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## PASSAGE II

The ninth planet of our solar system, Pluto, was discovered in 1930. It is the smallest planet in the solar system, with a surface area more than 300 times smaller than Earth's. Recently, Pluto's categorization as a planet has been debated. Two scientists discuss whether Pluto is a planet or another celestial object.

*Scientist 1*

Pluto is most certainly a planet. Some astronomers have suggested that Pluto be stripped of its planetary status, arguing that it is more accurately categorized as an asteroid or comet. However, with a 1,413 mile diameter, Pluto is almost 1,000 times bigger than an average comet, and it does not have a tail of dust and gas as comets do. A planet can be described as a non-moon, sun-orbiting object that does not generate nuclear fusion and is large enough to be pulled into a spherical shape by its own gravity. Strictly by definition alone, Pluto is a planet. Pluto is clearly not a moon, as it does not orbit another planet. Although Pluto's orbital path is irregular as compared with the other planets of the solar system, it undisputedly orbits the sun. Pluto does not generate heat by nuclear fission, distinguishing it from a star. It is large enough to be pulled into a spherical shape by its own gravitational force, distinguishing it from either a comet or an asteroid.

*Scientist 2*

There are many facts about Pluto suggesting that it is actually not a planet but a member of the Kuiper Belt, a group of sizable comets that orbit the sun beyond Neptune. First, Pluto is composed of icy material, as are the comets in the Kuiper Belt, while the other planets of the solar system fall into one of two categories: rocky or gaseous. The four inner planets, Mercury, Venus, Earth, and Mars are rocky planets; Jupiter, Saturn, Uranus, and Neptune are gaseous. Pluto is neither rocky nor gaseous but has an icy composition. In addition, Pluto is much too small to be a planet. It is less than half the diameter of the next smallest planet, Mercury. The Earth's moon is even larger than Pluto. Finally, the eccentricity of Pluto's orbit indicates that it is not a planet. Pluto is generally considered the ninth planet, but for twenty years of its 249 year orbit, it is actually closer to the sun than is Neptune, making it the eighth planet during that period of time. This irregular orbit is shared by over seventy Kuiper Belt comets.

6. Which of the following phrases best describes the major point of difference between the two scientists' viewpoints?
   - F. The actual location of Pluto in the solar system.
   - G. The length of Pluto's orbit.
   - H. The shape of Pluto.
   - J. The classification of Pluto as a planet.

7. According to Scientist 2's viewpoint, compared to other planets of the solar system, Pluto's surface is:
   - A. less icy.
   - B. more icy.
   - C. more gaseous.
   - D. more rocky.

8. Scientist 1's viewpoint indicates that Pluto differs from asteroids and comets in all of the following ways EXCEPT:
   - F. Pluto can generate heat through nuclear fission.
   - G. Pluto is pulled into a spherical shape by its own gravitational force.
   - H. Asteroids and comets have a tail of gas and dust particles.
   - J. Asteroids and comets are much smaller than Pluto.

9. The polar ice caps on Pluto's surface melt one time during every 249-year orbit, exposing Pluto's truly rocky surface, which is similar to that of Mars. Based on the information provided, this finding, if true, would most likely weaken the position(s) of:
   - A. Scientist 1 only.
   - B. Scientist 2 only.
   - C. both Scientist 1 and Scientist 2.
   - D. neither Scientist 1 nor Scientist 2.

10. With which of the following statements would both scientists most likely agree?
    - F. The size of Pluto indicates that it could actually be a satellite of another planet.
    - G. Pluto should be classified as neither a planet nor a comet; a new category is indicated.
    - H. The surface composition of Pluto is irrelevant and should not be considered in its classification.
    - J. Pluto's erratic orbit differentiates it from all other planets in the solar system.

11. Scientist 1's viewpoint would be weakened by which of the following observations, if true?
    - A. Scientists have recently discovered a Kuiper Belt comet with a radius of almost 1,500 miles.
    - B. Pluto only has one moon, Charon, which is half the size of Pluto.
    - C. Planets can be distinguished from comets by the lack of gas and dust particles in the wake of their orbits.
    - D. Comets and asteroids are capable of generating nuclear fission.

12. Which of the following statements best describes how Scientist 2 likens Pluto to a Kuiper Belt comet?
    - F. Neither Pluto nor Kuiper Belt comets have identifiable atmospheres.
    - G. Neither Pluto nor Kuiper Belt comets are trailed by a cloud of gases and dust.
    - H. Both Pluto and Kuiper Belt comets have similar eccentric orbital patterns.
    - J. Both Pluto and Kuiper Belt comets are roughly half the size of the next smallest planet, Mercury.

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