

### **Solar System Research Lab (1.5 classes)**

**Goal:** Become the class expert on one of the planets, moons or belts of our solar system. Investigate that planet/moon/belt in detail and make a planetary “cheat sheet” poster with interesting information about it, which you will present to the class during one of the activities in the Scale of the Solar System Lab next week.

#### **Instructions:**

You will be assigned a planet, group of moons or belt and a partner by your instructor. You will have the entire class on Monday, April 2 to plan your project and will be given some time (~15 mins) on Wednesday, April 4 to consult with your group. You will be given ~30min to assemble the poster itself during class on Monday, April 9. You will present your “cheat sheet” poster in a 5min presentation to the class on Wednesday, April 11. Your presentation will be graded by your peers according to the rubric on the course website (on the “labs” page).

#### The Research Phase:

1. You and your groupmates will listen to the episode of “Astronomy Cast” ([astronomycast.net](http://astronomycast.net)) on your assigned planet/moon/belt and take notes.
2. You and your groupmates will visit the NASA Solar System Exploration website ([solarsystem.nasa.gov](http://solarsystem.nasa.gov)). Here, you must AT MINIMUM visit/read the “Missions” and “Images” pages in their entirety AND the three most recent entries from the “planetary photojournal”<sup>1</sup>

#### The Compilation Phase:

3. You and your groupmates will debate and choose the 5 most interesting things about your planet/moon/belt and will choose ONE (color, high res) image to represent each of these interesting features. You will compile these into a single .pdf, .doc or .ppt file and will e-mail or transfer it by flash drive to your instructor by Wednesday, April 4. The images will be printed for class Monday, April 9 when you will use them to make your poster.
4. You and your groupmates will write one paragraph describing each of the unique features you chose in 3 and will type these up to e-mail your instructor by Wednesday, April 4. These will also be printed for you to use in assembling your poster on Monday, April 9.

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<sup>1</sup> If your group has Jupiter or Saturn, please ignore information about missions to/images of the moons of those systems, since another group will be covering that. If you have ANY OTHER PLANET, you should also research the moons of that planet. If your group has the moons of Jupiter or Saturn, you should go to the page for that planet and focus on missions and images of the moons. For the photojournal, you should find the most recent three entries dealing with the moons, and ignore those that deal with the planet itself. For the asteroid and Kuiper belt groups, you should go to the “small bodies” photojournal and find the three most recent entries on objects in your assigned belt.

5. You and your group members will choose one space mission to your planet/moon/belt and will design a section of your poster highlighting it. You may be creative here. Any posters or text you want printed must be received by the end of class on 4/4 to be printed for poster assembly on 4/9.
6. You and your groupmates will complete the table of information (available in the Lab section of the course website) electronically and will e-mail it as a .doc, .rtf or .pdf file to your instructor by 4/4 to be printed for inclusion on your poster 4/9.

**Planet and “Astronomy Cast” Episode Number List:**

1. Mercury (Episode 49)
2. Venus (Episode 50)
3. Mars (Episode 52)
4. Jupiter (Episode 56)
5. Jupiter’s Moons (specifically the Galilean Moons Io, Europa, Callisto and Ganymede) (Episode 57)
6. Saturn (Episode 59)
7. Saturn’s Moons (specifically Titan, Mimas, Iapetus, Encelatus) (Episode 61)
8. Uranus (Episode 62)
9. Neptune (Episode 63)
10. Kuiper Belt and Outer Solar System (Episode 64)
11. Asteroid Belt (Episode 55)

**Tips for completing the table**

1. You will need to do a couple of unit conversions to describe the distance to and size of each planet in different units. See your instructor if you have trouble.
2. Density is measured in grams per cubic centimeter. By comparing this to the values for water ( $1\text{g/cm}^3$ ), rock ( $\sim 2.5\text{ g/cm}^3$ ), iron ( $8\text{ g/cm}^3$ ) ice ( $0.9\text{ g/cm}^3$ ) and gases ( $<0.5\text{ g/cm}^3$ ) you will get a clue as to the composition of your object.
3. For each mission to the planet, you should specify the date and type of mission (orbiter, lander, flyby, atmospheric probe, rover, etc.) and dates. For example: Viking 1 (1976-1982 lander and 1976-1980 orbiter)
4. If you have a planet (including Jupiter and Saturn) you should list the total number and the names and sizes of the largest five.
5. Superlatives are a statement containing most + an adjective (i.e. biggest, smallest, coldest, oldest, only etc.). List three for each planet or belt, and one for each moon.
6. Does the planet or moon have an atmosphere? Is it thick or thin? What gases is it composed of? How is it different from Earth’s?
7. List any geologic activity on this planet or moon (volcanoes, geysers, storms, impact craters, dunes, lakes, rain, erosion, plate tectonics etc.). If it’s unique or different from what we think of as typical, then describe it: for example “nitrogen geysers” or “sulfuric acid rain”)