CAT2 for S3 and S4: Galileo’s “Falling Bodies” Experiment Outline

In this experiment, you will do your own tests to determine whether heavier objects fall faster than lighter ones. Was Aristotle right, or did Galileo prove him wrong? How do you think ***gravity*** and ***inertia*** will affect your results? Get ready to test some ancient ideas and see how scientific history was made!

**Your final report should contain the information outlined below, but in your OWN WORDS. Copy and pasting is not acceptable. Each student must complete their own version of this document.**

**Aim:**

**Hypothesis:**

**Materials**

**Method**

1. If you are using an iPad to record your experiment, set the camera up first with the measured drop height visible
2. Drop the two balls from the same height at the same time. Be sure to have your partner record the balls falling and hitting the ground. Also make sure to state for the camera each trial number.
3. Did one ball hit the ground before the other? Did they hit at the same time? Record your results in the table. Use your video to see which ball landed first, and how long it took.
4. Repeat the experiment (steps 1 to 3) at least 9 more times, making a total of at least 10 trials. Be sure to always record your results in the data table.
5. When you are done, add up the total number of trials each type landed first and write this in the "Total" row at the bottom of your data table.
6. Look at your results and answer the discussion questions

*Hint:* If you are having trouble explaining your results, try re-reading the experiment information from the Year 7 FUSE Weebly.

**Results:** Complete the table

| Trial # | Heavy Ball  (Time) | Light Ball  (Time) | Same Time  (Time) |
| --- | --- | --- | --- |
| 1 |  |  |  |
| 2 |  |  |  |
| 3 |  |  |  |
| 4 |  |  |  |
| 5 |  |  |  |
| 6 |  |  |  |
| 7 |  |  |  |
| 8 |  |  |  |
| 9 |  |  |  |
| 10 |  |  |  |
| Total |  |  |  |

### Discussion Questions (each answer should contain 2-3 sentences)

1. What force causes all objects to fall to the ground?
2. Where does this force come from?
3. What role does inertia play in this experiment?
4. How did Newton’s Second Law (*f=m x a)* influence this experiment?
5. What could you do to the slower ball to make it hit at the same time as the faster ball?
6. What could you do to make the two balls fall at the same time? Think about the videos you watched at the start.

## Conclusion:

## Complete your own summary of the experiment. It should be a structured TEEL paragraph (Topic, Evidence, Explanation and Link). In it you must answer the question of who was right, Galileo or Artistotle?

### Bonus Extension Discussion Questions

1. If you carried out this experiment again, but with balls that differed greatly in size, what do you think would happen? If you are able to, test this theory.
2. Predict what would happen if you drop two objects of similar mass, but entirely different shapes. If you are able to, test this theory.
3. In this experiment you dropped balls through the air, but what happens when you drop them through something else, such as through water? If you are able to, test this theory.