Experiment Format

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Title: Solar Cars

Part 1. Question:

What do I want to find out?

How does the affect the friction?

Part 2. Hypothesis:

A hypothesis is a scientific prediction

"If…, then…, because…," format

- If we place the motor further from the gears then we can decrease the friction,because the pressure of the motor will decrease.
- Guide: http://www.miniscience.com/kits/CAR_SOLAR/

Part 3. Variables:

A. **Independent variable**. The position of the motor

B. **Dependent variable**. Friction (measuring the speed)

C. **Constants**: The sunlight, The same design (fleshed out: for example: axles determined by the roll down test (http://eweb.4j.lane.edu/downloads/solarchallenge/Lesson%20Plans/Solar%20Car%20tips.09.pdf)

Teflon has a very low coefficient of friction and is very common with pots and pan.

Part 4. Procedure:

This is what I will do

- Build one solar car according to the specification of the constants described above.
- Note the location of the motor (cm?)
- Test it using a constant source of light:
- Specify the number of trials for each step
- **Method 3: Tilted plane**
- Place a block on a tilted plane and increase the angle of tilt until the block begins to slide. The tangent of the tilting angle just found is the so called "friction angle". This angle is related to the coefficient of friction.

Part 5. Materials:

Here is what I will need

- Cut and paste from the manual.

Experiment Format (continued)

NOTE: Do this page WHILE YOU PERFORM YOUR EXPERIMENT, except prepare the blank data table ahead of time. Fill in the data table as you perform the experiment.

Part 6. Lab Set-Up:

This is a labeled sketch of your experiment

- Sketch large enough that your drawing can be easily understood
- Use enough detail for your drawing to be understood
- Label the important parts of your drawing
- If necessary, note the sequence ('before' and 'after', for example)

Part 7. Data Table:

Data are the bits of information you measure during your experiment

- Keep track of the data on a neat, organized table
- Name the measured variables, and give units
- Give totals or averages where appropriate
- Count or measure accurately
- Make appropriate records, such as charts, tables, bar graphs or line graphs

Part 8. Observations:

Use complete sentences to describe what you noticed during your experiment

- Give specific, relevant details
- Avoid opinions, feelings or generalizations

https://www.energysage.com/solar/cost-benefit/solar-incentives-and-rebates

Experiment Format (continued)

NOTE: Do this page AFTER you have performed your experiment. It's fun to actually do the test, but the learning comes in reflecting afterwards about what happened.

Part 9. Summary:

Use words to tell what the data mean

- Use complete sentences that show the main ideas of the data
- Describe any trends or patterns
- Use scientific and math vocabulary wherever it is appropriate

Part 10. Conclusion:

Did my data support my hypothesis?

- Use "The data supported/didn't support [choose one] my hypothesis"
- Don't say "I was right", "I was wrong", or "This proves…" (one experiment doesn't prove anything!
- If the data are unclear, state that more research is needed, and say what you should do next

Part 11. Big Idea:

What did I learn?

- How is what I learned related to a larger idea in science?
- How is what I learned related to something else I know about the world?

Part 12. Reflection:

What do I think about my experiment?

- Use complete sentences
- Did anything happen that you didn't expect?
- Were there any possible sources of error in your data?
- This is the section to put in any feelings or questions you have about what you did

Part 13. Next Testable Question:

What related experiment would I try next?

- Use complete sentences
- Use a question mark
- Your question must be related to this experiment in some way
- Your question must be testable

Background Paper: Three pages : **must include a bibliography with at least 3 references. See other side for correct format.**

Describe the Independent detail:

Car design in general and the importance of the motor and its placement

Dependent variable :

What is friction?

How is it measured?

What affects it?

You will find friction everywhere that objects come into contact with each other. The force acts in the oppositedirection to the way an object wants to slide. If a car needs to stop at a stop sign, it slows because of the friction between the brakes and the wheels. If you run down the sidewalk and stop quickly, you can stop because of the friction between your shoes and the cement.

Measures of friction are based on the type of materials that are in contact. Concrete on concrete has a very high **coefficient of friction**. That coefficient is a measure of how easily one object moves in relationship to another. When you have a high coefficient of friction, you have a lot of friction between the materials. Concrete on concrete has a very high coefficient, and Teflon on most things has a very low coefficient. **Teflon** is used on surfaces where we don't want things to stick; such as pots and pans.

Scientists have discovered that there is even less friction in your joints than in Teflon! It is one more example at how efficient living organisms can be.