8the Grade Science
Redlands Middle School

Student_____
Date_____ Score _____ /4

Crater Lab
Skill Builder

1. What does it mean for a system to have gravitational potential energy?

   _____

2. In addition to acceleration, what two factors affect the amount of gravitational potential energy a system has on Earth?

   _____ and _____

3. Write the formula for calculating gravitational potential energy. Include all units.

4. Elena rides her bike up to the top of a steep hill. Together, she and her bike have a mass of 80 kg. The hill is 200 meters high.
   Calculate the potential energy of this system.

5. Nate throws an object with a mass of 2 kg 29 meters up into the air.
   Calculate the potential energy of the object at the highest point.

6. A plane is 4,300 meters above the surface of the Earth. It has a mass of 10,892 kg.
   Calculate the gravitational potential energy of the plane.

7. While helping his elderly neighbors with household chores, Kyle climbs to the roof of their house to examine a leak. The roof is 15 meters high and Kyle has a mass of 150 pounds.
   Calculate his gravitational potential energy.

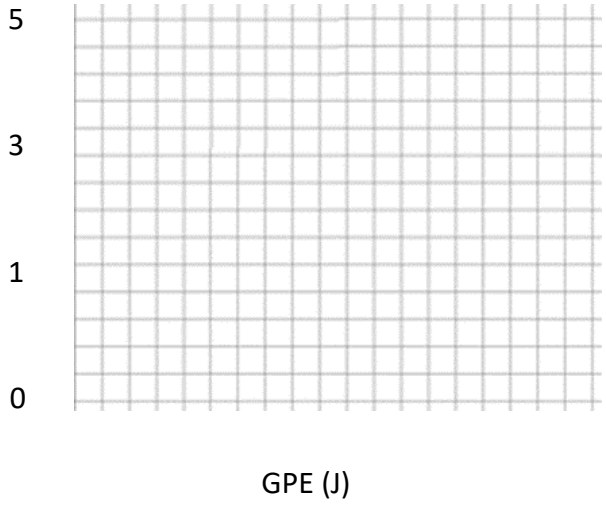
8. Write your own word problem in which you must calculate the gravitational potential energy of a system. Solve your problem.

   _____
   _____
   _____
   _____

9. Use the following data to complete the graph. Note: The X – axis is calculated GPE. You are required to calculate the GPE for the 1 kg ball which fell.

Height the 1 kg ball fell (meters)	Height the ball bounced back up (meters)
1	0.5
3	1.5
5	2.75
7	3.5

Show calculations here:



Challenge: An object has a gravitational potential energy of 50,632 J. The object's mass is 30.0 kg. What is the height of the object?

Challenge: An object has a gravitational potential energy of 130,947 Joules. The object's height is 1,089 meters. What is the mass of the object?