

Kindergarten Nemeth Braille Code Curriculum
Module 6: Subtraction, Geometry, and an Introduction to the Ellipsis
Teacher Reference Materials

Prerequisite skills:

- Ability to use rote counting number words in order to 100
- Ability to tactually identify the numbers 1-100
- Ability to tactually identify the general omission symbol, mathematical comma, plus sign, and equals sign
- Ability to write the numbers 1-20
- Ability to write the general omission symbol, mathematical comma, plus sign, and equals sign
- Ability to read and write the numbering of math problems from 1-20, including the punctuation indicator and period
- Ability to represent addition within 5 and 10
- Ability to solve addition word problems and add within 5 and 10

Math symbols and concepts, including braille knowledge, addressed:

- Subtract within 5 (and then 10)
- Minus sign
- Nemeth Braille Code equations in a horizontal format
- Ellipsis
- Missing numbers in a pattern of numbers represented by the ellipsis
- Shapes

Objectives:

The student will be able to:

- 1) Represent subtraction to 5 (and then 10) with objects, acting out situations, Five Frame, Ten Frame, and verbal explanations
- 2) Tactually identify the minus sign in Nemeth code
- 3) Tactually identify the ellipsis in Nemeth code
- 4) Tactually read Nemeth Braille Code equations in a horizontal format
- 5) Fluently subtract within 5, including with Nemeth Braille Code equations in a horizontal format
- 6) Use the Accessible Equation Editor and/or braillewriter to write the minus sign
- 7) Use the Accessible Equation Editor and/or braillewriter to write the ellipsis
- 8) Use the Accessible Equation Editor and/or braillewriter to write Nemeth Braille Code equations in a horizontal format

- 9) Use the Accessible Equation Editor and/or brailewriter to write the first three missing numbers in a list of missing numbers ranging from 0-20 represented by an ellipsis
- 10) Use a braille hundreds chart to verbally identify the first three missing numbers in a pattern of numbers ranging from 0-100 represented by an ellipsis
- 11) Tactually identify circle, triangle, rectangle, and square regardless of size and orientation
- 12) Verbally describe circle, triangle, rectangle, and square

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; 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.
- If a student reads the Nemeth symbols or equation incorrectly, tell the student the correct way to read the symbol or equation.
- Sorting trays often define the work space. 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 number cards, etc.
- It may also help to place 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.
- 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.
- Encourage the student to verbalize the process they use when solving problems and identifying shapes tactually.
- When teaching the child how to tactually discriminate 2-dimensional shapes, be sure to use a variety of sizes for the shapes. The child will also need to explore shapes in different orientations.
- Using the brailewriter for some of the writing activities is encouraged as it facilitates the development of motor memory.

- If needed, remind the student to move his/her fingers across the braille and check his/her work during writing activities.
- 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
- Work and/or sorting trays
- Counting bears and/or pennies
- Variety of small objects, tactile stickers, and paper with different textures
- Glue stick
- Five Frame and Ten Frame (available in contracted and uncontracted braille within the curriculum)
- Grid board (either the Grid Board from the APH Hundreds Board and Manipulatives Kit or one that you create)
- Number cards from 1-100 that fit onto the grid board (either the Numbers Set from the APH Hundreds Board and Manipulatives Kit or a set of number cards that you create)

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

- Assorted objects, Unifix blocks, or base ten unit blocks
- Magnetic counters on a cookie sheet or magnetic board
- Rubber shelf liner
- Construction paper and graphic art tape (or other materials needed to create a grid board)
- Number board (either the Number Board from the APH Hundreds Board and Manipulatives Kit or one that you create)
- Small stickers
- Timer
- Small storage boxes

Explanation of activities embedded into module:

- 1) Create a subtraction story within 5. The student will need a braillewriter, braille paper, a variety of small objects, and a glue stick. You may also use sticky-back strips of Velcro and sticky-back circles of Velcro to attach the items to the braille paper. If preferred, you can glue the braille paper to cardboard or poster board.

Begin by telling the student that you will be working together to create a subtraction story. Ask the student to select a topic to write about. Offer suggestions as needed. Then collect objects to illustrate the story that can be easily counted like one smooth button, two birthday candles, or three keys. Afterwards, work with the student to create a subtraction story that incorporates the objects. Encourage the child to braille as much of the story as possible. The last step will be to attach the objects to the braille paper.

It may help to place the braille paper on a nonslip surface such as rubber shelf liner so it will not move as the student is attaching the items and reading the story. It may also help to use bowls or a sorting tray to keep the assortment of small objects organized. If you are using Velcro, you may want to glue an envelope or Ziploc bag to the back of the braille paper to hold the items inside.

Velcro is recommended so that the student can take the objects on and off of the braille paper when acting out the situation. If preferred, you can use hot glue instead of Velcro to attach the objects.

- 2) In some of the activities, the student will listen carefully and then write the numbers, braille symbols, or equations 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, braille symbols, or equations. Afterwards he/she will write the numbers, symbols, or equations in braille. Remind the student to check his/her work. An answer key has been provided for these activities in the document entitled "B3 Module 6_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.

- 3) Create flash cards with the following equations using the index cards:
1-1 = ?
5-2 = ?

2-0 = ?
4-1 = ?
3-2 = ?
1-0 = ?
5-3 = ?
4-0 = ?
5-1 = ?
4-2 = ?
0-0 = ?
3-3 = ?
2-1 = ?
5-4 = ?
4-3 = ?

Cut out the upper right corner of each flash card for easy identification of orientation. Begin by shuffling the flash cards, and then have the student select a card. As the child reads each equation, have him/her use a sorting tray to separate which cards he/she has read and which cards he/she has not read.

Afterwards, have him/her tell you what number the general omission symbol stands for. If needed, the student can use manipulatives in order to determine what number the general omission symbol stands for. Once he/she can read all of the equations correctly, have him/her go back and time how quickly he/she can read the equations!

- 4) The child will go on a shape hunt in one of the activities. Ensure that there are objects in the shapes of a circle, triangle, rectangle, and square in the room where you will be completing the shape hunt. Then give the student the following directions:

First, find 3 objects that are in the shape of a circle. Second, find 3 objects that are in the shape of a rectangle. Third, find 3 objects that are in the shape of a triangle. Fourth, find 3 objects that are in the shape of a square.

This activity can easily be completed with the student and one of his/her friends (or you, if no other students are present).

- 5) In one of the activities, the student will locate the ellipsis in each line of braille and then write the first three missing numbers in the list of

missing numbers. The student will need the Accessible Equation Editor and/or his/her braillewriter and braille paper for this activity. Remind the student to number his/her responses and use a mathematical comma between the numbers.

- 6) In a related activity, the student will locate the ellipsis in each line of braille and then use his/her braille hundreds chart to figure out the first three missing numbers in the pattern of numbers represented by the ellipsis. Since the numbers range from 1-100, the student will answer these problems verbally.
- 7) Create flash cards with the following equations using the index cards:
 $0-0 = ?$
 $2+2 = ?$
 $4-2 = ?$
 $1+3 = ?$
 $4+1 = ?$
 $3-2 = ?$
 $4-1 = ?$
 $3-2 = ?$
 $5-1 = ?$
 $2-2 = ?$
 $5-3 = ?$
 $4-0 = ?$
 $1+0 = ?$
 $3-1 = ?$
 $2+3 = ?$
 $0+3 = ?$
 $5-4 = ?$

Cut out the upper right corner of each flash card for easy identification of orientation. If you have the flash cards containing addition problems from Module 5 and the flash cards containing subtraction problems from earlier in Module 6, they can be used instead of creating new flash cards.

Begin by shuffling the flash cards, and then have the student select a card. As the child reads each equation, have him/her use a sorting tray to separate which cards he/she has read and which cards he/she has not read.

Afterwards, have him/her tell you what number the general omission symbol stands for. If needed, the student can use manipulatives in order to determine what number the general omission symbol stands for. Once he/she can read all of the equations correctly, have him/her go back and time how quickly he/she can read the equations!

- 8) Materials for the follow-up activity include the Accessible Equation Editor and/or a braillewriter and braille paper in addition to the maze included within this module in both uncontracted and contracted braille.

Begin by having the student tell you what he/she knows about a maze. As needed, explain that a maze is a series of paths or tunnels. Then explain that the student will be completing a simple maze puzzle with subtraction and addition problems.

Then give the student an embossed copy of the maze and ask him/her to use his/her hands to explore the maze. It may help to place the maze on a nonslip surface such as a rubber shelf liner.

Then ask the student what he/she noticed about the maze? Student responses may include that the maze includes subtraction and addition problems in boxes. The student may also note that the box on the top left side has the word "start" in it, and the box on the bottom to the right has the word "finish" in it.

If not mentioned, ask the student if he/she noticed that the maze does not have a title? Let them know that not all charts and games will have a title.

Now tell the student to trace the path of the maze with his/her hands. Have the student begin with the box that has the word "start" in it.

Afterwards, the student will be ready to work his/her way through the addition and subtraction problems to complete the maze. The student will record his/her answers using either the Accessible Equation Editor and/or his/her braillewriter and braille paper. Have the student space one time between his/her answers.

If it would be helpful, let the student know that he/she can place a small piece of a Wikki stick in the box that he/she is working on to keep his/her place more easily! When the student moves to the next

subtraction problem, he/she can move the piece of Wikki stick to the next box.

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)
- Consumable Hundreds Chart (5-82710-00)
- 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*
- MathBuilders, Unit 6: Geometry Kit (5-03563-00; 7-03563-00)
- Shape Board (1-03710-01)
- Textured Sorting Circles and Shapes (1-08834-00)
- *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)

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

Fun Facts from:

Disabled-World

<https://www.disabled-world.com/artman/publish/wheelchair-famous.shtml>

History of the Wheelchair by Encyclopedia Britannica

<https://www.britannica.com/topic/history-of-the-wheelchair-1971423>

International Society of Wheelchair Professionals

http://www.wheelchairnet.org/WCN_WCU/Research/StakeholderDocs/PDFs/materials.pdf

KidsHealth

Sponsored by The Nemours Foundation's Center for Children's Health

<http://kidshealth.org/en/kids/wheelchairs.html?WT.ac=ctg>

Scoping Review of Mobility Scooter-Related Research Studies from the *Journal of Rehabilitation Research & Development* (available at <http://www.rehab.research.va.gov/jour/2016/535/JRRD-2015-05-0084.html>)

Wheelchair Facts, Numbers and Figures [Infographic]
<https://kdsmartchair.com/blogs/news/18706123-wheelchair-facts-numbers-and-figures-infographic>