STEAM: Make a Sea Monkey Habitat with Jamie Hudson

Chapter 1 - STEAM: Make a Sea Monkey Habitat

Overview

- Hi, I'm Jaime Hudson. I'm a crafter and a scientist. I'm very excited to introduce you to my favorite novelty item that you may have seen in the back of a comic book, Sea Monkeys. Using the Cricut cutter, we're going to make a space monkey themed aquarium for them to swim around in. (upbeat music) Sea Monkeys and space monkeys, it's just gonna be a lot of monkeys.

Materials

- To make our space monkey sea monkey aquarium, what you need is water, a sea monkey kit. We're gonna find a tank to grow 'em in. This is a pretzel container. I ate the pretzels already. We'll need natural sea salt. We'll wanna make sure it's not iodized. Sea monkeys don't like iodine. Just a measuring spoon, a tablespoon will do, something to poke holes in our sky, an Exacto knife and scissors, some glue dots. You need a Cricut and a mobile device to access Design Space. And then we're gonna use the light grip mat. We're going to use white poster board, black poster board, and then we're gonna use some inkjet paper, this adhesive on the back. And so you'll also need an inkjet printer to print out the sea monkey props. And just to help put this together, I'll use a straight edge and a cutting mat. And of course, don't forget to download the PNG files of the space monkey props that you'll use for the print and cut function on the Cricut.

Assemble the habitat

- First, let me just introduce you to what sea monkeys are. This is what the kit looks like that you can buy on the internet or from the back of a comic. If you tear that open what you'll find is it's got three packets and just some instructions, and it falls outta there. Tiny little spoon for feeding your sea monkeys. It's very important that you remember to feed the sea monkeys. The way these work is that it comes in three packets. The first packet is called water purifier and the instructions will tell you to put that into about 12 ounces of water and leave it sit overnight. On the second day you'll add what they call instant live eggs. When you do that, that'll begin the process of hatching the sea monkeys. After about five days you'll start to see them grow up and you'll wanna feed them with packet three. You'll hold on to packet three because every five days or so you'll wanna feed your sea monkeys. It's tempting to feed them too much, but that's the easiest way to kill sea monkeys is to feed them a little bit too much. A few tips for growing your sea monkeys. One is that you wanna try and keep the temperature pretty consistently between about 70 and 80 degrees. So if your house tends to be a little bit cold, you might wanna put them somewhere a little warm kind of closer to a heating vent, on top of a refrigerator. If your house tends to run a little bit hot, try and find a cool spot. They do tend to like sunlight a little bit. Sunlight helps algae grow and the sea monkeys eat the algae and so that's part of their life cycle is to expect a little bit of sunlight. The secret is, actually the water purifier actually contains the sea monkey eggs. All a sea monkey is is a species called artemia salina, which is a fancy way of saying brine shrimp. It's a little type brine shrimp that came out of the Mediterranean about five million years ago. They're really neat. The species has adapted by living in an environment where there aren't very many predators. They've adapted by living in very very salty solutions and they're a brine shrimp. They can live in salinities of up to 25%, so very very salty water. Another thing that's very very neat about artemia is they go a cyst state,

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through a process called cryptobiosis, where they basically dehydrate and they can sit in essentially suspended animation and then when you rehydrate them in salty water they'll hatch and turn into little brine shrimp. And so, this envelope contains sea monkey eggs that can last for years inside a little foil envelope until you're ready to bring them to life. So, it's really really neat. Because of those properties brine shrimp are really studied in a lot of cases. Scientists use them to study things like toxicity and in fact, brine shrimp have been to space I think something like 12 times and they've been to the moon. They've done all kinds of stuff because they're really interesting species to study since they are so tolerant and so well adapted to living in harsh environments. When you use sea monkeys be sure to follow the instructions on the packets and the instructions that come with it. If you follow 'em carefully you can have sea monkeys in about a week. Here's an example that I did in a jar about a week ago, and if you look in there you can see some of those little sea monkeys swimming around. They can get quite large. They can grow up to about three quarters of an inch. So, they're really noticeable. They're really cool looking 'cause they have these little cilia that swim through the water and they've got funny little eyes that kind of seem like they're looking at you. We're gonna get them a little nicer aquarium to swim around in, help them dream big and think that someday they can grow up and become space monkeys like the brine shrimp before them. This is a pretzel container and I ate all the pretzels and rinsed it out really well so we don't have any pretzel residue, though sea monkeys won't mind the salt. But, what we're gonna do is convert this into our sea monkey aquarium. It'll be a little like a terrarium. We're gonna use the black poster board. We're just gonna cut this by hand and we're gonna make a black background. Using the pokey tool we're gonna put some holes in there to make stars and then using the print and cut feature on the Cricket and Design Space we're going to print out a few sea monkey props, a little monkey that waves and a monkey space capsule and then a planet Earth that can be in the background. And because the size of your pretzel container might be different than the size of mine, I thought I'd describe just a little bit generically how this is done. So this is gonna be a little bit more versatile and might require you to scale things a bit in Design Space. Let's make our sea monkey props first. We're gonna go into Design Space. So, open a new blank canvas. On the bottom left of the tool bar we'll say upload. And then, we're gonna upload image. We're gonna say browse. And then, we're gonna go find those drawings that we did. We have one called Earth which looks like a planet. This is just part of the planet Earth. It'll fit down in the corner of our spacescape. Whenever you do the print and cut function what you're doing is uploading an image. The Cricket's very smart and it's figuring out what the image is and it's gonna try and cut that out by itself after you print and cut. For image type since we have a clear background, you'll say simple and continue. If you have a more complicated shape you can try some of the other functions. It gives you the ability to come in and edit the images. These should be fine just the way they are, so just say continue. Now we have the option of either bringing it in as a cut image, this is if you wanted to do a silhouette, but we're gonna do a print and cut, so we're actually gonna make this on an inkjet printer, put it onto some posterboard and then cut it out using the Cricket's print and cut feature. So, we have that image uploaded. And then let's go immediately back. We'll upload image, browse. Let's grab monkey capsule, simple 'cause we had a clear background. Continue. Say continue again. And then, making sure it's highlighted, we'll say save as print and cut image, and save. For a third time, upload image. Browse. Just the space monkey itself. We'll say simple. Continue. Continue. Save as print and cut image. And save. To import these onto the canvas you can select each one individually, or if you hold down the shift key while clicking, you can select all three together. So, all three of them have green highlights and say insert images. So you can do that one at a time or if you wanna save a little bit of time just

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highlight 'em all together. Say insert images, and now in the canvas you'll see all three of those images kinda piled on top of each other. So now we're just gonna lay this out and get the size about right. These are pretty big the way they imported. For example, this capsule appears to be eight and a half inches wide. Instead of that we're gonna make that quite a bit smaller. We have, our container is about four inches wide, so let's make our space capsule I don't know, let's say about three inches wide here. We're gonna take our space monkey and again, this is about a four inch by four inch thing. So, we wanna make sure that's quite a bit smaller. We'll make that monkey about two and a quarter inches. The idea is I think we'll put this planet and we'll put the space capsule in the back of the aquarium and then we'll put this little space monkey itself in the front. That should look just, just too cute for words. The Earth itself is about eight and a half inches. Well, not the actual Earth, but this picture is. So, we're gonna shrink that down again and let's go for, I don't know, about five inches or so. And then I'm just gonna take a second and lay these out. Now that we have all three of them where we want them we're gonna lay them out by hand like that. I'm gonna go ahead and say attach, just to make sure that those three stay where I put them when I go and say make it. If you don't say attach, the Cricket will be very smart and it'll lay it out for you, but for my own reasons I prefer to just attach everything together. Now we can say make it. Now you can see that those images are showing how they're gonna print, and then when you put the mat down how it's gonna cut. You'll notice there's a black box around it. That's what the Cricket uses for the print and cut feature. It's gonna use a little optical sensor and its cuthead to go and find those black lines and from that, in its smart little way, figure out where the monkey, the capsule and the Earth are in the image and cut those out for you. The first thing you'll do is say continue. And now you can say send to printer. This is gonna print to your inkjet printer and for that what we use is adhesive paper. So, it's adhesive on one side and you print the inkjet image on the other. It pulls off like a sticker back and we'll put that on to a piece of posterboard to make our actual props for the aquarium. So, we'll say print here. And that'll open the system dialogue. Using the print and cut feature on the Cricket if you wanna make something on cardboard that's got a little bit of extra strength, what you'll use is this adhesive paper. So, you print inkjet on one side and then the other side has got sort of a sticker film that just peels right off. And then everything is sticky on that. And so, you can print onto this, put it onto wood or put it onto cardboard and then use the cut function on the Cricket to find those objects and cut them out for you. We've already printed out our sea monkey props. So now we're ready to just cut this piece of film out, put it on some posterboard and cut it. Just to make putting it on there a little easier I like to sorta cut the pattern out of paper and then we'll apply it directly to a piece of posterboard. When you're applying something like this, what I recommend is trying to expose just one edge. Here it's got a nice tab so it makes it a little easier. But even if it doesn't you can just pull back, oh you know, part of that edge and then just very carefully put one edge of that down, attach it and then working yourself over just very carefully apply that down. What we're trying to do here is just avoid getting bubbles. The Cricket'll work fine. It won't look too bad. But, it's always a good idea just to try and keep those bubbles and things out of there. We'll try and keep it roughly parallel with the edges of the posterboard just so we don't have to have the Cricket do too much work to kinda figure out how you've oriented that on there. Now with the film applied to the posterboard we'll just use our light print mat that we use every time we do posterboard. Center that on the mat. Just press that down a little bit and we're ready to load into the Cricket. Over in Design Space, now we've printed we'll want to browse all materials. We're gonna find posterboard 'cause that's what we're cutting here. So we'll search poster, select posterboard, say done. Since the blade is gonna have to go through that, just extra little bit of paper on the top. We're gonna go ahead and

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take that pressure and set it to more and that'll just tell the Cricket to give it a little bit of extra umph and it's trying to cut through there. The machine tells us to load the fine point blade and clamp D. We already have that loaded over here. This is the blade that comes with the Cricket machine. And now, the load/unload button is flashing, so we can put our mat in there. Say load. When it's ready to go the Cricket light will start flashing. Let's go ahead and press that. That means it's gonna start cutting. So the first thing it's doing is it's driving around and it's trying to find that black square that you made, or that black rectangle that you made. So it's gonna go find the top and the bottom of that using that optical sensor and it's gonna go find the left and the right of that using the optical sensor. It's done cutting out the monkey, the capsule and the Earth. So now the load/unload button will flash again. We'll go ahead and click that again. Let's just take a look and see how that cut out. Sometimes when you're using these films the blade, it's just a little tricky to get through it all. It looks like maybe it didn't quite cut out. So, what we're gonna do is just repeat that entire process. We're gonna load it one more time, let it align and let it cut those out one more time. That looks like it cut through so what I like to do is just remove the negative space, the parts we're not gonna use from the mat first. Just very carefully bending the mat back a little bit. Pull that out. If anything doesn't cut through that's not uncommon. Just follow with a Xacto knife or pair of scissors and clean that cut up or try it one more time. So now we've got our mat and it's got a capsule. I'm gonna just carefully pull that off of there. We've got our little space monkey in his banana suit, awesome. And we've got Earth that's gonna sit in the corner of the back of our tank. I'm gonna grab a piece of black posterboard and I could cut this on the Cricket and it's a good challenge if you wanna try doing that, but I'm just gonna do it by hand, since mostly we're just making kind of a square or rectangle here, I'm just gonna use this and just make a little mark with a knife and get it about right. We're gonna basically have the sea monkeys, we're gonna look through the front, have the sea monkeys in the back. Thought is to have a scene in the back with the Earth kind of in the corner, the capsule flying nearby somehow. And then on the very front of the tank we're just gonna have that space monkey looking off in awe while all the sea monkeys swim around behind it. To do that let's just cut a piece up here. I'm just gonna use a cutting mat and an Xacto knife. I'm gonna line this up on the bottom and rather than getting math involved I'm using a ruler, though I do love math. Let's just put that where we think we'd wanna have it appear. I'm gonna go ahead and put it near the bottom of the tank. And then I'm just gonna make a little mark with my pokey tool here where I think that goes on the top. Just using a metal straight edge, gonna line that up and just get a fairly straight cut across the top of this using an Xacto knife. So, I'm just gonna cut off a piece here. Rather than putting a lotta pressure on there you should do like the Cricket does and just take a couple of passes and you'll be able to feel when you stop cutting and when you get it nice and cut through, it'll just fall away. Go ahead and wrap the back around to see just kinda how it looks and we're just gonna cut all this out by hand. To get the width let's figure out about how big we want it. Let's start by just bending this part up and get a crease about where we want it to be. I am going to line that up in there and then I'm gonna fold it over the back and just basically get it into about where I want it. Sea monkeys aren't gonna complain too much. I'm gonna use the straight edge again by lining it up on the mat. I've got the spot about where I want it and using an Xacto knife making a couple of passes real easily, minding all your fingers. That'll fall away. That looks pretty good. That looks like the night sky. Kinda fold that around a little bit, see how that looks on our sea monkey tank. I think the sea monkeys are gonna love it. Hopefully they give me a nice review online for their new tank. Using a pokey tool, gonna run around and just make a few holes. I'm gonna use the mat to kinda back that up with so that I don't use my thumb to back that up with.

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Gonna put some stars in there. If you have a desk light or you put this near a window the light will shine through here, it'll look a little like stars in space, should look really neat. And I'm pretty sure the sea monkeys are gonna love it. We'll go ahead and continue those around onto the sides. I'm just giving it a good poke to kinda penetrate through the paper and then we'll follow it up here in a second and run that through a little deeper. You can put as many or as few stars as you want. If you wanna be very clever you can go find some good constellations, the Big Dipper, Little Dipper, Ursa. I'm not sure if there's any monkey constellations, but there's no reason you can't make one up and I wouldn't be surprised if there's some monkey constellations. I'm not the only scientist who thinks monkeys are just about the neatest thing ever. Now that I've done that I'm just gonna use the pokey tool and without getting my fingers, just kinda run around and make those holes a little bit bigger so that light will shine through them when I put this near a window and hopefully give the effect of stars kinda comin' through into the sea monkey tank. Interestingly, the American space program has sent sea monkeys to space, oh gosh, several times. The Russians have sent sea monkeys to space several times. They've sent sea monkeys to the moon, all as eggs. I think some they've hatched in space as well and it's because they are such an interesting food source. There's a whole field of aquaculture in which you use brine shrimp because they convert algae into shrimp and then you can feed the brine shrimp to bigger fish and you can slowly build up a little ecosystem in a kinda controlled environment and it's a really great way to grow food. In fact, if we were to ever go colonize Mars, or when we go colonize Mars, it's likely that brine shrimp will play a role in feeding the people there. We can make some of these holes bigger than others. Some stars and things are bigger than others. That looks like stars to me. Next really we're just decorating our sea monkey tank here. I'm gonna put the Earth here in the corner so it kinda looks like it's on the horizon there. And to attach it I'm gonna use a couple of glue dots. You can use super glue or any kinda glue you have. But, I have glue dots and I like glue dots, so I'm gonna put a couple of those back there. And then those also are easy enough to remove if you wanna put a different background on there or do something a little different. Maybe you wanna draw Super Nova or something happening in space for the sea monkeys to enjoy if they start to get bored of this. I'm gonna go ahead and put this capsule kinda floatin' how 'bout right about here. I kinda like it just kinda hovering over the planet. Go ahead and put a couple of glue dots on our space capsule. It's okay that we're covering some of the stars that we just poked in there. Using glue dots, we've attached the capsule. We've attached the Earth. Let's just put this together kind of dry here and see how it looks. I think that looks really cool. I'm pretty sure the sea monkeys are gonna love it. To attach this to the side I'm just gonna go ahead and use some glue dots in the top and bottom. You could use a little bit of tape or however you want. Depending on your container and depending on the size you might wanna adjust the size of the props and things like that. Here I'm just gonna go ahead and use some glue dots in the corner just to help kinda hold that on. Center that all back together. And, stick it on there. I think that's a great lookin' little sea monkey tank. The only thing to add now is an actual monkey. We could put it into the background, but I thought it'd be kinda cuter to put it in the front, sorta staring, floated away. So, we're gonna put it up in the front here, just kinda staring back, marveling at all the space sea monkeys I guess, that it's seeing. To actually move our sea monkeys into our new tank what we're gonna wanna do is make a new brine solution. Brine shrimp of course, love brine. So they tend to be able to tolerate all different ranges of salt concentrations. A good rule of thumb for sea monkey brine is to do about one and a half tablespoons per quart of water. Here we've estimated that we'll need about two and a half tablespoons of salt. I'm gonna use an actual tablespoon. Measure out a little more precisely. And again, it's very important to use non iodized salt. Sea

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monkeys do not care for iodine. The other one is, if you're using water I'd recommend using purified water that you buy from the store or if you wanna use tap water there's a really good chance the tap water you use in your house has got chlorine in it. That's no problem. Chlorine dissipates out of water over about 24 hours. So simply fill water up and let it sit, or if you're not that patient you can bring water up to a boil and as soon as it cools down you can be confident the chlorine is gone. The other trick is that you might want to after you prepare your solution, just move a few sea monkeys over as kind of test sea monkeys and see how they fare. If they seem like they're maybe not enjoying the solution, then try again or maybe check the pH of the water. So for this we're gonna go ahead and add about two tablespoons of salt. Again, sea monkeys are very tolerant of different amounts of salt. I would not exceed about a tablespoon and a half of salt per quart for your sea monkeys. I've added salt into our tank. Now, I'm gonna use water that we let sit overnight. And I'm just gonna fill that up. We don't need to go to the top. We're just gonna go a little ways up and that's it. We'll use that same spoon and just mix in the salt to make sure it's good and dissolved. We've got our sea monkey tank pretty well made right there. If you do wanna put a lid on your sea monkey tank to help it avoid evaporation, make sure you put some air holes in it. Sea monkeys need air like most things on the planet and they get enough oxygen through the water. If you have a little pipette or something and wanna blow a few bubbles in there with that, of just air, it helps to give it a little more oxygen. The sea monkeys might appreciate it. But really, it should be plenty with just the air. And you can also just stir the water a little bit every once in a while. I would not recommend using an actual air pump, and I would also not recommend using an actual immersion heater at all for your sea monkeys. The last step here is to relocate our sea monkeys. You can just pour the sea monkeys in. But, I'm gonna try grabbing just one of 'em, pull him over using this little pipette. I'm gonna try and catch one of you guys. Come on guys. It's like fishing, but I'm about as good at fishing as this. So we're gonna grab. Woop, there goes a sea monkey. Got him in there. I'm gonna go ahead and move just that one sea monkey over into our tank. Not complaining, it looks pretty happy. I say it probably looks pretty good. Let's go ahead and just pour the rest of them over there. So we're gonna just carefully decant all those guys over. We're adding a little bit more water to the tank. See 'em kinda topsy turvy. They don't seem like they love it, but they're happy enough. So, I'd recommend starting your sea monkeys in a jar, just following the instructions very closely, according to the package. There's lots of information online for how to raise sea monkeys. A few things I find to be most important. One is the temperature. So really, they do like to be between 70 and 80 degrees, particularly when you're hatching them. The other one is not overfeeding them. So make sure you only feed 'em about once every five days. You'll notice, they'll tend to reproduce. You can actually keep a sea monkey tank going for quite a while. My record is not super long, but I've had 'em going for a few months before. They're a lotta fun. They're really neat to look at and they're a really cool thing. It's also a good introduction into aquaculture, helps you understand things like evolution. This all came from the Mediterranean Ocean, nearly dried up about five million years ago and gave rise to this entire species. Enjoy your sea monkeys and I hope they enjoy their new space monkey themed tank.

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