



SOAR for STEM Program

2019-2020SY Student Notebook



Student Name: _____

Pre-Visit Lesson: Foam Flyers

1. Build a foam flyer with your teacher's help.
2. Take your foam flyer for a test flight and observe its movement. Did it fly straight? Did it turn?
3. Record your data under **Test Flight Observations**.

Test Flight Observations

During my test flight, my foam flyer...

4. Make a change to the design of your foam flyer. Record your change under **Design Change**.

Design Change

I changed my foam flyer's....because...

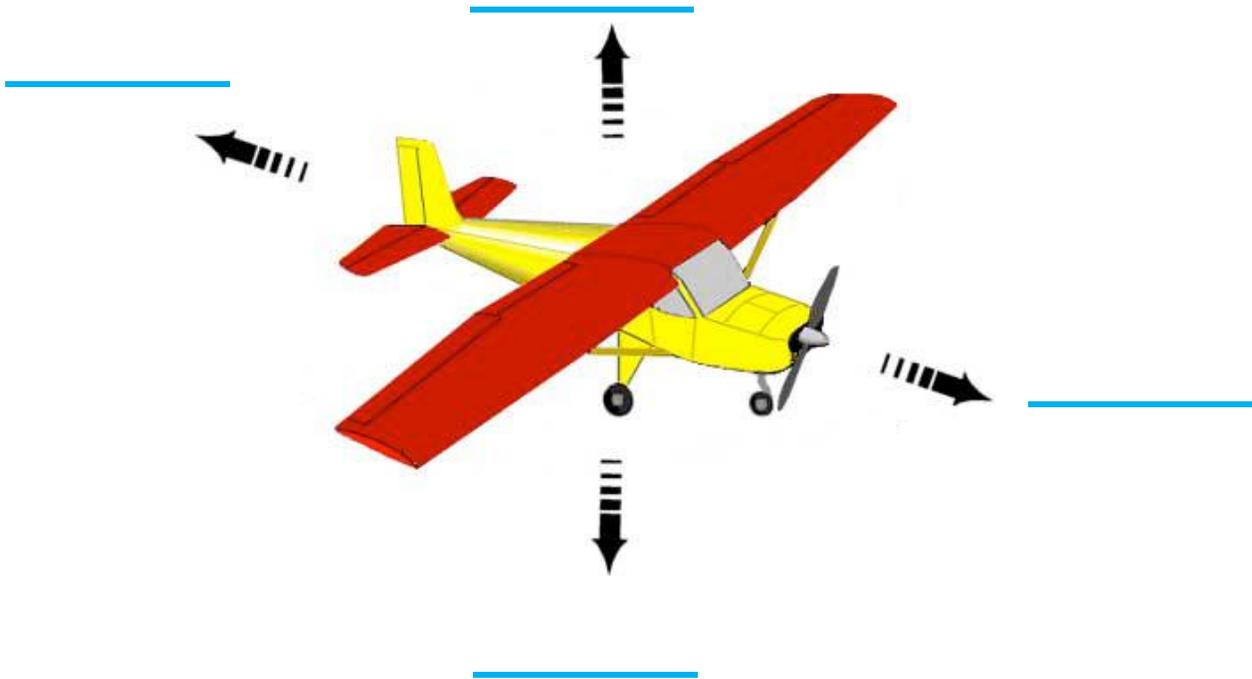
5. Take your foam flyer for a second flight and observe its movement. Did your design change effect its flight?
6. Record your data under **Second Flight Observations**.

Second Flight Observations

During my second flight, my foam flyer...

7. Share your results with your classmates.

SOAR for STEM Museum Visit: The Four Forces of Flight



Answer the following questions with **PUSH** or **PULL**:

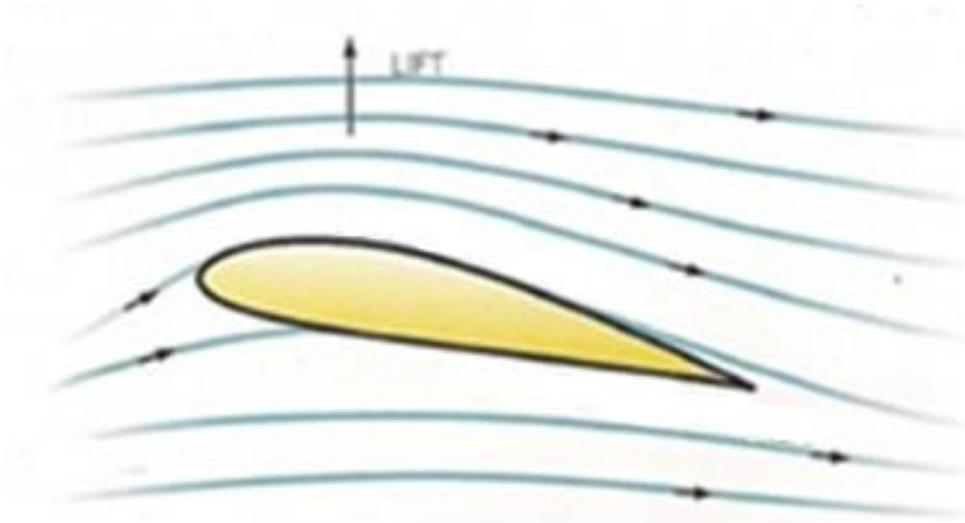
Weight/Gravity is what type of force? _____

Drag is what type of force? _____

Thrust is what type of force? _____

Lift is what type of force? _____

How do airplanes create lift?



1. _____ **The shape of an airplane's wing**
2. _____ **For every action, there is an equal and opposite reaction**
3. _____ **When air moves faster, it has less pressure**

Focused Experiment

CHALLENGE: Using your knowledge of the science of flight, build and fly a straw glider and make a change to its design with the goal of increasing your flight distance.

Step 1: Build a straw glider using the materials provided and the sample glider on your table as a guide. Your SOAR for STEM teachers will help you!

Step 2: Take your glider into the hangar for a **Test Flight**. Observe the glider's movement during the flight. Return to the classroom.

Step 3: Record your **Test Flight Distance** and **Test Flight Observations**:

TEST FLIGHT DISTANCE My glider traveled...	TEST FLIGHT OBSERVATIONS During my flight, my glider...
_____ Feet	

Step 4: Make a change to the design of your glider. Remember, your goal is to make it fly a greater distance during your second flight!

Step 5: Record your **Design Change** and **Hypothesis**. A hypothesis is a prediction or scientific guess.

DESIGN CHANGE I changed my glider's...	HYPOTHESIS My design change will change my glider's...
	<input type="checkbox"/> Drag <input type="checkbox"/> Weight <input type="checkbox"/> Lift

Step 6: Bring your Student Notebook to your SOAR for STEM teachers. They will check your work and clear you to take your Second Flight.

Step 7: Record your **Second Flight Distance** and **Second Flight Observations**.

SECOND FLIGHT DISTANCE My glider traveled...	SECOND FLIGHT OBSERVATIONS During my flight, my glider...
<p>_____ Feet</p>	

Step 8: Answer the following **Conclusion Questions**.

1. What inspired you to make your design change? Was it something you learned today? Something you saw in the museum?

2. If you could make another change to your glider to try to increase its flight distance, what would it be?

Step 9: Decorate or redesign your glider while you wait for other students to finish the experiment.

Step 10: Share your experiment results with the class!