

LESSON 18

- TABLES
- FIGURES AND DIAGRAMS
 - Number Lines
- KEYING TECHNIQUE

Answers to Practice Material

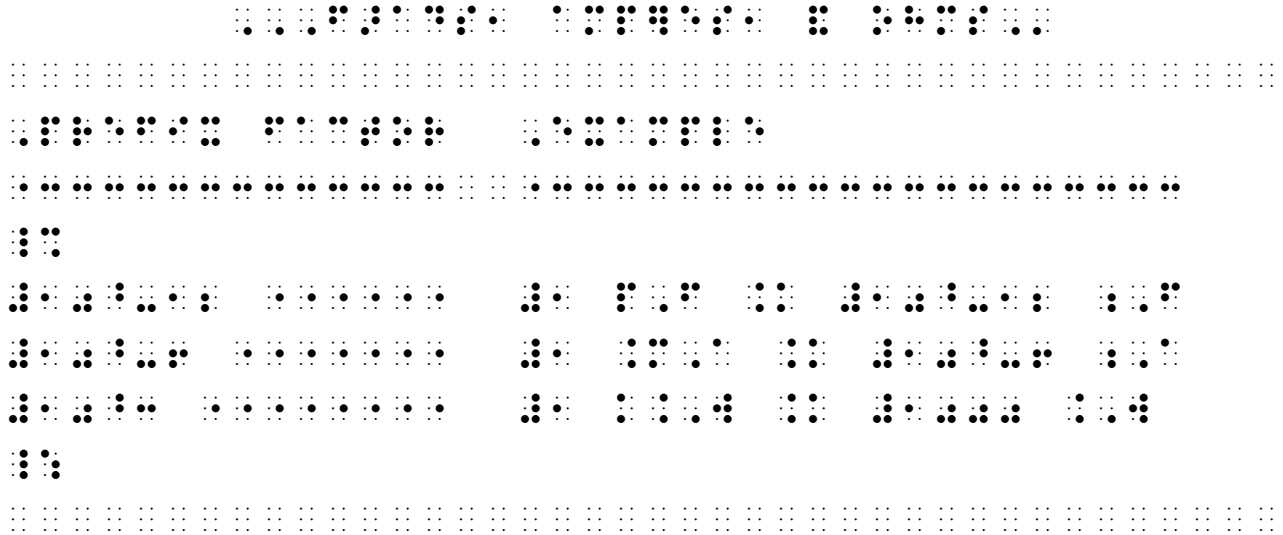
LESSON PREVIEW

Code switching in tables is examined, including considerations regarding box lines and transcriber's notes. Some rules about technical diagrams are introduced. The technique of keying long labels and table entries is explored.

Example 18-5

FARADS, AMPERES, AND OHMS

Prefix factor	Example
10^{-12}	1 pF = 10^{-12} F
10^{-6}	1 μ A = 10^{-6} A
10^3	1 k Ω = 1000 Ω



- 18.4.3 **Code Switching Considerations.** When a mixture of narrative entries and mathematical data occur in a table, the transcriber may switch to Nemeth only where needed, or the table may be transcribed entirely in Nemeth. Each table must be individually assessed in order to determine the clearest representation in braille. Keeping in mind that a table is read both vertically and horizontally, it is best if a minimum of code switching is encountered within the body of the table. Use common sense, however. For example, if there are very few Nemeth items within a table, switching before and after each item may make more sense than transcribing the entire table in Nemeth. This section examines a few possibilities which you will encounter in your work.
- Column Headings in UEB.** When the column headings consist entirely of words, the preferred method is to transcribe them in UEB.

Example 18-6

<u>Score</u>	<u>Tally</u>	<u>Frequency</u>
1		4
2	 / / / /	9
3	 / / / /	7
4	 / / / / / / / /	12

1	2	3	4
1		4	
2	 / / / /	9	
3	 / / / /	7	
4	 / / / / / / / /	12	

All of the table entries are transcribed in Nemeth, including the unmodified numbers in columns one and three. Digits in column three are left adjusted in the print table; the same alignment is followed in braille.

Transcription a: Switch indicators are required for the math symbols in column 1. The words in columns 2 and 3 are contracted.

$\frac{1}{2}$	one	two
$\frac{1}{3}$	one	three
$\frac{1}{4}$	one	four
$\frac{1}{5}$	one	five
$\frac{1}{6}$	one	six
$\frac{1}{7}$	one	seven
$\frac{1}{8}$	one	eight
$\frac{1}{9}$	one	nine
$\frac{1}{10}$	one	ten
$\frac{2}{3}$	two	three
$\frac{2}{4}$	two	four
$\frac{2}{5}$	two	five
$\frac{2}{6}$	two	six
$\frac{2}{7}$	two	seven
$\frac{2}{8}$	two	eight
$\frac{2}{9}$	two	nine
$\frac{2}{10}$	two	ten
$\frac{3}{4}$	three	four
$\frac{3}{5}$	three	five
$\frac{3}{6}$	three	six
$\frac{3}{7}$	three	seven
$\frac{3}{8}$	three	eight
$\frac{3}{9}$	three	nine
$\frac{3}{10}$	three	ten
$\frac{4}{5}$	four	five
$\frac{4}{6}$	four	six
$\frac{4}{7}$	four	seven
$\frac{4}{8}$	four	eight
$\frac{4}{9}$	four	nine
$\frac{4}{10}$	four	ten
$\frac{5}{6}$	five	six
$\frac{5}{7}$	five	seven
$\frac{5}{8}$	five	eight
$\frac{5}{9}$	five	nine
$\frac{5}{10}$	five	ten
$\frac{6}{7}$	six	seven
$\frac{6}{8}$	six	eight
$\frac{6}{9}$	six	nine
$\frac{6}{10}$	six	ten
$\frac{7}{8}$	seven	eight
$\frac{7}{9}$	seven	nine
$\frac{7}{10}$	seven	ten
$\frac{8}{9}$	eight	nine
$\frac{8}{10}$	eight	ten
$\frac{9}{10}$	nine	ten

Transcription b (preferred method): The entire body of the table is transcribed in Nemeth. The words are uncontracted.

$\frac{1}{2}$	one	two
$\frac{1}{3}$	one	three
$\frac{1}{4}$	one	four
$\frac{1}{5}$	one	five
$\frac{1}{6}$	one	six
$\frac{1}{7}$	one	seven
$\frac{1}{8}$	one	eight
$\frac{1}{9}$	one	nine
$\frac{1}{10}$	one	ten
$\frac{2}{3}$	two	three
$\frac{2}{4}$	two	four
$\frac{2}{5}$	two	five
$\frac{2}{6}$	two	six
$\frac{2}{7}$	two	seven
$\frac{2}{8}$	two	eight
$\frac{2}{9}$	two	nine
$\frac{2}{10}$	two	ten
$\frac{3}{4}$	three	four
$\frac{3}{5}$	three	five
$\frac{3}{6}$	three	six
$\frac{3}{7}$	three	seven
$\frac{3}{8}$	three	eight
$\frac{3}{9}$	three	nine
$\frac{3}{10}$	three	ten
$\frac{4}{5}$	four	five
$\frac{4}{6}$	four	six
$\frac{4}{7}$	four	seven
$\frac{4}{8}$	four	eight
$\frac{4}{9}$	four	nine
$\frac{4}{10}$	four	ten
$\frac{5}{6}$	five	six
$\frac{5}{7}$	five	seven
$\frac{5}{8}$	five	eight
$\frac{5}{9}$	five	nine
$\frac{5}{10}$	five	ten
$\frac{6}{7}$	six	seven
$\frac{6}{8}$	six	eight
$\frac{6}{9}$	six	nine
$\frac{6}{10}$	six	ten
$\frac{7}{8}$	seven	eight
$\frac{7}{9}$	seven	nine
$\frac{7}{10}$	seven	ten
$\frac{8}{9}$	eight	nine
$\frac{8}{10}$	eight	ten
$\frac{9}{10}$	nine	ten

18.4.4 **A Table of Values.** A table of values showing a set of ordered pairs is best presented entirely in Nemeth, including the column headings. When printed horizontally, a tables of values will not have column headings.

Instructions: If the body of the table can be transcribed entirely in UEB, do so. Center the first table's label on one line and its caption on the next line, disregarding the typeform. Show two ways to transcribe the second table —first, with the column headings in UEB; then, repeat the table heading and transcribe the column headings in Nemeth.

PRACTICE 18A

Table 18.1-5 Values and iterations of e.

e	e^2	S
1	1	6
2	4	24
3	9	54
4	16	96

RTD TABLE

R	T	D
30	$t + 2$	$30(t + 2)$
45	t	$45t$

18.5 When Row Headings are Words

When table entries consist of technical material but the row headings are words, to minimize the use of code switch indicators the entire table (excluding the table title and column headings) is considered to be technical material. Words within the table are transcribed without contractions. The single-word switch indicator is not used.

Example 18-10

Description	Qty	Cost per Unit	Total Cost
Shin guards	3	\$5.09	\$15.27
Cleats	2	\$28.89	\$57.78
Soccer ball	4	\$12.54	\$50.15
TOTAL			_____

Example 18-12

x	y
-2	-3
1	3
3	-3
5	3

Braille transcription of the table above, showing Nemeth characters for negative signs and alignment by digit.

The negative sign dictates use of Nemeth in this table of values. The values are aligned as printed, by digit. The vertical line between columns is not transcribed.

Example 18-13

Instructions: Select inputs that have exact outputs.

x	$f(x) = \sqrt{x}$	$(x, f(x))$
0	0	(0, 0)
1	1	(1, 1)
3	1.7	(3, 1.7)
4	2	(4, 2)
7	2.6	(7, 2.6)
9	3	(9, 3)

Braille representation of the table above, including the instructions and the table content.

Recall that Nemeth "Instructions" format (5-3) is applied only when followed by itemized material. These instructions are formatted as a narrative paragraph (3-1). A blank line is required before the top box line as well as after the bottom box line unless it falls on line 25 of the braille page.

18.6.3 **Technical Material Before or After a Box.** If technical material immediately precedes or follows the box, the code currently in use continues through the box line.

Example 18-14

The table below shows values for the line $y = 2x - 3$.

IN (x)	-3	-2	-1	0	1	2
OUT (y)	-9	-7	-5	-3	-1	1

Braille representation of the table above, including Nemeth Code markers and a terminator.

Nemeth begins before the technical material preceding the box and is terminated after the completion of the table. For box lines to match, the Nemeth Code terminator is not included in the bottom box line. The Nemeth Code terminator follows the blank line required following the bottom box line. Note that, in print, the numerals are right-adjusted in their columns. Braille follows print. Also note that internal table lines are disregarded.

Example 18-15

IN (x)	-3	-2	-1	0	1	2
OUT (y)	-9	-7	-5	-3	-1	1

$y = 2x - 3$ is the line represented by the table above.

Braille representation of the table and equation. The table is enclosed in a box. The equation $y = 2x - 3$ is shown below the table. The Braille uses Nemeth for the table and UEB for the equation.

Nemeth continues after the boxed table. UEB resumes after the equation. For box lines to match, Nemeth must be opened before the box line is transcribed. The required blank lines precede and follow the box lines. Note that, in print, the numerals are right-adjusted in their columns. Braille follows print. Also note that internal table lines are disregarded.

18.6.4 **Placement of Transcriber's Note.** A transcriber's note that refers to boxed material is generally placed inside the box. However, since the transcriber's note indicators are a UEB symbol, an exception is allowed for boxed material that is entirely 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 themselves. Two versions of the next example illustrate these options.

Example 18-16

Notice the pattern formed in the table of equivalent fractions in the box below.

$\frac{0}{12}$	$\frac{0}{6}$	$\frac{0}{4}$	$\frac{0}{3}$	$\frac{0}{2}$
$\frac{2}{12}$	$\frac{1}{6}$			
$\frac{4}{12}$	$\frac{2}{6}$		$\frac{1}{3}$	
$\frac{6}{12}$	$\frac{3}{6}$	$\frac{2}{4}$		$\frac{1}{2}$
$\frac{8}{12}$	$\frac{4}{6}$		$\frac{2}{3}$	
$\frac{10}{12}$	$\frac{5}{6}$			
$\frac{12}{12}$	$\frac{6}{6}$	$\frac{4}{4}$	$\frac{3}{3}$	$\frac{2}{2}$

Format Instructions: A table must begin in cell 1, even when following an identifier. Use top and bottom box lines, and column separation lines. Disregard typeform in the column headings.

PRACTICE 18C

1) Given exponent x , compute the value of y by completing each table.

a)

x	$2^x = y$	y
-1	$2^{-1} = y$?
2	$2^2 = y$?

b)

x	$2^{x+1} = y$	y
3	$2^4 = y$?
5	$2^6 = y$?

More Table Rules Specific to the Nemeth Code

18.7 A Table of Numbers

18.7.1 **Numeric Indicator May Be Omitted.** When row headings and entries in a table consist entirely of numerals, the numeric indicator may be omitted. The numerals can contain commas or decimal points but may not contain any other symbol. This rule applies only to the body of a table and not to the headings.

This technique is used only as a space saving option. The table must be transcribed in Nemeth when the numeric indicator is omitted. (The UEB numeric passage indicator is not used in a Nemeth transcription.) A transcriber's note is not required to explain the omitted numeric indicator.

Example 18-17

×	0.1	0.2	0.3	0.4	0.5	0.6
0.1	0.01	0.02	0.03	0.04	0.05	0.06
0.2	0.02	0.04	0.06	0.08	0.1	0.12
0.3	0.03	0.06	0.09	0.12	0.15	0.18

In order to retain print layout, the numeric indicator is omitted in the body of the table. The column headings and the row headings use a numeric indicator.

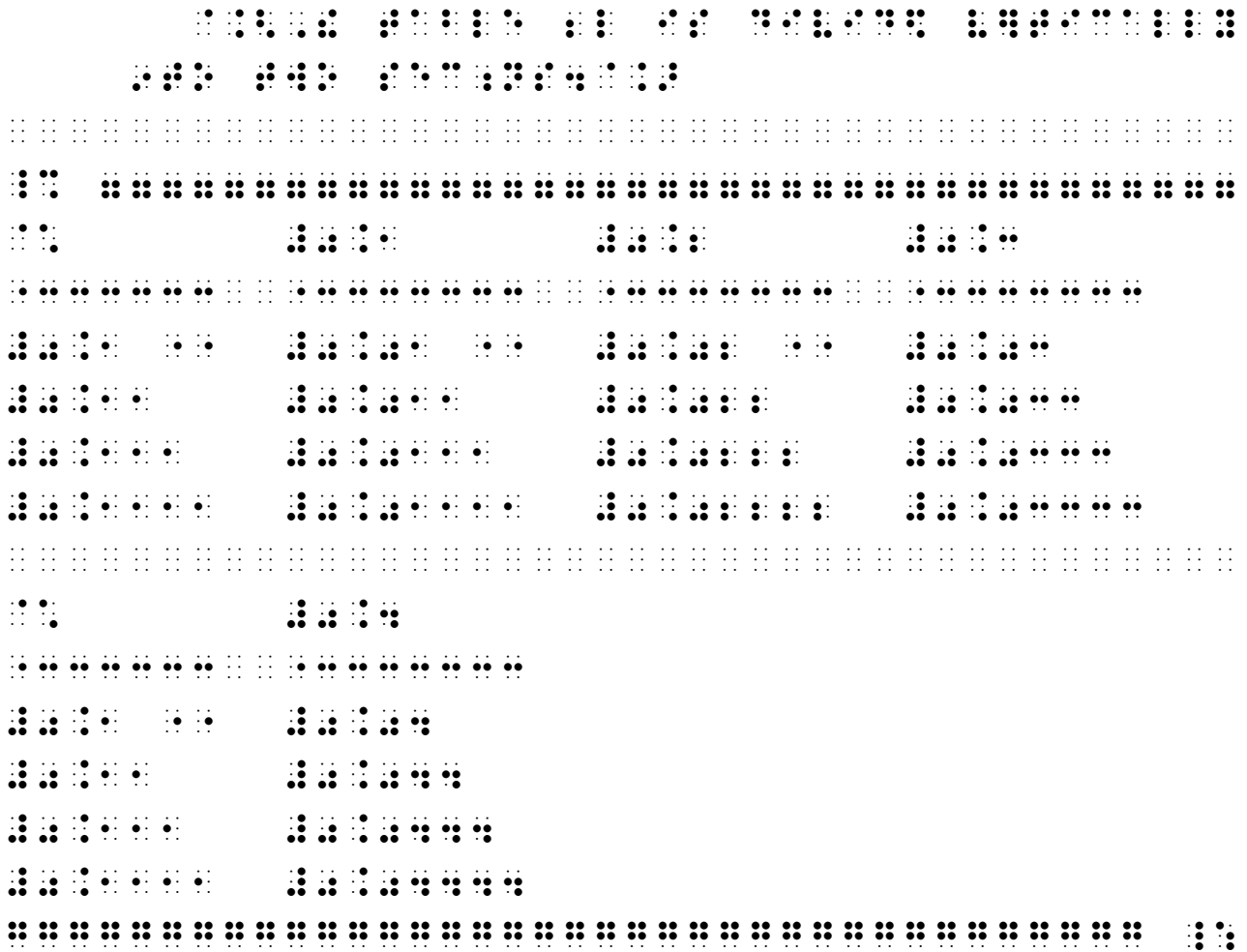
Note: *Braille Formats* guidelines allow for one blank column of cells between columns when the table consists entirely of numbers, as long as the column headings are no wider than the longest entry in the column. If this change allows you to include the numeric indicator, it may be a preferable option.

18.7.2 **Numeric Indicator Required.** This rule does not apply to tables whose entries include any of the following items, all of which are considered to be nonnumeric symbols. In such tables, the numeric indicator must be used throughout the table.

- words
- letters
- mathematical signs such as the dollar sign, percent sign, prime, fraction line, etc.
- a minus symbol
- a general omission symbol
- an ellipsis or a long dash
- guide dots within any column

Example 18-18

×	0.1	0.2	0.3	0.4
0.1	0.01	0.02	0.03	0.04
0.11	0.011	0.022	0.033	0.044
0.111	0.0111	0.0222	0.0333	0.0444
0.1111	0.01111	0.02222	0.03333	0.04444



Although this table will fit as printed if only one blank cell comes between columns and if the numeric indicators are omitted, because guide dots are needed in this table, numeric indicators required throughout. The transcriber's note is required according to Braille Formats guidelines.

Instructions: Do not transcribe tables side by side even though they are printed in this manner. Each table should be preceded and followed by a top and bottom box line, with a blank line between boxes. Treat each table individually regarding code switching. If the body of the table can be transcribed entirely in UEB, do so.

PRACTICE 18D

Age	Height
24	5'3"
26	5'9"
30	6'1"
34	5'10"
35	5'4"

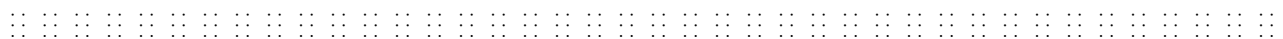
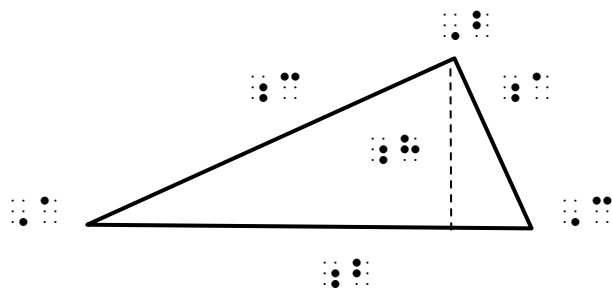
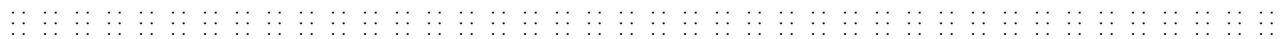
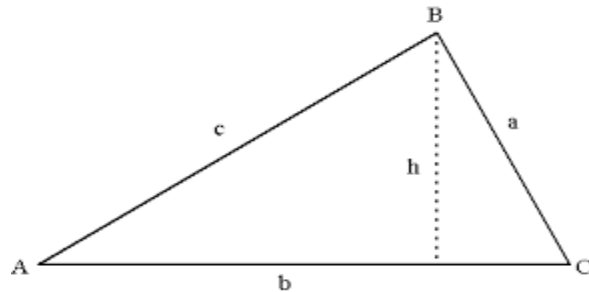
Age	Blood Pressure
24	108
26	104
30	122
34	119
35	128

Age	BMI
24	18.4
26	33.5
30	23.8
34	19.6
35	25.0

- b. **More Than One Letter.** A The rules differ for more than one letter, depending on the code in use with the diagram. In UEB, a grade 1 indicator is required when an uncapitalized combination of letters corresponds to a shortform (e.g., ab, cd). In Nemeth, the

English-letter indicator is not used for any letter combination in regular type. (See Section 3.16 in Lesson 3.)

Example 18-20



These figure labels are transcribed in UEB because they are freestanding, unmodified letters. The leftmost item in a diagram is placed in cell 1, regardless of the surrounding format.

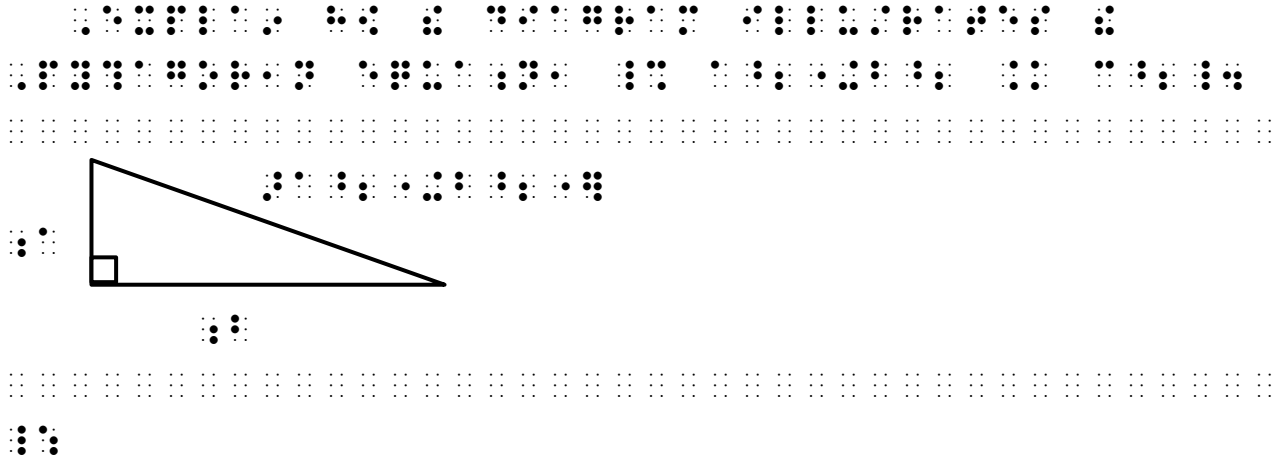
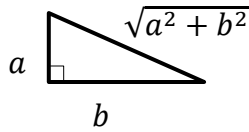
18.9 Switch Indicators and Tactile Graphics

When a tactile graphic contains material that requires Nemeth, and when the preceding text is already in Nemeth, Nemeth continues to be in effect for the graphic. If the preceding text is in UEB and if a switch to Nemeth must be made for the tactile graphic, the opening switch indicator is placed at the end of the preceding text or in cell 1 on the line before the required blank line.

Note that displayed graphics begin in cell 1, as prescribed in *Guidelines and Standards for Tactile Graphics*.

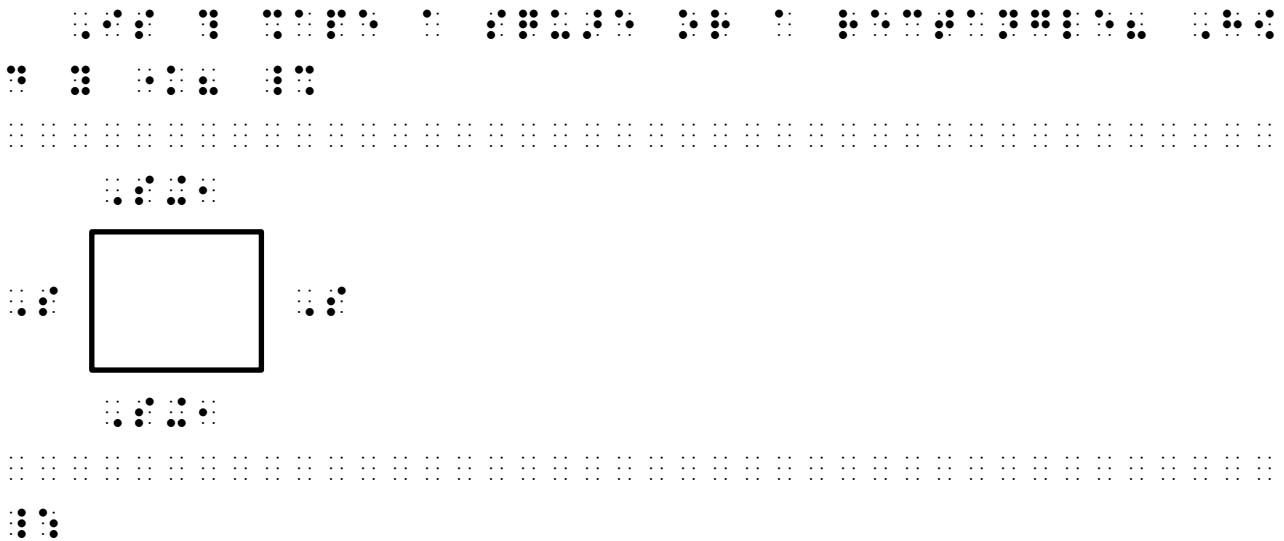
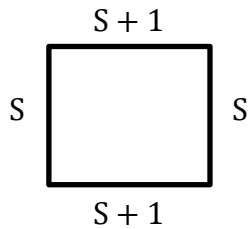
Example 18-21

Explain how the diagram illustrates the Pythagorean equation, $a^2 + b^2 = c^2$.



Example 18-22

Is this shape a square or a rectangle? How do you know?



18.10 Number Lines

There are many details to consider when transcribing a number line. Unit 6 of *Guidelines and Standards for Tactile Graphics* examines a variety of examples. Both UEB and Nemeth examples are shown. Be sure you are looking at the Nemeth example.

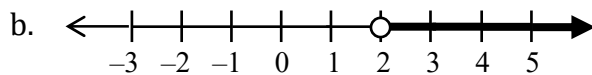
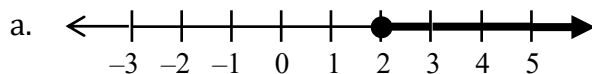
For kindergarten through grade 3, the number line must be produced as a tactile graphic. For grades 4 and up, braille symbols may be used to depict the number line. Symbols you may encounter on a number line can be found in Unit 6 of *Guidelines and Standards for Tactile Graphics*. Be sure to refer to the Nemeth symbols table, as the symbols are different in UEB.

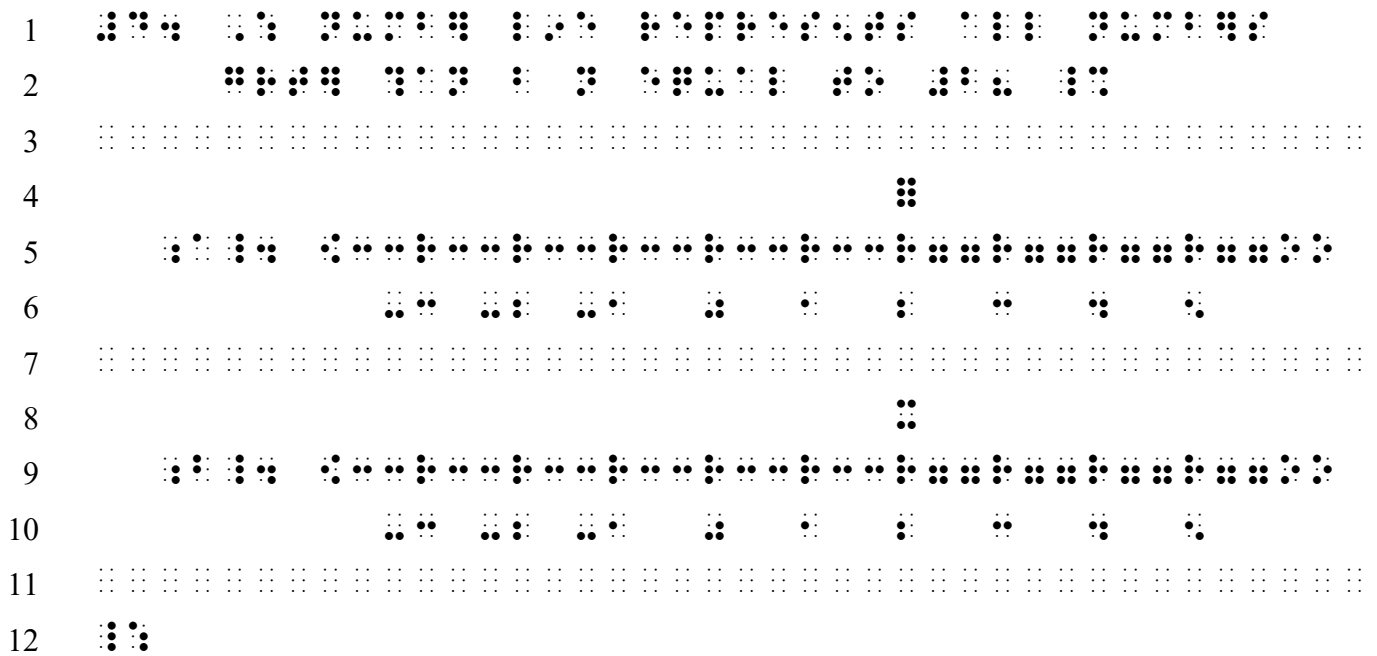
Here are the rules which are applied in the simple number line illustrated in the next example.

- A number line is transcribed in Nemeth. Because it is a spatial construction, it is preceded and followed by a blank line, and the rules for placement of code switch indicators around a spatial arrangement are followed.
- Arrowheads at the end or ends of a number line are included, if shown in print.
- The proportional spacing between units must be preserved.
- *Numeric scale labels*: Scale labels are transcribed below the number line, regardless of their placement in print. The numeric indicator is omitted. The first digit is aligned with the scale mark, whether or not the label is preceded by a plus or minus sign.
- *Plotted points*: A plotted point on a number line is placed above the number line, regardless of its placement in print.
- *Bold line, bold arrowhead*: Bold lines and arrowheads are incorporated into the number line, regardless of their placement in print.

Example 18-24

4. Which number line represents all numbers greater than but not equal to 2?





Lines 5 and 9: The scale marks are embedded in the braille number line.

Lines 5 and 9: The scale marks are equidistant.

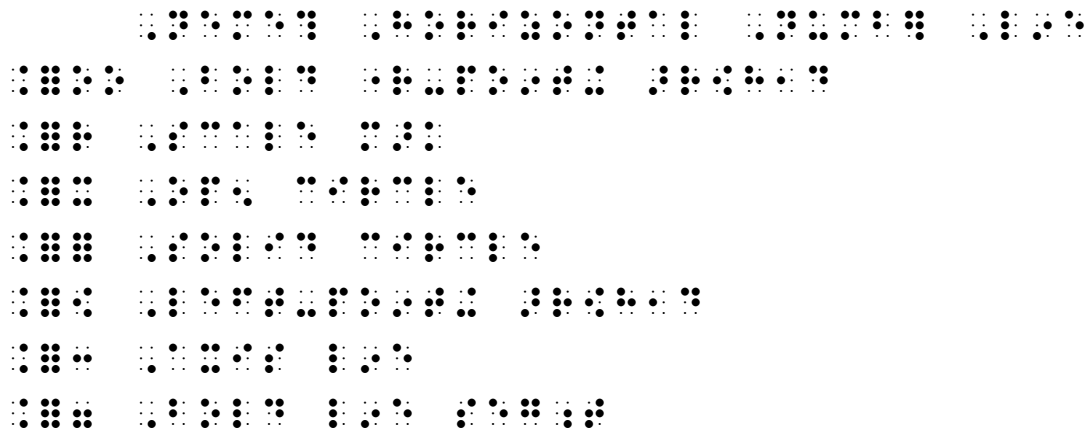
Lines 6 and 10: The digit of each negative number is aligned with its scale mark.

Lines 5 and 9: The bold arrow shaft and its arrowhead are superimposed on the number line.

Lines 4 and 8: The plotted point (open or solid circle) is transcribed on the line above the number line.

- 18.10.1 **Special Symbols Page.** Number line symbols must be listed on the Special Symbols page. After the completion of the UEB symbols list , the number line symbols are listed in braille order under a cell-5 heading, "Nemeth Horizontal Number Line". The next example lists the symbols used in [Example 18-24](#).

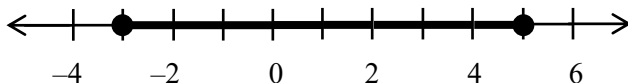
Example 18-25



Instructions: First, transcribe the list of number line symbols as it would appear on a Special Symbols page. Include the symbol for the right-pointing arrowhead, (135). Begin the number line in cell 1.

PRACTICE 18F

Bass drew a number line to represent all real numbers between, and including, -3 and $+5$.



18.11 Diagrams in Exercise Material

If a diagram, number line, or other graphic is placed between instructions and the itemized exercise material which follows, apply the spacing and margin rules for the graphic as outlined in *Guidelines and Standards for Tactile Graphics*. Then continue Nemeth formatting for the exercise material.

18.12 Molecular Diagrams

Transcribing chemical notation requires further study and is beyond the scope of this lesson manual. Refer to *Chemical Notation Using the Nemeth Braille Code* for rules and guidance.

KEYING TECHNIQUE

[NC 26.9]

18.13 Keying

When space does not permit the inclusion of labels, column or row headings, entries, etc., in a figure, in a table, or in an array, one or more of the labels, headings, entries, etc., may be keyed. A keyed item consists of two or three cells made up of letters, numbers, or a combination of letters and numbers. The key items are placed in the same position as the material which they replace. Two items which are identical will have the same key assigned to them.

Keep in mind that keyed items add an extra step for the reader. The technique of keying should not be relied upon as a catch-all technique when other methods may be available. Judicious use of keying can be a good solution after other strategies fail to give a clear presentation.

In addition to the keying guidelines outlined in *Braille Formats* and in *Guidelines and Standards for Tactile Graphics*, the following rules apply in Nemeth.

- 18.13.1 **Alphabetic Key.** An alphabetic key consists of two or three lowercase English letters. At least one cell of a two- or three-letter key must contain a dot 3 or dot 6. The letter combination should be suggestive of the item it represents, if possible. Quoting *Braille Formats*, "Keys work best when they are related to the terms used in the text to help the reader remember what they are. Typically a letter key will be more memorable for the reader."

An alphabetic key cannot be used if any items remaining in the figure, determinant, matrix, or table are made up of two or three lowercase letters. In that case, a numeric key is used.

- 18.13.2 **Numeric Key.** A numeric key consists of one or two digits transcribed in the upper part of the braille cell, preceded by the numeric indicator. There must not be punctuation associated with a key number.

- 18.13.3 **Combination Key.** The combination of letters and numbers must not exceed three cells. One of the symbols must contain a dot 3 or dot 6.

- 18.13.4 **The Key List.** A list of numeric and/or alphabetic keys and their meanings is given in a transcriber's note. Letter keys are generally listed in alphabetic order, but may, if appropriate, be listed in order of appearance (see *Braille Formats*). Number keys are listed in numeric order. In a circle graph, the keyed items are listed in clockwise order, starting at the top (see *Guidelines and Standards for Tactile Graphics* and [Example 18-28](#)).

If the last item in the key listing is in Nemeth, Nemeth must be terminated before closing the transcriber's note.

Example 18-27

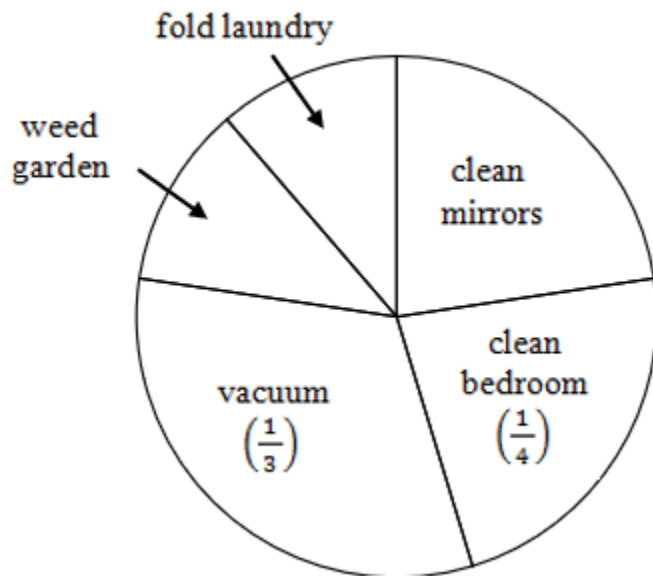
	<u>Town A</u>	<u>Town B</u>	<u>Town C</u>
Highest Temperature	25°C	-1°C	30°C
Lowest Temperature	13°C	-9°C	22°C
Precipitation (rain or snow)	0 cm	5 cm	2.5 cm

Braille representation of the table above. The row headings are keyed. Because there are entries in the table consisting of two lowercase letters ("cm"), a numeric key must be used.

The row headings are keyed. Because there are entries in the table consisting of two lowercase letters ("cm"), a numeric key must be used.

Example 18-28

ADYLYN'S CHORE SPINNER



Adylyn hopes she will spin either "vacuum" or "weed garden" today. What is the probability that she will spin one of these chores?

- What is $P(\text{vacuum})$?
- What is $P(\text{weed garden})$?
- What is $P(\text{vacuum})$ OR $P(\text{weed garden})$?

Page 1

Lines 1-2: Centered heading and blank line following.

Lines 3-4: The transcriber's note "Key to labels:" begins in cell 7. A blank line precedes the key list.

Lines 3-5: An alphabetic key provides the reader with clues regarding each item's meaning. The key is listed in clockwise order as stipulated in Guidelines and Standards for Tactile Graphics.

Line 7: "clean bedroom" cannot use the key letters "cb" because there is no dot 3 or dot 6 in that letter combination. "cbr" is chosen to represent "clean bedroom".

Lines 10-19: The graphic is drawn and the labels are placed outside of the graph as outlined in Guidelines and Standards for Tactile Graphics.

Page 2

Lines 5-8: Bulleted items follow guidelines given in Braille Formats. The probability notation is mathematical. Nemeth switch indicators are used and words are not contracted.

PRACTICE 18G

Substance	Melting Point (°C)	Boiling Point (°C)	Heat of Fusion (kJ/kg)	Heat of Vaporization (kJ/kg)
Aluminum	660	2467	396	10500
Ammonia	-78	-33	332	1370
Lead	328	1740	25	866

EXERCISE 18

Prepare Exercise 18 for your grader.

BLANK PAGE

PRACTICE 18D

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22		

Lines 4-10: The presence of prime signs in the first table dictates Nemeth. The opening Nemeth Code indicator is placed alone on line 4; the Nemeth Code terminator is placed alone on line 10.

Lines 16-20: The numbers in the second table can be transcribed in UEB.

