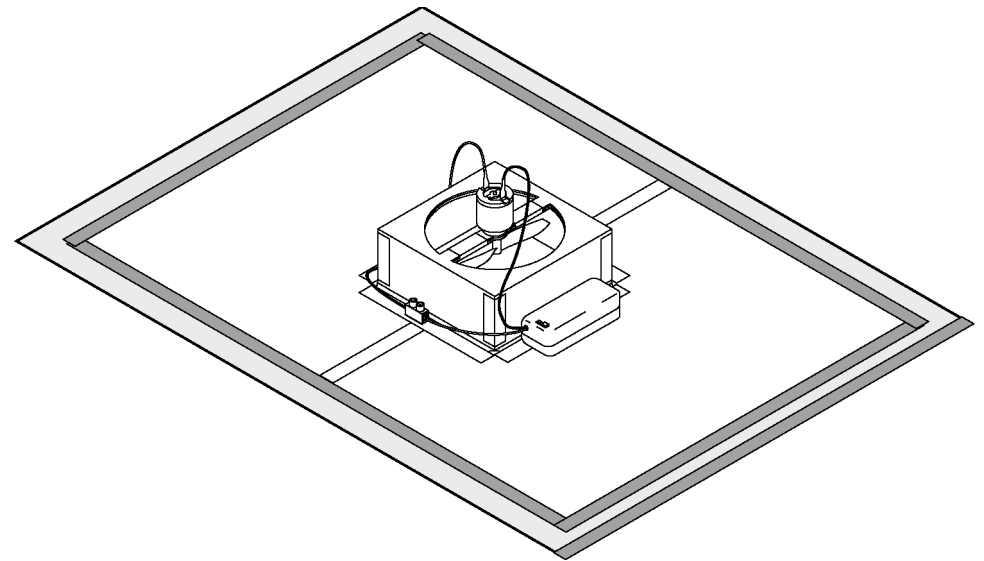


What next?

- Colour or decorate your hovercraft using pens or paint or by designing and printing graphics with a computer.
- Try using different bags for your hovercraft, such as a bin liner or an old carrier bag.
- Explore the internet for other ways of making hovercraft. Some have been made using balloons, paper plates, polystyrene cartons and even vacuum cleaners.

Hovercraft

(MSK 017)



Supplied by:

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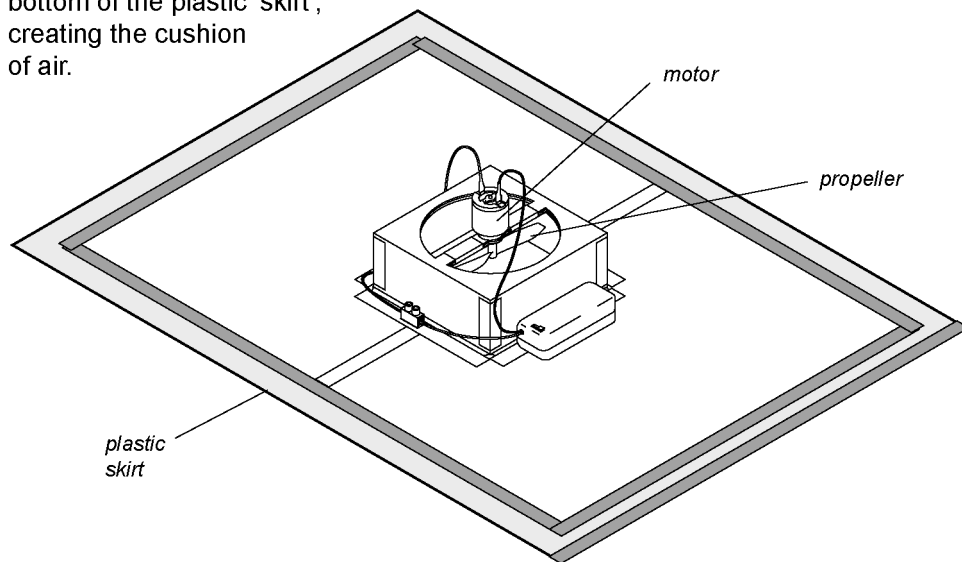
About 300 years ago Emmanual Swedenborg designed a vehicle that would float on a cushion of air. With virtually no friction between the vehicle and the ground it would move very easily. However, there was no way at that time to produce the power needed to make the vehicle work.

After the invention of the internal combustion engine in the early 20th century, designers thought again about air cushion vehicles (ACVs).

In the mid 1950s the British radio engineer Christopher Cockerell developed a jet system which he called the '*hovercraft principle*'. His experiments used an electric blower and two tin cans, one inside the other, to show the principle. On 11th June 1959 Cockerell demonstrated the first working hovercraft, the Saunders Roe Nautical One (SR.N1), at East Cowes on the Isle of Wight.

About your hovercraft

Your hovercraft uses an electric motor with a propeller to create a cushion of air. As the propeller spins, air is forced into the body of the hovercraft, filling it like a balloon. The air is then forced out the bottom of the plastic 'skirt', creating the cushion of air.



Using your hovercraft

Place your hovercraft on a flat surface and switch ON the battery box. The propeller should spin and within a few seconds the hovercraft should be hovering. A gentle tap will start it moving over the surface.

WARNING: KEEP YOUR FINGERS WELL AWAY FROM THE SPINNING PROPELLER.

If the motor does not spin check that:

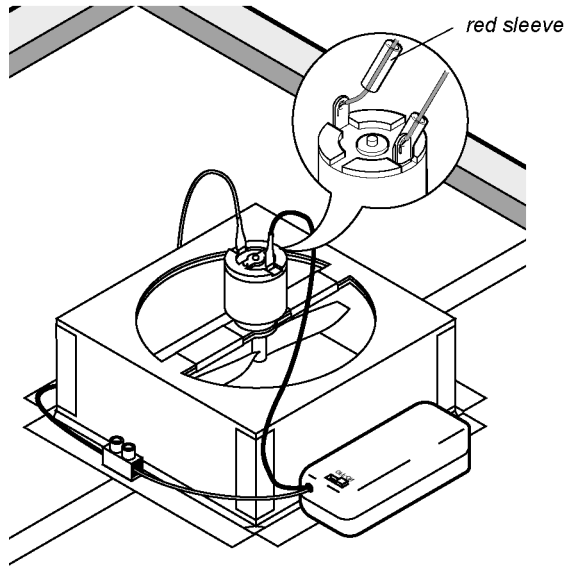
- the batteries are working and inserted the right way round;
- the wires are connected properly to the motor;
- the wires are connected properly in the connecting block;
- the propeller is not stuck against the motor.

If the motor spins but the hovercraft doesn't hover try lifting the motor gently while it's spinning. If this doesn't work check that:

- the propeller is fitted the right way - with the round tip upwards;
- the red wire is connected to '+' on the motor and the black wire to '-';
- the underneath of the hovercraft is not sticking to the surface.

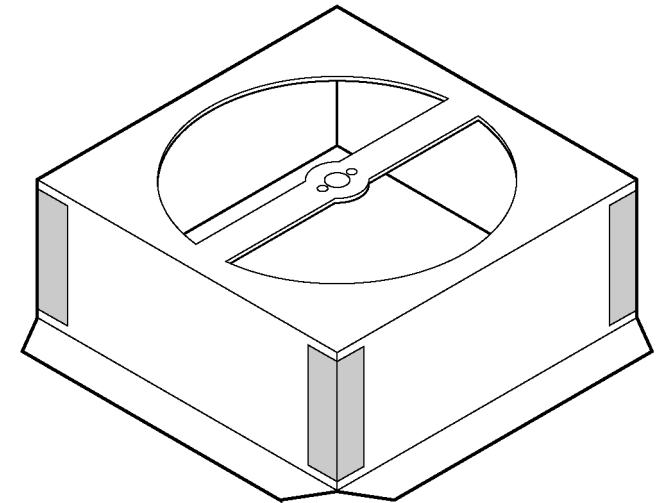
Once your hovercraft is working you can try it on different surfaces, such as a carpet or a kitchen floor. You may also try using your hovercraft over small obstacles, such as a key or a pen.

17. Connect the red wire to the '+' terminal on the motor and the black wire to the '-' terminal. Do this by sliding a red sleeve over each wire and then threading the ends of the wires through the small holes in the metal tabs. Slide the red sleeves over the tabs to hold the wires in place.

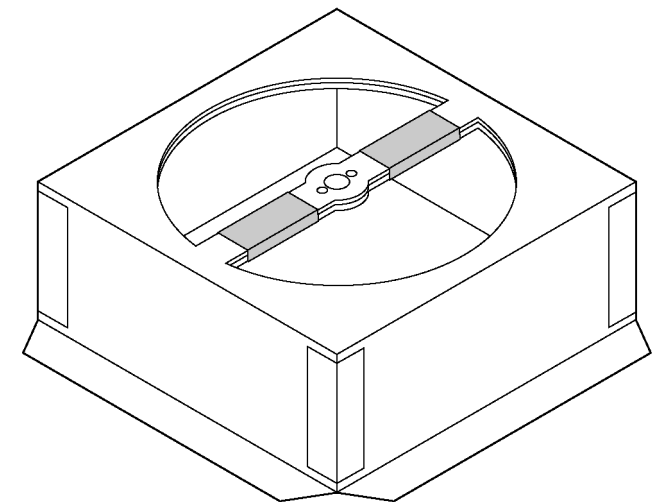
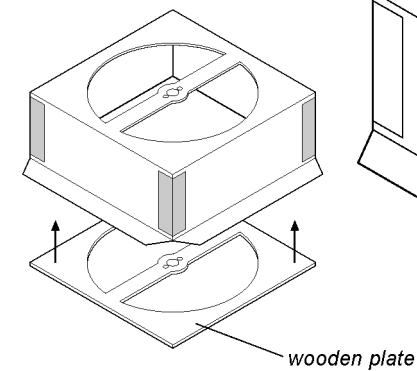


Making your hovercraft

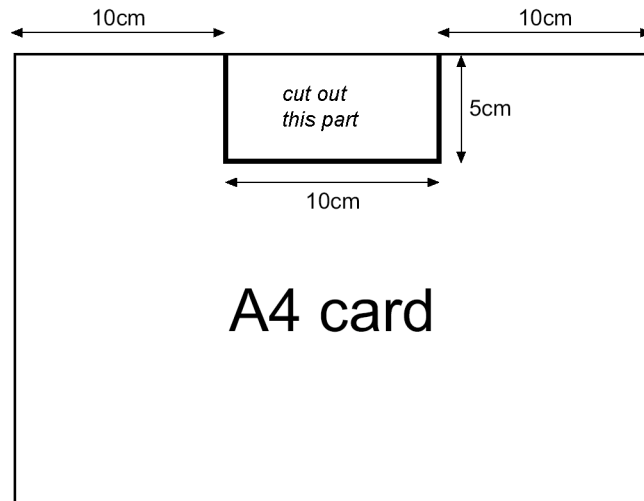
1. Fold the pre-cut card along the crease lines to make the motor holder. Stick the glue tabs using glue or sticky tape.



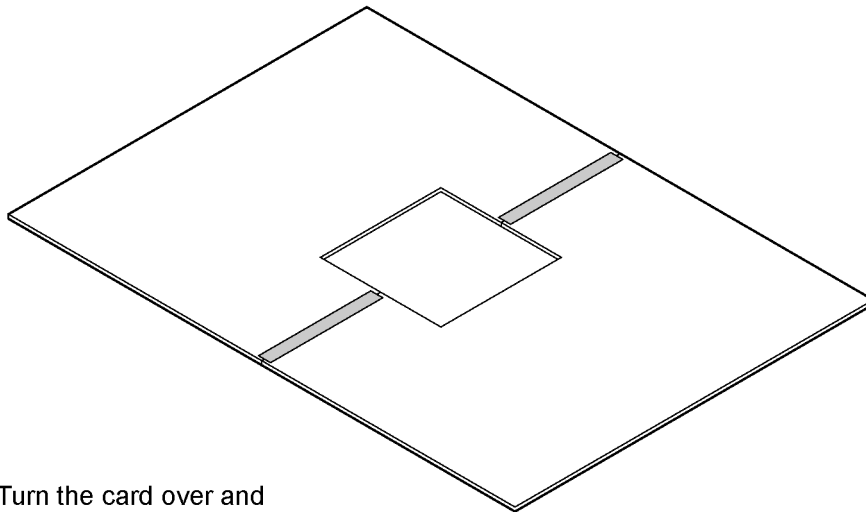
2. Stick the wooden plate inside the motor holder to strengthen it.



3. Mark out the two pieces of A4 card as shown then carefully cut out the rectangular areas.

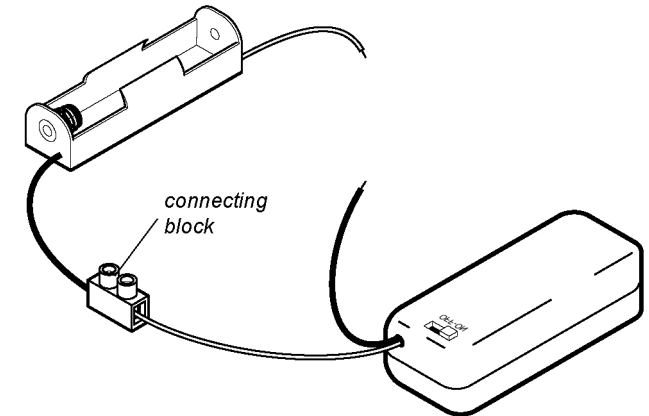


4. Place your two pieces of card together on a flat surface. The edges should be touching but not overlapping. Stick the edges with sticky tape.

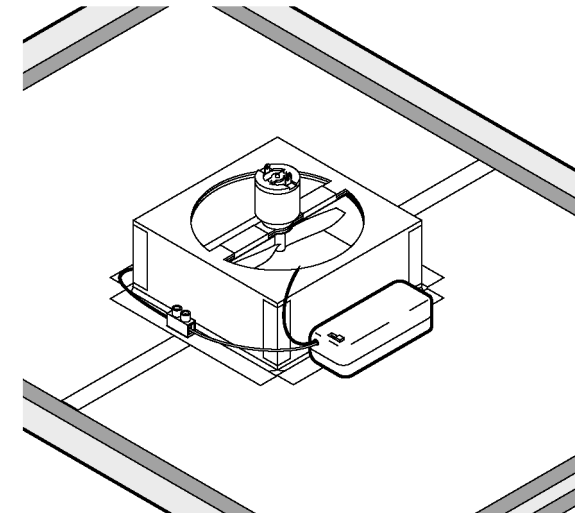


6. Turn the card over and stick some tape along the edges on that side.

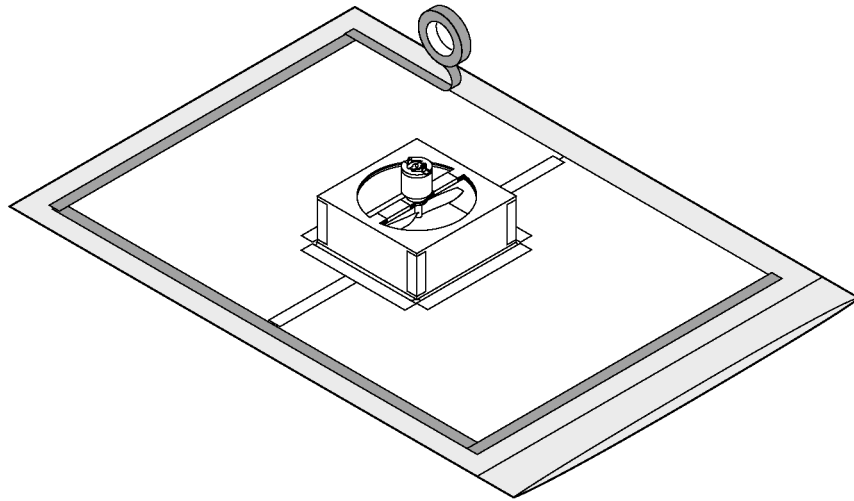
15. Connect the red wire of one battery holder to the black wire of the other using the small connecting block. You will need to loosen the screws in the connecting block before inserting the wires. Tighten the screws to hold the wires in place.



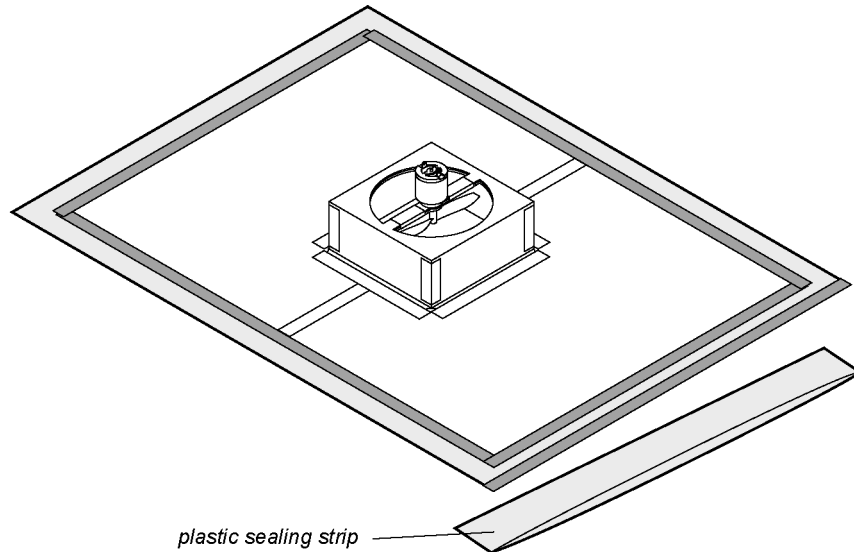
16. Insert a new AA battery into each battery holder and check the switch is 'OFF'. Stick the holders and the connector to the card in the positions shown using the sticky pads.



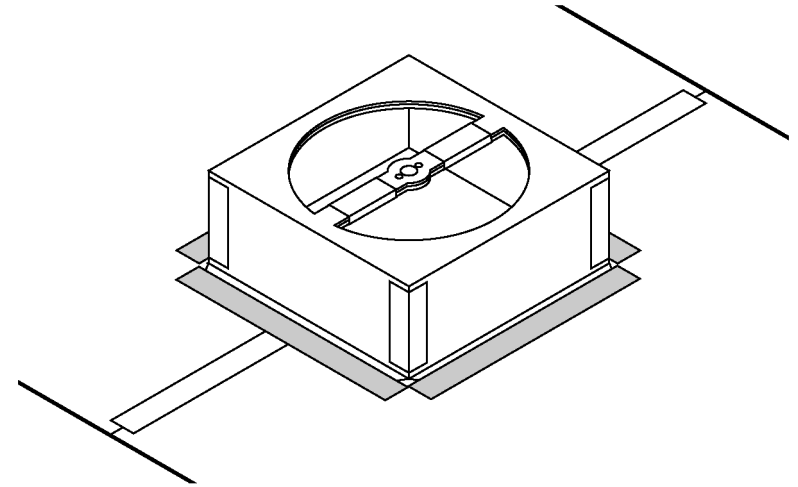
13. Place the card back on top of the bag then tape along the edges. Make sure all four edges are completely covered in tape so that no air can escape.



14. Cut the plastic sealing strip off the end of the bag. Tape the end to make an airtight seal.



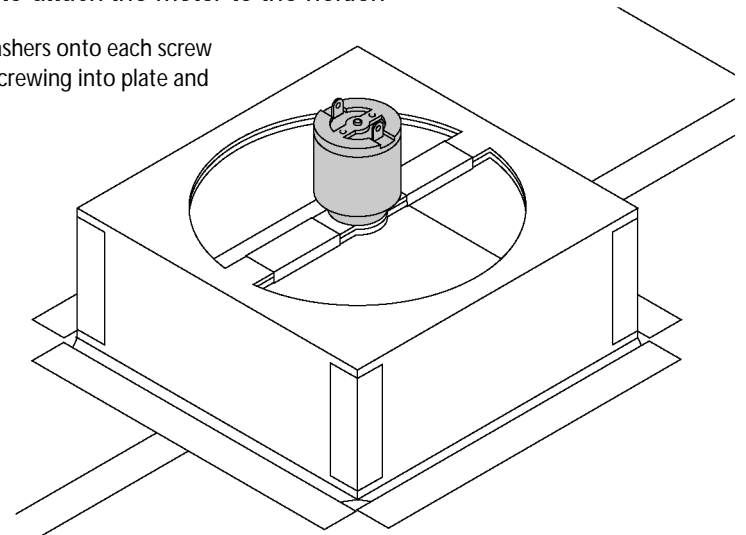
7. Attach the motor holder to the card by taping or gluing the glue tabs.



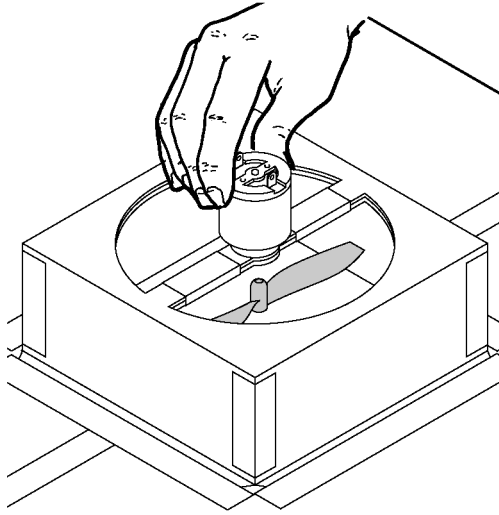
8. Very carefully, attach the motor to the motor holder using the two small screws (see tip below).

TIP: Before attaching the motor to the holder try screwing the screws directly into the motor to make a thread - then unscrew them. This will make it easier to attach the motor to the holder.

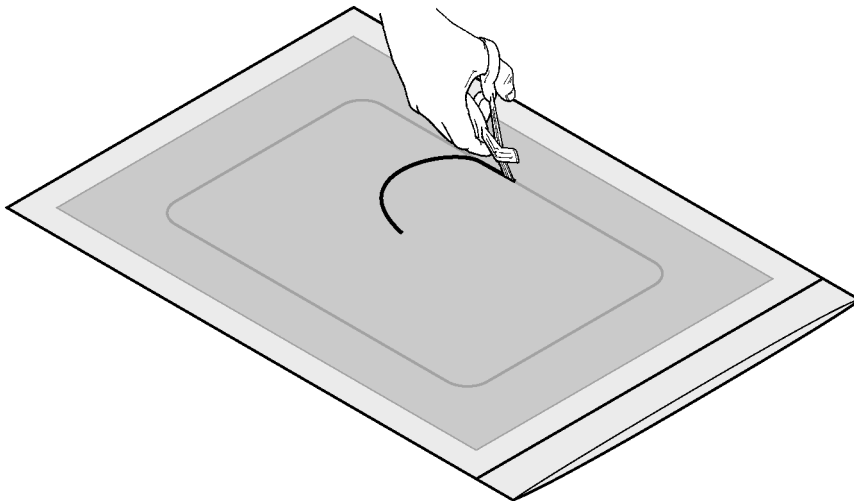
Place washers onto each screw before screwing into plate and motors.



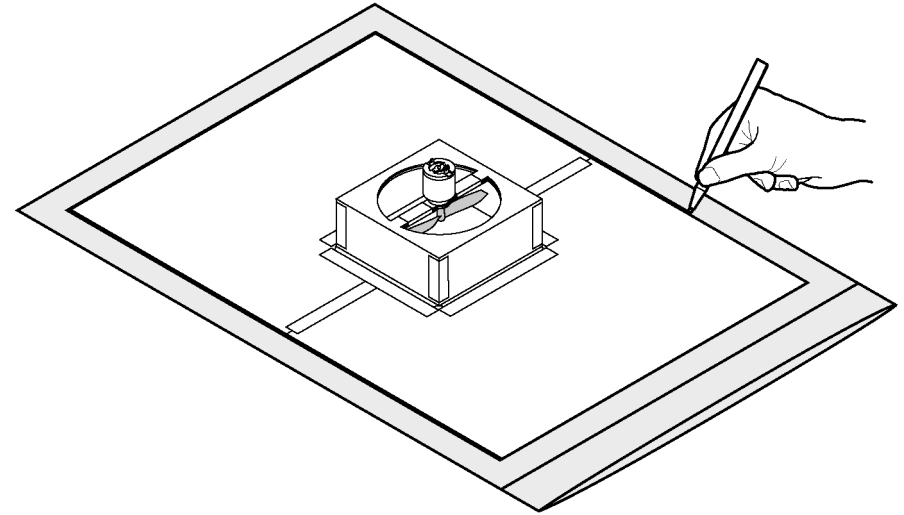
9. Hold the motor in one hand and press the propeller onto the motor spindle with the other hand. Make sure the rounded tip of the propeller faces upwards towards the motor. Also make sure the propeller is free to turn - it should not be pressed all the way to the end of the motor spindle.



10. Open the large self-seal bag included in your kit and slide in the paper template. Pierce the middle of the plastic bag and the paper template with the pointed end of a pair of scissors. Cut out the area marked, taking care not to cut the other side of the bag.



11. Turn the bag over so that the uncut side is on top then place the card over the middle of the bag. Draw a line around the edge of the card onto the plastic bag using a ball-point pen or suitable marker.



12. Move the card away from the plastic bag and draw a second line about 1cm inside the first line. Using a sharp pair of scissors cut along the inside line, taking care not to cut the other side of the bag.

