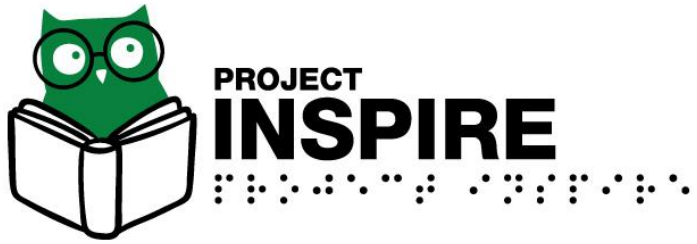
An Introduction to Nemeth Code Symbols Used in Grades 2 to 5 and Strategies for Supporting Elementary Students in Building Math Skills

Lesson 1: Nemeth Code Signs of Operation, Signs of Comparison, and Switch Indicators



University of South Carolina Upstate, Summer 2020

Lesson 1 Objectives

- Participants will be able to read and write Nemeth Code symbols for signs of operation and signs of comparison.
- Participants will be able to read and write linear math problems using the long dash or general omission symbol to represent a missing number, sign of operation, or sign of comparison.
- Participants will be able to properly use Nemeth Code switch indicators.

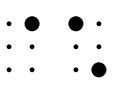
Nemeth Code within UEB Contexts

- As of January 4, 2016 the United States now uses Nemeth Code within UEB Contexts.
- Resources published before 2016 are in Nemeth Code and surrounding text is in EBAE, not UEB.
- The 2018 document *Guidance for Transcription Using the Nemeth Code within UEB Contexts* explains how to prepare braille materials. http://brailleauthority.org/ueb.html#nemeth

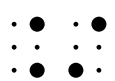
Signs of Operation

 Plus sign (+) (dots 3-4-6)

 Minus sign (−) (dots 3-6)

 Multiplication cross (×) (dot 4, dots 1-6)

 Multiplication dot (·) (dots 1-6)

 Division sign or divided by sign (÷) (dots 4-6, dots 3-4)

Signs of Comparison

⠸⠶ is the equal sign (=) (dots 4-6, dots 1-3)
⠸⠕ is the greater than sign (>) (dots 4-6, dot 2)
⠸⠣ is the less than sign (<) (dot 5, dots 1-3)

65 < 73
⠼⠖⠑ ⠸⠣ ⠼⠛⠉

105 > 25
⠼⠁⠚⠑ ⠸⠕ ⠼⠃⠑

General Omission Symbol

- The general omission symbol is ⠿ (dots 1-2-3-4-5-6).
- The general omission symbol is used when a question mark or blank space in print shows a missing number, sign of operation, or sign of comparison.
- Space the general omission symbol the same way you space what it replaces.

88 ÷ ? = 11

⠼⠓⠓⠲⠿⠶⠼⠁⠁

Long Dash

- The long dash is ⠸⠸⠸⠸ (dots 3-6 written four times).
- Generally place a space before and after a long dash unless there is a mark of punctuation next to it.

7 · ___ = 56

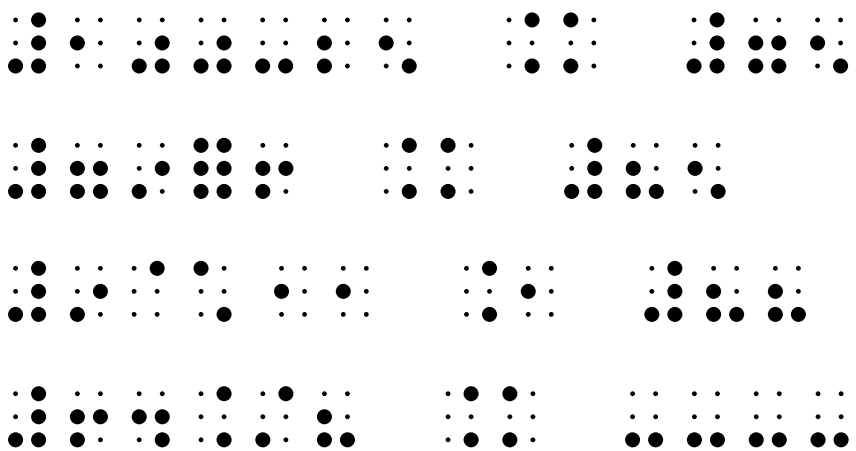
⠼⠶⠐ ⠸⠸⠸⠸ ⠐⠶⠐ ⠼⠑⠶

___ −12 < 35

⠸⠸⠸⠸ ⠼⠂⠶ ⠐⠶⠐ ⠼⠒⠢⠼⠉⠑

Rules for Linear Problems with Signs of Operation and Signs of Comparison

- The problem begins with a numeric indicator.
- There is no space on either side of the sign of operation.
- There is a space on either side of the sign of comparison.



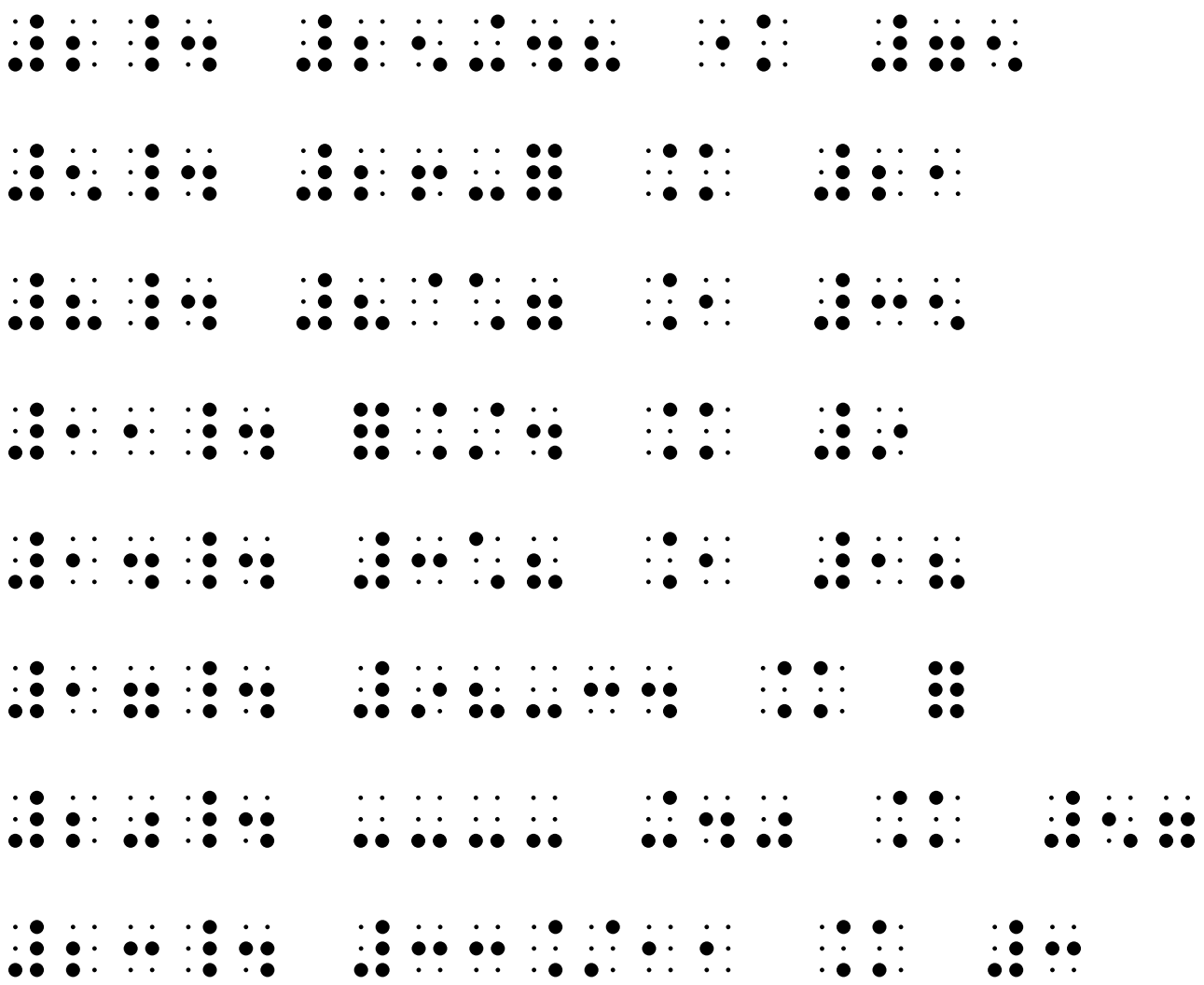
100 − 25 = 75

79 ? 6 = 85

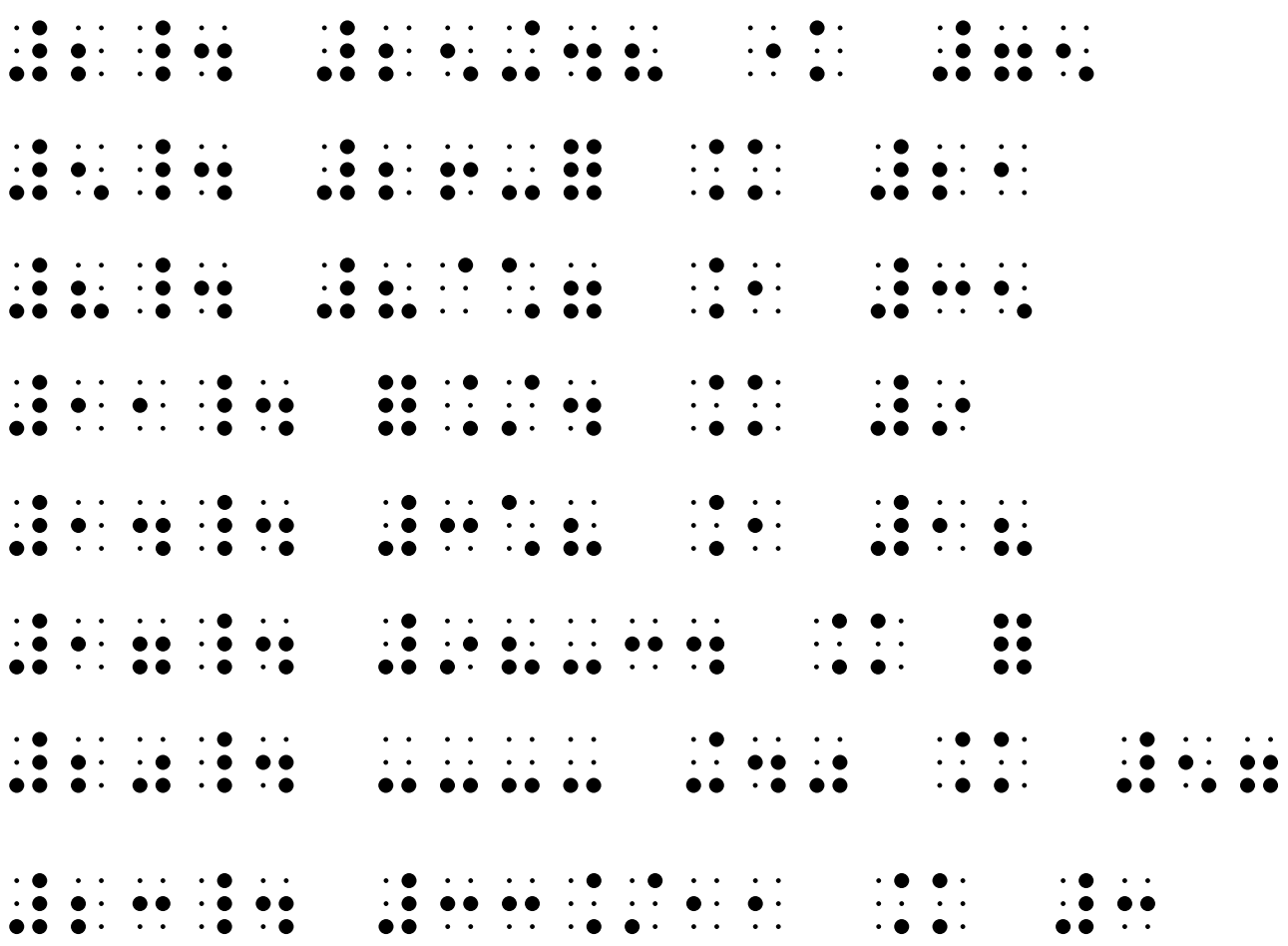
9 × 11 > 88

64 ÷ 8 = _____

Activity 1A: Interline the Linear Problems



Activity 1A: Answer Key



2. 25 + 48 < 75

5. 26 − ? = 21

8. 8 × 7 > 35

11. ? ÷ 4 = 9

14. 3 · 8 > 18

17. 98 − 34 = ?

20. _____ + 40 = 57

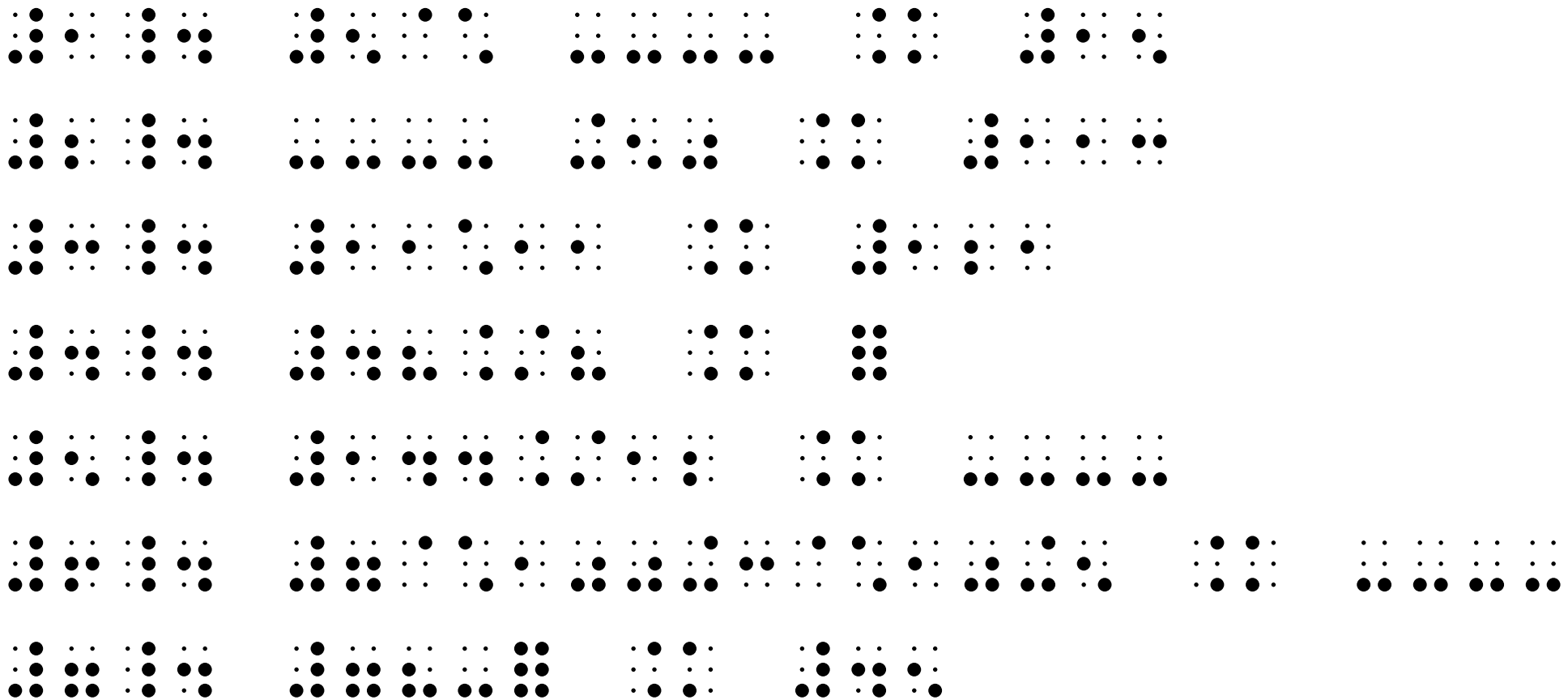
23. 33 ÷ 11 = 3

Activity 1B

Braille the following problems:

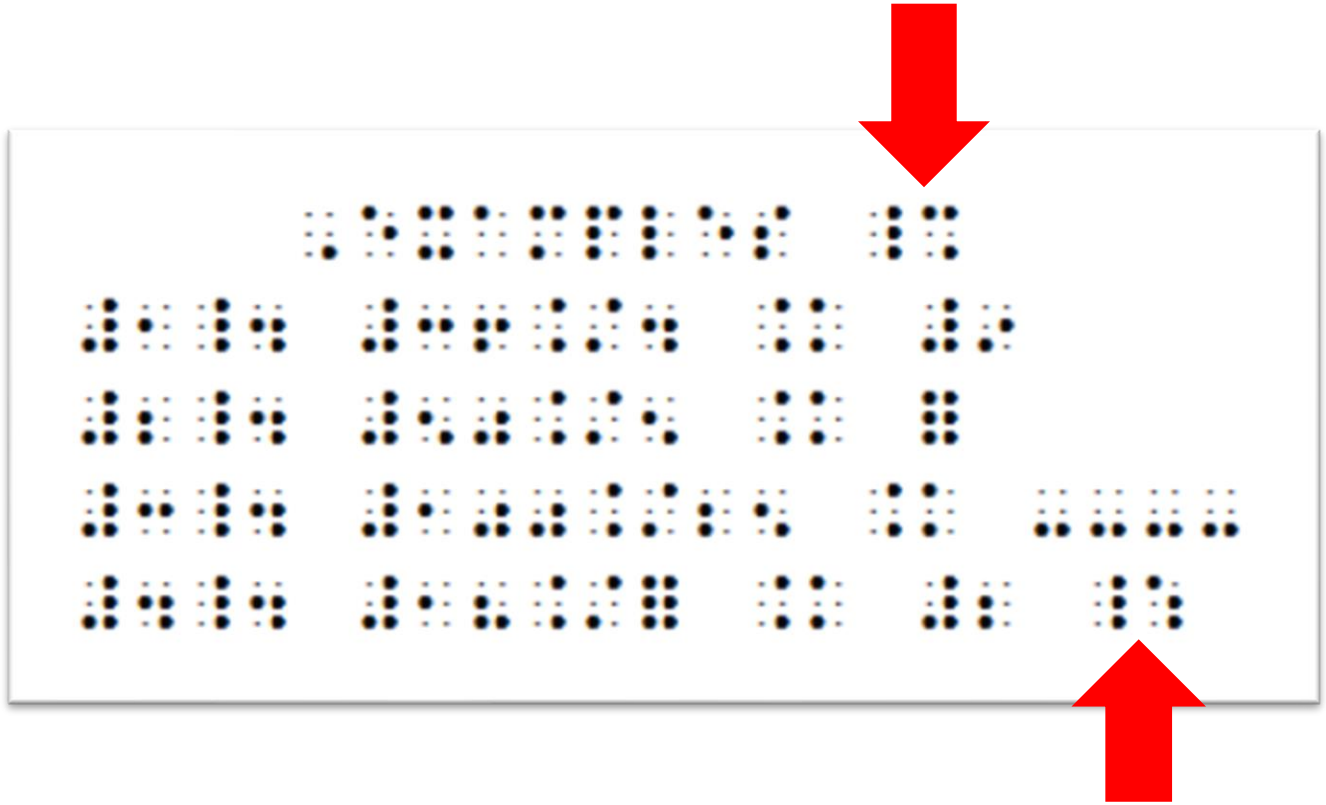
1. $5 \times \_\_\_ = 15$
2. $\_\_\_\_ + 50 = 113$
3. $11 \cdot 11 = 121$
4. $48 \div 8 =$
5. $144 \div 12 = \_\_\_\_$
6. $7 \times 100 + 3 \times 10 + 5 = \_\_\_\_$
7. $78 - ? = 45$

Activity 1B: Answer Key



Nemeth Code Switch Indicators

- The opening Nemeth Code indicator ⠸⠸ (dots 4-5-6, dots 1-4-6) opens Nemeth Code.
- The Nemeth Code terminator ⠸⠸ (dots 4-5-6, dots 1-5-6) ends Nemeth Code.



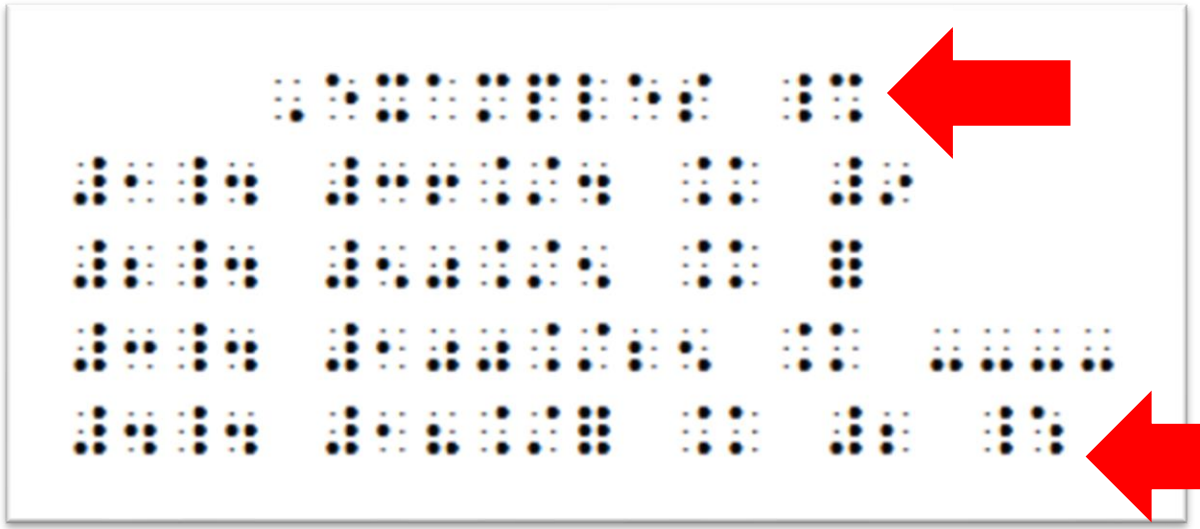
Positioning of Nemeth Code Switch Indicators and Consistency

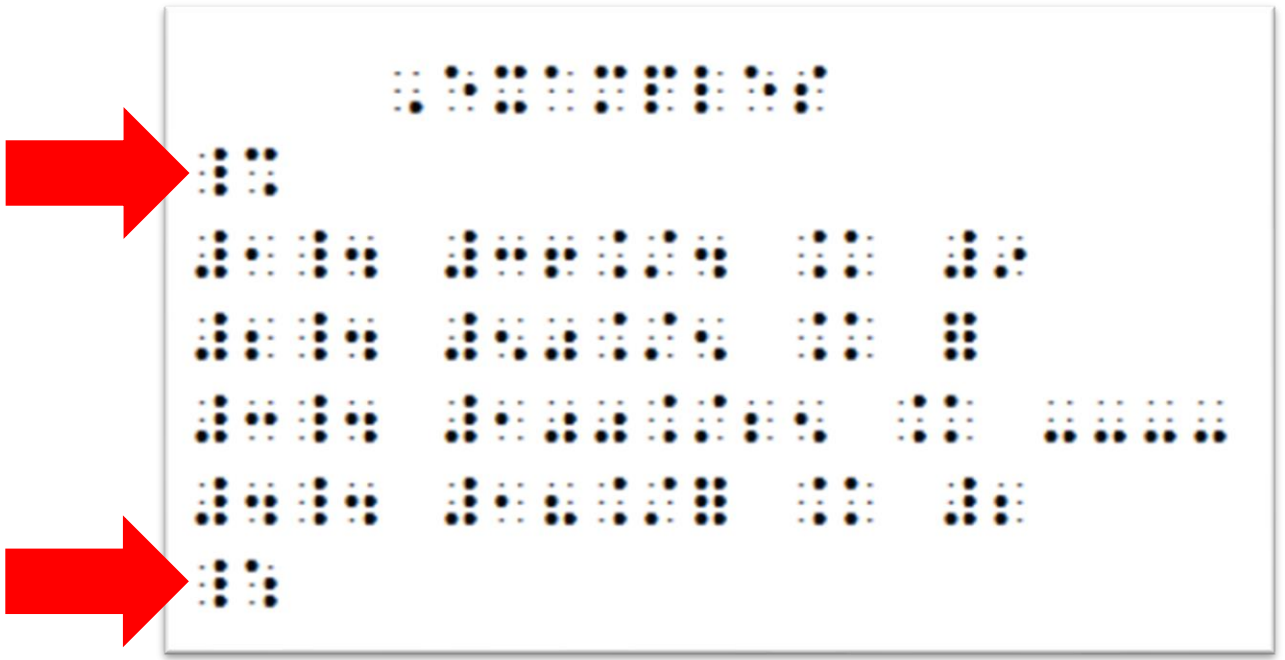
- The opening Nemeth Code indicator can be placed at the end of a line of literary text **or** on its own line.
- The Nemeth code terminator can also be placed after the math it ends **or** on its own line.
- When deciding where to place indicators, consider consistency and clarity for the braille reader.

Placement of Switch Indicators: Two Options

Examples

1. $36 \div 4 = 9$
2. $50 \div 5 =$
3. $100 \div 25 =$ ____
4. $18 \div ? = 2$

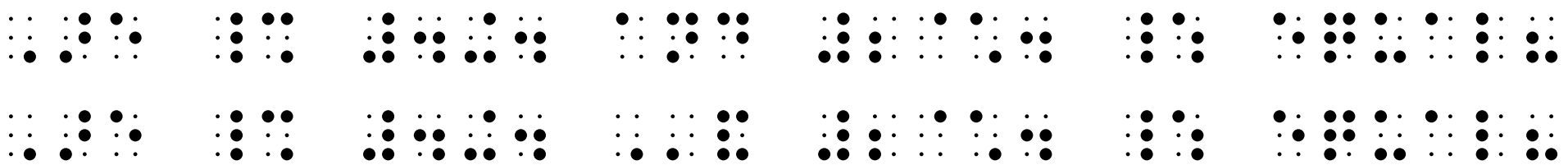




Single Words in Nemeth Code Within UEB Contexts

- There are two different ways to indicate a single word within Nemeth Code.
  - Braille the word with no contractions **OR**
  - Use a single word switch indicator ⠸⠂ (dot 6, dot 3).
- Be consistent in preparing materials.
- Ensure students are familiar with both ways to transcribe single words within Nemeth Code.

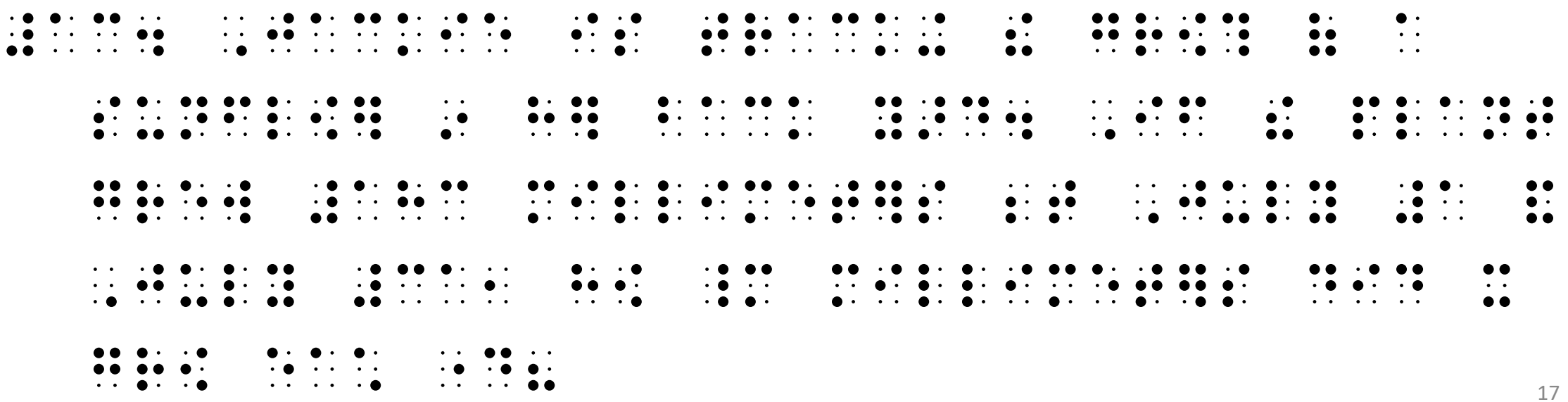
  Are 4 + 4 and 2 × 4 equal?



Non-Use of Nemeth Code Switch Indicators

When there are whole numbers (e.g., 750, 14, 109) in Nemeth Code materials you may use UEB numbers.

13. Jackie is tracking the growth of a sunflower in her back yard. If the plant grew 183 millimeters between July 1 and July 31, how many millimeters did it grow each day?



Activity 1C

Braille the following word problems. Problem number 16 can be brailled two ways, give it a try!

13. How many ounces of water are equal to 3 cups of water?

14. What is the product of 8×9?

15. There are 6 apples and 8 oranges in each box. How many apples are in 10 boxes?

16. Which is greater, $29 - 16$ or $18 - 5$?

Activity 1C: Answer Key

13. How many ounces of water are equal to 3 cups of water?

⠠⠓⠕⠺ ⠍⠁⠝⠽ ⠕⠥⠝⠉⠑⠎ ⠕⠋ ⠺⠁⠞⠑⠗ ⠁⠗⠑ ⠑⠟⠥⠁⠇ ⠞⠕ ⠼⠉ ⠉⠥⠏⠎ ⠕⠋ ⠺⠁⠞⠑⠗⠦

14. What is the product of 8 × 9?

⠠⠓⠕⠺ ⠍⠥⠉⠓ ⠊⠎ ⠁ ⠏⠗⠕⠙⠥⠉⠞ ⠕⠋ ⠼⠓ ⠁⠝⠙ ⠼⠊⠁⠦

15. There are 6 apples and 8 oranges in each box. How many apples are in 10 boxes?

⠠⠓⠕⠺ ⠍⠁⠝⠽ ⠁⠏⠏⠇⠑⠎ ⠁⠗⠑ ⠊⠝ ⠑⠁⠉⠓ ⠃⠕⠭ ⠁⠝⠙ ⠼⠓ ⠕⠗⠁⠝⠛⠑⠎ ⠊⠝ ⠑⠁⠉⠓ ⠃⠕⠭⠦ ⠠⠓⠕⠺ ⠍⠁⠝⠽ ⠁⠏⠏⠇⠑⠎ ⠁⠗⠑ ⠊⠝ ⠼⠁⠚ ⠃⠕⠭⠑⠎⠦

Activity 1C: Answer Key (continued)

16. Which is greater, 29 − 16 or 18 − 5?

⠼⠃⠊ ⠤ ⠼⠁⠋ ⠐⠎ ⠼⠁⠃ ⠤ ⠼⠑

⠼⠃⠊ ⠤ ⠼⠁⠋ ⠐⠎
⠼⠁⠓ ⠤ ⠼⠑ ⠐⠎

The Guidance gives us flexibility to braille this word problem in 2 different ways. Also notice how the math is placed on the same line whenever possible.