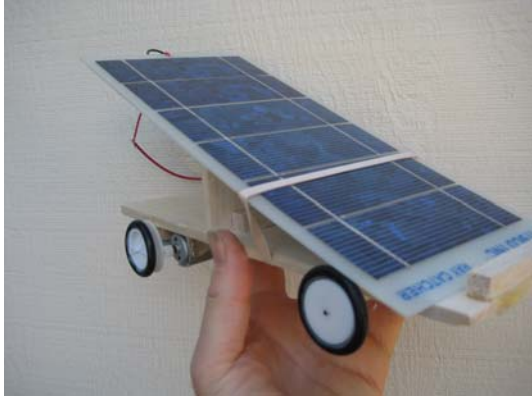


Model Solar Car Instructions



Materials

- Pitsco or SolarWorld 3v/1A solar module
- Solar World motor & gearset

Body

- 4" x 12" x 1/4" balsawood piece for chassis
- Straws
- 1/4" x 1/4" sticks of balsawood
- duct tape
- velcro
- eyelet screws - mini

Tools

- Glue gun
- Solder
- Xacto Blade saw
- Utility knives or xacto knives
- Rt-angle or T-square
- Pencil
- Ruler
- Small screw driver – Philips
- Wire strippers & wire cutters
- Hammer
- Wood block or hard surface

This car design starts with a solid chassis – a piece of balsawood. Care should be taken to attach the wheel axles as parallel as possible to one another – for a straight-running and fast car. The solar module is designed for easy removal for use with other cars. In this model, we've put the gears near the rear wheels for ease of construction. This approach required using a 1/4" x 1/4" balsawood stick to distance the axle from the chassis and make room for the motor to be mounted under the car and in position to engage the gears. We've used duct tape and a few screws to hold the motor snugly in position.

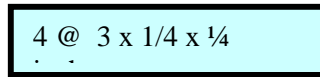
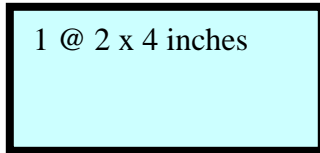
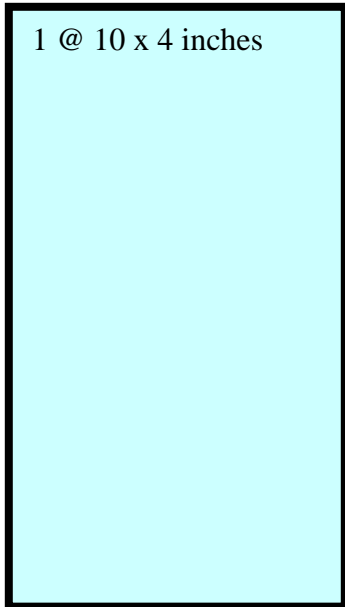
An alternate method is to put the gear(s) in the middle of axle (requiring cutting out a piece of the balsawood chassis) and mounting the motor on top of the chassis using the mounting bracket. Either way works. Attaching both gears to the axle offers the option of switching the gear ratios if desired, simply by moving the motor location.

The straws we've used here provide a somewhat loose fit. If possible, use a smaller straw diameter that better fits the diameter of the axle – this will assure a snug fit between the gear and motor.

Step 1. Cut 2" piece off the 12" x 4" balsawood. This becomes the 'riser' that the solar module will rest upon. Cut 3 – 3" pieces of 1/4" x 1/4" balsa sticks.

Using a rt-angle (or T-square), mark a line ~ at the halfway point (4" from the end). Using the glue gun attach the 2" riser to the chassis. Add a support stick in front and back of the riser using glue. Then glue the 3rd piece to the front as a bumper and to catch the front end of the solar module. Add a piece of Velcro to the middle of the Riser and the opposite piece to the Solar Module.

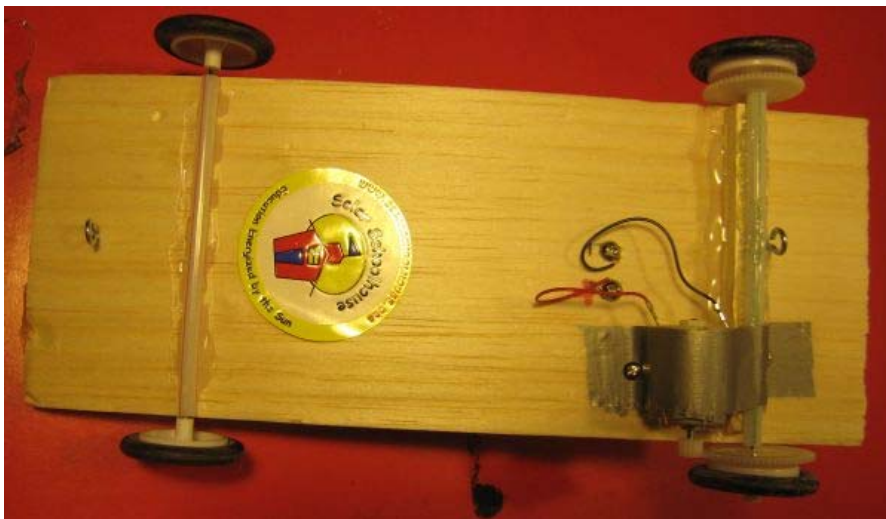
Model Solar Car Instructions



Step 2 Mark 2 straight lines ~ 1.5" from front and back using a pencil. Measure the top and bottom of the line to make sure the lines are precise and parallel.

Step 3. Assemble the Front Axle/wheel assembly. Cut a piece of straw 4" long (the width of the chassis). Put a wheel on one end of the axle, tap it with a hammer so that the wheel is snug on the axle. Slide the straw over the axle and attached the other wheel. Tap with hammer till axle comes through to the edge of the wheel. Put a bead of glue on the front line of the chassis and attach the straw/axle assembly. Take care to attach the straw as straight as possible.

Step 4A Side gear approach with Motor underneath. Attach wheels, gears and straw as shown. Cut a 1/4" x 1/4" x 4" balsa stick – glue it on the back line – straight. Glue the straw/axle assembly on top of the balsa stick. Mount the motor using duct tape underneath the chassis as shown. Use mini screws to keep the duct tape and motor snug.

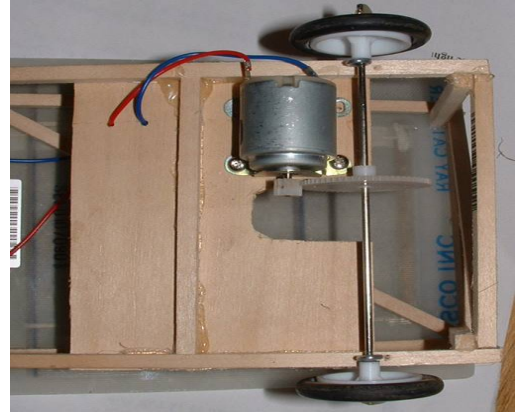


Step 4B. Middle Gear approach with motor above. Cut a slot in the middle of chassis, allowing room for one or 2 gears on the axle. Attach gear(s) to axle first in middle of axle, then cut piece of 1"-1.5" of straw for either side of the gear, then the wheels. Glue the straw/axle assembly the chassis underneath.

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Mount motor in bracket above chassis. Adjust so the gears and motor are snug fit, then secure to the chassis with screws.

Step 5. If the motor is mounted above the chassis, the solar module can be clipped directly on the motor leads. If motor is mounted under the chassis, one option is to attach the motor wire leads to 2 screws that extend to the topside, providing a + and – connection point for the solar module. (as shown in the picture)



Step 6. Solder alligator clips and insulator boots to the tips of the wire leads on the Solar Module.

Step 7. Attach a mini screw eyelet to the front and back underside of the car. Open the eyelet slightly so that you can easily attach to guideline for the race. Try to center the eyelets in the middle of the car to minimize friction of the guideline. Mount the rear eyelet on the raised axle if possible to minimize friction.



Step 8. Attach solar module to the car, add sunlight and watch it go.

An alternate version using a lattice body structure is shown in the Your Solar Home Guidebook, from Solar Schoolhouse.

Additional design ideas can be found on www.solarschoolhouse.org

Lessons and Guidelines for the American River College (ARC) Solar Car Race

Wonderful Guide for maximizing learning opportunities from this project:

http://eagle.csd49.org/middle/jss/Course_Instr.htm

For registration and other information on the ARC Solar Race and to get construction tips, photos, inspirations:

www.solarschoolhouse.org/newssh/arc