


Grades 3-5



FoodMASTER

Using Food to Teach Mathematics and Science Skills

CREATED BY:

**Melani W. Duffrin
Sharon Phillips
Jana A. Hovland**

PARTNERED WITH:



NIU STEAM



Northern Illinois University

SPONSORED BY:

SEPA SCIENCE EDUCATION
PARTNERSHIP AWARD

Supported by the National Center for Research Resources, a part of the National Institutes of Health



FoodMASTER

Food, Mathematics And Science Teaching Enhancement Resource Initiative

www.foodmaster.org

Primary Authors:

Melani W. Duffrin, PhD, RDN
Principal Investigator of the FoodMASTER Initiative
Professor of Nutrition Science

Sharon Phillips, MSED
Talented and Gifted Elementary Teacher

Jana A. Hovland, MS, RD, LD
Past Associate Director of the FoodMASTER Initiative

Contributing Authors:

David Rivera, Jr., PhD
Associate Professor of Hospitality Management

Virginia Carraway-Stage, PhD, RDN, LDN
Director of the FoodMASTER Initiative
Assistant Professor of Nutrition Science

Reviewers:

Jennifer Shu, MD, FAAP
Pediatrician and Author

Katherine Phillips, PhD
Research Scientist
Director of Food Analysis Laboratory

Diana Hunn, PhD
Associate Professor of Science Education
University of Dayton

Brenda Davy, PhD, RD
Associate Professor of Human Nutrition, Food, and
Exercise

Diana Saum, MS, RDN, LDN
Instructor of Nutrition Science

George Johanson, PhD
Professor Emeritus of Education

Darlene Berryman, PhD, RD, LD
Professor of Food and Nutrition

Annette Graham, PhD
Associate Dean of Business Management

Third Grade Pilot Teachers:

Ruth Al-Esaili, MSED
Athens City Schools
The Plains, Ohio

Julie Hall, MEd
Warren Local Schools
Vincent, Ohio

Sherry Hensler
Meigs Local Schools
Middleport, Ohio

Kyle Lonas
Athens City Schools
The Plains, Ohio

Robert Maher, MEd
Federal Hocking Schools
Amesville, Ohio

Sandy Needs, MSED, NBCT
Eastern Local Schools
Reedsville, Ohio

Bonnie Owens, BS in Ed
Eastern Local Schools
Reedsville, Ohio

Debbie Pratt, MSED
Eastern Local Schools
Reedsville, Ohio

Elizabeth A. Schwarzel, MSED
Athens City Schools
Athens, Ohio

Jan Slattery, MSED, NBCT
Athens City Schools
The Plains, Ohio

Teresa Stoops, MSED
Wolf Creek Local Schools
Waterford, Ohio

Howard W. Tornes, MEd
Wolf Creek Local Schools
Waterford, Ohio

Sandra Walker, MSED
Meigs Local Schools
Middleport, Ohio

www.foodmaster.org

ISBN 978-0-9863691-2-4

These resource materials were supported by the Science Education Partnership Award which is funded from the National Center for Research Resources a component of the National Institutes of Health. The content is solely the responsibility of the authors and does not necessarily represent the official views of NCRR or NIH.

Book Design by Cara Cairns Design, LLC

*This book is dedicated in loving memory of
Beverly Wyckoff Wilson,
a fourth grade teacher,
and to all teachers that selflessly
give so much every day.*

*We wish to thank family, friends, co-workers and teachers
who have provided much love, support and feedback,
and God with whom all things are possible.*

— Melani W. Duffrin, Sharon Phillips and Jana A. Hovland

SEPA SCIENCE EDUCATION PARTNERSHIP AWARD

Supported by the National Center for Research Resources, a part of the National Institutes of Health

The Science Education Partnership Award (SEPA) was created to improve K-12 health sciences education and to create public awareness of life sciences. SEPA brings educators, media experts, community leaders, and biomedical and behavior scientists together in partnerships to design and disseminate innovative K-12 science programs. SEPA is administered by the National Center for Research Resources, a component of the National Institutes of Health.

The Food, Mathematics, and Science Teaching Enhancement Resource (FoodMASTER) initiative received three years of SEPA-Phase I funding to develop the multimedia FoodMASTER Intermediate curriculum and to investigate its impact. Thirteen classrooms in Appalachian Ohio participated in the pilot program and four classrooms served as controls. Initial results showed promise for using food as a tool to teach mathematics and science to intermediate students. FoodMASTER was awarded SEPA-Phase II funding to prepare the curriculum for national dissemination and to continue to investigate the impact of FoodMASTER Intermediate.

Table of Contents

| | |
|---|-----------|
| Chapter 1: Measurement | 1 |
| Measuring Up | 2 |
| Scientific Inquiry: Cups, Spoons and Scales | 3 |
| Scientific Inquiry: Liquid Measurement | 5 |
| While You Wait: Fractional Mathematics | 6 |
| Try this at Home: Oatmeal Cake | 7 |
| Proficiency Questions | 8 |
| | |
| Chapter 2: Food Safety | 9 |
| Safe Kitchen Cooks | 10 |
| Scientific Inquiry: Temperature and Microorganisms | 11 |
| While You Wait: Kitchen Clean Up | 13 |
| Try this at Home: Clean Kitchen Test | 14 |
| | |
| Healthy Hands | 15 |
| Scientific Inquiry: Hand Washing | 16 |
| Try this at Home: Wash Away Germs | 18 |
| Proficiency Questions | 19 |
| | |
| Chapter 3: Vegetables | 21 |
| Vegetable Jungle | 22 |
| Scientific Inquiry: Stating the Facts About Vegetables | 23 |
| Try this at Home: Ants on a Log | 24 |
| | |
| Vegetable Rainbow | 25 |
| Scientific Inquiry: Color Changes in Acids and Bases | 26 |
| Try this at Home: Copious Carrots | 27 |
| | |
| Eating Vegetables | 28 |
| Scientific Inquiry: Scientific Soup | 29 |
| Try this at Home: Silly Chili | 31 |
| Proficiency Questions | 32 |
| | |
| Chapter 4: Fruits | 33 |
| Fruit Groups | 34 |
| Scientific Inquiry: Pomes, Drupes, Berries, Melons and Citrus Fruit | 35 |
| Try this at Home: Fruity-licious Pops | 37 |
| | |
| Fruit Reactions | 38 |
| Scientific Inquiry: Browning | 39 |
| While You Wait: Fruit Salad | 41 |
| Try this at Home: Fruity Fusion | 42 |

| | |
|---|-----------|
| Perfect Prune | 43 |
| Scientific Inquiry: Plump Plums and Pit-less Prunes | 44 |
| Try this at Home: Prune-tastic Trail Mix | 46 |
| Proficiency Questions | 47 |
| Chapter 5: Milk and Cheese | 49 |
| Many Milks | 50 |
| Scientific Inquiry: Comparing Milk | 51 |
| Try this at Home: Bananas and Milk. | 53 |
| Making Cheese | 54 |
| Scientific Inquiry: Curds and Whey | 55 |
| While You Wait: Tasty Cheese | 57 |
| Try this at Home: Cottage Cheese and Lime Gelatin Salad | 58 |
| Proficiency Questions | 59 |
| Chapter 6: Meat, Poultry and Fish | 61 |
| Hamburger Hints | 62 |
| Scientific Inquiry: Lean and Fat. | 63 |
| Try this at Home: Pizza Casserole Please. | 65 |
| Hot Diggity Dog | 66 |
| Scientific Inquiry: Healthier Hotdog. | 67 |
| Try this at Home: Hot Diggity Dog Soup | 69 |
| Something is Fishy | 70 |
| Scientific Inquiry: Fish in the Kitchen | 71 |
| While You Wait: Oh My! Omega. | 73 |
| Try this at Home: Super Salmon Patty | 74 |
| Proficiency Questions | 75 |
| Chapter 7: Eggs | 77 |
| Egg-ceptional Eggs | 78 |
| Scientific Inquiry: Egg Facts | 79 |
| Try this at Home: Creamed Eggs. | 82 |
| Fantastic Foams | 83 |
| Scientific Inquiry: Peaks, Peaks, Peaks | 84 |
| While You Wait: Egg-citing Egg Foams. | 86 |
| Try this at Home: O-mazing Puffy Omelet Squares | 87 |
| Proficiency Questions | 88 |

| | |
|--|------------|
| Chapter 8: Fats | 89 |
| Dress it Up | 90 |
| Scientific Inquiry: Reading Labels | 91 |
| Try this at Home: Garden Vegetable Dressing | 93 |
| Emulsify This | 94 |
| Scientific Inquiry: Immiscible | 95 |
| Try this at Home: Rainbow Pasta Salad | 96 |
| Mmmm Creamy | 97 |
| Scientific Inquiry: We All Scream for Ice Cream | 98 |
| Try this at Home: Chocolate Coffee Can Ice Cream | 100 |
| Proficiency Questions | 101 |
| Chapter 9: Grains | 103 |
| Selecting Cereal | 104 |
| Scientific Inquiry: Label Logic | 105 |
| Try this at Home: Crunchy Munchy Cereal Bar | 107 |
| Rice Review | 108 |
| Scientific Inquiry: Nice Rice | 109 |
| While You Wait: Main Grain | 111 |
| Try this at Home: Bountiful Brown Rice Casserole | 113 |
| Pasta Perfection | 114 |
| Scientific Inquiry: Cooking Pasta | 115 |
| While You Wait: Brainy Grains | 117 |
| Try this at Home: Snazzy Spaghetti and Meatballs | 119 |
| Proficiency Questions | 120 |
| Chapter 10: Meal Management | 121 |
| Menu Madness | 122 |
| Scientific Inquiry: Money Matters | 123 |
| Try this at Home: My Menu | 125 |
| Nutritious and Delicious | 126 |
| Scientific Inquiry: Let's do Lunch | 127 |
| Try this at Home: Magnificent Menu | 130 |
| Proficiency Questions | 131 |
| Glossary | 133 |

Introduction

FoodMASTER Intermediate

A food, mathematics and science activity book for grades 3-5

Welcome to FoodMASTER! In this program, you will learn about ten topics in foods. These topics include measurement; food safety; vegetables; fruits; milk and cheese; meat, poultry and fish; eggs; fats; grains; and meal management. You'll get to explore foods, cook and eat! At the same time you'll learn fun and exciting mathematics and science facts and problem solving skills. In addition, you'll receive take-home recipes and activities to share with your family and friends. Get your taste buds ready and let's go!

