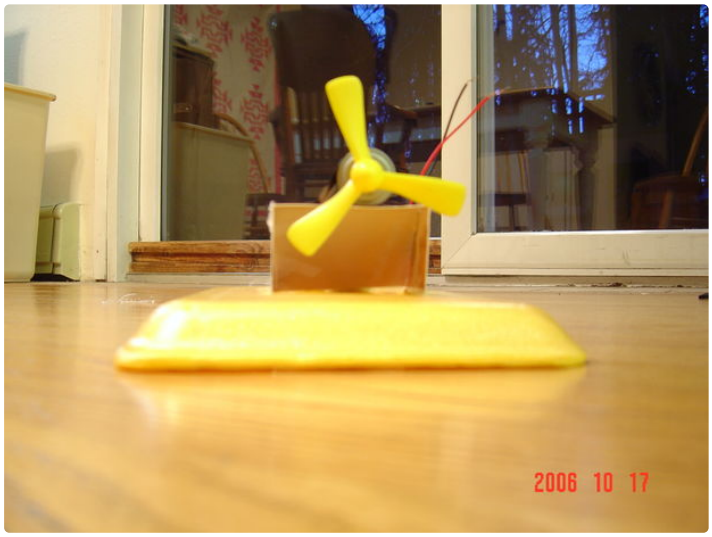
Fifteen Minute, Self-propelled Hovercraft

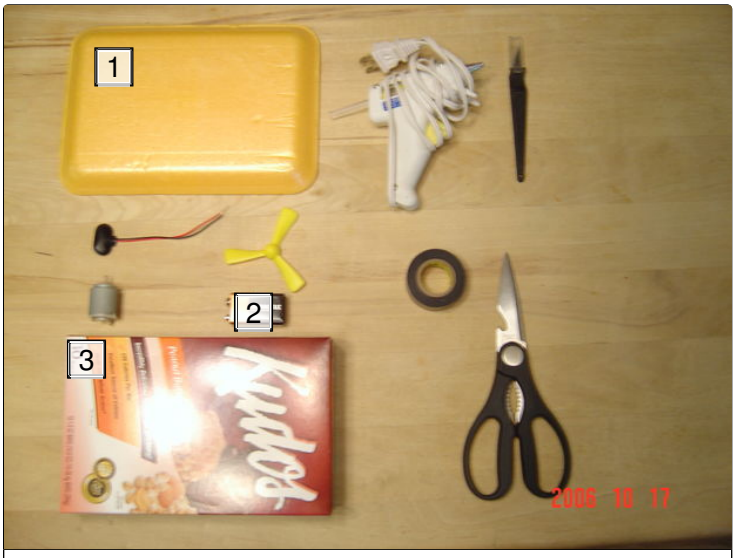
by Dr. No

This instructable coves how to build a hovercraft out of a foam tray, cardboard, and some other household items.



Step 1: Materials

For this project you need:
A foam meat tray (smaller is better)
Some non-corrugated cardboard (I used the kind in Kudos bar boxes)
A small 1.5 volt DC motor
A propeller that can attatch to the motor (I used one from an old RadioShack kit)
A nine volt battery
A nine volt battery snap
Scissors
A glue gun
A craft knife
Tape



1. Wash the tray with soap to kill any germs before you use it.
2. Make sure the battery is fresh
3. mmmm... kudos...

Step 2: Make the Intake

The intake should be as short as possible to allow very little air to escape. Measure the length from the bottom of the motor to the end of the propeller blade, then add a half a centimeter or so. The top should be just wide enough to fit the motor on it without too much overhang. The angle of the back isn't crucial, but I have found 45˚ works the best. Once you have figured out the measurements and cut it out of cardboard, glue it all together with liberal amounts of hot glue.

Step 3: Make the Base

The base is just a foam meat tray with a hole in it. Trace the outline of your intake in the center of the meat tray, then cut it out with the craft knife. Be careful not to dent the bottom edge of the tray, as it could cause it to go off balance and touch the ground.

Step 4: Attatch the Intake to the Base

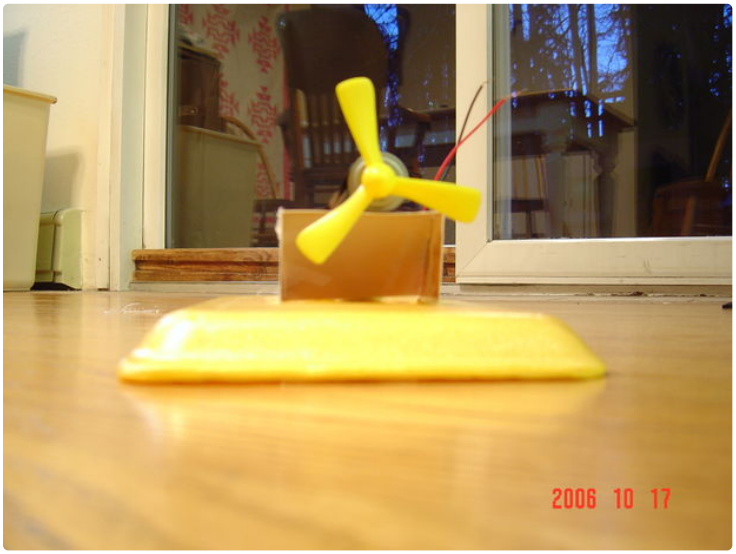
Now hot glue the intake to the foam tray, directly over the hole, with the meat tray facing down.

Step 5: Attatch Motor and Battery

Use the tape to attatch the motor to the top of the intake, and more tape to attatch the battery to the back, just past the intake. Make sure to leave enough room for the fan blade to move. Then attatch the battery snap to the battery.

Step 6: Finished!

To start, place the hovercraft on a hard, smooth surface. Put one of the wires from the battery snap through one of the holes in one of the contacts on the back of the motor and bend it so it doesn't come loose. Then, put the other wire through the other hole, so that it just barely stays there. That way, it's easier to remove when you chase it down. If the propeller blows the air forwards, reverse the wires. Also, this is a 1.5 volt motor, so hooking it up to a nine-volt is not good for it. Don't let it run for long periods of time or it will burn out the motor. It works by creating a high pressure zone inside the meat tray. The escaping air travels under the rim of the meat tray, causing the tray to lift off the ground very slightly. The top part of the propeller provides lateral thrust, causing the whole thing to move forward.



for the intake are we supposed to make the air escape?

I made this and it worked wonders. I even added a switch to it!

Where did you get the motor and propellers?

Amazon. I was doing this for "Science Olympiad". I'm guessing you know of it. Anyways, I also just took meat trays from meat dinners. Sorry for the late response.

How did this work im doing it for the same thing, what did you place?

Where can you get the batteries, my friend and I are doing this for our Science Fair?

Hi

Sorry it might me a bit late for the science fair, but 9 volt batteries are small rectangular batteries that you might use in a smoke alarm or some toys. They have two connections on their top, and they can be found at supermarkets and battery shops, as well as hobbiest electronics shops. (ie a Woolworths, Coles, BI-LO, BatteryWorld, Jaycar). Just ask for 9V battery.

They are also known as PP3 9V batteries. PP3 is the sice of the battery but everyone knows them as 9Vs. Here's a pic in case I haven't described it well enough!

Any sort of lightweight fan should work in place if the propeller/motor? Like a pc fan? If you don't get back to me on that, I will try it anyway! EXPERIMENTATION! :D

Thanks anyway!

Any sort of lightweight fan should work in place if the propeller/motor? Like a pc fan? If you don't get back to me on that, I will try it anyway! EXPERIMENTATION! :D

Thanks anyway!

could you post a video to show it flying?

is it compulsory that the propeller should be attached to the motor

Nice and simple, good job!

how does an rc helicopter work?....doesn't seem to match the concept of this model....

sih.....

awsom

 how fast does it go

Does the motor voltage affect how good it hovers?

 I only tried it with one motor, but I'm guessing it would.

would it be possible to use flat styrofoam rather than the meat tray? Thanks{{{

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 Actually a flat styrofoam is much butter if you tape a plastic sheet to it .it should be a bit loose....in the centre stick the plastic to the styrofoam plate with the help of screws and a metal strip(tin wil do the trick) but remember to add a fey holes close to the metal strip....this make a good air cusion in the middle.....i am going to try this model.....i have made my designs....just waiting to buy a few of the stuff.....actually i am looking for a moter for the downward thrust.....and i am sure that the motor used in computer cpu's for cooling parts will work best.....

 Flat styromfoam might work, just make sure it's not warped or the air will escape through the gaps between the styrofoam and the ground.

Hey. I'm building a hovercraft in school. We're using two motors? What do you suggest that I do?

For the fan for the downward thrust you should use the one that are used in computer cpu's for cooling down parts.....you can easily screw and tape it to the tray after making a hole for it.....and for the vertical thruster you can easily use dc motor.....if you want to make a rc hovercraft you can make flaps like those used for setting the direction of air in car ac's and connect them to a moter.....

get to meat trays put the small tray over the other use match sticks between the trays with a space of about 1/2 a centimetre make a hole on the bigger tray then u finished the hvercraft produces more thrust

just put them side by side

you just helped save my butt!

me too

Eeemmm no offence..but ... Did you wrote this book?

http://www.klutz.com/catalog/product/3110 (http://www.klutz.com/catalog/product/3110)

I mean...you can understand why is easy to asume that at least , you bought it...right?
otherwise very detailed instructable

None taken, I will admit that is pretty much identical. If anyone owns a copy of the book, would

they be kind enough to check the publishing date? While I didn't publish this until '06, I built the original model in 2004. In case anyone didn't know, klutz has an unfortunate history of "borrowing" ideas from independent makers.

http://blog.makezine.com/archive/2009/02/sad_day_for_makers_unauthorized_boo.html (http://blog.makezine.com/archive/2009/02/sad_day_for_makers_unauthorized_boo.html)

 I know my engineering class made almost identical ones. I'm sure it's a common design.

Amazon says the publication date is 2003.

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would a usb hard drive motor work for this?

 Wasn't this by klutz? it seems like you just took it out of their battery science book

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 i'm going to do this with a hair dryer fan

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hey, my fans starts to spin really slow after 10 sec... any idea to why?

 Your propeller could be too big or too heavy.

I think that your fan spin because you (removed by community request) put the motor a little angled, thus producing angular thrust. You cold either try moving the motor more towards the middle of the craft, or un-angling the motor.

Maybe your battery is low?

Wouldn't it be easier to just add a small switch instead of moving the wires every time?

I'm thinking of making something bigger with a gas engine. I have an old car I don't use and it has a small 4 cylinder engine in it. Think this design would work in a larger scale? Also, what is a Kudos bar?

I would love to see a bigger scale hover craft. It might just work, with the right things. I'm not very well at that stuff so dont take my advice. Are you planning on riding in it, if you attempted?

Of course I would ride it. I wonder what the police would say if I took it out on the road, depending on if it can do the speed limit of 40mph.

Sorry to rain on your parade, but I just want to point out that hovercrafts on a large scale are rather difficult for a DIY project, I've done quite a bit of research on them, and probably the biggest problem is finding a motor+fan system that can push enough air out to counter the weight of person and motor, also the propulsion motor as well. It's totally possible, I've seen some good ones, but hitting 40 isn't that feasible.

What if I was to use a V-twin, 16hp engine for the lift engine and have one of my mechanic friends make 2 fans to move air and then just use my 4 cylinder as the propulsion engine? I can get a big

piece of wood that I can attach the tarp/ballon thing to and have an aluminum support frame made up along with supports for bothe engine and the gas tank. I was thinking a single 20-30 gallon tank towards the front along with a chair or two to counter the weight of the engine in the back. Think that might work? I don't care if I'm wasting my time, I have nothing better to do.

I'm actually in the process building one now. The 16hp engine should definitely be enough for the hovering part, I've seen people use .5 horsepower electric leaf blowers and they were strong enough to lift two people. Just wondering, how do you plan on using the 16 hp engine to blow air in? Are you going to do it like this instructable, are you going to point the fan straight down or are you going to use a centrifugal fan? Also, where do you plan on putting the hover engine? In the middle or on one side?

I was thinking of having a horizontal shaft engine with a pully that would drive two different fans via a belt drive off of the engine. I'm not too sure of the locoation yet, but I'm think towards the back in front of the other one but before the chairs which would be somewhere in the middle.

a kudos bar is basically a chewy bar

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its kinda like a rice crispy treat but without the marshmallow stuff and more of a carmel/chocolate "paste" and then usually with some kind of candy on top like mini eminems or some peanut butter for snicker kind. depends on the kind you get. There good though!