

KidzLabs™ Doorbell Making Kit

⚠ WARNING:
CHOKING HAZARD – Small parts.
Not for Children under 3 years.

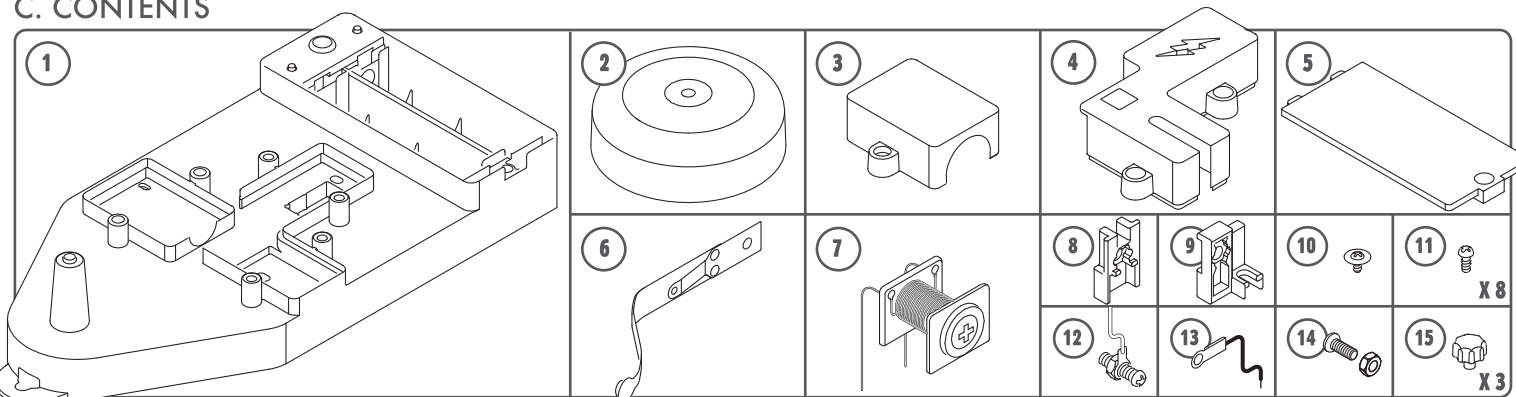
A. SAFETY MESSAGES

1. Adult supervision and assistance are required at all times.
2. This kit is intended for children 8 years or older.
3. This kit and its finished product contain small parts which may cause choking if misused. Keep away from children under 3 years old.
4. To prevent possible short circuits, never touch the contacts inside the battery case with any metal.
5. Only install batteries after assembled, adult supervision required.

B. USE OF BATTERIES

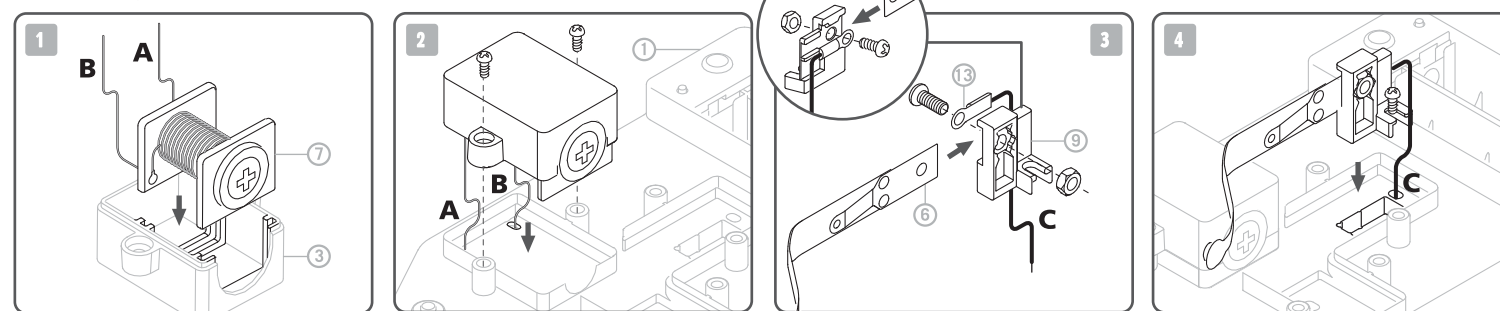
1. Requires two 1.5V AA batteries (not included).
2. For best results, always use fresh batteries.
3. Make sure you insert the batteries with the correct polarities.
4. Remove the batteries from the kit when not in use.
5. Replace exhausted batteries straight away to avoid possible damage to the kit.
6. Rechargeable batteries must be removed from the kit before recharging.
7. Rechargeable batteries should be recharged under adult supervision.
8. Make sure that the supply terminals in the battery case are not short circuited.
9. Do not attempt to recharge non-rechargeable batteries.
10. Do not mix old and new batteries.
11. Do not mix alkaline, standard (carbon-zinc), or rechargeable (Ni-Cd) batteries.

C. CONTENTS

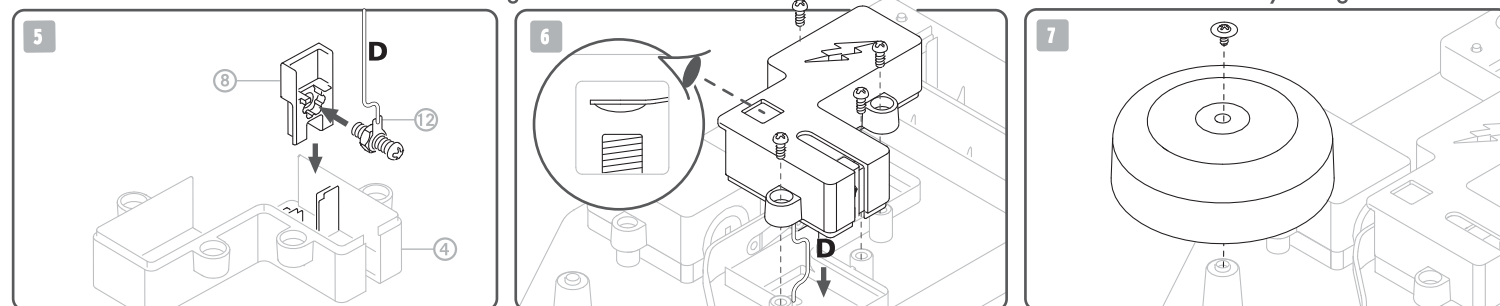


Part 1: Base board, Part 2: Bell, Part 3: Coil cover, Part 4: L-shaped cover, Part 5: Battery cover, Part 6: Hammer, Part 7: Coil, Part 8: Adjuster holder, Part 9: Hammer holder, Part 10: Washer screw, Part 11: Screw x 8, Part 12: Adjuster, Part 13: Wire with metal ring, Part 14: Long screw and nut, Part 15: Terminal cap x 3. Also required but not provided: 2 x 1.5V AA batteries and a crosshead screwdriver.

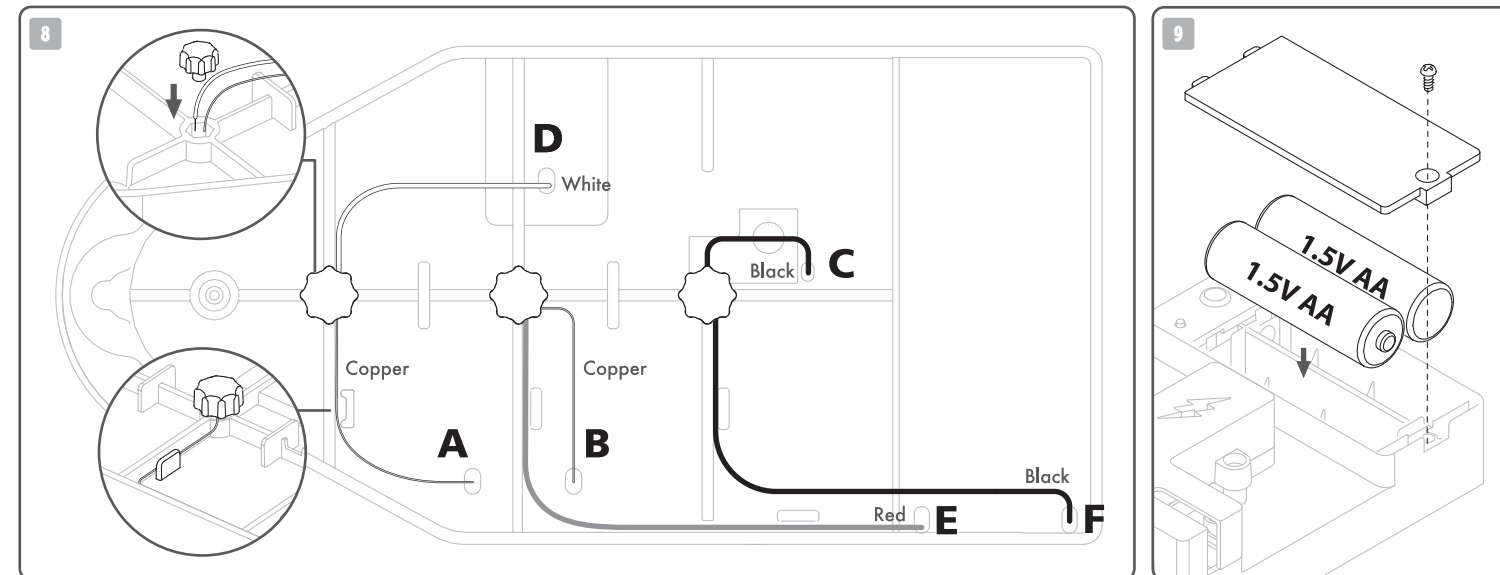
D. ASSEMBLY



1. Slide the coil to the slots in the inside of the coil cover.
2. Flip over the coil cover. Thread the two ends of copper wire into the holes on the base board. Fit the coil cover onto the base board. Fix two screws to secure it.
3. Slide the hammer to the slots on the hammer holder. Place the metal ring with wire over the hole on the hammer. Fit a nut at the back of the hammer holder. Drive the long screw to affix all three parts together to make the hammer set.
4. Thread the wire from the hammer set through the hole on the base board. Secure the hammer set on the board by fixing a screw.



5. Take the adjuster. Fit it to the adjuster holder. Next, slide the adjuster set onto the slots on the inside of the L-shaped cover.
6. Flip over the L-shaped cover. Thread the wire through the remaining hole on the base board. Install the L-shaped cover onto the base board covering the hammer set. Fix four screws to secure the cover. View the L-shaped cover from the top, and make sure the adjuster screw aligns with the hammer.
7. Place the bell on the front pin on the base board. Use the washer screw to affix it.



8. Turn over the base board, with the bell positioned on your left-hand side. Put the left copper wire (Position A) and the white wire (Position D) into the left terminal hole, the right copper wire (Position B) and the red wire (Position E) into the middle terminal hole, and the two black wires (Position C & F) into the right terminal hole. Secure the wiring connection with three terminal caps.
9. Insert two 1.5V AA batteries into the battery case, with the flat ends against the springs. Put on the battery cover and secure it with a screw.

E. OPERATION

1. Ensure the screw end of the adjuster is in contact with the metal plate of the hammer. Use the screwdriver to tune the adjuster so that the hammer just touches the bell.
2. Press and hold the ON/OFF button. At the same time, use the screwdriver to slowly release the hammer from the bell, until it can vibrate and ring the bell.

Congratulations! Your Doorbell is done! Place it on your table/bed-side, or hang it at the door of your room!

Remarks: Do not hold the ON/OFF button for too long as the copper wire may heat up, triggering the safety protection device which stops the bell from vibrating before it cools down again. If the situation persists, you may have to adjust the hammer again as in Step 1.

F. TROUBLESHOOTING

If the hammer does not vibrate,

- Check if you are using fresh batteries.
- Check if the batteries are inserted the correct way in the battery case.
- Check if the wire connection is done correctly (Step 8).
- Check if the wires are touching the metal terminals.
- Check if the hammer is against the bell, stopping it from moving.
- And if the doorbell has been in use for some time, try to gently rub the contact areas of the hammer and adjuster screw with sand paper (from home).

If the hammer vibrates but cannot hit the bell, you may bend it a bit to adjust the angle.

If the doorbell stops working after operating for a while, the copper wire may have heated up. Do not touch the wire. Let it cool down for several minutes and then turn it on again.

G. HOW DOES IT WORK?

This is a demonstration of electromagnetic forces. In this set, once the switch is pressed and held, the batteries, hammer set, adjuster, and coil form a complete circuit. The coil acts as an electric magnet. When it is powered, a magnetic field forms and attracts the neighbouring hammer. At the moment when the hammer touches the metal bell, the circuit is no longer complete. Hence, the coil (electric magnet) loses its attraction, releasing the hammer back to its original position. The circuit is then complete once again. By repeating this cycle, the hammer vibrates and rings the bell. Some doorbells nowadays, especially traditional ones, also use a similar design.

H. FUN FACTS

- The first doorbell was invented by Joseph Henry in 1831.
- There was once a doorbell device that charged visitors money. It was designed for busy housewives to keep away annoying salesmen. The device needed a coin to trigger the circuit and to ring the bell. If you were an invited guest, the coin could be returned upon entrance. But if not, the coin would go to charity.
- Some people, especially teenagers, do not use doorbells now - they text or call to say they are outside!
- One of the important applications of electromagnetics is the electric motor. A motor generates magnetic fields with electric current through a coil, converting electrical energy into physical movement.
- Electric speakers are also an application of electromagnetics. The rapid but gentle movement of the speaker cone, which makes sounds that we can hear, is caused by the attraction and repulsion of the electromagnet inside the speaker.

I. QUESTIONS & COMMENTS

We value you as a customer and your satisfaction with this product is important to us. If you have comments or questions, or you find any part of this kit missing or defective, please do not hesitate to contact our distributor in your country. You will find the address printed on the package. You are also welcome to contact our Marketing Support Team: Email: infodesk@4m-ind.com, Fax (852) 25911566, Tel: (852) 28936241, Web site: WWW.4M-IND.COM