Tennessee Department of Education:

TNCore

Task: Darron's Calculator	**2nd Grade**
Darron's calculator is broken. It doesn't always add correctly. He has difficulty deciding if a problem is done correctly. He added 43 + 113. His calculator showed a sum of 543. Do you agree? Explain your answer in words.	
Teacher Comments: • Students' understanding of addition enhances when they have opportunities to think about and model it in various ways. • Although it is easy to show students how we picture a situation, we learn a great deal about how they understand the quantities and operations involved in the situation when they create their own representations of problems (Quintera, 1986). • This activity is designed to allow students the opportunity to work with addition and rounding numbers. It also gives them practice at checking an answer to see if it makes sense.	
Common Core State Standards for Mathematical Content	**Common Core State Standards for Mathematical Practice**
2.NBT.B.7 Add and subtract within 1000, 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. Understand that in adding or subtracting three digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds. 2.NBT.A.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases: a. 100 can be thought of as a bundle of ten tens — called a "hundred." b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).	1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct a viable argument 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.
Essential Understandings/NCTM Resources	
• Many different problem situations can be represented by part-part-whole relationships and addition or subtraction. • The value of a digit in a written numeral depends on its place, or position, in a number. • Part-part-whole relationships can be expressed by using number sentences like a+b=c or c – b = a, where a and b are the parts and c is the whole. • The commutative and associative properties for addition of whole numbers allow computations to be performed flexibly. • Place-value concepts provide a convenient way to compose and decompose numbers to facilitate addition and subtraction computations. • Properties of addition are central in justifying the correctness of computational algorithms.	

Explore Phase	
Possible Solution Paths	**Assessing and Advancing Questions**
I disagree, because one number is less than 50 and one is just a little greater than 100, so together they must be smaller than 200. 200 is a lot less than 543, so his calculator is not working.	Assessing Questions: • Tell me about the numbers you're adding. • How do you know that one number is less than 50 and one is greater than 100? Advancing Questions: • Can you use mental math to solve this? • Can you use these numbers in a different way to see if you get the same answer? • Can you show your thinking using a number line, or a part, part, whole diagram? • What if the calculator showed a sum of 443, how would that change things?
I disagree, if you add the two numbers yourself without a calculator you get 43+ 113= 156 and that's not what the calculator got, so it's not working.	Assessing Questions: • Tell me about the numbers you're adding. • Show me how you added the numbers together. • Is there a way you can check to see if your calculations are correct? Advancing Questions: • Can you use mental math to solve this? • Can you use these numbers in a different way to see if you get the same answer? • Can you show your thinking using a number line, or a part, part, whole diagram? • What if the calculator showed a sum of 443, how would that change things?
I disagree, because I estimated using 100 + 40 and got 140 (front-end estimation) and that's not what the calculator got, so it's not working.	Assessing Questions: • Tell me about the numbers you're adding. • Why didn't you add the other parts of the numbers? Advancing Questions: • Can you use mental math to solve this? • Can you use these numbers in a different way to see if you get the same answer? • Can you show your thinking using a number line, or a part,

	part, whole diagram? • What if the calculator showed a sum of 443, how would that change things?
I disagree, if I subtract 113 from 543, I get 430 and that's not 43. So the calculator is not working.	Assessing Questions: • Tell me about the numbers you're working with. • How did you subtract 113 from 543? • Is there a way you can check to see if your calculations are correct? Advancing Questions: • Can you use mental math to solve this? • Can you use these numbers in a different way to see if you get the same answer? • Can you show your thinking using a number line, or a part, part, whole diagram? • What if the calculator showed a sum of 443, how would that change things?
I disagree, if I subtract 43 from 543, I get 500 and that's not 113. So the calculator is not working.	Assessing Questions: • Tell me about the numbers you're adding. • How did you subtract 43 from 543? • Is there a way you can check to see if your calculations are correct? Advancing Questions: • Can you use mental math to solve this? • Can you use these numbers in a different way to see if you get the same answer? • Can you show your thinking using a number line, or a part, part, whole diagram? • What if the calculator showed a sum of 443, how would that change things?
Possible Student Misconceptions	
The student adds 43+113=543. 43 + 113 543	Assessing Questions: • Tell me about the numbers you're adding. • What is 43 close to? • What is 113 close to? • If you put them together, about how much should you have?

	• Is that close to 543? Advancing Questions: • Can you add these numbers in a different way to see if you get the same answer? • Can you use mental math to solve this? • What is the value of the first '1' in 113?
Entry/Extensions	**Assessing and Advancing Questions**
If students can't get started…	Assessing Questions: • What do the digits in the problem represent? • What is the problem asking you to find? • Who can give me an idea of how to start our thinking? Advancing Questions: • Can you draw a model to represent your thinking?
If students finish early…	Extension: • Tell me what you found. • What problems did you have during your work? • What if the calculator showed a sum of 443, how would that change things?
Discuss/Analyze	
Whole Group Questions	
• What were some of the different way we found to solve this task? • Tell me something about the value of the digits in these numbers and where they are placed and how that makes a difference when you are adding these numbers. • Was anyone able to use a part, part, whole relationship to solve this task? Can you tell us about it? • We didn't all use the same equations to solve this task. Can you tell me why? How did we all get the correct answer using different equations? • Did anyone decompose the numbers to solve this task? Tell us how you decomposed the numbers and why you chose that way?	

Darron's Calculator Name _____

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