THE ACCELERATION of GRAVITY Name_____hr__

Question: How does an object's mass, volume, and shape affect how fast it falls to the ground due to gravity?

Introduction: It is a common observation that gravity pulls objects down. Newton made observations in the 17th century and came up with his theory of gravity. This lab will determine which characteristics of an object affect the speed of gravity. Keep in mind that the ACCELERATION of gravity is different than the FORCE gravity causes objects to exert.

Hypotheses: I think the mass of an object will cause _____
I think the shape/volume of an object will cause_____

Procedure:

1. Hold both objects at the exact same height, being careful to keep the bottoms of the objects level
2. Have two students get eye level with the floor to determine which one hits first.
3. Drop the objects several times to be sure of your findings.

	Shape	Volume (bigger or smaller?)	Mass in grams	Gravitational speed (faster or slower?)
marble				
Tennis ball				

1. Of these two objects, which one does gravity pull HARDER? (which has a greater number of molecules for gravity to grab hold of?)

2. Of these two objects, which one does gravity pull FASTER?

	Shape	Volume (bigger or smaller?)	Mass in grams	Gravitational speed (faster or slower?)
Paper wad (you make)				
Piece of paper (flat)				

3. Of these two objects, which one does gravity pull HARDER? (which has a greater number of molecules for gravity to grab hold of?)

4. Of these two objects, which one does gravity pull FASTER?

5. Which of these objects can buoyant air forces affect more?

	Shape	Volume (bigger or smaller?)	Mass in grams	Gravitational speed (faster or slower?)
Paper wad (taped to be the same size as tennis ball)				
Tennis ball				

6. Of these two objects, which one does gravity pull HARDER? (which has a greater number of molecules for gravity to grab hold of?)

7. Of these two objects, which one does gravity pull FASTER?

	Shape	Volume (bigger or smaller?)	Mass in grams	Gravitational speed (faster or slower?)
Tight paper wad				
Loose paper wad				

8. Of these two objects, which one does gravity pull HARDER? (which has a greater number of molecules for gravity to grab hold of?)

9. Of these two objects, which one does gravity pull FASTER?

	Shape	Volume (bigger or smaller?)	Mass in grams	Gravitational speed (faster or slower?)
Compressed peanut				
Expanded peanut				

10. Of these two objects, which one does gravity pull HARDER? (which has a greater number of molecules for gravity to grab hold of?)

11. Of these two objects, which one does gravity pull FASTER?

12. Why does one of these objects hit the ground faster?

13. Error Analysis: What errors could have affected the outcome of this lab?

14. Did all objects take the same amount of time to drop?

15. Which ones dropped faster, which slower?

16. Did having a greater mass cause objects to fall faster?

17. What else could be acting on the objects besides gravity?

18. Where is there no other force but gravity acting on a falling object?

19. Which item would hit first IF we crushed each individual item into a ball that is exactly the same size and shape? Why?

20. Give a situation where gravity helps us do something and a situation where gravity prevents us from doing something.