FLINN SCIENTIFIC

Name_____

Planetary Orbits Worksheet

Data Table 1

Ellipse	String Length	Foci Separation, *f* (cm)	Major Axis, *a* (cm)	Eccentricity *f*/*a*
1	28 cm			
2	25 cm			
3	25 cm			

Data Table 2

Ellipse	A_1 (cm)	A_2 (cm)	$A_1 + A_2$ (cm)	B_1 (cm)	B_2 (cm)	$B_1 + B_2$ (cm)
1						
2						
3						

Post-Lab Calculations and Analysis

1. Calculate the eccentricity of each ellipse and record these values in Data Table 1.
2. Which ellipse has the greatest eccentricity? Which has the least eccentricity?

3. How do the orbits of the bodies listed in Table 1 of the *Background* section compare to the three ellipses constructed in this activity?

4. In terms of the definition of eccentricity, what property of the ellipse is changed when the length of the string is changed?

5. Describe the difference in eccentricity between Ellipse 2 and Ellipse 3. Note the perihelion of each "orbit." How might this explain why Pluto is sometimes closer to the Sun than Neptune?

6. Add the length of line segments A_1 and A_2 for Ellipse 1. Record the sum in Data Table 2. Do the same for line segments B_1 and B_2.
7. Complete Data Table 2 for Ellipse 2 and Ellipse 3, respectively.
8. How does the sum of line segments A_1 and A_2 compare to the sum of line segments B_1 and B_2 for each ellipse?

9. Write a definition of an ellipse that includes the results from question 8.