

First Grade Nemeth Braille Code Curriculum
Module 4: Subtraction to 20 and Equal Shares of Circles and Rectangles

Note: *It is recommended that this module be completed with hard copy braille and a braillewriter instead of a refreshable braille display.*

It's time to prepare for a helicopter ride! Before we begin our journey, locate the first line of braille on the page. It is at the top of the page. Softly glide your fingers across the line. It says First Grade Nemeth. Now move your hands down to the second line of braille on the page. It says Curriculum Module 4. Now move your hands down to the third line of braille on the page.

There is just one symbol on the third line. It is on the left side of the page.

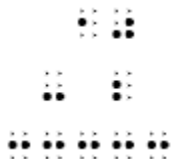


Do you remember what this symbol is called and its purpose? You got it! It is called an opening Nemeth Code indicator, and it tells us that we are going to read math or science.

Fun fact: A helicopter is a type of aircraft that does not have wings. Instead, it has rotors that are called blades.

For the first part of our adventure, let's review how to read subtraction problems that are vertically aligned. This format is very helpful when we calculate or compute the answer!

Directly below the opening Nemeth Code indicator on the first braille page, there is an equation for you to explore with your hands.



The minuend is written directly above the subtrahend in the equation. Math problems are considered to be in spatial format when the numbers are vertically aligned. When we read and write subtraction problems and equations in vertical alignment, we do not use numeric indicators.

The problem begins with the number 10 in the first line. Now move your hands down to the next line. You will find a minus sign. Which dots make the minus sign? You got it! Dots 3-6 make the minus sign. Notice that there is not a numeric indicator after the minus sign.

The minus sign is always spaced one cell to the left of the widest number in the spatially aligned subtraction problem. Since the minuend on the first line contains two digits in this problem and the subtrahend on the second line contains only one digit, there is a space between the minus sign and the subtrahend.

After the minus sign, there are the dots 2-3. What number is made with dots 2-3? Yes, the number 2 is made with dots 2-3.

So far our problem reads 10-2. On the third line, there is a line of dots 2-5. Do you remember what this is called in Nemeth? That is correct. In Nemeth we call this a separation line. It begins one cell to the left of the minus sign and continues to the right one cell beyond the numbers.

So our problem reads ten minus two equals.

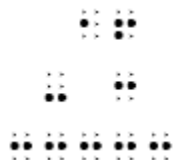
There are different strategies that we can use when subtracting if we do not know the answer immediately. One strategy is to count back. With this strategy, you begin with the minuend and count back from that number. So this time let's begin with 10 and count back two.

10, 9, 8

So what does 10-2 equal? Yes, 10-2 equals 8.

Note: If needed, Teddy Bear Counters, Digi-Blocks, or Unifix blocks may be used.

Try reading another equation. What does it begin with?



You got it, Nemeth superstar! The problem begins with the number 16. What follows the number 16 on the next line? Yes, there is a minus sign, followed by the number 3.

So our problem reads sixteen minus three equals. Let's use the count back strategy by beginning with 16 and count back 3.

16, 15, 14, 13

That's correct! Sixteen minus three equals 13!

Fun fact: Helicopters are used for medical transport, fighting fires, aerial photography, and military activities such as moving troops and dropping off supplies.

Read the last two vertically aligned subtraction problems on the braille page and then use the count back strategy to determine the difference.

$$\begin{array}{r} 9 \\ - 1 \\ \hline 8 \end{array}$$
$$\begin{array}{r} 17 \\ - 4 \\ \hline 13 \end{array}$$

Yes, that's right. The first problem is 9-1. What is the line under the subtrahend called? Outstanding work! It is called a separation line.

Use the count back strategy and then tell me what 9-1 equals? Yes, nine minus one equals eight!

Now it is time to read the second problem. Yes, the second problem is 17-4. Use the count back strategy to determine what 17-4 equals? You got it! Seventeen minus four equals thirteen.

Activity time: Let's use flash cards to practice reading problems in vertical alignment and using the count back strategy. Afterwards, tell me the answer before moving to the next flash card. Once you finish, go back and time how quickly you can read the problems! Do you think you can read the problems even quicker? If so, try one more time!

Note: *Flash cards are available in braille within the curriculum. It may be helpful to place the flash cards on a nonslip surface such as a rubber shelf liner for this activity.*

Way to go, Nemeth superstar! While we wait for the pilot to tell us when it is time to board the helicopter, let's learn another strategy we can use when subtracting. We can use the related doubles addition facts we learned in the last module to help us determine the difference when we subtract. Before we learn how to use the doubles addition facts to help us subtract, let's quickly review our facts! Read the addition problems on the top row of page 2 and then tell me the sum for each problem.

Note: It may be helpful to point out that braille page numbers are placed at the right margin on the last line. Also point out that braille page numbers are transcribed in Unified English Braille, not the Nemeth braille code.

$\begin{array}{r} 1 \\ +1 \\ \hline 2 \end{array}$	$\begin{array}{r} 2 \\ +2 \\ \hline 4 \end{array}$	$\begin{array}{r} 3 \\ +3 \\ \hline 6 \end{array}$	$\begin{array}{r} 4 \\ +4 \\ \hline 8 \end{array}$
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Answer:

$\begin{array}{r} 1 \\ +1 \\ \hline 2 \end{array}$	$\begin{array}{r} 2 \\ +2 \\ \hline 4 \end{array}$	$\begin{array}{r} 3 \\ +3 \\ \hline 6 \end{array}$	$\begin{array}{r} 4 \\ +4 \\ \hline 8 \end{array}$
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Yes, that's right. The first problem is 1+1. What does one plus one equal? You got it! One plus one equals two. Now move to the second addition problem and read it. Good job! The problem is 2+2. What does 2+2 equal? Yes, it equals 4.

Now find the next problem and read it. Yes, the problem is 3+3. What does 3+3 equal? Perfect! Three plus three equals six. Now find the last problem on this row and read it. Yes, it is 4+4. What does 4+4 equal? Yes, it equals 8.

Let's move to the next row of problems. Read the problems, beginning with the one on the left. Then tell me the answer before moving to the next problem.

$\begin{array}{r} 5 \\ +5 \\ \hline 10 \end{array}$	$\begin{array}{r} 6 \\ +6 \\ \hline 12 \end{array}$	$\begin{array}{r} 7 \\ +7 \\ \hline 14 \end{array}$	$\begin{array}{r} 8 \\ +8 \\ \hline 16 \end{array}$
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Answer:

$\begin{array}{r} 5 \\ +5 \\ \hline 10 \end{array}$	$\begin{array}{r} 6 \\ +6 \\ \hline 12 \end{array}$	$\begin{array}{r} 7 \\ +7 \\ \hline 14 \end{array}$	$\begin{array}{r} 8 \\ +8 \\ \hline 16 \end{array}$
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Yes, the first problem is 5+5, and it equals ten. Now move to the second addition problem and read it. You got it! The problem is 6+6. What does 6+6 equal? Yes, it equals 12. Now find the next problem and read it. Yes, the problem is 7+7. What does 7+7 equal? Good job, Nemeth superstar!

Seven plus seven equals fourteen. Now find the last problem on this row and read it. Yes, it is $8+8$. What does $8+8$ equal? Yes, it equals 16.

We are ready for the next row of problems. Just two more doubles addition problems to review!



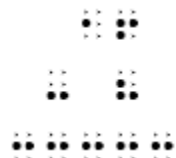
Answer:

$$\begin{array}{r} 9 \\ +9 \\ \hline 18 \end{array} \qquad \begin{array}{r} 10 \\ +10 \\ \hline 20 \end{array}$$

Way to go! The first problem is $9+9$, and it equals 18. Now move to the second addition problem and read it. Yes, it is $10+10$. What does $10+10$ equal? That's correct. Ten plus ten equals twenty!

Fun fact: Leonardo Da Vinci drew sketches of a flying machine that resembled a helicopter in the 1480s.

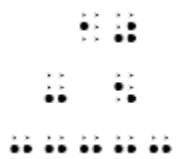
When we have a subtraction problem, we can use a related addition fact to help us figure out the difference. Let's practice an example together.



Begin by reading the problem at the top of page 3. What does it begin with? Yes, the problem begins with the number 16. What follows the number 16 on the next line? Yes, there is a minus sign, followed by the number 8.

So our problem reads sixteen minus eight. What does 16 minus 8 equal? If we remember that $8+8 = 16$, then we know that $16-8 = 8$ since they are related facts.

Try reading another problem. What does it begin with?



You got it, Nemeth superstar! The problem begins with the number 10. What follows the number 10 on the next line? Yes, there is a minus sign, followed by the number 5.

So our problem reads ten minus five. What does 10 minus 5 equal? Do you know a related doubles addition fact that might help us? Yes, $5+5 = 10$. So what does ten minus five equal? Yes, it equals 5.

Let's try one more together. Read the problem first.

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Yes, the problem is twenty minus ten. Do you know a related doubles addition fact that might help us? Yes, $10+10 = 20$.

So what does $20-10$ equal? Way to go, math superstar! The answer is 10.

Fun fact: Helicopters can be used to fight fires by carrying tanks or huge buckets filled with water and suspended by a cable.

Co-pilot, now read the subtraction problems on page 4 and tell me the difference for each problem as you go. Use what you know about related doubles addition facts to help you.

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Answer:

$$\begin{array}{r} 12 \\ - 6 \\ \hline 6 \end{array}$$

$$\begin{array}{r} 8 \\ - 4 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 18 \\ - 9 \\ \hline 9 \end{array}$$

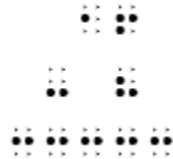
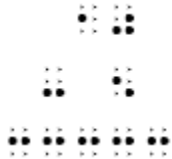
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Answer:

$$\begin{array}{r} 6 \\ - 3 \\ \hline 3 \end{array}$$

$$\begin{array}{r} 20 \\ - 10 \\ \hline 10 \end{array}$$

$$\begin{array}{r} 14 \\ - 7 \\ \hline 7 \end{array}$$



Answer:

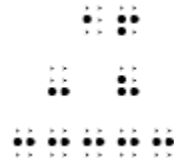
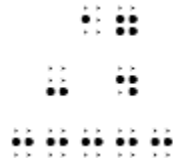
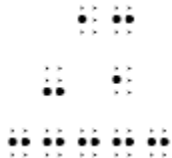
$$\begin{array}{r} 10 \\ - 5 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 4 \\ - 2 \\ \hline 2 \end{array}$$

$$\begin{array}{r} 16 \\ - 8 \\ \hline 8 \end{array}$$

Fun fact: Helicopters are sometimes called choppers.

Activity time: Read each of the subtraction problems on page 5. Use the new strategies we have learned and tell me the difference before moving to the next problem.

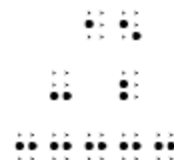
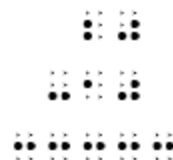
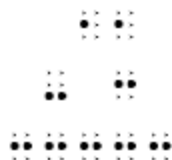


Answer:

$$\begin{array}{r} 13 \\ - 1 \\ \hline 12 \end{array}$$

$$\begin{array}{r} 17 \\ - 4 \\ \hline 13 \end{array}$$

$$\begin{array}{r} 16 \\ - 8 \\ \hline 8 \end{array}$$



Answer:

$$\begin{array}{r} 11 \\ - 3 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 20 \\ - 10 \\ \hline 10 \end{array}$$

$$\begin{array}{r} 15 \\ - 2 \\ \hline 13 \end{array}$$

$$\begin{array}{r}
 \text{Braille representation of } 10 - 5 = 5
 \end{array}$$

Answer:

$$\begin{array}{r}
 10 \\
 - 5 \\
 \hline
 5
 \end{array}$$

$$\begin{array}{r}
 \text{Braille representation of } 14 - 7 = 7
 \end{array}$$

Answer:

$$\begin{array}{r}
 14 \\
 - 7 \\
 \hline
 7
 \end{array}$$

It is time to board the helicopter! Since helicopters are noisy, let's wear earplugs, a headset or safety earmuffs. If you are wearing a hat, hold onto it firmly because the rotors are generating a lot of air as they turn. As we walk toward the helicopter, crouch down and stay away from the rotors.

For the second part of the adventure, let's work together to review how to write spatially aligned subtraction problems.

Let's begin by writing

$$\begin{array}{r}
 8 \\
 - 4 \\
 \hline
 \end{array}$$

Note: 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 on page 1 of the document entitled "B3 Module 4_Answer Key for Writing Activities_1".

In this problem, the minuend in the first line will begin in cell 3 because the minus sign on the second line will begin in cell 2 and the separation line will begin in cell 1 on the third line. Place your fingers on the correct keys on your braillewriter, and let's get started. In order to braille the number 8 in cell 3, press the space bar twice.

How should we braille the number 8 in a vertically aligned problem? Yes, you should press dots 2-3-6. We will not need a numeric indicator since the problem is vertically aligned.

Press the line spacing key only once and move to the next line. The number 4 will be brailled directly below the minuend in the first line. Since this is a vertically aligned problem, how do we write the number 4? Yes, you should press dots 2-5-6. We will not need a numeric indicator again since the problem is vertically aligned.

Where will we braille the minus sign? Yes, we will place the minus sign one cell to the left of the number 4 on the second line. Use the backspace key to line up the embossing head so that we can write the minus sign one cell to the left of the number 4. Then press the line spacing key only once and move to the next line.

Now you are ready to braille the separation line below the minus sign and number 4. How do you braille a separation line? Yes, we press the dots 2-5 four times to make the separation line. It will begin in cell 1 and continue one cell to the right of the numbers.

Way to go, co-pilot! Let's write another problem.

$$\begin{array}{r} 12 \\ -3 \end{array}$$

What should we braille first? Yes, begin by brailing the minuend on the first line. What cell will it begin? You got it! The number 12 will begin in the third cell in this problem. Place your fingers on the correct keys on your braillewriter and press the space bar twice so that we can write the number 12.

How should we braille the number 12 in a vertically aligned problem? Yes, you should press dot 2 first and then dots 2-3 in the next braille cell. We will not need a numeric indicator again since the problem is vertically aligned.

What should we do next? That's correct. We need to press the line spacing key only once to go the next line and braille the minus sign and subtrahend. Use the backspace key to line up the embossing head and braille the minus sign and the number 3. The number 3 will be brailled directly below the number 2 in the minuend. Remember that the minus sign should be one cell to the left of the widest number in the spatially aligned subtraction problem.

Once you are finished, press the line spacing key only once and move to the next line. Now you are ready to braille the separation line below the minus sign and numbers. How do you braille a separation line? Yes, press the dots 2-5 four times to make the separation line. It will begin in cell 1 and continue one cell to the right of the numbers.

Fun fact: A helicopter can move forward, backward, and side-to-side.

Now it is time for you to write more subtraction problems! After you write each problem, press your line spacing key three times.

Note: 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 on pages 2-3 of the document entitled "B3 Module 4_Answer Key for Writing Activities_1".

$$\begin{array}{r} 16 \\ -3 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ -4 \\ \hline \end{array}$$

$$\begin{array}{r} 12 \\ -6 \\ \hline \end{array}$$

$$\begin{array}{r} 19 \\ -1 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \\ -10 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ -0 \\ \hline \end{array}$$

$$\begin{array}{r} 14 \\ -7 \\ \hline \end{array}$$

$$\begin{array}{r} 13 \\ -2 \\ \hline \end{array}$$

Fun fact: In order to fly a helicopter in the United States, a person must be certified as a rotorcraft pilot by the Federal Aviation Administration.

The pilot is giving a safety briefing before we take off. It is important that we fasten our seatbelts and stay seated during the flight! For the third part of the adventure, let's use the set of subtraction problems you just wrote and review how to write answers for subtraction problems that are vertically aligned. Begin by placing your paper in the braillewriter, and then roll the paper into the braillewriter by using the knobs on either side of the braillewriter. The paper should stop automatically. Then push the line spacing key.

We will write the answer to each subtraction problem on the line that is below the separation line. So, let's work together to find the first problem and press the line spacing key until the embossing head is on the line below the separation line. Then we will use the space bar to line up the embossing head so that we can write the difference directly under the separation line. You can see now how vertical aligned problems make it easier to calculate or compute the answer!

Note: *Provide assistance 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 on pages 4-5 of the document entitled "B3 Module 4_Answer Key for Writing Activities_1".*

Read the first problem again. Yes, it is sixteen minus three. What does sixteen minus three equal? You got it! The difference is 13.

Where will we braille the answer? Yes, we will write the answer below the separation line. The digits in thirteen will be aligned by place value. The one will be in the tens column and the three will be in the ones column. Let's line up our embossing head together. You are ready to write your answer! You got it! Congratulations!

Note: *Provide assistance in lining up the embossing head as needed.*

Good job, Nemeth superstar! Let's try one more together. Use your hands and find the next problem. You found it! Now read the problem. Yes, it is nine minus four. What does nine minus four equal? You got it! Nine minus four equals five.

Show me where we will write the answer. Perfect! We will write the answer below the separation line and the embossing head will be vertically in line with the minuend and subtrahend.

Note: *If needed, Teddy Bear Counters, Digi-Blocks, or Unifix blocks may be used.*

Co-pilot, you are ready to write the answers for the rest of the problems. Afterwards, we will check your work together. Let me know if you need any help.

Fun fact: Ross Perot and J. W. Coburn traveled around the world in a helicopter. Their trip around the world took 29 days, 3 hours, 8 minutes and 13 seconds.

Now that we are finished with the safety briefing and there is air circulating around the rotors, the helicopter has the lift it needs to take-off and fly! Let's begin to countdown! Five, four, three, two, one, time for take-off!

The helicopter is in the air! For the fourth part of our adventure, let's learn more about shapes and equal shares of circles. What do you remember about circles and semi-circles from the last module?

Note: *There are several possible correct responses to the question. For example, a circle is a perfectly round shape, each half-circle has a straight edge, and two half-circles can be put together to make a circle.*

In addition to a work tray, you will need several 2-dimensional circles, half-circles, and rectangles. Many of these manipulatives are available in the MathBuilders, Unit 7: Fractions, Mixed Numbers, and Decimals Kit; MathBuilders, Unit 6: Geometry Kit; Puzzle Form Board Kit; and the Focus in Math Kit available from the American Printing House for the Blind. If preferred, you can use textured paper to create the shapes. Feel 'n Peel Sheets: Carousel of Textures from American Printing House for the Blind has a variety of non-adhesive backed textured paper.

Place three circles, semi-circles, and rectangles in a work tray.

There is a variety of shapes in your work tray. Pick up one shape at a time and tell me if it is a circle, semi-circle, or rectangle.

Fun fact: Helicopters have a number of limitations. They can be noisy, vibrate a lot, and are not as fast as airplanes.

Very nice! Now place the objects back in the work tray and take a moment to explore this circle. If I cut the circle into two equal parts, then I will have two half-circles.

Note: *Give the student a circle made of paper or another material that can be easily cut. After the student explores the circle, use scissors to cut it into halves. If desired, the student can assist you. Then give the student the half-circles.*

Sometimes half-circles are called semi-circles. Take a minute and explore the half-circles with your hands.

The two half-circles are the same size because we cut the circle into two equal parts. Each half-circle is half of the whole circle.

Now explore another circle.

Note: *Give the student another circle made of paper or another material that can be easily cut. After the student explores the circle, use scissors to cut it into two drastically unequal parts. If desired, the student can assist you. Then give the student the two unequal parts to explore.*

I cut the circle into two parts again. This time the two parts are not equal. One piece is much larger than the second piece.

Let's move to the inTACT Sketchpad (or the DRAFTSMAN: Tactile Drawing Board). I have drawn three circles on the tactile film. Two of the circles have been divided into two equal parts with a line, and one of the circles has been divided into two unequal parts with a line.

Note: *Additional information about drawing shapes is available in the Teacher Reference Materials. You may also use Wikki Stix® or textured paper to create the shapes.*

Use both hands and scan the drawing film from left to right. Tell me about the shapes, moving from left to right!

Note: *If needed, use hand-under-hand technique to model scanning the drawing film from left to right.*

First find the two circles that have been divided into two equal parts with a line.

Note: *Point out that a circle can be divided into two equal parts in many different ways, including with either a horizontal or vertical line.*

Now find the circle that has been divided into two unequal parts with a line.

Let's remove the film from the Sketchpad (or the DRAFTSMAN) and place a new sheet of tactile drawing film in the Sketchpad (or the DRAFTSMAN). Use the stylus and a stencil to draw a circle on the left side of the tactile drawing film using the Sketchpad (or the DRAFTSMAN). The stylus is sometimes called a drawing tool.

Note: *If needed, provide information about how to hold the stylus and/or use hand-under-hand technique to draw the first shape together. It is*

recommended that shapes be drawn by using a continuous, clockwise motion. You may also use a ball-point pen instead of a stylus. The student may also enjoy drawing the shapes free-hand.

Now let's work together with a ruler to draw a line that divides the circle into two equal parts.

Note: *Once the student has finished drawing the line, encourage them to check his/her work.*

Excellent drawing, shape superstar! Tell me about your drawing.

We can also divide a rectangle into two equal parts. On the right side of the tactile drawing film, let's use the stylus and a stencil to draw a rectangle.

Since there are several ways to divide a rectangle into two equal parts, what kind of line would you like to use this time? We can use a horizontal, vertical, or a diagonal line.

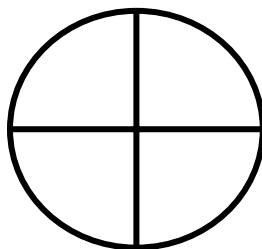
Note: *If needed, discuss the different types of lines and draw examples of the lines using the stylus on the tactile drawing film.*

Now let's work together with a ruler to draw that kind of line to divide the rectangle into two equal parts.

Remove the film from the Sketchpad (or the DRAFTSMAN) and place a new sheet of tactile drawing film in the Sketchpad (or the DRAFTSMAN). Let's work together to draw another circle and rectangle. Next divide one of the shapes into two equal parts and the other shape into two unequal parts.

Now that you are finished, tell me about the shapes and how you divided them into two parts.

Let's place the Sketchpad (or the DRAFTSMAN) to the side. Take a moment to explore this circle. I can divide this circle into 4 equal shares. Each equal part will be a fourth of the whole circle.



Note: *Give the student a circle made of paper or another material that can be easily cut. After the student explores the circle, use scissors to cut it into*

quarters. If desired, the student can assist you. Then give the student the pieces of the circle.

Take a minute and explore the four fourths of the circle with your hands. Each equal part is a quarter of the whole circle.

Note: *The student will need a piece of construction paper and glue (or a glue stick) for the next activity.*

Let's glue the pieces onto the construction paper and create a circle. Excellent work, shape superstar!

Fun fact: Hovering is one of the most difficult skills to learn when flying a helicopter. Constant control is required to maintain almost motionless flight over a point of interest and to offset the gusty air created by the helicopter.

Once the student has finished gluing the shape back together, encourage them to check his/her work.

I can also divide a rectangle into 4 equal shares. Take a moment to explore this rectangle. Let's work together to cut the rectangle into four equal parts. Each equal part will be a fourth of the whole rectangle.

Note: *Give the student a rectangle made of paper or another material that can be easily cut. After the student explores the rectangle, use scissors to cut it into quarters. Then give the student the pieces of the rectangle.*

Take a minute and explore the four fourths of the rectangle with your hands. Each equal part is a quarter of the whole rectangle.

Note: *The student will need a piece of construction paper and glue (or a glue stick) for the next activity.*

Let's glue the pieces onto the construction paper and create a rectangle.

Activity time: We will need playdough, a circle cookie cutter (or mold), and a cutting tool such as a plastic knife. Begin by flattening the playdough by pounding or squishing it. Next create a circle with the playdough. It may be helpful to use the circle cookie cutter (or mold). Now let's work together to cut the circle into two equal shares.

Now carefully place the pieces on top of each other so we can ensure that they are equal shares. Very nice!

Use your hands to squash the pieces back together into one piece and then create another circle with the playdough. Now let's work together to cut the

circle into two unequal shares. Now carefully place the two pieces on top of each other. Are they the same size? If not, how do they differ?

Answer: No, the pieces are not the same size. One share is larger than the other share.

Way to go, shape superstar! Use your hands to squash the pieces back together into one piece and then create another circle with the playdough. Now let's work together to cut the circle into four equal shares!

Carefully place the four pieces on top of each other. Are they equal shares of the circle? How do you know?

Answer: Yes, the four pieces are all the same size.

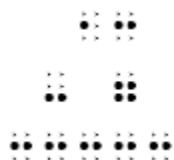
Use your hands to squash the pieces back together into one piece again and then create a rectangle. Afterwards we will work together to cut the rectangle into four equal shares.

Note: *If desired, a rectangular mold can be used.*

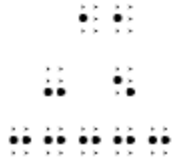
Fun fact: The German-made Focke Achgelis 61 was the first official helicopter.

The helicopter is hovering above the canyon so that a person can repel! As we stay almost motionless in the sky, let's learn about another subtraction strategy. We can use what we know about addition facts to help us solve subtraction problems. Sometimes this strategy is called the "think addition" strategy. Let's talk through an example problem together.

Begin by reading the subtraction problem at the top of page 6.



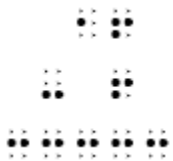
Yes, that's right. The problem is $13 - 7$. Every subtraction fact has a related addition fact. So using the "think addition" strategy, we think of a related fact. Seven plus what number equals thirteen? You got it! Seven plus six equals thirteen. Thus, thirteen minus seven equals six. Now move to the second subtraction problem on the page and read it.



Good job! The problem is $11-5$. So what related addition fact would we begin with? Yes, five plus what number equals eleven. Perfect! So what number plus five equals eleven? Yes, five plus six equals eleven.

So what does $11-5$ equal? You got it! Eleven minus five equals six.

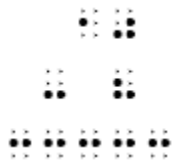
Now move to the third subtraction problem on the page and read it.



The problem is $16-6$. So what addition fact would we begin with? Yes, six plus what number equals sixteen. Yes! So what number plus six equals sixteen? You got it! Six plus ten equals sixteen.

So what does $16-6$ equal? Yes! Sixteen minus six equals ten.

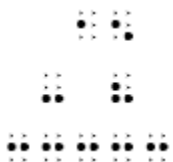
Now find the next problem and read it.



Yes, the problem is $10-8$. Talk through the “think addition” strategy and then tell me what $10-8$ equals.

Answer: The problem is $10-8$. Eight plus what number equals 10? Eight plus two equals 10. So, ten minus eight equals two.

Perfect! Ten minus eight equals two. Now find the last problem on the page and read it.






Yes, the problem is $15-8$. Once again, talk through the “think addition” strategy and then tell me what $15-8$ equals.

Answer: The problem is 15-8. Eight plus what number equals 15? Eight plus seven equals 15. So, fifteen minus 8 equals seven.

You got it, Nemeth superstar! Yes, fifteen minus eight equals seven.

Fun fact: Helicopters used for carrying heavy cargo loads have two blades. They are horizontal and spin in opposite directions.

Activity time: Read each of the numbered addition problems on page 7. Use the “think addition” strategy we have learned to help us with subtraction problems and tell me the answer before moving to the next problem.



Answer:

$$\begin{array}{r}
 1. \quad 15 \\
 - 8 \\
 \hline
 7
 \end{array}
 \qquad
 \begin{array}{r}
 2. \quad 6 \\
 - 4 \\
 \hline
 2
 \end{array}
 \qquad
 \begin{array}{r}
 3. \quad 9 \\
 - 6 \\
 \hline
 3
 \end{array}$$




Answer:

$$\begin{array}{r}
 4. \quad 16 \\
 - 9 \\
 \hline
 7
 \end{array}
 \qquad
 \begin{array}{r}
 5. \quad 14 \\
 - 5 \\
 \hline
 9
 \end{array}$$

Answer:

$$\begin{array}{r}
 6. \quad 16 \\
 - 9 \\
 \hline
 7
 \end{array}
 \qquad
 \begin{array}{r}
 7. \quad 14 \\
 - 5 \\
 \hline
 9
 \end{array}$$



Answer:

$$\begin{array}{r} 8. \quad 10 \\ - 7 \\ \hline 3 \end{array}$$

$$\begin{array}{r} 9. \quad 11 \\ - 4 \\ \hline 7 \end{array}$$

Below the last problem, there is a Nemeth Code terminator.



This symbol tells us that we are almost finished with our math adventure. Sometimes this symbol comes at the end of a braille document, just like it is this time. This symbol can also be used in other places within a document to tell us that we are finishing a math section and are moving to literary material.

Fun fact: Igor Sikorsky made the first practical helicopter flight in the United States in 1939.

Now that we are almost finished with our journey, the helicopter is slowly descending. We are getting closer to the ground! Before we land, let's practice writing subtraction problems on the braillewriter and using all of the mental math strategies we have learned for subtraction, including the count back strategy and thinking of related addition facts.

Activity time: You will need your braillewriter and braille paper for this activity. Listen and then braille what you hear. Then use a mental math strategy and write the answer to the problem. You will need to press your line spacing key twice to move to the next line before brailleing an equation each time.

Note: 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 on pages 6-7 of the document entitled "B3 Module 4_Answer Key for Writing Activities_1".

$$\begin{array}{r} 14 \\ - 1 \\ \hline \end{array}$$

$$\begin{array}{r} 15 \\ - 5 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ - 3 \\ \hline \end{array}$$

$$\begin{array}{r} 10 \\ - 3 \\ \hline \end{array}$$

$$\begin{array}{r} 18 \\ - 9 \\ \hline \end{array}$$

$$\begin{array}{r} 16 \\ - 8 \\ \hline \end{array}$$

$$\begin{array}{r} 19 \\ - 9 \\ \hline \end{array}$$

Excellent work, Nemeth superstar!

Fun fact: NASA is studying the helicopter to see if it could be used on the planet Mars in the future.

Now that the helicopter has safely returned to the ground, let's finish our adventure with a follow-up activity.

Follow-up activity:

We are going to play a game called FEED THE MONSTER. You will need your braillewriter, notecards, flash cards with various addition and subtraction problems, a sorting tray, a timer, and an empty container.

Note: *Additional information about the game is available in the Teacher Reference Materials. Previously made flash cards with subtraction and addition problems within 20 may be used instead of making new flash cards if preferred.*

Begin by decorating the empty container that will be the "monster". If you would like, you are welcome to name the monster. You can also "decorate" the monster with scented stickers, Wikki sticks, buttons, or textured paper. Now shuffle the deck of flash cards and pass out an equal number of cards to each player.

Note: *This would be a good time to use a sorting tray. Based on the student's preference, you can feed a dog, cat, or other animal instead of a monster.*

Instructions for playing FEED THE MONSTER:

1. You will need 2 or more players for this game. I will shuffle the deck of cards and pass out an equal number of cards to each player. Then I will call out a number the monster is hungry for, and you will race to find a problem with that same number as the answer. For example, if the monster is hungry for the number 5, you will try to find a problem such as $10-5$ or $8-3$.
2. As you read each problem, use a sorting tray to separate which cards you have read and which cards you have not read. As soon as you find a problem with an answer that is the same as the number that the monster is hungry for, try to be the first one to feed the monster. The monster can only eat the first flash card it is given. It is then ready for another number. All of the players will be reading their flash cards at the same time. You will not be taking turns.
3. Every time you are the first to feed the monster, write a tally mark on a piece of braille paper to help you keep up with how many times you have fed the monster. Remember to write the tally marks in sets of five and leave a space between the sets. If you would prefer, you can also use an abacus to keep up with how many times you have fed the monster.
4. At the end of 10 minutes, whoever has fed the monster the most cards is the winner!

Note: *This game can easily be played with students who read print or braille. If one of the players reads print, add print to each of the number flash cards. The length of time you play and the length of time to locate numbers is up to you.*