

Focused Discussion: Solar System Models (Scientific Models)

Leader:

Reporter:

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Purpose: To relate naked-eye observations to a geocentric and heliocentric model of the solar system.

Reflection: Which model provides a *simpler* picture for the positions of the planets?

Procedure: Attached are two blank templates for a “god’s-eye” view looking down from above of the paths of selected planets in the solar system. NOTE THAT EASTWARD IS COUNTERCLOCKWISE. In the Geocentric Model (Template 1) mark the earth at the center with a large dot and label “Earth.” In the Heliocentric Model (Template 2) mark the sun at the center with a large dot and label “Sun.” You will need to position on each model the sun and planets viewed from the earth as follows:

It is just after sunset. Mars is rising in the east. Venus is at maximum eastern elongation, 45 degrees from the sun. Jupiter is halfway between the sun and Mars in angular distance.

1. What are the angular positions of the planets, relative to the sun, along the ecliptic? Consider the sun at 0 degrees, with angles increasing *counterclockwise*.

2. Start with the Geocentric Model. Which path belongs to which planet? Place the earth on the correct path, right on the horizontal line that cuts through the center of the template. Then place Mars in its proper position, then Jupiter, and then Venus. Note that Venus must have a special position along its path. Label all the planets.

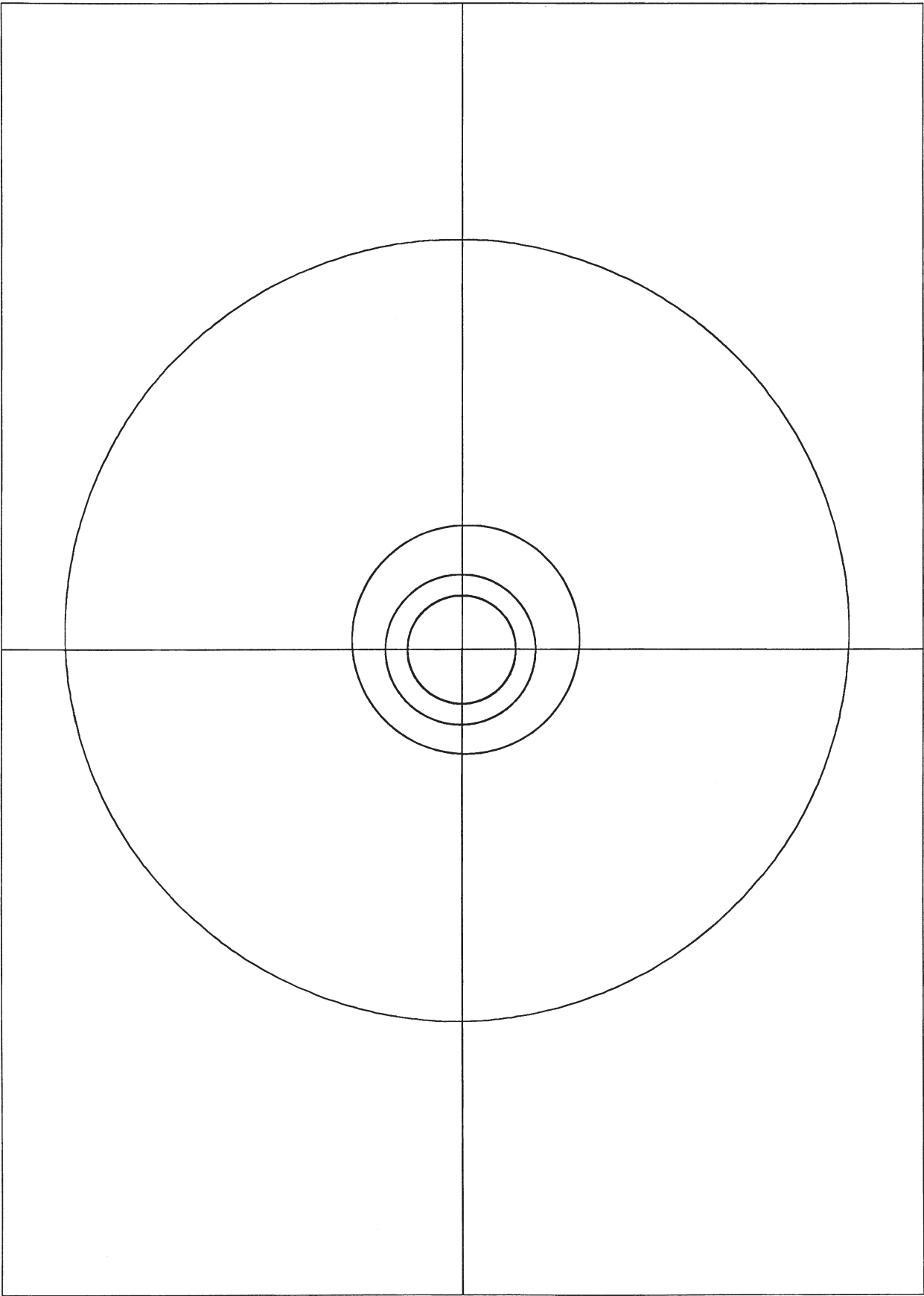
3. Now turn to the Heliocentric Model. Which path belongs to which planet? Start with the sun; place it on its path right on the horizontal line that cuts through the center of the template. Then place Mars in its proper position, then Jupiter, and then Venus.

4. Compare the figures. Which model gives a *simpler* layout of the observations? (Hint: What do you think is meant by “simpler” in this context?)

Concept Extension

If you were to stand in the center of each model, would the angular positions of the planets differ? If so, how? If not, why not?

Template 1: Geocentric Model



Template 2: Heliocentric Model

