Components of the Car

Memphis Light, Gas and Water

Components of the Car

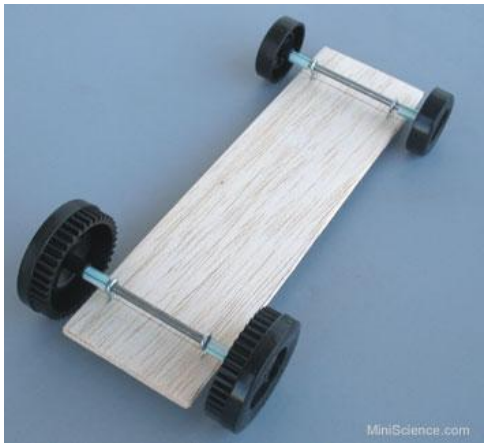
There are five key parts you will need to think about when it comes to designing your vehicle:

- Chassis: how to build the frame of the car
- Wheels and Bearings: how to make wheels that turn
- Power Source: how the solar panel and motor work
- Transmission: how to transfer power from the motor to the wheels
- Body Shell: how the shell effects car performance

Chassis – Base frame of a motor vehicle

Chassis: how to build the frame of the car

- Solar panel, motor, batter holder, gears and wheels will mount to the Chassis
- You don't want the car to be too heavy
- Possible Chassis Materials
  - Foam Core – at most art supply stores, Cardboard, Styrofoam, Plastic, Wood



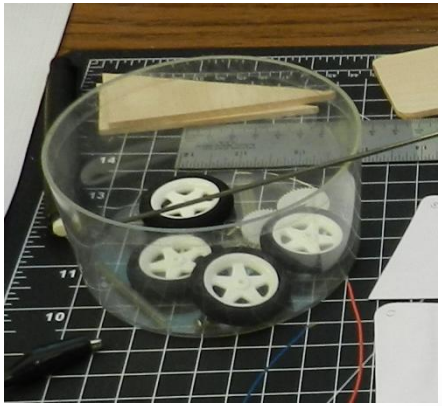
Wheel – Circular block of hard and durable material, at center has bored hole for axle

Bearing – Machine element that constrains relative motions to only the desired motion and reduces friction

Axle – A rod or spindle passing through the center of a wheel or a group of wheels

Wheels and Bearings: how to make wheels that turn

- Tire Traction
  - If your wheels are spinning – not rolling – add more tire traction
  - Increase tire traction with non-slip material around the wheels:
    - Rubber o-ring, Rubber bands, Rubber sheet, Cloth tape, Silicone or other caulking
- Alignment: Line the Wheels up
- Possible Wheel Materials– Anything that is round.
  - Balsa wood, Plastics, Toy/model wheels, Styroform, etc.

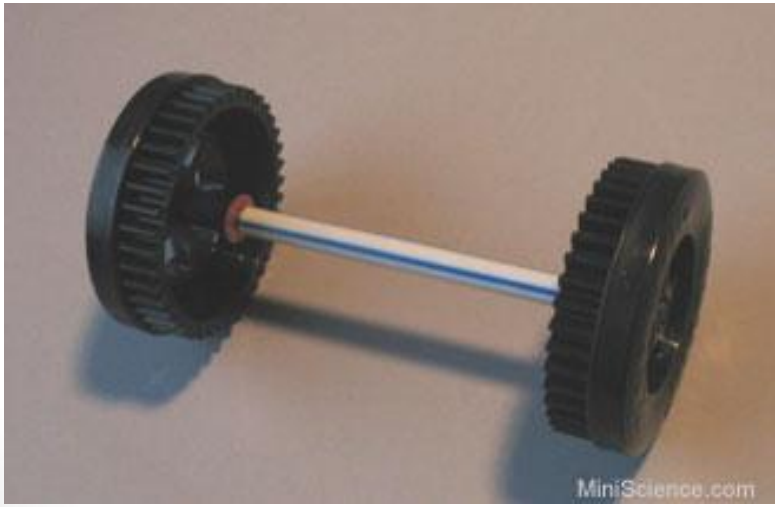


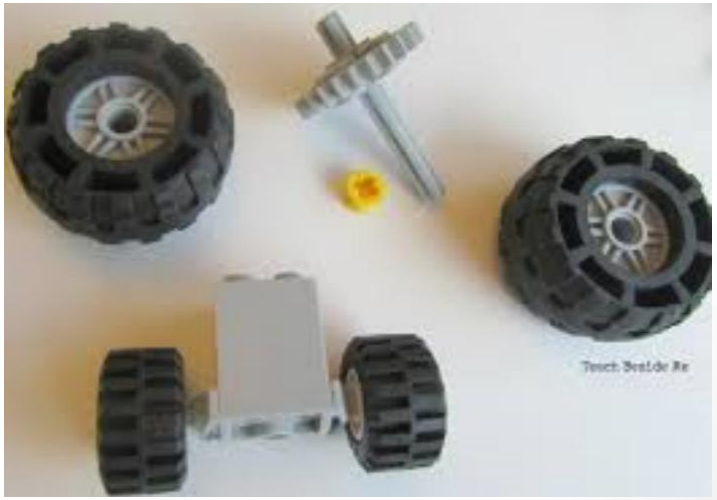
Wheels and Bearings: how to make wheels that turn

- Friction
  - Bearings allow relative motion between the wheel and the axel
- Possible Bearings Materials – Screw eyes/eyebolts, Brass tubing, Hard material with drilled hole, Brackets with holes pre-drilled, Holes drilled directly into the chassis.

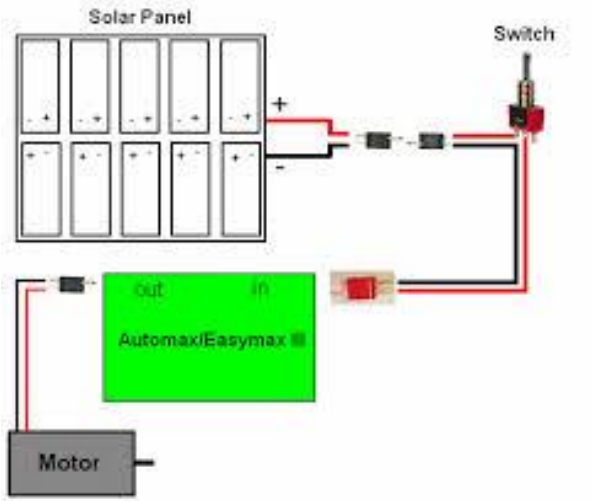
Wheels and Bearings: how to make wheels that turn

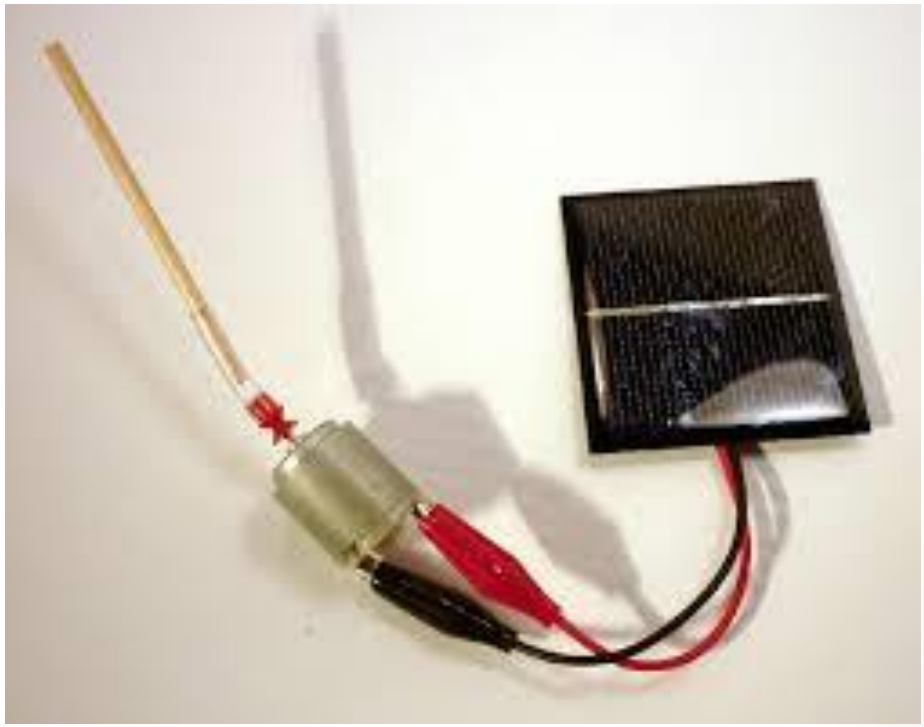
- Axle
  - The axle will be supported and attached to the chassis, but still able to turn
  - Axle should be stiff, narrow and round
- Possible Axle Materials- Straw, Plastic rod, Nails, Brass rod, Brass tubing, Coat-hanger wire, etc.



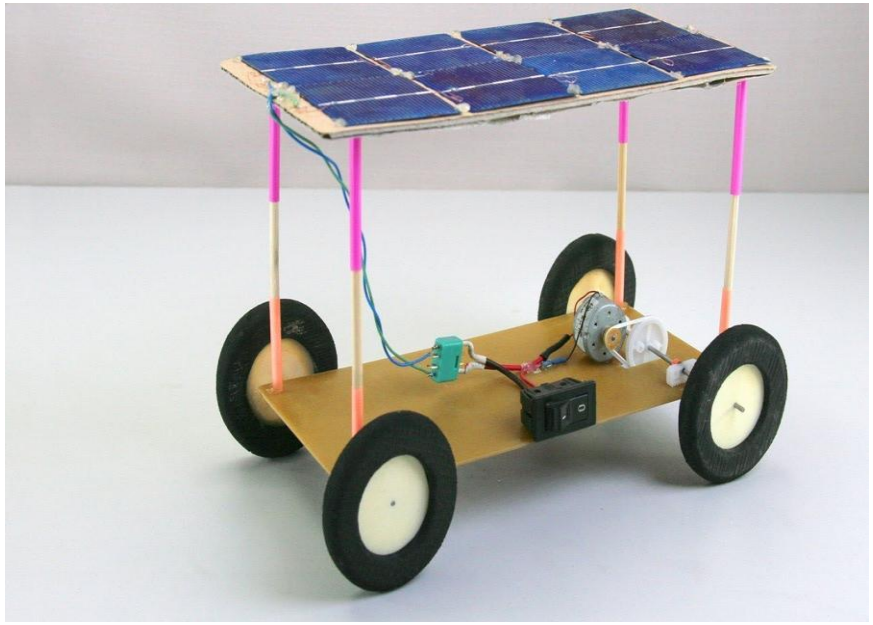


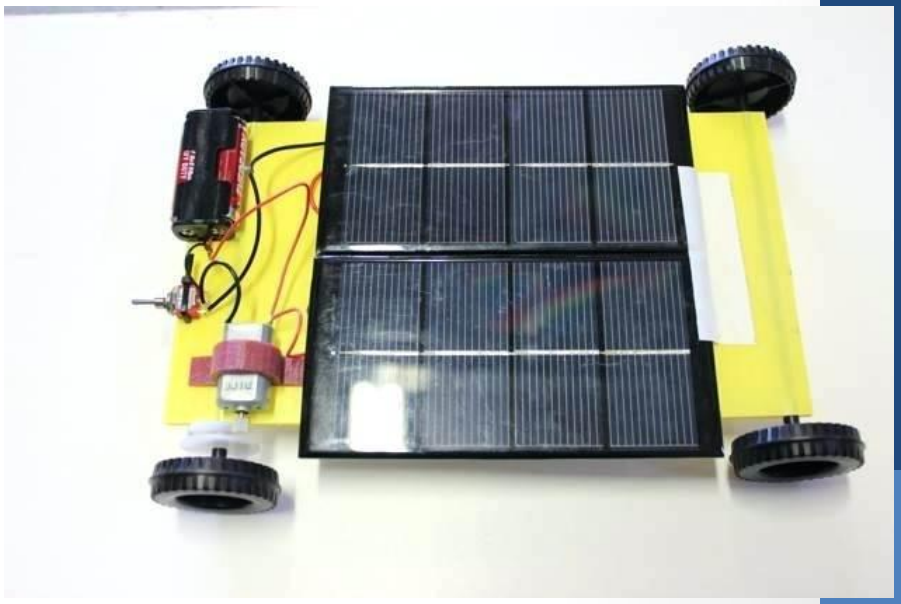
Power Source – Solar Panel
OR if weather requires, Batteries



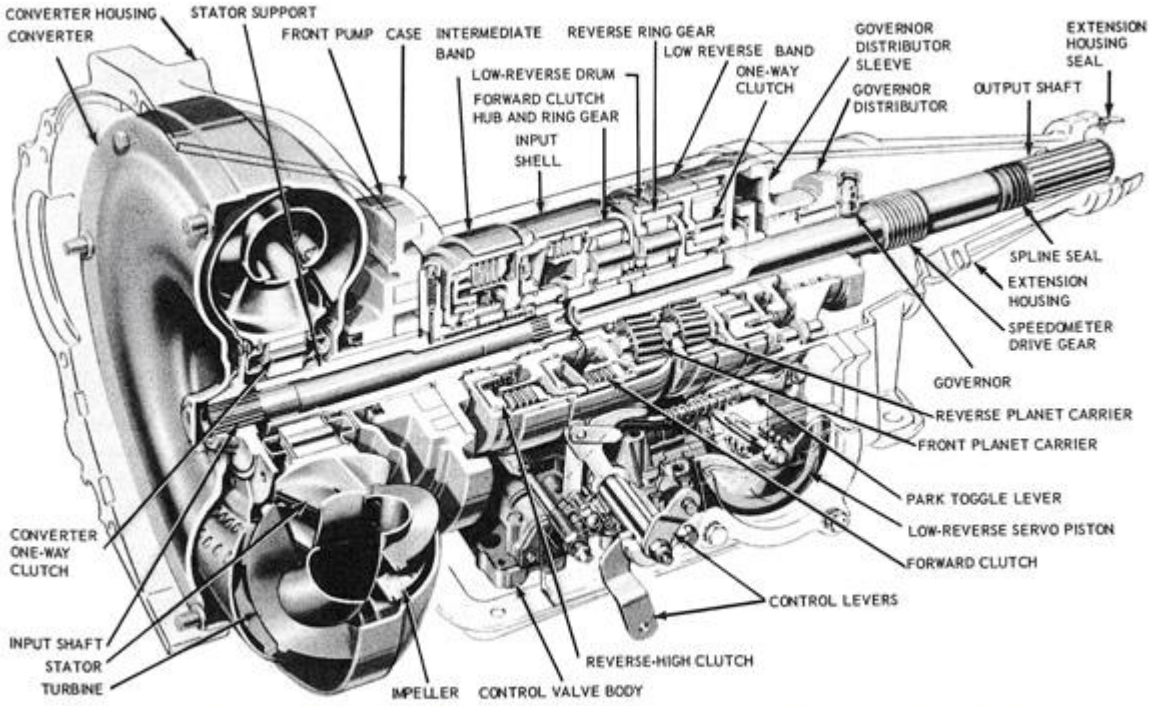


Power Source– Model Solar Car Examples





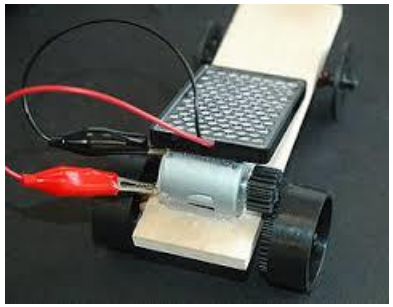
Transmission – Provides the controlled application of the power

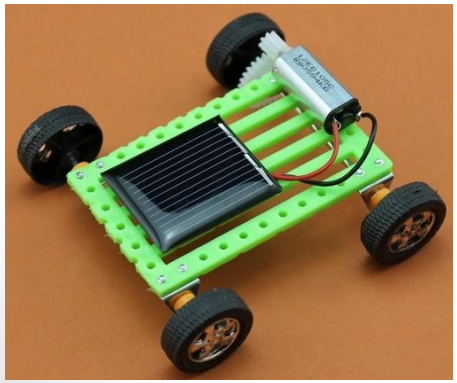


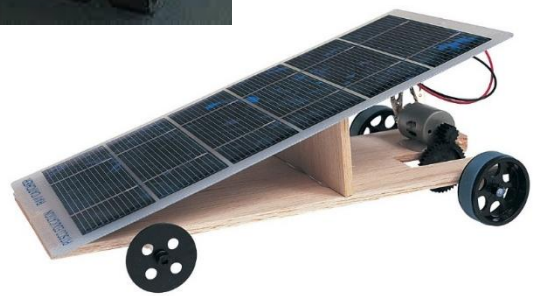
TRANSMISSION BREAKDOWN

Transmission: how to transfer power from the motor to the wheels

- Direct Drive – direct mount the motor on the wheel
- Belt drive – use rubber band or o-ring
  - Motor turns a pulley, which is connected to a belt, which is connected to the wheel. This turns the wheel
  - The size of the pulley affects how many rotations it takes to make the wheel rotate once
- Gear drive – Motor turns a gear, which turns a second gear, which turns the wheel.
  - The size of the gears is called the gear ratio





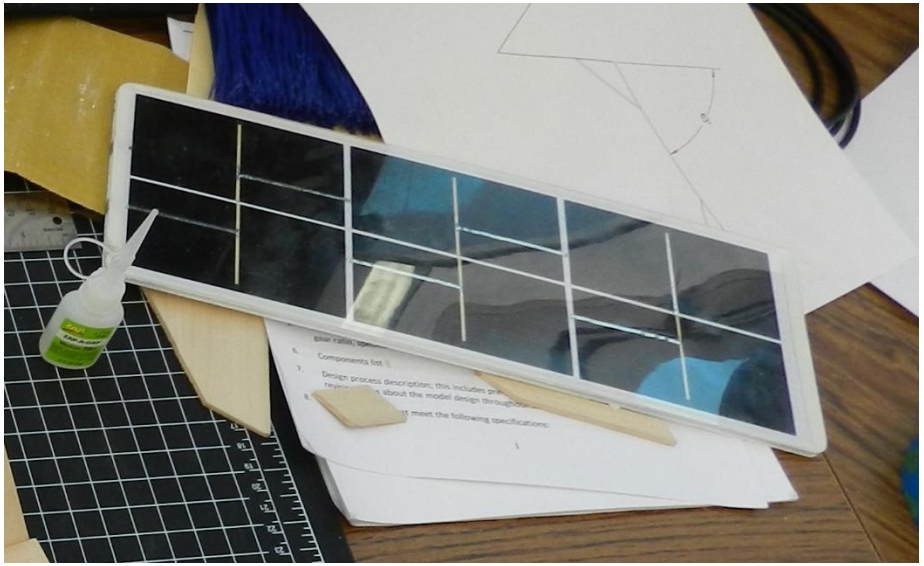


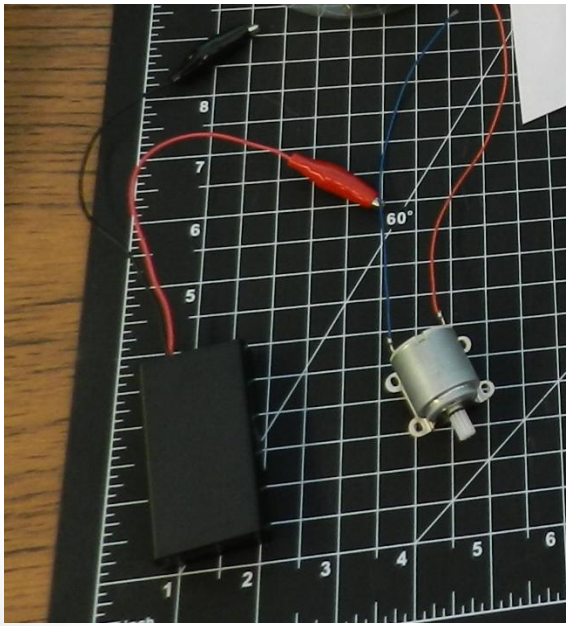
Body Shell – Provided the controlled application of the power

Body Shell: how the shell effects car performance

- Aerodynamics
  - Reduce drag force
- Possibly Body Shell Materials - Poster board, Cardboard, Foam core, Stiff insulation foam, Mylar or Plastic sheet, etc.

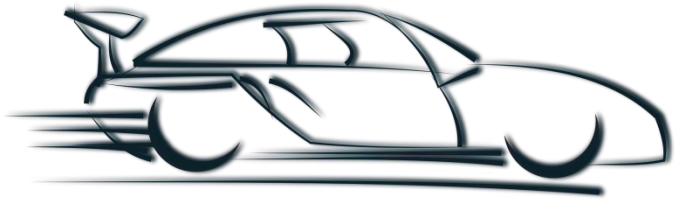
MLGW Provided Materials:





Test and Adjust

- Test different ideas to see what works and what doesn't
- If something doesn't work, try to figure out why and how to improve
- If it does work, how can you make it better
- Be creative and have fun!



Model Solar Car Examples