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LESSON OBJECTIVES

STUDENTS WILL:

- Understand the components that make a plane
- Understand the basics of flight
- Understand how control surfaces effect an aircraft during flight

TIME: 30-45 Minutes

PROVIDED LESSON

THE CONTROL SURFACE EFFECT

MATERIALS NEED

The FT Aircraft needed for this lesson is the FT Aviore or any of our FT STEM Chuck Gliders. See store for purchasing options.

The tools needed for this build are included in the FT Crafty Kit. See store for purchasing options.

Hot Glue Gun and hot glue sticks
IMPORTANT SAFETY NOTE REGARDING HOT GLUE

Hot Glue Guns get extremely hot, and should always be handled with care. Young students should always be supervised when using hot glue. Review hot glue safety with your students prior to using hot glue guns.

Utility Knives

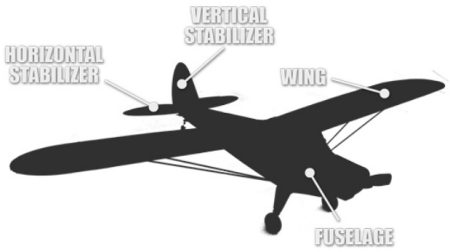
(if you are working with younger kids, you can use plastic cards instead of knives.)

Sponsored Lesson

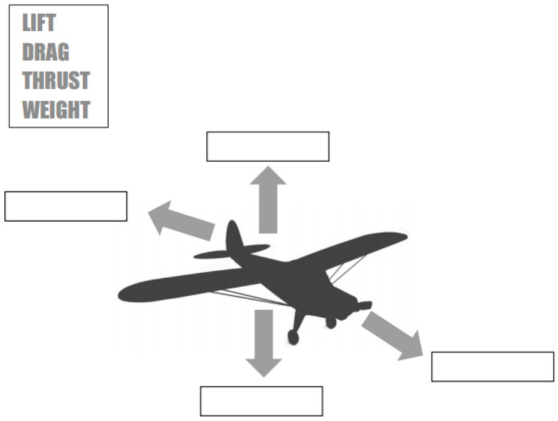
ACTIVITY ONE

INTRODUCTION COVERING THE BASICS

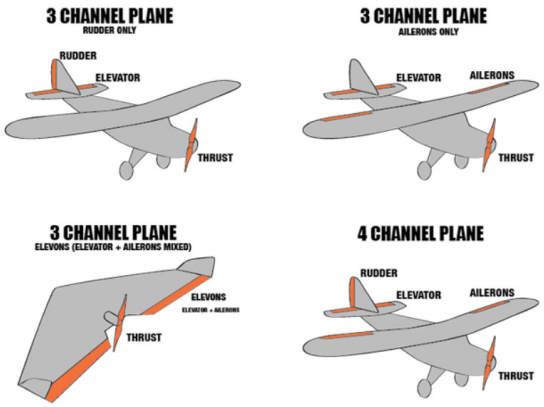
In order to get the students engaged and understand the terminology that you are going to present to them, we need to build on the foundational knowledge that these Young Eagle cadets first come in with. With a model plane or a pre-built glider in hand for demonstration, explain the different components that make up an aircraft.
See diagram below as a resource;



With the students helping identify the different componets, now get into the forces that act on the aircraft during flight. See diagram below as a resource;



Recognizing that the students are understanding through basic oral checks for understanding, explain how control surfaces are used on the plane to control it during flight and even on the ground. If using the FT STEM assortment pack it is good to cover all control surface layout options, this will support students understanding during build and testing activities. See diagram below as a resource;

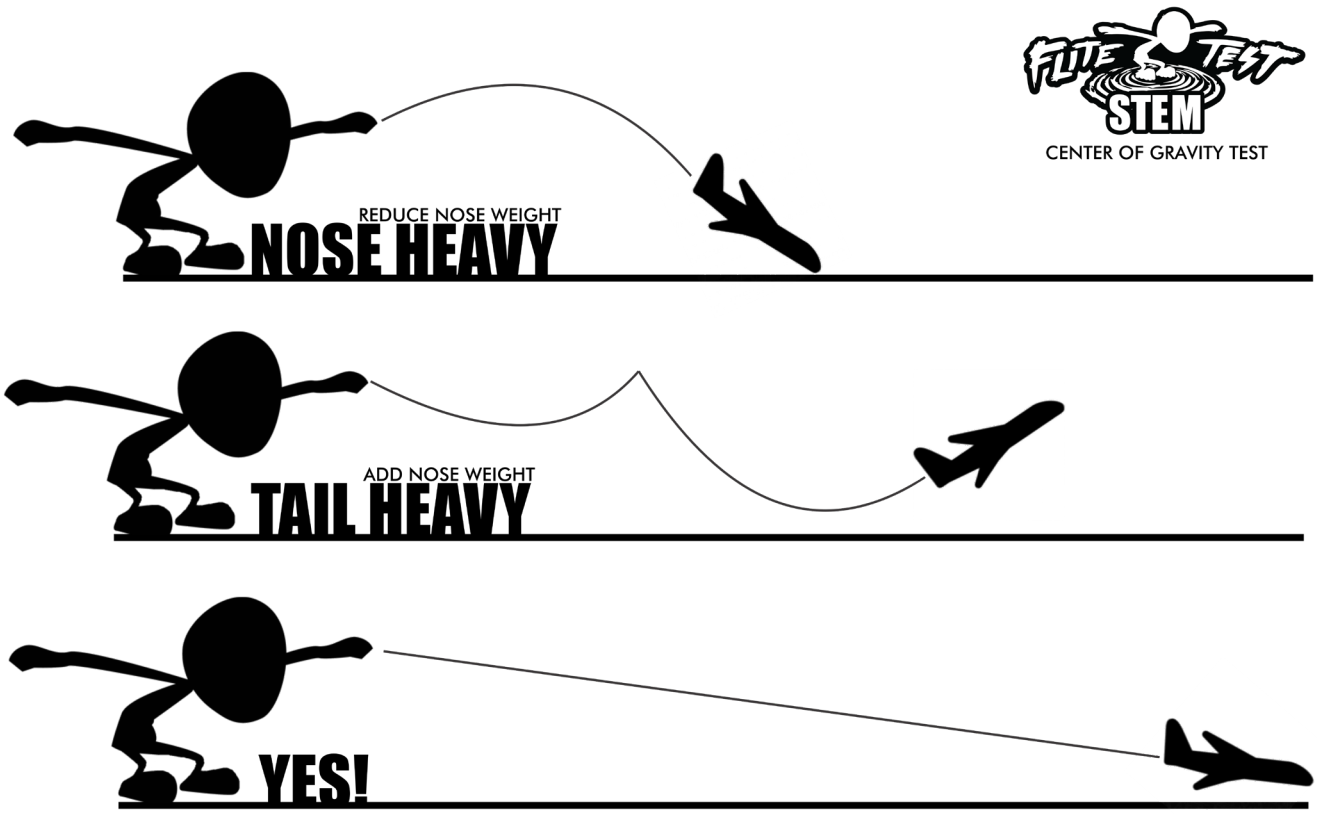


ACTIVITY TWO

BUILDING THE GLIDER

Depending on the site and the FT gliders that you are using, have your students now with your team's help build and decorate their gliders. Have them test their gliders and get them tuned-in based on the diagram below.

NOTE: Make sure to have the students keep in mind the Center of Gravity of their FT Glider. Depending on how the student constructs their aircraft, there might need to be some minor changes by adding weight to either the front or rear of the aircraft for correct CG. See reference below;



ACTIVITY THREE

CREATING CONTROL SURFACES

In this part of the lesson the students should now have an idea of where their control surfaces should be on their built gliders. Demo control surfaces constructed on a glider, typically it is just a 1/2 inch to an 1 inch surface cut with a bend using a ruler on the foam board to act as the hinge. Have your students construct their control surfaces and have them test it out. Note: Have a safe area to test their gliders!

EXTENDED LEARNING

Problem to Solve: Create a flight path that they have to adjust their gliders to get through during a simulated toss. I usually tell them they have to throw in one direction and curve around an obstacle with a safe landing on the other side. By doing this they are showing they understand the physics behind the control surfaces and basic movements needed to alter their planes flight path. Have fun, these little gliders can do some cool tricks!

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