

Name \_\_\_\_\_

Date \_\_\_\_\_ Period \_\_\_\_\_

LAB ACTIVITY  
Exploring Gravity

Gravity is a force of attraction that pulls objects toward each other. Anything which has mass also has a gravitational pull. The more massive an object is, the stronger its gravitational pull is. Earth's gravity is what keeps you on the ground and what causes objects to fall. Gravity is what holds the planets in orbit around the Sun and what keeps the Moon in orbit around Earth. The closer together two objects are, the stronger the pull of gravity between them. Gravity is what gives you weight. It is the force that pulls on all of the mass in your body.

**Step #1: Calculate the weight of an object on different planets**

Using the scale, weight the object you have been given and record that weight, to the nearest tenth of a gram, in each row of the "Weight on Earth" column below. Then multiply that weight by the gravity value for each location to determine the weight of that object at that location.

Location	Weight on Earth	Gravity	Calculated Weight
Moon		X 0.166	
Mercury		X 0.378	
Venus		X 0.907	
Mars		X 0.377	
Jupiter		X 2.360	
Saturn		X 0.916	
Uranus		X 0.889	
Neptune		X 1.120	

1. Why do you think the pull of gravity varies from location to location?

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2. Based on this data, what can you conclude about the sizes of Mercury and Mars?

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3. Based on this data, which location has the greatest mass? How do you know?

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**Step #2: Calculate how far you can jump on different planets**

Stand with your feet together at the starting line, then jump as far as you can, measuring the total number of centimeters that you traveled. Do this three times, then add up your jumps and divide by three to get an average jump length. Then complete the following table to see how far you would be able to jump at different locations in our solar system.

Jump #1	Jump #2	Jump #3	Average Jump

Location	Avg. Jump on Earth	Gravity	Calculated Jump
Moon		÷ 0.166	
Mercury		÷ 0.378	
Venus		÷ 0.907	
Mars		÷ 0.377	
Jupiter		÷ 2.360	
Saturn		÷ 0.916	
Uranus		÷ 0.889	
Neptune		÷ 1.120	

4. At which location could you jump the furthest? Explain why this is.

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5. On which planet would it be most difficult to kick a 20 yard field goal? Explain.

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6. What is the relationship between mass of objects and the pull of gravity between them?

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7. What is the relationship between the distance between two objects and the pull of gravity between them?

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