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## **STEAM: Make a Parachuting Ostrich** with Jamie Hudson

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### **Chapter 1 - STEAM: Make a Parachuting Ostrich**

#### Overview

(upbeat music) - Hi, I'm Jamie Hudson. I'm a scientist and a crafter. We're gonna help flightless birds take flight by making a parachuting ostrich using a Cricut cutter and some basic household materials. This project uses a parachute, and it's a great demonstration of basic drag and how parachutes work, and also a chance to talk about ostriches and how they're flightless. At the end, you'll have a little friend and a fun toy that you can throw off a balcony.

#### Materials

- To make our little flightless friend, you'll need a Cricut cutter, a mobile device to access Design Space, a light grip mat, a piece of poster board, just a garbage bag, thread, some glue dots, some pens to color the ostrich. Here I'm using brown, red, and black. A pipe cleaner to be the ostrich's neck and legs. And then we'll use scissors, needle-nose pliers will help, and some tape. And don't forget to download the SVG files that contain the information for how to make the ostrich and the parachute.

#### Make an ostrich and a parachute

- We'll start with the parachute. First, open up Design Space. Select New to get a blank canvas. On that same toolbar on the left on the bottom, click Upload. Then say Upload Image. Select Browse, find those SVGs you downloaded, and opened the one called Chute Garbage Bag. And you see there's a nice hexagonal chute with some vents, we'll say Save. And now the image is imported. Click on that image again till it's highlighted surrounded by a green box. And then say Insert Images on the bottom right. Parachute opens in the Design Space, and now say Make It. It's laid out and it looks good, so we'll say Continue. It'll now connect to the Cricut Maker over Bluetooth or USB, and we'll wanna Browse All Materials and then search for Foil. And what we're gonna do is find a material file called Adhesive Foil. That should work really well on this garbage bag. So we'll say Done on the bottom right. For pressure, Let's go ahead and say More just to give it a little extra chance to cut through that garbage bag. And now what you're gonna see is that the Design Space is recommending that you use the Fine Point Blade in clamp B. That's the one that comes with the system, that's loaded in over here. And so now we're ready to set up our materials and get to cutting. So materials, I'm just using a garbage bag. And I'm gonna take a single ply of it. Actually, a really easy way to do this is to pull that garbage bag as flat as you can get it, and then just push it down onto your mat. It doesn't have to be perfect but just try and get it kind of without bubbles and flattened down onto your mat. And then we'll use a pair of scissors to just run around the edge and have it cut to size this way. So this will make about a 12-inch by 12-inch garbage bag that will make a really great parachute. Nice, lightweight, robust parachute. Put your garbage bag in the garbage unless this was your last garbage bag. That's actually two plies. So we'll just go ahead and pull that top one off and set it aside. If we need to make another parachute, we can do that. Okay, that's a little bit bubbly, but it should be fine for what we're doing. So we're now ready to load the mat into the system. So we'll load the mat in. The Load/Unload button is blinking so press that and it'll load it in. And when it's ready to go, the Cricut light will begin to flash on your Maker. Let's go ahead and press that and cut a parachute. (machine whirs) All right, it's done cutting. Now the

Load/Unload button is flashing again, so we'll press it to unload the mat. Let's find out how our parachute worked. We'll just grab the corner of that bag and pull it back to find our hexagonal parachute. Looks really great, we can throw away that into the garbage again. And then we can grab our parachute carefully off of there. And just like that, you have the perfect parachute for a small ostrich. This will basically hold a weight of about a penny and let you make a parachute on whatever little toy or anything like that you have. What I did on this when I made it was to have six points, and each one's got a little dot in there where we're gonna run a thread. And then I actually ran around and made six vents that helps kind of orient the parachute as well. So to make the next step of the parachute, we're going to use some just basic thread. This is sewing thread. Find the end of the thread. And then what I like to do is just use this tape. Just on my countertop, make a little mark. And then about the width of the parachute, about eight inches or so, we'll go ahead and make another little tape mark. And that's just gonna help me set all my strings to about the right length. So for each one of these, I'm gonna take a thread. I'm gonna just go ahead and use a little piece of that pipe cleaner as a needle, kind of hook it through. We'll go ahead and wrap the thread around there. Make just a little hook over there. Let's see if we can't pull that guy through without doing any damage. Parachutes 'cause garbage bags are meant to hold things that are very pokey. It's pretty hard to tear a garbage bag. So just give it lots of thread. Go around, tie a good knot, so few loops around that knot, good and tight. It doesn't matter if you have a little bit of extra thread, we can just trim that off in a bit. So we'll do that. Come in with a pair of scissors, just trim it close to the edge of the parachute. And then what I like to do is to go back to my tape marks that have about eight inches between them. And then go back over and right about the end of them, just use that to guide. I'm just gonna repeat that five more times to make my parachute. So going to the top. Gonna use my needle made out of a pipe cleaner. Probably come up with something better than that. Hook a little thread through there again, whoop. And feed it back through that hole in the bin bag. Just like that, we have our parachute with six strings. It looks a little like a jellyfish. And now we're just gonna gather all those strings up all about the same length in our hand. And then we're gonna tie all that into one knot, and then we should have a nice little parachute that again should help support the weight of about a penny or about a tiny, little ostrich. So we just run around and grab all six of those strings. We've already got them cut to the same length. So we shouldn't have to worry too much about it being balanced. That's why we did that. So there's number five I think. And finally, number six. That's a good looking parachute. So let's just go ahead and tie that into a knot. Pull that string down close to the end. Exact length doesn't matter. As a matter of fact, it's fun to try playing with different lengths of string, different weights and see what that does to your parachute. So now our parachute should be pretty good, yay! (laughs) Okay great, we'll set that aside. We'll go back into Design Space. We'll make ourselves an ostrich. Make a new canvas. We'll go back onto the left bar at the bottom and say Upload, say Upload Image. We'll now say in the middle of the screen Browse, and we'll go select the SVG file that you saved. Ostrich White Poster Board, say Open, Save. And now highlight that ostrich and say Insert Images. That'll now appear in Design Space for a tiny little ostrich. We'll wanna grab all those items together and say Attach. And what that'll do is make sure that all of those get cut exactly the way it appears on the screen so that when we say Make It, we'll see that all nice and laid out. Let's just move that over a little bit. Now we'll say Continue. It'll connect to the Maker again using Bluetooth or USB. Go to Browse All Materials, and we're gonna make this out a white poster board and we're gonna use markers to color it. So let's look for poster board. We'll just search poster. Select it, say Done. Now Design Space is telling us to make sure again that we have the Fine Point Blade, the one that comes with it loaded into clamp B

which we do. And we're ready to load our materials and get to cutting on that. So we'll bring our mat back over. Bring over a piece of white poster board and just simply position it on the mat. Press it down into the adhesive a little bit just to make sure it doesn't get away from us while it's being cut. It's ready to load into the Maker. So now we'll just position that. The Load/Unload button is blinking, we'll hit Load. (machine whirs) And when it's ready, it'll tell you it's okay to cut and you can hit the Cricut button. So we'll wait for that to start flashing. And now we'll hit the Cricut button. It'll run around, do two passes, and cut out all the parts you'll need for your ostrich. (machine whirs) We should have all the parts we need for the ostrich. So the Load/Unload button is flashing again. We'll press it to unload our mat. (machine whirs) Pull back the negative space which is all the parts of the poster board that we're not gonna use for our project. Let's go ahead and pull that off. And then there's three parts that make up the ostrich, and they're all really tiny. One is the body that folds in half to form the body of the ostrich. The other is this little barbell shape that makes his eyes, I think funny little eyes that I made for it. And then lastly is its mouth. And it might be worthwhile to get in there with a little needle or something like that and just kind of pull out all the little parts in there. We'll use our a pipe cleaner again. And just kind of poke out all the little parts that are hard to cut out. It's amazing that the Cricut can cut things this well, but it's also kind of pushing the boundaries of what you can do with a little knife like that. So this is a little bit fuzzy, but I think it looks really great. Let me just move that onto something with better contrast. So these are the eyes for the ostrich. This is the ostrich's mouth that will fit over a pipe cleaner. And then of course this is the body. So I'm gonna go through and just do some coloring on this to make it look a little better. Let's bend the wings out a bit on our ostrich. It's gonna fold over like that to make the body. We'll have a few legs come down, and we'll have a little ostrich head come out the top. And just 'cause ostriches are kind of a black and white feathers, I'm gonna use a black marker and then just kind of go through here and color in an ostrich. So you can probably do a better job than I can, but... Let's just color that in. And I'm just gonna kind of do a little cross hatching here just to kind of give it that feel of a kind of black with a little bit of white on it. Sorta like what a real ostrich looks like. And do the same thing on the other side. This should be kind of a mirror image, so I'll try and get that crosshatching just going in opposite orientation. Try not to marker my thumb, but that'll happen. It isn't a proper day of crafting if you can unlock your phone with your fingerprint when you're done. It should be covered in glue, paint. Really know you did something. Okay, so that's the ostrich body. I think it looks good enough. And now I'm gonna do the ostrich mouth. So we'll say that the top of an ostrich beak is brown. So I'm just gonna kind of come in there and do this nice yellowy-brown on the top of it. And the inside of the ostrich mouth we're gonna make red just like the inside of our mouths. Just kind of move that around. Finally, we're gonna do the ostrich eyes. And for this, you can be as creative as you want, but I'll... Let's make them a little weird. Let's make the eyes look different directions. You can have him rolling his eyes, looking sideways, staring at his naval. It's your ostrich, make it however you want. So now with these three simple parts and a pipe cleaner, we're gonna get out our needle nose pliers, and we're gonna make ourselves an ostrich. The first thing I do is grab the pipe cleaner right at the end with my needle nose pliers. And I'm just gonna go ahead and bend that over to make a little loop. And what I'm gonna do with that loop is grab those eyes. Gonna put those in there. Now let's go ahead and take my needle nose pliers, and you might be able to do this with just your hand. And just kind of press that in there. Let's go ahead and give that one more little fold. So kind of roll those eyes up onto the ostrich. Now we're gonna take our mouth, and if you remember the red's inside, so we're going to fold that over and in. And the way that cut is as a tiny little slot in the back. And there's also a couple little nostrils on the top, and we

should be able to just kind of slide that pipe cleaner over his mouth. And then pull it up kind of near his head. The mouth will open up. And just like that, we have our goony little ostrich face. Ostriches have kind of nice, long necks. Gonna put it into the body now. So the idea is that the ostrich is gonna kind of look up this way, and then we'll wanna add a couple of legs. So what I'm gonna do is just put a little hook over here that we're gonna attach our parachute to. I'm gonna use the cutting part of my pliers, and scissors work well too on this. And I'm just gonna go ahead and cut that pipe cleaner. And then I'm gonna use the rest of the pipe cleaner to make a couple of legs. And so I'm gonna take that back over this bend in the ostrich, and I'm gonna set that pipe cleaner over there. I'm just gonna go ahead and wrap that around once just so it kind of gets nice and fixed. All this is gonna be hidden inside the ostrich, so it doesn't have to be perfect. And now we've got a couple of little legs. I'll cut it to about the right length. So they're about the same for legs, click. And now when I put that all together, what I'm gonna see is something that begins to look a little like a funny little ostrich. With silly little legs. (laughs) And for that, I'll take that little loop I did in the back. And I'm gonna go ahead and just attach that into my parachute. So I'm gonna take that parachute that comes down. Just pick maybe a couple of the threads and put it in there. Maybe I'll just put a little loop of string on that so it's nice and tight. I'm gonna go ahead and bend that pipe cleaner over. And then just since I have my pliers out, I'm gonna go ahead and just kind of push those together. And now what we're starting to get to is something that looks like a scurry little ostrich. Then what I'm gonna do is just take a couple of glue dots. I'm gonna put one on either side of this body. So we'll just put one up near the top. And that should be good enough. So now I should be able to press my ostrich head kind of in there. Fold the whole thing over. That glue dot should hold it. Oh, I guess I made a really short-necked ostrich. (laughs) That's all right, just of pull it around till it looks like the kind of ostrich you want. I've got the world's shortest-necked ostrich, but that's my choice. (laughs) So this should start looking a little like our ostrich. Let me go ahead and put one more glue dot on the back of this ostrich just to kind of help hold that back part together. So I'm just gonna open that up a little bit, sneak another glue dot in there. And just glue that back part. So now we've got our ostrich hanging from the thread. Let's try and kind of bend that over a little bit and see if we can get him a little more balanced. It's a really short-necked ostrich, but I like it. (laughs) So now we can have an ostrich that should parachute down when we let it go. What we've done is something that Da Vinci came up with which is building a parachute. And so when anything falls through the air, you've got a mass that's falling down through the air. It moves basically with gravity. One of the ways to minimize the amount of gravity 'cause you don't wanna be going too fast when you land. If for example like the ostrich you can't fly, then you'll wanna use a parachute. And the way that works is that you set up drag. So all the air that you're passing through blows up and into the parachute and just helps offset that weight. So even if you're falling through the air and you have a chance, then try and get flat and make yourself as wide as you can 'cause what that'll do is slow you down. All that air you're passing through has to hit you, roll around, and go out. One of the things we did with our parachute that was clever is that we installed vents. So all that air flows up through and can vent out the top. That helps keep the parachute's shape, help keeps it wide. And as that parachute falls down, it's creating a much bigger surface area for our ostrich than that ostrich naturally has. So that's the basic idea of how our parachute works. We'll bring in another ostrich that I made earlier with a more conventional neck. And there's a nice little ostrich also with a silly little face. He's got a bit longer neck. And we'll take it out and play with it by throwing it off a balcony and seeing how it floats down. (dramatic music) You can replace that ostrich with something like a penny, an toy army soldier you might have. Try different weights and see what happens. If you put too much weight,

that surface area will slow it down but it won't stop it enough, and it can hit the ground pretty hard. And if you put something too light, there's not enough mass holding down on it to actually help that parachute keep its form. So it'll just float down as if you'd thrown a garbage bag off the balcony. So play around with weights, and we'll play around with our ostrich. This is a really great way to make a simple parachute toy using just a garbage bag and the Cricut Cutter.