**Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_**

**Seed Dispersal Experiment**

*Adapted From: "Sailing Seeds: An Experiment in Wind Dispersal," by Steven K. Rice.*

**Background:** Dispersal of seeds is important for the continued survival of a plant species. If plants grow too closely together, they compete for light, water, and nutrients. Seed dispersal allows offspring to be spread over a wide area and decreases the competition between offspring. The main ways plants disperse their seeds are by animals, wind, water and self-dispersal.In flowering plants like apple trees, one or more seeds are housed within a fruit. Fruit, like apples, are eaten by animals that then disperse the undigested seeds. Some fruits can be carried by water, like the coconut. Burdock fruits have hooks that attach to an animal's furry coat. Dandelion fruits are suspended from feathery "parachutes" that are carried on the wind. The fruit of maple and ash trees have wings that let them float on air.

In this experiment, you will investigate how the size and shape of fruits or seeds influence their ability to be dispersed by wind. You will design your own seed and measure two important qualities that enhance its ability to disperse in the wind: distance traveled and time aloft.

**Materials and Equipment**

* Supplies to construct artificial "fruit" or "seeds" (paper, tape, scissors, glue, pipe cleaners, markers, etc.)
* Sunflower seeds, pumpkin seeds, and other seeds that might serve as a good base from which to add "wings"
* Window or large fan
* Meter stick or tape measure
* Stop watch
* Pen/pencil
* Video camera (optional for recording data)

**Experimental Procedure**

1. Develop a hypothesis for your experiment and record it.
2. Collect at least two seeds - one will be the control. Construct a wind dispersal mechanism for your seed using the materials provided.
3. Set up the fan on a table blowing horizontally across the room. Establish a standard drop site above the fan and set up a tape measure along the floor beneath the fan.
4. Choose someone to be the time keeper.
5. Drop the control seed from the same point above the fan.
6. Record the time aloft and distance traveled of each seed (control and experiment), then repeat 3 times.
7. Average the time aloft and distance traveled for each seed, then graph your results.
8. Gather the class data on the board or in an excel spreadsheet.
9. Optional: Construct an entire seed model only using the materials provided and repeat experiment.

**Hypothesis:**

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| **Seed Dispersal Data Table** |
|  | Time Aloft (s) | Distance Traveled (cm) | Average Time aloft (s) | Average Distance Traveled (cm) |
| Control #1 (no wings added) | Trial #1 |  |  |  |  |
| Trial #2 |  |  |
| Trial #3 |  |  |
| Trial #4 |  |  |
| Model #1 | Trial #1 |  |  |  |  |
| Trial #2 |  |  |
| Trial #3 |  |  |
| Trial #4 |  |  |
| Model #2 (optional) | Trial #1 |  |  |  |  |
| Trial #2 |  |  |
| Trial #3 |  |  |
| Trial #4 |  |  |

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**Class Data**

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| Group # | Characteristics of this seed (describe - if control, write "control") | Average Time Aloft (sec) | Average Distance Traveled (cm) |
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**Questions**

1. Which seed model went the farthest? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Which seed model was in the air the longest? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Describe the characteristics of the seed model that helped it go the farthest, and stay in the air the longest.

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1. Is there a correlation between maximum time aloft and the distance each seed/fruit traveled?

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1. Was your hypothesis supported by the class data? Why or why not?

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1. Predict what the characteristics of a seed dispersed by water might be. Do the same for seeds dispersed by animals.

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| Water |  |
|  |
| Animals |  |
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Use the graph below to answer the following questions.

*After Augspurger and Franson (1987)*

7. What is the average distance MOST heavy seeds travel? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8. What is the average distance MOST light seeds travel? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9. Describe the pattern of dispersal for heavy seeds.

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10. Describe the pattern of dispersal for light seeds.

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**Graphic Organizer for Seed Dispersal**

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| --- | --- | --- |
| **Method of dispersal** | **Benefit** | **Drawback** |
| Wind |  |  |
| Water |  |  |
| Self-propulsion |  |  |
| Animals |  |  |
| Animals - specifically humans |  |  |