



BONUS PROJECT

AMA Alpha

AMA ALPHA

Using everything we learned throughout the week, we can now embark on a free flight model airplane build! Free Flight is the oldest discipline of model aviation, and in the case of the AMA Alpha, utilizes a rubber band motor in order to fly.

The name “Free Flight” comes from the fact that you have no control over the airplane once it leaves your hands; It is free to fly anywhere at all! The AMA Alpha flies best outdoors on a clear day, or perhaps with a slight breeze.

Determine which direction the wind is blowing and experiment with flying the AMA Alpha both into the wind and with the wind. Which method results in a longer flight?

Winding the motor will make your airplane fly—but how far, and for how long? Experiment with the number of winds on the motor when you fly your AMA Alpha to see what works best.

CURRICULUM INFO FOR PARENTS:

4.PS.1 Investigate transportation systems and devices that operate on or in land, water, air, and space and recognize the forces (lift, drag, friction, thrust, and gravity) that affect their motion.

4.PS.2 Investigate the relationship of the speed of an object to the energy of that object.

4.PS.4 Describe and investigate the different ways in which energy can be generated and/or converted from one form of energy to another form of energy.

4.DA.1 Formulate questions that can be addressed with data. Use observations, surveys, and experiments to collect, represent, and interpret the data using tables (including frequency tables), line plots, and bar graphs.

GOALS & OBJECTIVES

Question: What will children know and be able to do as a result of this project?

Answer: Follow written and spoken instructions.

Parents have the option of either guiding their child through the project themselves, or completing the project with the aid of live AMA instruction.

ENGAGE WITH BOTH FINE & GROSS MOTOR SKILLS

Fine Motor Skills: Children will be able to refine their use of simple building methods through the construction of the AMA Alpha.

Gross Motor Skills: Children will be able to refine their object control skills through the act of winding up and flying the AMA Alpha in a controlled and calculated manner.

DETERMINE CAUSE & EFFECT

Children will have the opportunity to better understand how small changes in the number of winds and control surfaces determine the AMA Alphas' success as a flying object.

Question: What prior knowledge do children need to have to successfully complete this project?

Answer: It would be helpful, but not required, if:

1. The child has some prior exposure to arts and crafts of some kind.
2. The child has some prior knowledge of airplanes.
3. The child has some prior understanding of flight.

Question: What are some guiding questions for this project?

Answer: Guiding questions will help your child think creatively as they pursue this activity and encourage them to explore the topic further in the future.

1. What do you think makes airplanes fly?
2. What is the difference between an AMA Alpha and a full-scale airplane?
3. What would you change about the AMA Alpha to make it fly further?
4. Do you think the AMA Alpha would fly better indoors or outdoors?
5. Do you think the AMA Alpha would fly better if it's windy or when the air is still?

A BRIEF HISTORY OF FREE FLIGHT

Free Flight is one of the earliest forms of “aeromodeling” or model aviation. Free Flight means that the pilot (you) has no control over the aircraft once it takes off from the ground or your hands.

When Free Flight first “took off,” the standard way of judging the competitions was to figure out how far the airplane flew. You can try this method by counting your steps or using a pedometer app on a smartphone.

Later on, aeromodelers decided that duration was more important than distance—that is, how long the airplane flew rather than how far. You can try this method by using a stopwatch or timer.

HOW TO BUILD YOUR AMA ALPHA

Build instructions are located inside the AMA Alpha box. To watch a build video, please visit amaflightschool.org/alpha