

Kindergarten Module 6

Subtraction, Geometry, and an Introduction to the Ellipsis

Teacher Guide

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

Symbols and Concepts

- Subtract within 5 (and then 10)
- Minus sign
- 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:

- Represent subtraction to 5 (and then 10) with objects, acting out situations, five frame, ten frame, and verbal explanations
- Tactually identify the minus sign
- Tactually identify the ellipsis
- Tactually read equations in a horizontal format
- Tactually read numbered problems
- Fluently subtract within 5, including with equations in a horizontal format
- Use the braillewriter to write the minus sign

- Use the braillewriter to write the ellipsis
- Use the braillewriter to write equations in a horizontal format
- Number problems correctly
- Use the braillewriter to write the first three missing numbers in a list of missing numbers ranging from 0-20 represented by an ellipsis
- 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
- Tactually identify a circle, triangle, rectangle, and square regardless of size and orientation
- Verbally describe a circle, triangle, rectangle, and square

Other ECC Skills Addressed

Note: ECC stands for Expanded Core Curriculum.

- 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

Required Materials

- Braillewriter
- Braille paper
- Counting bears and/or pennies in a bowl
- Braille documents available within the curriculum
 - Student braille document
 - Five frame
 - Ten frame
 - Maze
- Work and/or sorting trays
- Timer
- Index cards
- Variety of small objects, tactile stickers, and paper with different textures

- Two-dimensional circles, triangles, rectangles, and squares (either shapes from an American Printing House for the Blind [APH] kit or ones that you create)
- Glue stick
- 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

- APH Tactile Five and Ten Frames
- APH Tactile Tokens
- Assorted objects, Unifix cubes, or base ten unit blocks in a bowl or container
- Magnetic counters on a cookie sheet or magnetic board
- Nonslip surface such as rubber shelf liner
- Writing answers braille document
- Grease marker or crayon to circle or underline answers
- 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)
- APH Consumable Hundreds Chart
- Small storage boxes

Teaching Tips

- Before opening any BRF files in Duxbury,
 - Go into the Global menu.
 - Select "**Formatted Braille Importer.**"
 - Select the box for "**Read formatted braille without interpretation**" at the top of the window. This will ensure that nothing is changed when opening the BRF files.
- All braille files in the curriculum are formatted with a 32-cell width by default.
- 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 workspace. 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 flashcards 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 can also do the following:
 - Stomp a foot
 - Underline or circle the number with a grease marker or crayon
 - Place a small sticker on top of the number
- 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 braillewriter for some of the writing activities is encouraged as it facilitates the development of motor memory.
- If needed, remind the student to move their fingers across the braille and check their 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.
- We maintain a list of [commercially available materials](#) that can be used to supplement instruction.

Activities

Activity 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.

Activity 2

- The student will listen carefully and then write the braille symbols and numbers that they hear. This activity can be completed using the brailewriter and braille paper.
- Remind the student to check their work. An answer key has been provided for this activity in the braille document entitled "GK-M6-Writing-Answers.brf".
- If your student is using a refreshable braille display for this activity, explain about the additional keys on the far right and far left.

Activity 3

Activity 3 is similar to Activity 2, but with a focus on numbering problems and writing a series of numbers with a mathematical comma.

Activity 4

- Create flashcards with the following equations using the index cards: 1 minus 1 equals what number, 5 minus 2 equals what number, 2 minus 0 equals what number, 4 minus 1 equals what number, 3 minus 2 equals what number, 1 minus 0 equals what number, 5 minus 3 equals what number, 4 minus 0 equals what number, 5 minus 1 equals what number, 4 minus 2 equals what number, 0 minus 0 equals what number, 3 minus 3 equals what number, 2 minus 1 equals what number, 5 minus 4 equals what number, and 4 minus 3 equals what number.

$1-1 = ?$

$5-2 = ?$

$2-0 = ?$

$4-1 = ?$

$3-2 = ?$

$1-0 = ?$

$5-3 = ?$

$4-0 = ?$

$5-1 = ?$

$4-2 = ?$

$0-0 = ?$

$3-3 = ?$

$2-1 = ?$

$5-4 = ?$

$4-3 = ?$

- Cut out the upper right corner of each flashcard for easy identification of orientation. Begin by shuffling the flashcards, and then have the student select a card. As the child reads each equation, have them use a sorting tray to separate which cards they have read and which cards they have not read.
- Afterwards, have the student 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 they can read all of the equations correctly, have them go back and time how quickly they can read the equations.

Activity 5

Activity 5 is similar to Activity 2, but with a focus on writing subtraction problems containing a general omission symbol.

Activity 6

- The child will go on a shape hunt in this activity. 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 their friends (or you, if no other students are present).

Activity 7

- 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 a braillewriter and braille paper for this activity.
- Remind the student to number their responses and use a mathematical comma between the numbers.
- Then the student will locate the ellipsis in each line of braille and use their 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.

Activity 8

All information is provided in the teacher script.

Activity 9

- Create flashcards with the following equations using the index cards: 0 minus 0 equals what number, 2 plus 2 equals what number, 4 minus 2 equals what number, 1 plus 3 equals what number, 4 plus 1 equals what number, 3 minus 2 equals what number, 4 minus 1 equals what number, 3 minus 2 equals what number, 5 minus 1 equals what number, 2 minus 2 equals what number, 5 minus 3 equals what number, 4 minus 0 equals what number, 1 plus 0 equals what number, 3 minus 1 equals what number, 2 plus 3 equals what number, 0 plus 3 equals what number, and 5 minus 4 equals what number.

$$0-0 = ?$$

$$2+2 = ?$$

$$4-2 = ?$$

$$1+3 = ?$$

$$4+1 = ?$$

$$3-2 = ?$$

$$4-1 = ?$$

$$5-2 = ?$$

$$5-1 = ?$$

$$2-2 = ?$$

$$5-3 = ?$$

$$4-0 = ?$$

$$1+0 = ?$$

$$3-1 = ?$$

$$2+3 = ?$$

$$0+3 = ?$$

$$5-4 = ?$$

- Cut out the upper right corner of each flashcard for easy identification of orientation. If you have the flashcards containing addition problems from Module 5 and the flashcards containing subtraction problems from earlier in Module 6, they can be used instead of creating new flashcards.
- Begin by shuffling the flashcards, and then have the student select a card. As the child reads each equation, have them use a sorting tray to separate which cards they have read and which cards they have not read.
- Afterwards, have them 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 they can read all of the equations correctly, have them go back and time how quickly they can read the equations.

Activity 10

- Materials for the activity include the 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 they know 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 them to use their 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 they 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 they 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 their hands. Have the student begin with the box that has the word "start" in it.
- Afterwards, the student will be ready to work their way through the addition and subtraction problems to complete the maze. The student will record their answers using the braillewriter and braille paper. Have the student space one time between their answers.
- If it would be helpful, let the student know that they can place a small piece of a Wikki Stix® in the box that they are working on to keep their place more easily. When the student moves to the next subtraction problem, they can move the piece of Wikki Stix® to the next box.
- The maze includes the following directions and problems: Start, 2 minus 1 equals what number, 3 plus 1 equals what number, 4 minus 3 equals what number, 0 plus 3 equals what number, 5 minus 4 equals what number, 1 minus 1 equals what number, 3 plus 2 equals what number, 1 plus 2 equals what number, 4 minus 1 equals what number, and Finish.

Start

⠠⠠⠠⠠⠠⠠

2-1 =

⠠⠠⠠⠠⠠⠠ ⠠⠠⠠

3+1 =

⠠⠠⠠⠠⠠⠠ ⠠⠠⠠

$4-3 =$

$$\begin{array}{|c|c|c|c|c|} \hline \bullet & \bullet & \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet & \bullet & \bullet \\ \hline \end{array} \quad \begin{array}{|c|c|c|} \hline \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet \\ \hline \end{array}$$

$0+3 =$

$$\begin{array}{|c|c|c|c|c|} \hline \bullet & \bullet & \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet & \bullet & \bullet \\ \hline \end{array} \quad \begin{array}{|c|c|c|} \hline \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet \\ \hline \end{array}$$

$5-4 =$

$$\begin{array}{|c|c|c|c|c|} \hline \bullet & \bullet & \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet & \bullet & \bullet \\ \hline \end{array} \quad \begin{array}{|c|c|c|} \hline \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet \\ \hline \end{array}$$

$1-1 =$

$$\begin{array}{|c|c|c|c|c|} \hline \bullet & \bullet & \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet & \bullet & \bullet \\ \hline \end{array} \quad \begin{array}{|c|c|c|} \hline \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet \\ \hline \end{array}$$

$3+2 =$

$$\begin{array}{|c|c|c|c|c|} \hline \bullet & \bullet & \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet & \bullet & \bullet \\ \hline \end{array} \quad \begin{array}{|c|c|c|} \hline \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet \\ \hline \end{array}$$

$1+2 =$

$$\begin{array}{|c|c|c|c|c|} \hline \bullet & \bullet & \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet & \bullet & \bullet \\ \hline \end{array} \quad \begin{array}{|c|c|c|} \hline \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet \\ \hline \end{array}$$

$4-1 =$

$$\begin{array}{|c|c|c|c|c|} \hline \bullet & \bullet & \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet & \bullet & \bullet \\ \hline \end{array} \quad \begin{array}{|c|c|c|} \hline \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet \\ \hline \end{array}$$

Finish

$$\begin{array}{|c|c|c|c|c|} \hline \bullet & \bullet & \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet & \bullet & \bullet \\ \hline \bullet & \bullet & \bullet & \bullet & \bullet \\ \hline \end{array}$$

Fun Facts

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