NFFS Website - Science Olympiad Student Resources – How to get started - Overview of Wright Stuff Airplane Design, Construction and Kits
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What is the best airplane design?

- If you are new to the event or have a limited amount of time, build a proven good performing design.
- If you have an experienced coach and have a significant amount of time for flying practice a custom design can be considered.
- Success in the flight events is 20% design and 80% flying practice and rubberband motor winding.
- At the very start of the school year, arrange to get gym time for flying practice. Meet with your school principal or board to get this done, if necessary. Two 3-hour practices each month are recommended. Ask to have the gym blowers off, or at least turned to their very lowest setting.
- You can be very successful flying a proven design or kit without customizing.

Should I build a kit or from scratch?

- If you are new to the event and/or have limited time, build one of the excellent kits on the market.
- A "best kit" depends upon the time you have to commit and your objectives. A top-level kit can take 8-12 hours to build and will get flights of 2:00-3:00. A mid-level kit will take 2-6 hours to build and 1:30 flights, or a little better, should still be possible.
- If time is limited, less time building and more time practicing is recommended.

Kit Manufacturers

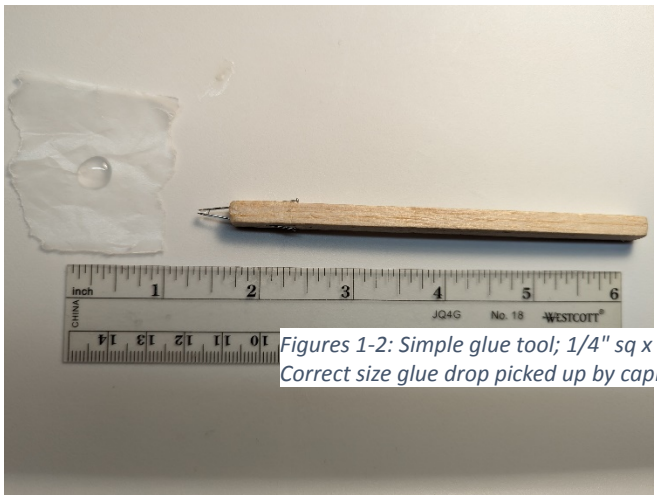
- Lasercutplanes – simple to construct basic-level kits (see the "Mountain Lion"); less expensive https://www.lasercutplanes.com/product-category/indoor-kits/
- Freedom Flight Models – Top level kit with excellent written and pictorial instructions; a little more expensive and more challenging to build - https://www.freedomflightmodels.com/
- J&H Aerospace - Top level kits with excellent video instructions; both mid-price and a little more expensive designs available https://jhaerospace.com/product-category/indoor-rubber-power/
- Retro RC Kits – Good medium-level kits; a little less expensive http://retrorc.us.com/FFRubberPowerKits.aspx
- Guru Engineering – Good medium-level kits; less expensive https://www.guruengineeringtech.com/
- Wards Scientific – Build materials; official kit supplier of Science Olympiad

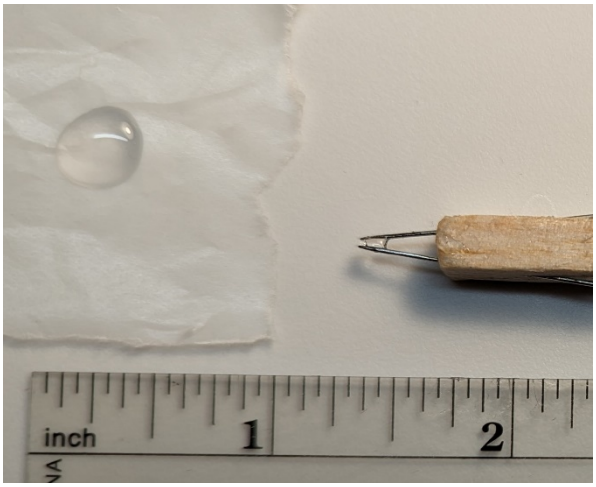
Very Simple Scratch Build

- Here is a simple mid-level airplane build and flight video; takes 30 minutes to build and uses medium grade balsa (less expensive) and can fly over two minutes in a typical school gym. You must read the detailed written instructions included in the video to get build dimensions and build details! Click "… more" in the text under the video to see all the instructions! https://www.youtube.com/watch?v=Mbxba3g1hMU&list=PLe1IYdMr0FSw2kL0_WXi1b6Z3nQ_GCoQZ&index=23&t=129s
- Very few local stores now carry balsawood. It looks like Michael's Craft Stores has balsawood in stock, but only in packages of several sheets that make it difficult to determine individual sheet quality or weight.
- For high-quality balsawood, you can order from the National Balsawood Co., Balsa USA or Specialized Balsa Wood. Be aware that shipping charges can be high, so you might want to order wood for airplanes along with wood for the Boomilever event. Or, your school could join with other local schools to share the shipping cost.

What else do I need to start? What glue should I use? Tips, etc.

- Read the kit instructions twice before starting. Ask questions in the Scioly.org forum here for quick help from experts: https://scioly.org/forums/viewforum.php?f=283
- Build with accurate alignment and with “gap free” joints. If you misalign a part, cut or crack the joint and do it over again.
- Good quality fresh cyanoacrylate (CA or “super glue”) for almost all joints. Fresh glue will bond in seconds. Glue that has been sitting on a store shelf for a year will not work. “Thin” CA if carefully applied to accurate joints can be a little lighter. “Medium” CA preferred by most teams and is also fine; you can buy at most hardware and craft stores. Favorite brands include, Zap a Gap, Bob Smith, Instacure, Gorilla Glue and Loctite (the “gel” viscosity glue is not necessary and is heavy).
- Make a simple CA glue tool as pictured below to apply the correct small drop to each joint. Applying glue directly from the bottle adds 5% or more to the airplane weight. Put a medium sized blob of glue on a small square of wax paper and pick up a tiny drop with the tool for each joint.
- Duco Cement is also handy for joints that you need a little time to position (like winglets attached to a wing). This is a strong light glue that dries and cures slower than CA. This you can buy at most hardware stores like Ace Hardware.
- 3M77 spray glue for attaching ultrafilm flying surface covering, or Elmers or UHU “blue” glue stick to attach tissue to flying surfaces. This you can buy at most hardware stores.
- You can build on any flat surface, but a foam project panel is handy and available from the most hardware stores like this https://www.homedepot.com/p/Project-Panels-Formular-1-in-x-2-ft-x-2-ft-Rigid-Foam-Board-Insulation-Sheathing-PP1/203553730





Figures 1-2: Simple glue tool; 1/4" sq x 4.5" balsa with pins. Correct size glue drop picked up by capillary action.