

## GRAVITY COMPARATIVE ANALYSIS

### DIRECTIONS:

Read the data in the table below. Use the data and your observations to answer the questions below. As you work, consider which relationships, or lack of relationships, influence gravity.

Planet	Mass of planet (kg; scale by $10^{23}$ )	Gravity on planet (N)	Gravitational pull sun has on planet (N; scale by $10^{21}$ )	Distance to sun (km; scale by $10^9$ )	Orbital period around sun (days)	Orbital speed around sun (km/s)
Mercury	3.285	3.70	13.06	57.9	88	47.87
Venus	48.67	8.87	55.38	108.2	225	35.02
Earth	59.72	9.81	35.41	149.6	365	29.78
Mars	6.39	3.71	1.64	227.9	687	24.08
Jupiter	18,980	24.79	416.15	778.3	4,380	13.07
Saturn	5,683	10.44	36.86	1,427	10,585	9.69
Uranus	868.1	8.87	1.40	2,871	30,660	6.81
Neptune	1,024	11.15	0.67	4,497.1	60,225	5.43

1. The process of analyzing a data table begins with scanning the data and taking note of any unique observations. Write down 3 observations about the data table above.
2. Could the data in this table represent objects on Earth instead of the planets? Why or why not? Use evidence from the table to justify your response.
3. How is the gravity on a planet different from the gravitational pull the sun has on a planet?

4. Are the planets in order from closest to the sun to furthest from the sun in the table above? Use evidence from the table to justify your reasoning.
  
  
  
  
  
  
  
  
  
  
5. In which columns do you see patterns? Explain what types of patterns you see and why you believe these patterns exist.
  
  
  
  
  
  
  
  
  
  
6. What is the reason for the pattern found in the orbital speed of planets around the sun?
  
  
  
  
  
  
  
  
  
  
7. Which factors (mass, volume, distance) do you think influence gravity? Explain your reasoning using the data found in the table and your results from the gravity bucket lab.
  
  
  
  
  
  
  
  
  
  
8. If the data for the sun were replaced with data for a black hole, how would the values in the table change?