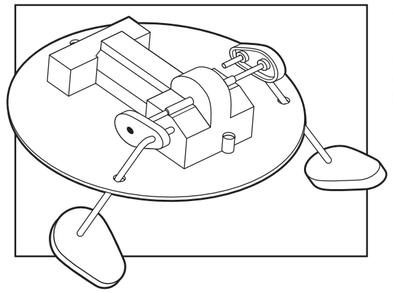


8. Insert 2 x AA, 1.5V batteries into the battery case. Turn ON the switch and place your robot on a firm surface such as a desk top or wooden floor. Your robot will move forward with crazy movements, waddling like a duck.

E. TROUBLE SHOOTING

If your robot does not move when is turned on:

- Make sure the batteries are installed in correct polarities.

- Make sure all connections are intact.

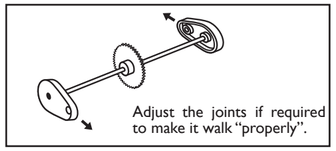
- Check if the gears and the joints positions are lubricated (with the wax provided or with any cooking oil from home).

If you robot moves backward:

- Check if the batteries are installed in the correct polarities.

- Check if the connection wires are connected in correct colour pairs and positions. The motor works in reverse direction if the wires' polarities are reversed.

- Sometimes the robot may not move properly because the hinges' positions are wrongly set. Adjust the hinge positions as shown in the diagram, make sure the holes for fixing the metal legs are pointing to opposite directions. It should be able to walk forward as intended. You may also experiment different walking movements by adjusting the position of the hinges.



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F. FUN FACTS

The word 'robot' comes from the Czech noun 'robota' meaning 'labour'. A robot is an automatic machine that does the work of a human. Most robots are used in factories but some, like Robot Duck, are used for fun.

Robot Duck has two crank mechanisms, one for each leg. These make the robot move like a waddling duck. Bicycles, car engines and sewing machines also contain a crank mechanism.

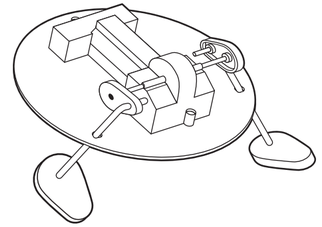
Robot Duck uses a small motor that is powered by a battery. Batteries were invented by Italian scientist Alessandro Volta in 1800. Volta's battery was made from zinc, silver and blotting paper soaked in salt water.

Most of the parts for Robot Duck are made from plastics. Did you know that nearly all of the plastics used today were discovered less than 100 years ago? One of the first uses of plastics was for making billiard balls.

G. QUESTIONS AND COMMENTS

We treasure you as a customer and your satisfaction with this product is important to us. If you should have any comments or questions, or any parts of this kit are found missing or defective, please do not hesitate to contact our distributor in your country, whose address is printed on the package. You are also welcome to contact our marketing support team at Email: infodesk@4M-IND.com, Fax (852) 25911566, Tel (852) 28936241, Web site: WWW.4M-IND.COM

ROBOT DUCK



A. SAFETY MESSAGES

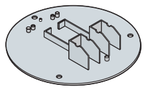
1. Please read through these instructions before you start.
2. Adult assistance and supervision is recommended.
3. This kit is intended for children aged over 8.
4. This kit and its finished product contain small parts which may cause choking hazard if misused. Keep away from children under 3 years old.
5. Metal plates and wires may contain sharp points. Adult assistance is required during connection.
6. Never touch the contacts inside the battery case to prevent possible short circuit.

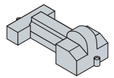
B. USE OF BATTERY

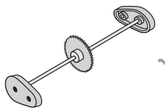
1. Requires two"AA", 1.5V batteries (not included).
2. For optimum operation, always use fresh batteries.
3. Insert batteries according to the correct polarities.
4. Make sure that the supply terminals are not short circuited.
5. Do not leave batteries in the kit if it is not in use.
6. Remove exhausted batteries from the kit.
7. Do not recharge non-rechargeable batteries.
8. Rechargeable batteries should be removed from the kit before being charged (if removable).
9. Rechargeable batteries should only be charged under adult supervision.
10. Do not mix old and new batteries.
11. Do not mix alkaline, standard (Carbon-Zinc) or rechargeable (Nickel-Cadmium) batteries.
12. Only use batteries of the same type.
13. The kit should not be connected to more power supplies than recommended.

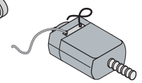
Middlesex University teaching resources

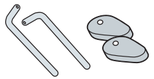
C. CONTENTS


Plastic disc


Motor cover


Gear & axle set

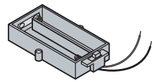

Motor


Metal legs and Plastic feet


Long screw


Short screws


Plastic tube


Battery case

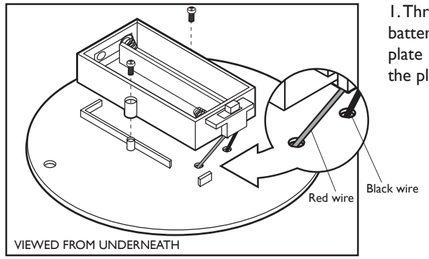

Nut


Wax for lubrication

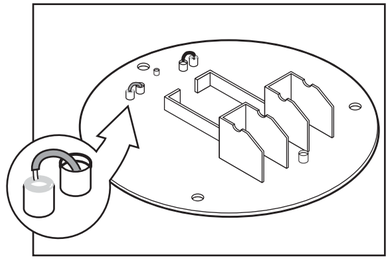

Plastic Pins

**Pocket screw driver (for cross head screw) required. Ask an adult's assistance getting it from home. 2 AA, 1.5V batteries required, not included.

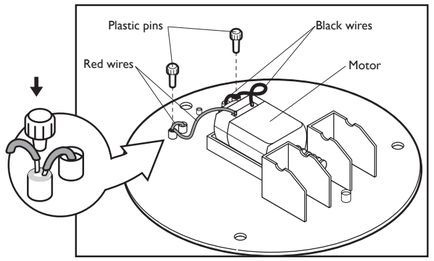
D. ASSEMBLING THE ROBOT DUCK



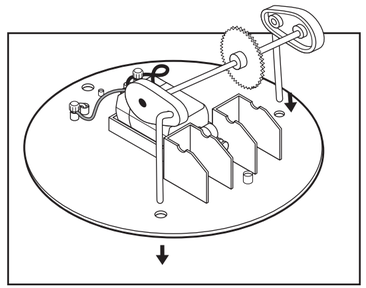
1. Thread the red and black wires from the battery case through the holes in the round plate as shown. Attach the battery case to the plate using two of the small screws.



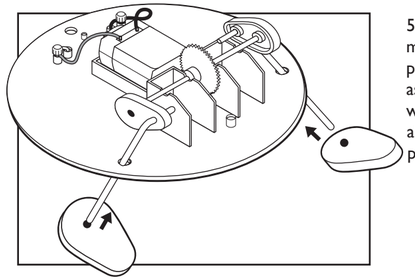
2. . Insert the ends of the wires into the metal eyelets as shown. Make sure the metal strands touch against the eyelets.



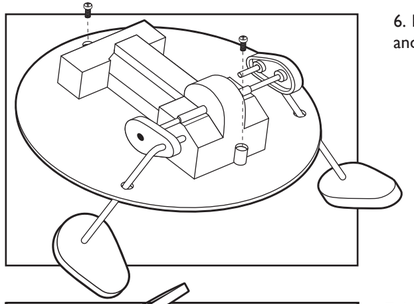
3. Place the motor on the plate as shown and insert the ends of the wires into the metal eyelets. The red wire from the motor should connect to the red wire from the battery case. Press the two plastic pins into the eyelets to hold the wires in place.



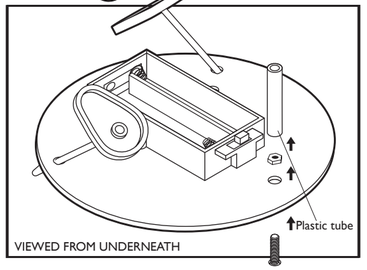
4. Thread the metal legs through the holes in the plate.



5. Press a plastic foot onto the end of each metal leg. Apply wax to the gears and all positions holding the axle. This will serve as a lubricant which reduces the friction when the system is in motion. You may also consider using cooking oil for this purpose. Please ask an adult for assistance.



6. Place the motor cover over the motor and fix it in place using two screws.



7. Insert the long screw through the hole in the plate and twist a nut onto the other end of the screw. Twist the plastic tube onto the screw.