

Kindergarten Nemeth Braille Code Curriculum
Module 3: Nemeth Numbers 16-20, Mathematical Comma, and
Punctuation Indicator
Teacher Reference Materials

Prerequisite skills:

- Ability to use rote counting number words in order
- Ability to verbally count objects
- Ability to tactually identify the numbers 0-15
- Ability to tactually identify the general omission symbol
- Ability to write the numbers 0-15
- Ability to tactually count tally marks (1-15)
- Ability to write the general omission symbol and tally marks

Math symbols and concepts, including braille knowledge, addressed:

- Counting to answer "how many"
- Numbers 16-20
- Mathematical comma
- Numbering of math problems from 1-20, including the punctuation indicator and period
- Patterns that incorporate the general omission symbol (introduced, but not assessed)
- Represent numbers 16-20 with concrete materials, including base ten blocks or Digi-Blocks
- "One more" and "one less"

Objectives:

The student will be able to:

- 1) Tactually identify and read the numbers from 16-20
- 2) Tactually identify the mathematical comma in Nemeth code
- 3) Tactually identify the punctuation indicator and period
- 4) Use the Accessible Equation Editor and/or braillewriter to write the numbers 16-20
- 5) Use the Accessible Equation Editor and/or braillewriter to write the mathematical comma
- 6) Use the Accessible Equation Editor and/or braillewriter to number math problems from 1-20
- 7) Count to answer "how many" questions about as many as 20 objects arranged in a line or rectangular array

- 8) Represent numbers 16-20 with concrete materials, including base ten blocks or Digi-Blocks
- 9) Identify a number that is "one more" or "one less" than a given number

Other ECC skills addressed:

Listening skills; concept development; following directions; organization; tactual discrimination; left-to-right tracking; scan and interpret tactile graphics used in math; taking turns; hand positioning; light touch (as opposed to scrubbing); recreation and leisure

Teaching tips:

- This module should be completed across multiple sessions.
- If the child is using a refreshable braille display, ensure that the child knows how to move to the next line of braille. Offer assistance as needed.
- Sorting trays often define the work space as well as assist students in determining which flash cards have already been read. If you do not have sorting trays, you can use cafeteria type trays, cookie sheets, small cake pans, and/or small storage boxes.
- Using small storage boxes with labels can make it easier for a child to independently locate stored items such as unit blocks, flash cards, etc.
- It may also help to place the flash cards and hard copy braille on a nonslip surface such as rubber shelf liner so they will not move as the student is reading.
- Base ten blocks and Digi-Blocks are often used in elementary general education classrooms. If you do not have base ten blocks or Digi-Blocks, request to borrow them from a classroom teacher.
- A two-compartment sorting tray may be used as the place value chart. Label the right compartment "ones" and the left compartment "tens" in braille. The sorting tray may assist students in easily keeping their units and rods in the correct columns.
- If you are using hard copy braille, the student may also underline or circle the answer with a grease marker or crayon. Placing a small sticker on top of the answer is another option.
- Using the braillewriter for some of the writing activities is encouraged as it facilitates the development of motor memory.
- It is very important to use the correct finger on each key when learning new Nemeth symbols. This will help the student become accurate in their writing!

Materials/technology needed:

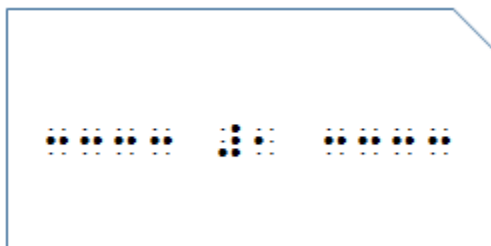
- Accessible Equation Editor and/or braillewriter
- Braille paper
- Index cards and sorting trays
- Base ten blocks (or Digi-Blocks) and a place value chart (available in contracted and uncontracted braille within the curriculum)

Optional materials for follow-up activities or adaptation of activities:

- Bingo cards
- Small stickers
- Pushpins on a cork board
- Magnets on a cookie sheet
- Timer
- Small storage boxes

Explanation of activities embedded into module:

- 1) Create flash cards for the numbers 0-20 with the index cards. Cut out the upper right corner for easy identification of orientation. Make five flash cards for each number. Use lines of dots 2-5 for leading in and away from the number. See below for an example. If you have number cards from Kindergarten Module 2, they can be used instead of creating new flash cards for 0-15.



The flash cards will be used to practice reading numbers at first. Give the student one number card at a time. Make sure that it is oriented with the cut out corner at the upper right.

- 2) In two activities embedded in the Module, the student will learn how to build numbers using either base ten blocks or Digi-Blocks. These blocks will provide a spatial model of our base ten number system.

Place the units and rods in different containers, baskets or bowls. If preferred, Digi-Blocks (a different type of base ten blocks that nest) can be used. If needed, allow the student to independently explore

with the base ten blocks. It may also be helpful to re-introduce the student to the words "unit" and "rod".

The student should be re-introduced to the place value chart. It will provide a means for the student to organize his/her work as he/she explores the relationships among the blocks and determines how groups of blocks can be used to represent numbers. Encourage your student to use his/her hands to explore the place value chart. Afterwards, ask the student to find the title and read it together. Then point out that there is a line going down the middle of the page. Have the student find the column headings at the top, and then help him/her read the headings. The column on the right is the ones, and the column on the left is the tens.

A two-compartment sorting tray may also be used as the place value chart. Label the right compartment "ones" and the left compartment "tens" in braille. The sorting tray may assist students in easily keeping their unit blocks and rods in the correct columns. If you do not have a two-compartment sorting tray, use two small storage boxes.

Then work with the student to build numbers, beginning with 16. Depending on the child's response, the following questions may be needed. Can you represent the number using units? If so, how many units do you need? If not, why not? As the student counts the unit blocks, assist him/her if needed in placing them in the ones column on the place value chart or "ones" compartment. Can you represent a number using a rod and units? If so, how many of each kind do you need? If not, why not?

If needed, model placing the rods in the tens column and the unit blocks in the ones column using hand-under-hand technique.

- 3) In some of the activities, your student will listen carefully and then write the numbers and/or braille symbols that he/she hears. These activities can be completed using the Accessible Equation Editor and/or a braillewriter and braille paper.

Begin each time by asking the student to listen carefully as you read numbers and symbols. Afterwards he/she will write the number(s) and symbol(s) in braille. Remind the student to space one time between the numbers and check his/her work. An answer key has been

provided for these activities in the document entitled "B3 Module 3_Answer Key for Writing Activities_K".

If your student is using a refreshable braille display for this activity, explain about the additional keys on the far right and far left. If your student is using a QWERTY keyboard with the Accessible Equation Editor, it may be helpful to use tactile dots on the keys used for dot 1 and dot 4.

- 4) The student will identify and write the missing number that the general omission symbol is representing in one activity. If needed, provide the student with a hard copy of numbers or number flash cards in order to help him/her identify which number is missing. It may help to place the flash cards on a nonslip surface such as rubber shelf liner so they will not move as the student is reading the cards. You may also use a strip of sticky back Velcro on the back side of each flash card and then arrange the flash cards on a long strip of Velcro on the student's desk.

The student will write the missing number either using the Accessible Equation Editor and/or his/her braillewriter and braille paper. Space one time between the numbers.

- 5) In one of the activities, the student will count the number of tally marks on several lines of braille. He/she will write the number of tally marks on each line using the Accessible Equation Editor and/or a braillewriter. Remind the student to space one time between the numbers and check his/her work. An answer key has been provided for these activities in the document entitled "B3 Module 3_Answer Key for Writing Activities_K".
- 6) In some of the activities, your student will listen carefully and then write a math problem about "one more" or "one less" that he/she hears. These activities can be completed using the Accessible Equation Editor and/or a braillewriter and braille paper.

Before beginning the activity, review or teach the meaning of the phrases "One More" and "One Less". Remind the student to listen carefully as you read each problem and to include a space after the period when numbering each problem. Also remind the student to press his/her line spacing key twice to move to the next line before brailleing a new problem each time.

Repeat saying each problem as many times as needed. Also remind the student to move his/her fingers across the braille and check his/her work if needed. An answer key in braille is provided in the document entitled "B3 Module 3_Answer Key for Writing Activities_K".

- 7) The follow-up activity is an adaptation of Bingo. You will need 2 or more players for this game. It can easily be played by students (or you if no other students are present) who read print or braille. If some of the players read print, add print to each of the flash cards and Bingo cards. Materials for the game include: Bingo cards, notecards cut into halves, a two-compartment sorting tray, and markers.

Small stickers or pieces of Wikki sticks can be used for markers. If you use Wikki stick pieces, roll them into a ball with your hand so that they will stick to the braille paper more easily. Another option is using pushpins on a cork board or magnets on a cookie sheet.

The Bingo cards can be created by using the template. Notice that the middle square on the template has been labeled as the free space. Use a braillewriter or freeware/ software program such as Perky Duck or Duxbury to write the following numbers and symbols randomly in the squares on the Bingo cards: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, general omission symbol, numeric indicator, and 3 tally marks. You can use the Feel 'n Peel Stickers: Nemeth Braille-Print Numbers from the American Printing House for the Blind to create the Bingo cards.

Another option is creating your own Bingo cards. One way to create your own card is with 1-inch graph paper from the American Printing House for the Blind to create the Bingo cards. There are many other creative ways to make your own personalized cards.

Before beginning the activity, have the student make the Bingo number/symbol cards by using index cards and his/her braillewriter to create a set of number cards from 0-20. Then have the student make cards for the general omission symbol and numeric indicator. Afterwards, have the student make a card with 3 tally marks. If preferred, number cards for 0-20 from the Module can be used instead of creating new flash cards. If you do not have a two-compartment sorting tray, use two small storage boxes.

Have the student use his/her hands to explore the Bingo card. Explain that each column is labeled at the top. The column on the far left is

labeled B, the second column is labeled I, the middle column is labeled N, the fourth column is labeled G, and the fifth column is labeled O. Each column is made up of five squares below the title. There will be a number or symbol in each square. The letter indicator is not used on the column labels as we considered the Bingo card a tactile graphic. If needed, explain how a person wins Bingo by having five in a row down, across, or diagonally.

Then explain that center square is a "free space" in the middle of the Bingo card. Have the student place a marker on it. If you repeated some of the numbers on the Bingo cards, explain that the student will need to scan the entire card in case the number has been included more than once in the squares.

Then shuffle the flash cards. Have the students take turns drawing one flash card and reading the number or symbol on the card. As each student reads the number/symbol card, use a two-compartment sorting tray to separate which cards have been read and which cards have not been read.

Then as each number or symbol is read, have the student quickly scan his/her Bingo card and place a marker on the number or symbol that was called. Explain that you will play until a winner calls out "Bingo" or "Braille-o".

Materials Commercially Available:

Materials that could be used from the American Printing House for the Blind (www.aph.org) include

- Hundreds boards and Manipulatives Kit (1-03105-00)
- FOCUS in Mathematics Kit, Second Edition that includes base ten blocks (with print Teacher's Guide 1-08280-01, with braille Teacher's Guide 1-08281-01)
- Small Work-Play Tray with Dividers (1-03751-00, 1-03770-00) *also available within the FOCUS in Mathematics Kit*
- Textured sorting Circles and Shapes (1-08834-00)
- MathBuilders Unit 1: Matching, Sorting, and Patterning (with print Teacher's Guide 7-03560-00, with braille Teacher's Guide 5-03560-00)
- *Picture Maker Wheatley Tactile Diagramming Kit (1-08838-00) *Many of these objects and a blue felt board are also available in the MathBuilders Unit 1 and the FOCUS in Mathematics Kits mentioned above.*
- *Feel 'n Peel Stickers: Nemeth Braille-Print Numbers 0-100

(1-08876-00)

- *Feel 'n Peel Point Symbols or Stars (1-08846-00; 1-08868-00; 1-08867-00)
- *FOCUS in Mathematics: Base Ten Blocks: Units (61-115-278)
- *FOCUS in Mathematics: Base Ten Blocks: Rods (61-115-274)

** WARNING: CHOKING HAZARD -- Small Parts. Not intended for children ages 5 and under without adult supervision.*

Fun Facts from:

2012 book entitled *Get Started in Cycling* by Edward Pickering

Official Tour de France website

<http://www.letour.fr/us/>

For the Love of Bikes

<http://www.icebike.org/>

U.S. Blind Tandem Cycling Connection

<http://bicyclingblind.org/>