2003 TAIWAN INTERNATIONAL SCIENCE FAIR

CATEGORY：Physics

PROJECT TITLE ：The NET Result

AWARD：First Award

SCHOOL：Marlborough Girls' College

FINALISTS：Kali Maria Stratford

COUNTRY：New Zealand

THE NET RESULT

Table tennis the fastest ball sport in the world has become so fast that rallies have become very short. My investigation this year is a further study into slowing the game down. Last year I studied the effects the newly introduced 2mm larger ball had on the game. I concluded an average increase in rally length from 2.93 to 3.47 balls per rally passing the net. Although a 16% increase sounds large, it was an average of less than 1 ball per rally difference. I came up with another way to slow the game down my aim was to find out if increasing a table tennis net height will decrease spin, speed and increase control i.e. rally length and to find out what percentage extent each height level has on these factors. I wanted to be able to present a finding as to the optimum net height for the percentage increase in rally length that is desired.

First I had to make some net extensions, so I could adjust the height of the net. After many difficulties including a sagging net, I managed to design and build a successful one so I could start my investigation. I investigated increasing the height at 1cm intervals, testing speed, spin and control (rally length). I had already designed testing methods for these three aspects last year, which were very successful so I was confident they would give me accurate results.

The speed test involved two players standing close to the table hitting the ball to each other for 30 seconds as quickly as they could. I counted each time the ball passed the net, repeating this test on each of the 21 heights I tested, with both forehand and backhand rallies.

My spin test involved one player serving repeatedly to me while I held a bat still and vertical. I measured the angles of the spin and the length the ball travelled after it had hit my bat. I repeated these tests with fast and slow rubber and at each of the 21 net heights. I recorded 10 serves using each net height and with each kind of rubber, choosing only about 20% of the serves delivered to analyse, as I had to make sure they were served in exactly the same areas of the table I required each time. These were two small target areas I had marked out with chalk at each end of the table.

The control test was used to work out how long the rallies are with the net at each height. My two players had 20 rallies with 10 serves each, while I counted each time the ball passed the net, repeating the tests on each height.

After many hours testing and lots of fun, I found my hypothesis was partly correct. Increasing the net height definitely decreased speed and spin and as a result, control was increased i.e. rally length became longer. However, as the net is raised 10 cm higher than the legal height, the rally length begins to shorten. I was surprised how well my results showed an optimum height could be obtained for the increase in rally which is desired.

評 語

探討如何增長乒乓球賽，每次的時間。題目及探討方式有巧思。