**Simulation: Exploring Gravity**

**6th grade Earth Science**

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

**Class Period**:\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Introduction and Directions**:

In the following simulation, you will explore the relationship between the Earth, Sun and the Moon as well as how gravity is involved in that relationship. It is important that you read and follow the directions carefully so that you will not fall behind. Be sure to record answers for every question. Have fun ☺

**Part 1: Exploring Gravity**

1. The simulation that we will use for the first part of this lesson should already be downloaded to your computer. If not, please click the following link that will take you to a simulation involving Gravity and Orbits. <http://phet.colorado.edu/en/simulation/gravity-and-orbits>
2. If you are looking at the screen on the simulation, you should see a sun in the middle and the planet Earth off to the right hand side. If you do see this, GREAT! This simulation will help you come to a better understanding of gravity and its relationship with the sun, moon and the earth. Use the 4 options that you can click to the right (sun and moon, etc) just so that you can get familiar with this simulation. Also, please select **path** on the right so that you can see the path of the particular orbits. Record what happens in the space below.

|  |  |
| --- | --- |
| **Condition** | **Action (What is going on?)** |
| Sun and Earth |  |
| Sun, Earth and Moon |  |
| Earth and Moon |  |
| Earth and Satellite |  |

1. What are some of the similarities and differences that you observed.
2. What you have just observed is the relationship between the sun, moon, earth and other objects with gravity. You have seen how gravity effects those objects. What do you think will happen if there is no gravity? Record your thoughts below.

**Record your thoughts here:**

1. Now that you have recorded your thoughts, lets explore what happens without the force of gravity. Please select **RESET ALL** and then click **PATH** again. This should take you back to the screen where you should see the sun in the middle and the earth off to the right of it. Also, select **GRAVITY OFF** under the word Physics. Follow the directions below
2. Click on the first selection (Sun and Earth). Draw the path of Earth when you click play, now that gravity is off. Label this diagram “NO GRAVITY-Sun and Earth” Once you have done that, click **RESET** at the bottom of the page. **DO NOT** **SELECT RESET ALL**!!!!!
3. Click on the second selection (Sun, Earth and Moon). Draw the path of Earth and the moon when you click play, now that gravity is off. Label this diagram “NO GRAVITY-Sun, Earth and Moon” Once you have done that, click **RESET** at the bottom of the page. **DO NOT** **SELECT RESET ALL**!!!!!
4. Click on the third selection (Earth and Moon). Draw the path of the Moon when you click play, now that gravity is off. Label this diagram “NO GRAVITY-Earth and Moon” with the Once you have done that, click **RESET** at the bottom of the page. **DO NOT** **SELECT RESET ALL**!!!!!
5. Click on the fourth selection (Earth and satellite). Draw the path of the satellite when you click play, now that gravity is off. Label this diagram “NO GRAVITY-Earth and Satellite” Once you have done that, click **RESET** at the bottom of the page. **DO NOT** **SELECT RESET ALL**!!!!!

Diagrams:

1. **Drawing conclusions**: Looking at the diagrams that you have drawn for each of the above four scenarios, tell me why gravity is important in the relationship between the sun, moon and earth.