Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Pd: \_\_\_\_\_ Ast: \_\_\_\_\_

**Solar System Study Guide**

***On a sheet of notebook paper, respond to the following prompts.***

1. **Vocabulary**

Match each description below with a key term from the Solar System Unit.

* 1. ***NEBULA*** – An extremely large “space cloud” made of dust and gas where stars are “born”
  2. ***SOLAR SYSTEM*** – A star together with the group of planets and other celestial bodies that are held by its gravitational attraction and revolve around it
  3. ***STAR*** – A giant ball of gas that forms within a nebula and produces its own light and heat through nuclear fusion
  4. ***ASTRONOMICAL UNIT (AU)*** – Unit of measure in space equal to the average distance between Earth and the Sun
  5. ***MOON*** – A celestial body that revolves around a planet
  6. ***DWARF PLANET*** – A large spherical object that orbits a star but whose orbit is “cluttered” with other large objects
  7. ***TERRESTRIAL*** – Rocky and Earth-like surface
  8. ***GRAVITY*** – The force of attraction that attracts masses and controls the motion of our solar system
  9. ***COMET*** – A celestial body of ice, dust, and rock with a very elongated elliptical orbit around the Sun
  10. ***PLANET*** – A large celestial body that orbits a star, has a spherical shape, and has a clear orbital path

1. **Models of the Solar System**
2. Compare the geocentric and heliocentric models of the solar system.

*The geocentric model proposed that all celestial objects orbit the Earth, while the heliocentric model proposes that celestial objects orbit the Sun.*

1. What do the words, “geocentric” and “heliocentric”, mean?

*“geocentric” means “Earth centered”*

*“heliocentric” means “Sun centered”*

1. Which famous astronomers are responsible for proposing and confirming the heliocentric model?

*Copernicus proposed the heliocentric model and Galileo confirmed it with his observations.*

1. **Formation of the Solar System**
2. What is a nebula and why is it important?

*A nebula is an extremely large “space cloud” made of dust and gas. These are the places where stars are “born”.*

1. Briefly describe the “Nebular Theory”.

*Nebular Theory says that solar systems form as nebulae condense around areas of higher mass. The points where matter condenses eventually become stars, and the disc of dust & gas surrounding the star condenses at points to form planets through a process called “accretion”.*

1. What force causes matter to condense around areas of higher mass as described in the Nebular Theory?

*Gravity is responsible for causing areas of higher mass to condense to form stars/planets from a nebula.*

1. Describe the distribution of mass in our solar system.

*99% of the mass in the universe is contained in the Sun, while the other 1% makes up the planets.*

1. **The Role of Gravity**
2. What two factors affect the force of gravity?

*Gravity is affected by the masses of the objects and the distance between them.*

1. Identify two ways gravity influences the objects in our solar system.

*Gravity is responsible for forming the Sun and planets into spherical shapes as well as keeping the planets in elliptical orbits around the Sun.*

1. **Measuring Distances Within the Solar System**
2. What does “AU” stand for and what does it mean?

*“AU” stands for Astronomical Unit. It refers to the average distance between the Sun and Earth; and it is used to describe distances within the Solar System.*

1. What is the value of 1AU in km?

*1AU is about 150 million Km.*

1. **The Sun**
2. What two elements make up 99.9% of the Sun?

*Hydrogen (92.1%) and Helium (7.8%)*

1. What process is responsible for releasing radiant and thermal energy in the Sun?

*Nuclear Fusion*

1. **Planets**
2. List the 3 characteristics a celestial body must have to be classified as a “planet”.

*1 – Orbit the Sun*

*2 – Enough mass that its own gravitational force shapes it into a spherical shape*

*3 – Enough gravitational force to “clear” its orbit of other large objects either by absorbing them or deflecting them out into space.*

1. List the planets in order from the Sun.

*Mercury – Venus – Earth – Mars – Jupiter – Saturn – Uranus – Neptune*

1. What are some common characteristics of the inner planets?

*Inside the Asteroid Belt*

*Relatively Small*

*Few Moons*

*Warmer Temperatures*

*Faster Orbits*

1. What are some common characteristics of the outer planets?

*Outside the Asteroid Belt*

*Very Large*

*Many Moons*

*Cooler Temperatures*

*Slower Orbits*

*Ring Systems*

1. Which is the biggest planet? *Jupiter*
2. Which is the smallest planet? *Mercury*
3. Which is the hottest planet? *Venus (atmosphere)*
4. Which is the coldest planet? *Neptune (furthest from Sun)*
5. Which is the least-dense planet? *Saturn*
6. Which planet rotates nearly “sideways”? *Uranus*
7. As planets get further from the Sun, what pattern emerges with their…
   1. Temperatures? *Temperatures get cooler farther from the Sun (except for Venus).*
   2. Revolution? *Revolutions take longer the further out from the Sun a planet orbits.*
   3. Orbital Speed? *Planets move slower the further out from the Sun they orbit.*
8. **Dwarf Planets**
9. Compare “dwarf planets” to “planets”. How are they similar? How are they different?

*Dwarf planets are spherical objects that orbit the Sun, but they have not “cleared” their orbit of other large objects.*

1. How is Ceres unique among dwarf planets?

*Ceres is the only dwarf planet in the Asteroid Belt.*

1. Where are most of the dwarf planets located?

*Most of the dwarf planets are in the Kuiper Belt & Scattered Disc*

1. **Other Celestial Objects**
2. How is an asteroid different from planets, dwarf planets, and moons?

*Unlike planets and dwarf planets, asteroids do not have enough mass to have formed into a spherical shape under their own gravitational forces. Unlike moons, asteroids orbit the Sun rather than a planet.*

1. In which regions within the Solar System are most asteroids located?

*Most asteroids are found within the asteroid belt, a region between the orbits of Mars and Jupiter, though some asteroids can be found scattered throughout the solar system.*

1. How is a comet different from an asteroid?

*Comets are relatively small chunks of ice/dust/rock that orbit the Sun in an elongated elliptical orbit. Most comets are thought to come from the Kuiper Belt or the Oort Cloud (a region of icy objects outside the Kuiper Belt)*