Log Book

Date	Learnings, Observations, Ideas, Feedback, Notes, Sources (references)
27-Jun-24	Started thinking regarding the science fair projects for Grade 5 (2024-25). Checked prior science fair project online on CYSF platform.
07-Jul-24	Checked prior science fair project online on CYSF platform.
21-Jul-24	Checked prior science fair project online on CYSF platform. Brainstorm and discussion in family on the science fair topic in summer vacation.
11-Aug-24	Brainstorm and discussion in family on the science fair topic in summer vacation. Checked national and international environmental topic online.
18-Aug-24	Checked national and international energy topic online.
04-Nov-24	Email received from Mr. Rip (School Coordinator) for the Glamorgan School Science Fair.
11-Nov-24	Fall Break: Online search on Google: Pollution control, Energy generation, Environmental issues
12-Nov-24	Fall Break: Online search on Google: Environmental issues, Energy generation sources While watching the pictures of our trip to Waterton Park, I found a picture of wind turbine on the way to Waterton Park. Then, I was interested on the energy topic for my science project.

Log Book

Date	Learnings, Observations, Ideas, Feedback, Notes, Sources (references)
19-Nov-24	Meeting 1 (In-person at Glamorgan School) **Discussion & Learnings:** - Big ideas in science - CYSF award topics - Big questions and how to answer them
22-Nov-24	Online search on Google: Checked national and international environmental topic online for science fair ideas. (Checked more on energy generation.) **Ideas:** Lego is my favorite toy to play. So, I checked different Lego technic pieces with the motor to get some ideas for my project.
23-Nov-24	Calgary Public Library: Searched different books on science topic, and energy generation. **Ideas:** From Lego, I prepared one movable thing with the help of motor.
24-Nov-24	Online search on Google: Checked energy sources online for science fair topic. Calgary Public Library: Searched different books on energy generation, and Lego Ideas

Log Book

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24-Nov-24	**Ideas:** From the Lego Ideas Book and Brick Science book, I found different uses of Lego pieces and gears. I tried to connect one old motor (from my broken train) with the Lego rack. The motor was not rotating fast and unable to light the LED bulb. I was keep trying to get the LED light on, but unable to succeed. But I found the possibility to generate electricity in such a way with the help of Lego technic Pieces and generator motor. We can try to install the Lego technic pieces and generator motor somewhere on the road (on a Lego Baseplate).

Log Book

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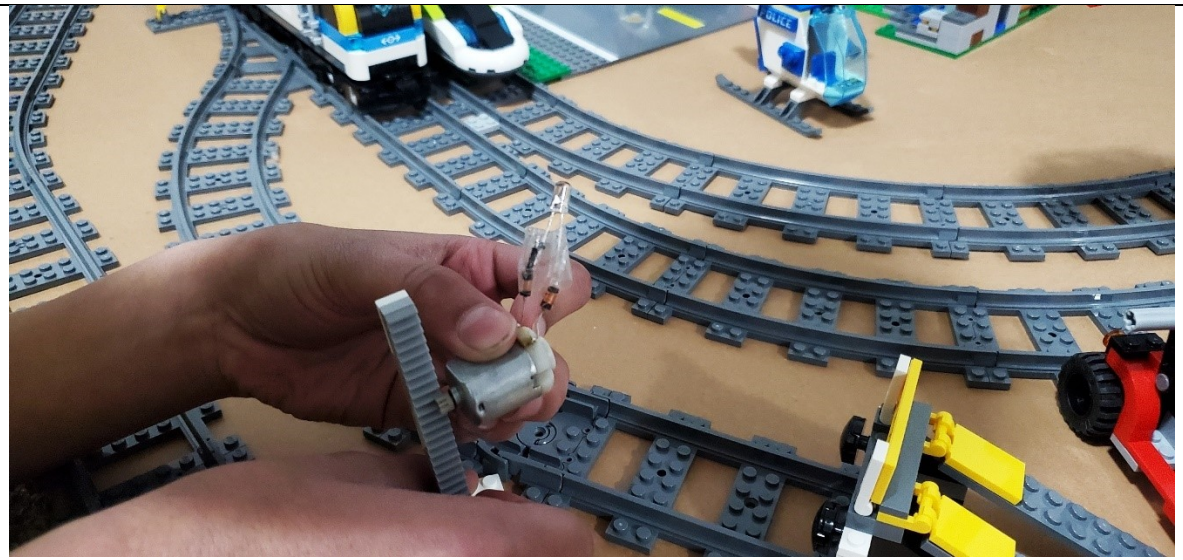
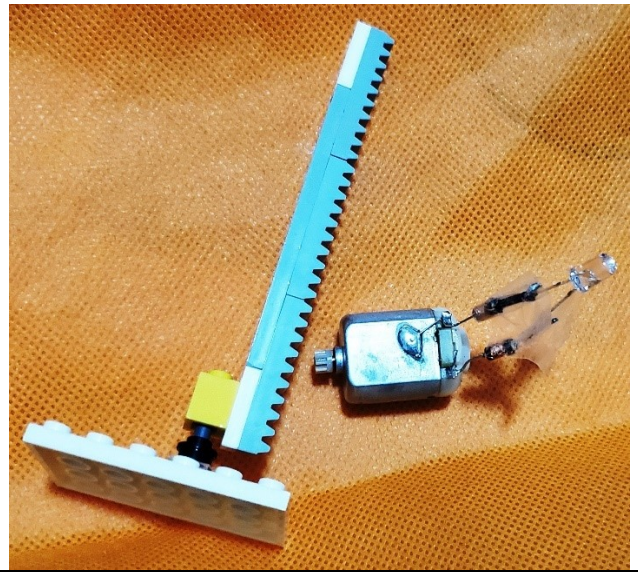
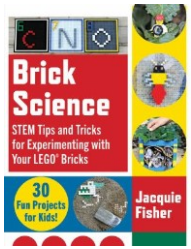
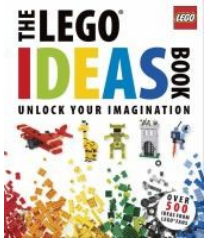
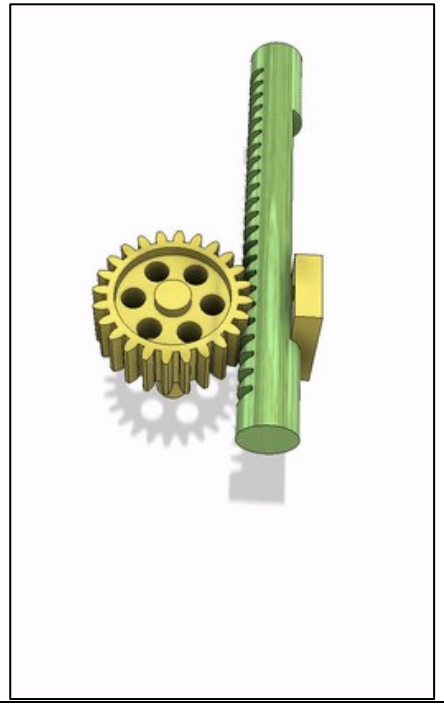
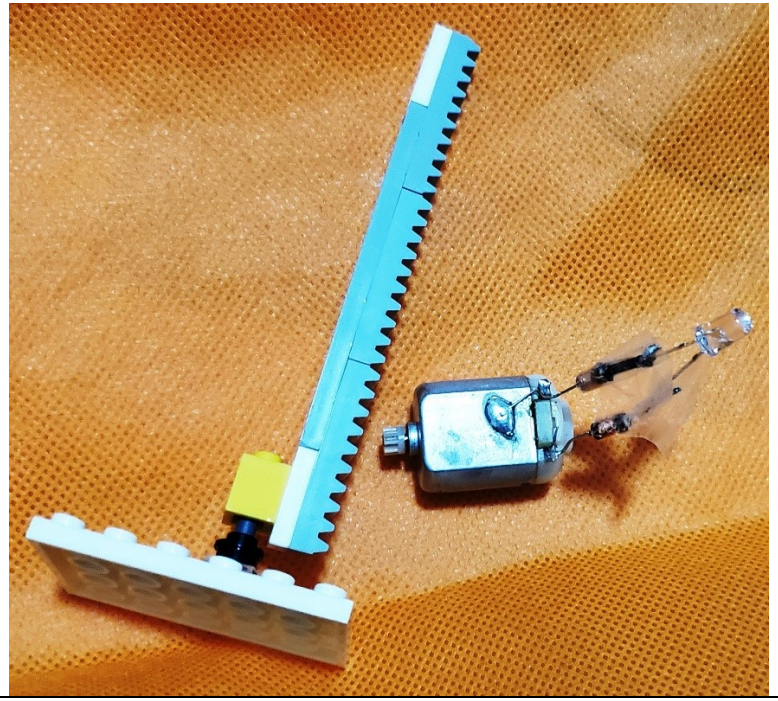
24-Nov-24	 

Log Book

Date	Learnings, Observations, Ideas, Feedback, Notes, Sources (references)
27-Nov-24	Meeting 2 (Virtual) **Discussion & Learnings:** - Big question or topic - Experimental or research project - Hypotheses and Variables with examples - Log book
28-Nov-24	**Sources (references):** Online search on Google: Checked different types of Lego technic pieces, gears and its uses with Lego motor. Calgary Public Library: Searched different books on Lego to get an idea how to use the Lego technic pieces. - Brick Science, STEM Tips and Tricks for Experimenting With your LEGO Bricks by Fisher, Jacquie Book - 2021  - The Lego Ideas Book, Unlock your Imagination by Lipkowitz, Daniel Book - 2011 

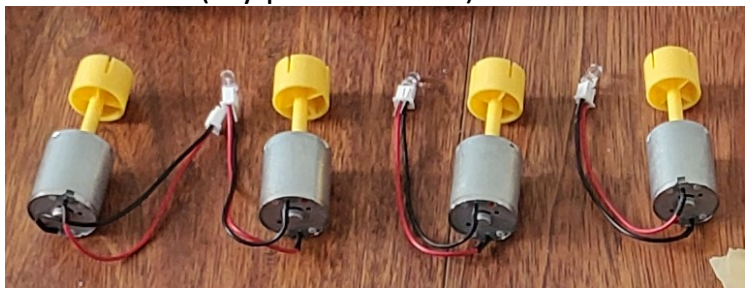
Log Book

Date	Learnings, Observations, Ideas, Feedback, Notes, Sources (references)
29-Nov-24	**Sources (references):** Online search on Google: I found different gears (Rack and Pinion gears) that are similar to the Lego technic pieces, and my old motor.
29-Nov-24	**Ideas:**  
30-Nov-24	**Ideas:** I will check the possibilities to install the above gears and motor below the Speed Bump and try to generate electricity.

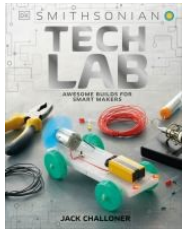
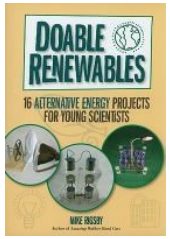
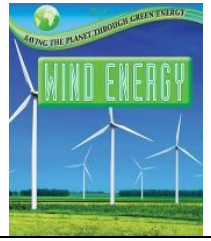
Log Book

Date	Learnings, Observations, Ideas, Feedback, Notes, Sources (references)
01-Dec-24	Assignment 1: Submission **Learnings & Ideas:** - Question - Hypothesis - Prediction - Independent Variable - Dependent Variable - Controlled Variable
03-Dec-24	**Ideas:** I found a 'Press and Go' Toy Cars that I was playing with it when I was little. The 'Press and Go' Toy Cars is working with Rack and Pinion gears in it. The toy is the best piece for my project.

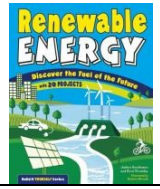
Log Book

Date	Learnings, Observations, Ideas, Feedback, Notes, Sources (references)
04-Dec-24	Meeting 3 (In-person at Glamorgan School) **Discussion & Learnings:** - Hypothesis notes - Experimental Procedures and replications - Material list
07-Dec-24	- Working on Hypothesis notes, and experimental procedures. - Prepared a list of material for working model. - Referred library books and online sources. - Discussed with parents for Hypothesis notes, experimental procedures and material to be used. We checked (my parents and I) online and found a generator motor that will work in my project. 
08-Dec-24	- Working on Hypothesis notes, and experimental procedures. - Addition in a list of material for working model. - Referred library books and online sources. - Discussed with parents for Hypothesis notes, experimental procedures and material to be used.

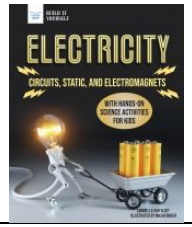
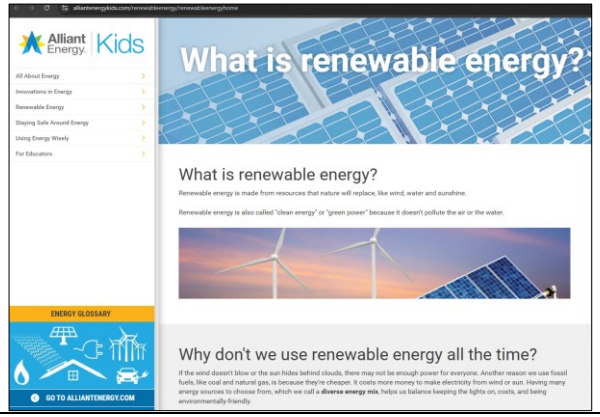
Log Book

Date	Learnings, Observations, Ideas, Feedback, Notes, Sources (references)
08-Dec-24	**Books from Calgary Public Library: For Project Research** - Tech Lab Brilliant Builds for Super Makers by Challoner, Jack Book - 2019 | First American edition  - Doable Renewables16 Alternative Energy Projects for Young Scientists by Rigsby, Mike Book - 2010  - Wind Energy by Grady, Colin, Book – 2017 

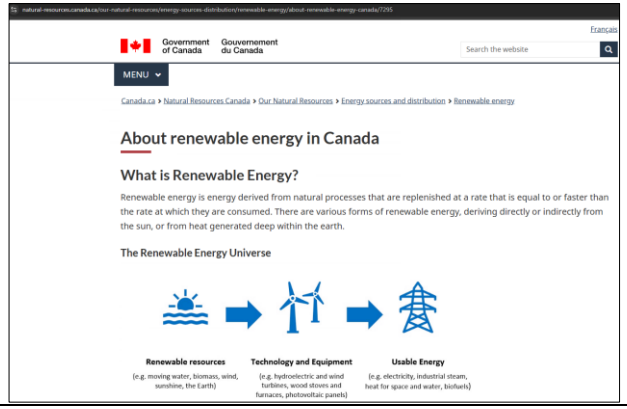
Log Book

Date	Learnings, Observations, Ideas, Feedback, Notes, Sources (references)
11-Dec-24	Meeting 4 (In-person at Glamorgan School) **Discussion & Learnings:** - Background research and introductions - Big picture, Specific information, what is missing
14-Dec-24	**Feedback:** Received feedback and suggestion from Parents on the Hypothesis notes and Procedures. Finalised: Hypothesis notes, experimental procedures and material to be used for working model.
15-Dec-24	Assignment 2: Submission **Learnings & Ideas:** - Experimental projects: Write your step-by-step procedure - Material will be used for Working Model
21-Dec-24	Working on Background research. **Sources (references):** - Online search on Google - Calgary Public Library - Checked prior science fair project online on CYSF platform
21-Dec-24	**Books from Calgary Public Library: For Project Research** - Renewable Energy Discover the Fuel of the Future : With 20 Projects by Sneideman, Joshua Book - 2016 

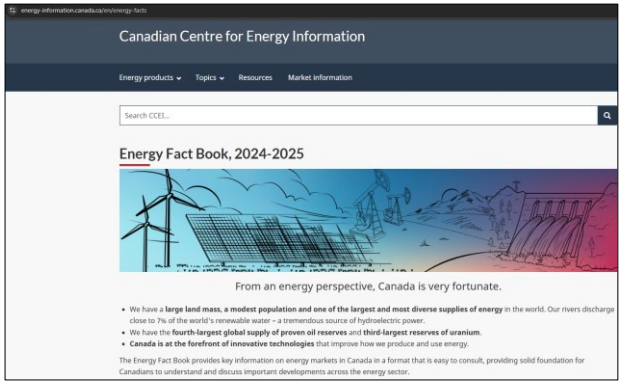
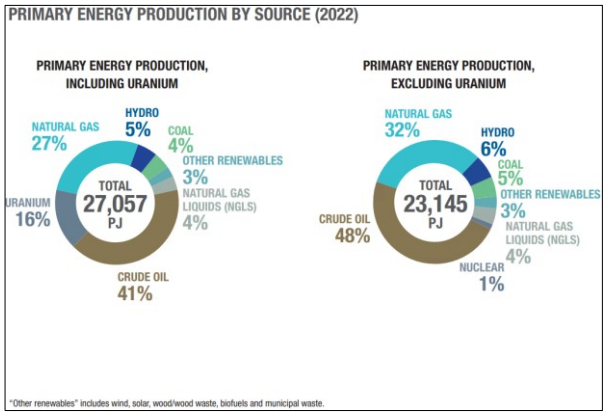
Log Book

Date	Learnings, Observations, Ideas, Feedback, Notes, Sources (references)
21-Dec-24	**Books from Calgary Public Library: For Project Research** - Electricity Circuits, Static, and Electromagnets With Hands-on Science Activities for Kids by Van Vleet, Carmella, Book - 2022 
22-Dec-24	Working on Background research. **Sources (references):** - Online search on Google - Calgary Public Library - Checked prior science fair project online on CYSF platform
22-Dec-24	Renewable Energy https://www.alliantenergykids.com/renewableenergy/renewableenergyhome 

Log Book

Date	Learnings, Observations, Ideas, Feedback, Notes, Sources (references)
22-Dec-24	Renewable Energy in Canada https://natural-resources.canada.ca/our-natural-resources/energy-sources-distribution/renewable-energy/about-renewable-energy-canada/7295 
23-Dec-24	Winter Break:Reviewed a list of materials for working model.
23-Dec-24	Renewable Energy in Canada https://www.canadaaction.ca/canadian-renewable-energy-facts

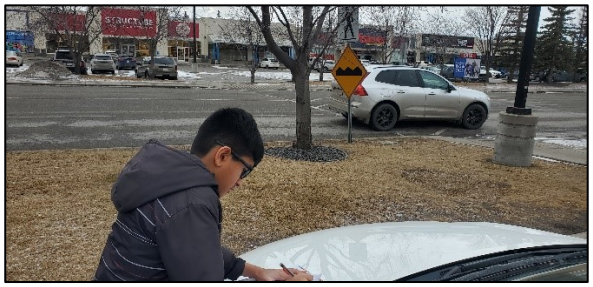
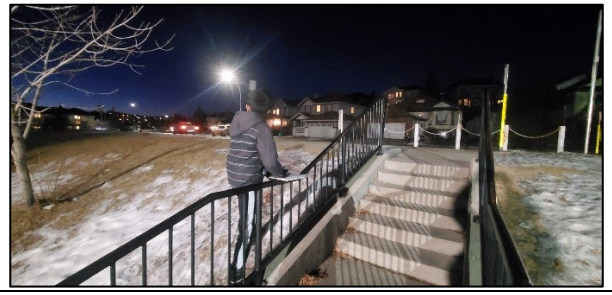
Log Book

Date	Learnings, Observations, Ideas, Feedback, Notes, Sources (references)
28-Dec-24	Winter Break: Reviewed Science project.
28-Dec-24	Canadian Centre for Energy Information Energy Fact Book, 2024-2025 https://energy-information.canada.ca/en/energy-facts  Energy Fact Book, 2024-2025 https://energy-information.canada.ca/sites/default/files/2024-10/energy-factbook-2024-2025.pdf 

Log Book

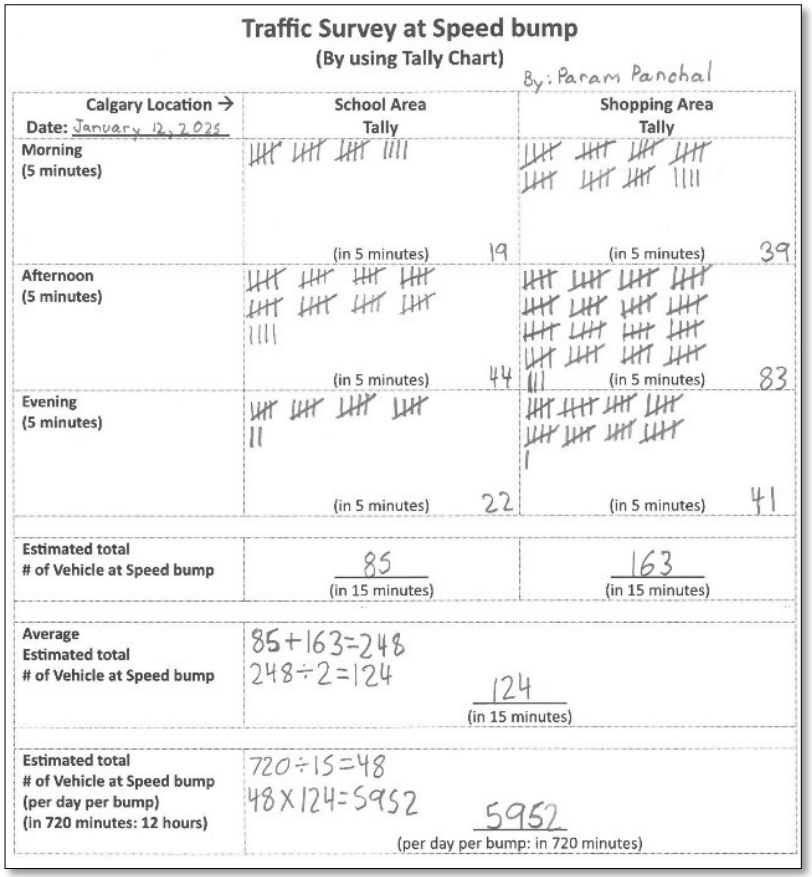
Date	Learnings, Observations, Ideas, Feedback, Notes, Sources (references)
04-Jan-25	Discussion with Parents on Background research.
05-Jan-25	**Feedback:** Discussed with Parents and got suggestion on Background research. Finalised: Background research, Big Topic, Specific Topic, how my topic solves a problem
09-Jan-25	Assignment 3: Submission **Learnings & Ideas:** - Background research - Big Topic - Specific Topic - How my topic solves a problem
11-Jan-25	Planning for the Traffic Survey at one Speed bump in my community. Prepared form for Traffic Survey

Log Book

Date	Learnings, Observations, Ideas, Feedback, Notes, Sources (references)
12-Jan-25	**Traffic Survey at Speed bump:**  

Log Book

Date	Learnings, Observations, Ideas, Feedback, Notes, Sources (references)
12-Jan-25	**Traffic Survey at Speed bump:** **Observations: (Result)** About 124 Vehicles passes over one Speed Bump in 15 minutes About 5,952 Vehicles pass over one Speed Bump per day (in 720 minutes: 7 am to 7 pm).

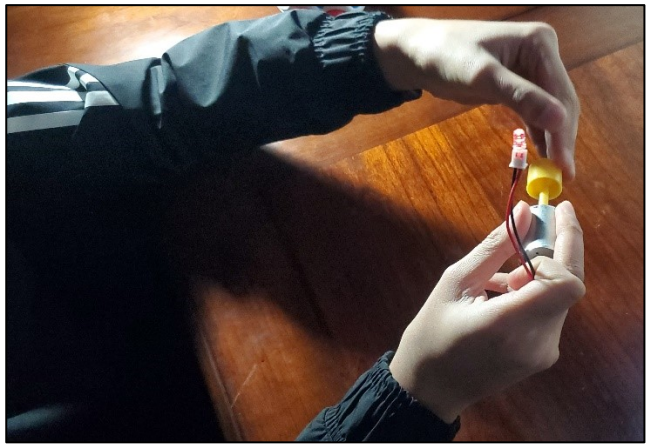
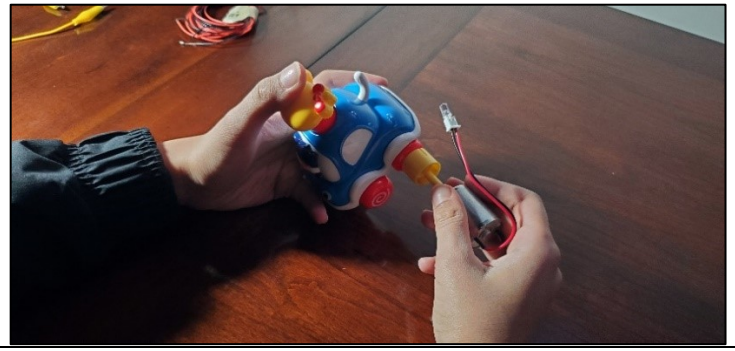


Traffic Survey at Speed bump
(By using Tally Chart)

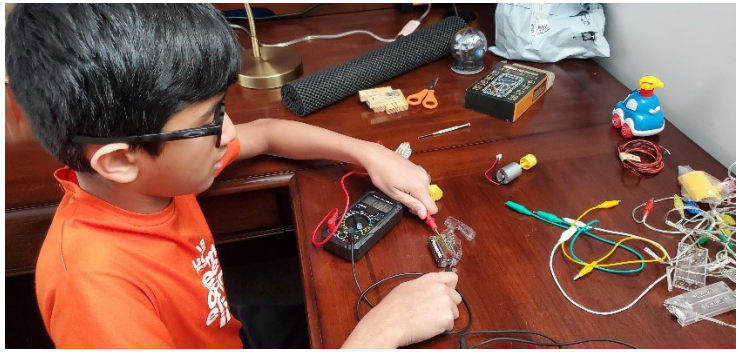
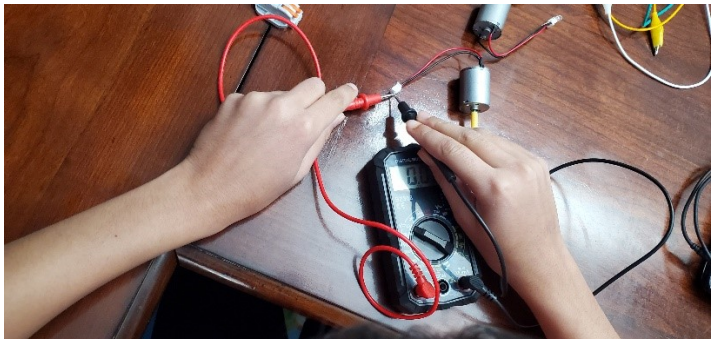
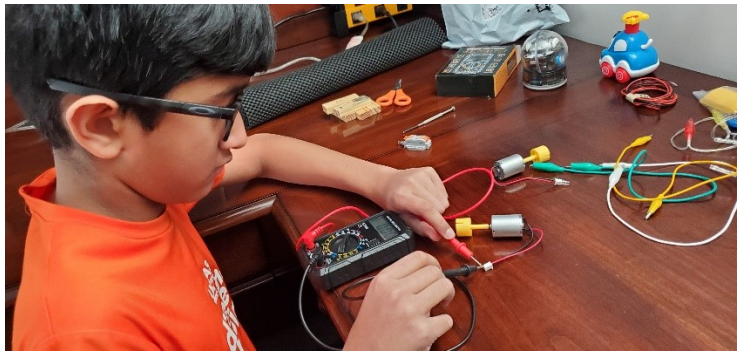
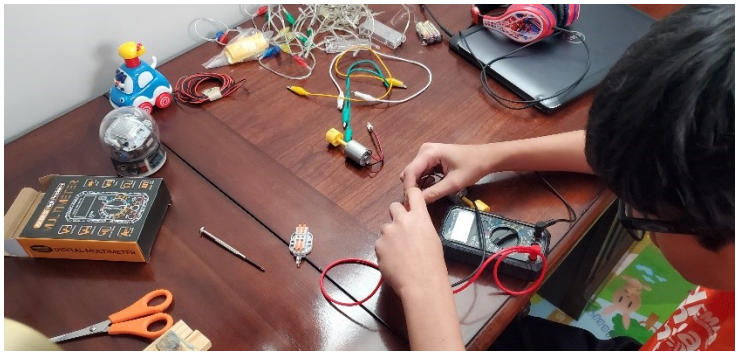
By: Param Panchal

Calgary Location → Date: January 12, 2025	School Area Tally	Shopping Area Tally
Morning (5 minutes)	𝍸 𝍸 𝍸 IIII (in 5 minutes) 19	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 IIII (in 5 minutes) 39
Afternoon (5 minutes)	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 IIII (in 5 minutes) 44	𝍸 III (in 5 minutes) 83
Evening (5 minutes)	𝍸 𝍸 𝍸 𝍸 II (in 5 minutes) 22	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 I (in 5 minutes) 41
Estimated total # of Vehicle at Speed bump	85 (in 15 minutes)	163 (in 15 minutes)
Average Estimated total # of Vehicle at Speed bump	85+163=248 248÷2=124 124 (in 15 minutes)	
Estimated total # of Vehicle at Speed bump (per day per bump) (in 720 minutes: 12 hours)	720÷15=48 48×124=5952 5952 (per day per bump: in 720 minutes)	

Log Book

Date	Learnings, Observations, Ideas, Feedback, Notes, Sources (references)
22-Jan-25	Meeting 5 (Virtual) **Discussion & Learnings:** - Presenting data using a graphic or chart - Data analysis, tables, and graphs
25-Jan-25	- Preparation for Project Experiment (working model). - Checking all parts and material for working model.  

Log Book

Date	Learnings, Observations, Ideas, Feedback, Notes, Sources (references)
25-Jan-25	- Preparation for Project Experiment (working model). - Checking all parts and material for working model. - Received feedback and suggestion from Parents while preparing for working model. - Parents helped for preparation of the working model and assured the safety first.    

Log Book

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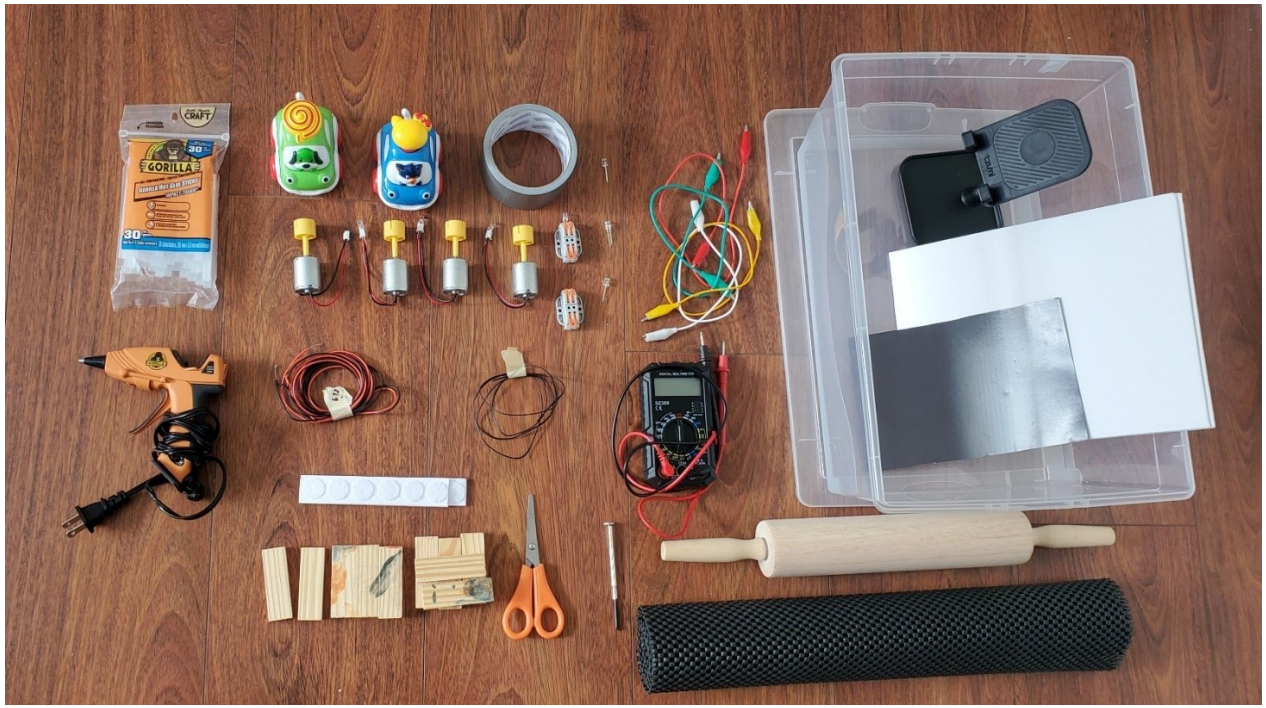
30-Jan-25	Meeting 6 (In-person at Glamorgan School) **Discussion & Learnings:** - Conclusions: Summarize key results, Connect back to hypothesis - Next steps: What further research to do - To do: Basic project info. and ethics and due care on the CYSF platform
01-Feb-25	- Preparation for Project Experiment (working model) - Received feedback and suggestion from Parents while preparing for working model. - Prepared the working model under supervision of Parents. 

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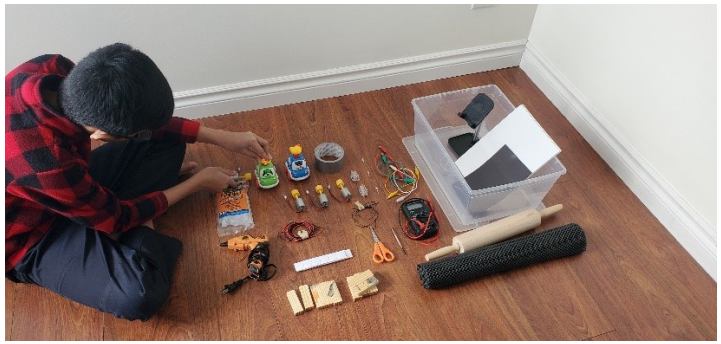
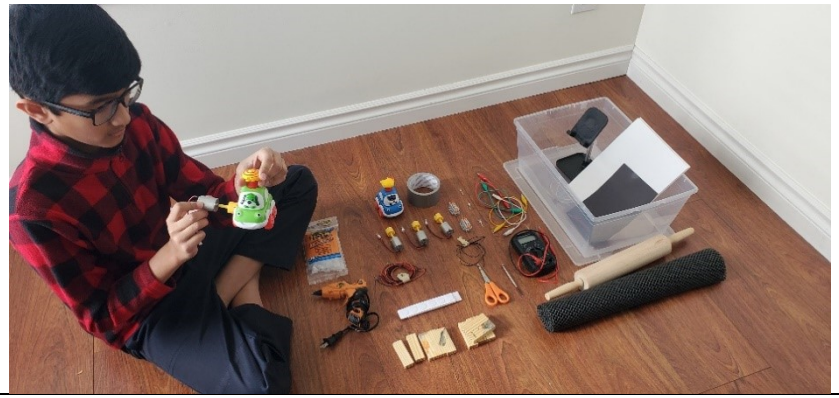
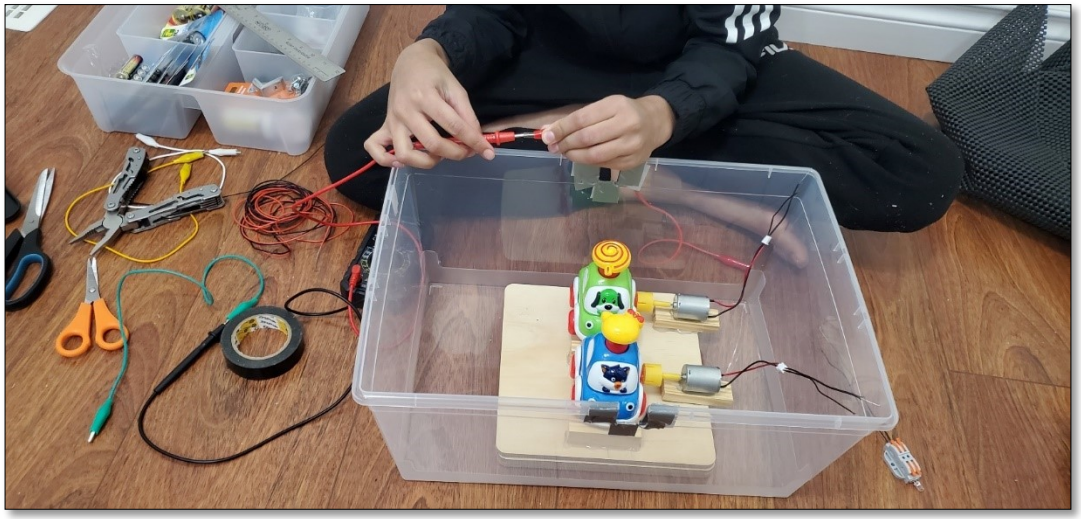
Date	Learnings, Observations, Ideas, Feedback, Notes, Sources (references)
01-Feb-25	Preparation for Project Experiment (working model)  

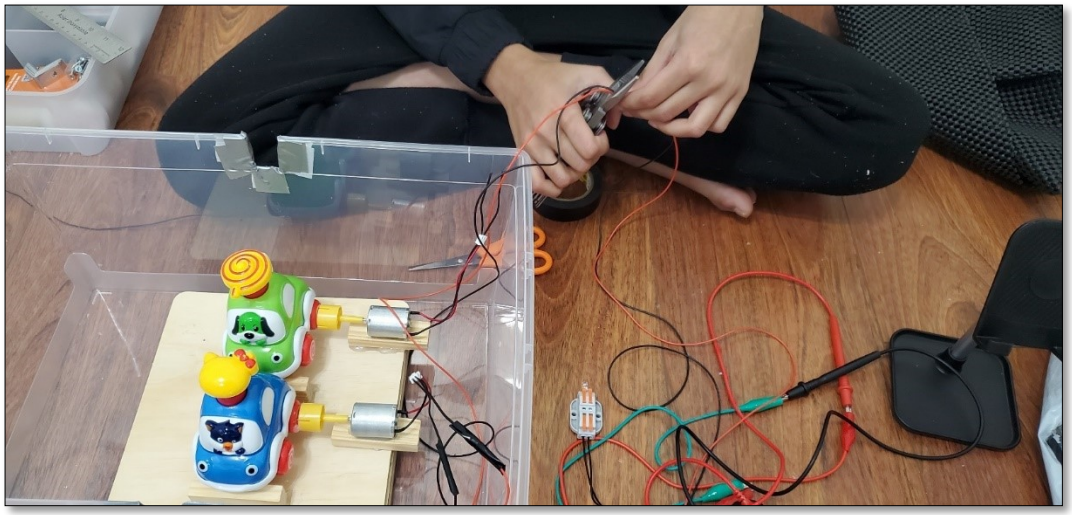
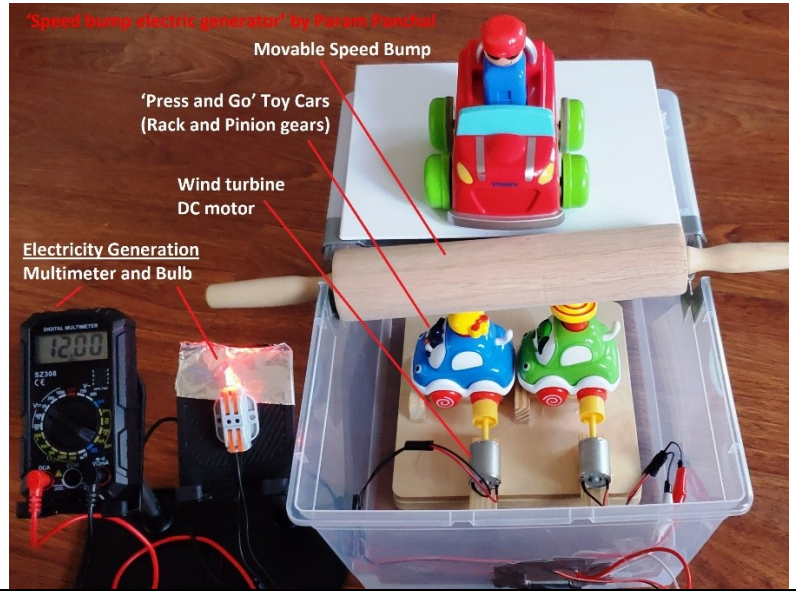
Log Book

Date	Learnings, Observations, Ideas, Feedback, Notes, Sources (references)
02-Feb-25	**Final Experiment: (on a Working Model)**

Log Book

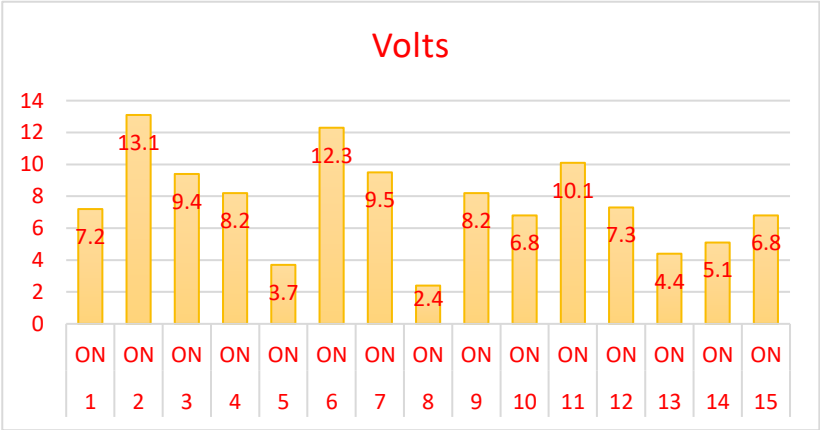
Date	Learnings, Observations, Ideas, Feedback, Notes, Sources (references)
02-Feb-25	**Final Experiment: (on a Working Model)** 

Log Book

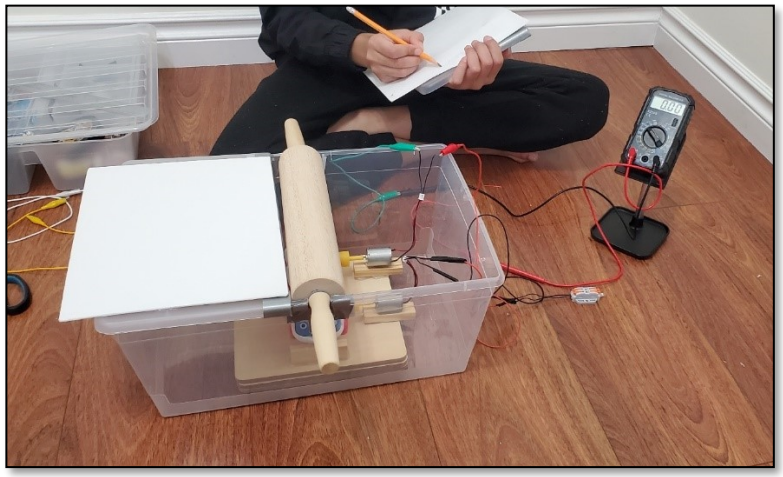
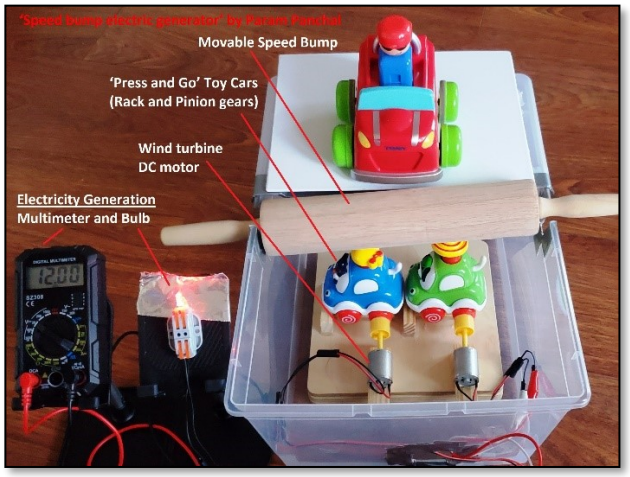
Date	Learnings, Observations, Ideas, Feedback, Notes, Sources (references)
02-Feb-25	**Final Experiment: (on a Working Model)**  

Date	Learnings, Observations, Ideas, Feedback, Notes, Sources (references)
02-Feb-25	**Final Experiment: (on a Working Model)** When a car passed over the speed bump, it pushed the speed bump. Small gears under the Speed Bump rotated and the DC motor connected with the gears generated electricity. All my observations/counts (in a table form) are noted when the electricity was generated after pushing the movable Speed Bump.
02-Feb-25	**Observations: (Result 1)** **Project Title: Speed bump electric generator** **Result: Observation** **(Experiment on a Working Model)** Final Experiment Date: February 2, 2025 By: Param Panchal

# of Experiment	LED Light Turn ON / OFF	Reading on a Multimeter In Volts	Note
1	ON	7.2	
2	ON	13.1	Fast gear spin
3	ON	9.4	
4	ON	8.2	
5	ON	3.7	Slow gear spin
6	ON	12.3	Fast gear spin
7	ON	9.5	
8	ON	2.4	Slow gear spin
9	ON	8.2	
10	ON	6.8	
11	ON	10.1	
12	ON	7.3	
13	ON	4.4	Slow gear spin
14	ON	5.1	
15	ON	6.8	
	Total	114.5 volts	
	Average	7.63 volts	



Log Book

Date	Learnings, Observations, Ideas, Feedback, Notes, Sources (references)
02-Feb-25	**Learnings:** We can generate electricity (Dependent Variables) by modifying the movable speed bump (Independent Variables) by installing gears and wind turbine motors (Independent Variables) under the Speed Bump.  

Log Book

Date	Learnings, Observations, Ideas, Feedback, Notes, Sources (references)
06-Feb-25	Completed the 'Basic Project Info' and 'Ethics Due Care 2A' on the CYSF platform.
07-Feb-25	Ethics And Due Care Form 2A for project 'Speed bump electric generator: Param Panchal' is approved by CYSF.
11-Feb-25	Assignment 4: Submission **Learnings & Ideas:** - Result: (Experiment on a Working Model) - Result /observations/counts: in a table form
11-Feb-25	Assignment 5: Submission **Learnings & Ideas:** Presentation slides: - Title - Question and Hypothesis - Background Research - Variables (experimental), comparisons made (research) - Materials and Procedure (experimental) - Results - Conclusion - Next Steps - Sources (site ALL sources)
19-Feb-25	Meeting 7 (In-person at Glamorgan School) **Discussion & Learnings:** - Reviewed Trifold Layout and Design - Oral Presentations

Log Book

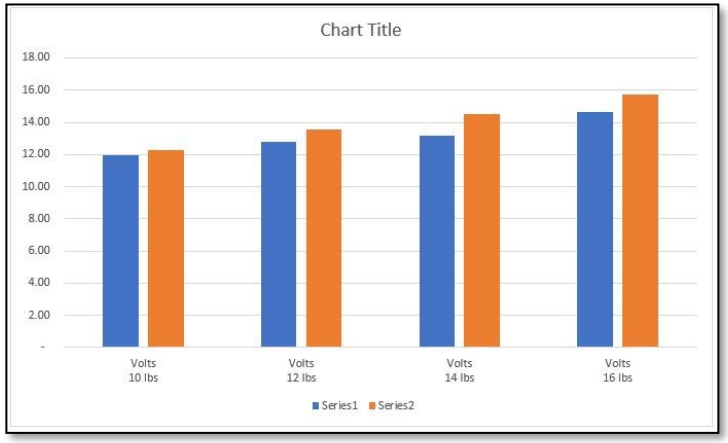
Date	Learnings, Observations, Ideas, Feedback, Notes, Sources (references)
09-Mar-25	Project presentation slides: Completed Trifold: Prepared Oral Presentations: Ready
13-Mar-25 14-Mar-25	Glamorgan Science Fair
15-Mar-25	**Observations: (Result 2)**

Project Title: Speed bump electric generator
Result: Observation
(Experiment on a Working Model)

Experiment Date: March 15, 2025

# of Experiment	Reading on a Multimeter In Volts	Reading on a Multimeter In Volts	Reading on a Multimeter In Volts	Reading on a Multimeter In Volts
Weight →	10 lbs	12 lbs	14 lbs	16 lbs
1	11.96	12.81	13.15	14.64
2	12.3	13.55	14.5	15.73

Results: a heavier vehicle will generate more electricity because the generater spins faster.



Sources (References, Citations)

Websites: For Project Research

Renewable Energy
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https://www.alliantenergykids.com/renewableenergy/windenergy
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Renewable Energy in Canada
https://natural-resources.canada.ca/our-natural-resources/energy-sources-distribution/renewable-energy/about-renewable-energy-canada/7295
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Canadian Centre for Energy Information
Energy Fact Book, 2024-2025
https://energy-information.canada.ca/en/energy-facts

Calgary's community information
https://newsroom.calgary.ca/the-city-of-calgary-releases-community-and-ward-profiles/

Rack and Pinion gear information
https://www.developingexperts.com/glossary/rack-and-pinion?info=secondary#:~:text=The%20rack%20is%20a%20straight,of%20rotation%20of%20the%20pinion.
https://kids.kiddle.co/Gear
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Sources (References, Citations)

Websites: For Image (including gif file) for ppt slides

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https://giphy.com/gifs/desktoppaints-jump-spring-xT0xeGxcmzPAdn9mzC

Image of 'Press & Go Toy Cars' from Amazon

https://www.amazon.ca/

Grade 5: Study material on Energy

- Renewable vs Non-Renewable Energy
- Solar Energy, Wind Energy, Hydro Energy, Biomass and Tidal Energy, Geothermal Energy
- Nuclear Energy
- Alberta's Energy Usage
- Conserving Energy, Energy Efficiency

Sources (References, Citations)

Books from Calgary Public Library: For Project Research

- Brick Science, STEM Tips and Tricks for Experimenting With your LEGO Bricks by Fisher, Jacquie, Book – 2021
- The Lego Ideas Book, Unlock your Imagination by Lipkowitz, Daniel, Book - 2011
- Tech Lab Brilliant Builds for Super Makers by Challoner, Jack, Book - 2019 | First American edition
- Doable Renewables16 Alternative Energy Projects for Young Scientists by Rigsby, Mike, Book - 2010
- Wind Energy by Grady, Colin, Book - 2017
- Renewable Energy Discover the Fuel of the Future : With 20 Projects by Sneideman, Joshua, Book - 2016
- Electricity Circuits, Static, and Electromagnets With Hands-on Science Activities for Kids by Van Vleet, Carmella, 2022