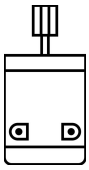
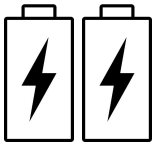
Coleman STEM Night

Rubber band drive, motor car

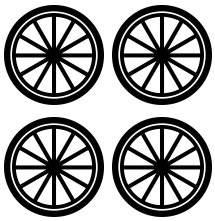
In the bag, you should have,



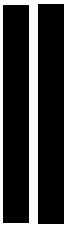
Motor



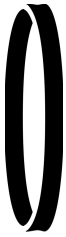
2 x Batteries & Battery Holder



4 x Wheels



2 x Axle Rods



1 Rubber Band

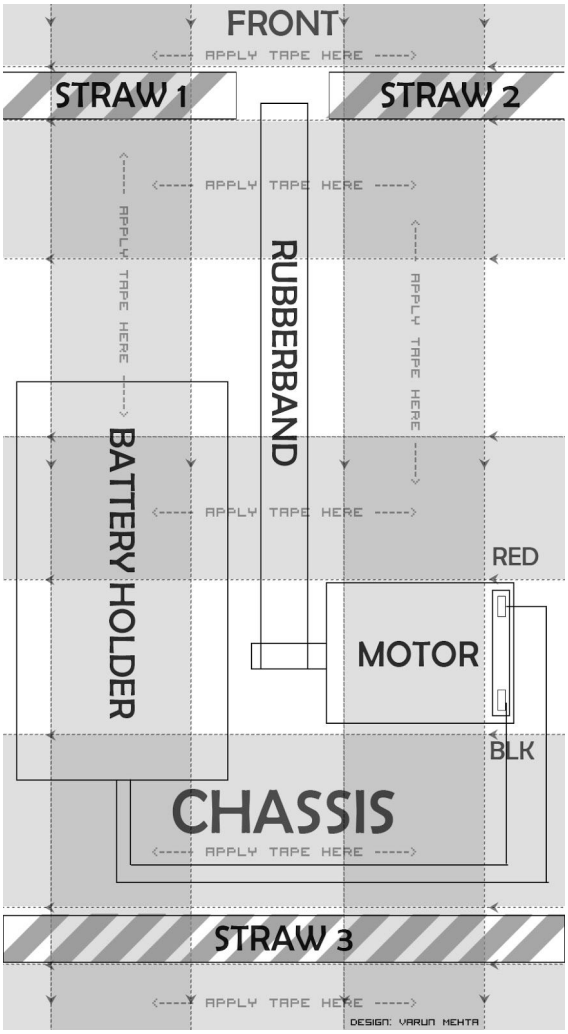
2 x Straw

(If any of the items are missing, please get in touch with a volunteer right away)

STEPS:

Any time while building the car, if you need any help, please raise your hand for volunteers.

The cardboard piece works as the **CHASSIS** (the main body) of the car. There are markings on the diagram, where you have to attach the different parts. All shaded areas between dotted lines is where tape needs to be applied.



1. Keep side marked "**CHASSIS**" facing up towards you, so you can see the diagrams.
2. Use tape to stick it to the piece of cardboard supplied.
3. Take the straw and cut it to 3 pieces **(Straw 1, Straw 2, Straw 3**) each measured off the chassis. Keep the straw on the chassis and mark the length where it has to be cut.
4. Place the straw on the outline **Straw 1**, and apply scotch tape along the length of the chassis, follow the shaded-area between the dotted line in the direction of the arrows.
5. Don't be afraid to use to use a lot of tape, the aim is to make sure the straws and motor are firmly in place and don't move.
6. Repeat for all 3 pieces of straw.
7. Now apply tape across the width of the chassis, following the shaded-area between the dotted line in the direction of the arrows across. This is important to reinforce the length wise tape to make sure the straw does not move under the pressure of the rubberband.
8. Don't be afraid to use to use a lot of tape, the aim is to make sure the straws and motor are firmly in place and don't move.

9. Take the motor and place it on the chassis where marked "**MOTOR**"
10. Make sure the connectors are facing up, away from the chassis, so they are not hidden.
11. Tape the motor to the chassis, similar to the straws, follow the dotted line and tape across the shaded area around the motor.
12. Tug the straws and motor to make sure they are snug in place. If they are rolling along the length, apply more tape, and secure it nicely.
13. Take the axle, put a wheel at one end, and slide the open end through the long straw, marked **Straw 3**.
14. Push the other wheel at the other end.
15. Place the rubberband perpendicular to the straw, such that it makes a **T** with the straws, over the line marked "**RUBBERBAND**".
16. Take the second axle, and attach the wheel to one end of it, slide is thru the straw marked **STRAW 1** and **STRAW 2**, **such that the axle passes thru the rubberband**. Once you slide the axle all the way thru, attach the other wheel.
17. **The rubberband should be locked in place between the two straws.**
18. Now connect the wires from the battery holder to the motor.
19. Make a small loop at the end of the wire and pass it thru the holes on the motor connectors.
20. Connect the red wire to the hole marked "**RED**" and black wire to the hole marked "**BLK**".
21. Put some tape on the connector's to make sure the wires don't fall off.
22. The small metal piece on the battery holder works as a switch. When you push it down to touch the battery, it will switch on. When standing upright, it disconnects the battery.
23. Turn the switch on, and the motor should run.
    a. If the motor turns, your connection is good, move to the next step 24.
    b. if the motor does not turn, check the connections again. Repeat steps 18-22
24. Carefully tape the battery holder on the side, maked **"BATTERY HOLDER"** make sure it does not touch the rubberband, or the motor shaft.
25. Pull the rubberband gently over the shaft of the motor. It should be a little tight.
26. Now hold the car in your hand, without touching the wheels, turn on the switch. The motor should turn, pulling the rubberband, there by pulling the front axle and the wheels should spin.
27. Place your car on a flat ground and push the switch to turn on the motor. Your car should move forward in the direction of the rubberband.
28. Once you finish building your car, line up near the "**Race Track**" to time your car's speed and time.

Bonus:

At home, try switching the **BLACK** and **RED** wires connected on the motor and see what happens.