ADDENDUM 3 – Updated Copy
NEMETH FORMAT SUMMARIES

Formatting refers to layout on the page, such as linage, line spacing (blank lines), pagination, margins, placement of code switch indicators, headings, etc. *The Nemeth Braille Code for Mathematics and Science Notation 2022* specifies certain formats which are summarized in this addendum. For illustrative examples, go to the sections in the lesson material which are cited as bold numbers in brackets.

General Principles

In a UEB with Nemeth transcription, the format rules stated in *The Nemeth Braille Code for Mathematics and Science Notation 2022* are to be applied to the entire transcription including those portions transcribed in UEB. When a format is not specifically addressed in the Nemeth code, the rules provided in *Braille Formats Principles of Print-to-Braille Transcription* are followed. [**Preliminary Lesson, Section P7**]

LINAGE

"Keep Together" Rules

Code Switch Indicators

Embedded Within a paragraph, a code switch indicator and/or terminator should appear on the same line as the expression to which it applies if there is room on that line. [**1.5.1**]

Displayed When displayed math is preceded and followed by UEB material the opening Nemeth Code indicator is placed on the same line as the math only if the Nemeth Code terminator will also fit on that line. [**7.1.1.a**]

Spatial When spatial math is preceded and followed by UEB material the opening Nemeth Code indicator and the Nemeth Code terminator are placed on the same braille page as the math. [**9.14.2, 9.29**]

Mathematical Expressions

A mathematical expression that will fit on one braille line within the current margins must not be divided between lines. The entire expression is brought down to the next line. [**1.5**] Individual math expressions need not lie on the same line. [**1.5.1.a**] An identifier can be placed alone on the line if, by doing so, the math will fit undivided on the next line. [**Examples 2-40, and 2-43**] If a page number on line 25 or line 1 does not allow the entire expression to fit on the line, the expression is brought down to the next line that has enough usable cells. [**3.8**]

Other

The following items or constructions must not be divided between braille lines if they fit on one line within the current margins.

- A number or letter and its related abbreviation. [**3.4.1, 4.1.1**]
- A hyphenated expression containing one or more Nemeth characters. [**3.7.8**]
- An enclosed list. [**4.17.3**]
- A fraction. [**8.3.b**] If the entire fraction will not fit on the line, the numerator should not be divided, nor should the denominator be divided. [**15.2**]
- In a mixed number, the whole number must not be divided from its fractional part. [**8.5.1**]
- A linked expression. [**8.21**] A linked expression with more than one link is a single mathematical expression.
- A shape symbol and the letter, sequence of letters, or numeral which follows it. [**11.23.1**]
- A single keystroke construction. [**11.34**]
- Tally marks which belong to the same group. [**13.4.a**]
- A function name or an abbreviated function name and its argument. [**14.5**]
- A mathematical expression between grouping signs. [**15.2**]
- The components of the following symbols: a symbol of operation using plus and minus [**5.2**]; a symbol of comparison compounded vertically or horizontally [**5.8-5.9**]; a shape symbol with structural or interior modification [**11.7-11.18**]; the components of an expression modified according to the five-step rule [**12.2**]; superposed signs [**13.5-13.6**]; a two-part function name [**14.5**].

Runover Rules

Long Numeral

A long numeral is divided after a comma if a comma is present, and a hyphen is inserted. If the numeral does not contain a comma, the hyphen may be inserted after any digit. A numeric indicator is inserted before the first digit of the runover line. [**1.7.1**]

Enclosed List

If an enclosed list will not fit on a single braille line, use as much of the current line as possible, ending with a comma. Begin the runover line with the next item in the list. [**4.17.3.a**]

Embedded Identifier

An embedded identifier may fall at the end of a line; it does not need to be placed on the same line as the material with which it is associated. [**4.27**]

Linked Expression

Do not divide an anchor that will fit on one line. Do not divide a link that will fit on one line.

When a linked expression will not fit on one line, use as much of the line as possible; then break before a link. The link's comparison sign (usually an equals sign) will begin the next line in the runover margin of the current format. [**8.21**]

If the anchor or any link requires division, each link must begin on a new line.

The comparison sign at which the new line begins must be on the baseline. An expression should not be divided before a comparison sign that is part of an item enclosed in grouping symbols, between fraction indicators, within radical signs, or within a modifier. [**8.21.1, 12.2**]

Mathematical Expression

When a mathematical expression is too long to fit on one braille line within the current margins the expression is divided between braille lines according to the rules outlined in Rule 26.2 of the Nemeth code. It is not necessary to start a new line if there is room for the beginning of the expression provided the break is made in accordance with the principles defined below. Runovers conform to the margin requirements currently in effect be it embedded, itemized, displayed, or spatial. There is a summary of these tactics at the end of **Lesson 15**.

Mathematical Units

Mathematical expressions which will not fit on one braille line within the boundaries of the current margins can be organized into a series of mathematical units in order to choose runover sites. The strategies given in **Lesson 15** are outlined as follows. (a) Break before a comparison sign on the baseline [**15.3**]; (b) break before an operation sign on the baseline [**15.4**]; (c) break before a mathematical unit [**15.5**]; (d) break after a termination indicator [**15.6**].

Blank Lines

Braille Formats Guidelines

For formats not mentioned in the Nemeth code, follow the guidelines for blank lines which are summarized in Appendix C of *Braille Formats.* Follow *Braille Formats* guidelines regarding blank lines before and after displayed narrative.

Displayed Math

A line is not skipped above or below displayed mathematical material unless the preceding or following material requires a blank line [**7.1**] or unless the displayed material is spatial.

Mathematical Statements and Proofs

A line is left blank before the beginning and after the end of a mathematical statement or a proof. Normal paragraphing (3-1) is applied. The label can be formatted as a paragraph heading or as a cell-5 or cell-7 heading. [**11.38.b**] If the statement starts on a new braille page, line 1 should be blank. [**11.38.a**]

When a mathematical statement or a proof contains auxiliary captions such as *Given*, *Prove*, or *Conclusion*, etc., such captions begin a new paragraph in cell 3 with runovers in cell 1. A line is not skipped above a caption. [**12.16.d**]

A Formal Proof in Two Columns: When a formal proof is printed in step-number form and divided into two columns, follow the format described in Section **12.16.1**.

Spatial Arrangements

A blank line precedes and follows a spatial arrangement. A spatial arrangement may start on line 1 and may end on line 25 provided no character in the arrangement comes within three cells of the page number. [**9.14.2, 9.26.3**] A code switch indicator does not take the place of a required blank line. [**4.25**]

PAGINATION

Itemized Material

An itemized exercise problem should not be divided between braille pages. [**1.16.1**] An identifier cannot stand alone at the bottom of a braille page. [**2.19**]

Code Switch Indicators

An opening Nemeth Code indicator should not be the last item at the bottom of a braille page; a Nemeth Code terminator should not be the first item at the top of a braille page. **[3.8]**

Exercise Set

It is preferable for an exercise set not to be divided between braille pages. When an exercise set with accompanying instructions requires more than one braille page, the instructions may begin on the previous page as long as there is sufficient space on that page for the first complete problem. If there is not room, the instructions should begin on the new page. [**5.11.1**]

MARGINS

Nemeth formatting can be broken down into two major styles: *indented* and *hanging*. A noted exception is commentary which follows a blocked style.

- In the indented style, the first line is indented two cells to the *right* of the runover margin.
- In the hanging style, the first line begins two cells or four cells to the *left* of the runover margin.

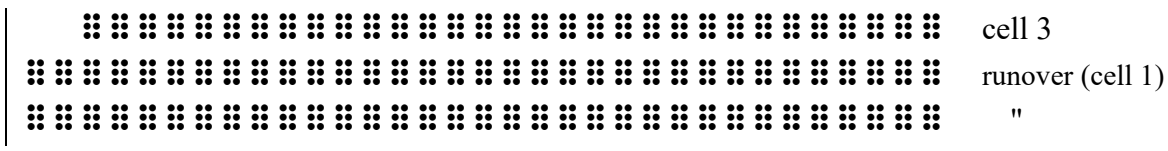
INDENTED STYLES

Paragraphs

Paragraphs begin in cell 3 and are run over in cell 1. Except for commentary, blocked paragraphing is not used in a Nemeth transcription. [**1.14**] A continued paragraph which follows displayed material may appear to be blocked because it will begin in the runover cell of the paragraph from which it continues. [**7.1.4**]

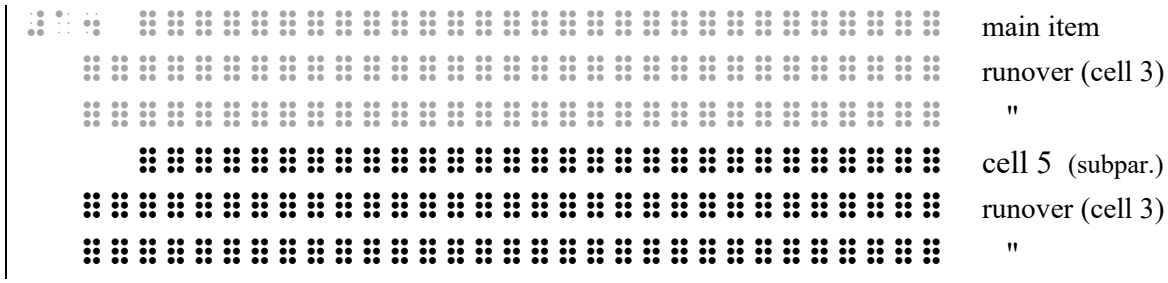
If instructional text is not followed by lettered or numbered exercise material, the text is formatted as a narrative paragraph beginning in cell 3 with runovers in cell 1. The (5-5) style of "directions" given in *Braille Formats* does not apply in a UEB with Nemeth transcription. [**5.12.1**]

Paragraph (3-1)



Subparagraph of a Main Item with No Subdivisions (5-3)

If a main item contains more than one paragraph, each subparagraph begins in cell 5 with runovers in cell 3. [**1.16**]



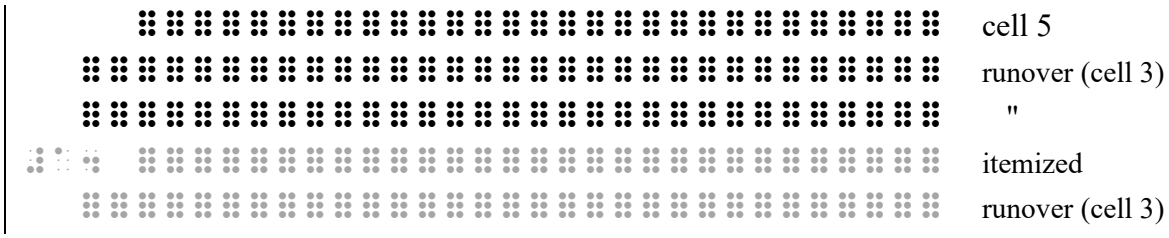
Subparagraph of Items with Subdivision (7-5)

If a main item or a subdivision has more than one paragraph, each new paragraph begins in cell 7, and its runovers begin in cell 5. [**6.1.1**]

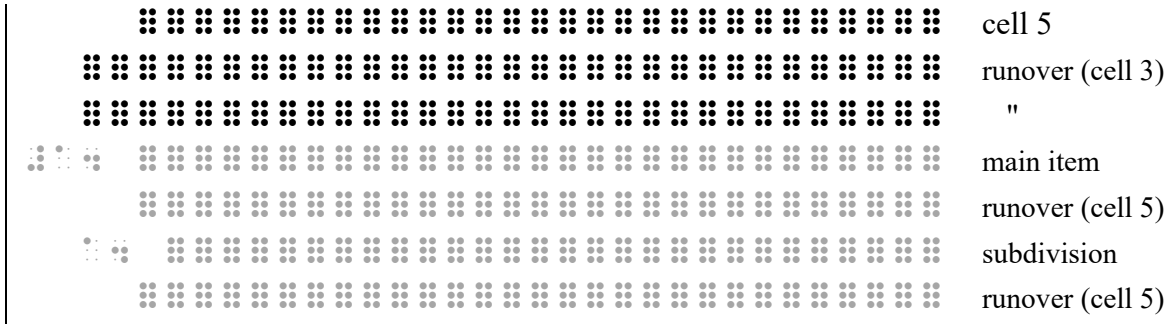
Nemeth Instructions

When a group of numbered or lettered problems is preceded by instructions, the instructions begin in cell 5 with runovers in cell 3. One line is left blank above instructions unless the instructions follow a cell-5 or a cell-7 heading. Instructions may begin on line 1 of the braille page if no running head is in use unless a pagination rule from *Braille Formats* is violated. The related itemized material follows on the next line unless the material itself requires a leading blank line. [**5.11**]

Nemeth Instructions (5-3)



OR

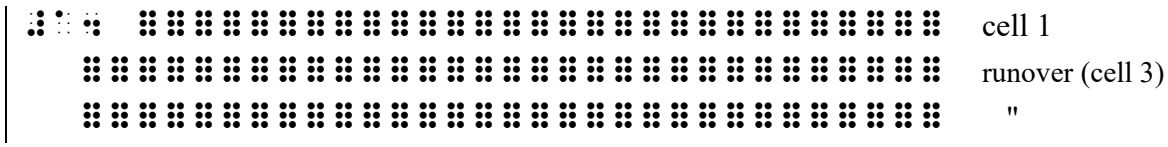


HANGING STYLES

Itemized Material

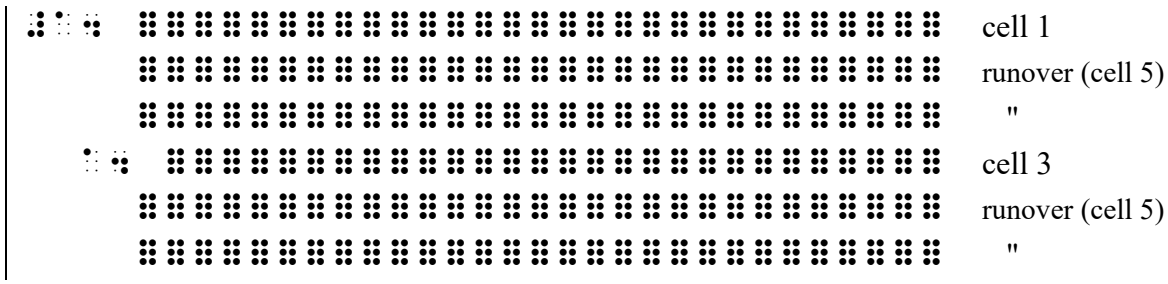
Main Item with No Subdivisions (1-3)

The identifier begins in cell 1; runovers begin in cell 3. [**1.16**]



Main Item with Subdivision (1-5, 3-5)

The main item designation begins in cell 1, and its runovers begin in cell 5. Each lettered or numbered subdivision – regardless of print indentation – begins in cell 3, with any runovers in cell 5. [**6.1**]



Side-by-Side Layout

When the print copy arranges nonspatial itemized material side by side across the page, the braille format is changed so that all identifiers start in the same cell. [**2.18, 6.1.2**] Itemized spatial problems may be arranged side by side across the width of the braille page. [**9.23.1**]

Tabular Layout

When itemized material is arranged in tabular form so that items are numbered at the margin and subdivisions are aligned beneath lettered column headings, the material is transcribed in one of the following ways: [**6.1.3**]

- If all the columns can be accommodated across the braille page, the print columnar arrangement is followed. Each problem number begins in cell 1. The letter identifying each column is aligned with the first cell of the related column. A blank line is left above and below the lettered column headings. Two blank cells separate the columns.
- If all the columns cannot be accommodated across the braille page, each subdivision in each problem must be lettered individually, and the (1-5; 3-5) format is followed.

Exercise Set

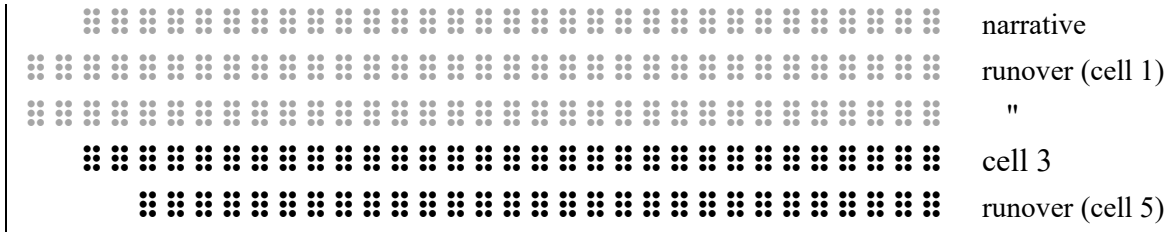
Runover margins for itemized material are determined individually for each item. A numbered or lettered problem with no subdivisions will be (1-3); the next numbered or lettered problem may have subdivisions and so will be (1-5; 3-5), etc. [**6.1.4**]

Displayed Mathematical Material

When mathematical material is set apart from the body of the text in the print copy, it is referred to as a displayed expression. The margins depend upon the layout of the preceding text. The first cell of the displayed material begins two cells to the right of the runover cell of the preceding material, whether or not a runover is actually present. Runovers of the displayed math are usually indented two cells further. [**7.1**]

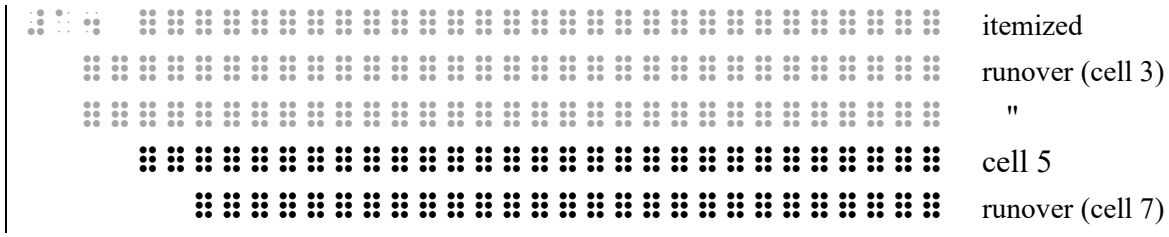
Math Displayed to Narrative (3-5)

In unitemized explanatory portions of the text, displayed mathematical material begins in cell 3. Runovers begin in cell 5. Text (3-1); displayed material (3-5). [**7.1.2**]



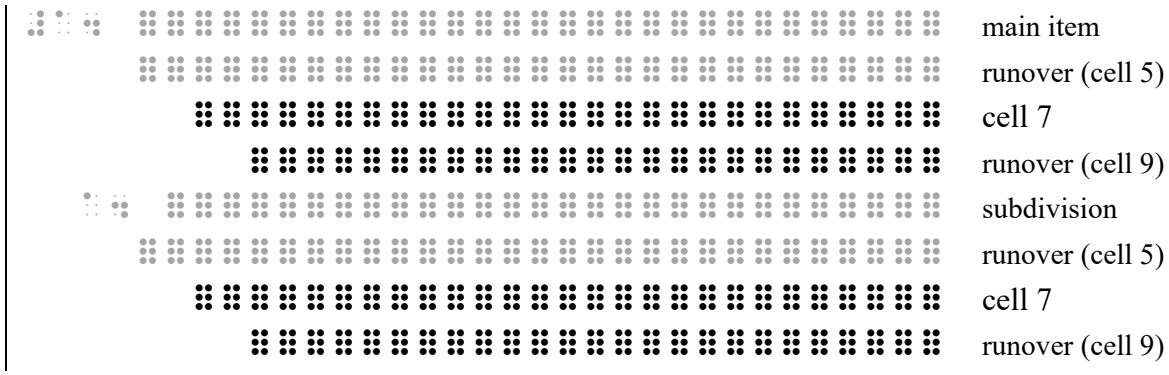
Math Displayed to Itemized Text (5-7)

In itemized text without subdivisions, displayed mathematical material begins in cell 5. Runovers begin in cell 7. Text (1-3); displayed material (5-7). [**7.1.5**]



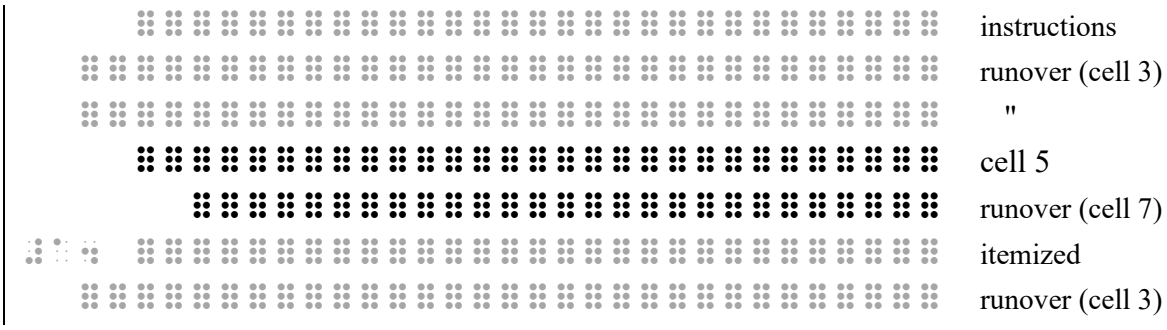
Math Displayed to Itemized Text with Subdivisions (7-9)

In itemized text with subdivisions, displayed mathematical material begins in cell 7. Runovers begin in cell 9. Main division text (1-5); displayed material (7-9). Subdivision text (3-5); displayed material (7-9). [**7.1.7**]



Math Displayed to Instructions (5-7)

Within or following instructions, displayed mathematical material begins in cell 5. Runovers begin in cell 7. Instructions (5-3); displayed material (5-7). [**7.1.6**]



Special Format: Nested Linked Expression

A nested linked expression, defined in Section **8.22**, can occur in a displayed or itemized format.

- Displayed to 3-1 Narrative (3-7, 5-7) The anchor is indented two cells to the right of the runover cell of the preceding material – cell 3. Each link begins on a new line and is indented two cells to the right of the anchor – cell 5. Any runovers are indented two more cells – cell 7. [**8.22.2**]
- Displayed to 1-3 Itemized Text (5-9, 7-9) The anchor is indented two cells to the right of the runover cell of the preceding material – cell 5. Each link begins on a new line and is indented two cells to the right of the anchor – cell 7. Any runovers are indented two more cells – cell 9. [**8.22.3.a**]
- Displayed to 1-5; 3-5 Itemized Text with Subdivisions (7-11, 9-11) The anchor is indented two cells to the right of the runover cell of the preceding material – cell 7. Each link begins on a new line and is indented two cells to the right of the anchor – cell 9. Any runovers are indented two more cells – cell 11. [**8.22.3.b**]
- Itemized Math With No Narrative When a nested linked expression immediately follows an identifier with no intervening narrative, the anchor is placed on the same line as the identifier. Each link begins a new line, two cells to the right of the cell in which the identifier begins. Runovers are indented two cells further—that is, four cells to the right of the cell in which the identifier begins. [**8.22.4**]

Labeled Displayed Mathematical Expressions

When a number or letter is used to identify a displayed mathematical expression it is placed at the left of the expression in braille regardless of the location of the label in the print copy. The label (identifier) begins in the appropriate cell for displayed material. [**7.2.1**]

OTHER MARGIN RULES

Spatial Arrangements

The leftmost symbol of a spatial arrangement is placed in the appropriate cell following the rules for itemized, unitemized, or displayed material. [**9.18**] *Exception:* A number line begins in cell 1. [**18.10**]

For further references regarding spatial material see the section on Spatial Arrangements at the end of this addendum.

Instructional Commentary

Line-by-Line Commentary

Comments printed beside related math problems are placed on the line following the expression, blocked four cells to the right of the runover position of the expression. [**16.11**]

Commentary Printed Beside Spatial Material

Comments which apply to more than one line of a spatial arrangement begin to the right of the first line of the arrangement. Runovers are indented two cells from the cell in which the comment begins. [**17.10**]

PLACEMENT OF CODE SWITCH INDICATORS

Embedded math, displayed math, itemized material, spatial arrangements, tables, and lists are only some of the formats that have unique considerations regarding placement of code switches. Guidelines are given when the switch indicators do not fall neatly on a line or on a page. Use this section to find the category that fits your layout.

General Principles

Only Nemeth symbols and the neutral symbols in the next paragraph are allowed between the opening Nemeth Code indicator and the Nemeth Code terminator (the *switches*). Nemeth symbols are not used outside of the switches; UEB symbols are not used inside the switches. [**1.1**]

Certain neutral symbols may appear in either UEB or Nemeth context: a page change indicator [**3.9**], box lines [**5.5, 18.6**], column separation lines and guide dots [**5.5**], an icon [**11.35**], a note separation line [**13.10.4**].

Narrative (Embedded) Context

The objective within a paragraph is to keep the switch indicators on the same line as the mathematics to which they apply. The opening Nemeth Code indicator is followed by a space unless it ends a line. The Nemeth Code terminator is preceded by a space unless it begins a line. These spaces do not represent spaces in print. [**1.1**] Within a paragraph, each switch indicator is placed on the same line as the related math expression if there is room on the line. [**1.5.1.b**] A switch indicator may stand alone on a line if there is not room for the math expression and one or

both of the switch indicators. Keeping the mathematical expression intact on one line is the priority. [**1.5.2**]

Switch Indicators with Itemized Material (Nonspatial)

Identifiers are transcribed according to the rules for the code in use at the time. All identifiers in a section do not need to be transcribed in the same code. [**2.16**]

The following suggestions are recommended by the authors as they are not addressed in the code book.

- Isolated Nemeth When both an opening Nemeth Code indicator and a Nemeth Code terminator are needed for a single item, transcribe the identifier in UEB and place the opening switch after the identifier. [**2.16.1.a**]
- Nemeth Continues When a Nemeth item is followed by another Nemeth item, place the opening Nemeth Code indicator at the end of the UEB material which precedes the first identifier. Transcribe the identifier in Nemeth and continue in that code. [**2.16.1.b, 2.16.1.c**]
- Top of Page Coming from UEB, when itemized Nemeth material begins at the top of a braille page and the first two items are transcribed in Nemeth, place the opening switch in cell 1 on the line before the first item. Transcribe the identifier in Nemeth. If a blank line is required place it on the line before the opening switch. [**2.16.1.d**]
- Following a Centered Heading When itemized Nemeth material immediately follows a centered heading, place the opening Nemeth Code indicator alone on the line immediately before the first identifier. A switch indicator alone on a line does not replace a necessary blank line. [**4.25.1.a**]
- Returning to UEB Text The Nemeth Code terminator is placed after the last Nemeth item. If there is no room on that line, the terminator is placed in the runover cell. Transcribe the next identifier in UEB. [**2.16.2**]

Switch Indicators with Unitemized or Bulleted Listed Math

This topic is not addressed in the code book. The authors recommend the following layouts.

- A Simple Vertical List of Nemeth Items The opening Nemeth Code indicator is placed in cell 1 on a line by itself. The list begins on the next line. The Nemeth Code terminator follows the last Nemeth item at the end of that line if room allows. If there is not room on the line, the Nemeth Code terminator is placed in the runover position. [**2.17.1**]
- A Multi-Column List The opening Nemeth Code indicator is placed. in cell 1 on a line by itself. The list begins on the next line. The Nemeth Code terminator is placed on the line following the multi-column list, in cell 1. [**2.17.2**]

Switch Indicators with Nemeth Instructions

When itemized mathematical material follows instructions, the opening Nemeth Code indicator is placed after the last word in the instructions or in the runover position if it does not fit there. [**5.11.2**] If instructions end with an expression in Nemeth and the subsequent problem starts with Nemeth, Nemeth code remains in effect between the end of the instructions and the start of the problem. [**5.11.2**]

Switch Indicators with Displayed Mathematical Material (Nonspatial)

When displayed nonspatial mathematical material is preceded and followed by UEB text, the expression and its two switch indicators are placed all together on one line if they will fit there within the current margins. The opening Nemeth Code indicator is placed in the starting cell for the particular displayed format.

If the displayed math and its two switch indicators will not fit on one braille line, the opening Nemeth Code indicator is placed at the end of the previous text. The Nemeth Code terminator is placed at the end of the displayed math. When either indicator will not fit on its current line, it is placed on the following line in the runover position. [**7.1.1.a**]

If Nemeth continues after the displayed expression, it is preferable to place the opening Nemeth Code indicator at the end of the line of text preceding the displayed material. [**7.1.1.b**]

Switch Indicators with Spatial Arrangements

Embedded Spatial Arrangement

Placement of code switch indicators with embedded spatial material follows the rules for any embedded math expression. When the code switches fit on the same line as the math, they are placed on the main line of the arrangement. Blank lines are required before and after the lines which contain an embedded spatial math expression.

Displayed, Unitemized, or Itemized Spatial Arrangement

Code switch indicators are placed outside of the displayed, unitemized, or itemized spatial material. The blank lines which are required before and after the arrangement are considered to be part of the spatial problem and so must be inside the Nemeth switches. The opening Nemeth Code indicator and the Nemeth Code terminator do not take the place of a required blank line.

- Displayed Spatial Arrangement The opening Nemeth Code indicator is placed at the end of the text that precedes a displayed spatial arrangement. If there is not room for the opening switch on the same line as the text, it is placed on the next line in cell 1 regardless of the current margins. The required blank line comes next. When Nemeth ends after the spatial material, the required blank line comes first. On the next line, the Nemeth Code terminator is placed in cell 1 regardless of the current margins. The transcription resumes on the next line. [**9.29, Example 9-57**]
- Unitemized Spatial Arrangement The opening Nemeth Code indicator is placed at the end of the text that precedes an unitemized spatial arrangement. If there is not room for the opening switch on the same line as the text, it is placed on the next line in cell 1

regardless of the current margins. The required blank line comes next. When Nemeth ends after the spatial material, the required blank line comes first. On the next line, the Nemeth Code terminator is placed in cell 1 regardless of the current margins. The transcription resumes on the next line. [**9.29**]

- Itemized Spatial Arrangement The opening Nemeth Code indicator is placed at the end of the text that precedes an itemized spatial arrangement. If there is not room for the opening switch on the same line as the text it is placed in the runover position of that text. The required blank line comes next. When Nemeth ends after itemized spatial material, the required blank line comes first. On the next line, the Nemeth Code terminator is placed in cell 1 regardless of the current margins. The transcription resumes on the next line. [**9.30**]

Switch Indicators with Tables

When mathematical data occur in the table, code switching decisions depend upon the content of the entire table and the spacing restrictions encountered on the braille page. Each table must be individually assessed in order to determine the clearest representation in braille. [**18.4.3**]

Column headings which contain words are transcribed in UEB. There may be items within the column headings that require switching to Nemeth. [**18.3**]

When the entire body of the table is transcribed in Nemeth, the opening switch is placed in cell 1 of the line following the column separation line. The entries begin on the next line. The Nemeth Code terminator follows the last line of entries, placed in cell 1. [**18.4.2**] Words within the table, including row headings, will be transcribed without contractions. If a row heading consists of one word, the single-word switch indicator is not used. [**18.5**]

It is best if a minimum of code switching is encountered within the body of the table. See Section **18.4** for various strategies.

Other Considerations

Switch Indicators and Punctuation

Punctuation that relates to the main text is placed outside of the switch indicators when the following text is in UEB. There is no space between the terminator and the punctuation. [**1.4**] To avoid excessive code switching between mathematical items, punctuation which belongs to the sentence structure is transcribed inside the switches. [**2.3**] When parentheses, brackets, braces, or quotation marks enclose a Nemeth symbol or expression, the paired punctuation is transcribed inside the code switches. [**2.12**] Paired grouping symbols (parentheses, brackets, braces) must be transcribed in the same code. [**2.13**]

Switch Indicators after a Heading

An opening Nemeth Code indicator cannot be placed at the end of a centered heading. [**4.25.1.a**] An opening Nemeth Code indicator may be placed at the end of a cell-5 or cell-7 heading or in the runover position. [**4.25.1.b**]

Switch Indicators at Page Turns

When Nemeth is in effect, Nemeth is not terminated by transition to a new braille page or across a page turn line. [**3.8**, **3.9**] When code switching occurs at a braille page turn, the opening Nemeth Code indicator and the Nemeth Code terminator must appear on the same braille page as the expression to which they apply. The opening Nemeth Code indicator should not stand alone at the bottom of a braille page, nor should the Nemeth Code terminator stand alone at the top of a braille page. [**1.5.3**]

Switch Indicators and Transcriber's Notes

Transcriber's note indicators are UEB symbols and must be placed outside of the Nemeth switches. Within the note, code switching is applied as needed. When mathematical material follows a transcriber's note, the opening Nemeth Code indicator may be placed following the closing transcriber's note indicator only if it fits on the same line. If it does not fit, follow established directives regarding placement of the opening switch. [**4.26**]

Switch Indicators with Instructional Commentary

- Linear Commentary When instructional commentary alternates with math problems, switch indicators are used in order to transcribe the comments in contracted braille. When switching into or out of Nemeth before a change of margins, the switch indicators are placed after the last item of the line rather than at the beginning of the next line to maintain clarity of the indented margin pattern. [**16.11**]
- Spatial Commentary When a comment or condition applies to a spatial arrangement the comment begins on the top line of the arrangement, to the right of the enlarged grouping symbol (if present) or a transcriber-inserted grouping symbol. [**17.10.4**] When the comment contains narrative, code switching is not applied even though the words may not be part of a mathematical expression. The words are uncontracted; the single-word switch indicator is not used. [**17.10.2**] If there is little room beside the math for the comment, it may be placed before or after the math arrangement. A transcriber's note must explain that the comment applies to the spatial arrangement. [**17.10.3.a**]

Switch Indicators with Boxed Material

Box lines may be transcribed in either code. When literary content is followed by boxed mathematical material, if all of the material in the box is in Nemeth, the opening Nemeth Code indicator is placed at the beginning of the top box line, followed by a blank space and the Nemeth Code terminator is placed at the end of the bottom box line, preceded by a space. [**18.6.2**] When a transcriber's note refers to material within box lines and all of the material within the box is in Nemeth, the note may be transcribed above the top box line in order to allow the insertion of switch indicators in the box lines. [**18.6.4**]

Switch Indicators with Tactile Graphics

Nemeth remains in effect for a tactile graphic if the graphic intervenes between two items in Nemeth. If the preceding text is in UEB and if a switch to Nemeth must be made for the tactile graphic, the opening switch is placed at the end of the preceding text or in cell 1 on the line before the required blank line. [**18.9**]

SPATIAL ARRANGEMENTS

Formatting details regarding various spatial arrangements can be found in the following sections of the lesson manual.