

Student Conducted Lab: Paper Airplanes

Score /17

Follow the Scientific Method!

****To COMPLETE this Lab: Fill in the missing information for each step!**

1. Identify the problem /1
- **How can I make a paper airplane fly _____?**
Use the Problem (question) **provided IN CLASS!**

2. Make observations /2
- **Do the Research!** (**HIGHLIGHT** the website you used)
 - i. <https://www.foldnfly.com/1.html>
 - ii. <https://www.diynetwork.com/made-and-remade/learn-it/5-basic-paper-airplanes>
 - iii. <https://www.instructables.com/id/how-to-make-the-fastest-paper-airplane/>
 - **Pick TWO designs to test!**
Name and Describe your two designs:
 - i.
 - ii.
 - **Which design do you think will fly farther and why?**

3. State the hypothesis /2
- **H = IV + DV**
 - i. **IV =**
 - ii. **DV =**
 - iii. **So, the Hypothesis is:**

Use the IV, DV and Hypothesis **provided IN CLASS!**

4. Test the hypothesis, in other words: set up an experiment: /1
- **Materials** – what did you use? /1
Provide Materials List
... be specific about what type & size of paper you used; measurement tool, etc.
 - i.
 - ii.
 - iii.
 - iv. (add more if needed)
 - **Procedure** – what steps did you follow? /2
Provide a Step by Step INSTRUCTIONS of HOW you created BOTH airplanes

Directions to Make Paper Airplane #1

- i.
- ii.
- iii.

- iv.
- v. (add more if needed)

Directions to Make Paper Airplane #2

- i.
- ii.
- iii.
- iv.
- v. (add more if needed)

Procedure: TEST Distance of Paper Airplanes

1. Construct BOTH paper airplanes per your instructions above.
2. Find a linear measuring tool (ruler, tape measure, yard stick, etc.)
 - a. This **MAY be a tool that measures inches/feet** IF you do not have a metric measuring tool.
3. Find a space you can fly your airplanes and identify your start point.
4. Fly only ONE airplane at a time.
5. From the start point, fly your airplane.
6. Measure from the start point to where the plane lands – enter that distance as Trail #1 in the data table.
7. Return to the start point and repeat flying the plane for four more trials – entering the distance flown for each trial.
8. Repeat Steps 5 through 7 with Airplane #2.

5. Collect data/2

Paper Airplane #1 Data Table

	Trial #1	Trial #2	Trial #3	Trial #4	Trial #5
Distance flown					

Paper Airplane #2 Data Table

	Trial #1	Trial #2	Trial #3	Trial #4	Trial #5
Distance flown					

Don't forget UNITS!

6. Analyze the data/2

- **Complete Graphs of your Data**
 - i. **MAKE TWO graphs using:** <https://nces.ed.gov/nceskids/createagraph/>
Full directions below Analysis Questions and demonstrated in class recording
 1. X axis = Trials
 2. Y axis = Distance flown

INSERT Airplane #1 Graph – saved as a JPG

INSERT Airplane #2 Graph – saved as a JPG

- **Examine the Graphs of your Data:** You are looking for which plane flew the furthest.

7. Form conclusions/2

- **Based upon the data, which plane design flew the farthest?** (write in complete sentences)

8. Write and present your research.

- Make sure all sections (above) are filled in and answer the Analysis Questions (below).

- And, SUBMIT your saved lab document through the Assignments module.

Analysis Questions:/3

1. Did you have a control? If you did, what was it?
2. What were your constants?
3. What were your replicates?

Complete ALL Sections/Questions above this line!

DIRECTIONS

Make Graphs to insert in your lab using: <https://nces.ed.gov/nceskids/createagraph/>

You will have to make TWO Graphs!

Use these direction for Paper Airplane #1,
then **select "Start Over"** at the bottom
and do it again for Paper Airplane #2.

Select **BAR** Graph

1. On the **Design Tab**: make sure the following are SELECTED
 - i. Direction - Vertical
 - ii. Shape - Rectangular
2. On the **Data Tab: ADD**
 - a. Graph Title – Add a Title
 - i. For your first Graph: Paper Airplane #1
 - ii. For your second Graph: Paper Airplane #2
 - b. X Axis - Trials
 - c. Y Axis - Distance in ____ (fill the blank with the units you used)
 - d. Group Label - Distance Flown
 - e. Item Label - Trial 1, Trial 2, Trial 3, Trial 4, Trial 5
 - f. Value - **your data** for each trial for that plane (**no units** – just the number values in decimal form)
 - g. Min-Value - ZERO (0)
 - h. Max-Value - the largest number (distance) EITHER airplane flew
3. SKIP the **Labels Tab**
4. On the **Preview Tab**
 - a. **Make sure your graph has:**
 - i. A Title
 - ii. Label on the X axis
 - iii. Label on the Y axis
 - iv. Five Trials = bars
 - v. A Key for the bars
5. On the **Print/Save Tab**
 - a. Select Download (pop ups must be enabled)
 - i. In the pop-up that opens:
CHANGE the **File Format** to **JPG** (JPEG – like a picture)
 - ii. **CLICK** Download
 - iii. **OPEN** the downloaded file
 - iv. **SAVE** to your Science folder

INSERT the Graph JPG image in the Lab Document:

1. In the Word document, CLICK where you want to insert your image in the document.
2. CLICK Insert in the Menu Bar

3. CLICK Illustrations
4. CLICK Pictures ... FIND the folder and image from your desktop
5. CLICK Insert
6. It should look like the image below. (This was a sample and does not reflect actual data.)

