Solarias Potestas
Student Design Portfolio
Design Brief

Design Situation:

Humans dig, drill and dry up the Earth's resources to feed their selfish desires. Energy is a highly sort after resource, yet different forms of it make them either easy to use or not. For example, getting the energy possessed in a rock and transforming it into a useful form is difficult. However, crude oil is relatively easy. Crude oil is a product of mother nature that takes millions of years to develop. The rate at which crude oil is currently being used means that in less than 100 years we will run out. Crude oil can be separated into many useful products such as octane. Octane is used to power petrol vehicles. When crude oil runs out, the impact on society will be significant. Image walking to school camps, the shopping centre, and so on, 'ain't nobody got time for that'. We need a solution. Motor vehicle manufacturers have created hybrid vehicles that use an electric motor in combination with a traditional petrol motor. A temporary solution, but a permanent solution to the issue of limited crude oil could be solar panels. Solar panels transform light energy into electrical energy. Electric motors use electrical energy and transform it into mechanical energy (energy possessed by moving objects).

Design Brief:

Solar power vehicles could be a common sight in the near future. Most likely in your lifetime, we will be driving vehicles not powered by octane. In groups of 2 students are to design, make and evaluate a land based vehicle to be powered by solar energy with the objective of travelling to deliver water to rural and remote communities.

To be submitted:

At the completion of the project you must submit the final design project along with your completed workbook and folio

Duration: 20 Weeks

Analysis of the brief

1. Name the fuel base that is commonly used to power vehicles at present.

2. What is the aim of this design project?

3. What power source is to be used to make you design project move?

4. What is the object of your design?

5. How many people will be in you group?

6. What must be submitted at the completion of the project?

7. How many weeks do you have to complete the design project?

Research and Investigation

Solar Energy

Compile a report that outlines how solar energy is converted into useable power that can be used in all aspects of commercial and domestic life. Your report should include diagrams/pictures to help explain the process.

Existing Designs

In the spaces provided below find 4 examples of solar vehicles that have already been designed and built. For each design, complete a Plus/Minus/Interesting (PMI) for each design.

Design 1

Plus	Minus	Interesting

Design 2

Plus	Minus	Interesting

Design 3

Plus	Minus	Interesting

Design 4

Plus	Minus	Interesting

Research Task

Research the different types of materials currently used in vehicles. Outline the changes in material in a **timeline** (e.g. metals-->plastics) and relate the properties to their intended uses.

Research any new materials that could potentially replace existing materials.

Idea Generation

In the spaces provided below, sketch four ideas that would be suitable solutions to the Design Brief given. For each of your ideas, complete a Plus Minus Interesting (PMI) table. Each idea should show a progression of the previous idea, improving on any negative points in each sketch.

Design 1

Plus	Minus	Interesting

Design 2

Plus	Minus	Interesting

Design 3

Plus	Minus	Interesting

Design 4

Plus	Minus	Interesting

Final Idea

In the space provided, draw a detailed sketch of your final design that you feel meets the need set in the Design Brief. You must also justify your choice of designs.

Final Design

Justification

Final Idea

Orthogonal Drawing

Pictorial Drawing

Draw a pictorial (3D) drawing of your final design. The pictorial should be rendered to give the appearance of being a 3D product.

Steps in Construction

List the steps that you will need to follow in order to develop and construct your final design. Include all tools and processes that may be used. The initial steps can be generalised then added to as the project develops through to completion.

Realisation

Upon the completion of your project, take a photo then include it in the space below.

Final Evaluation

Final Evaluation
Students evaluate their design throughout the entire process and complete a final evaluation upon completion in relation to the parameter set in the Design Brief and at the analysis stage of the process