



2. Now connect the red and black wires of the battery to the motor and light bulb respectively. (Fig. 2)



**Explanation:**  
This experiment demonstrates the ability of a magnetic field to exert a force on a current-carrying conductor. The force is perpendicular to the direction of the current and the direction of the magnetic field. This force is called the Lorentz force. The force and torque exerted on the motor can be used to do work. The motor and battery are used to power the motor and light bulb. The motor and light bulb are used to power the motor and light bulb.

**Activity 8 Light Control Alarm**  
Material: - 1 Bread board (1) - 1 Spring connector (2) - 1 Battery (1.5) - 1 Light sensor (2)  
Items you will need: - A Bread board  
- A Spring connector  
- A Battery  
- A Light sensor


**Steps:**  
1. Connect the red (+) and black (-) wires of the battery to the bread board. (Fig. 8)  
2. Connect the light sensor to the bread board. (Fig. 8)



**Explanation:**  
The light sensor is used to detect the presence of light. When the light sensor detects light, it sends a signal to the bread board. The bread board then sends a signal to the light sensor, which turns on the light bulb.

**Activity 9 Make a Bell**  
Material: - 1 Bread board (1) - 1 Switch plate (2) - 1 Motor plate (2) - 2 Spring connectors (2) - 1 Adjusting screw (1)  
- 1 Adjusting screw spring (2) - 1 Adjusting screw knob (1) - 1 Adjusting screw leg (2) - 1 Spring holder (2)  
- 1 Nut (2) - 1 Bolt (2) - 1 Bolt head (2) - 1 Brass insulator wire (1) - 1 Iron nail (2)  
- 1 Hammer (2) - 1 Hammer (2) - 1 Hammer (2) - 1 Iron nail (2) - 1 Motor plate (2)  
- 1 Spring (2) - 1 Spring (2)

**Steps:**  
1. Insert the iron nail (2) in the hole of the same wire (2). (Fig. 9)  
2. Insert the adjusting screw (1) through the adjusting screw hole (2). (Fig. 9)



**Explanation:**  
The iron nail is used to create a magnetic field. When the iron nail is placed near the motor, it attracts the motor's armature, causing it to move and ring the bell.

3. Insert the red (+) and black (-) wires of the battery to the bread board. (Fig. 10)  
4. Insert the motor plate (2) to the bread board. (Fig. 10)  
5. Insert the spring connector (2) to the bread board. (Fig. 10)  
6. Insert the adjusting screw (1) through the adjusting screw hole (2). (Fig. 10)  
7. Insert the adjusting screw spring (2) to the bread board. (Fig. 10)  
8. Insert the adjusting screw knob (1) to the bread board. (Fig. 10)  
9. Insert the adjusting screw leg (2) to the bread board. (Fig. 10)  
10. Insert the spring holder (2) to the bread board. (Fig. 10)  
11. Insert the nut (2) to the bread board. (Fig. 10)  
12. Insert the bolt (2) to the bread board. (Fig. 10)  
13. Insert the bolt head (2) to the bread board. (Fig. 10)  
14. Insert the hammer (2) to the bread board. (Fig. 10)  
15. Insert the hammer (2) to the bread board. (Fig. 10)  
16. Insert the hammer (2) to the bread board. (Fig. 10)  
17. Insert the iron nail (2) to the bread board. (Fig. 10)

**Explanation:**  
The iron nail is used to create a magnetic field. When the iron nail is placed near the motor, it attracts the motor's armature, causing it to move and ring the bell.

**Activity 10 Make an Electromagnet**  
Material: - 1 Iron nail (1) - 1 Battery (1) - 1 Spring connector (2) - 1 Wire (1)  
Items you will need: - Iron nail  
- Battery  
- Spring connector  
- Wire

**Steps:**  
1. Insert the iron nail (1) to the bread board. (Fig. 11)  
2. Insert the battery (1) to the bread board. (Fig. 11)  
3. Insert the spring connector (2) to the bread board. (Fig. 11)  
4. Insert the wire (1) to the bread board. (Fig. 11)



**Explanation:**  
The iron nail is used to create a magnetic field. When the iron nail is placed near the wire, it attracts the wire, causing it to move.

**Activity 11 Make a Motor**  
Material: - 1 Base plate (2) - 1 Motor coil (1) - 1 Motor pin (2) - 1 Long Tin Size Lay (1) - 1 Magnet (2) - 2 Spring Connector (2)

**Steps:**  
1. Insert the base plate (2) to the bread board. (Fig. 12)  
2. Insert the motor coil (1) to the bread board. (Fig. 12)  
3. Insert the motor pin (2) to the bread board. (Fig. 12)  
4. Insert the long tin size lay (1) to the bread board. (Fig. 12)  
5. Insert the magnet (2) to the bread board. (Fig. 12)



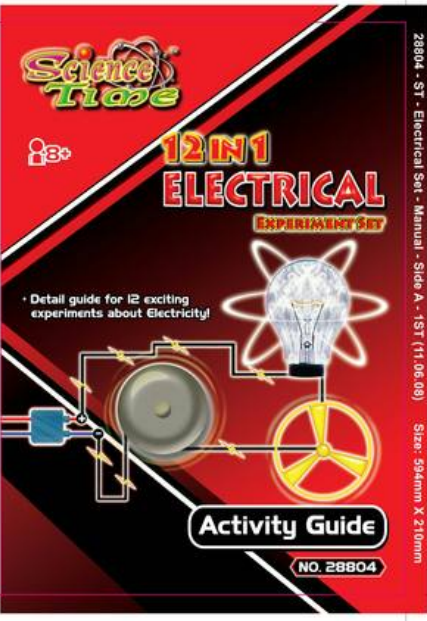
**Explanation:**  
The motor coil is used to create a magnetic field. When the motor coil is placed near the magnet, it attracts the magnet, causing it to move.

**Activity 12 Solar power cell**  
Material: - 1 Base Plate (2) - 1 Light bulb (2) - 1 Solar panel (2) - 2 Spring connectors (2)

**Steps:**  
1. Insert the base plate (2) to the bread board. (Fig. 13)  
2. Insert the light bulb (2) to the bread board. (Fig. 13)  
3. Insert the solar panel (2) to the bread board. (Fig. 13)  
4. Insert the spring connectors (2) to the bread board. (Fig. 13)




**Explanation:**  
The solar panel is used to create a magnetic field. When the solar panel is placed near the light bulb, it attracts the light bulb, causing it to move.



Science Time  
12 IN 1  
ELECTRICAL  
EXPERIMENT SET  
NO. 28804

Detail guide for 12 exciting experiments about Electricity!



Activity Guide

## 12 in 1 Electrical Experiment Set Activity Guide

**WARNING!**  
Only for use by children over 8 years old. To be used only under the strict supervision of adults that have studied the precautions given in the experimental set. Not suitable for children under 10 months because of small parts and because of being made of plastic. Not suitable for children under 3 years because of being made of plastic. Not suitable for children under 3 years because of being made of plastic. Not suitable for children under 3 years because of being made of plastic.

**IMPORTANT!**  
Keep these instructions. DO NOT DISCARD.

- Only adults should install and replace batteries.
- Alkaline batteries are recommended.
- If the device has not been used for a long time, remove the batteries.
- Do not use rechargeable batteries.
- Do not mix old and new batteries.
- Do not mix alkaline (standard carbon zinc) or rechargeable (nickel cadmium) batteries.
- Exhausted batteries are not to be recharged.
- Non-rechargeable batteries are not to be recharged.
- The supply terminals are not to be short-circuited.
- Only batteries of the same or equivalent type as recommended are to be used.
- Batteries are to be inserted with the correct polarity.
- Do not dispose of batteries in fire. Batteries may explode or leak.
- Batteries may explode or leak if mistreated.

Batteries required: 2 x 1.5V AA (Not included)

If at any time in the future you should need to dispose of this product please note that Waste electrical products should not be disposed of with household waste. Please recycle where facilities exist. Check with your Local Authority or retailer for recycling advice (Waste Electrical and Electronic Equipment Directive)

## Components:

1. 1 x 9V Battery	15. 1 x Battery	31. 1 x Spring connector	44. 1 x Spring connector
2. 1 x 1.5V AA Battery	16. 1 x Battery	32. 1 x Spring connector	45. 1 x Spring connector
3. 1 x 1.5V AA Battery	17. 1 x Battery	33. 1 x Spring connector	46. 1 x Spring connector
4. 1 x Motor plate	18. 1 x Battery	34. 1 x Spring connector	47. 1 x Spring connector
5. 1 x Motor plate	19. 1 x Battery	35. 1 x Spring connector	48. 1 x Spring connector
6. 1 x Motor plate	20. 1 x Battery	36. 1 x Spring connector	49. 1 x Spring connector
7. 1 x Motor plate	21. 1 x Battery	37. 1 x Spring connector	50. 1 x Spring connector
8. 1 x Motor plate	22. 1 x Battery	38. 1 x Spring connector	51. 1 x Spring connector
9. 1 x Motor plate	23. 1 x Battery	39. 1 x Spring connector	52. 1 x Spring connector
10. 1 x Motor plate	24. 1 x Battery	40. 1 x Spring connector	53. 1 x Spring connector
11. 1 x Motor plate	25. 1 x Battery	41. 1 x Spring connector	54. 1 x Spring connector

**Activity 1 Static Electricity**  
Material: - 1 Plastic plate (1) - 1 Glass rod (1) - 1 Cloth (1)  
Items you will need: - Plastic plate  
- Glass rod  
- Cloth

**Steps:**  
1. Rub the glass rod with the cloth. (Fig. 14)  
2. Bring the glass rod near the plastic plate. (Fig. 14)



**Explanation:**  
The glass rod is used to create a static electric charge. When the glass rod is rubbed with the cloth, it becomes charged. When the glass rod is brought near the plastic plate, it attracts the plate.

**Activity 2 Conductors and Insulators**  
Material: - 1 Base plate (2) - 1 Spring connector (2) - 1 Plastic plate (2) - 1 Glass rod (2) - 1 Battery (2)  
Items you will need: - Base plate  
- Spring connector  
- Plastic plate  
- Glass rod  
- Battery

**Steps:**  
1. Insert the base plate (2) to the bread board. (Fig. 15)  
2. Insert the spring connector (2) to the bread board. (Fig. 15)  
3. Insert the plastic plate (2) to the bread board. (Fig. 15)  
4. Insert the glass rod (2) to the bread board. (Fig. 15)  
5. Insert the battery (2) to the bread board. (Fig. 15)



**Explanation:**  
The plastic plate is used to create a static electric charge. When the plastic plate is rubbed with the glass rod, it becomes charged. When the plastic plate is brought near the battery, it attracts the battery.

1. Insert the base plate (2) to the bread board. (Fig. 16)  
2. Insert the spring connector (2) to the bread board. (Fig. 16)  
3. Insert the plastic plate (2) to the bread board. (Fig. 16)  
4. Insert the glass rod (2) to the bread board. (Fig. 16)  
5. Insert the battery (2) to the bread board. (Fig. 16)

**Explanation:**  
The plastic plate is used to create a static electric charge. When the plastic plate is rubbed with the glass rod, it becomes charged. When the plastic plate is brought near the battery, it attracts the battery.

**Activity 3 Make a Fan**  
Material: - 1 Motor (1) - 1 Fan blade (2) - 1 Fan holder (2) - 1 Base plate (2)  
Items you will need: - Motor  
- Fan blade  
- Fan holder  
- Base plate

**Steps:**  
1. Insert the motor (1) to the bread board. (Fig. 17)  
2. Insert the fan blade (2) to the bread board. (Fig. 17)  
3. Insert the fan holder (2) to the bread board. (Fig. 17)  
4. Insert the base plate (2) to the bread board. (Fig. 17)



**Explanation:**  
The motor is used to create a magnetic field. When the motor is placed near the fan blade, it attracts the fan blade, causing it to move.

**Activity 4 Resistor**  
Material: - 1 Base plate (2) - 1 Light bulb (2) - 1 Resistor (2) - 2 Spring connectors (2)  
Items you will need: - Base plate  
- Light bulb  
- Resistor  
- Spring connector

**Steps:**  
1. Insert the base plate (2) to the bread board. (Fig. 18)  
2. Insert the light bulb (2) to the bread board. (Fig. 18)  
3. Insert the resistor (2) to the bread board. (Fig. 18)  
4. Insert the spring connectors (2) to the bread board. (Fig. 18)



**Explanation:**  
The resistor is used to create a magnetic field. When the resistor is placed near the light bulb, it attracts the light bulb, causing it to move.

**Activity 5 Diode**  
Material: - 1 Motor (1) - 1 Light bulb (2) - 1 Fan blade (2) - 1 Fan holder (2) - 1 Base plate (2)  
Items you will need: - Motor  
- Light bulb  
- Fan blade  
- Fan holder  
- Base plate

**Steps:**  
1. Insert the motor (1) to the bread board. (Fig. 19)  
2. Insert the light bulb (2) to the bread board. (Fig. 19)  
3. Insert the fan blade (2) to the bread board. (Fig. 19)  
4. Insert the fan holder (2) to the bread board. (Fig. 19)  
5. Insert the base plate (2) to the bread board. (Fig. 19)



**Explanation:**  
The diode is used to create a magnetic field. When the diode is placed near the light bulb, it attracts the light bulb, causing it to move.

**Activity 6 Make a Light**  
Material: - 1 Base plate (2) - 1 Light bulb (2) - 1 Resistor (2) - 2 Spring connectors (2) - 1 Resistor (2)  
Items you will need: - Base plate  
- Light bulb  
- Resistor  
- Spring connector  
- Resistor

**Steps:**  
1. Insert the base plate (2) to the bread board. (Fig. 20)  
2. Insert the light bulb (2) to the bread board. (Fig. 20)  
3. Insert the resistor (2) to the bread board. (Fig. 20)  
4. Insert the spring connectors (2) to the bread board. (Fig. 20)  
5. Insert the resistor (2) to the bread board. (Fig. 20)



**Explanation:**  
The resistor is used to create a magnetic field. When the resistor is placed near the light bulb, it attracts the light bulb, causing it to move.

**Activity 7 Make a Morse code machine**  
Material: - 1 Base plate (2) - 1 Spring connector (2) - 1 Resistor (2)  
Items you will need: - Base plate  
- Spring connector  
- Resistor

**Steps:**  
1. Insert the base plate (2) to the bread board. (Fig. 21)  
2. Insert the spring connector (2) to the bread board. (Fig. 21)  
3. Insert the resistor (2) to the bread board. (Fig. 21)



**Explanation:**  
The resistor is used to create a magnetic field. When the resistor is placed near the light bulb, it attracts the light bulb, causing it to move.

1. Insert the base plate (2) to the bread board. (Fig. 22)  
2. Insert the spring connector (2) to the bread board. (Fig. 22)  
3. Insert the plastic plate (2) to the bread board. (Fig. 22)  
4. Insert the glass rod (2) to the bread board. (Fig. 22)  
5. Insert the battery (2) to the bread board. (Fig. 22)

**Explanation:**  
The plastic plate is used to create a static electric charge. When the plastic plate is rubbed with the glass rod, it becomes charged. When the plastic plate is brought near the battery, it attracts the battery.

1. Insert the base plate (2) to the bread board. (Fig. 23)  
2. Insert the spring connector (2) to the bread board. (Fig. 23)  
3. Insert the plastic plate (2) to the bread board. (Fig. 23)  
4. Insert the glass rod (2) to the bread board. (Fig. 23)  
5. Insert the battery (2) to the bread board. (Fig. 23)

**Explanation:**  
The plastic plate is used to create a static electric charge. When the plastic plate is rubbed with the glass rod, it becomes charged. When the plastic plate is brought near the battery, it attracts the battery.

1. Insert the base plate (2) to the bread board. (Fig. 24)  
2. Insert the spring connector (2) to the bread board. (Fig. 24)  
3. Insert the plastic plate (2) to the bread board. (Fig. 24)  
4. Insert the glass rod (2) to the bread board. (Fig. 24)  
5. Insert the battery (2) to the bread board. (Fig. 24)

**Explanation:**  
The plastic plate is used to create a static electric charge. When the plastic plate is rubbed with the glass rod, it becomes charged. When the plastic plate is brought near the battery, it attracts the battery.