***Internet Activity: "The Solar System"***

Astronomy

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\* Use the following links to complete the activity. Write your answers in the spaces provided below.

**Part I:** [***"The Solar System"***](http://www.teachastronomy.com/astropedia/article/Comparative-Planetology)

<http://www.ask.com/science/goal-comparative-planetology-474919eef4371eb4>

1. Briefly explain how astronomers use comparative planetology to learn about the planets.

Listed below are some of the “general rules” that astronomers use in comparative planetology:

 a. Older Surfaces Have More Impact Craters.

 b. Bigger Planets Have More Internal Heat and More Geological Activity.

 c. Bigger Planets have Stronger Gravity and Retain More Atmosphere.

 d. CO2 is the "Normal" Composition for the Atmosphere of a Terrestrial Planet.

 e. Free Oxygen Means Something Strange is Going On.

One of the "general rules" that astronomers use when applying comparative planetology states that only large terrestrial bodies (like Earth & Venus) can have enough internal heat to produce volcanoes, earthquakes etc.

How does the recent discovery of [Pluto's active geology](http://www.npr.org/sections/thetwo-way/2015/07/17/423872012/nasa-new-pluto-images-point-to-geologically-active-world) possibly violate general rule #2?

2. How can the comparative planetology rules be applied to "[extra solar" (exoplanet) worlds](http://lasp.colorado.edu/education/outerplanets/exoplanets.php#comparing)?

3. List the factors that the IAU (International Astronomical Union) uses to define a "[dwarf planet](http://www.universetoday.com/72717/what-is-a-dwarf-planet/)." <http://www.universetoday.com/72717/what-is-a-dwarf-planet/>

 Why was Pluto reclassified as a dwarf planet in 2006? (Watch the short video!)

 Why do some astronomers have a problem with Pluto (and other bodies) being classified in this way?

4. "It is possible that there are another \_\_\_\_\_\_ known objects in the solar system that could be rightly classified as dwarf planets. Estimates are that up to \_\_\_\_\_\_ dwarf planets may be found when the entire region known as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ belt is explored, and that the number may exceed \_\_\_\_\_\_\_\_\_ when objects scattered outside the \_\_\_\_\_\_\_\_\_\_\_\_\_ belt are considered."

5. [Define the following terms](http://www.sciencekids.co.nz/sciencefacts/space/cometasteroidmeteoroiddifferences.html):

 asteroid -

 meteoroid -

 meteor -

 meteorite -

 comet -

6. List the [terrestrial](http://www.space.com/17028-terrestrial-planets.html) and [Jovian planets](http://www.universetoday.com/33061/jovian-planets/) and describe the general features of both.

7. Describe the [asteroid belt](http://space-facts.com/asteroid-belt/) and the [Oort cloud](http://www.space.com/16401-oort-cloud-the-outer-solar-system-s-icy-shell.html). Include the location of these two regions in our solar system.

**Part II:**[***“Spacecraft Exploration of the Solar System***](http://www.planetary.org/blogs/guest-blogs/2013/20130926-gravity-assist.html)***”***

[*http://www.planetary.org/blogs/guest-blogs/2013/20130926-gravity-assist.html*](http://www.planetary.org/blogs/guest-blogs/2013/20130926-gravity-assist.html)

1. How did the Voyager I space probe manage to recently enter interstellar space?

 Why is this technique useful in exploring the solar system?

 List three other space probes that used this technique to explore the solar system.

2. Name three space probes that explored [the planet Venus](http://starchild.gsfc.nasa.gov/docs/StarChild/space_level2/venus.html). Briefly list the discoveries made by each probe.

3. There are currently \_\_\_\_\_\_ [space probes orbiting Mars](https://en.wikipedia.org/wiki/Exploration_of_Mars). List their names and describe their primary mission (click the link for each probe on the wikipedia page).

 What are the names of the surface rovers currently exploring Mars?

4. List the name(s) of the space probe(s) that visited each planet listed below. Include at least one discovery made by a space probe that visited the planet (click on the space craft link).

 [Jupiter](http://www.windows2universe.org/jupiter/space_missions.html) [Saturn](http://www.windows2universe.org/saturn/space_missions.html) [Uranus](http://www.windows2universe.org/uranus/space_missions.html) [Neptune](http://www.windows2universe.org/neptune/space_missions.html)

**Part III:**[***"Formation of Planetary Systems"***](http://www.daviddarling.info/encyclopedia/P/plansysform.html)

[*http://www.daviddarling.info/encyclopedia/P/plansysform.html*](http://www.daviddarling.info/encyclopedia/P/plansysform.html)

1. Describe the "nebular" and the "catastrophic" hypothesis/theories on how the solar system and planets formed. Which hypothesis is currently accepted based on the evidence?

2. Make a sketch of the three basic stages of planetary formation. Include a brief description of each stage. (Label each stage as "a" "b" and "c.")

3. What are the two "key factors" that determine what a planet will become?

 Explain the difference between the four inner terrestrial & the four outer gas giant planets using the nebular hypothesis model.

4. What is the "problem" with applying the nebular hypothesis model with the discovery of extrasolar planets? How can this problem be explained?

5. Explain the "difference" between the nebular hypothesis theory and the [condensation theory of solar system formation](https://answers.yahoo.com/question/index?qid=20090325225117AAPdFG9).

6. Describe the star system that is [Beta Pictoris](http://www.solstation.com/stars2/beta-pic.htm) (age, size, possible planets etc.) Where is the location of the "habitable zone" around this new star system?

7. Play the [planet simulation game](https://dan-ball.jp/en/javagame/planet/). <https://dan-ball.jp/en/javagame/planet/>

***Challenge:*** try to recreate our solar system with the eight major planets in orbit around the Sun (Earth is already in orbit). Experiment by placing two or three stars in your system. What happens to the orbits of the existing planets with more than one star?