



Mastering the *i*LEAP
Math Test
in
Grade 5

Erica Day
Colleen Pintozzi
Mary Reagan

AMERICAN BOOK COMPANY
P. O. BOX 2638
WOODSTOCK, GEORGIA 30188-1383
TOLL FREE 1 (888) 264-5877 PHONE (770) 928-2834
TOLL FREE FAX 1 (866) 827-3240
WEBSITE: www.americanbookcompany.com

Contents

Acknowledgements	ii
Preface	vii
Diagnostic Test	1
Part 1	1
Part 2	2
Part 3	6
Part 4	11
1 Whole Numbers and Number Sense	15
1.1 Place Value: Greater Than One	15
1.2 Practicing Adding	17
1.3 Adding Whole Numbers	18
1.4 Practicing Subtraction	19
1.5 Subtracting Whole Numbers	20
1.6 Multiplying Whole Numbers	21
1.7 Divisibility Rules	22
1.8 Dividing Whole Numbers	23
1.9 Factors	24
1.10 Prime and Composite Numbers	25
1.11 Multiples	26
1.12 Whole Number Word Problems	28
1.13 Determining the Operation	29
1.14 Using Estimation to Solve Word Problems	30
1.15 Using Reasoning to Solve Word Problems	31
Chapter 1 Review	32
Chapter 1 Test	33
2 Fractions and Ratios	35
2.1 Fractions	35
2.2 Simplifying Fractions	36
2.3 Simplifying Improper Fractions	37
2.4 Finding Numerators	38
2.5 Adding Fractions	39
2.6 Subtracting Fractions	40
2.7 Changing Mixed Numbers to Improper Fractions	41
	iii

2.8	Estimating Fractions	42
2.9	Comparing Fractions	43
2.10	Comparing Fractions on a Number Line	44
2.11	Changing Fractions to Decimals	45
2.12	Changing Mixed Numbers to Decimals	46
2.13	Changing Decimals to Fractions	46
2.14	Changing Decimals with Whole Numbers to Mixed Numbers	47
2.15	Fraction Word Problems	47
2.16	Representing Fractions and Decimals Graphically	48
2.17	Ratios	50
2.18	Equivalent Ratios	51
	Chapter 2 Review	52
	Chapter 2 Test	54
3	Introduction to Algebra	56
3.1	Algebra Vocabulary	56
3.2	Understanding Algebra Word Problems	57
3.3	Setting Up Algebra Word Problems	59
3.4	Modeling Equations	60
	Chapter 3 Review	61
	Chapter 3 Test	62
4	Solving Equations and Inequalities	63
4.1	Solving Equations with Addition and Subtraction	63
4.2	Solving Equations with Multiplication and Division	65
4.3	Solving Algebra Word Problems	66
4.4	Graphing Inequalities	68
4.5	Solving Inequalities with Addition and Subtraction	70
4.6	Solving Inequalities by Multiplication and Division	71
4.7	Inequality Word Problems	72
	Chapter 4 Review	73
	Chapter 4 Test	74
5	Patterns	75
5.1	Number Patterns	75
5.2	Patterns Using Tables	77
5.3	Pattern Word Problems	79
5.4	Geometric Patterns	80

Contents

Chapter 5 Review	82
Chapter 5 Test	83
6 Measurement	84
6.1 Time	84
6.2 Elapsed Time	87
6.3 Estimating Time	88
6.4 Customary Measure	89
6.5 Approximate U. S. Measure	89
6.6 Converting Units of Measure	90
6.7 Converting within the Customary System	91
6.8 The Metric System	92
6.9 Understanding Meters	92
6.10 Understanding Liters	92
6.11 Understanding Grams	92
6.12 Estimating Metric Measurements	93
6.13 Converting Units within the Metric System	94
6.14 Compare Measurements Between the U. S. and Metric Systems	95
Chapter 6 Review	96
Chapter 6 Test	97
7 Angles and Shapes	98
7.1 Types of Angles	98
7.2 Measuring Angles	99
7.3 Angle Applications	100
7.4 Types of Shapes	102
7.5 Properties of Shapes	104
7.6 Shapes in Objects	106
Chapter 7 Review	107
Chapter 7 Test	108
8 Transformations and Symmetry	110
8.1 Translations	110
8.2 Reflections	112
8.3 Rotations	114
8.4 Rotational Symmetry	116
Chapter 8 Review	118
Chapter 8 Test	119

9 Coordinate Geometry	120
9.1 The Coordinate Grid and Ordered Pairs	120
9.2 Plotting Points on a Coordinate Grid	122
9.3 Finding Points From Diagrams	124
Chapter 9 Review	125
Chapter 9 Test	126
10 Data Analysis	128
10.1 Charts and Tables	128
10.2 Line Graphs	131
10.3 Comparing Scales and Labels on Line Graphs	133
10.4 Bar Graphs	134
10.5 Double Bar Graphs	136
10.6 Comparing Scales and Labels on Bar Graphs	138
10.7 Spreadsheets	139
10.8 Surveys	140
Chapter 10 Review	141
Chapter 10 Test	143
11 Probability	145
11.1 Probability	145
11.2 More Probability	147
11.3 Probability Using Pictures	149
11.4 Probability Using Spinners	151
Chapter 11 Review	153
Chapter 11 Test	154
Practice Test 1	156
Part 1	156
Part 2	157
Part 3	162
Part 4	167
Practice Test 2	169
Part 1	169
Part 2	170
Part 3	175
Part 4	180
Index	182

Diagnostic Test

Part 1

This section of the test covers estimation. You have 3 minutes to complete these 5 questions. You may NOT use a calculator.

1. Three friends are going to share the cost of a book priced at \$14.86 including tax. What is an estimation of how much each girl will pay for the book?

A \$5.00
B \$4.00
C \$3.50
D \$3.75

GLE 9

2. Alma baked 8 dozen cookies for the school bake sale. If she sold all of the cookies for \$3.05 per dozen, about how much money did Alma earn for the school bake sale?

A \$2.00
B \$22.00
C \$24.00
D \$240.00

GLE 7

3. What is the value of the number 5 digit in the number below?
826, 543, 212

A five hundred thousand
B fifty thousand
C five thousand
D five hundred

GLE 8

4. How many feet are in one yard?

A 6
B 5
C 4

D 3

GLE 15

5. Which number sentence below is true?

A $\frac{1}{2} > \frac{3}{8}$

B $\frac{1}{2} > \frac{3}{4}$

C $\frac{3}{4} < \frac{1}{2}$

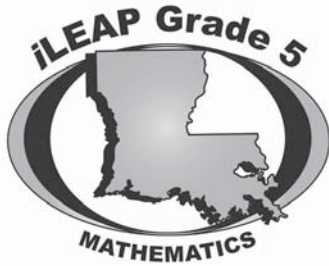
D $\frac{3}{8} > \frac{1}{2}$

GLE 4

Chapter 1

Whole Numbers and Number Sense

This chapter covers the following *i*LEAP 5 Standards:



	Benchmark	GLE
Number and Number Relations	N-1-M	1
	N-5-M	7, 8
	N-6-M	9, 10

1.1 Place Value: Greater Than One

Place Value: The value of a digit based upon its place, within the number. For example, in the chart below, the number 5 has two very different values in the number 987,654,325:

Hundred-million	Ten-million	Million	Hundred-thousand	Ten-thousand	Thousand	Hundred	Tens	Ones
100,000,000	10,000,000	1,000,000	100,000	10,000	1,000	100	10	1.0
9	8	7	6	5	4	3	2	5

From the right, let's start in the ones column. As we progress from right to left, we see that each column represents 10 times the value of the column before it:

Ones:	1
Tens:	10 times 1 = 10
Hundreds:	10 times 10 = 100
Thousands:	10 times 100 = 1000
Ten-Thousands:	10 times 1000 = 10,000
Hundred-Thousand:	10 times 10,000 = 100,000
Million:	10 times 100,000 = 1,000,000
Ten Million:	10 times 1,000,000 = 10,000,000
Hundred Million:	10 times 10,000,000 = 100,000,000

1.13 Determining the Operation

In order to solve a problem, determining which operation to use is essential. When reading a problem, certain key words may help you to determine which operation to use.

Which Operation Should I Use?

Key Words/Phrases	Operation
In all, In total, Sum of	Addition
Are left, Remaining	Subtraction
Equal installments, Times	Multiplication
In each set	Division

Example 15: Jackie wants to purchase three new video games from her friend, Pam. The cost of each video game is \$39.50. She plans to pay Pam in 6 monthly installments. What will be her monthly installment?

Answer: Compute the total due to Pam: $\$39.50$ per game times 3 games = $\$118.50$
 Calculate her installment: $\$118.50 \div 6$ months = $\$19.75$
 Jackie's monthly installment will be $\$19.75$.

Example 16: Tyler earns \$25.00 per lawn mowed. If he mows 13 lawns per month, how much will Tyler earn?

Answer: $\$25.00$ per lawn \times 13 lawns = $\$325.00$
 Tyler will earn $\$325.00$ per month.

Solve the problems.

1. Kayla went to the movies and purchased candy, popcorn, and soda for 2 of her friends. If the total was \$12.50, how much money did she spend on each of her friends? Bonus: If she paid with \$20.00, how much change should she receive?
2. James went to the bookstore and purchased 6 science fiction books and 4 mystery books. If the science-fiction books cost \$4.95 each and the mystery books cost \$4.25 each, how much did he spend in total?
3. Amy baked 4 cakes for a school bake sale. If each cake had 12 slices that sold for \$0.50 each, how much money did she earn?
4. Keith bought 4 pizzas for his soccer team. The cost was \$48.60. The 12 teammates plan to reimburse him for the total charge. If they divide the cost evenly, how much will each teammate contribute?

2.7 Changing Mixed Numbers to Improper Fractions

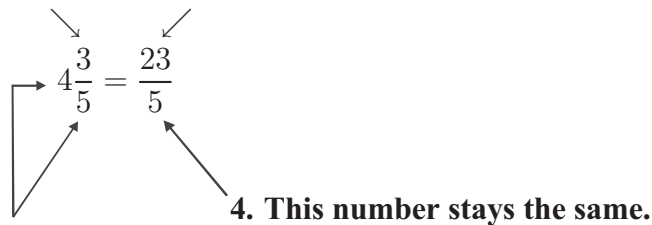
Example 9: Change $4\frac{3}{5}$ to an improper fraction.

Step 1: Multiply the whole number (4) by the bottom number of the fraction (5).
 $4 \times 5 = 20$

Step 2: Add the top number to the product from Step 1: $20 + 3 = 23$

Step 3: Put the answer from step 2 over the bottom number (5).

2. Add this number. **3. Put the answer here.**



1. Multiply these two numbers.

Change the following mixed numbers to improper fractions.

1. $3\frac{1}{2} = \underline{\hspace{2cm}}$ 6. $8\frac{5}{8} = \underline{\hspace{2cm}}$ 11. $3\frac{3}{5} = \underline{\hspace{2cm}}$ 16. $2\frac{5}{6} = \underline{\hspace{2cm}}$

2. $2\frac{7}{8} = \underline{\hspace{2cm}}$ 7. $1\frac{2}{7} = \underline{\hspace{2cm}}$ 12. $9\frac{3}{8} = \underline{\hspace{2cm}}$ 17. $7\frac{3}{7} = \underline{\hspace{2cm}}$

3. $9\frac{2}{3} = \underline{\hspace{2cm}}$ 8. $2\frac{4}{9} = \underline{\hspace{2cm}}$ 13. $10\frac{4}{5} = \underline{\hspace{2cm}}$ 18. $6\frac{7}{9} = \underline{\hspace{2cm}}$

4. $4\frac{3}{5} = \underline{\hspace{2cm}}$ 9. $6\frac{1}{5} = \underline{\hspace{2cm}}$ 14. $3\frac{3}{10} = \underline{\hspace{2cm}}$ 19. $7\frac{2}{5} = \underline{\hspace{2cm}}$

5. $7\frac{1}{4} = \underline{\hspace{2cm}}$ 10. $5\frac{2}{7} = \underline{\hspace{2cm}}$ 15. $4\frac{1}{7} = \underline{\hspace{2cm}}$ 20. $1\frac{6}{7} = \underline{\hspace{2cm}}$

Whole numbers become improper fractions when you put them over 1. Change the following whole numbers to improper fractions. The first one is done for you.

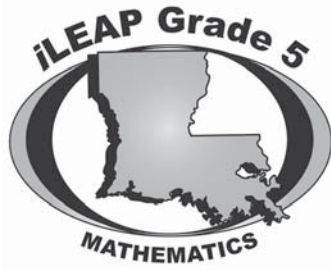
21. $4 = \frac{4}{1}$ 23. $3 = \underline{\hspace{2cm}}$ 25. $15 = \underline{\hspace{2cm}}$ 27. $6 = \underline{\hspace{2cm}}$ 29. $8 = \underline{\hspace{2cm}}$

22. $10 = \underline{\hspace{2cm}}$ 24. $2 = \underline{\hspace{2cm}}$ 26. $5 = \underline{\hspace{2cm}}$ 28. $11 = \underline{\hspace{2cm}}$ 30. $16 = \underline{\hspace{2cm}}$

Chapter 5

Patterns

This chapter covers the following *i*LEAP 5 Standards:



	Benchmark	GLE
Patterns, Relations, and Functions	P-1-M	33

5.1 Number Patterns

Number **patterns** using addition and subtraction vary according to math equations. For instance, counting by two's is a number pattern using addition. Or starting from 100 and counting backwards by fours is a number pattern using subtraction.

Example 1: What number would continue the pattern 1, 3, 5, 7, ___?

Step 1: Find the pattern. The numbers are increasing by 2.

Step 2: Find the next number. $7 + 2 = 9$. The next number in the pattern is 9.

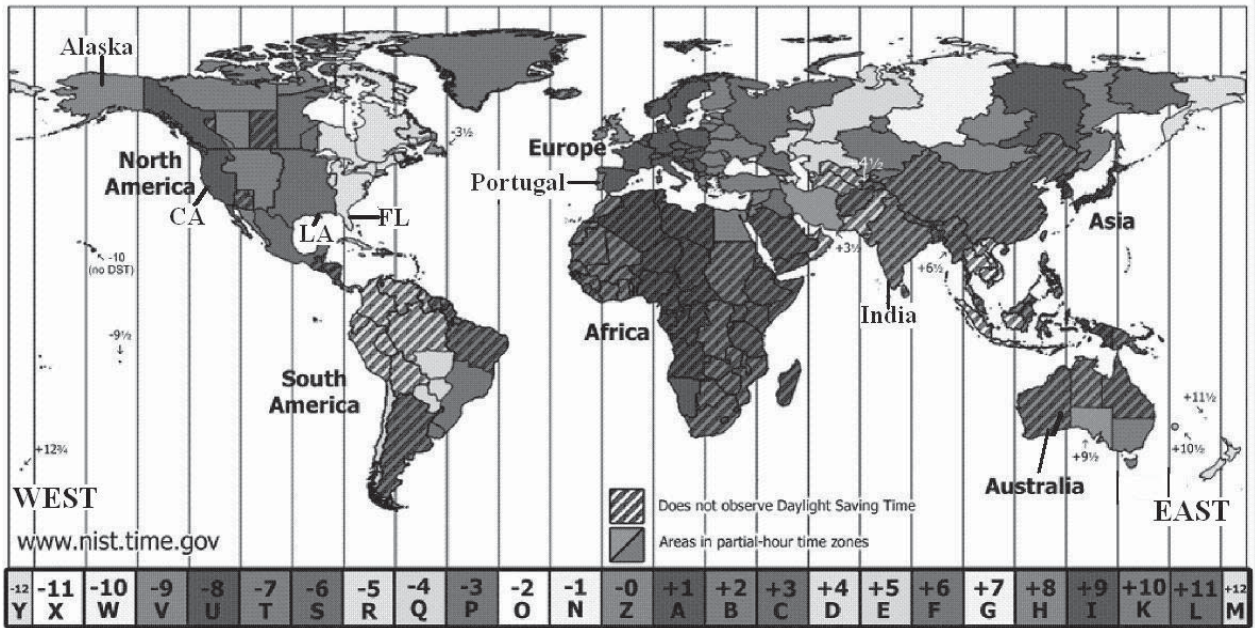
Example 2: What number is missing in this pattern? 30, 25, 20, ___, 10, 5.

Step 1: Find the pattern. The numbers are decreasing by 5.

Step 2: Find the next number. $20 - 5 = 15$. The number missing in the pattern is 15.

Find the missing number in the following patterns using addition and subtraction.

1. 2, 4, 6, ___, 10, 12
2. 100, 90, 80, 70, ___
3. 60, 63, 66, ___, 72, 75
4. 17, 15, 13, 11, ___, 7
5. 40, 44, ___, 52, 56, 60
6. 18, 23, 28, ___, 38, 43
7. 94, 88, 82, 76, ___, 64
8. 11, 19, ___, 35, 43, 51
9. 62, 59, 56, 53, ___, 47
10. 55, 53, 51, ___, 47, 45
11. 32, 42, ___, 62, 72, 82
12. 300, 250, 200, ___, 100
13. 55, 66, ___, 88, 99, 110
14. 220, 210, 200, 190, ___
15. 717, 723, 729, ___, 741



Using the time zone map above, answer the questions below.

1. It is 3:00 p.m. in California. What time is it in the most eastern part of Florida?
2. It is 4:00 a.m. in the western part of Australia. What time is it in the eastern part of Australia?
3. It is 6:00 p.m. in Louisiana. What time is it in the western part of mainland Alaska (not including the islands)?
4. It is 1:00 p.m. in Louisiana. What time is it in the most eastern part of Africa?
5. It is 5:00 p.m. in the most eastern part of South America. What time is it in Louisiana?
6. It is 9:00 a.m. in Greenwich England. What time is it in Louisiana?
7. It is 5:00 p.m. in central India (marked +5 on the time zone band). What time is it in the most western part of Australia?
8. It is 7:00 a.m. in western Portugal. What time is it in Louisiana?

7.5 Properties of Shapes

Shapes are defined by their sides and angles. In describing the sides of a shape, we include the number of sides, whether the sides are the same size or not, and whether the sides are parallel or perpendicular to each other. In describing the angles of a shape, we include the number of angles, if they are the same size, and if the angles are right angles or other kinds of angles.

Parallel lines are two or more lines that are equal distance to each other. An easy example of this is the equal sign " $=$ ". The lines of an equal sign are equal distance apart and they never intersect. Perpendicular lines are two lines that meet or cross each other at a right angle (90°). A plus sign is an example of perpendicular lines " $+$ ".

In describing each of the twelve shapes below, only "regular" shapes will be referred to. For instance, a pentagon has five sides. In this section, we will only be referring to a regular pentagon with five equal sides, not a pentagon with different lengths of sides. The same goes for the rest of the shapes. In a later section of this chapter, irregular shapes will be discussed.

Triangle - 3 sides and 3 angles. The 3 sides and angles may be equal as in the case of an equilateral triangle, 2 sides and angles may be equal as in the case of an isosceles triangle, or no sides and angles equal as in the case of a scalene triangle.

Square - all 4 sides are equal, 2 pairs of sides parallel to each other. All 4 angles equal and are right angles.

Rectangle - 2 pairs of equal and parallel sides, all 4 angles are right angles. One pair of sides may be longer than the other pair of sides.

Trapezoid - 2 sides are made up of 1 pair of parallel lines that are opposite each other, and 2 sides that are not parallel to each other. 4 angles, 2 are acute and 2 are obtuse.

Rhombus - All 4 sides are equal. 2 pairs of sides that are parallel to each other. 2 pairs of equal angles.

Parallelogram - 2 pairs of parallel lines that are opposite each other, making up two pairs of equal sides and 2 pairs of equal angles.

Pentagon - 5 sides. A regular pentagon has 5 equal sides and 5 equal angles.

Hexagon - 6 sides. A regular hexagon has 6 equal sides and 6 equal angles, 3 pairs of sides are parallel and opposite each other.

Heptagon - 7 sides. A regular heptagon has 7 equal sides and 7 equal angles.

Octagon - 8 sides. A regular octagon has 8 equal sides and 8 equal angles, 4 pairs of sides are parallel and opposite each other.

Nonagon - 9 sides. A regular nonagon has 9 equal sides and 9 equal angles.

Decagon - 10 sides. A regular decagon has 10 equal sides and 10 equal angles, 5 pairs of sides are parallel and opposite each other.

10.7 Spreadsheets

Spreadsheets are used in businesses to show profit and loss, assets and liabilities, costs of individual accounts such as payroll, utilities, etc. Students can make spreadsheets to figure their grade point average (GPA), track allowances or earnings and where their money was spent, how much time was spent on practicing their musical instrument, etc. Spreadsheets do not use keys, but do use labels.

Carefully read the spreadsheet below and answer the questions that follow.

Carlin's Earnings from Lawn Mowing, Paper Route, and Odd Jobs And Where the Money was Spent for the Month of June:						
	<u>Earnings:</u>			<u>Spending:</u>		
	<u>Lawns</u>	<u>Paper Route</u>	<u>Odd Jobs</u>	<u>Savings</u>	<u>Toys & Games</u>	<u>Charity</u>
June 10	\$15.00			\$5.00	\$5.00	\$5.00
June 12		\$30.00	\$5.00	\$10.00	\$20.00	\$5.00
June 15	\$20.00		\$2.00	\$10.00	\$2.00	\$10.00
June 18	\$15.00		\$3.00	\$10.00	\$5.00	\$3.00
June 21	\$12.00			\$10.00	\$2.00	
June 22	\$22.00			\$10.00	\$2.00	\$10.00
June 26		\$30.00	\$6.00	\$15.00	\$15.00	\$6.00
June 27	\$15.00		\$8.00	\$10.00	\$6.00	\$7.00
Total	\$99.00	\$60.00	\$24.00	\$80.00	\$57.00	\$46.00

1. What is the total amount Carlin earned mowing lawns?
2. How much did Carlin save from his June 18 earnings?
3. How much did Carlin spend on toys and games from his June 26 earnings?
4. What is the total amount Carlin saved in the month of June?
5. How much did Carlin give to charity from his June 12 earnings?
6. How many times during the month of June did Carlin receive pay from his paper route?
7. How much did Carlin earn from doing odd jobs on June 15th?
8. How much did Carlin earn from mowing lawns on June 22?
9. How much did Carlin give to charity from his June 27 earnings?