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P38-EL258-81001000

INSTRUCTIONS

POWERED HoverCraft

Build your own working model

10+

EDU-TOYS®

Important Safety Information!

WARNING!

For children over 8 years of age only.

This kit is not suitable for children under 36 months due to small parts that could cause a choking hazard and long cord which may represent an entanglement hazard. Adult supervision is required at all times. Contains functional sharp points that could cause an injury.

Although the propeller on this kit is protected by a series of rings, care should be taken to avoid fingers or loose objects coming into contact with the propeller. This hazard may particularly affect younger children whose fingers may be small enough to pass through this protection. This product is not designed for use on water.

Safety Advice for Supervising Adults

This project is safe to do, but you must follow the instructions as specified.

Because children's abilities vary so much, even within age groups, supervising adults should exercise discretion as to whether the project is suitable for children within their care. The supervising adult should discuss the warnings and safety information with children before commencing the activities, and should observe the activities at all times. The activity in this kit should only be completed with the materials supplied/specified, and should be used as instructed. Read and follow these instructions, the safety rules and any first aid information supplied. Please retain all packaging material and instructional material for future reference.

Keep small children and animals away from this kit at all times. Carefully put all equipment away when not in use, and store out of the reach of children and babies.

Do not mix different types of battery. The supply terminals are not to be short circuited.

Batteries: Do not insert batteries into the battery box until the model is complete. Slide the switch to the 'off' position before inserting the batteries. 4 x 1.5V AAA batteries are required. Do not use rechargeable batteries. Never try the activity with different batteries to those recommended. Never mix old and new batteries. Do not attempt to recharge non-rechargeable batteries. Remove and carefully dispose of exhausted batteries (recycle if possible). Batteries are to be inserted with the correct polarity. The spring in the battery compartment corresponds to the negative (-) end of the battery.

Mains Electricity: Never connect any of the components in this kit to mains electricity. Children should be instructed about the dangers of mains electricity.

The Battery Box: Open and close the battery box using a suitable screwdriver. When connecting the battery box to the motor, make certain that the plug engages correctly with the socket. This will ensure that the correct polarity is maintained. Never cross or hold bare wires when the batteries are connected as this may cause injury, fire, or burning. Never leave electrical circuits unattended, even if they do not seem to be working. Remove batteries from the battery box when not in use.

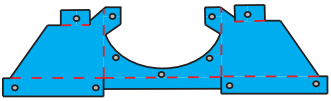
Introduction

A Hovercraft is neither a ship, nor an aeroplane, nor a wheeled vehicle. It is completely unique, but it does combine many of the attributes of all these three forms of transport: It can carry heavy loads over land or water, and is airborne whilst in operation..

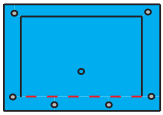
As the name suggests, Hovercraft 'hover' on a cushion of air, which is pumped into the cavity under the hull by the powerful fan. Because the Hovercraft has no physical contact with the surface over which it is travelling, it can not use conventional steering systems, but needs to have aerodynamic controls, rather like those of an aircraft.

Hovercraft are used where other vehicles can not go. They can rescue people off thin ice, they can explore rocky rivers that other powered vehicles can't visit, they can act as ferries in places where the water is too shallow for a normal boat, and they can deliver troops and supplies right onto almost any beach in the world. Hovercraft are also used just to have fun. Your model hovercraft is styled on a racing hovercraft. People all over the world join "hoverclubs" and run hovercraft races across land and water. You can find information about a hovercraft club near you on the internet.

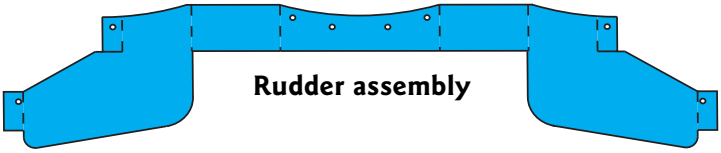
Hovercraft Parts List



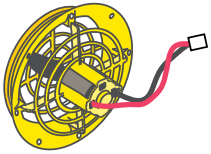
Airbox walls



Airbox floor

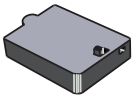


Rudder assembly



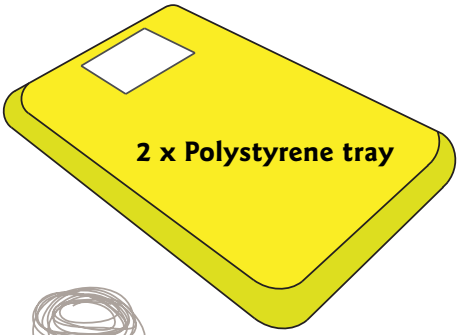
Fan assembly

2 x Hook-and-loop fastener



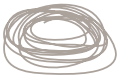
Battery box

30 x Paper fastener

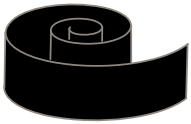


2 x Polystyrene tray

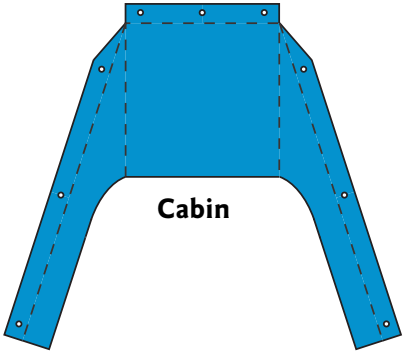
Self-adhesive Foam Strip



String



Polythene tube

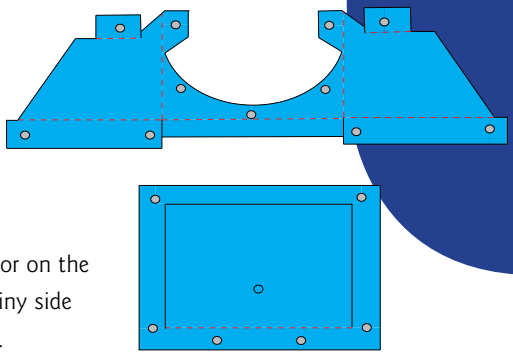


Cabin

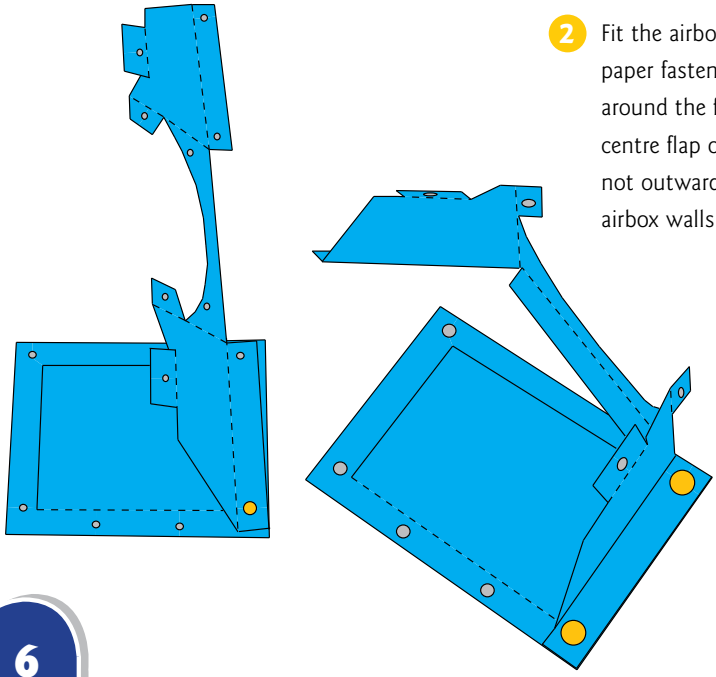
Building the hovercraft

Prepare each of the blue foam-board components as follows:

Lay the component on a flat table top with the shiny side downwards. Using the table to brace the component so that you can fold with both hands, fold along each crease. Turn the component over (so that the shiny side is upwards) and fold along each crease in the opposite direction.

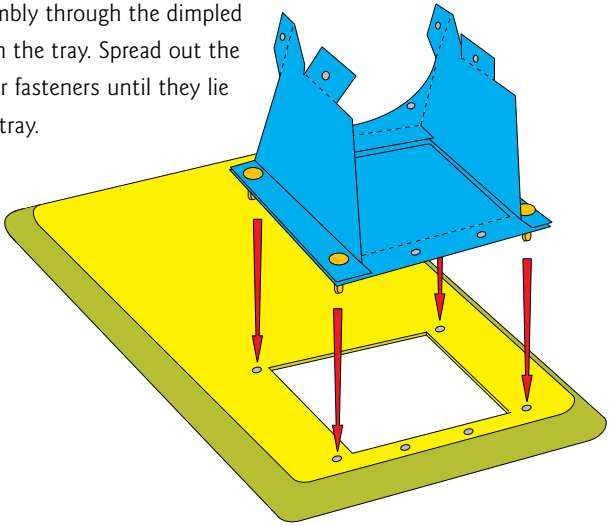


1. Lay the airbox walls and airbox floor on the table as shown, with the walls shiny side down, and the floor shiny side up.

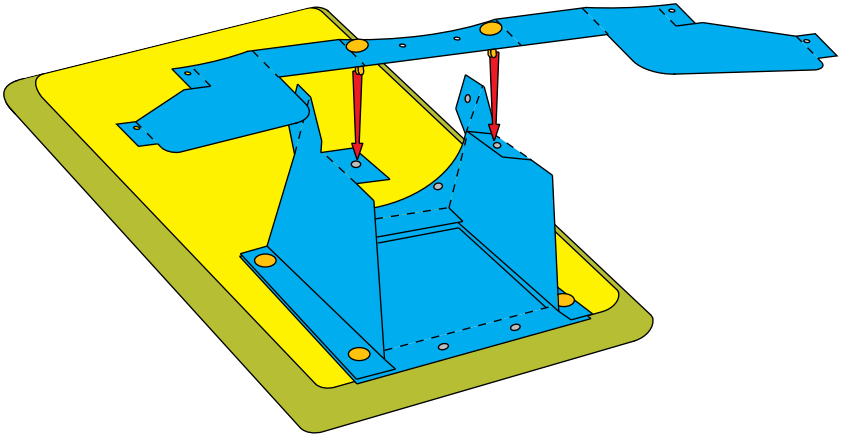


2. Fit the airbox walls to the floor with 4 paper fasteners, folding the airbox walls around the floor, making certain that the centre flap of the walls tucks inwards, not outwards. The shiny side of the airbox walls should now face outwards.

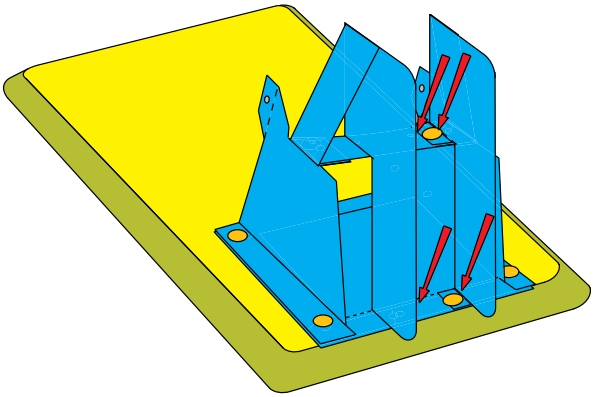
3 With the yellow polystyrene tray lying face down, push the 4 paper fasteners in the airbox assembly through the dimpled hole markings in the tray. Spread out the legs of the paper fasteners until they lie flat against the tray.



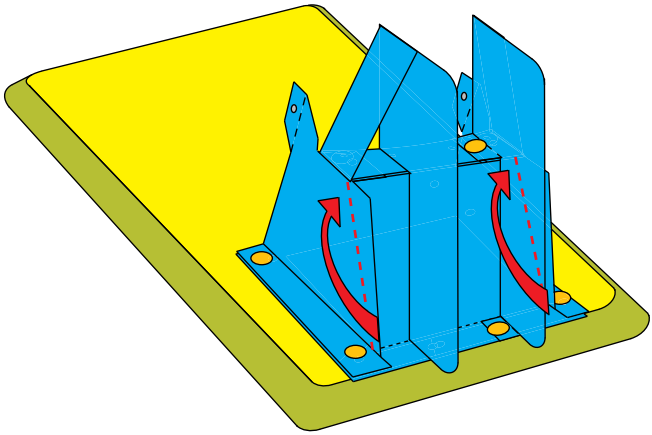
4 Fold in the two upper flaps on the airbox assembly, and locate the rudder assembly, shiny side down, with 2 further paper fasteners. Spread the legs on the paper fasteners.

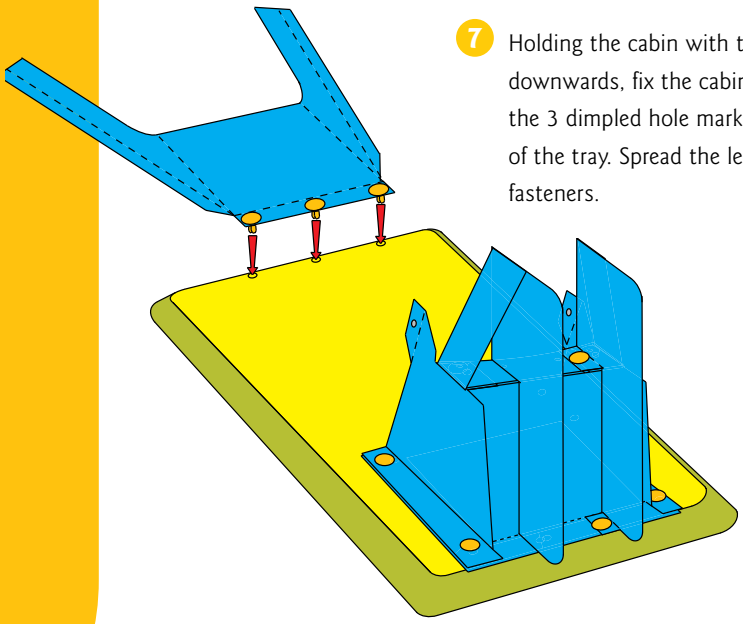


5 Fold in each leg of the rudder assembly, fastening each leg with a paper fastener at the top and another at the bottom. Spread the legs on the paper fasteners.



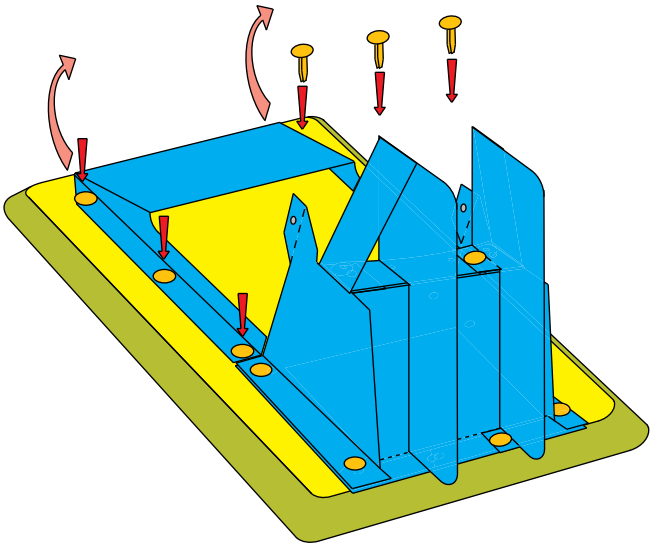
6 Fold up the flap in the airbox floor. When fully open, the flap will touch the rudders. You may need to adjust the position of the legs on one or two paper fasteners in order to get this flap to open properly and stay in the correct position.



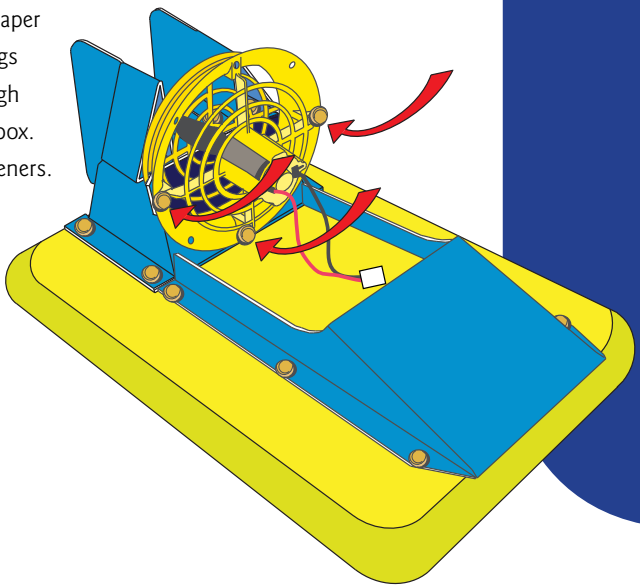


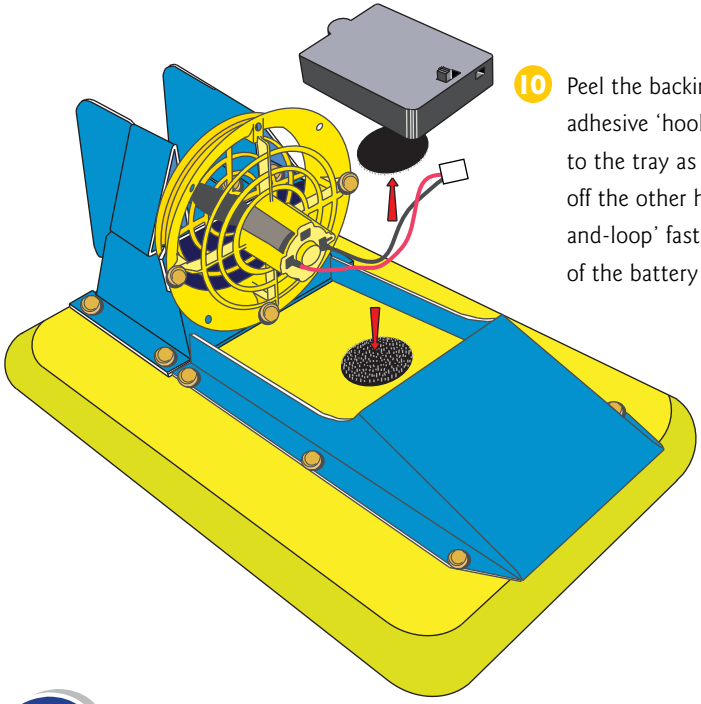
7 Holding the cabin with the shiny side downwards, fix the cabin to the tray through the 3 dimpled hole markings in the front of the tray. Spread the legs on the paper fasteners.

8 Fold the cabin back towards the airbox, and fix in position using 3 paper fasteners on each side. Spread the legs on the paper fasteners.

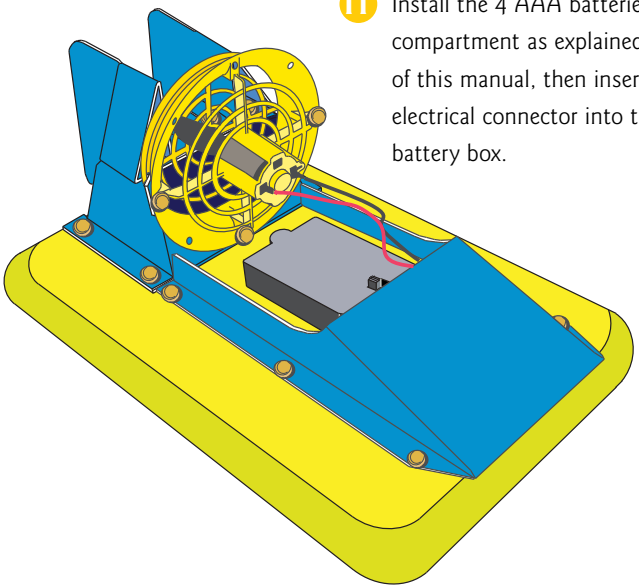


9 Mount the fan assembly with a paper fastener through each of the 2 lugs on the airbox, and another through the hole at the bottom of the airbox. Spread the legs on the paper fasteners.



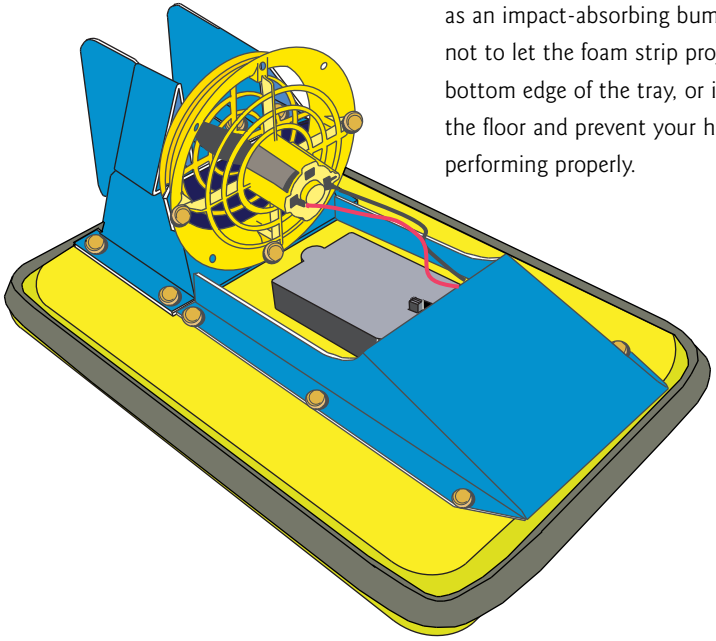


10 Peel the backing paper off one of the self adhesive 'hook-and-loop' fasteners and stick to the tray as shown. Peel the backing paper off the other half of the self adhesive 'hook-and-loop' fastener and stick to the underside of the battery compartment.



11 Install the 4 AAA batteries in the battery compartment as explained at the beginning of this manual, then insert the fan assembly electrical connector into the socket on the battery box.

12 Peel the backing tape from the self-adhesive foam strip and, starting from the rear of your hovercraft, carefully stick the tape to the outer perimeter of the tray, so that it acts as an impact-absorbing bumper. Take care not to let the foam strip project below the bottom edge of the tray, or it will drag on the floor and prevent your hovercraft from performing properly.



Fly your hovercraft

Just turn on the switch on the battery box and place the hovercraft on a smooth surface. Shiny floors are the best surfaces, but the hovercraft should work on short-pile carpets as well.

To control your hovercraft, you can attach the string. Use a brass fastener to attach the string just ahead of the battery box. Your hovercraft should follow you like an obedient dog! You can stow the string in the cabin if you want the hovercraft to fly free, and you can tape the string to the floor if you want the hovercraft to travel in circles.

You will notice, however, that the hovercraft is not very good at going over rough surfaces or obstacles. This is why most hovercraft are fitted with a 'skirt'.

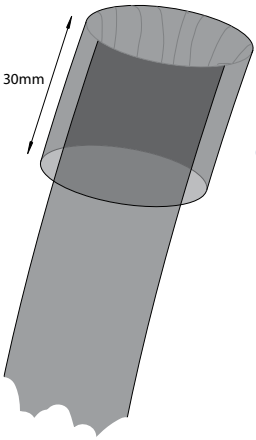
Hovercraft 'trim'

It is important that your hovercraft is correctly balanced [known as the 'trim']. Switch on the fan and run your hovercraft on a table at eye level. Prevent it from moving, but do not hold it down. The gap between the table and the craft should be the same front-to-back and side-to-side. Adjust this gap by moving the battery box slightly towards the higher side.

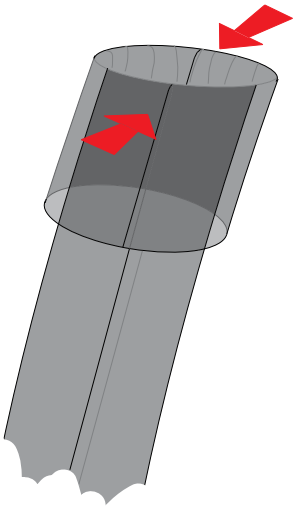
Fitting a skirt to your hovercraft

A hovercraft skirt provides a flexible extension to the bottom of the craft so that, when an obstacle is encountered, the skirt will flex and pass over the obstacle, allowing the hovercraft to go on it's way. The skirt is like a very low pressure balloon which extends all around the bottom of the hovercraft, preventing the escape of the air which lifts the hovercraft, which is sealed inside the walls created by this balloon. The air pressure in the skirt has to be very low – if the pressure were too high, the hovercraft would just bounce off obstacles.

The skirt can be fitted either directly to the hovercraft, or you can fit it to the spare polystyrene tray, making it easier to remove when you want to fly your hovercraft without it.

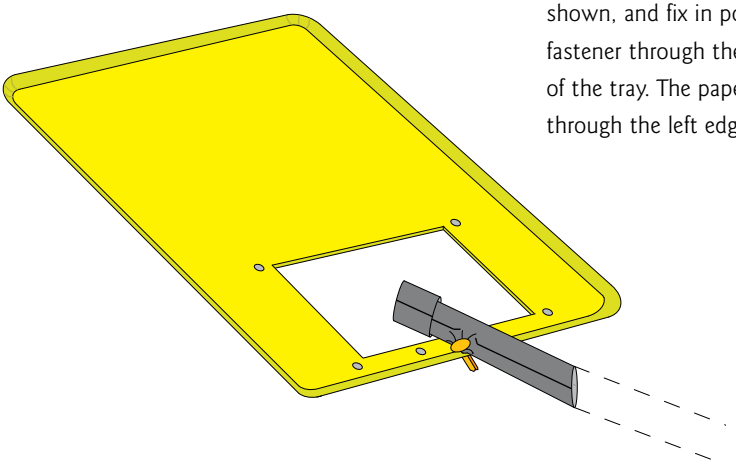


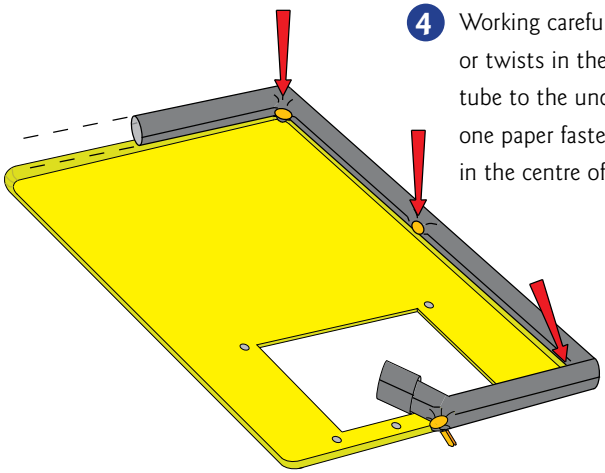
1 Take the black polythene tube and turn back the first 30mm of one end so that it looks like a roll-neck jumper.



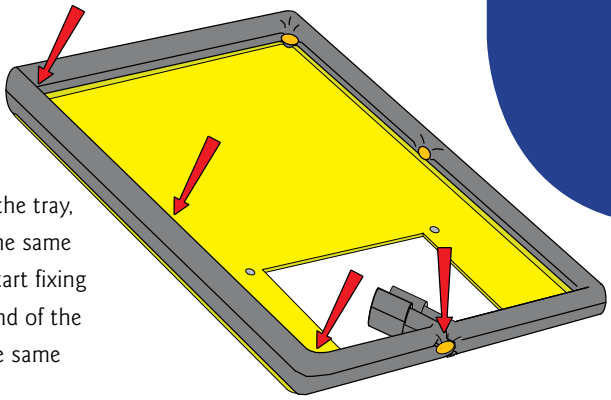
2 The polythene tube has a seam down one side, and this must be re-positioned in the centre. To achieve this, inflate the tube by blowing into one end whilst holding the other end closed, then gently squeeze the tube together so that the two creases align.

3 Turn the tray or hovercraft upside down, position the end of polythene tube as shown, and fix in position with a paper fastener through the centre of the rear edge of the tray. The paper fastener should just go through the left edge of the tube.

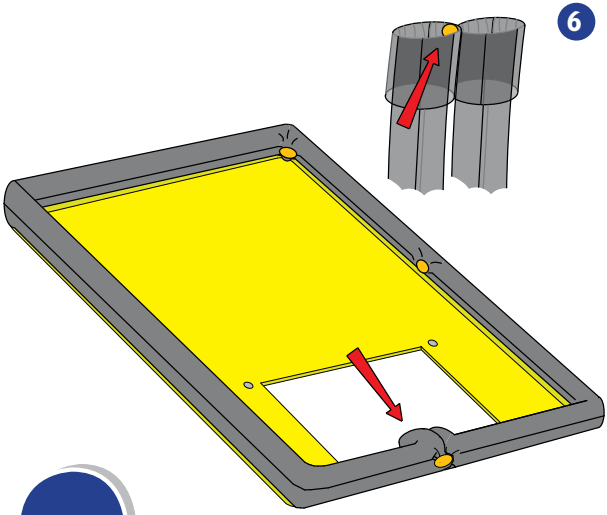




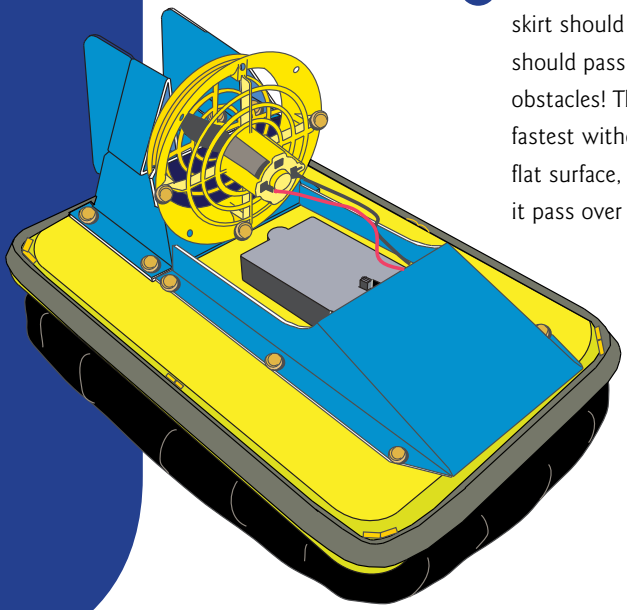
4 Working carefully to avoid kinks, folds or twists in the tube, fix the edge of the tube to the underside of the tray using one paper fastener in each corner, and one in the centre of each long side of the tray.



5 When you get all the way round the tray, fix the right edge of the tube to the same paper fastener that you used to start fixing the tube. Carefully trim the free end of the tube, and roll it back 30mm in the same manner as the other end.



6 The two ends of the tube should be fixed with a paper fastener through the dimpled hole in the centre of the flap in the airbox floor. Make certain that both ends of the tube are completely open, so that the air from the fan can blow into them and inflate the tube. (If you fitted your tube to the spare tray, you will need to fix the 2 trays together with a couple of paper fasteners before you fit the tube to the airbox flap.)



7 When you switch on your hovercraft, the skirt should now inflate, and the hovercraft should pass much more easily over obstacles! The hovercraft will normally go fastest without the skirt, on a very smooth, flat surface, but the addition of the skirt lets it pass over a far greater variety of surfaces!

Hovercraft 'trim'

Moving the battery box rearwards slightly will improve the hovercraft's obstacle clearance even more, whereas moving the battery box further forward will increase the speed of the craft.

Repairing damage

If you should damage the tray on your hovercraft, it can be easily repaired using either PVA (wood) glue, or a little adhesive tape.