Avatar Project

Activity 1: “Designing a Solar System”

In recent weeks we have covered the basic concepts behind the formation of a solar system. During this classroom activity you will be designing a solar system of your choice that will contain both a star and planets of terrestrial and gas nature. Each planet’s conditions will be dependent on its location relevant to the center of the system and the size an type of star. Each individual will be responsible for a portion of the activity but the group will be graded as a whole.

Below is a list of requirements for this activity that will be completed prior to being turned in. Before starting, each group should reflect on what is already known about the formation of a system. Secondly, decide what type of star will be at the center of your solar system. Remember different star types result in differences in surface temperatures and elements formed. Finally, make sure that the information on each planet coincides with its location to the star and the conditions that are formed.

Each class will be required to design and construct a solar system made of paper mache.

Each class will be broken down into groups of three.

Each group will be responsible for the development of a planet.

Planet order in the solar system will be determined by the class.

Star type will be decided by the class.

Each group will be responsible for constructing a paper mache representation of their planet along with a typed paper no less than two pages double spaced 12 font detailing conditions found on the planet.

Groups may need to look at information about other planets and stars for ideas.

All information should be given in metric units.

Questions to consider when designing/researching your planet

What is the name of your planet?

What relevance does the name have?

What is the diameter of your planet?

What is the approximate density and mass of or planet?

Where is it located in the solar system

What is it’s distance from the star?

What is it made up of?

What is it’s orbital period/ length of year?

What is it composed of?

What is the length of a day?

Does it have moons?

Does it have an atmosphere?

What gases are present in the atmosphere?

What is the temperature during the day/night?

Is there water?

Does it have ice caps?

Does the planet have weather conditions?

Is there plate tectonics

Are there oceans or seas

Does the planet have plate tectonics?

What interesting features can be found on the surface?

Does it have gas rings?

Is it a gas or terrestrial planet?

1. Your entry will be graded on scientific accuracy (40%) and creativity (40%). Remember that everything on your planet must obey the laws of nature. Provide a diagram of the planet and its location in the solar system.

2. Writing and correct grammar count for the remaining 20% of your total score.

Each group will give a brief presentation of 5-10 minutes detailing their planet and its characteristics to their classmates. This will not be graded but will be used as a means of classroom discussion.

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Activity 2: “Designing an organism”

To better understand the potential of life scientists may find in space, each student will construct a model, draw a picture and write an essay of an organism that has features that might allow it to live on or near the surface of the planet they have constructed as a group.

Conduct research about the environment on the planet. Consider the geology, gravity, atmosphere, radiation exposure, and weather conditions on the planet etc. Choose a habitat somewhere in the planet’s environment for the organism to live. Then construct a model of the plant or animal and include the special features it would need to live in that harsh environment.

You may want to research the special adaptations animals and plants have to survive in difficult places here on Earth. Be creative and use your imagination and be sure to use complete explanations.

Make a scale model or picture of your organism (10 bonus points). Answer all the questions on the next page and form a two page, 12 font, double spaced paper describing your organism, its environment and survival techniques.

GRADING

1. Your entry will be graded on scientific accuracy (40%) and creativity (40%). Remember that everything on your planet must obey the laws of nature and your creature must have good survival traits. Provide a scale to indicate the actual size and shape of your organism.

2. Writing and correct grammar count for the remaining 20% of your total score.

Description and Questions to consider

1. The organism’s name, color, other interesting features.

2. Describe the habitat and climate in which your organism lives.

3. How does it change locations (move)?

4. What does it eat or use as nutrients?

Is it herbivorous, carnivorous, omnivorous, or other?

5. What other creatures does it prey on, if any?

6. How does it protect itself against harsh environmental conditions and predators?

7. How does your creature survive with the planet’s extreme cold, unfiltered solar radiation, and other environmental factors?

8. Does it live alone or in large groups? Describe its interaction with others.

9. What is its main food source and how does it acquire this

food?

10. What other interesting facts would you like others to know about your organism?