The Solar Racer- Final Presentation

M3- 22 ENGINEERING

Question

- Does the amount of sunlight a solar R/C receives affect how fast it can reach a certain distance?

Abstract

- My problem: Does the amount of sunlight a solar R/C receives affect how fast it can reach a certain distance? The reason I wanted to do this experiment is because I was interested in solar energy and how it works.
- The procedures for my experiment:
- First, solder one wire to a positive output and one to a negative output, in the battery compartment of the car.
- Then connect 6, ½ volt solar panels together, tape them onto a small piece of card board on top of the car, and connect them to the two wires from the car.
- Attach the two alligator clips from the 12-volt panel to the wires.
- Mark the start and finish lines.
- Put all the panels outside for 30 minutes in direct sunlight to charge.
- Test it 20 times with none of the panels covered, ¼ of the panels covered, half of the panels covered, ¾ of the panels covered, and with all the panels covered, and record the amount of time it takes the car to reach the marked distance for every trial, charging the car about every 5 trials.
- The results of my experiment: It takes a lot of solar panels to power the car because I couldn't get the car to move consistently with the panels provided.
- My conclusion: my hypothesis was correct because the less power the car had, the longer it took to get to the finish line-if it got there at all.

Hypothesis

- If the amount of solar energy a solar powered R/C car receives decreases, then the time it takes the R/C car to get to a certain distance increases, because it does not have as much power.

Materials

- 25.4 mm by 18.288 meters of electrical tape
- 12 Volt Solar Panel Charger
- F1 Race Car Battery Operated Remote Control RC Car 1:24 Scale Size Ready to Run RTR
- A stopwatch or a phone with a timer
- A flat surface with sunlight that is 1.8288 meters' long
- Regular Duct Tape
- Two copper wires
- Black Sharpie
- Soldering Iron
- Solder
- 6, ½ volt solar panels
- Cardboard

Procedure

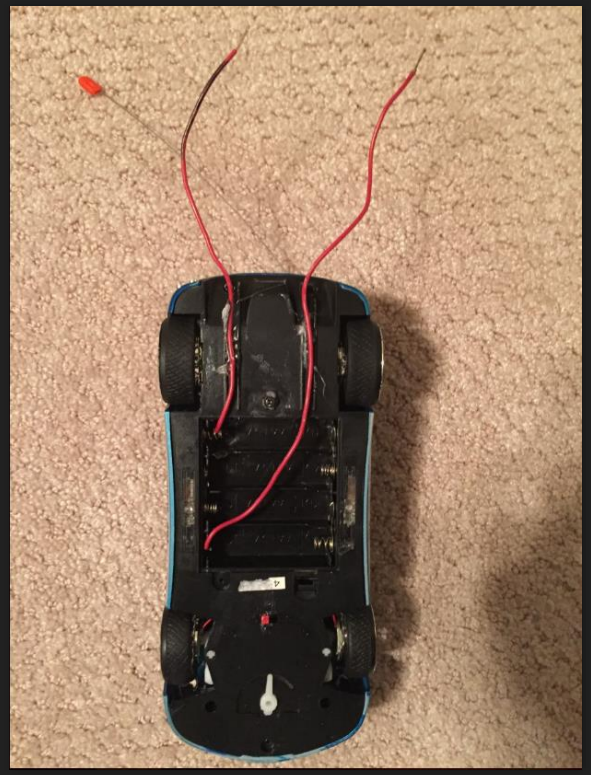
- First, solder one wire to a positive output and one to a negative output, in the battery compartment of the car.
- Then connect 6, ½ volt solar panels together, tape them onto a small piece of card board on top of the car, and connect them to the two wires from the car.
- Attach the two alligator clips from the 12-volt panel to the wires.
- Mark the start and finish lines.
- Put all the panels outside for 30 minutes in direct sunlight to charge.
- Test it 20 times with none of the panels covered, ¼ of the panels covered, half of the panels covered, ¾ of the panels covered, and with all the panels covered, and record the amount of time it takes the car to reach the marked distance for every trial, charging the car about every 5 trials.

Variables

- Independent Variable- The amount of energy the Solar powered R/C car receives
- Dependent Variable- The amount of time it takes the car to reach a certain distance
- Constant(s)- The Solar powered R/C car and the distance the car has to reach

Pictures

Bottom of the Car

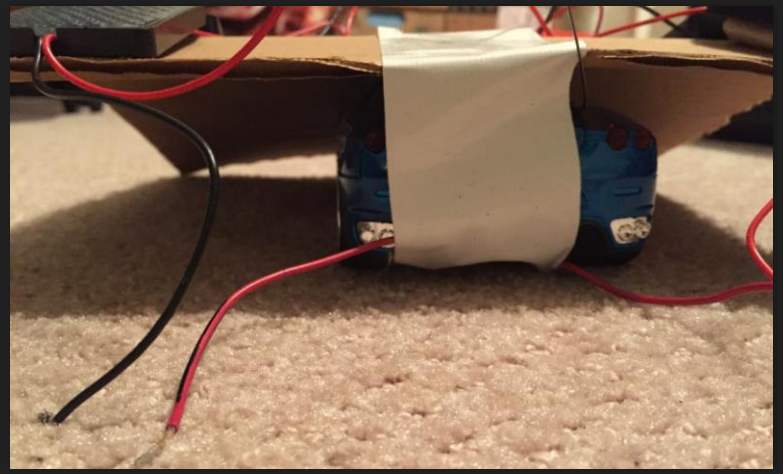


Car with Lights on

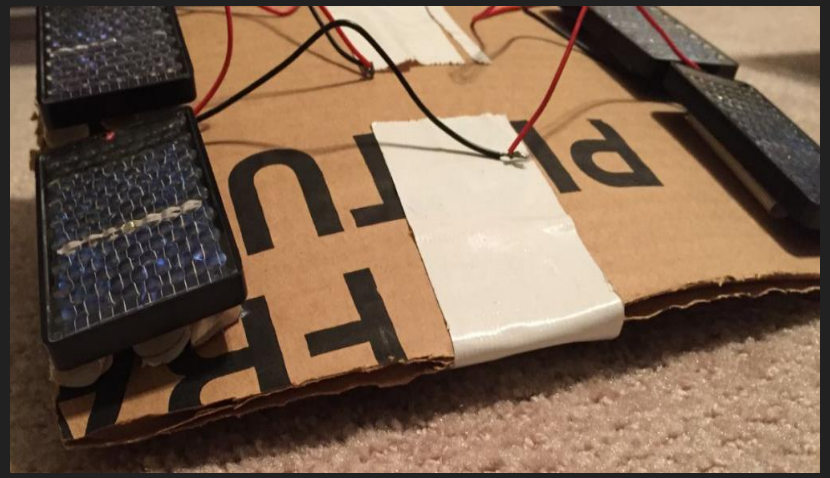
Car with Light off

Pictures

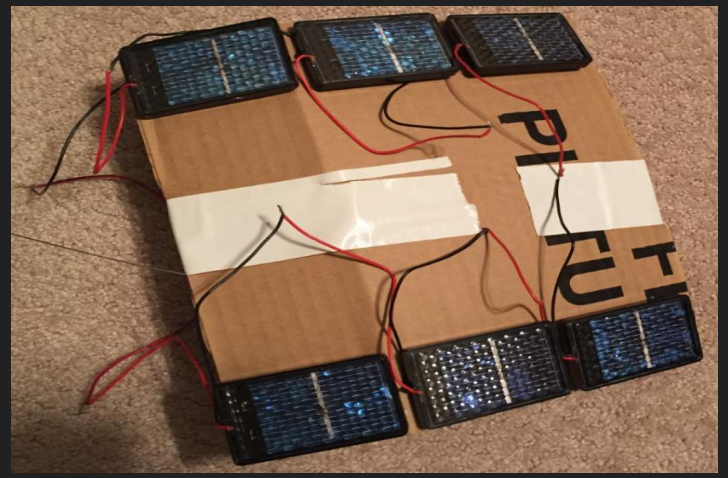
Back of Car (with panels on)



Front of Car (with panels on)



Above Car (with panels on)



Pictures

Main Solar Panel

Results

Tests

# of panels covered	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Test 7	Test 9	Test 9	Test 10	Test 11	Test 12	Test 13	Test 14	Test 15	Test 16	Test 16	Test 17	Test 18	Test 19	Test 20
0	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
¼	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
½	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
¾	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞
All	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞

OF PANELS

Time (in minutes)

Results


Time (To Reach Set Distance)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
¼
½
¾
All
Portion of Total Panels

Conclusion

- My conclusion is that my hypothesis was correct because the less power the car had, the longer it took to get to the finish line-if it got there at all. I also decided that the solar panels I had available, were not enough to fully power the R/C car.

Resources

- Google. (n.d.). Retrieved September 13, 2016, from https://www.google.com/webhp?sourceid=chrome-instant
- Harrington, R. (2015, September 24). Here's how much of the world would need to be covered in solar panels to power Earth. Retrieved September 13, 2016, from Here's how much of the world would need to be covered in solar panels to power Earth
- When Will We Finally Be Able To Use Solar Power Cars? (n.d.). Retrieved September 15, 2016, from http://www.solar-energy-for-homes.com/solar-power-cars.html
- "Rules for All Projects." *Student Science*. N.p., n.d. Web. 25 Aug. 2015. https://student.societyforscience.org/rules-all-projects
- Solar Energy. (n.d.). Retrieved November 11, 2016, from http://www.seia.org/about/solar-energy