

Name: _____ Date: _____ Period: _____

Elliptical Orbits Lab

Purpose: To study the properties of ellipses and to compare the shapes of the planet's orbits.

Procedures: Work with your partner, alternating jobs . . .

1. Read the entire lab procedure sheet before beginning.
2. As you do the lab record data in the table below.
3. Use the data to answer all questions.

Data Table A

| Ellipse # | Focal Distance (cm) | Major Axis (cm) | Eccentricity $FD \div MA$ |
|-----------|---------------------|-----------------|---------------------------|
| 1 | | | ____ ÷ ____ = ____ |
| 2 | | | ____ ÷ ____ = ____ |
| 3 | | | ____ ÷ ____ = ____ |
| 4 | | | ____ ÷ ____ = ____ |

Data Analysis

1. How many foci are needed to draw an ellipse?
2. All the planet's orbits are elliptical. What is at one foci of the ellipses' of the planets?
3. What two measurements are needed to calculate eccentricity?
4. What does increasing the focal distance do to the shape of the ellipse?

Data Table B

| Planet | Eccentricity | Rank |
|---------|--------------|------|
| Mercury | 0.206 | |
| Venus | 0.007 | |
| Earth | 0.017 | |
| Mars | 0.093 | |
| Jupiter | 0.048 | |
| Saturn | 0.056 | |
| Uranus | 0.047 | |
| Neptune | 0.008 | |
| Pluto | 0.247 | |

5. Is an ellipse with a higher eccentricity number rounder or flatter?
6. Using Table B, list the planets from highest-9 to the lowest-1 eccentricity.
7. Earth's orbit is closest in shape to which ellipse that you drew?
8. Does Earth's orbital path look more like an ellipse or a circle? *Circle Answer*
9. Pluto's orbit is closest in shape to which ellipse that you drew?
10. Does Pluto's orbital path look more like an ellipse or a circle? *Circle Answer*

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