Name_____ Period _____ Date _____

Space Gravity STEM Sims

Lesson 5: Gravitational Potential Energy

One form of stored energy is called gravitational potential energy (GPE). Gravitational potential energy depends on three factors: the mass of an object, the height of an object above some reference point (distance), and the acceleration due to gravity (*g*). Can you find the gravitational potential energy of a falling ball on various astronomical objects?

Doing the Science

1. You must have completed Lesson 4: Advanced Ball Drop and have those data available to complete this activity.
2. Record your data from Lesson 4 in the appropriate places in Table 1 below.
3. Assume the ball has a mass of 1-kilogram.
4. Use the following formula to calculate the GPE of the falling ball at the instant it began falling in each of the five locations and record your calculation in Table 1.

$$\text{GPE} = (\text{mass}) \times (\text{distance}) \times (\text{gravitational acceleration})$$

Table 1.

Trial	Location ID	Mass (kg)	Distance (m)	*g* value (m/s^2)	GPE (joules)
1		**1**			
2		**1**			
3		**1**			
4		**1**			
5		**1**			

Do You Understand?

1. In which space location of the five you investigated did the ball at the instant it began falling have the largest GPE?

2. For a given location, did the ball have the same GPE at all points during its fall to the ground? Please explain your response.

3. At the instant before the ball hit the ground, about how much GPE did the ball have?

4. Since energy cannot be lost, what happened to the ball's GPE during its fall?