Ball Bounce I
Algebraic Connections

Team Members:

_____ _____

_____ _____

1. In your group, collect the data from dropping a ball from a height of 150 centimeters.

2. After the first drop, drop the Ball from the rebound height for each successive Bounce. That is, if the ball comes back up to a height of 100 centimeters on the first bounce, which will be the height that you drop the ball from for the next bounce. Try to get as many bounces as possible.

3. Before you fill in the Average Height column, mark out the highest and lowest heights for each Bounce from the 5 Trials. This means the Average will be the sum divided by 3.

Table I

Bounce Number	Trial One Height	Trial Two Height	Trial Three Height	Trial Four Height	Trial Five Height	Average Height
0	150	150	150	150	150	150
1						
2						
3						
4						
5						
6						
7						

4. Now fill in Table II, using the Average Height from above as the Initial and Final Heights for each Bounce. Calculate the Ratio of the Heights and place it in the last column.

Table II

Bounce Number	**Initial Height (H_i)**	**Final Height (H_f)**	**Ratio = H_f , H_i**
0	150		
1			
2			
3			
4			
5			
6			
7			

5. Average the Ratio column from Table II.

   Average Ratio = _____

6. Using Graphical Analysis, TI Interactive!, Excel, or your Graphing Calculator, put the data from Table I into two lists (X-Values = Bounce Number, Y-Values = Average Height).

7. Produce a XYline graph of this data.

8. Select a Model from The Five Models web page and get the equation (ala Bubble Boy/Regression equation).

9. Produce the answers to questions 6, 7, and 8.

10. Repeat steps 6, 7, 8, and 9 using the data from Table II (X-Values = $\mathbf{H_i}$ Y-Values = $\mathbf{H_f}$).