What do you need?

Materials
- Motor
- 1.5 volt battery (AA) with battery holder
- Low-voltage wire
- 12 split pins
- Wooden board A4 size, 3 mm thick
- Cardboard A4 size
- The two last pages of this document
- Little wooden beam 8x8x400 mm
- 2 banana plugs (1 red and 1 black)
- 1 cork
- Cartridge for glue pistol (or wood glue)

Tools
- Scissors
- Compasses
- Ruler and pencil
- Pierce
- Wire cutter
- Wire stripper
- Electric screw driver
- Glue pistol
What do you have to do?

1. Use the ruler to measure exactly 30 cm of the electric wire and cut it with the wire cutter.
2. Strip both tips of the wire with the wire stripper.
3. Connect one of the tips to the black wire of the motor. Insulate with some insulation tape so that you do not see the copper wire any more.
4. Bend the other tip twofold and connect to the black banana plug.
5. Cut off a new 10 cm long piece of electric wire.
6. Strip both tips and connect one of the tips to the red wire of the motor. Insulate the connection with insulation tape.
7. Connect the other tip of this (short) wire to one side of the battery holder.
8. Cut off a new 30 cm long piece of electric wire.
9. Strip both tips and connect one side to the battery holder.
10. Bend the other tip twofold and connect to the red banana plug.
11. Take the wooden board (size A4) and put it in front of you. Glue the motor to the right upper corner and glue the battery holder next to it.
12. Pierce a hole in the cork by means of the piercer. Stick the cork to the upper side of the motor.
13. Draw a circle by means of the compasses on the small soft card board and cut it out.
14. Decorate this disc with your own drawing and glue the turn disc to the cork.
15. Now the first part of the Electro is ready. Test if everything functions properly. Proceed as follows: put a battery in the battery holder. Hold both banana plugs against each other. Is the disc turning? Then, it works! This is called closing the circuit. This allows the current from the battery to reach the motor.
16. Now take the second cardboard. Put it diagonally in front of you. When you now measure from the top to the bottom, the result is 21 cm. When you measure from left to right, the result is 29.6 cm. Make three columns. The first column is 3.0 cm large, the second 23.6 cm the third again 3.0 cm.
17. Put on each line between the columns 6 crosses with the pencil: at 1.5 cm, at 5.0 cm, at 8.5 cm, at 15.5 cm and at 19.0 cm. Then you get more or less the following result:

18. Pierce a whole through each cross and put a split pin through the hole.
19. Put the cardboard upside so that the legs of the split pins point upwards.
20. Cut six other 30 cm pieces of electric wire.
21. Strip the tips.
22. Connect one tip of each wire to split pin on the one side and the other tip to the other side. You may choose yourself you connect the split pins, but the wire always has to pass across your paper.
23. Then you open the legs of the split pins so that the wire and the split pin are securely locked. The result may look as follows:

24. Saw the little beam into two halves.
25. Glue to each side of the cardboard a wooden beam. Then turn the cardboard upside down and put it over the first part. Your Electro is now ready. Do a test. Proceed as follows: hold one banana plug to the head of a split pin in the first column and then tap lightly against all other split pins of the other column. At one point the disc should turn. Did you succeed? Congratulations!
26. All you have to do now is to devise questions and answers. The purpose is that someone else solves the puzzle without looking at the wire at the bottom. All they may do is to think hard and hold the banana plugs to the right split pins. If the answer is correct, the disc will turn. Attention! The questions and answers may not be reproduced next to each other. In the example of this working sheet, the answer to question one has to appear in the second answer section!
27. You can use the next two pages to write down questions (left) and answers (right). Then you have to make new pages yourself. Have lots of fun!!!