7TH GRADE · DATA CHALLENGE

Flight of Fancy

Teacher Facilitation Guide

Duration: ~ 7 50-minute class sessions

CHALLENGE OVERVIEW

Students take on the role of engineers at a small design firm responding to a Request for Proposals (RFP) from A+ Airways, a struggling airline. Working in small teams, students research different types of aircraft, build foam gliders, and test six wing configurations. They collect flight data over multiple trials, calculate averages, and create a bar graph to compare wing performance. By the end of the challenge, each team has a real dataset and a set of data-backed conclusions that will inform their design work later in the semester.

BY THE END OF THIS CHALLENGE, STUDENTS WILL BE ABLE TO:

- Identify different types of aircraft and explain the basic forces of flight
- Assemble a foam glider and attach different wing configurations
- Collect and record accurate flight data using a consistent testing procedure
- Calculate the average (mean) flight distance for each of six wing configurations
- Create a labeled bar graph comparing wing performance across configurations
- Use data to draw conclusions about which wing designs perform best

MODULE STRUCTURE
Activity 1 — Introducing the Flight of Fancy Challenge (Day 1)
Activity 2 — How Wings Work (Day 2)
Activity 3 — Establishing a Testing Procedure (Day 3,)
Activity 4 — Glider Testing (Days 4–5)
Activity 5 — Data Analysis and Visualization (Days 6–7)

MATERIALS

Foam trays for glider parts: White foam meat trays: 9.25”x7.25”x.5”. 2 per group (plus extra for mistakes)
NASA Foam Glider Template – 1 per group

Wing cut-outs — 6 configurations per group (straight, elliptical, swept-back, delta, swept-forward with canard, swept-back with canard)

Tape measure or measuring tape — 1 per group

Masking tape (for launch-point marking)

Open floor space for glider launches (hallway or gym recommended)

Engineering Notebooks

Graph paper or large chart paper for class data display

Computers or tablets (for optional digital graphing in Activity 5)

Handout 1 – A+ Airways Interior Design RFP

Handout 2 - Aircraft Market Research

Handout 3 – Wing Configuration Reference Sheet

Handout 4 – Establishing Testing Procedure

Handout 5 – Glider Flight Data Collection Sheet

Handout 6 – Class Flight Data Analysis

STANDARDS ALIGNMENT

NGSS Engineering Design
- MS-ETS1-1: Define the criteria and constraints of a design problem with sufficient precision

Science and Engineering Practices
- Practice 3: Planning and Carrying Out Investigations
- Practice 4: Analyzing and Interpreting Data
- Practice 5: Using mathematics and computational thinking
- Practice 8: Obtaining, evaluating, and communicating information

Common Core Standards for Mathematical Practice
- SMP 1: Make sense of problems and persevere in solving them
- SMP 2: Reason abstractly and quantitatively
- SMP 3: Construct viable arguments and critique the reasoning of others
- SMP 6: Attend to precision

See the Arcade Entrepreneur Data Challenge Planning Guide for complete alignment details.

KEY VOCABULARY	
Lift	The upward force that keeps an aircraft in the air, created as air moves over the wings.
Drag	The force of air resistance that works against an aircraft moving forward.
Thrust	The forward force that moves an aircraft. In a glider, this comes from the launch.
Weight	The downward pull of gravity acting on the aircraft.
Wing planform	The shape of a wing when viewed from above.
Fuselage	The main body of an aircraft that holds the wings, tail, and everything else together.
Variable	Something that can change in an experiment.
Procedure	The consistent steps followed during an experiment so every trial is comparable.
Configuration	A specific arrangement or design — here, a particular wing shape attached to the glider body.
Average (mean)	The sum of all values divided by the number of values. Used to describe typical performance across multiple trials.

ACTIVITY 1

Introducing the Flight of Fancy Challenge

TIME
~50 min

Essential Question: What do engineers need to know before they start designing?

Students are introduced to the semester-long challenge through an RFP (request for proposals) from A+ Airways. They read and discuss the challenge as a class, explore different types of aircraft through a short research activity, and begin to understand what problem they have been hired to solve. This activity sets the stage for the data, systems, visualization, and design work to come.

SETUP & MATERIALS

- A+ Airways Interior Design RFP
- Aircraft Market Research form
- Engineering Design Process (EDP) poster or projected slide
- Laptops or tablets for research in Part 2
- Student engineering design logs (composition notebooks or binders)

Part 1 — Reading the RFP (20 min)

Open by telling students they have been hired as engineers at a small design firm. Their first job is to respond to a real Request for Proposals from a company that needs their help.

Distribute the A+ Airways RFP and read it as a class, either aloud or individually. Give students a moment to underline or highlight key details.

A+ Airways — Interior Design Request for Proposals

A+ Airways is seeking proposals from aircraft design companies to create the interior designs for a fleet of new airplanes. Our current fleet is aging — the oldest in the industry. Our airplanes are fuel inefficient, do not meet current federal air quality regulations, and require a large amount of maintenance. To cover these costs, A+ has added more rows of seats, leaving just 29 inches of leg room between rows — the least among all airlines. Customers don't like this, and we are losing them to competitors.

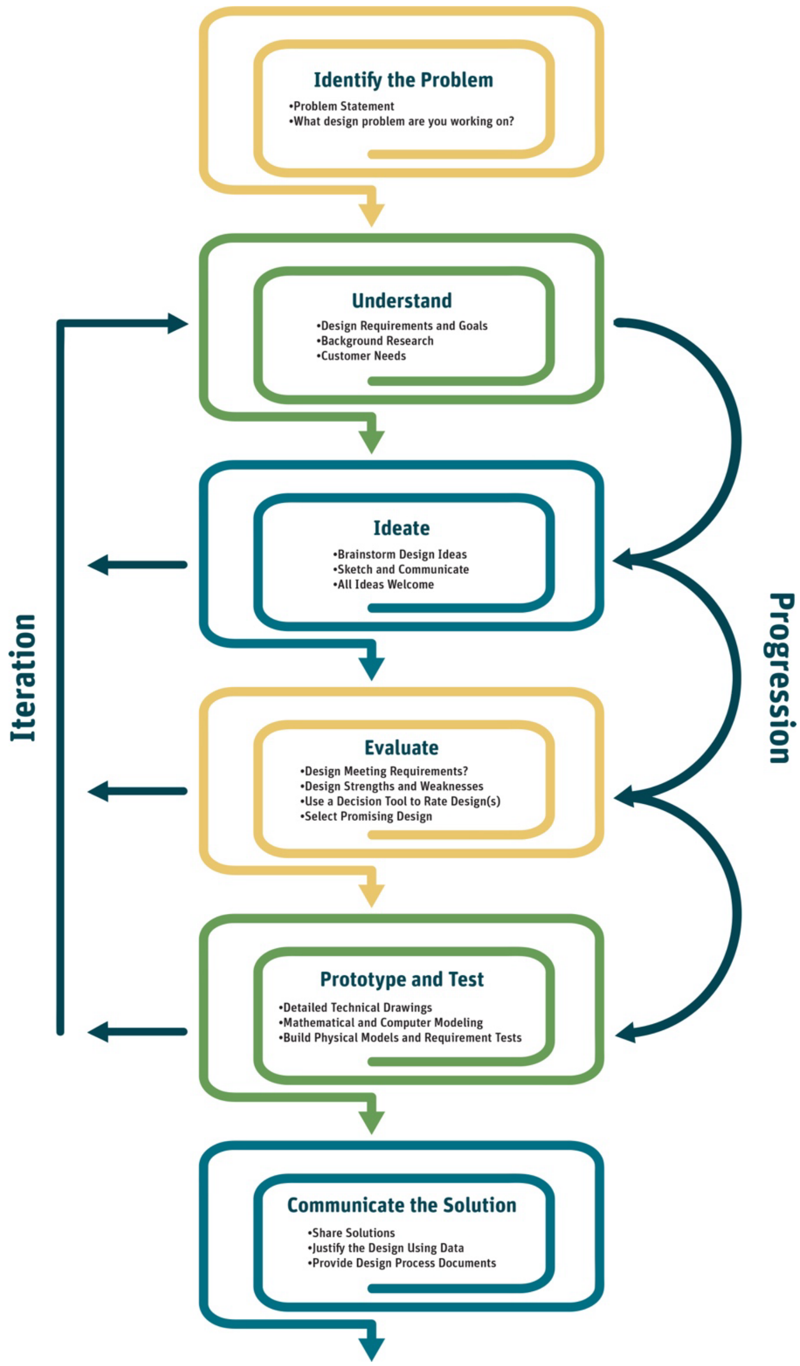
A+ needs to turn things around. We are requesting proposals for how to make our planes more profitable. Proposals should include a new airplane interior design and a prediction of potential profits.

After reading, introduce the Engineering Design Process (EDP) using the poster. Walk through the stages briefly. Explain that this first challenge focuses on the Identify and Understand stages, and that students will work through the other stages over the rest of the semester.

Have students write a problem statement in their engineering notebooks. A good problem statement names who has the problem and what is going wrong — without jumping to a solution.

SAMPLE PROBLEM STATEMENT

A+ Airways is losing customers because their planes are uncomfortable and out of date. Our engineering team needs to design a more profitable airplane interior that gives passengers a better experience.



DISCUSSION QUESTIONS

- What is A+ Airways asking engineers to help them with?
- What information would you need before you could start designing?
- Why does the RFP mention profit? What does that tell you about what the client cares about?

Part 2 — Aircraft Research (25 min)

Before students can think about airplane design, they need to know what kinds of aircraft already exist. Allow students to work independently or in pairs to research different types of aircraft using the internet, and fill out the Aircraft Market Research form with at least four aircraft types.

Good starting places:

- Wikipedia: Fixed-wing aircraft — en.wikipedia.org/wiki/Fixed-wing_aircraft
- Wikipedia: Rotorcraft — en.wikipedia.org/wiki/Rotorcraft

Students should record each aircraft's purpose, key design features, and why someone might choose it. Encourage them to look at a range of types: commercial passenger jets, cargo planes, military aircraft, gliders, helicopters, small private planes.

TEACHER TIPS

- This research activity does not need to be exhaustive. The goal is to get students thinking about the variety of aircraft designs and what different designs are built to do. They will draw on this broader thinking when they start ideating on their own airplane design later in the semester.
- If laptops are unavailable, prepare a printed "Types of Aircraft" reference sheet with images and brief descriptions for each major category.

Part 3 — Discussion and Reflection (5–10 min)

Give a few groups the chance to share one aircraft type with the class. Keep it brief. Use this as a bridge into Activity 2.

DISCUSSION QUESTIONS

- What different types of aircraft did your group find?
- How are they different from each other in purpose, size, or design?
- Which aircraft do you think is most relevant to what A+ Airways needs?
- What questions do you still have about the challenge?

ACTIVITY 2

How Wings Work

TIME
~50 min

Essential Question: How does wing shape affect how far a glider flies?

Students get a brief teacher-led introduction to how aircraft fly, then assemble their foam gliders and examine the six wing configurations they will test. This activity builds the background knowledge students need to make sense of their testing data.

SETUP & MATERIALS

- Foam gliders: Assembled with glider parts cut from foam trays using NASA Foam Glider Template. — 1 per team of 3–4 students
- Wing Configuration Reference Sheet — 1 per team
- Scissors and adhesive as required by kit instructions
- Paper clips or small clay pieces for nose weight (if not included in kit)

Part 1 — Mini-Lesson: How Planes Fly (15 min)

Introduce the four forces that act on every aircraft in flight. Draw a simple diagram on the board as you talk — a side view of a glider with four labeled arrows showing direction.

Force	What it does
Lift	Pushes the aircraft upward. Created when air flows over the wings during forward motion.
Weight	Pulls the aircraft downward due to gravity.
Drag	Slows the aircraft down. Caused by air resistance pushing against the aircraft's shape.
Thrust	Pushes the aircraft forward. On real planes, engines provide thrust. On gliders, the launch provides it.

For level flight, lift balances weight and thrust balances drag. A glider has no engine, so once launched, its job is to stay in the air as long as possible by maximizing lift and minimizing drag. Students will now test six different wing shapes to see how planform affects that balance.

Introduce the six wing configurations using the Wing Configuration Reference Sheet. Ask students to write a prediction on the sheet: which wing shape do they think will fly the farthest, and why?

Configuration	Description
1 — Straight Wing	A simple rectangular shape extending straight out from the fuselage.
2 — Elliptical Wing	A rounded, oval-shaped wing.
3 — Swept-back Wing	Wings angled toward the back of the glider.
4 — Delta Wing	A triangular shape spanning the fuselage; no separate horizontal stabilizer.
5 — Swept-forward Wing with Canard	Wings angled toward the front, with a small mini-wing near the nose (a canard).
6 — Swept-back Wing with Canard	Wings angled toward the back, plus a rectangular mini-wing near the nose.

DISCUSSION QUESTIONS

- Which wing shape do you predict will fly the farthest? What is your reasoning?
- Based on what you know about drag, which wing do you think creates the least air resistance?
- Why might engineers choose different wing shapes for different types of aircraft?

TEACHER TIPS

- Don't spend too much time on the physics here — the hands-on testing will make these concepts concrete. The goal is for students to have a working understanding of lift, drag, and wing shape before they build. Save deeper discussion for Activity 5 after students have seen the data.
- The "canard" mini-wing near the nose is worth a brief mention: it's the same configuration the Wright Brothers used on their first aircraft. Students often find this surprising.

Part 2 — Assembling the Foam Glider (25 min)

Distribute foam trays and NASA Foam Glider template to guide students through assembly. Students work in their teams following the template instructions. Each team needs one assembled glider that they will keep for the rest of the challenge, swapping out different wing configurations as they test.

Note: Encourage students to be as precise as possible when cutting glider parts from the foam trays. Jagged edges and asymmetrical wings can affect assembly and flight. If time or students' ability to cut glider parts precisely is a concern, consider cutting parts ahead of time and providing as kits for students to assemble.

Assembly tips:

- Make sure wings are seated evenly and securely in the wing slots, with both sides at the same angle.
- The nose weight (paper clip or clay) should be centered, not shifted to one side.
- Balance check: hold the glider at the wing slot. The nose should tilt only slightly downward. A very nose-heavy or tail-heavy glider will not fly well.

TEACHER TIPS

- Have one team assemble a glider at the front as a class demonstration while other teams work through their kits. The most common issue is uneven wing placement — a wing that is tilted or not fully seated will cause the glider to veer sideways.
- If a glider is not flying straight during practice, check: (1) Is the nose weight centered? (2) Are both wings at the same angle? (3) Is the tail piece straight and not bent?

Part 3 — Preview the Wing Configurations (10 min)

Walk through each of the six wing configurations using the reference sheet. Have students handle each wing piece before attaching any of them.

Tell students: In the next activity, we will develop a fair way to test all six wings. The driving question for our testing: Which wing shape flies the farthest?

ACTIVITY 3

Establishing a Testing Procedure

TIME
~50 min

Essential Question: Why does it matter how we test?

Before collecting real data, students must agree on a consistent way to launch their gliders. Through practice launches, they discover that inconsistent launches produce widely different results — and that controlling variables is essential for their data to be useful. This activity mirrors real scientific practice and prepares students for the full data collection in Activity 4.

SETUP & MATERIALS

- Assembled foam gliders from Activity 2, with Straight Wing attached to start
- Tape measures — 1 per group
- Masking tape to mark a launch line on the floor
- Establishing Testing Procedure Sheet – 1 per group
- Open space: gym, hallway, or cleared classroom (at least 20 feet of clear floor space)

Part 1 — Why Procedure Matters (10 min)

Before heading to the launch space, introduce the idea of a variable: something that can change in an experiment.

Ask students: If we want to know which wing flies the farthest, what needs to stay the same every time we launch the glider? What might accidentally change from launch to launch?

Things that could vary and should be controlled:

- Launch height — how high the glider is held at the moment of release
- Release angle — whether the nose points level, slightly up, or slightly down
- Launch force — a smooth gentle release vs. a hard throw
- Starting position — where the launcher stands relative to the line

Explain: If any of these things change between launches, we can’t be sure whether a distance change was caused by the wing shape or by the launch itself. Controlling variables lets us trust our results.

DISCUSSION QUESTIONS

- If one person launches with a lot of force and another launches gently, what problem does that create for the data?
- What is one thing you could do to make sure every launch is as similar as possible?
- Why does it matter that the data is reliable?

Part 2 — Practice Launches (25 min)

Move students to the launch space. Each team starts with the Straight Wing on their glider and records flight distance for two rounds of 5 launches:

- Round 1 — Inconsistent: Deliberately vary the technique — some high, some low, some hard, some gentle. Record each distance.
- Round 2 — Consistent: Try to make every launch as similar as possible. Record each distance in feet to one decimal place.

After both rounds, each team calculates the range (longest minus shortest) for each set. Teams with a smaller range in Round 2 have more consistent — and more trustworthy — data.

TEACHER TIPS

- Students should clearly see that the inconsistent trials produce a wider spread of results. This is the key moment that motivates the class procedure in Part 3. If students' results happen to be similar anyway, ask them to try extreme variations — launch from the floor versus from overhead — to make the point obvious.
- You can also demonstrate this yourself before students begin: launch the same glider twice with very different techniques and show where each one lands.
- Students may find converting measurements of feet and inches to feet to the nearest two decimal places challenging. Explain that converting the data in this way will make it easier to calculate average distances over multiple trials. If you expect this conversion to be difficult for your students, you can walk them through a simple example (12ft 6 in. = 12.5 ft.) and/or provide the conversion table below as scaffolding.

Inches	Feet
1	.08
2	.17
3	.25
4	.33
5	.42
6	.50
7	.58
8	.70
9	.75
10	.83
11	.92
12	1.00

Part 3 — Class Procedure Agreement (15 min)

Bring the class back together. Have a few teams share their ranges from both rounds. Lead a discussion about what made some results more consistent.

As a class, agree on a standard launch procedure. Write it on the board and have students copy it onto their Testing Procedure sheet. This is the official procedure for all testing in Activity 4.

SAMPLE CLASS LAUNCH PROCEDURE

1. Stand at the launch line with both feet behind the tape.
2. Hold the glider at shoulder height, level (not tilted left or right).
3. Point the nose slightly downward — about 10 degrees below level.
4. Use a smooth, gentle forward push to release. No snapping or throwing.
5. Measure from the launch line to where the nose of the glider first touches the ground.

DISCUSSION QUESTIONS

- Why should we use the same launch procedure for all six wing configurations?
- If a launch goes badly (the glider flips or spins), should we count that trial? What's the fairest thing to do?
- If two teams use different launch procedures, can we combine their data? Why or why not?

ACTIVITY 4

Glider Testing

TIME
~100 min

Essential Question: Which wing configuration helps a glider fly the farthest?

Using the class procedure from Activity 3, student teams test all six wing configurations, recording 10 flight distances per configuration. This is the core data collection activity of the challenge. Students record results on the Glider Flight Data sheet and add their averages to the class data chart.

SETUP & MATERIALS

- Assembled foam gliders with all 6 wing configuration pieces
- Glider Flight Data Collection Sheet – 1 per group
- Tape measure — 1 per group
- Launch line marked with masking tape (same location as Activity 3)
- Reference data table for groups with missing data "Class Data Summary"
- Calculators

BACKGROUND FOR TEACHERS

The table below shows the average flight distances from a reference dataset for each configuration. Do not share these with students before testing — let them discover the results through their own data. Use this to check whether class results are in a reasonable range.

Wing Configuration	Avg. Distance (ft)	Notes
1 — Straight Wing	12.07 ft	
2 — Elliptical Wing	12.70 ft	
3 — Swept-back Wing	14.75 ft	Best performer
4 — Delta Wing	14.18 ft	
5 — Swept-forward Wing with Canard	13.37 ft	
6 — Swept-back Wing with Canard	12.18 ft	

Part 1 — Testing Configurations 1–3 (~50 min)

Briefly review the class launch procedure before starting. Assign each team a starting configuration or let teams choose their own starting point. Each configuration requires 10 trials before moving to the next.

Suggested team roles (rotate so everyone launches at least once):

- Launcher — holds and releases the glider following the class procedure
- Recorder — writes each distance on the Glider Flight Data sheet
- Measurer — places a marker and measures the distance from the launch line to where the glider's nose first touches the ground

TEACHER TIPS

- Remind students: measure to where the nose first lands, not where the glider slides to afterward.
- Safety: only one glider in the air at a time. All other students stand behind the launch line or along the side walls. Use a clear signal (a raised hand or a countdown) before each launch.
- If a glider flips or clearly malfunctions on release (not a flight issue), have the team discard that trial and repeat it to keep 10 valid data points.

Part 2 — Testing Configurations 4–6 (~50 min)

Continue testing until all teams have recorded 10 trials for all six configurations.

Encourage students to notice patterns as they work:

- Are some wings more consistent than others (similar distances every trial)?
- Are there any results that surprised you compared to your predictions from Activity 2?

DISCUSSION QUESTIONS

- Looking at your raw data, which wing seems to be performing best? Which is worst?
- Were there any configurations that surprised you?
- What made some individual flights go better or worse than others?

TEACHER TIPS

- If teams finish all six configurations, encourage them to identify the configuration with the most consistent results — the smallest difference between their longest and shortest trial. This previews the concept of reliability they will explore in Activity 5.
- If any team is missing data for any configuration, have them use the value from the reference dataset above so everyone has complete data to work with in Activity 5.

ACTIVITY 5

Data Analysis and Visualization

TIME
~100 min

Essential Question: What story does our data tell?

Students use their collected flight data to calculate average distances for each wing configuration, build a bar graph to compare performance, and write data-backed conclusions. Results are discussed as a class, and students connect their findings back to the A+ Airways design challenge.

SETUP & MATERIALS

- Completed Glider Flight Data Collection sheets from Activity 4
- Class Flight Data Analysis Sheet — 1 per student
- Reference data table for groups with missing data
- Rulers and colored pencils or markers
- Class data chart from Activity 4 (projected or on large paper)

Part 1 — Calculating Group Averages (25 min)

Review the concept of average (mean) before students begin. Write the formula on the board:

AVERAGE (MEAN)

Average = (sum of all trial distances) ÷ (number of trials)

- For this challenge: add up all 10 distances, then divide by 10.

Work through the calculation for the Straight Wing as a class before students do the rest independently:

1. Add up the 10 trial distances for the Straight Wing.
2. Divide the total by 10.
3. Round to the nearest hundredth (two decimal places).

Students then calculate and record the average for each of the remaining five configurations on their Data Analysis sheet.

Part 2 – Calculating Class Averages

Project the Class Flight Data Analysis Sheet. Have each group record their average flight distance for each wing configuration.

Students then calculate and record the overall class average for each configuration.

DISCUSSION QUESTIONS

- Why do we use the average instead of just looking at the best (longest) single flight?
- What did we learn by looking at averages reported by several groups?
- Could two wing configurations have the same average distance but very different patterns of results? What would that mean for a designer?

TEACHER TIP

- If any team is missing data from Activity 4, direct them to the reference dataset. The goal of Activity 5 is data analysis and visualization — it is perfectly fine for any group to use the provided data if needed.

Part 2 — Building a Bar Graph (25 min)

Have students create a bar graph of the class data on the Data Analysis sheet. Walk through the requirements as a class before students begin.

Graph requirements:

- Title: "Average Flight Distance by Wing Configuration"
- X-axis: labeled "Wing Configuration." List each configuration by number (1–6) under each bar.
- Y-axis: labeled "Average Flight Distance (ft)." Start at 0, go up to at least 16 ft, use 2 ft intervals.
- Bars must be the same width, evenly spaced, and drawn with a ruler.
- Both axes must include labels and units.

TEACHER TIPS

- Show students a sample completed graph (with made-up data) before they start so they can see what a complete, well-labeled graph looks like. The most common issues are uneven intervals on the Y-axis and bars of inconsistent width.
- For students who finish quickly: ask them to use a second color to mark the bar that represents their original prediction from Activity 2, then reflect on whether the data supported that prediction.

Part 3 — Interpreting the Data (50 min)

Once graphs are complete, students answer the analysis questions on their Data Analysis sheet individually. Then bring the class together to discuss results and connect findings to the A+ Airways challenge.

Guide students through these questions:

4. Which wing configuration had the highest average flight distance? Which had the lowest?
5. What do the top-performing wings have in common? Look at their shape.
6. Which configuration was most consistent (smallest difference between highest and lowest individual trial)? Does consistency matter as much as average distance?
7. Does the data match your prediction from Activity 2? What surprised you?

DISCUSSION QUESTIONS

- Which wing would you recommend to A+ Airways based on your data? What evidence supports your choice?
- If a wing had one very long flight but nine short ones, would you trust its average? Why or why not?
- What are some limitations of this test? What else would you want to know before recommending a wing to the airline?
- How is the data you collected today similar to — or different from — the kind of data a real aerospace engineer might collect?

TEACHER TIP

- The swept-back wing typically outperforms the others in this test because its shape reduces drag at the speeds produced by a standard glider launch. Students do not need the aerodynamic details at this point — the goal is that they can identify the pattern in the data and use evidence to support a claim. The physics will deepen over the rest of the semester.
- Collect completed Data Analysis and Glider Flight Data sheets at the end of Activity 5. The wing performance data they gathered today will be referenced again in the Design Challenge.

Companion Handouts

Handout 1 – A+ Airways Interior Design RFP

A+ Airways — Interior Design Request for Proposals

A+ Airways is seeking proposals from aircraft design companies to create the interior designs for a fleet of new airplanes. Our current fleet is aging — the oldest in the industry. Our airplanes are not fuel efficient, do not meet current federal air quality regulations, and require a large amount of maintenance.

To cover these costs, A+ has added more rows of seats, leaving just 29 inches of leg room between rows — the least among all airlines. Customers don't like this, and we are losing them to competitors.

A+ needs to turn things around. We are requesting proposals for how to make our planes more profitable. Proposals should include a new airplane interior design and a prediction of potential profits.

Handout 2 – Aircraft Market Research

Name: **Date:** **Period:**

Research at least 3 different types of aircraft. These could include different kinds of airplanes (passenger, military, cargo), helicopters, or something unusual. For each aircraft you research, find an image and fill in the information below. List the website where you found your information.

Goal: Look for aircraft that are different from each other. Think about how the size, shape, and design of each one connects to what it is used for.

Aircraft 1

Name:

Source (website / book):

Image:

paste image here

Primary Uses:

Main Characteristics:

Aircraft 2

Name:

Source (website / book):

Image:

paste image here

Primary Uses:

Main Characteristics:

Aircraft 3

Image:

paste image here

Name:

Source (website / book):

Primary Uses:

Main Characteristics:

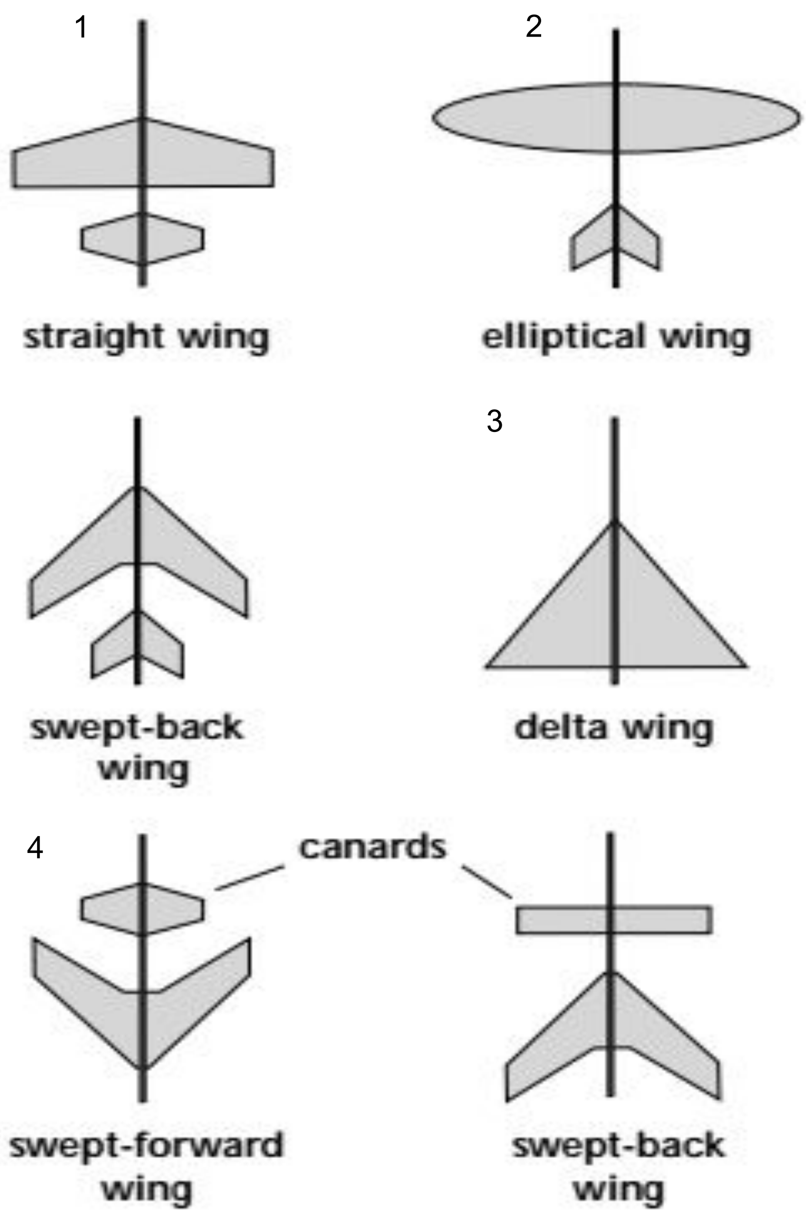
Bonus: Research a 4th aircraft — something unusual or one you've always wanted to learn about.

Aircraft 4

Aircraft name:

What makes it interesting or unusual?

Handout 3 – Wing Configuration Reference Sheet



Handout 4 – Establishing Testing Procedure

Group Members: ______________________ **Date:** ______________ **Period:** ____________

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Part 1. Practice Launch Data

Record each trial distance in feet, to two decimal places. If a throw doesn't count (wrong release, glider was dropped), note it and redo that trial.

Round 1 (Inconsistent)	
Trial	**Distance (ft)**
1	
2	
3	
4	
5	
Range	

Round 2 (Consistent)	
Trial	**Distance (ft)**
1	
2	
3	
4	
5	
Range	

What patterns do you notice in your data? Did you notice a difference between round 1 and round 2?

Part 2 — Our Class Testing Procedure

As a class, agree on a procedure to launch the glider. Write the steps below exactly as the class decides. Use this exact procedure for all testing in Activity 4 — do not change it once it's set.

Step	Description

Handout 5 – Glider Flight Data Collection Sheet

Group Members:

____

____

____

____

Date: ____________ **Period:** ____________

Glider Flight Data

Record each trial distance in feet, to two decimal places for each wing configuration. If a throw doesn't count (wrong release, glider was dropped), note it below and redo that trial.

	Straight Wing	Elliptical Wing	Swept-Back Wing	Delta Wing	Swept-Forward Wing (w/ canard)	Swept-Back Wing (w/canard)
Trial	**Distance (ft)**	**Distance (ft)**	**Distance (ft)**	**Distance (ft)**	**Distance (ft)**	**Distance (ft)**
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
AVG Sum ÷ 10 =						

Handout 6 – Class Flight Data Analysis

Name: ______________________ **Date:** ______________ **Period:** ____________

Part 1. Class Data Summary

As each group reports their average, fill it in the table below. When all groups have reported, calculate a class average for each wing configuration.

Wing Configuration	Group 1 Avg	Group 2 Avg	Group 3 Avg	Group 4 Avg	Class Avg
Straight Wing					
Elliptical Wing					
Swept-back Wing					
Delta Wing					
Swept-forward Wing with Canard					
Swept-back Wing with Canard					

Rank	Wing Configuration	Class Avg (ft)	Notes
1			
2			
3			
4			
5			
6			

Part 2: Building a Bar Graph

Directions: In the space below, create a bar graph showing the class average for each wing configuration. Make sure your graph includes the following:

- Title: "Average Flight Distance by Wing Configuration"
- X-axis: labeled "Wing Configuration." List each configuration by number (1–6) under each bar.
- Y-axis: labeled "Average Flight Distance (ft)." Start at 0, go up to at least 16 ft, use 2 ft intervals.
- Bars must be the same width, evenly spaced, and drawn with a ruler.
- Both axes must include labels and units.

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