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# **Grade 1: Practice with Addition and Subtraction**

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A Set of Related Tasks and Lesson Guides

# Table of Contents

## Introduction

Arc Overview .....	3
Arc Preview .....	4
Tasks' Standards Alignment .....	8

## Tasks and Lesson Guides

<b>Task 1: Lunch Menu</b> .....	9
Lesson Guide .....	10
<b>Task 2: Dollywood Trip</b> .....	13
Lesson Guide .....	14
<b>Task 3: Crayon Box</b> .....	16
Lesson Guide .....	17
<b>Task 4: Hardware Store</b> .....	19
Lesson Guide .....	20
<b>Task 5: Fun with Tens</b> .....	22
Lesson Guide .....	23
<b>Task 6: Valentine Cookies</b> .....	25
Lesson Guide .....	26
<b>Task 7: Pencil Task</b> .....	28
Lesson Guide .....	29

## Arc Overview

In this set of related math tasks, 1st Grade students will build on their understanding of place value that began in Kindergarten in order to add and subtract within 100. Because operations with numbers such as tens and hundreds make for simple calculations, place value plays a critical role throughout the grades in the development of computation strategies.

The Arc Preview table on page 4 provides all of the task questions contained in this arc. The tasks are aligned to standards 1.NBT.C.4, 1.NBT.C.5, and 1.NBT.C.6.

- Tasks 1-3 will develop the concept of adding within 100, progressing from a single digit number and a two-digit number to 2 two-digit numbers.
- Task 4 will *solidify* understanding of adding within 100.
- Task 5 will explore mentally adding or subtracting 10 from a two-digit number.
- Task 6 will develop subtracting a multiple of 10 from a multiple of 10, within 100.
- Task 7 will *solidify* understanding of adding and subtracting multiples of 10 within 100.

Note that the some of the Essential Understandings listed in each task were modified from those contained in Pearson’s EnVision Math series. Others were taken from NCTM’s Developing Essential Understanding series. Tennessee State Mathematics Standards were retrieved from <http://www.tn.gov/education/standards/math.shtml>.




By the end of these seven tasks, students will be able to answer the following overarching questions:

- When is it necessary to compose a ten when adding?
- How can you find ten more and ten less than a two-digit number mentally?
- Can you describe the process of adding any two-digit number?
- What changes take place in a two-digit number when subtracting a multiple of 10?
- How do we use equations to represent addition and subtraction?
- What is the relationship between addition and subtraction?
- How do you use addition (subtraction) to check your work on subtraction (addition)?

The assessing questions, advancing questions, and whole group questions provided in this guide will ensure that students are working in ways aligned to the Standards for Mathematical Practice. Although the students will not be aware that this is occurring, the teacher can guide the process so that each MP (Mathematical Practice) is covered through good explanations, understanding of context, and clarification of reasoning behind solutions.

## Arc Preview

<p><b>Task 1: Lunch Menu</b></p> <p>1. On Monday the second grade class of Lakeview Elementary is taking a trip to the drama center. Fifty-two students chose a school lunch. Six more students bring a lunch from home.</p> <p>How many second grade students will be eating lunch? Write a number sentence and explain how you know it is correct.</p> <p>2. On Tuesday the third grade class will take a trip. Sixty-four students chose a school lunch. Seven more students bring a lunch from home.</p> <p>a) How many third grade students will be eating lunch? Write a number sentence and explain how you know it is correct.</p> <p>b) Did a change take place in the tens place value when you solved part a? If so, explain why.</p>	<p><b>Goals for Task 1:</b></p> <ul style="list-style-type: none"><li>• Add a two-digit number and a one-digit number using strategies based on place value.</li><li>• Write an addition number sentence.</li><li>• Compose a ten when adding two numbers.</li><li>• Explain mathematical reasoning.</li></ul>
<p><b>Task 2: Dollywood Trip</b></p> <p>Tonia is going on a trip to Dollywood in 3 months and wants to earn extra money. She already has \$38. She will earn a \$10 allowance every month for doing chores.</p> <p>a) How much money can she earn for the trip?</p> <p>b) Her brother, Thomas, claims she will have \$48 to take on the trip. Tonia claims she will have \$68 for the trip. Who is correct? Explain using words, base ten blocks, or number sentences to show your work.</p>	<p><b>Standards for Task 1:</b></p> <p><b>1.NBT.C.4</b> Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.</p> <p><b>Goals for Task 2:</b></p> <ul style="list-style-type: none"><li>• Represent and solve addition problems within 100.</li><li>• Add a two-digit number and a multiple of 10.</li><li>• Explain mathematical reasoning.</li></ul> <p><b>Standards for Task 2:</b></p> <p><b>1.NBT.C.4</b> Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.</p>

<p><b>Task 3: Crayon Box</b> Mrs. Shrum places 49 crayons on the art table for the class to use. Next, she opens a box of 16 crayons. Jessie claims there are 55 crayons altogether. Luis claims there are 65 crayons.</p> <p>a) Who is correct? Use pictures, numbers, or words to explain.</p> <p>b) What mistake did the other student make in solving for the total?</p>	<p><b>Goals for Task 3:</b></p> <ul style="list-style-type: none"> <li>• Represent and solve addition problems within 100.</li> <li>• Compose a 10 when adding two numbers.</li> <li>• Explain mathematical reasoning.</li> </ul> <p><b>Standards for Task 3:</b> <b>1.NBT.C.4</b> Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.</p>
<p><b>Task 4: Hardware Store</b> <i>Solidifying Task</i></p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>\$54</p> </div> <div style="text-align: center;">  <p>\$26</p> </div> <div style="text-align: center;">  <p>\$48</p> </div> </div> <p>Thomas would like to buy two items from Winningham’s Hardware Store. He is not allowed to spend more than \$75 dollars.</p> <p>a) Which two items can Thomas buy? Show your work to support your answer.</p> <p>b) Are there two items that would cost exactly \$90? Explain your answer using words or numbers..</p>	<p><b>Goals for Task 4:</b></p> <ul style="list-style-type: none"> <li>• Add a two-digit number and a multiple of 10 using the relationship of addition and subtraction.</li> <li>• Explain mathematical reasoning.</li> </ul> <p><b>Standards for Task 4:</b> <b>1.NBT.C.4</b> Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.</p>

**Task 5: Fun With Tens**

1. Jackson found 78 Easter eggs during the hunt. Jackson collected 10 more to fill his basket to the top. How many eggs did he find? Write an equation and explain how you solved the problem.

2.

a) Complete this section of a hundred chart:

	45	
54	55	

b) What number is 10 less than the smallest number on the chart?

c) What number is 10 more than the largest number on the chart?

**Goals for Task 5:**

- Use mental arithmetic to find 10 more and 10 less of a two-digit number.
- Explain mathematical reasoning.

**Standards for Task 5:****1.NBT.C.5**

Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.

**Task 6: Valentine Cookies**

Sofia is planning for her Valentine's Day Party. She and her friends need 60 cookies for the party. Only 3 friends come to help her bake. Each person will bake 10 cookies.

a) How many cookies will get baked? Explain your answer and write an equation.

b) How many cookies will not get baked? Explain your answer and write an equation.

**Goals for Task 6:**

- Subtract multiples of 10 from multiples of 10 within 100.
- Write equations to represent math problems involving addition and/or subtraction.
- Explain mathematical reasoning.

**Standards for Task 6:****1.NBT.C.6**

Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

<p><b>Task 7: Pencil Task</b>  <i>Solidifying Task</i>          Hunter has 80¢ to spend on pencils. Each pencil costs 10¢.</p> <p>a) If Hunter buys 1 pencil, how much money will he have left? Explain your answer.</p> <p>b) Write an equation to show how could you check your answer for part a).</p> <p>c) If Hunter buys 5 more pencils, how much money will he have left? Explain your answer.</p> <p>d) Taylor wants to buy one of the 6 pencils Hunter just bought. If he sells it to her for 10¢, how much money will he have?</p>	<p><b>Goals for Task 7:</b></p> <ul style="list-style-type: none"> <li>• Use mental arithmetic to find 10 more and 10 less of a two-digit number.</li> <li>• Subtract multiples of 10 from multiples of 10 within 100.</li> <li>• Write equations to represent math problems involving addition and/or subtraction.</li> <li>• Explain mathematical reasoning.</li> </ul> <hr/> <p><b>Standards for Task 7:</b></p> <p><b>1.NBT.C.5</b>          Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.</p> <p><b>1.NBT.C.6</b>          Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.</p>
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## Tasks' Standards Alignment

Task	1.NBT.C.4	1.NBT.C.5	1.NBT.C.6	MP 1	MP 2	MP 3	MP 4	MP 5	MP 6	MP 7	MP 8
<b>Task 1</b> Lunch Menu	✓			✓	✓	✓	✓		✓	✓	
<b>Task 2</b> Dollywood Trip	✓			✓	✓	✓	✓		✓	✓	✓
<b>Task 3</b> Crayon Box	✓			✓	✓	✓	✓		✓	✓	
<b>Task 4</b> Hardware Store <i>Solidifying Understanding</i>	✓			✓	✓	✓	✓		✓	✓	✓
<b>Task 5</b> Fun with Tens		✓		✓	✓	✓	✓	✓	✓	✓	✓
<b>Task 6</b> Valentine Cookies			✓	✓	✓	✓	✓		✓		✓
<b>Task 7</b> Pencil Task <i>Solidifying Understanding</i>		✓	✓	✓	✓	✓	✓		✓		✓

### The Standards for Mathematical Practice

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.



### Task 1: Lunch Menu

1. On Monday the second grade class of Lakeview Elementary is taking a trip to the drama center. Fifty-two students chose a school lunch. Six more students bring a lunch from home.

How many second grade students will be eating lunch? Write a number sentence and explain how you know it is correct.

2. On Tuesday the third grade class will take a trip. Sixty-four students chose a school lunch. Seven more students bring a lunch from home.

- a) How many third grade students will be eating lunch? Write a number sentence and explain how you know it is correct?

- b) Did a change take place in the tens place value when you solved part a? If so, explain why.

**Department of Education: Lesson Guide 1**

<b>Task 1: Lunch Menu</b>		<b>1<sup>st</sup> Grade</b>
<p>1. On Monday the second grade class of Lakeview Elementary is taking a trip to the drama center. Fifty-two students chose a school lunch. Six more students bring a lunch from home. How many second grade students will be eating lunch? Write a number sentence and explain how you know it is correct.</p> <p>2. On Tuesday the third grade class will take a trip. Sixty-four students chose a school lunch. Seven more students bring a lunch from home.</p> <p>a) How many third grade students will be eating lunch? Write a number sentence and explain how you know it is correct.</p> <p>b) Did a change take place in the tens place value when you solved part a? If so, explain why.</p>		
<b>Teacher Notes:</b>		
<p>The term “number sentence” has been used intentionally in Task 1 of this arc with the goal to move students to use the term “equation” by the end of the arc. Teachers should facilitate this by interchanging the two terms during class discussions.</p>		
<b>Tennessee State Standards for Mathematical Content</b>	<b>Tennessee State Standards for Mathematical Practice</b>	
<p><b>1.NBT.C.4</b> Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.</p>	<ol style="list-style-type: none"> <li>1. Make sense of problems and persevere in solving them.</li> <li>2. Reason abstractly and quantitatively.</li> <li>3. Construct viable arguments and critique the reasoning of others.</li> <li>4. Model with mathematics.</li> <li>5. Use appropriate tools strategically.</li> <li>6. Attend to precision.</li> <li>7. Look for and make use of structure.</li> <li>8. Look for and express regularity in repeated reasoning.</li> </ol>	
<b>Essential Understandings:</b>		
<ul style="list-style-type: none"> <li>• When adding two-digit numbers, a strong understanding of place value is fundamental.</li> <li>• Mathematical explanations can be given using words, objects, pictures, numbers, or equations.</li> </ul>		
<b>Explore Phase</b>		
<b>Possible Solution Paths</b>	<b>Assessing and Advancing Questions</b>	
<p>1. Students write <math>52 + 6 = 58</math>. Student work may include tally marks, base ten blocks, number line, hundred chart, and drawings.</p>	<p><b>Assessing Questions:</b></p> <ul style="list-style-type: none"> <li>• Can you explain your work to another student?</li> <li>• How did you know to add six?</li> <li>• Can you explain why you wrote this number sentence?</li> </ul> <p><b>Advancing Questions:</b></p> <ul style="list-style-type: none"> <li>• How many second grade students buy school lunch on Monday?</li> <li>• How many students bring a lunch from home?</li> <li>• How can you combine those two numbers?</li> <li>• Can you tell me about the value of 5 in the number 52?</li> </ul>	

<p><b>2a)</b> Students write <math>64+7=71</math>.</p> <p>Student work may include tally marks, base ten blocks, number line, hundred chart, and drawings.</p>	<p><b>Assessing Questions:</b></p> <ul style="list-style-type: none"> <li>• Can you explain your work to me?</li> <li>• How did you know to regroup the tens?</li> <li>• How would the equation change if 5 students brought lunches from home?</li> </ul> <p><b>Advancing Questions:</b></p> <ul style="list-style-type: none"> <li>• How many third grade students buy school lunch on Tuesday?</li> <li>• How many students bring a lunch from home?</li> <li>• How can you combine those two numbers?</li> <li>• Can you tell me about the value of 6 in the number 64?</li> </ul>
<p><b>2b)</b> Students will need to correctly state that there was a change in the tens place.</p> <p>Students' explanations should include the fact that when combining the ones the total was larger than 10, necessitating the tens place to change from "5" to "6".</p>	<p><b>Assessing Questions:</b></p> <ul style="list-style-type: none"> <li>• Can you explain your reasoning to me?</li> <li>• Is there a way to check your answer?</li> <li>• How would you explain this to a friend that doesn't understand?</li> </ul> <p><b>Advancing Questions:</b></p> <ul style="list-style-type: none"> <li>• How many students bought school lunch on Tuesday? Can you tell me what digit is in the tens place?</li> <li>• Can you model this number with base ten blocks?</li> <li>• If you add seven more units to this number, how many unit blocks will you have? How can you regroup those blocks?</li> <li>• After regrouping, how many rods are in your number?</li> </ul>
<p><b>Possible Student Misconceptions</b></p>	<p><b>Assessing and Advancing Questions</b></p>
<p><b>2a) and 2b)</b> Students fail to regroup correctly or even recognize the need for regrouping.</p>	<ul style="list-style-type: none"> <li>• Can you model 64 with base ten blocks?</li> <li>• If you add seven more units to this number, how many unit blocks will you have?</li> <li>• How can you regroup those blocks?</li> <li>• After regrouping, how many rods are in your number?</li> </ul>
<p><b>Entry/Extensions</b></p>	<p><b>Assessing and Advancing Questions</b></p>
<p>If students can't get started....</p>	<ul style="list-style-type: none"> <li>• What is the problem asking?</li> <li>• Can you model the numbers and solve the problem using base ten blocks?</li> <li>• How many second grade students buy school lunch on Monday?</li> <li>• How many students bring a lunch from home?</li> <li>• How can you combine those two numbers?</li> </ul>
<p>If students finish early....</p>	<ul style="list-style-type: none"> <li>• How can you compare the sums of Monday and Tuesday?</li> <li>• If the two numbers added were in a different</li> </ul>

order, how would the answer change?

- Can you write about what you have learned today?

### Discuss/Analyze

### Whole Group Questions

**When adding two digit numbers, a strong understanding of place value is fundamental.**

- When adding 52 and 6, which two digits did you add together? In your resulting answer, did you your tens place change?
- When adding 64 and 7, which digits did you add together first? In your resulting answer, did you your tens place change?
- Can you describe the process for adding any 2 two-digit numbers?

**Mathematical explanations can be given using words, objects, pictures, numbers, or equations.**

- Since one of the essential understandings of this task (and arc) pertains to the variety and richness of possible mathematical explanations, the whole group discussion should highlight different strategies used to solve the problem and to explain reasoning.



Tennessee Department of Education: Lesson Guide 2

Task 2: Dollywood Trip		1 <sup>st</sup> Grade
<p>Tonia is going on a trip to Dollywood in 3 months and wants to earn extra money. She already has \$38. She will earn a \$10 allowance every month for doing chores.</p> <p>a) How much money can she earn for the trip?</p> <p>b) Her brother, Thomas, claims she will have \$48 to take on the trip. Tonia claims she will have \$68 for the trip. Who is correct? Explain using words, base ten blocks, or number sentences to show your work.</p>		
<p><b>Teacher Notes:</b></p> <p>Some students may need an explanation of the words “chores” and “allowance” to gain a better understanding of the problem.</p>		
Tennessee State Standards for Mathematical Content	Tennessee State Standards for Mathematical Practice	
<p><b>1.NBT.C.4</b> Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.</p>	<ol style="list-style-type: none"> <li>1. Make sense of problems and persevere in solving them.</li> <li>2. Reason abstractly and quantitatively.</li> <li>3. Construct viable arguments and critique the reasoning of others.</li> <li>4. Model with mathematics.</li> <li>5. Use appropriate tools strategically.</li> <li>6. Attend to precision.</li> <li>7. Look for and make use of structure.</li> <li>8. Look for and express regularity in repeated reasoning.</li> </ol>	
<p><b>Essential Understandings:</b></p> <ul style="list-style-type: none"> <li>• When adding two-digit numbers, a strong understanding of place value is fundamental.</li> <li>• Mathematical explanations can be given using words, objects, pictures, numbers, or equations.</li> </ul>		
<p><b>Explore Phase</b></p>		
Possible Solution Paths	Assessing and Advancing Questions	
<p>a) Students should find that \$30 can be earned for the trip.</p> <p>Students’ work may include a number sentence, skip counting, or a base ten block model.</p>	<p><b>Assessing Questions:</b></p> <ul style="list-style-type: none"> <li>• How do you know Tonia can earn \$30 for her trip?</li> <li>• Can you explain your work to another student?</li> </ul> <p><b>Advancing Questions:</b></p> <ul style="list-style-type: none"> <li>• How could you represent this problem with base ten blocks?</li> <li>• How much can she save each month in allowance? How many months is Tonia working?</li> <li>• How can you quickly add tens?</li> <li>• Can you explain the pattern from month to month?</li> <li>• Can you extend the pattern to show a total for 5 months?</li> <li>• What math symbol could you use to show how to put these numbers in a math sentence?</li> </ul>	
<p>b) Students should state that Tonia is correct.</p> <p>Possible explanations include that the 3 months</p>	<p><b>Assessing Questions:</b></p> <ul style="list-style-type: none"> <li>• Why did you decide to add \$30 and \$38?</li> <li>• Can you write a number sentence for the total</li> </ul>	

<p>earnings total \$30, so combining this amount with the \$38 Tonia started with, the new total is \$68.</p> <p style="text-align: center;"> <math>\\$30 + \\$38 = \\$68</math>  OR  <math>\\$10 + \\$10 + \\$10 + \\$38 = \\$68</math> </p> <p>Since Thomas said she would have \$48, he is incorrect.</p>	<p>amount of money Tonia will have for her trip?</p> <ul style="list-style-type: none"> <li>Can you explain what each number in the number sentence represents?</li> </ul> <p><b>Advancing Questions:</b></p> <ul style="list-style-type: none"> <li>How much money does Tonia start with?</li> <li>From part a), how much allowance can she save?</li> <li>How would you combine those values to see how much money she would have?</li> <li>What math symbol could you use to show how to put these numbers in a math sentence?</li> </ul>
<p><b>Possible Student Misconceptions</b></p>	<p><b>Assessing and Advancing Questions</b></p>
<p>a) Students claim that the total amount earned is \$10, not recognizing that this amount is earned for each of the 3 months (<math>\\$10 + \\$10 + \\$10 = \\$30</math>).</p> <p>Note that this would result in an error in part b) of students solving by adding \$38 and \$10 for the total of \$48.</p>	<ul style="list-style-type: none"> <li>Is your total reasonable for 1 month?</li> <li>Is your total reasonable for 3 months?</li> <li>How can you draw or use manipulatives to show an amount for each month?</li> <li>What does the \$38 represent in the problem?</li> <li>What does the \$10 represent in the problem?</li> <li>How many months does Tonia earn money?</li> </ul>
<p><b>Entry/Extensions</b></p>	<p><b>Assessing and Advancing Questions</b></p>
<p>If students can't get started....</p>	<ul style="list-style-type: none"> <li>What is the problem asking?</li> <li>What does the \$10 represent in the problem?</li> <li>How many months does Tonia earn money?</li> <li>What does the \$38 represent?</li> <li>What math symbol could you use to show how to put these numbers in a math sentence?</li> <li>Can you model the numbers and solve the problem using drawings, hundred chart, or base ten blocks?</li> </ul>
<p>If students finish early....</p>	<ul style="list-style-type: none"> <li>Can you use a different strategy to show how much money she will have for the trip?</li> <li>Can you use math symbols to compare Thomas's and Tonia's totals?</li> <li>How much money would she have for her trip if she had five months?</li> </ul>
<p><b>Discuss/Analyze</b></p>	
<p><b>Whole Group Questions</b></p>	
<p><b>When adding two-digit numbers, a strong understanding of place value is fundamental.</b></p> <ul style="list-style-type: none"> <li>Can you explain why the digit in the ones place didn't change?</li> <li>When adding 38 and 30, which two digits did you add together? In your resulting answer, did you your ones place change?</li> <li>Can you describe the process for adding any 2 two-digit numbers?</li> </ul> <p><b>Mathematical explanations can be given using words, objects, pictures, numbers, or equations.</b></p> <ul style="list-style-type: none"> <li>Since one of the essential understandings of this task (and arc) pertains to the variety and richness of possible mathematical explanations, the whole group discussion should highlight different strategies used to solve the problem and to explain reasoning.</li> <li>What are some different equations that can represent the total in this problem?</li> </ul>	

### Task 3: Crayon Box

Mrs. Shrum places 49 crayons on the art table for the class to use. Next, she opens a box of 16 crayons. Jessie claims there are 55 crayons altogether. Luis claims there are 65 crayons.

a) Who is correct? Use pictures, numbers, or words to explain.

b) What mistake did the other student make in solving for the total?






<b>Task 3: Crayon Box</b>		<b>1<sup>st</sup> Grade</b>
<p>Mrs. Shrum places 49 crayons on the art table for the class to use. Next, she opens a box of 16 crayons. Jessie claims there are 55 crayons altogether. Luis claims there are 65 crayons.</p> <p>a) Who is correct? Use pictures, numbers, or words to explain.</p> <p>b) What mistake did the other student make in solving for the total?</p>		
<b>Teacher Notes:</b>		
Encourage students to write an addition equation to show the mistake in part b.		
<b>Tennessee State Standards for Mathematical Content</b>	<b>Tennessee State Standards for Mathematical Practice</b>	
<p><b>1.NBT.C.4</b> Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.</p>	<ol style="list-style-type: none"> <li>1. Make sense of problems and persevere in solving them.</li> <li>2. Reason abstractly and quantitatively.</li> <li>3. Construct viable arguments and critique the reasoning of others.</li> <li>4. Model with mathematics.</li> <li>5. Use appropriate tools strategically.</li> <li>6. Attend to precision.</li> <li>7. Look for and make use of structure.</li> <li>8. Look for and express regularity in repeated reasoning.</li> </ol>	
<b>Essential Understandings:</b>		
<ul style="list-style-type: none"> <li>• When adding two-digit numbers, a strong understanding of place value is fundamental.</li> <li>• Mathematical explanations can be given using words, objects, pictures, numbers, or operations.</li> </ul>		
<b>Explore Phase</b>		
<b>Possible Solution Paths</b>	<b>Assessing and Advancing Questions</b>	
<p>a) Students note that Luis is correct.</p> <p>Students' explanations should include the use of pictures, numbers, or words to show the total number of crayons to be 65, Luis' answer. For example, a drawing of a group of 16 added to a group of 49, for a total of 65.</p>	<p><b>Assessing Questions:</b></p> <ul style="list-style-type: none"> <li>• Can you explain your work to another student?</li> <li>• How did you know when to regroup?</li> <li>• Why did you use this strategy?</li> <li>• How did you know to use addition?</li> </ul> <p><b>Advancing Questions:</b></p> <ul style="list-style-type: none"> <li>• How many crayons were on the table? Can you model this number with a drawing?</li> <li>• How many more crayons did the teacher put on the table? Can you draw those additional crayons?</li> <li>• How many total crayons are on the table in your drawing?</li> <li>• Is there another way to group these numbers to show the same amount?</li> <li>• Can you write the number sentence used to find the total number of crayons?</li> </ul>	
<p>b) Students use pictures, numbers, or words to show that Jessie did not compose a ten correctly, only added the ones column, perhaps even noting there was an additional ten created when doing so, but</p>	<p><b>Assessing Questions:</b></p> <ul style="list-style-type: none"> <li>• What is the difference in Luis's answer and Jessie's answer?</li> <li>• Can you explain your work to another student to</li> </ul>	

<p>failing to include that ten in the total, making 55 instead of 65.</p>	<p>show how you solved for the total?</p> <p><b>Advancing Questions:</b></p> <ul style="list-style-type: none"> <li>• When you add the ones, how many ones do you have? Are there enough to compose a 10?</li> <li>• Would the total change if the numbers were 50 and 15?</li> </ul>
<p><b>Possible Student Misconceptions</b></p>	<p><b>Assessing and Advancing Questions</b></p> <ul style="list-style-type: none"> <li>• How many ones do you need to regroup?</li> <li>• How could you model this problem?</li> <li>• Does it make sense to only have 55 when a box of 16 was added to the 49 you already have?</li> <li>• Can you explain how the number 55 changes when you add 1? When you add 10?</li> </ul>
<p>Students do not have a clear understanding of the structure of the number system, resulting in addition errors.</p>	<p><b>Assessing and Advancing Questions</b></p> <ul style="list-style-type: none"> <li>• How many ones do you need to regroup?</li> <li>• How could you model this problem?</li> <li>• Does it make sense to only have 55 when a box of 16 was added to the 49 you already have?</li> <li>• Can you explain how the number 55 changes when you add 1? When you add 10?</li> </ul>
<p><b>Entry/Extensions</b></p>	<p><b>Assessing and Advancing Questions</b></p>
<p>If students can't get started....</p>	<ul style="list-style-type: none"> <li>• What does the 49 represent in the problem? Can you model that with base ten blocks?</li> <li>• What does the 16 represent in the problem? Can you model that with base ten blocks?</li> <li>• Can you combine your base ten blocks? How many units do you have? Can you regroup your units in a different way?</li> <li>• How many total base ten blocks do you have?</li> </ul>
<p>If students finish early....</p>	<ul style="list-style-type: none"> <li>• If you add another box of 16 crayons, how many would you have?</li> <li>• If you have 49 crayons and added 11 more, how many would you have? 21 more?</li> </ul>
<p><b>Discuss/Analyze</b></p>	
<p><b>Whole Group Questions</b></p>	
<p><b>When adding two-digit numbers, a strong understanding of place value is fundamental.</b></p> <ul style="list-style-type: none"> <li>• What is the value of each digit in the numbers in this problem?</li> <li>• Did anyone decompose/break apart the numbers to solve this problem? If so, how?</li> <li>• When adding 49 and 16, which two digits did you add together first? What did you do when you got 15 ones?</li> <li>• When adding the tens places, how did you get 6 tens?</li> <li>• Can you describe a process for adding any 2 two-digit numbers?</li> <li>• What would happen if the tens were added before the ones?</li> </ul> <p><b>Mathematical explanations can be given using words, objects, pictures, numbers, or equations.</b></p> <ul style="list-style-type: none"> <li>• Since one of the essential understandings of this task (and arc) pertains to the variety and richness of possible mathematical explanations, the whole group discussion should highlight different strategies used to solve the problem and to explain reasoning.</li> <li>• Can you write the number sentence used to find the total number of crayons?</li> </ul>	



Tennessee Department of Education: Lesson Guide 4

Task 4: Hardware Store		1 <sup>st</sup> Grade
<p>Thomas would like to buy two items from Winningham’s Hardware Store. He is not allowed to spend more than \$75 dollars.</p>		
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>\$54</p> </div> <div style="text-align: center;">  <p>\$26</p> </div> <div style="text-align: center;">  <p>\$48</p> </div> </div>		
<p>a) Which two items can Thomas buy? Show your work to support your answer.</p> <p>b) Are there two items that would cost exactly \$90? Explain your answer using words or numbers.</p>		
Teacher Notes:		
<p>A brief review of money should take place prior to this task, emphasizing that the dollar sign does not change place value.</p>		
Tennessee State Standards for Mathematical Content	Tennessee State Standards for Mathematical Practice	
<p><b>1.NBT.C.4</b> Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.</p>	<ol style="list-style-type: none"> <li>1. Make sense of problems and persevere in solving them.</li> <li>2. Reason abstractly and quantitatively.</li> <li>3. Construct viable arguments and critique the reasoning of others.</li> <li>4. Model with mathematics.</li> <li>5. Use appropriate tools strategically.</li> <li>6. Attend to precision.</li> <li>7. Look for and make use of structure.</li> <li>8. Look for and express regularity in repeated reasoning.</li> </ol>	
Essential Understandings:		
<ul style="list-style-type: none"> <li>• When adding two-digit numbers, a strong understanding of place value is fundamental.</li> <li>• Mathematical explanations can be given using words, objects, pictures, numbers, or equations.</li> </ul>		
Explore Phase		
Possible Solution Paths	Assessing and Advancing Questions	
<p>a) Students claim that Thomas can buy the watering can and hard hat since the total is \$74.</p> <p>Students should have checked hard hat/binoculars (\$102) and watering can/binoculars (\$80) and notice that Thomas did not have enough money for either of those combinations.</p>	<p><b>Assessing Questions:</b></p> <ul style="list-style-type: none"> <li>• What did you have to do to find out what he could afford to buy?</li> <li>• Is this the only combination of items that will work?</li> <li>• Could you write equations for the combinations of items?</li> </ul> <p><b>Advancing Questions:</b></p> <ul style="list-style-type: none"> <li>• How much money can you spend?</li> <li>• How can you find out which two items you can buy without spending more than \$75?</li> <li>• Did Thomas have enough money to buy binoculars and a watering can? Can you check other combinations?</li> </ul>	

<p><b>b)</b> Students create combinations using words or numbers of two items to show that there is no way to spend exactly \$90. When putting two items together, you either spend less than \$90 or more than \$90, and the only time you have a sum ending in 0 is when the total is \$80.</p> <p style="text-align: center;">Combinations include:  <math>\\$54 + \\$26 = \\$80</math>  <math>\\$54 + \\$48 = \\$102</math>  <math>\\$48 + \\$26 = \\$74</math></p>	<p><b>Assessing Questions:</b></p> <ul style="list-style-type: none"> <li>• What steps were necessary to solve this part?</li> <li>• Could you write equations for the combinations of items?</li> </ul> <p><b>Advancing Questions:</b></p> <ul style="list-style-type: none"> <li>• Does it cost \$90 to buy binoculars and a watering can? Can you check other combinations?</li> <li>• How do you know you have all the combinations?</li> </ul>
<p><b>Possible Student Misconceptions</b></p>	<p><b>Assessing and Advancing Questions</b></p>
<p>Students do not regroup, which could lead them to say that Thomas could buy the watering can and binoculars, i.e., make the following error:</p> $\begin{array}{r} \$54 \\ + \$26 \\ \hline \$70 \end{array} \quad \text{or} \quad \$54 + \$26 = \$70$	<ul style="list-style-type: none"> <li>• Which digits should you add first?</li> <li>• Since we had 6 ones and 4 ones, how can the ones places total zero?</li> <li>• What is the sum of the ones?</li> <li>• When using base ten blocks, how can you make a trade when you have ten ones? Can you model this with base ten blocks?</li> <li>• What are the values of the 5 and 2 in the problem?</li> <li>• What is the sum of 50 and 20?</li> </ul>
<p><b>Entry/Extensions</b></p>	<p><b>Assessing and Advancing Questions</b></p>
<p>If students can't get started....</p>	<ul style="list-style-type: none"> <li>• What is something you know about the problem?</li> <li>• Can you model the value of each item using base ten blocks?</li> <li>• Which operation would help you to solve parts a) and b)?</li> </ul>
<p>If students finish early....</p>	<ul style="list-style-type: none"> <li>• How much money would you need to buy all 3 items?</li> <li>• Can you give me how you would use subtraction to show how much more the hard hat costs than the watering can?</li> </ul>
<p><b>Discuss/Analyze</b></p>	
<p><b>Whole Group Questions</b></p>	
<p><b>When adding two-digit numbers, a strong understanding of place value is fundamental.</b></p> <ul style="list-style-type: none"> <li>• How did you add \$54 and \$48? Did anyone do it differently?</li> <li>• When adding the tens places, how did you get 10 tens?</li> <li>• How did adding the ones place affect the tens place?</li> </ul> <p><b>Mathematical explanations can be given using words, objects, pictures, numbers, or equations.</b></p> <ul style="list-style-type: none"> <li>• Since one of the essential understandings of this task (and arc) pertains to the variety and richness of possible mathematical explanations, the whole group discussion should highlight different strategies used to solve the problem and to explain reasoning.</li> <li>• What are some different equations that can represent the total in this problem?</li> <li>• What were some different strategies used to find the totals of the items?</li> </ul>	

Name \_\_\_\_\_

### Task 5: Fun with Tens

1. Jackson found 78 Easter eggs during the hunt. Jackson collected 10 more to fill his basket to the top. How many eggs did he find? Write an equation and explain how you solved the problem.

2.

a) Complete this section of a hundred chart:

	45	
54	55	

b) What number is 10 less than the smallest number on the chart?

c) What number is 10 more than the largest number on the chart?

**Task 5: Fun with Tens**

1. Jackson found 78 Easter eggs during the hunt. Jackson collected 10 more to fill his basket to the top. How many eggs did he find? Write an equation and explain how you solved the problem.

2.

a) Complete this section of a hundred chart:

	45	
54	55	

b) What number is 10 less than the smallest number on the chart?

c) What number is 10 more than the largest number on the chart?

**Teacher Notes:**

Beginning with task 5, the term “equation” will be used rather than “number sentence.” Teachers may need to interchange the two terms during class discussion.

Tennessee State Standards for Mathematical Content	Tennessee State Standards for Mathematical Practice
<p><b>1.NBT.C.5</b> Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.</p>	<ol style="list-style-type: none"> <li>1. Make sense of problems and persevere in solving them.</li> <li>2. Reason abstractly and quantitatively.</li> <li>3. Construct viable arguments and critique the reasoning of others.</li> <li>4. Model with mathematics.</li> <li>5. Use appropriate tools strategically.</li> <li>6. Attend to precision.</li> <li>7. Look for and make use of structure.</li> <li>8. Look for and express regularity in repeated reasoning.</li> </ol>

**Essential Understandings:**

- Ten more than a number increases the tens digit by one.
- Ten less than a number decreases the tens digit by one.
- Mathematical explanations can be given using words, objects, pictures, numbers, or equations.

**Explore Phase**

Possible Solution Paths	Assessing and Advancing Questions						
<p>1. Students claim Jason has 88 eggs in all. They then write the equation <math>78 + 10 = 88</math> eggs and explain that they only need to add the tens.</p> <p>Students might use a base ten model or drawing to facilitate writing the equation.</p>	<p><b>Assessing Questions:</b></p> <ul style="list-style-type: none"> <li>• Which numbers did you add to find the sum?</li> </ul> <p><b>Advancing Questions:</b></p> <ul style="list-style-type: none"> <li>• How many tens and ones do you have?</li> <li>• Could you model this with base ten blocks?</li> <li>• Can you circle the part that represents how many eggs Jackson added to his basket?</li> </ul>						
<p>2a) Students should complete chart as follows:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>44</td> <td>45</td> <td>46</td> </tr> <tr> <td>54</td> <td>55</td> <td>56</td> </tr> </table>	44	45	46	54	55	56	<p><b>Assessing Questions:</b></p> <ul style="list-style-type: none"> <li>• How did you think about this problem?</li> <li>• Which empty space did you fill first? Why?</li> </ul> <p><b>Advancing Questions</b></p> <ul style="list-style-type: none"> <li>• What is the relationship between the 45 and the 55 in the chart? How can you use that to fill in the space above the 54?</li> </ul>
44	45	46					
54	55	56					

	<ul style="list-style-type: none"> <li>What is the relationship between the 54 and the 55 in the chart? How can you use that to fill in the space to the right of the 55?</li> </ul>
<p><b>2b)</b> Students should recognize that 10 less than the smallest number is 35.</p> <p><b>2c)</b> Students should recognize that 10 more than the largest number is 66.</p>	<p><b>Assessing Questions:</b></p> <ul style="list-style-type: none"> <li>How did you think about this problem?</li> </ul> <p><b>Advancing Questions:</b></p> <ul style="list-style-type: none"> <li>What is the smallest number on the chart? (largest?)</li> <li>What is the relationship between the 45 and the 55 in the chart? How can you use this to find the number 10 less than the smallest number in the chart? (or 10 more than the largest number in the chart?)</li> </ul>
<b>Possible Student Misconceptions</b>	<b>Assessing and Advancing Questions</b>
Students do not have a clear understanding of the structure of the number system.	<ul style="list-style-type: none"> <li>How could you model this problem?</li> <li>Can you explain how the number 55 changes when you add 1? When you add 10? (subtract?)</li> </ul>
<b>Entry/Extensions</b>	<b>Assessing and Advancing Questions</b>
If students can't get started....	<ul style="list-style-type: none"> <li>What is the problem asking you to do?</li> <li>Can you think about a hundred chart to help you begin?</li> <li>Can you show me how many tens Jason found?</li> <li>Can you explain how the number 78 changes when you add 10?</li> </ul>
If students finish early....	<ul style="list-style-type: none"> <li>Can you use a different strategy to show Jason's total eggs?</li> <li>Would the ones place have changed if he added 14 eggs to the basket?</li> <li>What numbers would be in the chart if we added three more spaces above and below?</li> <li>What method could you write down to explain how to continue the pattern going down in any column?</li> <li>Can you explain how you know when a number is ten more or ten less?</li> </ul>
<b>Discuss/Analyze</b>	
<b>Whole Group Questions</b>	
<p><b>Ten more than a number increases the tens digit by one.</b></p> <p><b>Ten less than a number decreases the tens digit by one.</b></p> <ul style="list-style-type: none"> <li>Why didn't the ones place change when adding Jason's new eggs to his basket?</li> <li>What do you notice about the patterns you see in the chart?</li> </ul> <p><b>Mathematical explanations can be given using words, objects, pictures, numbers, or equations.</b></p> <ul style="list-style-type: none"> <li>Since one of the essential understandings of this task (and arc) pertains to the variety and richness of possible mathematical explanations, the whole group discussion should highlight different strategies used to solve the problem and to explain reasoning.</li> <li>What are some different strategies you used to solve this problem?</li> </ul>	



Name \_\_\_\_\_

### Task 6: Valentine Cookies

Sofia is planning for her Valentine's Day Party. She and her friends need 60 cookies for the party. Only 3 friends come to help her bake. Each person will bake 10 cookies.

a) How many cookies will get baked? Explain your answer and write an equation.

b) How many cookies will not get baked? Explain your answer and write an equation.

Task 6: Valentine Cookies		1 <sup>st</sup> Grade
<p>Sofia is planning for her Valentine’s Day Party. She and her friends need 60 cookies for the party. Only 3 friends come to help her bake. Each person will bake 10 cookies.</p> <p>a) How many cookies will get baked? Explain your answer and write an equation.</p> <p>b) How many cookies will not get baked? Explain your answer and write an equation.</p>		
<b>Teacher Notes:</b>		
<p>During whole group discussion, teacher should highlight the relationship between subtraction and addition. Note that the standard in this task references explaining student reasoning. Teachers may need to prompt any students who struggle with explanations for equations and/or models during small group work as well as whole group discussion.</p>		
Tennessee State Standards for Mathematical Content	Tennessee State Standards for Mathematical Practice	
<p><b>1.NBT.C.6</b> Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.</p>	<ol style="list-style-type: none"> <li>1. Make sense of problems and persevere in solving them.</li> <li>2. Reason abstractly and quantitatively.</li> <li>3. Construct viable arguments and critique the reasoning of others.</li> <li>4. Model with mathematics.</li> <li>5. Use appropriate tools strategically.</li> <li>6. Attend to precision.</li> <li>7. Look for and make use of structure.</li> <li>8. Look for and express regularity in repeated reasoning.</li> </ol>	
<b>Essential Understandings:</b>		
<ul style="list-style-type: none"> <li>• When subtracting tens from a two-digit number, only the tens digit changes.</li> <li>• Part-part-whole relationships can be expressed by using equations like <math>a+b=c</math>, <math>c-b=a</math>, where <math>a</math> and <math>b</math> are the parts and <math>c</math> is the whole.</li> <li>• Mathematical explanations can be given using words, objects, pictures, numbers, or equations.</li> </ul>		
<b>Explore Phase</b>		
Possible Solution Paths	Assessing and Advancing Questions	
<p><b>a)</b> Sofia and three friends each baked 10 cookies for a total of 40. Students write the equation <math>10+10+10+10=40</math>.</p>	<p><b>Assessing Questions:</b></p> <ul style="list-style-type: none"> <li>• Why did you choose to have 4 tens?</li> <li>• How did you know to add?</li> </ul> <p><b>Advancing Questions:</b></p> <ul style="list-style-type: none"> <li>• How many people were baking cookies? How many cookies were each of them baking?</li> <li>• What math symbol is used to combine numbers?</li> </ul>	
<p><b>b)</b> Students explain that they subtracted the number of cookies that were baked from the number they needed for the party to see that 20 will not get baked. Students write the equation <math>60-40=20</math>.</p>	<p><b>Assessing Questions:</b></p> <ul style="list-style-type: none"> <li>• How did you know to subtract?</li> </ul> <p><b>Advancing Questions:</b></p> <ul style="list-style-type: none"> <li>• How many cookies were baked by Sofia and her friends?</li> <li>• How many cookies were needed?</li> <li>• What math symbol is used to find the difference between two numbers?</li> </ul>	

Possible Student Misconceptions	Assessing and Advancing Questions
<p>a) Students omit Sofia’s cookies and solve using only the three friends, which results in the equation <math>10+10+10=30</math>.</p>	<ul style="list-style-type: none"> <li>• Who is having a Valentine’s Day party?</li> <li>• Can you underline the sentence that states who will bake cookies?</li> <li>• How many total people are baking cookies in the problem?</li> </ul>
Entry/Extensions	Assessing and Advancing Questions
<p>If students can’t get started....</p>	<ul style="list-style-type: none"> <li>• What do you know about the problem?</li> <li>• What do the numbers represent?</li> <li>• How many cookies are needed for the party?</li> <li>• How many cookies will each person bake?</li> <li>• How many people are baking cookies?</li> <li>• Can you use a model to solve this problem?</li> </ul>
<p>If students finish early....</p>	<ul style="list-style-type: none"> <li>• How many people would you need to bake all 60 cookies?</li> <li>• If Sofia and her three friends baked 20 cookies each, how many cookies will they have for the party?</li> </ul>
Discuss/Analyze	
Whole Group Questions	
<p><b>When subtracting tens from a two-digit number, only the tens digit changes.</b></p> <ul style="list-style-type: none"> <li>• What do you notice about the ones place value in the problem and solution?</li> <li>• What pattern do you use when you are making a number that is 10 less?</li> </ul> <p><b>Part-part-whole relationships can be expressed by using equations like <math>a+b=c</math>, <math>c-b=a</math>, where <math>a</math> and <math>b</math> are the parts and <math>c</math> is the whole.</b></p> <ul style="list-style-type: none"> <li>• Some of you used addition and some used subtraction to solve this task. How can that be?</li> <li>• How can you check to see that your addition (subtraction) is correct?</li> </ul> <p><b>Mathematical explanations can be given using words, objects, pictures, numbers, or equations.</b></p> <ul style="list-style-type: none"> <li>• Since one of the essential understandings of this task (and arc) pertains to the variety and richness of possible mathematical explanations, the whole group discussion should highlight different strategies used to solve the problem and to explain reasoning.</li> <li>• What are some different strategies you used to solve this problem?</li> </ul>	



Task 7: Pencil Task		1 <sup>st</sup> Grade
<p>Hunter has 80¢ to spend on pencils. Each pencil costs 10¢.</p> <p>a) If Hunter buys 1 pencil, how much money will he have left? Explain your answer.</p> <p>b) Write an equation to show how could you check your answer for part a).</p> <p>c) If Hunter buys 5 more pencils, how much money will he have left? Explain your answer.</p> <p>d) Taylor wants to buy one of the 6 pencils Hunter just bought. If he sells it to her for 10¢, how much money will he have?</p>		
<p><b>Teacher Notes:</b></p>		
<p>“Cents” denotes the tenths and hundredths place, but since all of the values in this task are less than one dollar, whole numbers (with the ‘cent’ symbol) are used rather than decimal places. During whole group discussion, the teacher should highlight the relationship between subtraction and addition. Note that both standards in this task reference student reasoning. After the previous six tasks students should have an understanding of what constitutes a valid explanation for their answer. Teachers may need to prompt any students who still struggle with explanations for equations and/or models during small group work.</p>		
<p><b>Tennessee State Standards for Mathematical Content</b></p>	<p><b>Tennessee State Standards for Mathematical Practice</b></p>	
<p><b>1.NBT.C.5</b> Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.</p> <p><b>1.NBT.C.6</b> Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.</p>	<ol style="list-style-type: none"> <li>1. Make sense of problems and persevere in solving them.</li> <li>2. Reason abstractly and quantitatively.</li> <li>3. Construct viable arguments and critique the reasoning of others.</li> <li>4. Model with mathematics.</li> <li>5. Use appropriate tools strategically.</li> <li>6. Attend to precision.</li> <li>7. Look for and make use of structure.</li> <li>8. Look for and express regularity in repeated reasoning.</li> </ol>	
<p><b>Essential Understandings:</b></p>		
<ul style="list-style-type: none"> <li>• Ten more than a number increases the tens digit by one.</li> <li>• Ten less than a number decreases the tens digit by one.</li> <li>• When subtracting tens from a two-digit number, only the tens digit changes.</li> <li>• Part-part-whole relationships can be expressed by using equations like <math>a+b=c</math>, <math>c-b=a</math>, where <math>a</math> and <math>b</math> are the parts and <math>c</math> is the whole.</li> <li>• Mathematical explanations can be given using words, objects, pictures, numbers, or equations.</li> </ul>		
<p><b>Explore Phase</b></p>		
<p><b>Possible Solution Paths</b></p>	<p><b>Assessing and Advancing Questions</b></p>	
<p><b>a)</b> Students should say Hunter will have 70¢ left.</p> <p>Students may reason that since one pencil is 10 cents, taking 10¢ away from 80¢ will leave 70¢.</p> <p>Students may show this as</p> $80-10=70.$	<p><b>Assessing Questions:</b></p> <ul style="list-style-type: none"> <li>• How did you know to subtract?</li> <li>• How did you subtract?</li> <li>• Can you explain why you wrote this equation?</li> </ul> <p><b>Advancing Questions:</b></p> <ul style="list-style-type: none"> <li>• How much does each pencil cost?</li> <li>• How many pencils does Hunter buy?</li> <li>• How much money does Hunter start with?</li> <li>• Can you use a hundred chart to help you solve this problem?</li> </ul>	

<p><b>b)</b> Students write the equation <math>70+10=80</math>.</p>	<p><b>Assessing Questions:</b></p> <ul style="list-style-type: none"> <li>• How did you know to use addition?</li> </ul> <p><b>Advancing Questions:</b></p> <ul style="list-style-type: none"> <li>• Which operation is the inverse of subtraction?</li> <li>• What operation did you use to solve part a)?</li> </ul>
<p><b>c)</b> Students may use drawings or words to indicate that 5 more pencils will cost 50¢.</p> <p>One way this can be shown is  <math>10+10+10+10+10=50</math>.</p> <p>Students should then indicate that there will be 20¢ leftover,  <math>70 - 50 = 20</math>.</p> <p>Alternately, students may combine the pencils purchased in parts a) and c), saying that  <math>80-60=20</math>.</p>	<p><b>Assessing Questions:</b></p> <ul style="list-style-type: none"> <li>• How did you know how much money Hunter spent?</li> <li>• Can you explain how you found the amount of money Hunter had left?</li> <li>• What do the numbers in the problem represent?</li> </ul> <p><b>Advancing Questions:</b></p> <ul style="list-style-type: none"> <li>• How much does each pencil cost?</li> <li>• How many pencils does Hunter buy?</li> <li>• How much money does Hunter have to start with?</li> <li>• Can you use a hundred chart to help you solve this problem?</li> </ul>
<p><b>d)</b> Students should note that Hunter had 20¢ remaining after buying 6 pencils in part b). They should indicate that selling one pencil means that <math>20+10=30</math>, so he will have 30¢.</p>	<p><b>Assessing Questions:</b></p> <ul style="list-style-type: none"> <li>• How did you know to add?</li> <li>• How did you add?</li> </ul> <p><b>Advancing Questions:</b></p> <ul style="list-style-type: none"> <li>• How much does each pencil cost?</li> <li>• How much money does Hunter have after buying 6 pencils?</li> <li>• Can you use a hundred chart to help you solve this problem?</li> </ul>
<p><b>Possible Student Misconceptions</b></p>	<p><b>Assessing and Advancing Questions</b></p>
<p><b>b)</b> Students refer to the number of pencils instead of the cost of 6 pencils, using the total of 6, not 60.</p>	<ul style="list-style-type: none"> <li>• Can you tell me what your answer represents?</li> <li>• How much does each pencil cost?</li> <li>• Does your answer make sense?</li> <li>• How many pencils did he buy?</li> <li>• What steps did you take to solve this problem?</li> <li>• Could you use a drawing to help you solve this problem?</li> </ul>
<p><b>Entry/Extensions</b></p>	<p><b>Assessing and Advancing Questions</b></p>
<p>If students can't get started....</p>	<ul style="list-style-type: none"> <li>• What do the numbers represent in the problem?</li> <li>• How much does it cost Hunter to buy 1 pencil?</li> <li>• If you draw pencils, what number would each have on it?</li> </ul>
<p>If students finish early....</p>	<ul style="list-style-type: none"> <li>• How many dimes represent one dollar?</li> <li>• How many nickels does it take to make 80 cents?</li> <li>• How many more pencils can Hunter buy if he has \$1?</li> <li>• Which is the most efficient way to count to 80?</li> </ul>

## Discuss/Analyze

### Whole Group Questions

**Ten more than a number increases the tens digit by one.**

**Ten less than a number decreases the tens digit by one.**

- Why didn't the ones place change when subtracting the cost of the pencils?
- What do you notice about the patterns in the tens place?

**When subtracting tens from a two-digit number, only the tens digit changes.**

- What do you notice about the ones place value in the problem and solution?

**Part-part-whole relationships can be expressed by using equations like  $a+b=c$ ,  $c-b=a$ , where  $a$  and  $b$  are the parts and  $c$  is the whole.**

- What are some of the different ways to represent these solutions?
- How can you check to see that your subtraction is correct?
- How are addition and subtraction related?

**Mathematical explanations can be given using words, objects, pictures, numbers, or equations.**

- Since one of the essential understandings of this task (and arc) pertains to the variety and richness of possible mathematical explanations, the whole group discussion should highlight different strategies used to solve the problem and to explain reasoning.
- What are some different strategies you used to solve this problem?