**Astrophysics Quiz No. 17: What Do the Asteroids Tell Us?**

1. What asteroid-type object is considered both an asteroid and one of the dwarf planets which are gravitationally rounded? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.\_
2. Most asteroids become more irregular in shape especially as they become increasingly smaller than 300 km (186 miles) in diameter. They range in size from 525 km to 1 km. Most of the smaller bodies are clustered around a size of about \_\_\_\_\_\_\_\_\_.
3. The main-belt asteroids span an orbiting flat disk ranging between the inner edge of \_\_\_\_\_\_AU and the outer edge of \_\_\_\_\_\_\_ AU located between the orbits of Mars and Jupiter.
4. The total mass of the asteroids is typically compared to be close to but less than what celestial body? \_\_\_\_\_\_\_\_\_\_\_\_\_.
5. What are the three chief classifications? A. Main-belt; B. Comets; C. Trojans; D. Kuiper Belt Objects; E. Near Earth Objects.
6. Asteroids are divided into 3 main types: C-type, S-type, and M-type. What do the letters stand for? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
7. What asteroid type is the most common with its meteorites having organics and amino acids? \_\_\_\_\_\_\_\_\_\_\_. Also, this type theoretically caused the dinosaur extinction 65 million years ago.
8. What is the rationalization for igneous or basaltic (volcanic) rock found on the surfaces of asteroids? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
9. The first theory for the creation of the main-belt asteroids was a large collision between two planet-size bodies occurring between Mars and Jupiter. What is the theory called and why did it fall out of favor? \_\_\_\_.
10. A recently fallen meteorite was discovered to have carbonates, but carbonates require within the realm of our knowledge what three ingredients? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
11. How does consensus science explain that the earliest solar system materials of dust and small planetesimals have – organics and ammino acids for initiating life; volcanic rock from bodies not large enough to support hydrostatic equilibrium; and carbonates requiring liquid water that should have been boiled away during the hot T-Tauri phase of the protostar? \_\_\_\_.
12. How does consensus science explain why the asteroid belt does not comply with the accretion theory and its ongoing accretion over the past four billion years? \_\_\_\_\_\_\_\_\_\_\_.

A diagram of the solar system

Description automatically generated

**Distribution of Asteroids in the Inner Solar System**

A close-up of a rock

Description automatically generated

**First Asteroid Imaged by Spacecraft - Gaspra**

Answers:

1. Ceres
2. 1 km or 0.6 miles
3. 2 AU, 3 AU
4. Earth’s Moon
5. A, C, and E
6. chondrite, stony, and metallic
7. C-type or chondrite
8. Iron sinks to the center forcing lava upward due to hydrostatic equilibrium; *however, such required gravitational forces can only occur on the few larger bodies such as Vesta and Ceres*
9. The Disruption Theory and remnants of the colliding planets were never found.
10. Liquid water, CO2, and a solid, rocky surface for its formation.
11. *There are no consensus explanations*.
12. Jupiter’s nearby large gravity field causes perturbations and prevents any accumulation of the main belt asteroids which is only theorized.