical thinking exercises

Pre-Test

1. $48 + \underline{\quad\quad} + 123 = 188$
2. $2,008 - 199 =$
3. $49 \times 127 =$
4. $1,530 \div 6 =$
5. Draw a factor tree for 324.
6. Round 15,875 to the nearest tens place.

7. Round 2,893 to the nearest hundreds.
8. Sally is a dental assistant who works a variable schedule. During the month of December, she has averaged the following weekly total hours of work: 28 hours, 32 hours, 24 hours, and 40 hours. What is the mean or the average number of hours she has worked each week during the month of December?
9. Find the median for the chemistry data set: 12, 37, 15, 19, 20, 42, 18, 6, 10
10. Patients at the Village Central Rehabilitation Center, Wing B, are the following ages: 18, 28, 47, 98, 81, 83, 87, 31, 38, 56, 76, 69. What is the range of patient ages for the residents in Wing B?
11. Write a number statement for the relationship of 7 and -7 .
12. Convert 12:23 P.M. to Universal or military time.
13. Read the number: 108,273. The place value of the underlined digit is _____.
14. A dental assistant needs 192 hours of clinical practical work. The dental assistant has completed 89 hours; how many hours remain to fulfill the clinical requirement?
15. A patient's weight is fluctuating. The patient initially weighed 198 pounds, then he lost 13 pounds, only to gain another 7, and lose another 3. What is his new weight?



Overview

Mathematics is a key skill of health care workers. As a health care worker, you know that accuracy is important. Being competent in whole number concepts and addition, subtraction, multiplication, and division will form the basis for successful computations on the job. These basic skills form the foundation for the other daily math functions you will use in the workplace.

Whole Numbers

REVIEW

What is a whole number? A **whole number** is a positive number. Whole numbers do not include a fraction or a decimal. We use whole numbers in our everyday lives to add calories, count medicine capsules, calculate wages, arrive at a total cost of a purchase, and measure our weight in pounds. Math is used in the health care setting, and whole numbers and the operations of addition, subtraction, multiplication, and division form the basis for excellence in health care math.

As health care professionals we need to be aware of the information conveyed through whole numbers. These numbers are used in meaningful ways to convey important information. For example, whole numbers appear on over-the-counter drug packaging to show specific information.

The packet below notes that these are 12-hour tablets and that there are a total of 12 tablets in the package.



MATH SENSE

Approach math matter-of-factly; math is a job skill and a life skill.

loratadine *D-12 Hour*

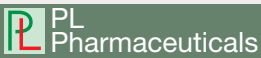
12 Tablets

5 mg/120 mg

12 extended release tablets

Rx only

12 Tablets



Loratadine 5 mg/Antihistamine
Pseudoephedrine Sulfate
120 mg/Nasal Decongestant

NON-DROWSY*

ALLERGY & SINUS RELIEF:

- Sneezing • Runny Nose
- Itchy, Watery Eyes • Sinus Pressure
- Nasal Congestion

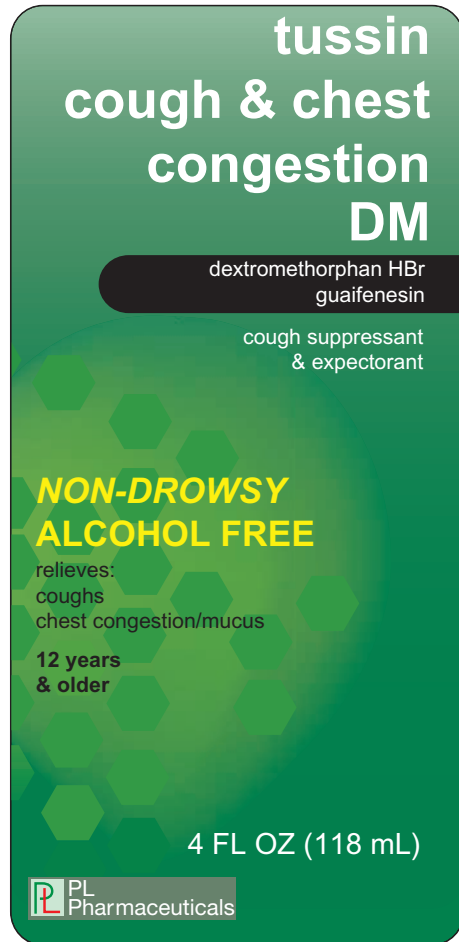
Cold Symptom Relief for:

- Nasal Congestion • Sinus Pressure

***When taken as directed.
See Drug Facts Panel.**

Practice Label

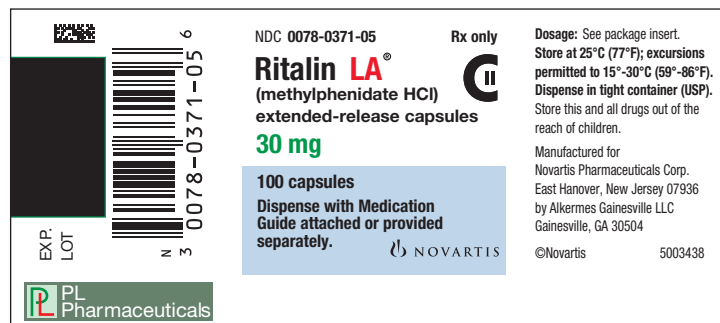
The label for tussin on the next page provides different types of information. This medicine is for children 12 years and older; the bottle contains 4 fluid ounces or 118 milliliters of medication.



Practice Label

Other whole numbers also appear on prescription drug labels such as the National Drug Code (NDC) number, temperature for storage instructions, and other company identifying numbers such as lot number and expiration date.

When we are aware of these whole numbers, we see they are meaningful.



Practice Label

Practice 1

Brainstorm: List at least 10 uses of whole numbers in the health care field.

1. _____
2. _____
3. _____
4. _____


- | | |
|----------|-----------|
| 5. _____ | 8. _____ |
| 6. _____ | 9. _____ |
| 7. _____ | 10. _____ |

We are surrounded by numbers in almost every aspect of our lives. Let's look at the prevalence of whole numbers in the context of health care.

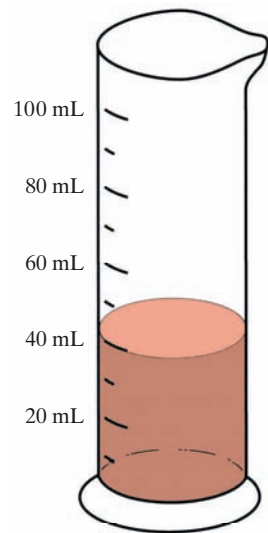
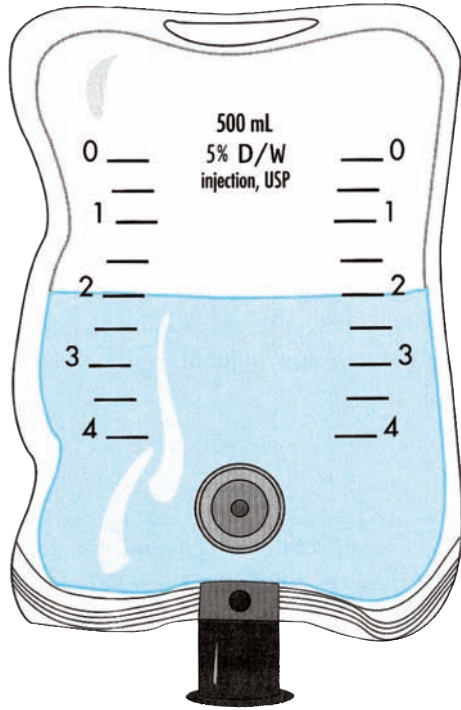
Practice 2

Circle the whole numbers in the figures below and note what information is provided by them.



doxazosin mesylate	*Each tablet contains doxazosin mesylate equivalent to 4 mg doxazosin.
100 Tablets	DOSAGE AND USE: See accompanying prescribing information.
4 mg*	Store below 30°C (86°F).
100 Tablets NDC 0049-2770-66	CAUTION: Federal law prohibits dispensing without prescription.
 0304	 3 0049-2770-66 6 05-4540-32-3

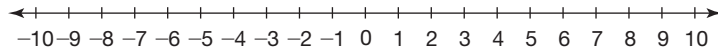
Practice Label



40 mL of 1:40
acetic acid (solution)

Integers

Whole numbers and their opposites are called **integers**. For example, 7 and -7 are integers, and they are opposite numbers. We often use a number line to visualize integers and their relationships with other integers. The **number line** is a line labeled with the integers in increasing order from left to right. The number line extends in both directions:



Remember that any integer is always greater than the integer to its left. In negative numbers, the closer a negative number is to 0 on the number line, the larger the number is. For example, -3 is larger than -19 because -3 is closer to 0 on the number line than -19 is.

Symbols and Number Statements

REVIEW

Symbols may be used to show the relationship among numbers. Symbols are important in creating math statements and relationships.

Symbol	Meaning	Example
=	is equal to	$1 + 7 = 8$
>	is greater than	$19 > 6$
<	is less than	$5 < 12$
\leq	is equal to or less than	age ≤ 5
\geq	is equal to or greater than	weight ≥ 110 pounds

A **number statement** or **simple equation** shows the relationship between numbers, operations, and/or symbols.

Practice 3

Use the symbols ($=$, $>$, $<$, \leq , and \geq) to complete the number statement.

1. 44 _____ 34
2. -5 _____ -17
3. 12 _____ -7
4. 12:00 P.M. _____ noon
5. Seven less than 4 _____ the numbers -5 , -4 , -3
6. \$2.00 _____ 2 hundred pennies

7. 235 _____ 187
8. 2 nickels _____ a quarter
9. 245 _____ $78 + 34 + 3$
10. One dollar + 2 quarters _____ \$1.35
11. The numbers 0, 1, 2, are _____ the number 2
12. 3 _____ $4 \div 2$

Practice 4

Write five number statements of your own.

1. _____
2. _____
3. _____
4. _____
5. _____

Addition



SET-UP HINT

Line up the addition problem according to the value of each digit (from the smallest digit to the largest) and then work left.

Remember to carry your extra digit to the next place value to the left.

REVIEW

Addition involves finding a total, or sum, by combining two or more numbers. To add, line up numbers in a vertical column and add them to find the total. These numbers are lined up by place value. In addition problems, the total, or answer, is called the **sum**.

Practice 5

Find the sum of each problem.

1. $7 + 8 + 10 + 9 =$ _____
2. $21 + 47 =$ _____
3. $1,297 + 90 + 102 + 5 =$ _____
4. $916 + 897 =$ _____
5. $1,773 + 233 + 57 =$ _____
6. $9 + 245 + 32 =$ _____

- 7. $11 + 357 + 86 + 34 =$ _____
- 8. $24,578 + 9,075 =$ _____
- 9. $443 + 2,087 + 134 =$ _____
- 10. $910 + 3 + 125 =$ _____

Practice 6

Inventory is an important clerical function in the health care industry. Supply technicians, clerks, nursing assistants, or other staff will sometimes perform this work. Keeping accurate inventory reduces overstocking and helps avoid the problem of understocking medical supplies.

Find the sum of each addition problem.

- 1. The Golden Years Care Center performs a monthly inventory. Find the sum for each category.

Category	Sum
a. Examination gloves: $31 + 88 + 47 +$ two boxes of 50	_____
b. Thermometer covers: $281 + 304 + 17 + 109$	_____
c. Medicine cups: $313 + 245 + 106 + 500 + 12$	_____
d. Boxes of disposable syringes (50 per box): $2 + 6 + 9 + 3$	_____

- 2. Intake and output totals require addition skills. Unlike household measurements, which are measured in cups, health care patient intake and output units are measured in milliliters (mL). Intake includes oral ingestion of fluids and semi-liquid food, intravenous feedings, and tubal feedings. Find the intake totals.

Type of Intake	Milliliters (mL)	Sum
a. Oral	120, 210, 150, 240	_____
b. Intravenous	250, 500	_____
c. Blood	500	_____
d.	Total Intake	_____

The intake sums would be charted in the patient's medical record.

- 3. Measuring output is important because it helps the health care worker ensure a patient's health and hydration. Output is measured in milliliters. Cubic centimeters were formerly used and may still appear on occasion; however, the metric units of milliliter or liter are the standard units of measure for volume today. Output includes liquid bowel movements or diarrhea, urine, emesis (vomiting), and gastric drainage. Find the output totals.