

LESSON 2

- MORE ABOUT PUNCTUATION
- PUNCTUATION IN NEMETH CODE
 - The Punctuation Indicator
- INTRODUCTION TO SIGNS OF GROUPING
 - Code-Switching Considerations
 - Spacing with Signs of Grouping
- IDENTIFIERS, cont.

Format

- Keep Together—Hyphenated Expressions
- Side-by-Side Layout

Answers to Practice Material

LESSON PREVIEW

The punctuation indicator is introduced as we take a closer look at punctuation inside the switches. Summaries are given regarding the use/nonuse of the punctuation indicator. Nemeth grouping symbols are introduced. Code switching within numbered/lettered formats is discussed. Nemeth rules regarding hyphenated expressions are given. An alternate layout option for itemized material is considered.

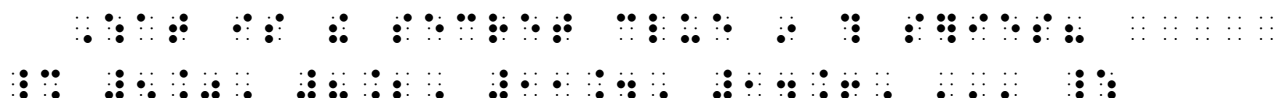
MORE ABOUT PUNCTUATION

2.1 Punctuation Mode

Punctuation mode is determined by whether the punctuation occurs inside or outside of the Nemeth switches. The concept is simple – punctuation that occurs outside of the switch indicators is transcribed in "literary mode" according to the rules of Unified English Braille; punctuation occurring within the switch indicators is transcribed in "mathematical mode" according to the rules of the Nemeth Code. Take another look at this example from Lesson 1, noting that UEB punctuation is used for the question mark and the Nemeth comma and ellipsis are used in the mathematical portion.

Example 2-1

What is the secret clue in this series? 5.0, 8.2, 11.4, 14.6, ...

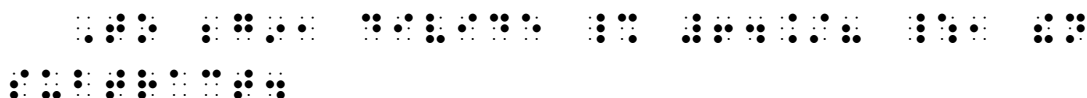


2.2 Spacing of UEB Punctuation and Code Switch Indicators

As shown in Lesson 1, punctuation that relates to the main text is placed outside of the switch indicators when the surrounding text is in UEB. There is no space between the terminator and the following punctuation.

Example 2-2

To begin, divide $64 \div 8$, then subtract.



Note the use of the literary comma (dot 2) outside of the Nemeth Code terminator.

Example 2-3

Divide $64 \div 8$ —then subtract.



The unspaced dash is part of the sentence punctuation and is placed outside of the Nemeth Code terminator.

Instructions: Consider carefully where to place the code switch indicators and what kind of punctuation to use in these three sentences. Apply 3-1 Nemeth paragraphing.

PRACTICE 2A

72813654, when written as 72 81 36 54, is obviously divisible by 9.

Write these numbers: 3.29, 500, -123, 2,000.88, -250,794. Now add them together.

Is the answer 4.0‰, or is it 4.0%?

PUNCTUATION IN NEMETH CODE

2.4 Background

So far we have looked at punctuation that is unambiguous in mathematical context: the mathematical comma and the short dash. These symbols are not the same as their UEB counterparts.

⦿ ⠠⠨⠠⠨ Mathematical comma

⦿ ⠠⠨⠠⠨⠠⠨ Short dash

When other punctuation marks are transcribed inside the Nemeth switches, the punctuation symbols from UEB are used: the apostrophe, colon, exclamation point, period, question mark, quotation marks,* and semicolon. When a punctuation mark is not preceded by a space, clarification is required because the symbols are formed with the same braille dots as Nemeth numerals and symbols, as demonstrated in this list.

| |
|---|
| A semicolon ⠠⠨⠠⠨ could be misread in Nemeth as the numeral 2. |
| A colon ⠠⠨⠠⠨ could be misread in Nemeth as the numeral 3. |
| A period ⠠⠨⠠⠨ could be misread in Nemeth as the numeral 4. |
| An exclamation point ⠠⠨⠠⠨ could be misread in Nemeth as the numeral 6. |
| A question mark ⠠⠨⠠⠨ could be misread in Nemeth as the numeral 8. |
| A closing “double” quotation mark ⠠⠨⠠⠨ could be misread in Nemeth as the numeral 0. |
| A closing “single” quotation mark ⠠⠨⠠⠨⠠⠨ could be misread in Nemeth as a comma and the numeral 0. |
| An apostrophe ⠠⠨⠠⠨ could be misread in Nemeth as a prime sign. |

Clarification is achieved by use of the *punctuation indicator*.

* Only the one-cell “double” quotation marks ⠠⠨⠠⠨ ⠠⠨⠠⠨ and the two-cell “single” quotation marks ⠠⠨⠠⠨⠠⠨ ⠠⠨⠠⠨⠠⠨ are used inside the Nemeth switches.

Nemeth switches. The final period applies to the entire sentence. It is placed after the Nemeth Code terminator.

2.5.4 **Digital Clock Time.** Digital clock time is transcribed in UEB unless the time is involved in computation or is part of a number line, in which case Nemeth symbols are used. A punctuation indicator precedes the colon to prevent misreading the colon as the number 3. A numeric indicator is then required to set the reading mode back to "numeric."

➤ 3:30

UEB: ⠠⠨⠠⠢⠠⠨⠠⠚⠠⠨⠠⠚

Nemeth: ⠠⠨⠠⠢⠠⠨⠠⠚⠠⠨⠠⠚⠠⠨⠠⠚⠠⠨⠠⠚

Recall from Lesson 1 that the numeric indicator is not restated when a hyphen connects Nemeth numerals.

➤ 7:45-8:20

UEB: ⠠⠨⠠⠗⠠⠨⠠⠘⠠⠨⠠⠕⠠⠨⠠⠒⠠⠨⠠⠒⠠⠨⠠⠒⠠⠨⠠⠚

Nemeth: ⠠⠨⠠⠗⠠⠨⠠⠘⠠⠨⠠⠒⠠⠨⠠⠚⠠⠨⠠⠒⠠⠨⠠⠚

Example 2-10

Last night, Jayquan arrived at 7:45 and left at 8:20. Use the shortcut method to figure out how many minutes he stayed. $7:45-8:20 = 15+20 = 35$. Jayquan stayed for 35 minutes.

⠠⠨⠠⠗⠠⠨⠠⠘⠠⠨⠠⠕⠠⠨⠠⠒⠠⠨⠠⠒⠠⠨⠠⠚⠠⠨⠠⠒⠠⠨⠠⠚⠠⠨⠠⠒⠠⠨⠠⠚⠠⠨⠠⠚⠠⠨⠠⠚
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It is not necessary for the digital time to be transcribed in the same code within the same word problem. UEB is used in the narrative and Nemeth is used in the computation.

2.6 Punctuation with Omission Signs

When a sign of omission represents omitted mathematical content the appropriate Nemeth symbol is transcribed. A Nemeth omission symbol is punctuated mathematically. Related punctuation is unspaced from the omission symbol.

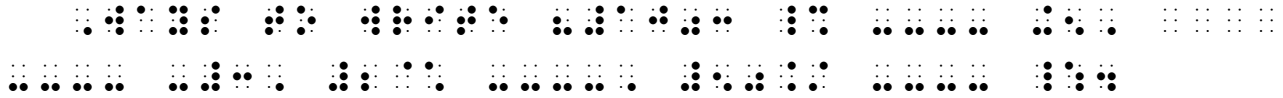
➤ $2 \times \dots,$ ⠠⠨⠠⠒⠠⠨⠠⠗⠠⠨⠠⠗⠠⠨⠠⠗⠠⠨⠠⠗

➤ $2 \times \underline{\quad}.$ ⠠⠨⠠⠒⠠⠨⠠⠗⠠⠨⠠⠒⠠⠨⠠⠒⠠⠨⠠⠒⠠⠨⠠⠒

Take another look at this example from Lesson 1. Notice the use of the mathematical comma with the long dash.

Example 2-11 |

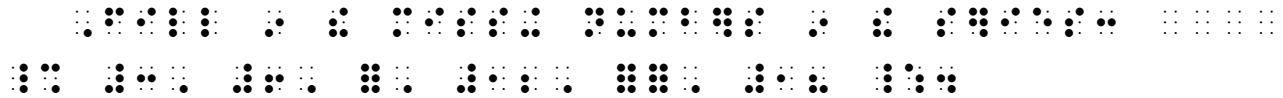
Ways to write "10": ____ + 5, ____ – 3, $2 \times$ ____, $50 \div$ ____.



Reminder: A space is inserted between a long dash and an operation symbol. Note that, on line 2, the omission symbol (long dash) is placed on the same line as the rest of its math expression even though there is room for the long dash on the first line.

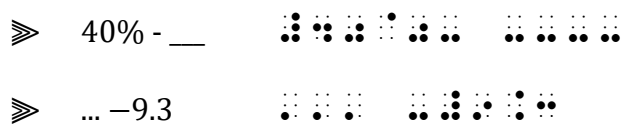
Example 2-12 |

Fill in the missing numbers in the series: 3, 6, ?, 12, ??, 18.



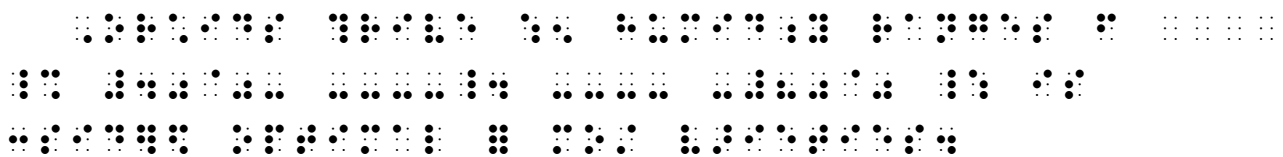
Switch Decision: These question marks represent omissions and so the Nemeth general omission symbol is required. (Section 1.11.) In order to avoid excessive code switching, the entire series is transcribed in Nemeth even though the numerals themselves could be transcribed in either code. Reminders: The general omission symbol is spaced according to rules of the item it represents (in this case, a numeral). The same number of omission symbols shown in print is used in braille.

2.6.1 **Spacing Exception—The Hyphen.** Although no space is left between an ellipsis and a related punctuation mark or between a long dash and a related punctuation mark, if the punctuation mark is a hyphen then a space is required.



Example 2-13 |

Orchids thrive when humidity ranges from 40% - ____. ____ – 80% is considered optimal for most varieties.



2.7 Punctuation and Spacing of Plural or Possessive Endings

When "s" or apostrophe-s is attached to a mathematical item, it becomes part of that expression. This means that the "s" is punctuated mathematically.

➤ $\times s$: $\text{⠠}\text{⠠}\text{⠠}\text{⠠}\text{⠠}\text{⠠}\text{⠠}\text{⠠}\text{⠠}\text{⠠}\text{⠠}\text{⠠}$

Example 2-14

Insert +s or insert $\times s$: $4 \dots 2 = 8$; $8 \dots 2 = 10$.

⠠

Reminder: A mathematical expression must not be divided between braille lines if it will fit on one line within current margins. The expression "4 ... 2 = 8" must not be divided and so it begins on line 2.

A punctuation indicator is required before the apostrophe in a possessive ending "apostrophe-s". Even so, a punctuation indicator is still required before a punctuation mark that immediately follows the "s". Compare this similar example to the previous one.

➤ $\times's$: ⠠

Example 2-15

Insert +'s or insert $\times's$: $4 \dots 2 = 8$; $8 \dots 2 = 10$.

⠠

A punctuation indicator is needed both before the apostrophe and before the colon in $\times's$.

The ending is unspaced from the symbol even if the symbol normally requires a space.

➤ $=s$ $\text{⠠}\text{⠠}\text{⠠}\text{⠠}\text{⠠}\text{⠠}\text{⠠}$

➤ $='s$ $\text{⠠}\text{⠠}\text{⠠}\text{⠠}\text{⠠}\text{⠠}\text{⠠}\text{⠠}\text{⠠}\text{⠠}\text{⠠}\text{⠠}$

Instructions: Here is a list of isolated mathematical items and punctuation marks. Transcribe an opening Nemeth Code indicator in cell 1. Start the list on the next line. Begin each line in cell 1, with any runovers in cell 3. Remain in Nemeth throughout the practice, including the clock time. Place a Nemeth Code terminator in cell 1 on the line following the last item in the list.

PRACTICE 2B

$+$, $-$; \times , \div .

$+$'s, $-$'s, \times 's, \div 's; $=$ s, $>$ s, $<$ s.

" :: "

5.1, 6.22, 7.333; \$8.44, \$9.55; \$10.66.

10:45-11:25

$-16 > -$ ___; $16 <$ ___.

\$1,400 < £ ?

5'3" ..., 6'1"—6'2" ..., 7'0".

"8 · 3 = 3 · 8"

2.8 Summary of the Use and Nonuse of the Punctuation Indicator

2.8.1 **Situations That Do Not Require a Punctuation Indicator.** A punctuation indicator is not required before any of the following punctuation marks. In these isolated examples, assume that the technical material continues after what is shown.

a. The mathematical comma never requires a punctuation indicator.

➤ 5.0, ⠠⠠⠠⠠⠠⠠⠠⠠

b. A punctuation indicator is not used before a hyphen or a dash.

➤ 5.5-7.0 ⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠

➤ \$47,689—2.6% ⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠

c. A punctuation indicator is not needed if the first character following a space is a punctuation mark or if the punctuation mark begins on a new line.

➤ "+" , "-" ⠠⠠⠠⠠⠠⠠⠠⠠ ⠠⠠⠠⠠⠠⠠

- d. In a sequence of punctuation marks following a mathematical expression, the punctuation indicator precedes only the first punctuation mark.

➤ "=". ⠠ ⠨ ⠠ ⠨ ⠠ ⠨ ⠠ ⠨ ⠠ ⠨ ⠠ ⠨ ⠠ ⠨

- e. In the next lesson, another situation where the punctuation indicator is not required will be presented: after a word or abbreviation.

2.8.2 Situations That Require a Punctuation Indicator. A punctuation indicator is required after any symbol of the type listed below when Nemeth has not been terminated and the mark of punctuation is not a comma, hyphen, or dash. In the following isolated examples, assume that the technical material continues after the final punctuation mark.

- a. After a numeric symbol.

➤ 98.6. ⠠

➤ "4.9" ⠠

- b. After a long dash or after an ellipsis.

➤ 24 = 6 + __. ⠠

➤ 1, 3.1413, ...; ⠠

- c. After a general omission symbol.

➤ 15 ÷ 3 = ?. ⠠

- d. After a grouping symbol.

➤ ("8"): ⠠

- e. After any of the miscellaneous symbols presented so far.

➤ 100%. ⠠

➤ 48¢? ⠠

- f. After a comma, hyphen, or short dash, provided that if these were removed and the space which they occupy were not present, one of the situations above would apply.

➤ 3y, ⠠

➤ "\$99—" ⠠

Other situations where the punctuation indicator is required will be presented later in this course.

INTRODUCTION TO SIGNS OF GROUPING

2.9 Definition

In mathematical context, symbols such as parentheses, braces, and brackets are not considered to be punctuation; they are classified as signs of grouping. Here are some grouping signs commonly encountered in technical material.

| | | |
|------|----------------------|---|
| ⠠⠠ | Left Parenthesis | (|
| ⠠⠠ | Right Parenthesis |) |
| ⠠⠠⠠ | Left Curly Brace | { |
| ⠠⠠⠠ | Right Curly Brace | } |
| ⠠⠠ | Left Square Bracket | [|
| ⠠⠠ | Right Square Bracket |] |
| ⠠⠠⠠⠠ | Left Angle Bracket | < |
| ⠠⠠⠠⠠ | Right Angle Bracket | > |
| ⠠ | Vertical Bar | |
| ⠠⠠ | Double Vertical Bar | |

More signs of grouping will be presented in Lesson 7.

2.10 Signs of Grouping with Numerals

- a. The numeric indicator is not used before a numeral that immediately follows a grouping symbol.

➤ (3)(5) ⠠⠠⠠⠠⠠⠠

Example 2-16

"Three times five" can be written this way: (3)(5).

⠠⠠⠠⠠⠠⠠ ⠠⠠⠠ ⠠⠠⠠⠠⠠⠠ ⠠ ⠠ ⠠⠠⠠⠠⠠⠠ ⠠ ⠠⠠⠠⠠ ⠠⠠⠠⠠⠠⠠

These parentheses function as mathematical symbols representing multiplication, therefore a switch to Nemeth is required.

- b. The numeric indicator is not used after a minus sign that immediately follows a grouping symbol.

➤ |-8| ⠠⠠⠠⠠

2.12 Nested Grouping Symbols

When two or more grouping signs follow one another the outer set may be printed using a taller size in order to visually distinguish the nested groupings. The braille transcription does not differentiate between the sizes—regular grouping symbols are transcribed.

Example 2-19

Perform the inner computations before subtracting. $((4 + 7) - (7 + 4))$

The Braille transcription shows the expression ((4 + 7) - (7 + 4)). The outer parentheses are taller than the inner ones, visually indicating the nesting of the operations.

In print, the first and last parentheses are taller than the others.

Code-Switching Considerations

2.13 Enclosed Technical Material

When parentheses, brackets, braces, or quotation marks enclose a Nemeth symbol or expression, the paired punctuation is transcribed inside the code switches.

➤ "+" $(2 + 2 = 4)$ The Braille transcription shows the plus sign and the expression (2 + 2 = 4) enclosed in code switches. The plus sign and the equals sign are transcribed inside the code switches.

Example 2-20

"+" means *plus*, "-" means *minus*, and "=" means *equals*.

The Braille transcription shows the plus, minus, and equals signs enclosed in code switches. The plus sign is transcribed as a plus sign, the minus sign as a minus sign, and the equals sign as an equals sign.

- Recall that many UEB punctuation symbols can be used inside of the code switches (a period, a semicolon, a colon, to name a few). UEB parentheses, brackets, and braces do not fall into this category. Inside the switches, Nemeth grouping symbols are transcribed even when the sign has no mathematical meaning.

➤ (×) The Braille transcription shows the cross symbol enclosed in a code switch.

Example 2-21

Multiplication can be printed as a dot (·) or as a cross (×).

The Braille transcription shows the dot and cross symbols enclosed in code switches.

2.16 Spacing Outside of the Grouping Signs

The spacing before and after an enclosed expression is subject to the spacing rules for the signs which precede or follow the enclosure.

Example 2-28

Perform the multiplication before the addition. $(4 \times 30) + (4 \times 2) = 128$

Operation signs are unspaced; comparison signs are spaced.

Example 2-29

Complete the missing values in the range $(0.1) \dots (0.9)$

The ellipsis is spaced.

- a. No space is left between an enclosed expression and a numeral when these items are part of the same expression unless other spacing rules apply. These items often appear to be spaced in print.

Example 2-30

Does $5(9 + 7) = (5 \cdot 9) + 7$?

- b. No space is left between an enclosed expression and another sign of grouping when these items are part of the same expression unless other spacing rules apply. These items often appear to be spaced in print.

Example 2-31

Multiply, then add. $[(3)(-1)] + [(1)(-3)]$

Instructions: Format each line or sentence in print as a 3-1 paragraph in braille.

PRACTICE 2C

Is $3(-2.5) + (-4)$ the same as $3(-2.5 + (-4))$?

Use a number line to illustrate this addition problem: $[-4 - (-1)] + [-1 - (-3)]$.

$$7 + (-3) + (-4) = ?$$

$$8 + |(-2) + (-3)| = ?$$

$$|2(-7.5)| + 3.2(2) = ?$$

The **multiplicative identify** [*sic*] property is illustrated: $(83)(1) = 83$.

A **unit set** is a set containing only one element. For example, $\{9\}$ is a unit set containing the element "9".

What is the meaning of the symbol "||" in "The answer is ||3.1||"?

A finite decimal (such as 0.152) is one that stops, whereas an infinite decimal (such as 0.9999...) repeats indefinitely.

- c. **UEB-to-Nemeth.** Similarly, within the list, when UEB is in effect at the end of an item and the beginning of the next item is in Nemeth, transcribe the identifier in UEB and then switch to Nemeth.

Example 2-37

True or False?

- (1) 98.6 is normal human body temperature expressed in degrees Celsius.
- (2) 50% represents the same portion as 0.5.

1

2

3

4

5

6

7

*Line 3: Only the decimal numeral is between the switches.
 Line 6: Only the percentage is between the switches.*

- d. **Nemeth-to-UEB.** When Nemeth is in effect at the end of an item and the beginning of the next item is in UEB, place the Nemeth Code terminator at the end of the Nemeth material and transcribe the next identifier in UEB.

Example 2-38

True or False?

- (1) 50% represents the same portion as 0.5.
- (2) Expressed in degrees Celsius, normal human body temperature is 98.6.

1

2

3

4

5

6

7

*Line 4: Nemeth is terminated before the period.
 Line 5: The identifier is in UEB, and UEB continues.*

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PRACTICE 2C

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- 2
- 3
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- 5
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- 7
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- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18
- 19

PRACTICE 2D

- 1
- 2
- 3