

Task: Counting Balls		Kindergarten
<p>Zanna and Sage like to play with different kinds of sports balls. Zanna has 5 tennis balls and Sage has 5 golf balls. Zanna says that she has more balls because the tennis balls are bigger. Do you think Zanna is right? Explain your answer with words and pictures. (See e below for pictorial representation of the size of the balls)</p>		
Teacher Notes:		
<p>Use of actual tennis balls and golf balls or cut outs of the attached figures as manipulatives is recommended. Conservation of number is essential to conceptual understanding of counting.</p>		
Common Core State Standards for Mathematical Content		Common Core State Standards for Mathematical Practice
<p>Count to tell the number of objects K.CC.B.4 Understand the relationship between numbers and quantities, connect counting to cardinality. K.CC.B.4a When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object. K.CC.B.4b Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted. K.CC.B.4c Understand that each successive number name refers to a quantity that is one larger. K.CC.B.5 Count to answer “how many?” questions about as many as 20 things arranged in a line, a rectangular array, or a circle or as many as 10 things in a scattered configuration; given a number from 1-20 count out that many objects.</p>		<ol style="list-style-type: none"> 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.
Essential Understandings		
<ul style="list-style-type: none"> • Counting includes one-to-one correspondence, regardless of the kind of objects in the set and the order in which they are counted. • When counting objects in a group/set, the last number stated names the total number of objects in that group/set. 		
Explore Phase		
Possible Solution Paths	Assessing and Advancing Questions	
<p>Student will count each set of balls and label or name them with the correct number. Student will then state that because there is the same number of tennis balls that there is of golf balls Zanna and Sage have the same or equal groups so Zanna’s claim is incorrect.</p>	<p><u>Assessing Question:</u> How did you decide that Zanna was not right? What strategy did you use to determine whether Zanna had more? <u>Advancing Question:</u> What would you change in the problem to make Zanna’s claim correct? Does the size of the objects make a difference in this problem? Is there another way to show /explain your answer?</p>	

<p>Student may line the balls up using one-to-one correspondence to show that the groups/sets of tennis balls and golf balls are the same. Zanna's claim is incorrect.</p>	<p><u>Assessing Question:</u> How did you know to line the balls up? Did that make it easier? Why or why not? <u>Advancing Question:</u> What would you change in the problem to make Zanna's claim correct? Does the size of the objects make a difference? Is there another way to show /explain your answer?</p>
<p>Student may use the pictorial representation to connect one tennis ball to one golf ball until all are paired and relate that the girls have the same number.</p>	<p><u>Assessing Question:</u> Tell me how you decided to draw the lines to match a tennis ball and a golf ball. Tell me how matching a tennis ball with a golf ball helped you answer the question. <u>Advancing Question:</u> If each girl had some of the tennis balls and some of the golf balls could you use the same strategy? Explain your answer.</p>
Possible Student Misconceptions	
<p>Students may think that there are more tennis balls because they are larger than the golf balls. When placed in a line, the line of tennis balls is longer than the line of golf balls so it may appear there are more. Students may count the balls in random order and count some of them more than once.</p>	<p><u>Assessing Questions:</u> Why do you think Zanna said she had more? How could you find out? <u>Advancing Question:</u> Is there a way to arrange the balls that would help you? If you move the balls around would that change your answer?</p>
Entry/Extensions	
<p>If students can't get started....</p>	<p><u>Assessing Question:</u> Why do you think Zanna said she had more balls? What can you do to see how many balls each girl has? <u>Advancing Question:</u> Is there a way to arrange the balls that would help you see if Zanna is correct?</p>
<p>If students finish early....</p>	<p>Have the students show how each girl could have an equal number of balls but a combination of both tennis balls and golf balls. Write number sentences to demonstrate their answers. If you gave each girl two more balls would they still have an equal number of balls? Write number sentences to demonstrate their answers.</p>

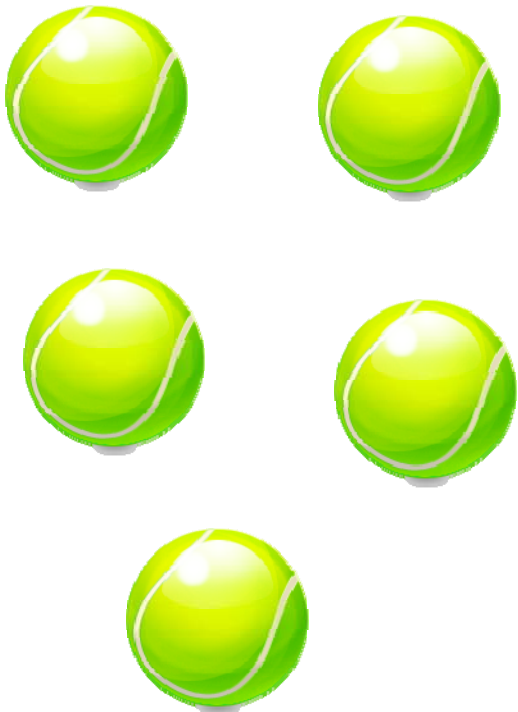
Discuss/Analyze

Whole Group Questions

- What ways did you use to count the balls?
- How were the counting strategies that we shared similar and different?
- How did you know if you had already counted a ball? How did you keep from counting it more than one time?
- Does it matter where you start when you are counting objects? Explain your answer.
- When you say the number of the last ball in a group, what does that number tell you?
- If you rearrange the balls in a group and count them again, will you get the same number? Explain your answer.
- If you are counting things in a group, does it matter if the things are different sizes? Explain your answer.

Tennis Balls and Golf Balls

Zanna's Tennis Balls



Sage's Golf Balls

