### **Lab Framework**

**Text: Bridges to Algebra and Geometry** 

Unit number and title: Chapter 2 graphing data or 3 Graphing Integers

**Short Description**: Collecting data to graph

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# <u>Lab Title</u> Flight Graphing Lab

## LAB PLAN

**TEACHER:** Teacher Prep/Lesson Plan

• Lab Objective

To give students a visual understanding of how to add and subtract positive and negative integers and enter data in to various graphs.

#### • Statement of pre-requisite skills needed

(Basic under standing of what a positive number is (more than zero) and a negative number is (less than zero)

#### • Vocabulary

Positive Integer Opposites Negative Integer Absolute Value

#### • Materials List

1 sheet of 8 ½ x 11 paper (for students) 20' tape measure Role of masking tape 1 sharpie felt pen Color pens or pencils (optional)

#### • State Standards addressed

Math: Math

#### • Leadership Skills

Students may demonstrate prior knowledge and assist others in the making of a paper airplane.

#### • SCAN Skills/Workplace Skills

Students will develop a product and use that product to perform measurable outcomes that will that will be visually displayed in graph form to demonstrate competency.

#### • Set-up information

Preferred lab environment would be a room or hallway that is at least 10ft wide and 30ft long that has a concrete floor (outside with no wind or rain is an option). Set up involves placing pieces of masking tape on the floor at certain intervals. Start with one line of tape about 6" long on the floor with a number 0 on it. Next in a linear faction measure 6" on both sides of the line an place a piece of tape with +.5 as you go away and

- .5 as you get closer to your starting point. Next place pieces of tape at 1' intervals from the 0 point going in opposite directions going away is positive and going to the starting point is negative. You may stop when you get about 7 to 8 feet in each direction. Next place a 2' wide piece of tape on the negative side about 12 ft from the 0 point.

#### • Lab organization

Students may perform as individuals or compete as teams. Students will make an airplane and make 10 flights each and recording data after each flight. The airplane building and flights with data collection may be completed in one 50 minutes class period.

#### Teacher Assessment of student learning

The teacher will position themselves at the 0 line and off to the side and will call off positive or negative numbers after each flight (makes for consistency). The student then records that number in one of the 10 blanks spaces on their data collection sheets. Students then will be graded on 4 items. #1 Data collection, #2 Data calculations, #3 Data graphing, #4 Summary statement

#### • Summary of learning

Students completed the airplane and made 10 successful flight (make adjustment to airplane as needed). Record the data, transfer the data, make calculations, and make graphs that represent the data. Good opportunity to have students present to the class any problems or adjustment that where needed to help prefect the flight of their airplane.

#### Optional activities

Can change the types of graphs students generate with the data collected.

#### • Career Applications

Most any career that requires product development and testing then displaying the data collect from their product.

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#### LAB TITLE: Flight Graphing Lab

#### STUDENT INSTRUCTIONS:

#### • Statement of problem addressed by lab

How hard is it to build and fly a paper airplane and have it consistently fly where you want it to go?

#### • Grouping instructions and roles

Students may compete as groups or teams if desired of 3 to 4 person teams and use the data from all the group participants to complete their lab sheets. Student may assist others in the construction of their airplanes.

### • **Procedures** – steps to follow/instructions

Each student will take their 1 sheet of paper and construct a paper airplane and place their name on it (colored decorations are optional). Then each student will stand behind the starting line and aim their plane toward the center of the taped lines on the floor. After a flight is completed your teacher will give you a number, record that number in one of the 10 spaces provided. Then proceed to the back of the line and take another flight until you have completed all 10 flights. After all 10 flights have been completed then go back to the classroom and start entering the data in to your calculations sheet.

#### Outcome instructions

To complete a flight worthy airplane that can be consistently flown to a predetermined destination and record the data accurately.

#### Assessment instructions

Students may judge other students planes for the most unusual, colorful, best looking, etc, if desired. Your teacher will give you a measurement after each flight that you will record on your data collection sheet.

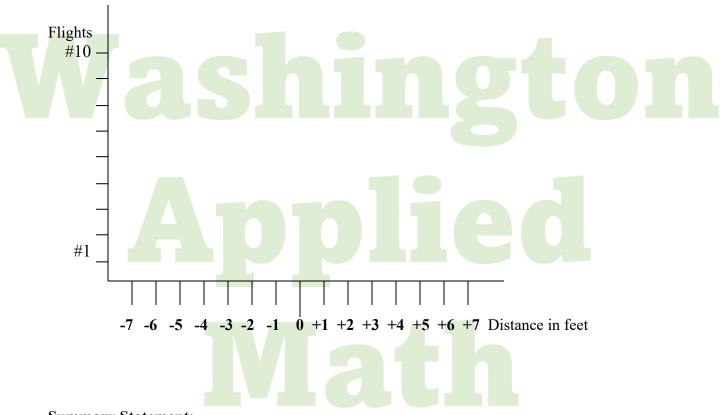
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# **Lab Data Collection**

Student:	Date:
Unit: Chapter 2 or Chapter 3 in Bridges to Algebra and Geometry	
Lab Title: Flight Graphing Lab	
Criteria: Write the problem/objective in statement form  To successful construct a paper airplane and complete 10 data gathering flights that will be used to determine overall distance flown, then present the data in graph form.	
Data Collection:  Flight #1 #2 #7  #6 #7  Calculations:  All 10 flights must be accounted How many positive numbere How many negative numbere How many flight landed on z  Calculate overall distance flown  Total distance of positive flight Total distance of negative flight Over all distance of negative flight to the collection of	for in your calculations and flights flown and flights flown are of the flights  Total flights  Total flights  Total flights  Total flights
Calculate the measures of central tendency (show your work)  Mean: average flight distance	
Median: the middle value of the data	Mean Scorea set
Mode: the distance that occurred the	Median Score e most often liedmath.org/
	Mode Score

## **Graphing:**

Complete a bar graph:



**Summary Statement:** 

Students must describe the following

Any problems associated with the construction or flight of the airplane:

Council

Any adjustments made during the flights:

Describe what you learned while performing this lab:

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Was this lab helpful in your understanding of graphing of data?