

**Area of Interaction:** Environments.

*Alternative energy sources must be developed.*

***ATL:*** Collaboration: How can I work well in teams?

Information Literacy: Web based ePortfolios

**Context.**

Car manufactures spend million of dollars each year trying to improve the performance of their cars. With the effects of global warming becoming evident, the focus of automotive designers is increasingly on car performance and energy efficiency. Electric, hybrid and solar powered cars have been hailed as possible breakthroughs.

Electric vehicles have their energy stored in a battery. Since electric and solar vehicles do not directly burn fuel, there are few harmful emissions produced. Replacing gasoline fueled vehicles with electric and solar cars would reduce CO2 emissions by 43% to 54% per vehicle.

Building a solar powered model car is similar to building a real car. Young engineers must consider the effects of forces, aerodynamics and the practical use of solar cells.

**Significant Concept:**

*Energy can be generated in many ways.*

**Unit Question:**

*How can technology help slow global warming?*

**Attitude: Level: 6**

**Plan: Level: 6**

**Design: Level: 6**

### **Assessment**

**Create: Level: 6**

**Evaluate: Level: 6**

**Investigate: Level: 6**

Year 8: Solar Car Challenge [Information] [Systems]

MYP Technology

Discovery College [Technology Web Site:](https://sites.google.com/a/dc.edu.hk/technology/)

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**Task:**

Your task is to design and make working prototype of a car that runs on an electric motor. In teams, you will race against each other to find the fastest car over a set distance (best performance). All cars will be given the same motor and must be powered by solar energy as well as standard batteries. Can we power cars with solar alone?

You will follow the Design Cycle to complete this task. I have created a checklist for you to follow for each stage of the Design Cycle complete with due dates. I will assess each section independently and then the whole Design Folio will be submitted for final assessment.

Remember to use your Google Site during this unit!

Year 8: Solar Car Challenge [Information] [Systems]

**Investigate**

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|  | **Assessment Criteria: A - Investigate** | |
| **5-6** | You have created a design brief. You have described the problem. You have investigated the problem, **logically organising** information from appropriate and **acknowledged sources**. You have listed a **range** of specifications that must be met by the product/solution. |  |
| **3-4** | You have **stated** the problem in the form of a **design brief**. You have investigated the problem, **selecting** information from some **acknowledged** **sources**. You have listed **some specifications** that must be met by the product/solution. |  |
| **1-2** | You have **investigated** the problem, sometimes inappropriately. You **collected** information. |  |

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| **Investigate: [Due: ]**  **Identify the Problem. (Research)**   * Rewrite the task in your own words. * Write some **guiding questions** * Explain the **AOI.** * Create a detiled **mindmap** * Write a Design Brief explaining **what** you will design, **why** you are making it and **what** problem you are trying to solve.   **Develop the Design Brief**   * Complete a **research** into the mechanics of model car construction * Conduct **research** into the impact of cars upon global warming and what automotive makers are doing about it. * Complete **research** into how solar cells work.   **Formulate a Design Specification**   * Write a **detailed** Design Specification * Describe the **test** of your completed car | **Investigate- Tips for Success**  [www.myp-tech.wikispaces.com](http://www.myp-tech.wikispaces.com) |

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|  | **Assessment Criteria: B- Design** | |
| **5-6** | You have generated a **range** of feasible designs, **each compared** against the design specification and you **explained** the reasons for your choice of final design. |  |
| **3-4** | You have generated a **few** designs, selecting one and **comparing** it against the design specification. |  |
| **1-2** | You have generated **one** design, and made some attempt to **describe** it. |  |

**Design**

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| **Design**: **[Due:** ]  **Design a product or Solution**   * Experiment with prototypes and record your observations. * Sketch **several, feasible** designs for your car and annotate thoroughly. * Evaluate **each** design against the Design Specification. * Justify your chosen design. | **Design- Tips for Success** |

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|  | **Assessment Criteria: C - Plan** | |
| **5-6** | You have produced a plan that contains a **number** of **detailed**, **logical** steps that describe the use of resources and time. You have described possible problems with the plan. |  |
| **3-4** | You have produced a plan that contains a number of **logical** **steps** that include **time**. |  |
| **1-2** | You have produced a plan that contains **some details** of the steps required to complete the design. |  |

**Plan**

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| **Plan: [Due: ]**  **Plan a Product or Solution**   * Write a **detailed** materials and component list * Write a **detailed** Production Plan for how you will make your car. * Develop a Gantt chart. * Evaluate your plan (during the Create phase) and explain any changes. | **Plan- Tips for Success** |

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|  | **Assessment Criteria: D - Create** | |
| **5-6** | You have **competently** used **appropriate** techniques and equipment. You have followed the plan, resulting in a product/solution of **appropriate** quality. |  |
| **3-4** | You have used **appropriate** techniques and equipment. You have considered the plan resulting in a product/solution of **good** quality. |  |
| **1-2** | You have created at least **part** of a product/solution |  |

**Create**

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| **Create: [Due: ]**  **Create the Product or Solution**   * Build your car with you team to the best of your ability.   **Use Appropriate Techniques and Equipment**   * Keep a **detailed** Process Journal each lesson. * Test and your car and explain improvements.   **Follow the Plan**   * Follow your production plan a explain **any** changes | **Create- Tips for Success** |

**Evaluate**

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|  | **Assessment Criteria: E - Evaluate** | |
| **5-6** | You have **considered** the success of the product/solution based on the results of **testing** and your **own views**. You have provided an evaluation of your own performance at **different stages** of the design cycle and suggested improvements. |  |
| **3-4** | You have **considered** the success of the product/solution **and** your own performance and suggested ways in which these could be improved. You have **compared** the final product/solution against **some** of the design specification requirements. |  |
| **1-2** | You have **considered** the success of the product/solution **or** your own performance |  |

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| **Evaluate: [Due: ]**  **Evaluate your Product or Solution**   * Race your car against other teams. * Evaluate your completed project against the Design Specification. * Suggest improvements to your final product   **Evaluate your Use of the Design Cycle.**   * Evaluate your use of the Design Cycle. * Evaluate the AOI and your understanding of the ‘Big Picture’ * Evaluate your personal engagement in the project. (effort and attitude.) | **Evaluate- Tips for Success** |

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|  | **Assessment Criteria: F - Attitude** | |
| **5-6** | You have **consistently** displayed a satisfactory standard in personal engagement (motivation, independence, general positive attitude) **and** attitudes towards safety, cooperation and respect for others. |  |
| **3-4** | You have **frequently** displayed a satisfactory standard in personal engagement (motivation, independence, general positive attitude) **and** attitudes towards safety, cooperation and respect for others. |  |
| **1-2** | You have **occasionally** displayed a satisfactory standard in personal engagement (motivation, independence, general positive attitude) **or** attitudes towards safety, cooperation and respect for others. |  |

**Attitude**