



MARYLAND COMMON CORE CURRICULUM FRAMEWORKS FOR BRAILLE

Braille, Formatting, and Tactile Graphics Alignment by Grade

2012



BRAILLE AND FORMATTING FOR ENGLISH/LANGUAGE ARTS CHARTS BY GRADE LEVEL AND COURSE

This document contains braille and tactile graphics organized by grade level or course. This is not meant to be an all-inclusive list of all Literary Braille Code and formatting/tactile graphics available.

Key

CC - Task Force-designated braille contractions based upon the Common Core

BOP - Task force-designated braille contractions based upon "Building on Patterns," Primary Braille Literacy Program

Pre Kindergarten

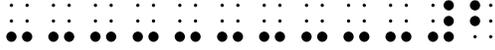
Literary Braille Code

	Literary Sign	Braille Symbol																																				
Capital sign	N/A	⠠																																				
Double capital sign	N/A	⠠⠠																																				
Numeric indicator	N/A	⠠																																				
Period	.	⠠																																				
Question mark	?	⠠																																				
Transcriber's note sign Opening	N/A	⠠⠠																																				
Closing		⠠																																				
Exclamation point	!	⠠																																				
Italic sign (single)	N/A	⠠																																				
Italic sign (double)	N/A	⠠⠠																																				
Alphabet	a b c d e f g h i j k l m n o p q r s t u v w x y z	<table style="display: inline-table; border: none;"> <tr> <td style="padding: 0 5px;">⠠</td><td style="padding: 0 5px;">⠠</td> </tr> <tr> <td style="padding: 0 5px;">⠠</td><td style="padding: 0 5px;">⠠</td> </tr> <tr> <td style="padding: 0 5px;">⠠</td><td style="padding: 0 5px;">⠠</td> </tr> <tr> <td style="padding: 0 5px;">⠠</td><td style="padding: 0 5px;">⠠</td> </tr> </table>	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠
⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠																														
⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠																														
⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠																														
⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠																														

Literary numbers 0-10	0 1 2 3 4	
	5 6 7 8 9	
	10	
First Name	N/A	

Pre Kindergarten

Formatting

	Literary Sign	Braille
Print page numbers	N/A	Top, right corner 1, a1, b1
Braille page numbers	N/A	Bottom, right corner
New print page indicator	N/A	
Title page	N/A	Braille titles are sometimes centered on the page, but they can also be located along the spine.

Kindergarten

Literary Braille Code

	Literary Sign	Braille Symbol
Double dash	----	⠠⠠⠠⠠
Ellipsis	...	⠠⠠⠠
Letter sign	N/A	⠠
Transcriber's note Opening Closing	N/A	⠠⠠ ⠠⠠ ⠠⠠
Alphabet words (BOP)	but can do every from go have just knowledge like more not people quite rather so that us very will it you as	⠠⠠⠠⠠⠠⠠ ⠠⠠⠠⠠⠠ ⠠⠠⠠⠠⠠ ⠠⠠⠠⠠⠠⠠⠠ ⠠⠠⠠⠠⠠
Contractions (BOP)	and of for the with	⠠⠠⠠⠠⠠⠠

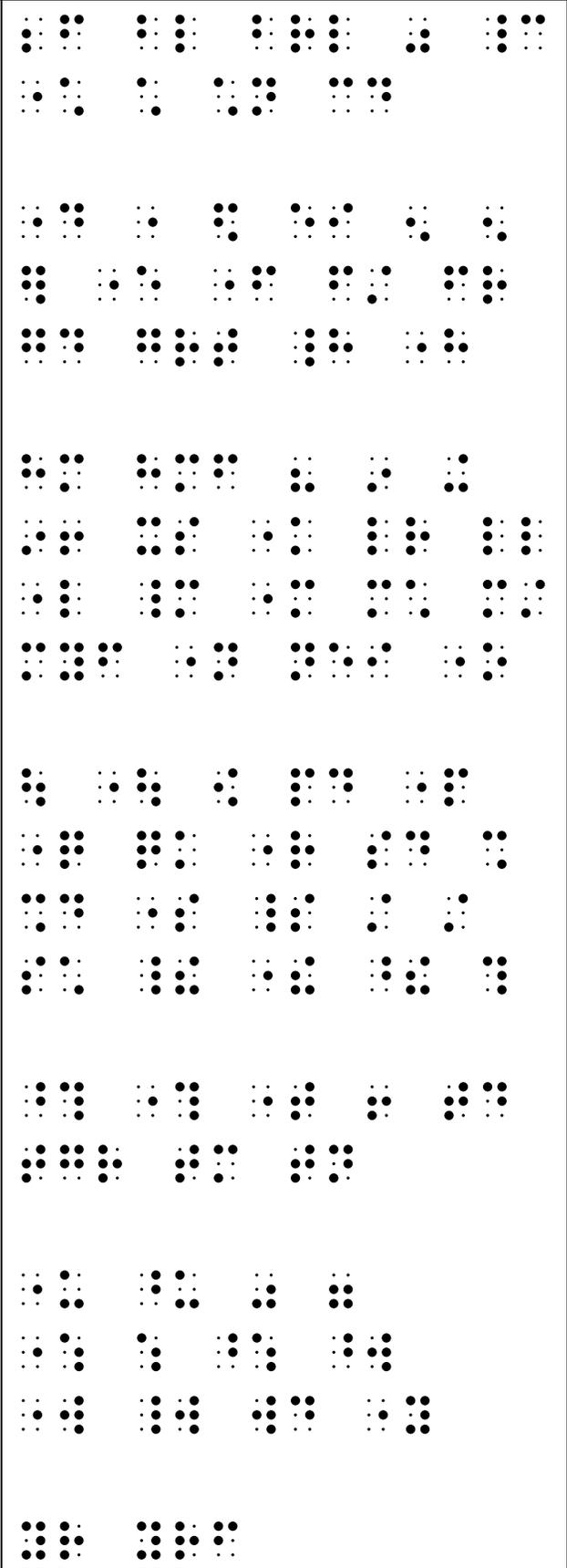
Formatting/Tactile Graphic

	Literary Sign	Braille
Title page: illustrator	N/A	According to <i>Braille Formats</i> , the illustrator is omitted from the title page so the name may not always be present.
Graphic organizers	N/A	See <i>Braille Formats</i>
Maps	N/A	See Appendix C: Resources

Grade 1

Literary Braille Code

	Literary Sign	Braille Symbol
Hyphen	-	⠆
Comma	,	⠂
Quotation marks		
Opening	"	⠆⠆
Closing	"	⠆⠆
Colon	:	⠆⠆
Apostrophe	'	⠂
Accent sign	N/A	⠆
Prefixes (CC)	com con dis	⠆⠆⠆ ⠆⠆ ⠆⠆
Suffixes (CC)	ation ble ful ity less ment ness tion	⠆⠆⠆⠆ ⠆⠆⠆ ⠆⠆⠆⠆ ⠆⠆⠆⠆ ⠆⠆⠆⠆ ⠆⠆⠆⠆ ⠆⠆⠆⠆ ⠆⠆⠆⠆ ⠆⠆⠆⠆
Common consonant digraphs (CC)	gh	⠆⠆
Common consonant digraphs (CC and BOP)	ch sh th wh	⠆⠆ ⠆⠆ ⠆⠆ ⠆⠆
Prepositions (CC)	above below behind beneath beside between beyond	⠆⠆⠆⠆ ⠆⠆⠆⠆ ⠆⠆⠆⠆ ⠆⠆⠆⠆ ⠆⠆⠆⠆ ⠆⠆⠆⠆ ⠆⠆⠆⠆ ⠆⠆⠆⠆ ⠆⠆⠆⠆ ⠆⠆⠆⠆
Contractions (BOP)	about across after afternoon again against almost already also always ar be because	⠆⠆⠆⠆ ⠆⠆⠆⠆⠆⠆ ⠆⠆⠆⠆ ⠆⠆⠆⠆⠆⠆ ⠆⠆⠆⠆⠆⠆ ⠆⠆⠆⠆ ⠆⠆⠆⠆⠆⠆ ⠆⠆⠆⠆⠆⠆ ⠆⠆⠆⠆⠆⠆ ⠆⠆⠆⠆⠆⠆ ⠆⠆⠆⠆ ⠆⠆⠆⠆⠆⠆ ⠆⠆⠆⠆⠆⠆ ⠆⠆⠆⠆ ⠆⠆⠆⠆

	<p>before blind braille by cannot character child children could day ea ed either en enough er ever father first friend good great had here him himself his in ing into its know letter little lord many mother much must myself name neither one ou ought out ow paid part question quick right said shall should some spirit st still such their there these this those through time to today together tomorrow tonight under upon was were where which whose word work world would young your yourself</p>	
--	---	--

Grade 2

Literary Braille Code

	Literary Sign	Braille Symbol
Dash	--	⠠⠠
Semicolon	;	⠠⠨
Parentheses Opening Closing	()	⠠⠠ ⠠⠠
Termination sign	N/A	⠠⠠
Reference indicator	N/A	⠠⠠
Contractions (BOP)		
	according ally ance	⠠⠠⠠⠠⠠⠠⠠⠠
	afterward although	⠠⠠⠠⠠⠠⠠⠠⠠
	altogether bb bb	⠠⠠⠠⠠⠠⠠⠠⠠
	conceive conceiving dd	⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠
	deceive deceiving declare	⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠
	declaring ence ff gg	⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠
	herself itself immediate	⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠
	necessary o'clock ong	⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠
	oneself ourselves ound	⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠
	ount paid perceive	⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠
	perceiving perhaps	⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠
	receive receiving	⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠

	rejoice rejoicing sion thyself themselves work yourselves	
Computer braille code: website address/hyperlink	www.google.com	
Trademark	TM	
Copyright	©	
Diacritical marks		
Stress	N/A	
Primary		
Secondary		
Tertiary		
Breve	ă	
Cedilla	ç	
Circumflex	â	
Crossbar or underbar	g l	
Ligatures, tied letters	s h	
Macron	ū	
Overdot	ř	
Tilde	~ n	

Grade 3

Literary Braille Code

	Literary Sign	Braille Symbol
Brackets Opening Closing	[]	 

Formatting

	Literary Sign	Braille
Nemeth Code Indicators Begin End	N/A	 
Poetry Stanzas Numbered lines Formats (shape)	N/A	See <i>Braille Formats</i>

Grade 4-12

Literary Braille Code

NONE

Formatting

NONE

BRAILLE AND TACTILE GRAPHICS FOR MATHEMATICS CHARTS BY GRADE LEVEL AND COURSE

This document contains braille and tactile graphics organized by grade level or course. This is not meant to be an all-inclusive list of all Nemeth Braille Code and tactile graphics available.

Pre Kindergarten

Nemeth Braille Code

	Mathematical Sign	Nemeth Symbol
Numeric indicator	N/A	⠠
Read numbers 0-10	0 1 2 3 4 5 6 7 8 9 10	⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠ ⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠ ⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠
Punctuation indicator	1.	⠠⠠⠠⠠⠠⠠⠠⠠
Transcriber’s note symbols Opening Closing	N/A	⠠⠠⠠⠠⠠⠠⠠⠠ ⠠⠠⠠⠠⠠⠠⠠⠠

Tactile Graphics

	Mathematical Sign	Braille
Number line	←→	Tactile graphic
Square	□	Tactile graphic
Circle	○	Tactile graphic
Triangle	△	Tactile graphic
Rectangle	▭	N/A
Objects	Example: picture of a car 	Tactile graphic Represented with simple, solid shapes (Example: rectangle)

Grade 1

Nemeth Braille Code

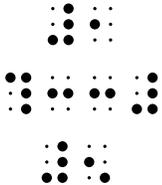
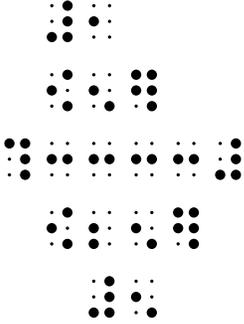
	Mathematical Sign	Braille
Numbers 21-120	32 33 99 100	
Tally marks		
Shape indicator	N/A	
Horizontal equations with question mark or blank space for omission	$4 + ? = 7$ $4 + \quad = 7$	
Horizontal equations with blank line for omission	$4 + _ = 7$	
Horizontal equations with box/square for omission	$4 + \square = 7$	
Spatial arrangements of addition and subtraction Separation line extending one space on each side of arrangement	$\begin{array}{r} 40 \\ +23 \\ \hline 63 \end{array}$	
Carried number indicator	$\begin{array}{r} 1 \\ 47 \\ +23 \\ \hline 70 \end{array}$	
Less than	$2 < 4$	
Greater than	$5 > 1$	

Tactile Graphics

	Mathematical Sign	Braille
Rectangular prisms, trapezoid, half-circle, quarter circle		Tactile graphics

Grade 2

Nemeth Braille Code

	Mathematical Sign	Nemeth Symbol
Numbers to 1000	500 875 1000	
Colon	:	
Decimal point	.	
Time	3:00	
Money	Pictures of currency and coins	Penny – pn, nickel – nk, dime – dm, quarter – qr
Cent sign	5¢	
Dollar sign	\$1.00	
Reading a key to a graph	N/A	Contains Nemeth Braille Code and sometimes tactile graphics
Horizontal fraction bar	—	
Simple fraction with horizontal bar	$\frac{2}{3}$	
Diagonal fraction bar	/	
Simple fraction with a diagonal bar	2/3	
Read spatial arrangements of fractions	$\frac{1}{5}$	
Termination indicator	N/A	
Cancellation indicator (used in examples of spatial arrangements, not for computation)	$\frac{1}{\cancel{5}} \frac{5}{\cancel{25}} \frac{5}{5}$	

Grade 2

Tactile Graphics

	Mathematical Sign	Nemeth Symbol
Ruler (nearest inch, centimeter, foot, yard, meter)	N/A	Tactile graphics
Clocks (nearest 5 minutes)	N/A	Tactile graphic
Dot (Line) plot (read and create)	Number line with Xs plotted horizontally above numbers for data points	Number line is a tactile graphic with a full cell to represent each X for plotted points <div style="text-align: center;">  </div>
Picture graph (read and create)	N/A	Lines created as a tactile graphic with Nemeth Braille Code labels. A full cell represents each picture <div style="text-align: center;">  </div>
Bar graph (read and create)	N/A	Tactile graphic with Nemeth Braille Code labels
Quadrilaterals, pentagons	<div style="display: flex; justify-content: space-around; align-items: center;">   </div>	Tactile graphic

Grade 3

Nemeth Braille Code

	Mathematical Sign	Nemeth Symbol
Multiplication cross	x	⠠⠠⠠⠠⠠⠠
Multiplication dot	•	⠠⠠⠠⠠
Division	÷	⠠⠠⠠⠠⠠⠠
Division cage (spatial format)	$\begin{array}{r} 7 \\ 3 \overline{) 21} \end{array}$	
Division cage (linear format)	$3 \overline{) 21}$	
Multipurpose indicator	N/A	⠠⠠⠠⠠
Remainder	$\begin{array}{r} 7 \text{ R}1 \\ 3 \overline{) 22} \end{array}$	
Parentheses	(5, 10)	
English letter indicator	N/A	⠠⠠⠠⠠
Picture graph with 2:1 scale (read and create)	N/A	<p>Lines created as a tactile graphic with Nemeth Braille Code labels. A full cell represents each whole picture</p> <p>Dots 4, 5, 6 represent each half picture</p>

Tactile Graphics

	Mathematical Sign	Nemeth Symbol
Rhombus		Tactile graphic
Right angle		N/A
Area and perimeter	N/A	Tactile graphics

Degree	5°	
Mixed numeral with diagonal fraction bar	$4\frac{3}{4}$	
Circle		
Triangle		
Diamond		
Square		
Star		
Rectangle		
Angle	\sphericalangle	
Angle ABC	$\sphericalangle ABC$	
Directly over indicator	N/A	
Line AB	 AB	
Line segment AB	— AB	
Ray AB	 AB	
Parallel		
Perpendicular	\perp	

Tactile Graphics

	Mathematical Sign	Nemeth Symbol
Point	•	Tactile graphic
Angle	\sphericalangle	Tactile graphic
Line		Tactile graphic
Ray		Tactile graphic
Line segment	—	Tactile graphic

Grade 5

Nemeth Braille Code

	Mathematical Sign	Nemeth symbol
Set braces	{ }	⠠⠨⠠⠨⠠⠨⠠⠨
Brackets	[]	⠠⠨⠠⠨⠠⠨⠠⠨
Ordered pair	(a, b)	⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨
Exponent (superscript)	3^2	⠠⠨⠠⠨⠠⠨⠠⠨
Baseline indicator	2^2+3^2	⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨

Tactile Graphics

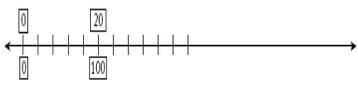
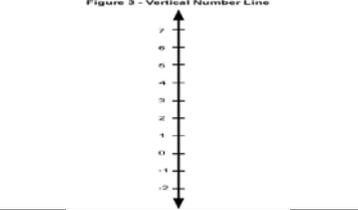
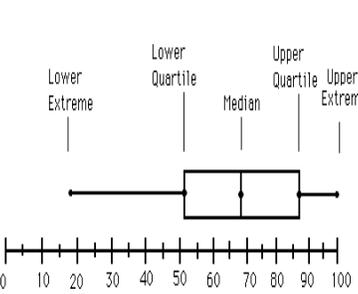
	Mathematical Sign	Nemeth symbol
Coordinate grid (axis, origin)	N/A	Tactile graphics

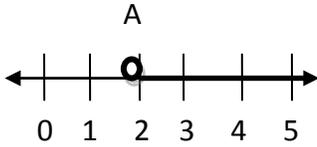
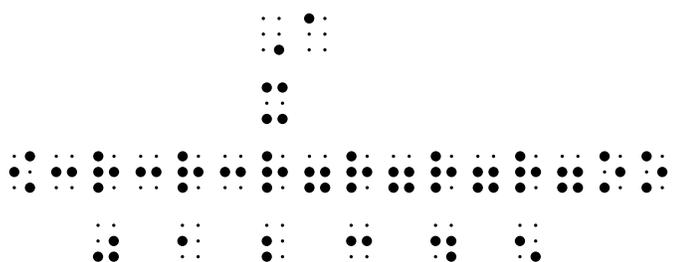
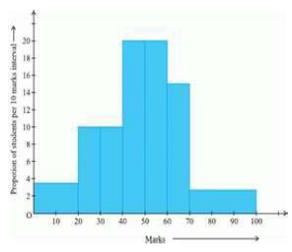
Grade 6

Nemeth Braille Code

	Mathematical Sign	Nemeth symbol
Not equal to	\neq	⠠⠨⠠⠨⠠⠨⠠⠨
Ratio	$2 : 4$	⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨
Percent	$\%$	⠠⠨⠠⠨
Absolute value of x	$ x $	⠠⠨⠠⠨⠠⠨⠠⠨
Is less than or equal to	\leq	⠠⠨⠠⠨⠠⠨⠠⠨
Is greater than or equal to	\geq	⠠⠨⠠⠨⠠⠨⠠⠨
Negative number	$-(-3) = 3$	⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨
Use of variable in expressions	$A=6s^2$	⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨

Tactile Graphics

	Mathematical Sign	Nemeth symbol
Tape diagram		Tactile graphic
Double number line diagrams		Nemeth Braille Code Number line
Vertical number line	 <p style="text-align: center; font-size: small;">Figure 3 - Vertical Number Line</p>	Nemeth Braille Code number line
Box plot or Box and whisker plot		Nemeth Braille Code Number Line with tactile graphics for box and whiskers

<p>Number line with inequality</p>		<p>Axis line $\ddot{\cdot}$ Bold axis line $\ddot{\bullet}$</p> <p>Open point $\ddot{\circ}$ Solid point $\ddot{\bullet}$</p> <p>Bold right arrow $\ddot{\rightarrow}$</p> <p>Bold right arrow $\ddot{\rightarrow}$</p> 
<p>Histogram</p>		<p>Nemeth Braille Code number line and tactile graphic for bars of data</p>

Grade 8

Nemeth Braille Code

	Mathematical Sign	Nemeth symbol
Principle square root of x	\sqrt{x}	
Index of radical	$(\sqrt[3]{8})^3 = 8$	
Negative exponent	3^{-3}	
Exponent in denominator	$\frac{1}{3^3}$	
A prime	A'	
A double prime	A''	
Transformational notation	$\angle A \rightarrow \angle A' \rightarrow \angle A''$	

Tactile Graphics

	Mathematical Sign	Nemeth symbol
Scatter plot	N/A	Tactile graphic
Line graph	N/A	Tactile graphic

Geometry

Nemeth Braille Code

	Mathematical Sign	Nemeth symbol
Base a , of b (subscript)	$S_n = \frac{a(1-r^n)}{(1-r)}$	
Sine of A	$\sin A$	
Cosine A	$\cos A$	
Therefore	\therefore	
Union	$A \cup B$	
Intersection	$A \cap B$	
Complement	A^c	
Corresponds to	$A \iff B$	
Conditional probability	$P(A/B) = 0.3$	

Tactile Graphics

	Mathematical Sign	Nemeth symbol
NONE		