Rules, Vehicle Specifications, Notebook & Engineering Design Process

Presented by

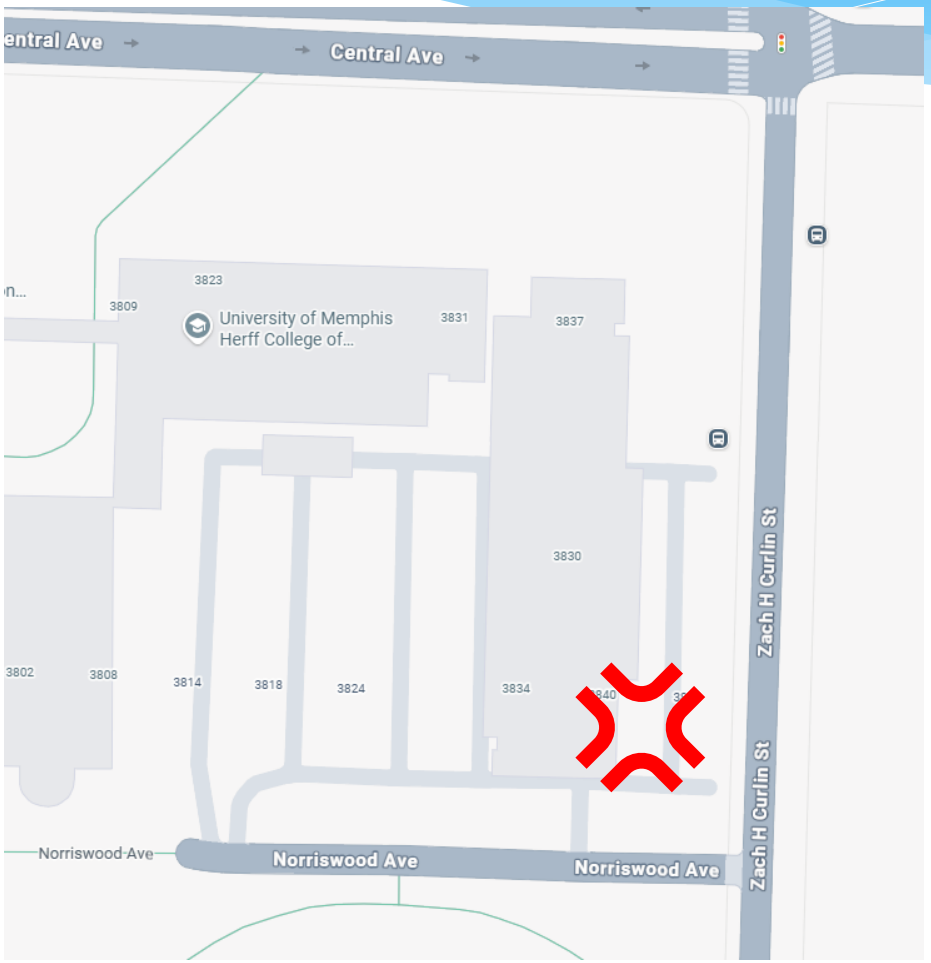
Memphis Light, Gas & Water

Agenda

* Location
* Materials
* Vehicle Specifications
* Inspection Card
* Track Specifications
* Notebook
* Engineering Design Process

Location

* University of Memphis – Corner of Norriswood and Zach Curlin



Materials

* The eyelets, motor, solar panel and battery holder must be used without any modification
* The rest of the vehicle must be your own design and can be made of any other material
* Materials will cost less than $20 and be easy to find. Original receipts for all materials purchased should be placed in an envelope and placed in notebook.

Vehicle Specifications

* The vehicle must be safe to contestants and spectators
  * No sharp edges, projectiles, etc
* Vehicle dimensions
  * 12 in x 24 in x 12 in. (USCS)
* Power must only be from the sun's light unless MLGW determines that batteries will be used. MLGW will provide the batteries. No other energy storage devices or batteries allowed.
* Any energy enhancing devices, like mirrors, must be attached to the vehicle.
* The vehicle must be steered by a guide wire using TWO eyelets (provided by MLGW) affixed to the vehicle. The vehicle must be easily removable from the guide wire, without disconnecting the guide wire.
* The body of the car must be three dimensional. The solar cell cannot be used as the body of the car. Teams will NOT be allowed to bolt the axles and wheels to the solar cell.

Inspection Card

INSPECTION CARD

Team Name _____

Car Number _____

Inspection Checklist

____ Car no longer than 24 inches

____ Car no wider than 12 inches

____ Car no taller than 12 Inches

____ Provided solar panel (not modified)

____ Provided motor (not modified)

____ At least one wheel driven by motor

____ No radio control device

____ Three dimensional body

____ Provided battery holder (not modified)

____ Provided eyelets on bottom front and rear ends

Circle One: PASS INSPECTION FAIL INSPECTION

DESIGN SCORE (*1-10*): _____

_____

Signature of Inspector

Track Specifications

* Race course length is 60 feet long over flat terrain.
* Race lanes are at least 2 feet wide.
* The guide wire will be located in the center of the lane and will not be more than ¾ inch above the track surface. VERY IMPORTANT!!!
* The track is a hard, flat, smooth surface (concrete walkway).

Notebook

* Documentation that must be include:
  * Title page
  * Table of Contents
  * Project log – detailed
  * Design drawings
  * Separate specification page of model design details
  * Component list
  * Design process description

Notebook Scorecard

NOTEBOOK JUDGING

Team Name _____

Car Number _____

The MLGW A-Blazing Race
A Model Solar Car Race

NOTEBOOK COMPONENTS SCORE: _____ *(7 points possible)*

Score one point for each of the following components in the notebook:

____ Title Page with team name, team members, year

____ Table of Contents

____ Project Log (May include dates, tasks, time involved, obstacles/issues encountered, modifications made, team member responsible, etc.)

____ Design Drawing(s)

____ Specification Page (Documents design details such as size, wheel size, gear ratio, specifications of the motor and solar panel, etc.)

____ Car Component List

____ Engineering Design Process Description

DESIGN DRAWINGS SCORE: _____ *(6 points possible)*

Score one point for each of the following:

		To Scale
One Drawing	_____	_____
Two Drawings	_____	_____
CAD Drawing	_____	_____

Notebook Scorecard

NEATNESS SCORE: _____ *(5 points possible)*

Please be consistent in awarding points as follows:

1	2	3	4	5
Poor	Fair	Good	Impressive	Excellent!

ENGINEERING DESIGN PROCESS SCORE: _____ *(7 points possible)*

Score one point for each of the following:

____ Define Goals and Objectives

____ List Ideas

____ Compare Concepts and Select Design

____ Build

____ Test

____ Optimize

____ Description of Final Product

NOTEBOOK JUDGING

Team Name _____

Car Number _____

TOTAL NOTEBOOK SCORE: _____

Sum of all four categories (Possible Score 0 through 25)

_____

Signature of Inspector

Design Process Steps

1. Define Goals & Objectives
2. Generate Ideas (List Ideas)
3. Compare Concepts & Select Design
4. Build
5. Test
6. Optimize (Improve)
7. Description of Final Product

Define Goals & Objectives

* What are your goals for the design?
* What objectives do you want the design to meet?
* In other words, **what do you want to achieve in this competition**?
* **Define what you want and how you are going to obtain it.**

Generate Ideas/ Brainstorm

* Make a list of design ideas
* How will the design look?
* What will the wheels be made from?
* What will the body be made from?
* What kind of shape should the car take?

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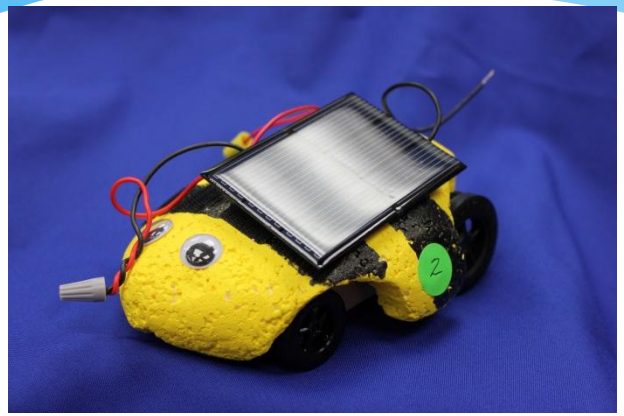
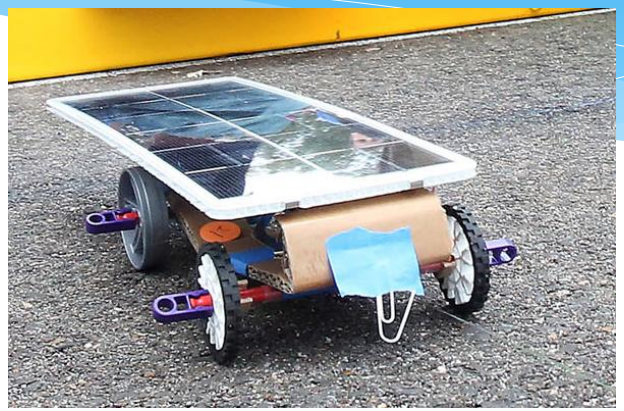
Compare Concepts & Select Designs

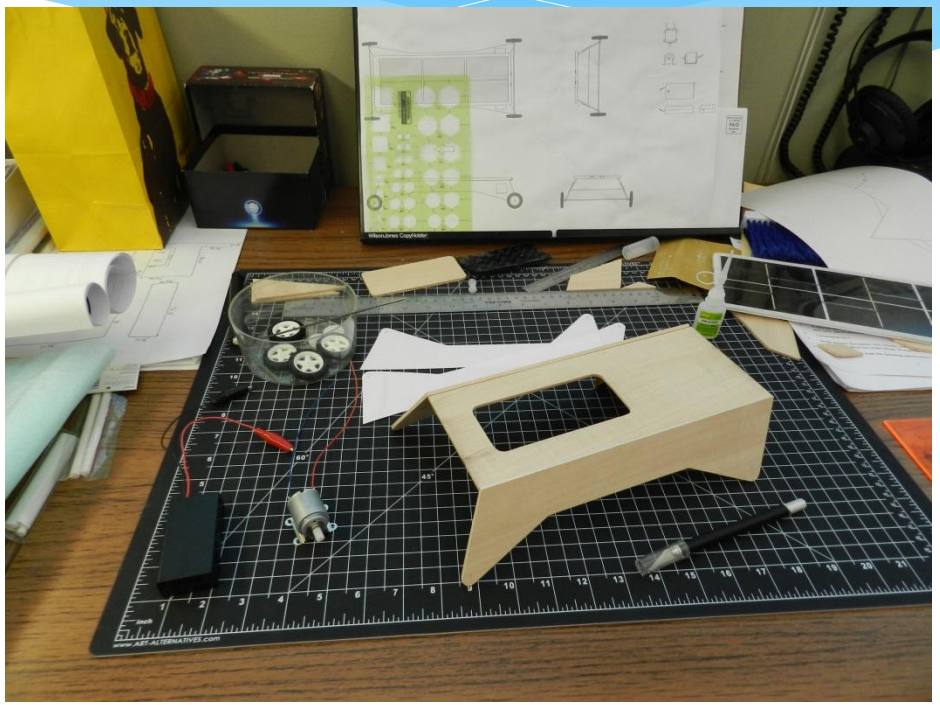




* List the pros and cons of each design
* Determine which is the best design using the pros and cons

Build

* Gather materials
* Start building
* Record steps/procedure

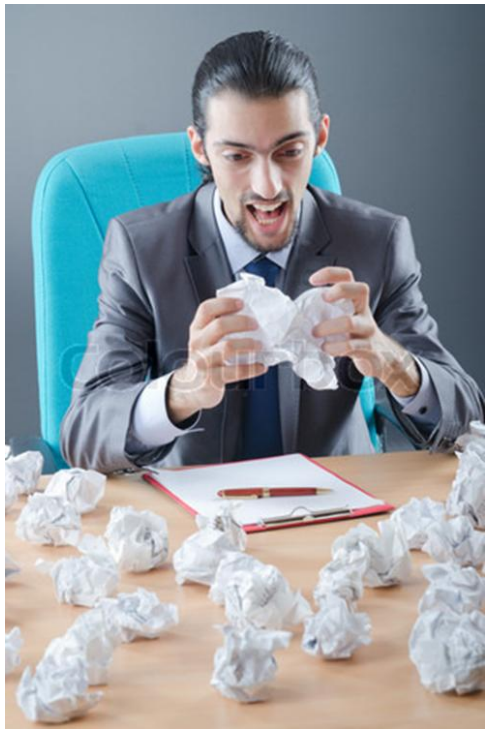


Test

* What type of test(s)?
* How many times will the design be tested?
* How long will each test be performed?
* What data/information will you record from the test(s)?

Optimize

* Determine if the design:
  * Meets stated goals & objectives
* If the design does not meet criteria
  * Test again
  * Repeat until design has met all goals & objectives



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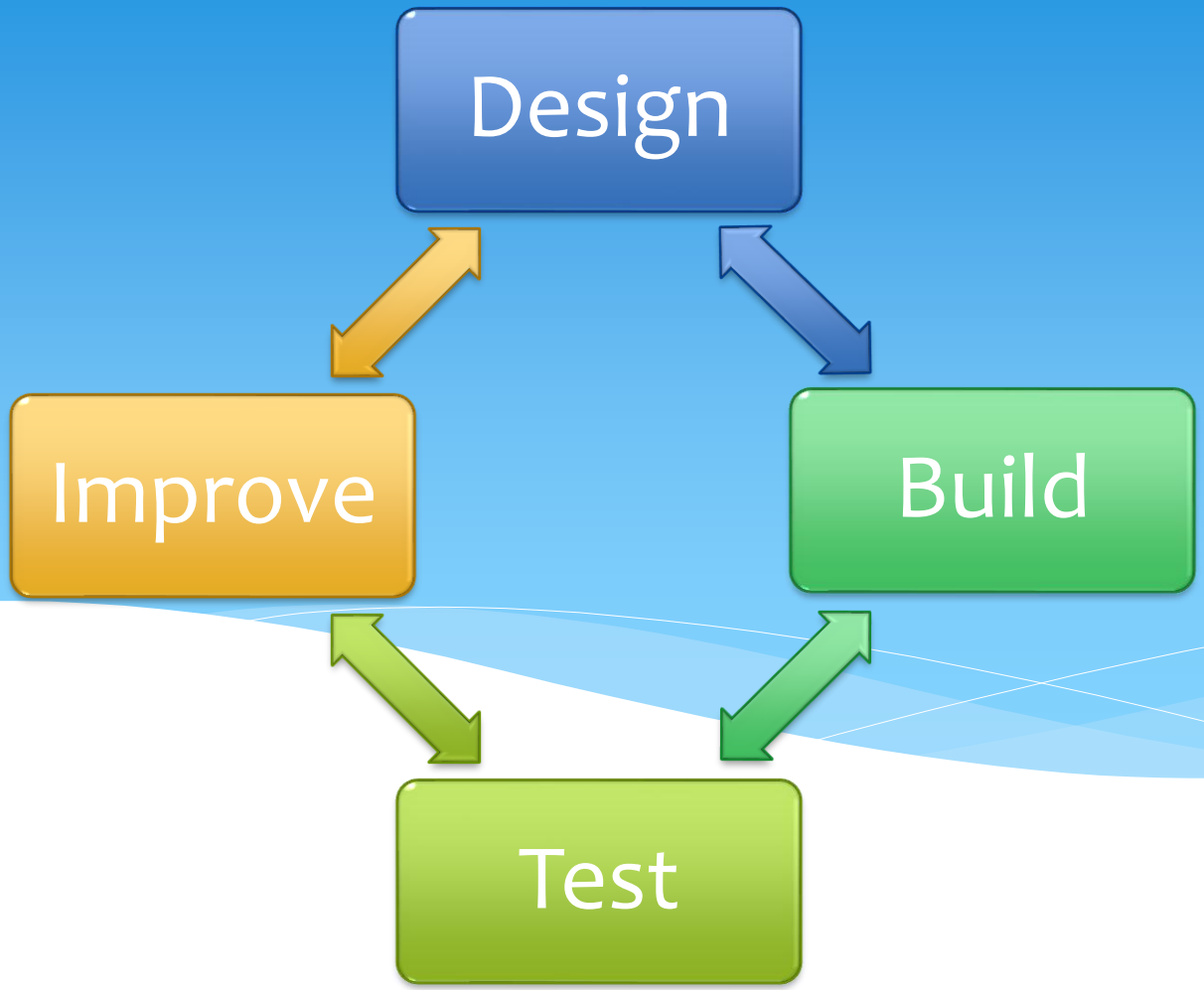
Design
Build
Test
Improve

Final Product

* Design complete!