Alternatively Powered Model
Car Group Project

Project Purpose:

The purpose of this project is to design and build a model car that runs on an alternate power source (In this case solar). Following the completion of the build, the cars will be raced to see which group's model design is the most effective.

Materials:

-Each group will provided with a solar kit that includes a solar panel, a DC motor, and several drive wheels for the motors.

-All other materials will be dependant on each groups design (i.e.: Styrofoam will be needed if that is the material you choose to build the body from.)

Rules:

(1)All group members must participate (each group member will be asked to evaluate all the other group members as to there participation. Low participation = Low mark.
(2)When designing/building the solar cars the only parts you have to use is the solar panel and the motor, everything else is up to you (i.e.: size, weight, etc)
(3) ****-a formal deign & build plan including the 5 main design aspects will need to be completed and approved by the instructor before the building can start.
(4)-The designs can be completed by hand on graph paper but it is recommended that design software be used.
(5) The finished model must compete in the race.

Time:

- Approximately 3 weeks will be allowed for design and construction.

Remember:

-There is no one right way to design a vehicle, but one must keep in mind the idea of "trade offs". Do you as a designer trade off a larger stronger frame/body for lesser performance/speed or a lighter weaker frame/body from better performance/speed.
-Don't get frustrated there will no doubt be mistakes made and road blocks encountered but do your best to determine solutions, and readjust your design accordingly.

Marking:

Research and Design=	30%
Model Building=	30%
Participation=	30%
Finishing the Race=	10%
	100%

Design:

-All the following aspects will need to be addressed in order for your design to be successful.

(1) Frame

Purpose: The car's frame or skeleton is meant to hold all of its main parts together as well as provide the substructure for the body.

Materials:

-Materials used need to be lightweight but strong at the same time.
-Any material that is light and rigid would be appropriate.

Ex: -Insulating foam board (used for home construction)
-Foam core (foam sandwiched in paper)
-balsa wood (lightweight wood often used in model building)
-Plastic pop bottle
-corrugated cardboard/ cardboard tubes (from boxes)

Considerations:

-Material must be relatively strong while being light:
too heavy = too slow
too flimsy = unable to support the weight of the vehicles components

(2) Wheels and Bearings

Purpose: The cars wheels allow it to roll. While the Bearings provide an axis on which the wheels can rotate.

Materials: -Wheels and bearings can be made anything you can show to be appropriate/functional.

Ex: -Tires: -Cd's (junk cd's, cdr, etc)
- Plastic Caps (bottle caps, etc)
-Bearings: - Eyelets (metal eyelets used for hanging things)
- Drinking Straws

Considerations:

- Regardless of size and material, you must keep in mind friction, traction, and wheel alignment.

Too much friction in the bearings = wheels won't turn
Too little traction = wheels will spin and vehicle won't move
Incorrect wheel alignment = car won't go straight

(3) Power Source:

Purpose: to provide power to move the vehicle.

Solar Cell: -Converts the suns energy into power (How? remember from lesson)
-The brighter the sun the more energy produced.

Considerations: -when mounting the solar panel one must keep in mind orientation.
-Putting the panel on an angle will increase the amount of the sun's light it can collect.

(4) Transmission:

Purpose: The transmission, does what its name implies, i.e.: it transmits the power from the motor to the wheels and inturn the ground.

Materials: -you can use one of the drive wheels provided in the kit or you can devise a pulley or gear system.

Considerations: -while it is definitely easier to use one of the direct drive wheels provided, using pulleys and gears can increase the speed of your car. Don't know how, ask or research.

(5) Body:

Purpose: typically the body's main function is to protect the inner workings/occupants

Materials: - Any of the materials that are used for the frame will also work for the body.

Considerations: When designing the body you must ensure that it is aerodynamic and doesn't create too much drag. Drag is created when air hits the body and inturn slows the vehicle down. Anything that can reduce drag will increase speed.

!!!!GOOD LUCK & HAVE FUN!!!!