

Airwaves Procedure

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Per. 2

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We will launch a tethered meteorological balloon to 1000 ft elevation at the Tobin James Cellars, Paso Robles, CA as part of the Balloon Fest, 2008.

Purpose: How much the shaving cream will expand at an altitude of 1000 ft.

Equipment: Balloon, helium, gondola, stopwatch, 1000ft of nylon cord, bright ribbon flags, shaving cream, Mason jar, test tube, check valve, stirring stick, and laptop.

Payload: One quart Mason jar, 5 ml of shaving cream, check valve, and 50 ml test tube.

Weight: ~2000 g

Shaving Cream Setup:

1. Collect all the materials you need for the experiment.
2. Put 5 ml of shaving cream into the test tube, and then wait for it to expand (3 min.).
3. While waiting start setting up the Mason jar and the gondola
4. Make sure the mason jar has a tight seal and that it is totally covered by the tinfoil
5. When the shaving cream is completely expanded at that altitude put it in the Mason jar (Note where the shaving cream is at, and record it into the log.)
6. Seal the Mason jar, and attach it to the gondola.

Sharing Launch Site:

We will be sharing the launch site with Pac-man and Centuria who both are doing a one way valve.

We will have to each take a launch at a time in a certain order so each of us will have enough time to analyze each runs data.

Flight Procedure:

1. Fill balloon with helium until it will lift at least 500 g more than the weight of the fully loaded gondola.

Calculations-tank is 2300 psi + 15 psi $V_0=1.80$ cu ft

$2315 * 1.80=4200$

$P_1=?$

$V_0=125$ cu ft

$P_1=0+15$

$V_1=284$ cu ft

$284*15=4200$

2. Securely tie balloon closed and attached to metal ring. Attach all rigging including the gondola, directly to the ring.
3. Start the written log. As the flight continues, note all start and stop times as well as any comments or observations about the balloon and gondola's behavior.
4. When ready to launch, verify that the Mason jar and the shaving cream is ready.
5. Press the Start/Stop on the stopwatch.
6. Launch balloon and let it rise smoothly about 100 ft or 30 m. This first 100 ft should take about 2 minutes.

7. Stop, tie a bright ribbon flag around the line and hold at this altitude for about 1 minute.
8. Continue but faster: rise 100 ft (2 minutes), tie a ribbon & hold altitude (1 minute) until all 1000ft of line is out. Record all actual times for any stops and starts.
9. Hold at top for 5 minutes.
10. Start smoothly bringing it down. This should take about 20 minutes.
11. Do 3 runs in total to get a good collection of data.

Shaving Cream Data Recovery:

1. Note where the shaving cream is at
2. Take that data and write it down on a table

Procedure:

1. After 3 experiments we will collect the data.
2. Analyze each run and make a graph of each run.
3. We will use Anthony's laptop to make the graphs on excel.
4. We will transfer the graphs to Power Point and create the presentation.
5. When we have the presentation setup we will then practice the presentation.