AN INTRODUCTION TO BRAILLE MATHEMATICS USING NEMETH CODE WITHIN UEB CONTEXTS

A Course for Transcribers

Provisional Online Edition 2017

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I believe that I could not have reached my potential in mathematics without the Nemeth Code. With it, I am able to read and write mathematics, as well as other sciences, at all levels, limited only by my talent and my ambition.

—Dr. Abraham Nemeth, creator of the braille code for mathematics and science notation

DEDICATION

I credit my interest in the continued training of braille transcribers in the Nemeth Code to my friend and mentor, Helen Hay, whose fascination and enthusiasm about this braille code was contagious. —Lindy Walton

THANKS

I offer my gratitude to the original authors of this lesson manual, Helen Roberts, Bernard M. Krebs, and Barbara Taffet, for their insight into the learning process and for their eye for detail. Many of the excellent examples from the original book are preserved in this edition. I also wish to thank my supervisors and colleagues in the Madison Metropolitan School District for realizing the importance of the development of this curriculum. —Lindy Walton

ABOUT THE PROVISIONAL ONLINE EDITION

Due to the need to make this training manual available to transcribers as soon as possible, we are offering a provisional version of the lessons in downloadable electronic format before being completely field tested and while BANA is revising the Nemeth Code. Exercises at the end of each lesson will not be available until a path toward certification is established. You may proceed through the course as each lesson is released with the understanding that certain details are still under construction and that some rules may change. A certification exam will not be available until the revised Nemeth Code is released. To apply for the exam, you must have turned in passing transcriptions of each of the yet-to-be-released lesson exercises.

We encourage you to contact us to report errors or to comment on topics that are unclear. As a result of user feedback, you can expect changes to appear in the online edition. All changes will be documented. A running list will be maintained and will be posted on www.nfb.org/transcribers.

Once a final version is approved, this lesson book will also be available in printed form.

To contact us by e-mail, send your message to transcribers@nfb.org.

FOREWORD TO THE 2017 EDITION

The first edition of the *Introduction to Braille Mathematics* was published in 1978 and was written by the late Helen Roberts and Bernard M. Krebs. It was my privilege to complete the text with Mr. Krebs after Helen passed away. Since that time, numerous corrections and updates have been made both to the Nemeth Code itself and to this manual. Now, however, a major change has necessitated a complete re-writing of the lessons. 2016 was the implementation year in the United States for new transcriptions to be produced using the Unified English Braille Code. Because Nemeth Code works *within* UEB, many of the rules of Nemeth Code must be modified.

After the first lesson most examples, practices, and exercises are shown in a text-like context. In this way, the student can see how the Nemeth Code works in a real setting such as found in texts of many grade levels and complexities.

The practices within each lesson are available for self-checking by the student. Answers to the practices are given at the end of each lesson. Braille reading practice will soon be offered in Appendix A. In the future, each lesson will conclude with an exercise which will be graded and evaluated by your teacher or by your NFB-assigned grader.

The braille examples are written on a 38-cell line in the lesson manual to allow for a reasonable margin on the given page size. However, the student should use the standard 40-cell line when transcribing the practices and exercises.

The student should understand that the Nemeth Code itself is the authoritative source for all mathematics transcriptions. The student should also be thoroughly familiar with the sourcebooks listed in the PREREQUISITES which follow this Foreword.

It has long been my hope that this manual could be brought into the present era. Lindy Walton, an experienced transcriber who works with the NLS Nemeth certification program, led the writing of this Second Edition. Once again, it is my honor to work with an exceptional member of the braille transcriber community.

Both Lindy and I thank the following for their support and help: Mary Denault, Peggy Jackson, Bill Jackson, Kyle DeJute, Julie Sumwalt, Lynnette Taylor, the members of the BANA Nemeth Code Technical Committee, and the Grafton Braille Service Center. We would also like to thank the National Federation of the Blind which has lent support to the development and publication of this comprehensive manual.

Barbara Taffet

PREREQUISITES

A prerequisite to the study of the Nemeth Code within UEB context is certification in Unified English Braille, adequate experience in literary braille transcription, and confidence in your production method. Before beginning this course of study the student should also be thoroughly familiar with current methods for transcribing a textbook. Rules and guidelines are found in the following sourcebooks, all of which are available from the Braille Authority of North America (BANA) at www.brailleauthority.org. Dates shown below are the editions used as a resource in this lesson manual.

The Rules of Unified English Braille, Second Edition 2013
Guidance for Transcription Using the Nemeth Code within UEB Contexts, 2016
Braille Formats: Principles of Print-to-Braille Transcription, 2016
The Nemeth Braille Code for Mathematics and Science Notation, 1972 Revision, 2007-2015 Updates
Guidelines and Standards for Tactile Graphics, 2010
Braille Code for Chemical Notation 1997

STUDY TIPS

HOW TO BECOME AN EXCELLENT NEMETH BRAILLE TRANSCRIBER

Don't race through the lesson material.

- Read carefully and deliberately as the narrative is compact and the language is exact.
- Study the examples and understand the point being made with each one but do not rely on the examples alone for an understanding of the rules. Braille the examples to reinforce the rule.
- Do the practice drills. Proofread them before checking the answers. See more tips below.
- Try back-translating the braille examples and practices without looking at the print.
- Take special note of rules regarding spacing, punctuation, abbreviations, and format.
- Make lists to help you remember differences between Nemeth and UEB rules.
- Don't be afraid to underline, highlight, or write notes in the margins of your lesson manual.

If the braille or the print doesn't make sense to you ...

- Compare new information to similar topics learned in previous lessons.
- Some of the lesson material is grouped in "use of" and "nonuse of." Compare them and look closely at the braille examples.

THE PRACTICE MATERIAL

- Slow down. By using 6-key entry instead of a translator you will better understand the braille from the reader's point of view.
- Compare your braille to the answers to the practice material found at the end of each lesson. Read each cell closely.
- At the end of each line, look at the braille cell in the line above and in the line below and compare it to the answer key. Any misalignment indicates an error on that line.
- When you identify your errors, return to the lesson to review the applicable rule.

PREPARING THE EXERCISE FOR GRADING

- Don't try to copy braille examples that look like the exercise material – understand and apply the rule.
- Don't guess. Don't rely on the proofreader's report to find your mistakes.
- Proofread carefully before turning in for grading. Your knowledge and understanding of the Nemeth Code will improve dramatically if you proofread from an embossed copy or from a simulated braille (print) copy, without looking at the print.
- Make note of items you are unsure of. If your transcription is correct, look these items over again after receiving your report to reinforce the rule.

RESEARCH/REVIEW

- Analyze the mistakes found in your exercise and make sure you understand your errors before moving ahead to the next lesson. Ask questions until you are sure of the rule.
- Return to earlier lessons. Topics will make more sense to you in retrospect.
- Read the index. Terminology used there will help you understand the language of Nemeth braille.
- Review format rules learned in earlier lessons. Study the examples.
- Go back to an earlier lesson exercise and back-translate the practices or your braille exercise by writing in longhand. Don't look at the print copy until you are finished. Giving yourself some distance from the lesson material is a good review strategy.
- In later lessons, research the topic in the Nemeth Code in addition to studying the lesson book. Not only will this enrich your understanding of the current subject, you will also review material already learned in a new context.

PROOFREADING TIPS

Accuracy is crucially important in technical work. Your proofreading skills will be challenged.

- Is your lighting adequate?
- Use a magnifier when print is questionable.
- Use a straightedge when levels are in question.
- Take breaks when your concentration wanes. Then go back a few pages when resuming proofreading.
- Read the braille dots. Compare often to the print copy.
- Vary your reading medium -- don't always proofread from the screen or from simulated braille or from embossed braille.

BRAILLE TRANSLATION SOFTWARE

Many students of the Nemeth Code have been brailling for years and have thousands of pages of braille to their credit. They also have been taking advantage of the many electronic input and proofreading aids available to transcribers and are quite adept at turning out high quality work. We expect you are one of those transcribers.

You are undertaking a serious study of one of the technical braille codes, and we would like you to consider stepping back a bit and learning the old fashioned way, using 6-key entry in your braille software program. It is our experience that the best braille transcribers are those that can read and write braille as the 6-dot code that it is, not solely reading a back translation or a source file and not using another input code to 'type' math problems. Using proofreading and production aids for more accurate and faster work is certainly something you will continue to use – it is important that you understand how your particular software and translation tools work in Nemeth mode – but we are convinced you will understand the Code better if you take the 6-key approach while learning.

Best of luck to you!

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