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 A1 and A2 compare to the sum of line segments B1 and B2 for each ellipse?
- 9. Write a definition of an ellipse that includes the results from question 8.

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