

Name: _____

Period: _____ Date: _____



BADDEST CLASS ON CAMPUS

AP Acceleration Due to Gravity

In this activity you will determine the time of fall of a tennis ball and groups of coffee filters dropped from a known height in order to calculate the ball's acceleration.

State a Hypothesis

Before you begin, write a hypothesis of what you think will happen on the lines below. Include in your hypothesis what you think the rate of fall will be, what could possibly hinder the object's rate of fall, expected differences in the rate of fall of the different objects, and any outside factors that could possibly influence your data.

Materials:

- 3-5 people
- Tape measure
- Tennis ball
- Protective goggles
- Clipboard
- Pen or pencil
- Stopwatch
- Closed-toed shoes
- 19 coffee filters

Procedure:

1. Assign Duties to Team Members:
 - a. Ball Dropper (tennis ball)
 - b. 2 X Ball Catchers/ Retrievers (protective goggles, closed-toed shoes)
 - c. Timer (stopwatch)
 - d. Recorder (clipboard, pen/pencil, lab sheet)
 - e. *If your team only has 4 members, the duties of Timer and Recorder can be combined.*
2. Using the tape measure, determine the height of the drop zone by measuring the distance from the planned drop point to the ground.

Vertical height of drop zone = _____ m
3. Timer announces "Ready" to Ball Dropper.
4. Ball Dropper announces "Ready" to Timer.
5. Timer announces "Drop" while simultaneously starting stopwatch.
6. Ball Dropper releases tennis ball at the release point used in the vertical distance measurement.

7. Timer stops the stopwatch when the ball hits the ground.
8. Timer gives the elapsed time to the Recorder who records the time in the table below.
9. Ball Catcher catches the ball after the first bounce and throws it back to the ball dropper. Coffee filters will have to be carried back to the top by the Retriever. Alternate positions to minimize fatigue.
10. Repeat for a total of 5 trials and then do the same thing for 3 coffee filters together, 6 coffee filters together, and 10 coffee filters together. To save time going up and down stairs, do 1 trial for each item before starting the next trial.
11. At the completion of 5 trials, all team members must copy the times onto their own lab sheets. Processing of data will be done individually

	Time			
	Tennis Ball	3 Coffee Filters	6 Coffee Filters	10 Coffee Filters
Trial 1				
Trial 2				
Trial 3				
Trial 4				
Trial 5				

Your final lab report must be typed with graphs and tables inserted.

Attach this data collection sheet to the back of your completed lab report.