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Ideas

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Report

Solar Powered Cars - 5A14

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Step 2 Ideas

1st Idea: Topic B**uild a Solar Powered Car**

My idea: To power a car with solar electricity.

Question:How much sun does it take to power the car? Does it need a lot of sun or just a little?

Resource(s): https://www.energy.gov/topics/solar-energy, https://www.nationalgrid.com/stories/energy-explained/how-does-solar-power-work,https://www.homesciencetools.com/article/solar-car/?srsltid=AfmBOoqUJgXg8RcOosGACUGdutlBOoGiAMp1Xj_xtSaNeyXWNUivUCed,

2nd Idea: Topic **Build a Water Filtration System**

My idea:To test different filtration methods to determine the best one.

Question: What type of filtration system provides the cleanest water?

Resource(s): https://www.epa.gov/ground-water-and-drinking-water/home-drinking-water-filtration-fact-sheet, https://www.sciencedirect.com/topics/chemical-engineering/water-filtration, https://www.cdc.gov/drinking-water/prevention/about-choosing-home-water-filters.html

3rd Idea: Topic Build a Wind Turbine

My idea: Develop and investigate different wind turbine blades to see which shape works best.

Question: Which blade shape works best for producing the most wind?

Resource(s): https://www.sciencebuddies.org/science-fair-projects/project-ideas/Aero_p040/aerodynamics-hydrodynamics/wind-turbine-design, https://learning-center.homesciencetools.com/article/wind-energy-science/,

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Step 3 Background Research
Source 1

Source 1

Title: https://www.energy.gov/topics/solar-energy

Summary: The article is about how to save solar energy and preserve it.

What's the big idea about the article? How solar energy is produced and used.

In complete sentences, describe a few details (who, what, where, when, why, and how)

On this website, I found resources to learn what solar energy is; how people, businesses, and community can utilize solar energy.

Source 1 Bibliography

"Solar Energy." *Energy.gov*, 2024, www.energy.gov/topics/solar-energy.

This source is a: __X____ Website _____ Other
The URL is https://www.energy.gov/topics/solar-energy
Last Date of Access: January 8, 2026
Title of Article: Solar Energy
Author's Name: Website information
Date of Article: Website information, no date given

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Background Research Source 2

Source 2

Title:
https://www.nationalgrid.com/stories/energy-explained/how-does-solar-power-work

Summary: How Solar Power Works

What's the big idea about the article?

Solar power works by converting energy from the sun into power.

Source 2 Bibliography

National Grid. "How Does Solar Power Work?" *National Grid*, 16 May 2023, www.nationalgrid.com/stories/energy-explained/how-does-solar-power-work.

This source is a: __X____ Website _____ Other

The URL is http:https://www.nationalgrid.com/stories/energy-explained/how-does-solar-power-work

Last Date of Access: 1/8/2026

Title of Article: How does solar power work
Author's Name: Information on website
Date of Article: Information on Website, no date given

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Background Research Source 3

Source 3

Title:
https://www.homesciencetools.com/article/solar-car/?srsltid=AfmBOoqUJgXg8RcO

Summary: to help kids build a solar powered car

What's the big idea about the article? In addition, students will experience using hand tools as they construct their solar vehicle.

Source 3 Bibliography

"Solar Car Science Project: Learn How to Make a Solar Car at Home." *Home Science Tools*, 2025, www.homesciencetools.com/article/solar-car/?srsltid=AfmBOoqUJgXg8RcOosGACUGdutlBOoGiAMp1Xj_xtSaNeyXWNUivUCed.

This source is a: —-X----- Website _____ Other

The URL is http:https://www.homesciencetools.com/article/solar-car/?srsltid=AfmBOoqUJgXg8RcOosGACUGdutlBOoGiAMp1Xj_xtSaNeyXWNUivUCed

Last Date of Access: 1/30/2025

Title of Article: Make a Solar Powered Car
Author's Name: Information on website
Date of Article: Information on website, no date given.

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Step 4 Hypothesis

Hypothesis:

I Hypothesize…. If the solar-powered car is tested in sunny conditions, then it will travel faster than in dark or shaded conditions because increased sunlight allows the solar panel to generate more electrical energy to power the car.

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Step 5 Materials and Procedures

Materials:

1.) DIY assemble car toy kit, quantity 1

a. 1- Balsa Wood

b. 2 – Straws

c. 1- Wood Dowel

d. 4 – Wheels

e. Pulley Set

f. Duct Tape

g. Double Sided Tape

h. 1- Motor

i. 2- Zip Ties

j. 1- Rubber Band

k. 2 – AA Batteries

l. Battery Holder with Switch

m. Photovoltaic Cell

n. 2- Alligator Clips

2:) Digital Multimeter

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Step 5 Materials and Procedures

Procedure

Experiment Procedure:

Step 1: Put Solar Car together.

Full Sun Procedures

Test 1 - 10AM - Put the car in the same place with the rear wheels just off the ground. Turn on multimeter and measure the voltage across the solar cell. Run the car over the same distance measuring the time to pass between the two lines.Perform the same procedure each time but using the battery pack.

Test 2 - 12PM - Put the car in the same place with the rear wheels just off the ground. Turn on multimeter and measure the voltage across the solar cell. Run the car over the same distance measuring the time to pass between the two lines. Perform the same procedure each time but using the battery pack.

Test 3 - 2PM - Put the car in the same place with the rear wheels just off the ground. Turn on multimeter and measure the voltage across the solar cell. Run the car over the same distance measuring the time to pass between the two lines. Perform the same procedure each time but using the battery pack.

Test 4 - 4PM - Put the car in the same place with the rear wheels just off the ground. Turn on multimeter and measure the voltage across the solar cell. Run the car over the same distance measuring the time to pass between the two lines. Perform the same procedure each time but using the battery pack.

Night Time Procedures

Test 5 - 7PM - Put the car in the same place with the rear wheels just off the ground. Turn on multimeter and measure the voltage across the solar cell. Run the car over the same distance measuring the time to pass between the two lines.

Cloudy Procedures

Test 6 - 10AM - Put the car in the same place with the rear wheels just off the ground. Turn on multimeter and measure the voltage across the solar cell. Run the car over the same distance measuring the time to pass between the two lines.

Test 7 - 12PM - Put the car in the same place with the rear wheels just off the ground. Turn on multimeter and measure the voltage across the solar cell. Run the car over the same distance measuring the time to pass between the two lines.

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Variables

Variables:

Independent Variable:

- Time of day
- Weather

Dependent Variable:

- How fast the car goes, measured by time and speed.

Control:

- Same car
- Same distance (16.2 feet)
- Same track or surface
- Same starting position
- Same battery (for battery tests)

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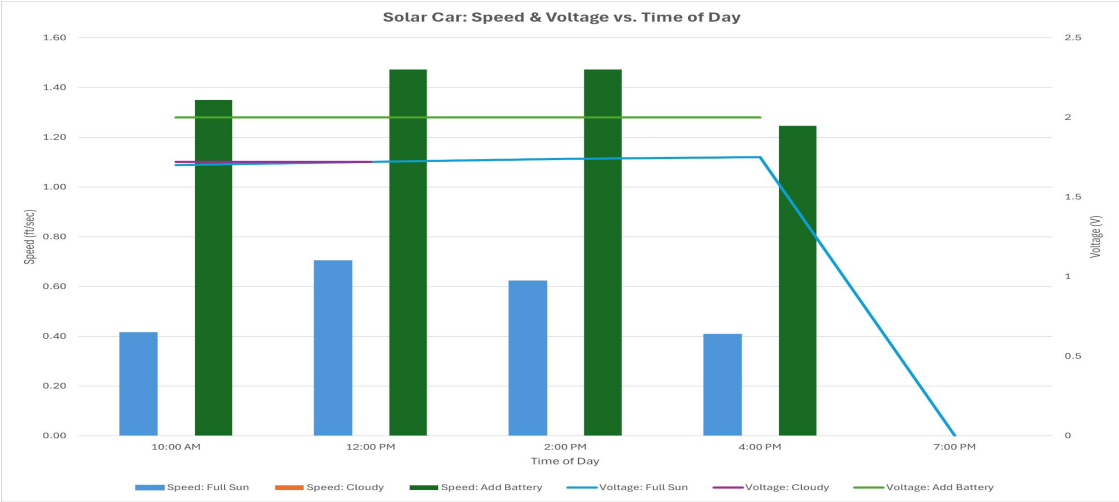
Step 6: Data and Conclusion

Data:



Data Table 1

	Time of Day	Conditions	Voltage	Time (sec)	Distance (ft)	Speed (ft/sec)
Test 1	10:00 AM	Full Sun	1.7	39	16.2	0.42
Test 2	12:00 PM	Full Sun	1.72	23	16.2	0.70
Test 3	2:00 PM	Full Sun	1.74	26	16.2	0.62
Test 4	4:00 PM	Full Sun	1.75	4.9	2	0.41
Test 5	7:00 PM	Dark	0	0	0	0.00
Test 6	10:00 AM	Cloudy	1.72	0	0	0.00
Test 7	12:00 PM	Cloudy	1.72	0	0	0.00
Test 8	10:00 AM	+Battery	2	12	16.2	1.35
Test 9	12:00 PM	+Battery	2	11	16.2	1.47
Test 10	2:00 PM	+Battery	2	11	16.2	1.47
Test 11	4:00 PM	+Battery	2	13	16.2	1.25

Conclusion:

The experiment shows that sunlight helps a solar-powered car go faster. When the sunlight was stronger, the solar panel made more energy and the car moved faster. The fastest time happened at noon when the sun was strongest. This supports the hypothesis that a solar-powered car works best in strong sunlight.

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Step 7: Report Rough Draft

PURPOSE OF MY EXPERIMENT

The purpose of this project is to see how sunlight affects a solar-powered car's speed. I tested the car at different times of the day and on a cloudy day to compare how fast it goes in different light conditions.

HYPOTHESIS

If the solar-powered car is tested in sunny conditions, then it will travel faster than in dark or shaded conditions because increased sunlight allows the solar panel to generate more electrical energy to power the car.

Conclusion

The experiment shows that sunlight helps a solar-powered car go faster. When the sunlight was stronger, the solar panel made more energy and the car moved faster. The fastest time happened at noon when the sun was strongest. This supports the hypothesis that a solar-powered car works best in strong sunlight.