
Contents

Introduction	4
Measuring Length	7
Exploring Measuring	11
Measuring Lines in Centimeters	13
Measuring to the Nearest Centimeter	15
Centimeter and Millimeters	18
Meters and Kilometers 1	22
Meters and Kilometers 2	24
Metric Units for Measuring Length	26
Weight in Kilograms	29
Grams and Kilograms	31
Metric Units of Weight	35
Milliliters and Liters	38
Metric Units of Volume	40
Decimals in Measuring Units and More	43
The Metric System	46
Rounding and Estimating	49
Measuring Temperature: Celsius	51
Temperature Line Graphs	55
Time Units	57
The 24-Hour Clock	60
Elapsed Time or How Much Time Passes	62
Review	67
Answers	69
More from Math Mammoth	82

Introduction

Math Mammoth Metric Measuring covers measuring related topics over the span of four grades (grades 1-4). The lessons for this book have been compiled from two of my books about measuring, and are presented here as a single book that only deals with metric units.

The lessons cover measuring length, weight, and volume, measuring temperature in the Celsius scale, the 24-hour clock and elapsed time, and using decimals within the metric system in general. While the book contains something for all grades from grades 1 to 4, the bulk of the lessons are targeted for second and third grade.

This book contains both explanations of the material and exercises, and is thus termed a *worktext*. It is designed to be very easy to teach from, requiring fairly little teacher preparation; however in several lessons the teacher needs to gather measuring equipment beforehand, such as a ruler, a scale, or measuring cups.

This book is not organized by grade-levels nor with increasing difficulty. Instead, the lessons are grouped by topic. The first lessons in each section typically have hands-on exercises where the student uses suitable measuring equipment, and the last lessons in each section include problems about conversion between the units.

Length

The very first lessons cover measuring length using centimeters and millimeters. Then we study meters and kilometers.

Weight

Children use the bathroom scales to weigh objects in kilograms. Other lessons teach grams and estimating weight. The goal is to let students become familiar with kilograms, and have an idea of how many kilograms some common things weigh.

Volume

The lessons include many hands-on activities so that the student gets first-hand experience in measuring, and has a basic knowledge of how “big” the units *milliliter* and *liter* are. One lesson also includes deciliters.

Metric System

In these lessons, students learn how to use decimal numbers within the metric system and the various prefixes.

Temperature

The lessons deal with Celsius degrees, how to read a thermometer, changing temperature, and temperature line graphs.

Time

The emphasis is in conversion between various time units, the 24-hour clock, and calculating elapsed time. The lessons do not cover how to read a clock; I have a separate book called *Math Mammoth Clock* that can be used to teach telling time.

When it comes to measuring, experience is the best teacher. We all use various measuring units in our everyday life, and using them is the key to remembering what they are and how to convert from one unit to another. The units your child is not using are likely to be forgotten easily. So encourage the young elementary students to have free “play time” with measuring devices such as scales, measuring cups, measuring tapes, rulers, and thermometers.

I wish you success in math teaching!

Maria Miller, the author

Helpful Resources on the Internet

Use these free online resources to supplement the “bookwork” as you see fit.

Measure Lines

Move the ruler to measure the line in centimeters

http://www.freewebtown.com/weddell/mw/ruler/ruler_cm.swf

Measure It!

Practice measuring lines with either centimeters or inches. Multiple choice questions.

<http://onlineintervention.funbrain.com/measure/index.html>

Measuring Units Worksheets

Generate worksheets for conversions between various measuring units. Includes both customary and metric system units.

<http://www.homeschoolmath.net/worksheets/measuring.php>

Bunny Balance

Place bunnies on the balance until it is even.

<http://www.peepandthebigwideworld.com/games/bunnybalance.html>

Scales Reader

Practice reading the scales in grams and/or kilograms.

<http://www.ictgames.com/weight.html>

Reading Scales

Helps teachers to illustrate a variety of measuring devices and how to read them.

<http://www.teacherled.com/2009/02/18/reading-scales-2/>

Reading Scales

Weigh objects on this virtual balance scale, using weights of 10 g, 50 g, 250 g, and 500 g.

<http://www.teacherled.com/resources/oldscales/oldscalesload.html>

Measurement Game for Kids

Measure the length and weight of various parcels using the interactive scales and ruler so you can give them a stamp with the correct postage rate. Uses grams and centimeters.

<http://www.kidsmathgamesonline.com/geometry/measurement.html>

Sample worksheet from
www.mathmammoth.com

Measurements

Online lessons with interactive exercises on metric prefixes, symbols, number values, metric mass, length, volume, US length and volume, and temperature conversions.

<http://www.aaamath.com/B/mea.htm>

Units of Measurement Quizzes

Quizzes for area, distance, volume, and mass - both metric and English systems.

http://www.quiz-tree.com/Units_of_Measurement_main.html

Metric Measurement Matching Game

Match metric terms and prefixes with the correct match

<http://www.quia.com/mc/4177.html>

Measures

An online activity about metric measuring units and how to read scales, a measuring cup, and a ruler.

Uses British spelling.

http://www.bgfl.org/bgfl/custom/resources_ftp/client_ftp/ks2/maths/measures

Bitesize Measures

Facts, problems, and quizzes about measuring length, mass, and capacity (in metric units).

http://www.bbc.co.uk/bitesize/ks2/maths/shape_space/measures/read/1/

A Dictionary of Units of Measurement

Explains the common measuring systems and has lots of background info of their history.

<http://www.unc.edu/~rowlett/units/>

The Metric Units Tutorial—Metric Number line

A tutorial of the common metric unit prefixes, and a way to convert between metric units using a “metric unit number line,” which visually shows you how many steps you need to move the decimal point.

<http://www.dmacc.edu/medmath1/METRIC/Metric%20Number%20Line%20HTML/sld001.htm>

Hours vs Minutes Game BBC SkillsWise

An online quiz to practice minutes versus hours. You have to tell whether, for example, 76 minutes or 1 hour is more.

<http://www.bbc.co.uk/skillswise/game/ma25time-game-hours-vs-minutes>

24 hour snap game

Two times are given, one using the 24-hour clock, and another using the am/pm system. Snap or don't snap the two times together.

<http://www.bbc.co.uk/skillswise/game/ma25time-game-24-hour-snap>