Tennis Ball Temperatures:

Problem: Does temperature affect the height that tennis balls bounce?

Hypothesis: (+3 Total) If we compare the height of the bounce of a cold ball compared to a warm ball then the (circle one) Cold Ball or Warm Ball +1 will bounce higher, because_________________________________________________________________________________+2

Materials: One room temperature tennis ball, one cold tennis ball (leave the cold tennis ball in the refrigerator/cooler until you are ready for it), and a meter stick

Procedure:
1. Place a meter stick in an upright position on your table with the 0 cm end of the meter stick touching the table.
2. Take your room temperature tennis ball and hold it next to the 100 cm mark of your meter stick.
3. Drop the ball at this height and record the height that it bounces. Do this 3 times and record the height that it bounces in the chart below. Find the average height that the ball bounced. MAKE SURE EACH TIME YOU DROP THE BALL YOU DROP IT FROM THE 100 CM MARK.
4. Return the room temperature ball and obtain a cold tennis ball. Repeat steps 1-3.
5. Graph all your results.

Data: (+4=Averages are +1 each. Round to a whole number. The ball is in motion and it is difficult to record the height to the tenths place with the level of accuracy)

<table>
<thead>
<tr>
<th>Trial</th>
<th>Warm Tennis Ball Height (cm)</th>
<th>Cold Tennis Ball Height (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

“Height of the Bounce of a Warm Vs. a Cold Tennis Ball”

Graph: (+5)

<table>
<thead>
<tr>
<th>Average Height (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
</tr>
<tr>
<td>90</td>
</tr>
<tr>
<td>80</td>
</tr>
<tr>
<td>70</td>
</tr>
<tr>
<td>60</td>
</tr>
<tr>
<td>50</td>
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<tr>
<td>40</td>
</tr>
<tr>
<td>30</td>
</tr>
<tr>
<td>20</td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

Warm  Cold

Tennis Balls
Questions: (+23)

1. What is a **hypothesis**?+2

__________________________________________________________________________________
__________________________________________________________________________________

2. What is an **independent** variable?+2

__________________________________________________________________________________
__________________________________________________________________________________

3. What is the **independent** variable in this experiment?+2

__________________________________________________________________________________
__________________________________________________________________________________

4. What is a **dependent** variable?+2

__________________________________________________________________________________
__________________________________________________________________________________

5. What is the **dependent** variable in this experiment?+2

__________________________________________________________________________________
__________________________________________________________________________________

6. What is a **controlled experiment**?+2

__________________________________________________________________________________
__________________________________________________________________________________

7. To make sure this was a **controlled experiment** what factors did we have to keep the same in this experiment?+2

__________________________________________________________________________________
__________________________________________________________________________________

8. Did the temperature of the ball affect the height to which it bounced?+2

__________________________________________________________________________________
__________________________________________________________________________________

9. Do you think it would make any difference playing tennis on a cold day versus a warm day?+2

__________________________________________________________________________________
__________________________________________________________________________________

10. Is there any part of this experiment that could be improved upon?+2

__________________________________________________________________________________
__________________________________________________________________________________

11. Fill in the conclusion Statement. Use the terms accept or reject. The averages are the numbers you should use for your data in your conclusion statement.

I __________+1 my hypothesis because the data shows that the warm tennis ball bounced _____ cm +1 and the cold tennis ball bounced ______ cm.+1