**Roto-Copter Investigation**

**Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Class:\_\_\_\_\_\_\_\_\_**

**Scenario:**

You work for an airplane manufacturer early in the 1900’s. Airplanes have been invented recently and are flying successfully. You are toying with the idea of designing a flying machine that has a rotor on the top of it so that it will take off and land upright!

Using the materials provided (cardboard, paper and paper clips) you set out to change the aviation industry!

***BUT WHERE DO YOU BEGIN???***

**Challenge:**

Design and construct a “Roto-Copter” that will take the longest time to fall to the ground from a height of 2 meters.

**Design Criteria:**

* Day 1 – You have one class period to build your Roto-Copters.
* Day 2 – test your designs and answer the questions provided.
* Each of the THREE Roto-Copters must withstand three experimental trials.
* You must use at least one paper clip per design.
* You must have a clearly labeled sketch before you begin to build your Roto-Copter.

**Method:**

1. Brainstorm possible designs with your group. What are the variables that would affect its falling motion?
2. Once you have decided on a variable to test, make labeled sketches of your designs.
3. Make a hypothesis!! What do you think is going to happen? Use scientific knowledge to back up your statement.
4. Let them fly!! Drop the Roto-Copters from a height of 2 meters and time how long it takes to reach the ground.
5. Record the results in the table. REMEMBER – three trials for each of the three designs.
6. Your best design will compete with those in the other groups for high grade!!

**DATA TABLE**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **DESIGN #1** | **DESIGN #2** | **DESIGN #3** |
| **Time (sec.) test #1** |  |  |  |
| **Time (sec.) test #2** |  |  |  |
| **Time (sec.) test #3** |  |  |  |
| **Time (sec.) test #4** |  |  |  |
| **Time (sec.) test #5** |  |  |  |

Questions:

1. Draw a conclusion…
   1. Do your results support or nullify your hypothesis?
   2. Give a scientific reason for your answer to “a”.
2. Name the INDEPENDENT VARIABLE in your experiment.
3. Name the DEPENDENT VARIABLE in you experiment.
4. Was your experiment a FAIR test? EXPLAIN…
5. Make a list of the possible sources of error in your experiment.
6. How did your best design compare to the rest of the class?
7. If yours wasn’t the slowest in the class, what changes would you make to your design?

**RUBRIC**

**Roto-Copter Experiment**

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