



Texas School for the Blind and Visually Impaired

Presents

Learning and Teaching the Nemeth Code within UEB Contexts

Florida State University
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Presented by
Susan A. Osterhaus

Texas School for the Blind and Visually Impaired
1100 West 45th Street
Austin, TX 78756

susanosterhaus@tsbvi.edu

www.tsbvi.edu/math

www.tsbvi.edu/videos-webinars/mathematics



Agenda

- What is the Nemeth Braille Code and when should instruction begin?
- Resources for Teachers, Parents, and Paraprofessionals to Learn the Nemeth Code
- Resources for Teaching the Nemeth Code
- High Tech Translation Apps



What is Nemeth Code?

- The Nemeth Braille Code for Mathematics and Science Notation was created by Dr. Abraham Nemeth for his own use as a brilliant mathematician, and he was kind enough to share it with rest of us. At the time, it blended beautifully with the surrounding literary text: English Braille American Edition (EBAE).
- In 2012, the Braille Authority of North America (BANA) adopted Unified English Braille (UEB), and we now transcribe Nemeth Code within UEB Contexts.



When should
Nemeth code instruction
begin?



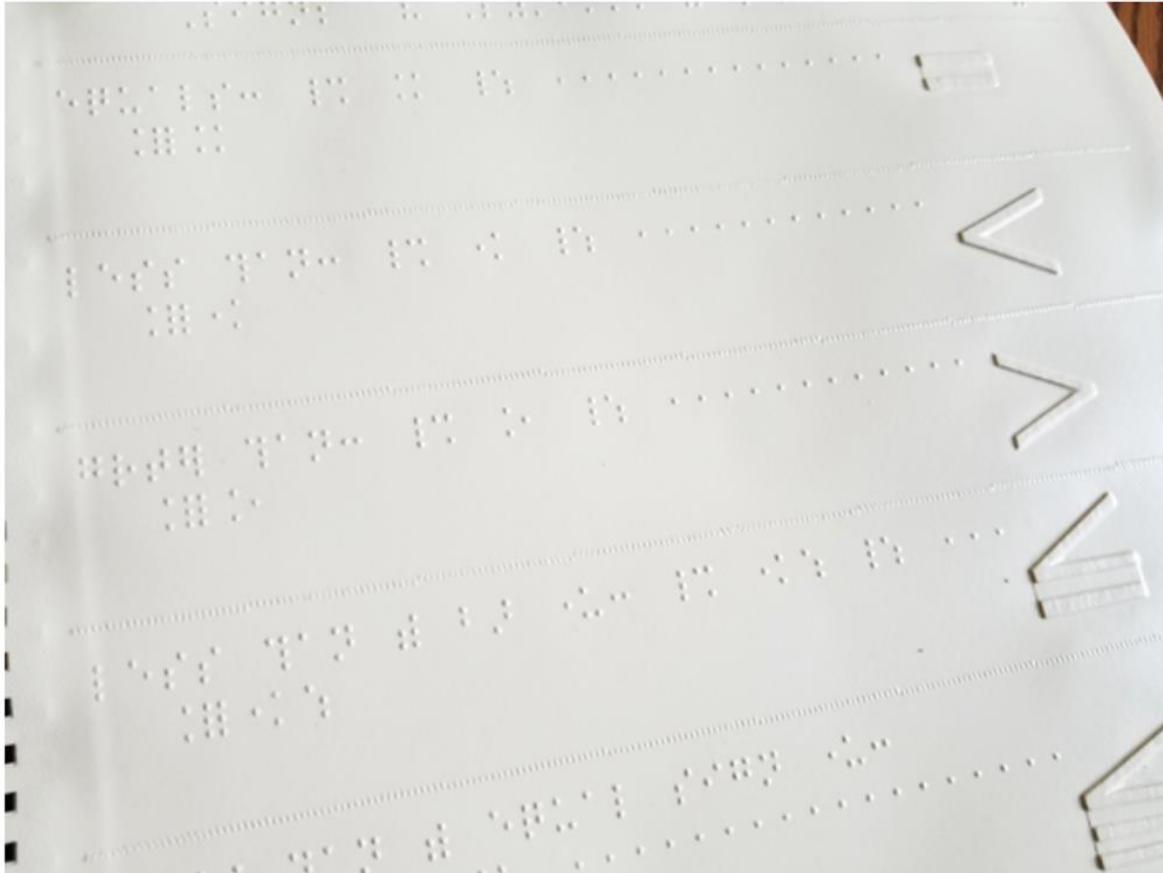
Begin in Pre-School



Braille Math Blocks from
<https://unclegoose.com/product/braille-math-blocks-2/>



Resources for Learning the Nemeth Code within UEB Contexts



BANA Nemeth Code Books

www.brailleauthority.org/mathscience/math-science.html

- *The Nemeth Braille Code for Mathematics and Science Notation, 1972 Revision.*
- Nemeth Updates from 2007 through 2015
- *Braille Code for Chemical Notation, 1997.*

In these Nemeth code rule books, the nonmathematical text that surrounds the mathematics is based on English Braille, American Edition (EBAE), which is being replaced by Unified English Braille (UEB).



Nemeth Code within UEB Contexts

www.brailleauthority.org/mathscience/math-science.html

The BANA Nemeth Code Technical Committee and the Ad Hoc Committee on Chemistry are in the process of updating their respective code books, but in the meantime, we have:

- *Guidance for Transcription Using the Nemeth Code within UEB Contexts*, April 2018
- *Graphing Calculator Guidelines*, April 2018
- *Provisional Guidance for Chemistry Notation Using Nemeth in UEB Contexts*, May 2018



National Federation of the Blind Course in Nemeth Code Transcribing

<https://www.nfb.org/programs-services/braille-certification/mathematics-braille-transcribing>

- *An Introduction to Braille Mathematics*, 1978
- *Errata and Addenda to An Introduction to Braille Mathematics*, November 10, 2014
- *An Introduction to Braille Mathematics* LESSON 16, Updated July 2016
- Course Manual Revision (Provisional)

The course manual is currently being updated to align with use of Nemeth code within UEB contexts. A provisional version of the revised lessons is made available here for review purposes only.



Online Nemeth

- *APH Nemeth Tutorial*
<https://tech.aph.org/nemeth/>
- *Nemeth Braille Code for Instructors and Paraeducators Online Courses*
<https://www.tsbvi.edu/course-listing#nemethdescription>



Resources for Teaching the Nemeth Code within UEB Contexts



When to Teach Nemeth Code Aligned with Math Standards

*Maryland's College and Career Ready
Standards for Unified English Braille and
Nemeth Code: Mathematics, Maryland State
Department of Education Updated 2015*
[https://mdk12.msde.maryland.gov/INSTRUCTION/common
core/Documents/MD_CCRS_UEB_Math.pdf](https://mdk12.msde.maryland.gov/INSTRUCTION/common/core/Documents/MD_CCRS_UEB_Math.pdf)



Other New Resources!

- *Nemeth at a Glance: A Math Resource, Grade Level Chart, and Evaluation Tool*, February 2017

<http://www.tsbvi.edu/store/ecom/index.php?action=ecom.pdetails&mode=nemeth>

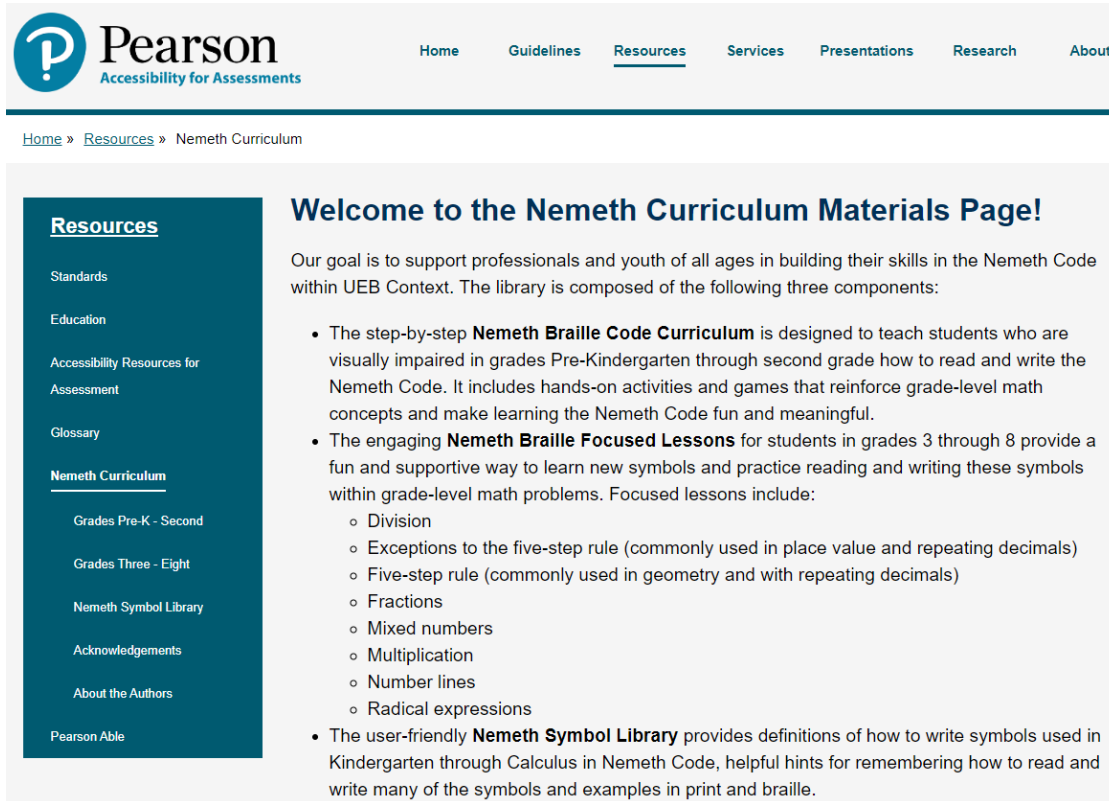
Nemeth Reference Sheets from the National Braille Press

<https://www.nbp.org/ic/nbp/NEMETH.html>



Pearson Nemeth Curriculum Materials Page

https://pearson.ccwizards.dev/resources/nemeth_curriculum/



The screenshot shows the Pearson Nemeth Curriculum Materials Page. At the top left is the Pearson logo with the tagline "Accessibility for Assessments". A navigation menu includes links for Home, Guidelines, Resources (which is underlined), Services, Presentations, Research, and About. Below the navigation is a breadcrumb trail: Home » Resources » Nemeth Curriculum. On the left side, there is a dark teal sidebar with a "Resources" header and several menu items: Standards, Education, Accessibility Resources for Assessment, Glossary, Nemeth Curriculum (which is underlined), Grades Pre-K - Second, Grades Three - Eight, Nemeth Symbol Library, Acknowledgements, About the Authors, and Pearson Able. The main content area features a heading "Welcome to the Nemeth Curriculum Materials Page!" followed by a paragraph stating the goal is to support professionals and youth in building skills in the Nemeth Code within UEB Context. Below this is a bulleted list of three components: 1) The step-by-step Nemeth Braille Code Curriculum for visually impaired students in grades Pre-K through second grade. 2) The engaging Nemeth Braille Focused Lessons for students in grades 3 through 8, with a sub-list of topics: Division, Exceptions to the five-step rule, Five-step rule, Fractions, Mixed numbers, Multiplication, Number lines, and Radical expressions. 3) The user-friendly Nemeth Symbol Library providing definitions and hints for symbols used in Kindergarten through Calculus.



Pearson Nemeth Curriculum Materials

- *The Nemeth Braille Code Curriculum (Pre-K through 2nd Grade)*
- *The Nemeth Braille Code Focused Lessons (3rd Grade through 8th Grade)*
- *The Nemeth Symbol Library*



Nemeth Curriculum for the Little Ones

Never too young!!



Pre-K – Second Grade Nemeth Braille Code Curriculum

https://pearson.ccwizards.dev/resources/nemeth_curriculum/grades_pre_k_second/index.php

Resources

Standards

Education

Accessibility Resources for
Assessment

Glossary

Nemeth Curriculum

Grades Pre-K - Second

Grades Three - Eight

Nemeth Symbol Library

Acknowledgements

About the Authors

Pearson Able

Welcome to the Pre-K - Second Grade Nemeth Braille Code Curriculum Materials!

Introduction

These materials are designed to teach students who are visually impaired in Pre-Kindergarten to Second Grade how to read and write the Nemeth Code. It is aligned with the Common Core State Standards (CCSS Initiative, 2010) and includes hands-on activities and games that reinforce grade-level math concepts and make learning the Nemeth Code fun and meaningful for children of all ages. The curriculum also includes teacher scripts, braille ready files for student worksheets, answer keys, data recording sheets, review activities, and assessments.

Use the following links to download a zipped folder with the curriculum for the grade level(s) you need.

- [Nemeth Braille Code Curriculum Pre-Kindergarten \(ZIP\)](#)
 - Introduction
 - Module 1: Braille Cell and Numeric Indicator
 - Module 2: Nemeth Numerals 1-3
 - Module 3: Nemeth Numerals 4-5
 - Module 4: Nemeth Numerals 6-7
 - Module 5: Nemeth Numerals 8-9
 - Module 6: Nemeth Numerals 0-10
 - Cumulative Review and Posttest



Nemeth Braille Code Curriculum (Pre-K through 2nd Grade)

- Teaches students to read and write Nemeth Code within UEB Contexts
- Pre-K, kindergarten, first grade, and second grade materials
- Aligned with the Common Core State Standards (CCSS Initiative, 2010)
- Hands-on games and activities
- Includes teacher scripts, braille ready files for student worksheets, answer keys, data recording sheets, review activities, and assessments



Nemeth Braille Code Focused Lessons

https://pearson.ccwizards.dev/resources/nemeth_curriculum/grades_three_eight/index.php

Resources

Standards

Education

Accessibility Resources for
Assessment

Glossary

Nemeth Curriculum

Grades Pre-K - Second

Grades Three - Eight

Nemeth Symbol Library

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About the Authors

Pearson Able

Welcome to the Nemeth Braille Focused Lessons!

Introduction

The Nemeth Braille Code Focused Lessons are designed to help students learn the Nemeth symbols primarily used in grades 3-8 and increase their knowledge and understanding of key mathematical concepts. Students of any age may enjoy and learn from the lessons, especially if they need a refresher or additional practice with Nemeth symbols.

The focused lessons were developed in response to feedback from dozens of students interested in learning new Nemeth symbols in a fun and supportive way. The user-friendly focused lessons include:

- How to read and write new symbols in Nemeth Code
- How to use these symbols for math concepts and applications like number lines and modified expressions
- Examples in braille
- Examples in print for parents and teachers
- Activities and games to reinforce the new symbols
- List of special symbols for reference
- Abbreviated lesson documents with only examples and problems for students who are transitioning to braille or new to the Nemeth Code

Use the following links to go to a description of each focused lesson and to download a zipped folder with the lesson.



Focused Nemeth Lessons

- The *Nemeth Braille Code Focused Lessons* are designed to help students learn the Nemeth symbols primarily used in grades 3-8 and increase their knowledge and understanding of key mathematical concepts.
- Students of any age may enjoy and learn from the lessons, especially if they need a refresher or additional practice with Nemeth symbols.
 - Five-Step Rule and Exceptions
 - Fractions and Mixed Numbers
 - Multiplication and Division
 - Number Lines
 - Radical Expressions



Nemeth Symbol Library Webpage

https://pearson.ccwizards.dev/resources/nemeth_curriculum/nemeth_symbol_library/index.php

Resources

- Standards
- Education
- Accessibility Resources for Assessment
- Glossary

Nemeth Curriculum

- Grades Pre-K - Second
- Grades Three - Eight

Nemeth Symbol Library

- Instructions
- Settings
- Tutorial
- FAQ
- Feedback Form
- Acknowledgements
- About the Authors

Pearson Able

Welcome to the Nemeth Symbol Library

Introduction

The purpose of this Nemeth Symbol Library is to allow individuals to look up Nemeth symbols and math related terms, using the words a student is accustomed to hearing. These symbols and terms are listed after this introduction. Once you have found the symbol or term in the list (see Instructions for additional keystrokes to help you navigate the library), select that particular link, which will take you to a description of how the symbol, expression, or equation is written in Nemeth Code. At the end of the description, you will find three additional links to examples in Nemeth Code. The first link takes you to a Braille Ready File (BRF) that includes examples using Nemeth Code in English Braille American Edition (EBAE). The second link takes you to a BRF file that includes examples using Nemeth Code within Unified English Braille (UEB) contexts. The third link takes you to a Microsoft Word document that includes examples in print and Simulated Braille (SimBraille), which adds shadow dots that can help sighted readers. We will continue to build this library and would welcome any comments or suggestions you might have for improving this library.

Sara Larkin, Susan Osterhaus, and Tina Herzberg

List of Symbols and Math Terms

- [Absolute value](#)
- [Alpha \(lowercase\)](#)
- [Angle](#)
- [Angle brackets](#)
- [Angle measure](#)
- [Angular velocity](#)
- [Antiderivative](#)
- [Approximately equal to](#)



Nemeth Symbol Library

- Began with higher grade levels
- Has extended down through all grade levels
- Over 600 examples at different grade levels
- Tutorial and list of commands used to access library
- 240 terms, 136 definitions



Project INSPIRE

(Increasing the STEM Potential of Individuals Who Read Braille)

Our goal is to support professionals, youth in grades 6-12, and young adults in building their skills in the two braille codes used in the United States for STEM classes. To accomplish our goal we will develop and offer:

- Six-week online courses
- STEM Braille Boot Camps
- STEM Braille Bowl Competitions

<https://www.uscupstate.edu/academics/school-of-education-human-performance-and-health/graduate-programs/project-inspire/>



What Does the Future Hold?

Learning and Teaching the Nemeth Code within UEB Contexts: A Step-by-Step Guide is designed to support you as you learn the Nemeth Code within UEB Contexts. Along the way, you will practice your skills and learn about strategies and resources for teaching the code. Throughout this book and supplemental materials, you will also view real life examples of STEM materials transcribed into braille.



Accessible Equation Editor

<https://accessibility.pearson.com/resources/aee/index.php>

The screenshot displays the Accessible Equation Editor interface. At the top, a toolbar contains various mathematical symbols: addition (+), subtraction (-), multiplication (x), division (÷), fractions (a/b), powers (x^y), square roots (√), equals (=), approximately (≈), undo (↶), redo (↷), delete (trash), a menu (three dots), and a close (X) button. Below the toolbar is a large text input field containing the equation $x^2 + y^2 = 4$. To the right of the input field is a vertical menu with the following categories: Numbers, Arithmetic, Fractions, Exponents, Functions, Groups, Relations, Omissions, Sets, Logic, Lines, Angles, and Arrows. At the bottom of the interface, a Braille representation of the equation $x^2 + y^2 = 4$ is shown.



Desmos Braille Demo

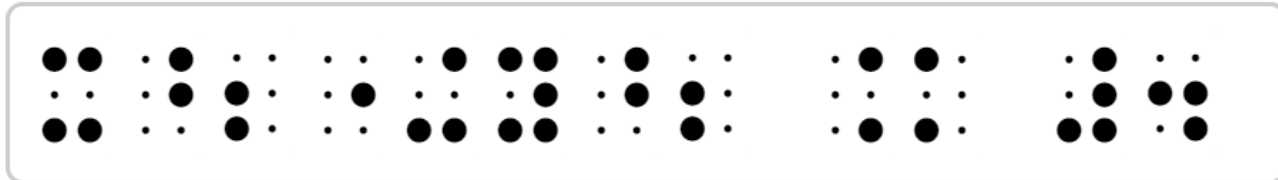
<https://www.desmos.com/braille-demo/index.html>

Nemeth

UEB

Six Key Input

Braille



Formatted Math

$$x^2 + y^2 = 4$$



Texas School for the Blind & Visually Impaired

- Thank you for your kind attention.
- Now, it's time for questions...

