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## RA LineGliders

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A lineglider is in the shape of an airplane body, with a propeller powered by a rubber band. Boys can build lineglider kits or make linegliders from balsa wood. Visit [www.royalracers.com](http://www.royalracers.com) to order RA LineGlider kits. The competition can be held indoors or outdoors.

### Materials Needed:

- RA LineGlider kit (1 per person)
- Sandpaper
- Small hammer
- Paint or stain and brushes
- Coping saw
- Needle-nose pliers
- Drill with 1/16" bit

### Building Hints:

1. Chose a design for the body of the lineglider. Note: The nose of the glider must accommodate the official propeller hub. Tail should accommodate tail wing.
2. Cut design from the board provided for the body.
3. Sand edges and surfaces as desired.
4. Saw a slot (3/8" from bottom edge of tail), 1/16" side and 1" long for tail wing. (Tail wing may be shaped and rounded if desired.)
5. Using a 1/16" bit, drill an angled hole 5/8" from rear of body up through slot and tail wing. The hole should be about 1/2" deep, and angled toward the front of the glider so the nail head will angle towards the rear of the glider. This hole is for the nail to attach a rubber band and to secure the tail wing.
6. Drive a nail into the hole. Leave it sticking 1/4" below the body of glider.
7. Drill one 1/16" hole approximately 2 1/4" from the front and rear of glider, through the edge of glider body from top to bottom.
8. Paint or stain your glider as desired.
9. Insert "y" wires through body from top through bottom of glider body.
10. With needle-nose pliers, bend small U-shape in bottom of wires and push U up into wood of the glider body. This helps secure wires to the glider body.
11. One inch below top of wires, make another U-shape bend in wires. This will enable the glider to be hung on line.
12. Mount propeller on front of glider. Install rubber band on nail and propeller.
13. Add an RA logo or other decorations to your glider as desired.

### RA LineGlider Specifications:

- Note: Only the official propeller and the official rubber band supplied with the kit can be used in competition.
- Width, Length, and Height Limits – None. Excessive height might necessitate using longer wires to hang the glider on the line.
- Weight –  $\frac{3}{4}$  ounce minimum. Note: very light RA LineGliders have occasionally found the torque so great that the glider will flip over and fall off. You can correct this problem by bending the wire in a circle to clasp the line.
- Details – Paint, additional wood, plastic and strings may be added for decorations and design.
- Attachments – No device may be used for propulsion, except the official propeller and rubber band in the RA LineGlider kit.
- Official Rubber Bands – (92-120) Additional rubber bands may be ordered from [www.royalracers.com](http://www.royalracers.com).

**Awards:** RAs who build and race an RA LineGlider are eligible to receive an RA LineGlider patch for the first year. Additional years of building and racing earn the RA a dated chevron for his participation.

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### Leader's Information

Contact your state RA leader to get a copy of the race rules for your state. Pattern your race event similar to this so that your boys and leaders will be familiar with the race procedures.

#### Race Course Materials:

- 100 feet of mono-filament line (50# test or greater)
- Two tree, poles, building, walls, 2- x 4-inch bracket or something to tie lines to
- Tape measures and level
- Starting line mark on lines
- Finish line mark on lines

#### Race Materials:

- Whistle
- 3- x 5-inch cards (1 per participant)
- Pencils or pens
- Stopwatch(es) (if racing by time)
- Plumb line

**Outdoor Course:** Tie mono-filament line between two trees, poles, or buildings. Secure the "track line" about four feet off the ground. Track line should be level. Secure the tape measure in place to help secure an accurate measurement. **Indoor Course:** Secure mono-filament line to pole, boards with eye bolts, or wall. Secure "starting line" four feet from floor and "finish line" end 6 feet from floor. Secure the tape measure in place to help secure an accurate measurement.

**Race Propulsion:** Only the official propeller and the official rubber band supplied with the kit can be used in competition. Wind propellers 150 turns. This is about the maximum amount of turns your rubber band will withhold. (More turns may break the rubber bands.) If a participant over winds and breaks the rubber band, a turn is lost (foul or scratch). Give a second rubber band to the boy. If you choose, you may disqualify the boy if two rubber bands break.

**Racing Procedures:** All RA LineGliders will be inspected before the race and those not meeting the specifications listed will not be allowed to participate until the glider is brought into compliance. Upon completion of inspection, give each participant a 3- x 5-inch card and have them write their name on the card. Have the boys form two lines, one on each side of the line track. Each participant will hold their own card and glider in line. At each boy's turn, switching between the two lines, the boy winds the

propeller (clockwise as he looks straight at the propeller). He holds it, and places the glider on the line at the designated starting point. (Leaders may desire to place all gliders on the track line to avoid accidental release of the propeller while attempting to place the glider on the track line.) At the whistle, the boy releases the propeller and the glider takes off. Boys may not touch their glider with their body while the race is in progress. Should this occur, a foul is called and the distance or time for this race is not counted. Allow each boy to race his glider three times. Record results on the boy's card. At the end of the third heat, the score keeper will keep all 3- x 5-inch cards. The furthest distance or fastest time per participant is used in competition and determines the overall winner. Distance: At the signal, the glider is released. Measure the distance from the starting line to the tip of the propeller. A simple plumbline is useful to mark distance on the tape measure. Time: Time the gliders with a stopwatch. Time starts at the signal. Time stops when the propeller of the glider crosses the finish line.

Award trophies for 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> in each division in addition to best looking and most unusual design. Consider combining this activity with a missions fund-raising event.

### **Devotional Thoughts:**

Choose one of these devotional thoughts to share with the boys during the leader's time.

- As a Royal Ambassador, I will do my best. (RA Pledge)
- Do your best to present yourself to God. (2 Timothy 2:15)
- I may finish my course and the ministry I received from the Lord Jesus. (Acts 20:24)
- Run in such a way that you may win. (1 Corinthians 9:24-27)
- Run with endurance the race, keeping our eyes on Jesus. (Hebrews 12:1-2)