

SOLAR SYSTEM B

Sample Performance Tasks

These are sample questions/tasks/activities that will help prepare students for the 2026 season. This list is not all-inclusive and is representative of what students may be asked on tournament exams.

- a. Given an image of a surface feature, identify the surface feature and the object it is on, estimate its age, and describe how that feature is thought to have been formed.

- b. Planet B has twice the radius and twice the mass of Planet A. What is ρ_B/ρ_A , the ratio of the densities of Planets B and A?

- c. The depth of a transit is given by $(R_{\text{planet}}/R_{\text{star}})^2$. Derive this equation and explain the assumptions it makes. If Jupiter transited the Sun, would we expect to see a transit depth closer to 0.1 or 0.01?

- d. Your friend at NASA is planning a mission to study Neptune, but they are not sure whether to power it using RTGs or solar panels. What are some of the advantages and disadvantages of each? In your opinion, which one should they choose? Explain your choice in detail.