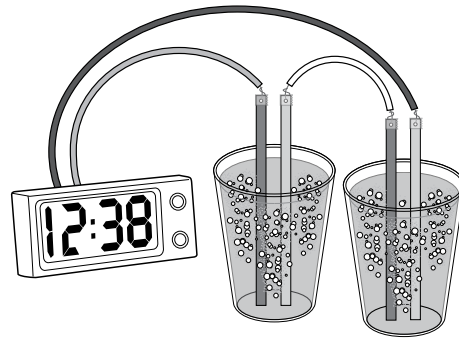


## G. FURTHER EXPERIMENTS

Put some soft drink into the pots provided. Insert the copper and zinc plates into the pots, as shown in the diagram, taking care that the metal plates do not touch each other. The clock should now start to work. You may experiment with different liquids like salt water, fruit juices; or fruit like lemon, orange, tomato etc. The fun is unlimited.



## H. FUN FACTS

- The copper and zinc strips are called electrodes, and the potato is called an electrolyte.
- The potato battery works in the same way as the batteries used in electrical and electronic devices, such as torches, radios and MP3 players. These batteries all contain different chemicals that produce electricity.
- Fruit and vegetables work well too. They contain plenty of particles that allow current to flow between the metal strips.
- Battery types are named after the chemicals used inside them. Common types are zinc-carbon, nickel metal hydride (NiMH), nickel cadmium (Ni-Cad).
- The chemicals in a battery are used up as the battery provides electricity. When no chemicals are left, the battery is dead.
- Some batteries can be recharged when they are dead. Feeding electricity into a rechargeable battery reverses the chemical changes inside the battery that happen when it produces electricity.
- The first battery was made by Italian scientist Alessandro Volta (1745-1827). He built a pile of metal discs with card soaked in salty water between them. It produced a small electric current. The battery is now known as a Voltaic pile.
- A fuel cell is a special type of battery. It produces electricity by the reaction between two chemicals. For example, a hydrogen fuel cell produces electricity from the reaction between hydrogen and oxygen, which produces water. The chemicals are constantly fed into the cell, so it never runs out.
- A non-rechargeable battery can't be recharged. Never try!
- Batteries contain some dangerous chemicals. Never open them up or cut them open, and always try to dispose of them properly at a recycling centre.
- Copper is a very good conductor of electricity. It is used to make wires and cables.
- Zinc is used to galvanise steel objects such as garden tools and screws. The objects are coated with zinc, which protects the steel from rusting.

**QUESTION AND COMMENTS:** We value you as a customer and your satisfaction with this product is important to us. If you have any comments or questions, or if any parts of this kit are missing or defective, please do not hesitate to contact our distributor in your country, whose address is printed on the packaging. You are also welcome to contact our marketing support team via email: [infodesk@4M-IND.com](mailto:infodesk@4M-IND.com), fax (852) 25911566, telephone (852) 28936241, or our website: [WWW.4M-IND.COM](http://WWW.4M-IND.COM).

# POTATO CLOCK

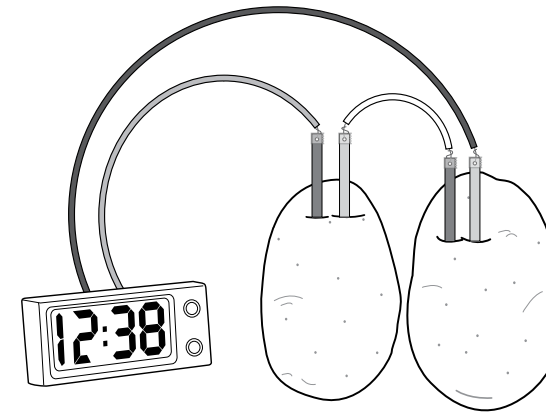
PLEASE SCAN THE QR CODE FOR VIEWING MULTI-LANGUAGE INSTRUCTIONS.



FR. Veuillez scanner le code QR pour afficher les instructions multilingues pour ce kit. DE. Bitte scannen den QR-Code, um die mehrsprachige Anleitung für dieses Set anzusehen. NL. Scan de QR-code om de instructies voor deze set in verschillende talen te bekijken. IT. Scansiona il codice QR per visualizzare le istruzioni multi-lingua per questo kit. ES. Escanee el código QR para ver instrucciones en varios idiomas para este kit. JA. QRコードをスキャンして、本キットの多言語説明書をご覧ください。

**WARNING:**  
CHOKING HAZARD - Small parts  
Not for Children under 3 years.

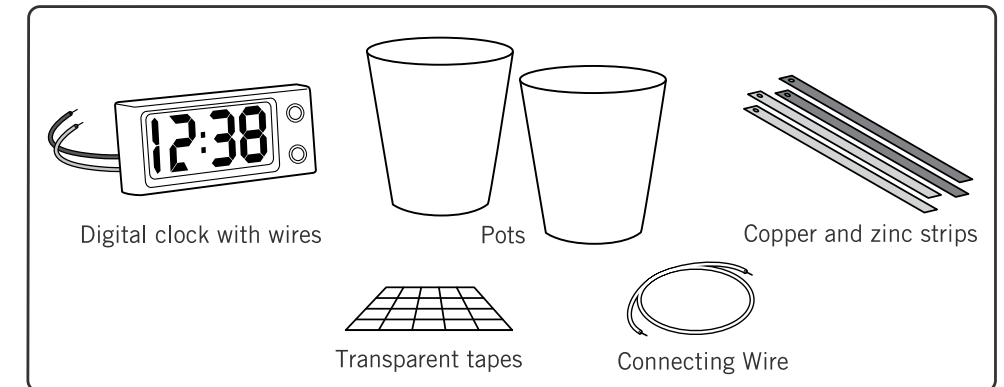
TO PARENTS: PLEASE READ THROUGH THESE INSTRUCTIONS BEFORE GIVING GUIDANCE TO YOUR CHILDREN.



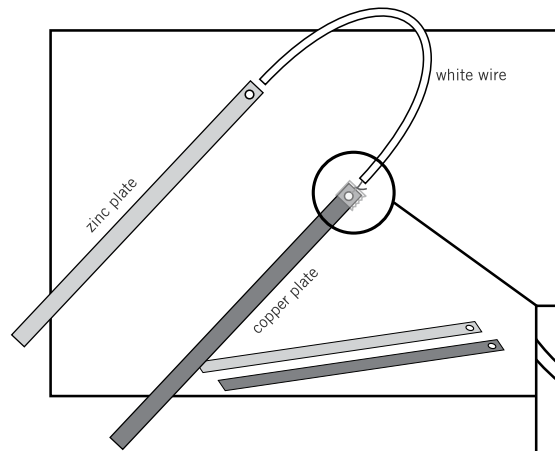
## A. SAFETY MESSAGES

1. Please read through these instructions before you start.
2. Adult supervision and assistance are required at all times.
3. Intended for children over 5 years of age.
4. This kit and its finished product contain small parts which may cause choking if misused. Keep away from children under 3 years old.
5. Metal parts may have sharp edges. Adult assistance is required when assembling these parts.
6. Do not connect any of the parts provided to any AC wall socket or any batteries. This may cause electric shocks or a short circuit.
7. The LCD watch may temporary lose its function at electrostatic discharge environment, but normal functions are resumed when the device is reset.

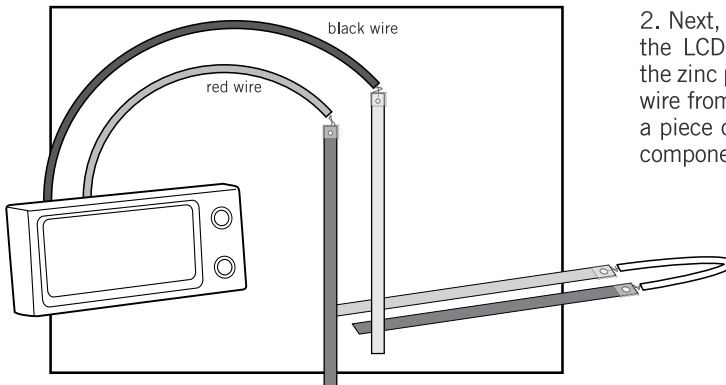
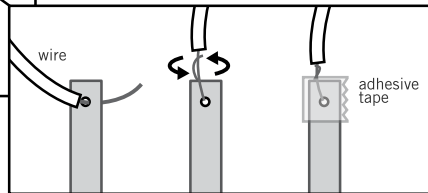
## B. CONTENTS



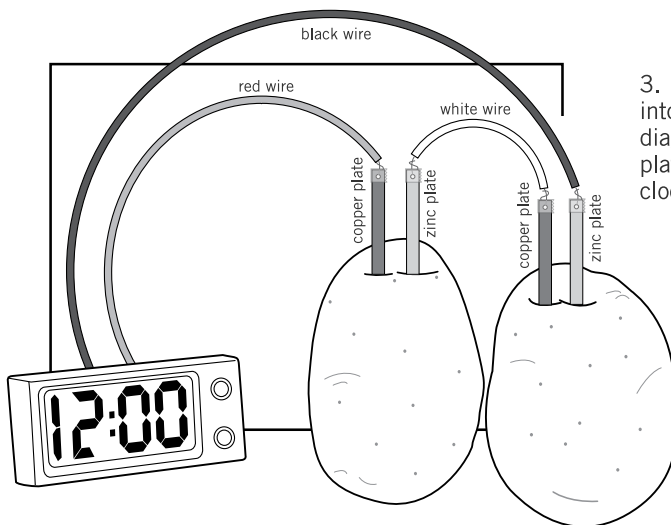
## C. MAKING THE POTATO CLOCK



1. Assemble a “connection pair” by connecting the pair of copper and zinc plates with a connection wire as shown. Carefully thread the wire’s exposed metallic end through the hole on the plate. Gently twist the wire to secure it to plate. Cover and secure the connection with the adhesive tape provided.



2. Next, connect the black wire from the LCD clock (negative) to one of the zinc plates. Then connect the red wire from the LCD clock (positive) to a piece of copper plate. Now all the components are connected.



3. Insert the copper and zinc plates into the potatoes, as shown in the diagram, taking care that the metal plates do not touch each other. The clock should now start to work.

## D. SETTING THE CLOCK

### 1. Setting the clock

When all the metal plates are first inserted into the potatoes, the LED screen will light up and will show a static display of “12:00”.

Press A once, the clock will start working. You will see the two dots in the middle start flashing.

Press B twice to obtain the set month mode, then press A to adjust to the right month. Press B confirm and the display will switch to the set day mode.

Press A to adjust to the right day. Press B to confirm and switch to the set hour mode.

Press A to adjust to the right hour. Press B to confirm and switch to the set minute mode.

Press A to adjust to the right minute and Press B to confirm.

After the minute is confirmed, press A once. The set time will be displayed.



### 2. Viewing the clock

By default, the clock display shows the current time.

To view the Date: Press A once. The clock display will resume showing the current time after 2 seconds.

To view the seconds, press A twice. To resume the current time, press A again.

## E. TROUBLE SHOOTING

If your potato clock produces a weak display, try one of the following:

1. Give it time, the signal is sometimes weak at the beginning, but gets stronger after a short while.
2. Examine the metal plates for rust (oxidization). Use sand paper to remove any rust.
3. Try putting the metal plates closer together (but not touching each other). Conduction will be better if the distance between the plates is shorter.
4. If there is no reaction whatsoever, check all the connection points. Make sure that the connection points are correctly and firmly placed. Also, check if the polarities are correct - make sure that the negative (black wires) and positive (red wires) terminals are connected properly.
5. Check if the metal plates/wires are touching each other, this causes short circuits.

## F. HOW IT WORKS

The metal strips and potatoes make a simple battery that creates the electricity to operate the clock. Each potato works as a device called a electrochemical cell. It converts the chemical energy stored in the metal strips into electrical energy. Two potatoes are needed to make electricity strong enough to run the clock.

A cell works because of the chemical properties of the metals inside (in this case the copper and zinc). The different properties cause tiny particles charged with electricity (called ions) to move between the two strips of metal. This flow is an electric current. The potato contains the particles that allow the current to flow, but it stops the metals touching. Electric current also flows along the wires between the zinc and copper strips and the clock. This current makes the clock work.