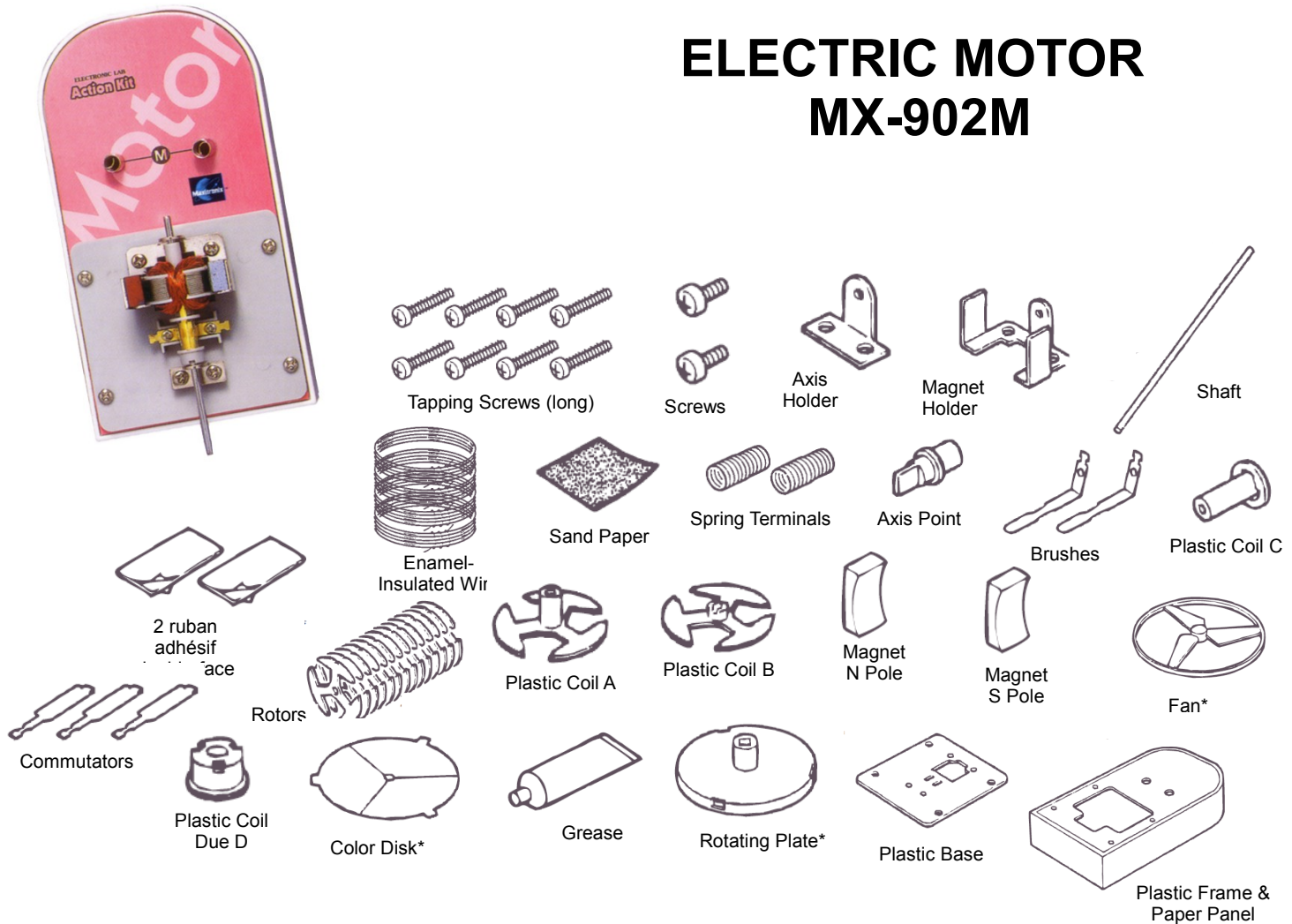
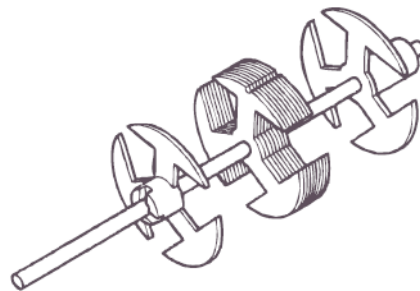


ELECTRIC MOTOR MX-902M



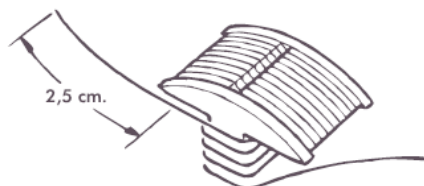
Practices - 1

Insert coil A, the 14 rotors, and coil B through the shaft, with their grooves aligned.



Practices - 2

Carefully wind the enamelinsulated wire around each pole, leaving about 1 inch at each end. Be sure to wind the wire in the same direction around the poles.

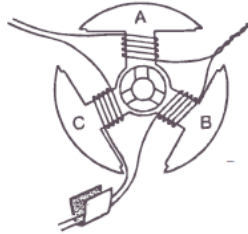


Practices - 3

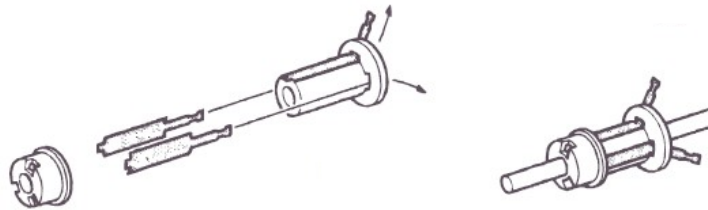
Use sandpaper to remove about 1 inch of insulation from both ends of three of the wires.

**Practices - 4**

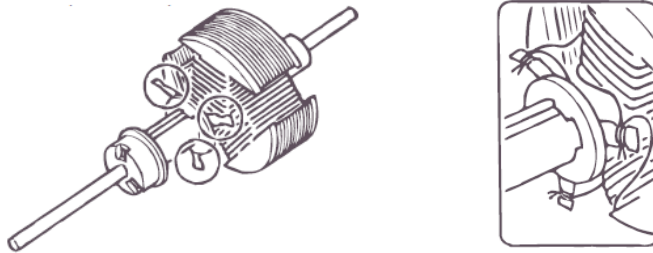
Twist the neighboring ends together.

**Practices - 5**

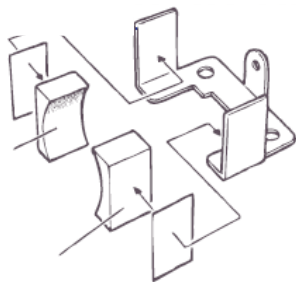
Insert the three commutators into coil C and attach coil D to hold in place. Then insert the coil with commutators attached onto the shaft. Then insert the assembled coil onto the shaft. You might need a pair of needlenosed pliers to insert the assembly. Fold the commutator outward to secure the coil.

**Practices - 6**

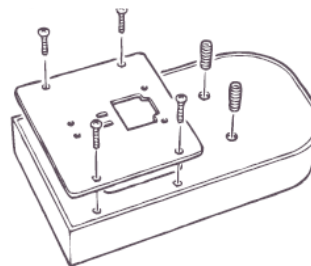
Wind the twisted end of a pair of enamel-insulated wires around each commutator. Make sure all the pieces are tightly connected

**Practices - 7**

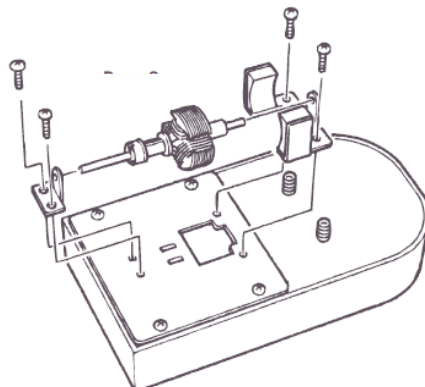
Use double-sided tape to attach the magnets to the inside of the magnet holder. Attach the white magnet to the holder's right side and red magnet to the holder's left side.

**Practices - 8**

Attach the plastic base to the paper panel with four of the long tapping screws. Insert four spring terminals in the holes in the paper panel.

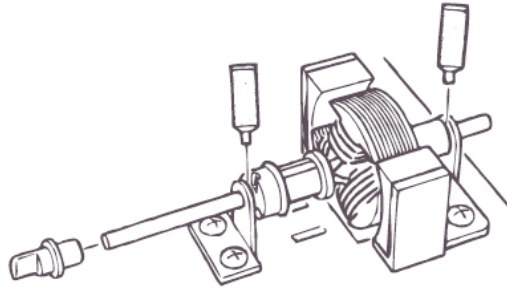
**Practices - 9**

Insert two wires from the battery case through the holes in the paper panel. Attach the battery case to the paper panel with two screws and nuts. Connect the battery case's wires to the two spring terminals as shown. The red one to "+" terminal, the black one to "-" terminal.

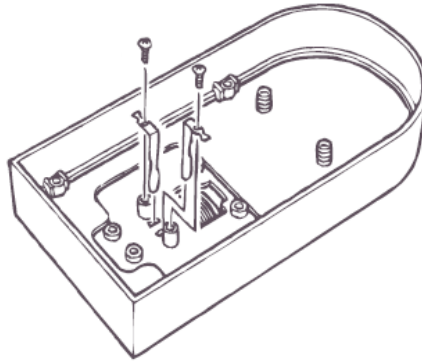


Practices - 10

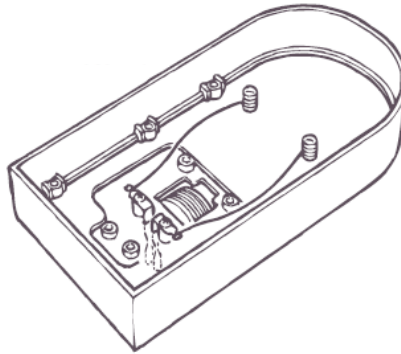
Insert the coil D side of the shaft's end into axis holder and the coil B-side into the magnet holder. Fasten each holder to the base with two screws.

**Practices - 11**

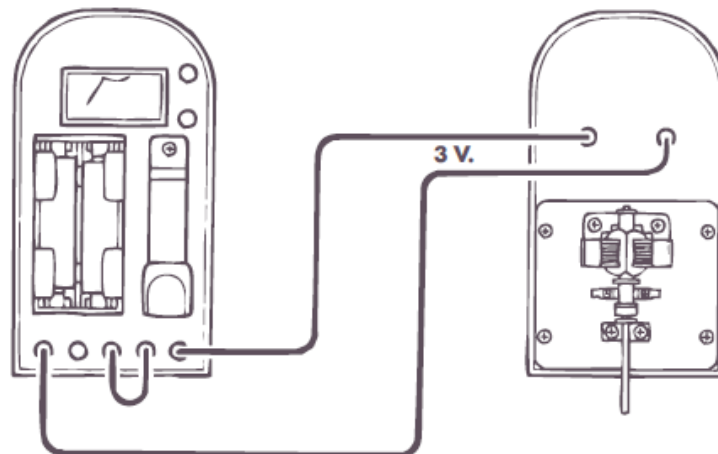
Attach the axis point to the shaft's end

**Practices - 12**

Secure the brushes with screws through the back of the panel so they contact the commutator on the front of the panel.

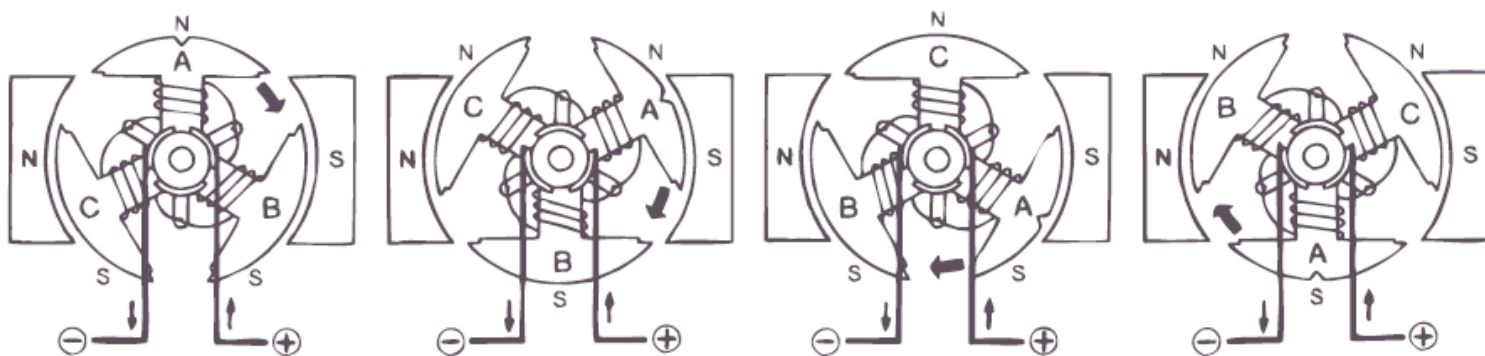
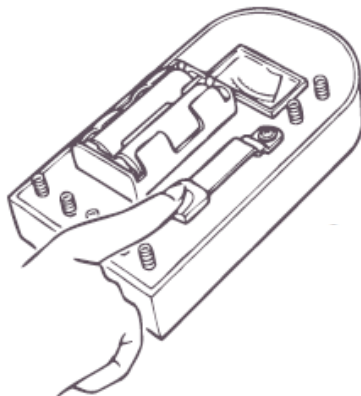
**EXPERIMENT 1:**

Operating the Motor



How does this work?

After the batteries installed, the coil in the motor becomes magnetized. The coil's magnetic field first repels, then attracts the permanent magnets, and the coil spins. When the coil travels $\frac{1}{3}$ of a circle, the first commutator breaks contact with the brush and electricity is cut off. Then the next commutator touches the brush, the next coil becomes magnetized, and the process repeats. When the commutator comes in contact with another brush, the motor receives repelling force from another magnet and keeps spinning until you remove the batteries or wires. When you are through with the experiment, remove the batteries from the battery case to avoid the leakage from the battery



NOTE: This kit is recommended for children aged 8 years, always accompanied by an adult



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