



TABLE OF CONTENTS (1 OF 3)

Master Fractions, Grade 3

Master Fractions	PAGE
Table of Standards	6
SECTION I: REPRESENTING FRACTIONS	
Vertical Alignment: Representing Fractions (3.3A, 3.3B, 3.7A)	11
Section I Thought Extenders	12
3.F.1 Bridge: Introduction to Representing Fractions	13
3.F.2 Master: Represent Fractions 0–1: Denominators of 2, 4, & 8 (Area Models).....	17
3.F.3 Master: Represent Fractions 0–1: Denominators of 2, 4, & 8 (Strip Diagrams)	25
3.F.4 Master: Represent Fractions 0–1: Denominators of 2, 4, & 8 (Sets)	33
3.F.5 Master: Represent Fractions 0–1: Denominators of 3 & 6 (Area Models, Strip Diagrams, & Sets)	41
3.F.6 Master: Represent Fractions 0–1: Denominators of 2, 3, 4, 6, & 8 (Area Models, Strip Diagrams, & Sets)	48
3.F.7 Master: Represent Fractions 0–1: Denominators of 2, 3, 4, 6, 8 (Area Models, Strip Diagrams, & Sets)...	53
3.F.8 Master: Represent Fractions 0–1: Denominators of 2, 4, & 8 (Number Line)	60
3.F.9 Master: Represent Fractions 0–1: Denominators of 3 & 6 (Number Line)	71
3.F.10 Master: Represent Fractions: Number Lines That Start at Numbers Other Than 0	81
3.F.11 Evaluate: Posttest for Section I	84
SECTION 2: PARTITIONING FRACTIONS	
Vertical Alignment: Partitioning Fractions (3.3C, 3.3D, 3.3E, 3.6E)	93
3.F.12 Bridge: Introduction to Unit Fractions, Decomposing, and Partitioning	95
3.F.13 Master: Explain/Describe Unit Fractions	98
3.F.14 Master: Compose and Decompose Fractions 0–1 Using Unit Fractions (Area Models)	107
3.F.15 Master: Compose and Decompose Fractions 0–1 Using Unit Fractions (Strip Diagrams)	114
3.F.16 Master: Compose and Decompose Fractions 0–1 Using Unit Fractions (Set Models)	121
3.F.17 Master: Solve Problems Involving Partitioning: Whole Objects with Unit Fraction Solutions	129
3.F.18 Master: Solve Problems Involving Partitioning: Sets of Objects with Unit Fraction & Whole Number Solutions	138
3.F.19 Master: Solve Problems Involving Partitioning: Whole Objects with Non-Unit Fraction & Mixed Number Solutions	149
3.F.20 Master: Solve Problems Involving Partitioning: Sets of Objects with Non-Unit Fraction & Mixed Number Solutions	157
3.F.21 Bridge: Different Sizes of Fractional Parts	166
3.F.22 Evaluate: Posttest for Section 2	174



TABLE OF CONTENTS (2 OF 3)

Master Fractions, Grade 3

SECTION 3: EQUIVALENT FRACTIONS AND COMPARISONS	
Vertical Alignment: Equivalent Fractions and Comparisons (3.3F, 3.3G, 3.3H).....	185
3.F.23 Bridge: Introduction to Equivalent Fractions & Comparing Fractions	187
3.F.24 Master: Represent Equivalent Fractions: Denominators of 2, 3, 4, 6, 8 with Area Models	192
3.F.25 Master: Represent Equivalent Fractions	200
3.F.26 Master: Represent Equivalent Fractions (Number Lines).....	209
3.F.27 Master: Represent Equivalent Fractions (Number Lines)	212
3.F.28 Master: Comparing Fractions When the Denominators are the Same	221
3.F.29 Master: Comparing Fractions When the Numerators are the Same.....	228
3.F.30 Master: Compare Fractions on a Number Line	234
3.F.31 Master: Solve the Problems—Solve the Puzzle	243
3.F.32 Master: Posttest for Section 3	246

Content and Instruction Extras

Master Fractions, Grade 3	PAGE
MEANING BEHIND THE MATH	
SECTION 3: EQUIVALENT FRACTIONS AND COMPARISONS	
Types of Fraction Models—Area, Linear, and Set (3.1E)	18
Fractions are Numbers (3.1D, 3.1F)	26
Writing Fractions (3.1D, 3.1E)	26
Types of Fractions (3.1D, 3.1E, 3.1F)	41
The Whole, The Parts, The Name (3.1E)	48
Modeling Fractions with Cuisenaire Rods (3.1C, 3.1D, 3.1F)	61
“Accidental” Experience with Equivalent Fractions (3.1C, 3.1D, 3.1F)	72
Finding the Name of a Point When the Number Line Doesn’t Start at Zero (3.1C)	81
What is a Unit Fraction? (3.1C, 3.1D, 3.1F, 3.1G)	99
Sum of Unit Fractions vs. Fraction Addition (3.1E)	107
Counting Fractional Parts Isn’t Just About Counting Fractional Parts (3.1C, 3.1D, 3.1F, 3.1G)	114



TABLE OF CONTENTS (3 OF 3)

Master Fractions, Grade 3

Understanding Set Models for Fractions (3.IC)	122
What is Partitioning? How Does It Connect to Operations with Fractions? (3.ID)	129
Set Models and Partitioning (3.IC, 3.ID, 3.IG)	139
Meaning of Equivalent (3.ID, 3.IF)	193
Ways to Find Equivalent Fractions (3.IC, 3.ID)	193
Rethinking “Reducing” Fractions (3.ID)	200
Equivalent Fractions on the Number Line (3.IC, 3.ID, 3.IF, 3.IG)	210
Comparing Fractions That Have the Same Denominator (3.IC)	221
The Problem with Tricks and Gimmicks for Comparing Fractions (3.IE)	222
Comparing Fractions That Have the Same Numerator (3.IC)	228
READING, WRITING, AND SPEAKING TO IMPROVE CRITICAL THINKING	
The Academic Vocabulary of Fractions (3.ID, 3.IG).....	53
Helping Students Write Better Explanations, A Couple of Ideas (3.ID).....	121
Listening to Reasoning (3.IG).....	187
Academic Vocabulary of Equivalent Fractions and Comparisons (3.ID, 3.IG).....	243
RESOURCES	
Virtual Manipulatives (3.IC)	33
Best Practices for Virtual Manipulatives (3.IC)	34
Evaluating Resources for Representing Fractions (3.ID)	61
Technology Resources for Partitioning Fractions (3.IC)	99
Evaluating Resources for Partitioning Fractions	157
Technology Resources for Equivalent Fractions (3.IC)	213
Evaluating Resources for Equivalent Fractions	213
Technology Resources for Comparing Fractions (3.IC)	235
Evaluating Resources for Comparing Fractions	235
WORKING THE CLASSROOM	
Open-Ended vs. Multiple Choice Problems (3.IG)	84
This is Hard! Small Group vs. Whole Class Instruction (3.IG)	150
Materials Management 101 (3.IC)	167



TABLE OF STANDARDS (PG. 1 OF 2)

The activities in this Master Fractions, Grade 3 book address the following standards.

Where are we going? Focus Standards		Activity
(3.3)	Number and operations. The student applies mathematical process standards to represent and explain fractional units. The student is expected to:	
3.3A	represent fractions greater than zero and less than or equal to one with denominators of 2, 3, 4, 6, and 8 using concrete objects and pictorial models, including strip diagrams and number lines; Supporting Standard	1, 2, 3, 4, 5, 6, 7, 11
3.3B	determine the corresponding fraction greater than zero and less than or equal to one with denominators of 2, 3, 4, 6, and 8 given a specified point on a number line; Supporting Standard	8, 9, 11
3.3C	explain that the unit fraction $1/b$ represents the quantity formed by one part of a whole that has been partitioned into b equal parts where b is a non-zero whole number; Supporting Standard	12, 13, 22
3.3D	compose and decompose a fraction a/b with a numerator greater than zero and less than or equal to b as a sum of parts $1/b$; Supporting Standard	12, 14, 15, 16, 22
3.3E	solve problems involving partitioning a set of objects among two or more recipients using pictorial representations of fractions with denominators of 2, 3, 4, 6, and 8; Supporting Standard	12, 17, 18, 19, 20, 22
3.3F	represent equivalent fractions with denominators of 2, 3, 4, 6, and 8 using a variety of objects and pictorial models, including number lines; Readiness Standard	23, 24, 25, 26, 30, 32
3.3G	explain that two fractions are equivalent if and only if they are both represented by the same point on the number line or represent the same portion of a same size whole for an area model; and Supporting Standard	24, 25, 26, 27, 30, 32
3.3H	compare two fractions having the same numerator or denominator in problems by reasoning about their sizes and justifying the conclusion using symbols, words, objects, and pictorial models. Readiness Standard	23, 28, 29, 30, 31, 32
3.6	Geometry and measurement. The student applies mathematical process standards to analyze attributes of two-dimensional geometric figures to develop generalizations about their properties. The student is expected to	
3.6E	decompose two congruent two-dimensional figures into parts with equal areas and express the area of each part as a unit fraction of the whole and recognize that equal shares of identical wholes need not have the same shape. Supporting Standard	21, 22
3.7	Geometry and measurement. The student applies mathematical process standards to select appropriate units, strategies, and tools to solve problems involving customary and metric measurement. The student is expected to	
3.7A	represent fractions of halves, fourths, and eighths as distances from zero on a number line. Supporting Standard	8, 9, 10, 11



TABLE OF STANDARDS (PG. 2 OF 2)

What kind of mathematical thinking will we use? Process Standards		Activity
(3.1)	Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:	
3.1A	apply mathematics to problems arising in everyday life, society, and the workplace;	1, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 23, 25
3.1B	use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution;	1, 6, 8, 9, 10, 11, 12, 14, 15, 16, 17, 18, 19, 20, 22, 23, 25
3.1C	select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems;	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 24, 25, 26, 27, 28, 29, 30, 31
3.1D	communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 24, 25, 26, 27, 30
3.1E	create and use representations to organize, record, and communicate mathematical ideas;	2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 15, 16, 17, 18, 19, 20
3.1F	analyze mathematical relationships to connect and communicate mathematical ideas.	1, 8, 9, 10, 13, 14, 15, 16, 21, 24, 25, 27
3.1G	display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.	1, 12, 13, 17, 18, 19, 20, 25, 26, 30