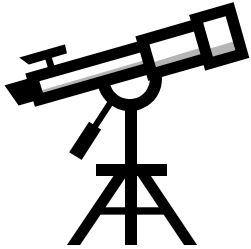


# MODELS to EXPLAIN CELESTIAL MOTIONS

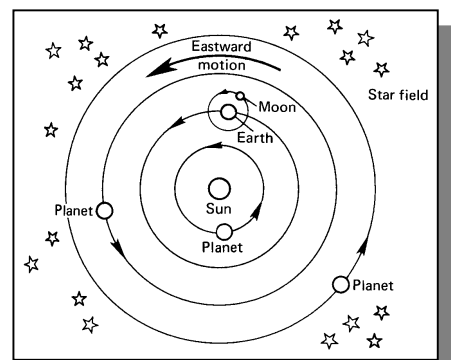
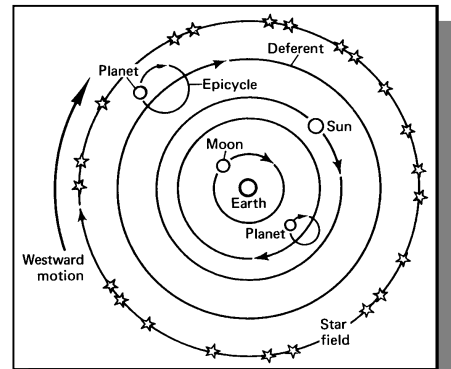
Name \_\_\_\_\_

Directions: define the following terms.

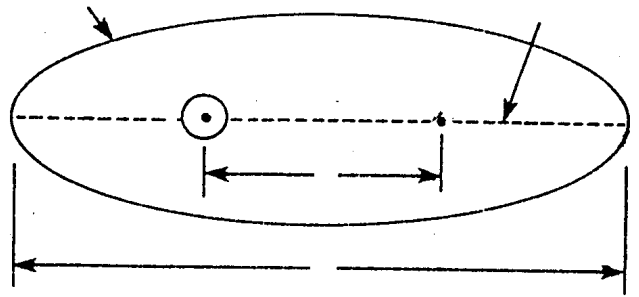
|                    |                            |               |                                                                                      |
|--------------------|----------------------------|---------------|--------------------------------------------------------------------------------------|
| geocentric model - | heliocentric model -       | ellipse -     | focus -                                                                              |
| orbital velocity - | eccentricity -             | aphelion -    | perihelion -                                                                         |
| period -           | Astronomical Unit (A.U.) - | gravitation - |  |

Directions: give the best answer to the following questions.

- At right is a model of the Solar System. This particular model is called the \_\_\_\_\_ model. This is the OLD / CURRENT model, which places the \_\_\_\_\_ at the center of the Solar System.
- Two things which cannot be explained using this model are:  
1) \_\_\_\_\_, 2) \_\_\_\_\_.
- Also, this model is particularly SIMPLE / COMPLEX.
- The next model is called the \_\_\_\_\_ model. This is the OLD / CURRENT model, which places the \_\_\_\_\_ at the center of the Solar System.
- Four things this model explains which the other model can't include:  
1) \_\_\_\_\_, 2) \_\_\_\_\_  
\_\_\_\_\_, 3) \_\_\_\_\_, 4) \_\_\_\_\_.

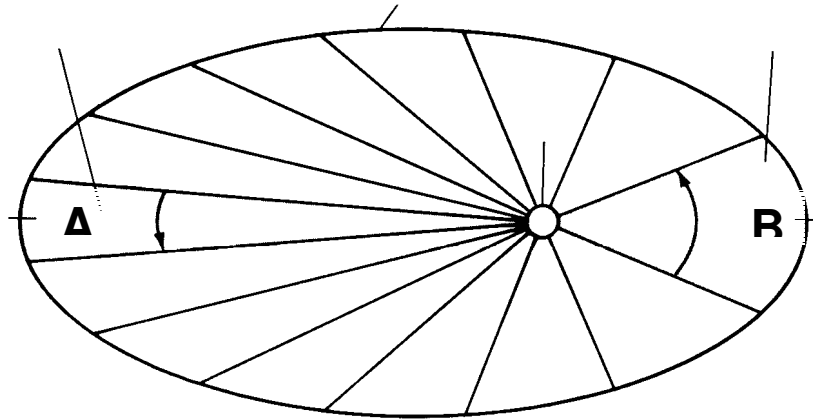


6. The diagram at right shows an \_\_\_\_\_. Label the parts.
7. Kepler's formula for eccentricity of an ellipse is:
8. For a given length (L), the greater the distance between the foci (d), the LESS / MORE eccentric the ellipse.
9. Kepler's Second Law of Planetary Motion states that



10. In the diagram at right, label the following:

1. Sun
2. planet's orbit
3. perihelion
4. aphelion
5. slowest orbital velocity
6. fastest orbital velocity
7. high kinetic energy
8. high potential energy
9. low kinetic energy
10. low potential energy
11. KE changing to PE
12. PE changing to KE



11. In this diagram, the area of sector A IS GREATER THAN / IS LESS THAN / EQUALS the area of sector B.
12. An "orbital period" of a planet is another word for its \_\_\_\_\_, which is the time the planet takes to complete one \_\_\_\_\_.
13. Keplers 3<sup>rd</sup> "Harmonic" Law states that the farther a planet is from the Sun, the \_\_\_\_\_ its orbit and the \_\_\_\_\_ its orbital period (year).
14. An Astronomical Unit(A.U.) is the average distance between the \_\_\_\_\_ and \_\_\_\_\_, and equals about \_\_\_\_\_ kilometers.
15. Newton's Universal Law of Gravitation tells us that as the masses of two objects increases, the gravitational attraction between them INCREASES / DECREASES. As their mass decreases, the gravitational force INCREASES / DECREASES.
16. As the distance between two planets increases, the gravitational attraction between them INCREASES / DECREASES. As the distance between two planets decreases, the gravitational attraction between them INCREASES / DECREASES.
17. On the Moon, you'd weigh about 1/6 what you weigh here on Earth. When on the Moon, is your mass less? \_\_\_\_
18. According to Newton's law, you weigh less on the Moon because \_\_\_\_\_.
19. According to the ESRT (p.14), the Planets with the longest years are the CLOSEST TO / FARTHEST FROM the Sun.