
Lumi: Photo Printed T-Shirt with Jesse Genet of Lumi

Chapter 1 - Introduction

Overview

- Hi, I'm Jesse Genet, founder of Lumi. And, we print fabric using light. We're going to walk you through the process step by step. We've partnered with CreativeBug to make detailed video guides to show you how everything works. So, at the end of it, you're going to have a custom fashion piece, printed with ink or dye, and a bit of sunlight. (guitar music)

Chapter 2 - Materials

Materials

- The first step to a successful Inkodye photo print is to choose a great image. But not just an image that pleases the eye, an image that's good for printing. What I mean by that is that images with simpler backgrounds are more successful than images with complicated ones. I call this Bad Zebra and this Good Zebra. Bad Zebra has a very complicated background and it's hard to tell what's going on. Good Zebra is very easy to tell what's going on. This is a negative made from Good Zebra. You can see that he really pops out and he's gonna make a very successful Lumi print. Now, if you're looking for images, you can search everywhere in your life. Snapshots, things you might have taken on your phone, old vintages images you might have. But also remember that things that aren't photographs can also be printed with light. Think about taking a photo of an old map, or something else that's graphical, like an album cover. Anything with strong contrast and simple backgrounds can make a great print with Inkodye. If you're working with a Lumi photo printing kit, you'll have a reusable project board, two packets of Inkodye Black, a packet of Inkodye Plum, a packet of Inkodye Blue, and two packets of Inkowash Detergent for washing your prints. You'll also have four printable sheets of inkjet Inko film. We're printing on a 100% cotton tank top. You'll want to make sure that whatever you choose to print is primarily made of a natural fiber, like cotton, silk, rayon, viscose, et cetera. You'll also want to gather blue painter's tape, some paper towel, pushpins for securing your project to the board, Scotch tape for taping negatives together if you're doubling up. And now remember that you have four Inkodye snap packs. And each one includes almost a full ounce of dye. So that means you can actually print four projects that are 12 inches by 12 inches, or 30 centimeters by 30 centimeters. You could also do smaller projects and use your snap pack more than once. So go through your closet or go to a store, go to the thrift store, grab some printable natural fiber items, and you can do a whole afternoon of printing.

Chapter 3 - Creating a Negative

Use Lumi app to make negative

- We've developed the Lumi app as a tool to help you make successful negatives. It's free, and it's on web and mobile. If you're an advanced user, feel free to use Photoshop or any other image editor to turn your images into negatives and manipulate them. Open up your Lumi app, and you'll notice that there is a guide to walk you through the process, a spotlight section with some free images you can download and some other things also here for you. Now, navigate yourself to the editor, which is the center bottom button. Once there, you'll notice you have a live camera feed. You can take a picture right in the app, or you can open one from your camera album. I'm gonna use the zebra. Once you have your image, it's still in color. Press "choose," and you have it now in monochrome.

The app turns into monochrome for you, so it's in gray scale for Lumi printing. Now, you can slide your thumb around to actually turn the image from like low contrast to high contrast. You'll notice along the bottom that you have all the nine Inkodye colors. You can press them to turn your image into that color. You can play around with your image. You can still edit the levels once you're in that color, and then you can click on any color you want so you can see what it looks like in different ones before you decide to move forward. I'm gonna go with Inkodye magenta. Once you like how your image looks, you can press the preview button in the middle top. The preview button overlays your image over shirts. You can still move it around to see how your image would look like printed in different areas of the shirt. You can also use the arrows in the middle bottom to click through and see what the image would look like on different colors. This will help you prevent mistakes. You can see the magenta Inkodye over a red shirt is very low contrast, and you might not want to do that. You can click through to see how different shirts would look in different colors. Like for instance, magenta Inkodye over a light blue shirt makes the print look very purple. You can then click on the top right LumiCam. LumiCam overlays your image over the real world. This is kind of cool if you're walking through a store or pulling things out of your closet because you can actually see what the image looks like over a real-life shirt or anything else. Once you like where you've placed it, you can press the little hand button in the bottom middle to freeze it into place. That gives me a mock-up of what my design would look like on this shirt. When I'm ready to actually print my negative, I press the "negative" button in the upper right, and it turns my image into a principal negative. From there, there's two options. You can see here, at the bottom of the screen, there's a "save negative" button and an "add to cart." If you save the negative, you can print it yourself on an inkjet printer using Inkofilm. You could also just save it for later use, or you can add it to the cart and order a 12-inch by 12-inch negative straight to your doorstep that Lumi prints for you.

Prepare negative for printing

- When you order negatives through the app, they come in an envelope at 12 by 12 inches, or by 30 by 30 centimeters. This is how big they are and they're ready to get printing right away, both sides are water safe. When you print negatives at home, you're gonna be using Inkofilm. Inkofilm is an inkjet printable film and it has two sides, this is a sheet of Inkofilm, and it has one sticky tacky side that is tacky to the touch, and the other side is water safe and wipeable and smooth to the touch. If you're truly wondering which is which, and you're having a hard time telling, I would wet your side very slightly, the tacky side will turn white when it hits moisture, and that's the side that is inkjet ink receptive. The other side is smooth, and even if you touch it with a finger that's slightly wet, it just slides around, so this side is wipeable, and this is the side that you will put down on your Inko-dye when printing. From there, you're actually going to be printing two copies of your image, to build up enough ink density to truly block light. Now I'm gonna talk a little bit about printer settings. You're gonna want to make sure your printer is set to put out as much ink as possible. Again we're going for ink density. The reason is that we're trying to truly block sunlight from getting through this clear transparency to the fabric, so that means you want to put down a thick layer of black. For some printers that means you can actually put it to max ink and actually have it laying down more ink. For others it's about setting it to a photo quality. You'll definitely want it set to maximum quality, if your printer has that setting. You'll also want to take a look at your paper setting. Often times printers have an actually transparency setting, please use that. But if your printer doesn't, it might have a photo paper setting, in which case use that one. If your inkjet printing your negatives on Inkofilm, here's what one would look like. And you can see here that the gray areas are very light, and even

the blacks, even though they look black, kind of down here, when you hold them up to the light, the sun might blow right through them. So what we're going to do, is we're going to take an identical negative here, printed on two sheets, we're gonna overlap them, and line them up to create a single denser negative. Now you wanna make sure you get your alignment nice and perfect, and which is pretty easy by eye, and just take little pieces of Scotch tape, and you can secure them together. Now all the Scotch tape is doing is holding your negative in place, so that the two don't separate during printing. Since this tape is clear, you won't really see it on your print, the sun will blow right through it, so it's really just serving the purpose of holding your negatives together. Now even two pieces might be enough, I'll do four, just to be on the safe side. And there we have one beautiful dense negative that's ready for printing. Another option is to order negatives through the free Lumy app. Negatives through the Lumy app come 12 inches by 12 inches, so much larger than the 8.5 by 8.5 you can print at home. Also the negatives from the app come with really dense blacks, so you don't need to worry about doubling them up. The other important difference between an app printed negative, and an Inkofilm at home printed negative, is that Inkofilm has two sides. So on Inkofilm, there's one sticky, kind of tacky inkjet receptive side, and that's what absorbs your black ink, and a more smooth shiny side that's water safe. You wanna make sure that you're always putting that water safe side down onto your Inko-dye prints, and the inkjet side that isn't water safe facing up, so you don't get it wet. With the app printed negatives, you don't have to be so concerned because both sides are water safe and you can wipe down and use both sides. Once you have your negative for printing, whether you're going with inkjet or negative from the app, you're ready to go and we can start photo printing.

Chapter 4 - Prepare Shirt for Printing

Apply dye and pin negative in place

- You want to find a work area that's away from natural light, so a place like a garage or a basement, even a laundry room, just some place where you're not interacting with sunlight is great, because once you start applying the Inkodye, it's light sensitive. So you want to give yourself a few minutes of working time before you're ready to take it outside. You also want to start your project earlier in the day. Maybe between 11am and 1pm, so that you give yourself enough time to get ready and go outside while the sun is still high in the sky and bright. I'm going to be printing with a negative from the app. And mine is a vintage image of some beautiful surfer girls. So this is a negative, remember, so I know they look a little strange at first, but we're going to be getting a positive image on our shirt. So just using my negative I can start positioning it and seeing how I might like it to be on the shirt. You have an option to use blue painter's tape to mask off an area for printing and I'm going to do that. So I'm going to put my negative to the side for a moment. It's actually good to get your negative out of the way just so you don't get it messy or dirty while you're applying dye. And before I start with my painter's tape, I'm going to take my project board and put it inside my tank top. So I'm just going to wiggly it in here and what this does, is it makes sure that as I apply my dye, it won't soak from the front to the back. It will also give me a nice firm surface to apply to and a pinnable surface, when I'm ready to pin my negative into place. Depending on your shirt this might be a challenge or easy to get it inside. If you're doing a project inside something that has a different shape and your project board doesn't fit inside, you can cut a piece of cardboard or a piece of foam core to fit inside maybe a sleeve or something like that. But the project board works for a lot of things so I recommend trying to use it. And again that comes in the kit. This looks nice. I want to make sure that my fabric is good and smooth for applying my dye, but before I apply the dye, I am

going to use some blue painter's tape. Again, this is optional, but what the painter's tape allows me to do is create some clean lines on my shirt. If I just apply from the packet to the shirt, I'll have rough edges, which is also another look. So I'm going to take a piece of painter's tape and I'm going to do an angled design. So I'm going to create a nice angled line here and I want to take my thumb and smooth the actual painter's tape line down, making sure it's making really good contact with my fabric. If I don't do that, there's a risk that my dye could still seep underneath my painter's tape which would kind of negate it being a clean line. So I've got the one edge up there, I'm going to do a second. Going to get a nice piece of tape here and I'm going to echo the same angle and carry it down. I want to give myself a good amount of printable space, so I think I'll go about here. And do the same thing. Smoothing this line down, really nicely. That looks good. If I wanted all my edges to be clean, I could also take a piece of tape and put it here, or a piece of tape and put it here, but I think I'm going to go with the clean edges on the top and bottom and rough edges on the sides. We're going to be using two colors of dye today, Inkodye black and Inkodye blue on our print, but before we start, we have to shake them. So I'll do two at once. I'll shake both my packets at once, get them both ready. So you want to make sure that the pigments get dispersed in the packets before we open them up, just to make sure that our prints have even dye. So that seems good to me. Now, I'm going to start with just one; I'm going to start with the Inkodye black. And this is an Inkodye snap pack and it's special because it has a perforation along the middle on the back. And the way you use it, is actually to push your finger on the middle and squeeze to actually snap it open. And then dye starts coming out and I find that for knitted items like tank tops and t-shirts, it's handy to actually drizzle it all over and then use the packet itself to spread. So I'm going to use my hand to kind of hold the fabric taut. Again, knitted items can be a little challenging. But I'm going to keep squeezing and then spreading. Now, my goal here is just to get the fabric saturated and wet. So I don't need it to be dripping. I'm just going to get it fully saturated. And on this design, we're going to do some color blending. So, I'm actually going to use a little bit of the blue and a little bit of black. And we probably won't use the entire packet, but we'll have a little bit in each one left over that we could use on another small project. So I'm just trying to get the black in these zones and then I'm going to come and add some blue in as well. The Inkodyes are fully blendable, so you can actually blend them right on the shirt itself. If you wanted a perfect blended color, you'd actually want to blend in a bowl and then maybe apply it with a brush, but I find that it's really easy just to apply directly on to the item itself and you can then apply straight from the packet. And you'll notice that my t-shirt is wrinkling a little bit and I have some drips, don't worry about this right now because we're going to remedy that in the next step. Right now you just want to focus on getting the whole printing area saturated. I'm going to apply some Inkodye blue now. So I'll set this Inkodye black to the side and I'll pick up my blue packet and same process applies. Going to bend it in half and wait for it to snap and then it starts coming out. I'd like to put the blue in the edges, so I'm going to focus my energy on the blue over here in these areas that are still uncoated. And just get them wet. So this bottom corner. There's really two ways to use the packet, either squeezing and then spreading or essentially squeezing and spreading at the same time. I think that squeezing and then spreading is easier when you're starting out but once you get a feel for it, you'll do a little bit of both. So I want to make sure that I get all the areas against my tape wet. And this is looking pretty good and it was a conscious decision to leave these edges with a rough edge, so I'm happy with how that looks. Kind of rough and painted. So I'm going to leave that as is. And this looks good to me. Set your Inkodye packet to the side and now we need to blot off our print before we put our negative down. The optimal printing surface is damp, not goopy. So we're going to take paper towel

and we're going to use it to soak up the excess dye. We don't want there to be any drips, or any puddles and we don't need to be shy about blotting. With this process you really want it just be saturated. So I'm going to press firmly to soak up the excess Inkodye. When working with two colors, you want to just blot straight down and press firmly instead of wiping from place to place so you don't migrate the color around. We actually have a really nice damp printing surface now and this is the best time to print. You actually don't want to let your print dry before you put your negative down and take it outside. Dry Inkodye is not as active and your prints won't be as vibrant. So you have a good amount of working time from the time you apply to getting your negative down but you don't want to let it dry entirely out. If you feel like your print has gotten too dry you can actually go back and apply some more Inkodye, blot again and then go outside. This is looking really good. The next step is to take our blue tape off. It's served its purpose, so we don't need to keep it on any longer. Going to take this top piece off. Great, this is pretty wrinkly. We need our printing surface to be smoothed out before we put our negative down. So I'm just going to tug and pull. Knitted garments can be a little tricky to get straight. We're pulling to actually get the print flat before we put our negative down. If you want, you can put gloves on for this process and just remember to wash your hands before you go outside because, even if you don't see the stains now, you will when you go out. So I'm just going to get this smoothed out. That looks really good. Grab your negative and you can start playing with placement and seeing where you want your print to be. Again, this is a negative from the app, so we can actually put it down either way but with an Inkofilm negative, printed on an inkjet printer, you want to be very careful that the inkjet ink side, the blacker side, that's slightly tacky is facing up. And the silky smooth side is actually facing down because that's the water safe side. So be careful you know which is which and then you can start playing with placement. You'll notice that our Inkodyed area is actually smaller than our negative, so depending on where we place our negative we'll get a crop of it in this zone. So I'm going to play with how I want this to look. And I definitely want all of their faces to be in it, so I think I'm going to cheat it this way and this looks really good to me. I'll double check by peeling up the sides, to see if I like my crop and then once I do, I'll smooth it down. Now I really want to take the side of my hand, make sure it's dry, and smooth my negative into place. You cannot simply place your negative down and hope for the best. You need to make sure it's making really good contact with your fabric. The next step is to pin it into place. Because if I simply took this outside, and just set it out like this, I would risk my negative blowing in the wind and that is a great way to ruin a print, real fast. I'm using clear pushpins and I'm going to push them in to the corners of my prints. They're actually sticking through the negative, through the shirt, and into the project board. A cool note is that if you stick them only in the dark areas of the negative, then their shadows won't show up. If you stick them in light areas, like if I were to put one right here in her hair, for instance, I would see the shadow. So I'm going to stick with only sticking them in darker areas of the negative. If you're still worried that they're going to cast a shadow, you can always use straight pins instead of push pins, because they are so thin they don't really cast a meaningful shadow. Depending on your design, you may need more or less pins. The name of the game is just to make sure that it's actually held down tightly, so your negative is making great contact and can't blow away in the wind. I think we're set, so now we get to take our print out in the sun and let the sun work its magic.

Print and reveal

- We're outside with our print, watching it develop. On a bright sunny day, a print will take 10 to 12 minutes in the sun. If it's an overcast day or if you're working much later in the day, then it might

take longer, up to 30 to 40 minutes. You really want to err on the side of leaving it longer than you think it might need, because the sun is actually doing two important things for you. The thing that you see happening is the first thing, the sun is developing your color right before your eyes. But the sun is also setting Inkodye permanently into the fibers of your fabric, so if you don't leave it long enough and you bring it in too early, your print might wash out or fade more than you want. Leave your print for at least 15 minutes to make sure it gets enough sun. While you're outside, it could be hard to tell what's happening with your print because the negative is covering it. In order to check to see if your print is finished, you can do a little peek. You don't want to peek too much because your print could get exposed, but it's okay to take a little peek, see if your print's fully developed in order to know if you should bring it inside. Let's reveal our print. We've just brought it in from outside and I'm gonna remove the pushpins. Gonna take all of them out and then I'm gonna peel the negative off to show our beautiful print. Our print looks beautiful, but there's one step left. The whole surface right now is still light sensitive and we need to wash out all of the unexposed Inkodye to permanently set our print so we can wear it and wash it over and over again. And then you can take your Inkowash packet that comes in your kit, squeeze it into the washing machine, throw your prints in. If you've done a whole afternoon of printing, that's fine, you can wash them all together. We recommend washing twice with Inkowash and then you can wash your prints normally with your normal detergent and with your other clothes and tumble dry is totally fine. So to illustrate the importance of proper washing, I've got some examples here. These two pieces are printed with plum on a light blue fabric. This one is properly washed twice with Inkowash and this one hasn't been washed at all and has gotten some UV and sunlight exposure after the fact. Now you can see that this one still has beautiful, sharp print contrast, and this one is foggy, kind of blurring, and also doesn't have great contrast at all. Remember to wash your prints properly. It is okay if you have to wait a little bit between printing and washing. If you don't have access to a washing machine right away, don't worry. You can actually take your prints and store them in a dark place like a box or a bag and wash them later, but I don't recommend waiting more than 24 hours. So if you're doing prints in the afternoon, it's okay to wait 'til evening to wash if you've stored them in a dark place. After you peel a print, your negative will have residue on it from the Inkodye. You want to take a paper towel and wet it and just gently wipe off the residue. If you're using an inkjet printed negative, you're going to want to make sure you're rubbing the residue off the right side, the water safe side, so that you don't smear or smudge your negative. Once your negative is wiped off and dried, you can store it flat in a cool, dry place, and it'll last a very long time. You can make multiple prints from one negative. Let's take a look at how our shirt turned out. We've already washed and dried this and you can see our surfer girls, our clean line at the top and the bottom, and rough edges on the side. Remember how we did some color blending. It's pretty subtle, but you do see these blue streaks in amongst the black print. So I'm pretty pleased with this. Now I also want to show a couple other examples of other prints on shirts. This shirt already had these colorful flecks in it and I actually saturated the whole shirt in Inkodye blue and then I sprayed some Inkodye magenta on it as well to create this spray effect that you're seeing on the sleeve and a little bit here. Now the shirt kind of looks like it's all over printed, but it really isn't. The negative was only about this size and a cut up, but how I got this effect was that I actually folded the sleeves, and you can see because this part of the sleeve is printed and this part. So by folding, you can also create some interesting effects on your shirt as well besides just the negative printing. And I printed right over the pocket. Because you're printing with light, you can actually print over seams and over pockets fairly easily, which is a fun thing to play with. This shirt is a fun neon yellow color printed with blue Inkodye. Now normal

color mixing rules apply, so when you print blue over yellow, you get a green effect, and the negative itself wasn't super high res, so the print is a little bit blurry looking, but has a really neat overall effect. This is actually a yellow mini-dress and I've printed it with blue Inkodye, so again I'm getting kind of a green print. You can see that this one has really great photographic detail. That's mainly due to our negative. So if you're wondering how much resolution you can get in an image, it relies on two things. One is the quality of your image and therefore your negative and the second is the weave of the material. If your material has a really dense weave, then it can hold a lot of detail. If it's a coarse weave, then the material itself might not show the fine details of your print. And this shirt is all over printed with an astronaut image. We got a massive all over print by actually tiling negatives from the app, so four 12 by 12 negatives to make one two foot by two foot negative to do this all over print, but this is some of the effects you could create on your shirt with a massive negative.

Chapter 5 - Pro Tips

Manipulating negatives

- One of my favorite differences between this process and screen printing, is that once you have your negative or design, there's still a lot of editing and manipulating you can do. I'm gonna show you a couple examples of that. Here we have good zebra, and here he is printed on his square background. And remember, that because his background was white in the original image, it's black on our negative. So when you print that out, it can turn out kind of blocky. You can see here that he has just a square of white around him. Now, to kind of fight that, and create something all your own, you can actually cut the negative out. And I just cut a black outline all around him of a consistent width, and then I printed that in a wild brushstroke pattern, and you can see that I get radically different prints from these two results, even though I've started with the same negative. Another example of that is using a piece of architecture. We've got the Griffith Observatory here, and here's the original image. And again, it had a white background in the original image. And then here's the negative that's just traditional, turned into a negative, and so it's got a black background. And here's the image it created, which is with a white square around it. Now this is a beautiful print, but to kind of get out of the box and kind of break that square. You can again, cut that negative out. And I did a brushstroke pattern again, and then print my cutout negative overtop and I get the architecture sort of popping out of this interesting composition. There's just a lot of ways you can use application techniques married with manipulated negatives to create really interesting custom effects. Another example of that is using scissors on your negative, but instead of cutting out the main object or feature, we actually cut the negative up into pieces. So this is an example of our beginning image. So this is the image that we started with, and then this is the negative. And what we did to create this effect over here is actually take scissors or an exacto blade and cut the negative up. So I'm gonna cut right into her face. And the result that I'm creating, it's kind of a broken glass effect. That's how it looks to me. And you don't need to make a lot of cuts. But by cutting this into several large pieces, you can then position them to create your own custom composition, and you'd be able to put these down and then pin them in place just like you would a full negative, but in this case, you're going to get actual Inkodye colored lines in between the pieces of your negative to create what I call the broken glass effect. So this is a whole other way to take a negative and continue altering it until you create a really custom piece of art. The other thing you can do is cut your negatives and combine techniques. So I cut this negative of a cityscape and I cut the black background off. Again, this would be white in the original image, but turned into black because of

the negative. So I cut it right away, and then I used this as a template for cutting this plastic doily out in the same shape. What I got was this print, made using Inkodye copper. This is now a cityscape with a plastic doily as the sky. So this is a very mixed media technique of using photo printing plus shadow printing to create one composition. This is a print of a woman made using this negative. Then I decided to get another kind of mixed media technique going on where I use an opaque paint marker to draw this design on blank transparency. So this is a bunch of little plus signs made using a Deco color opaque paint marker, just on transparency film. By combining and layering these two negatives, I made a really unique print that looked like this. So you can see the difference between the two women. This made just using the standard negative, the standard photo negative, and this made using by layering the negatives, a photo negative plus the drawn transparency. If you're looking to do an all-over print, or a larger print, you might be interested in getting a large negative. The easiest way to do this is tiling. That's how we created this shirt. The image itself is much larger than you can get from a 12 by 12 negative. But the way we created it is through tiling 12 by 12s. So you can see here, I've actually already pre-cut the clear edge off of these. When you get these from the Lumi app, these are four negatives ordered through the app, and when they arrive to you, they have a clear edge to them. I've cut that off, you can use scissors or an exacto blade, and then I butt them up right against each other and used clear scotch tape to tape them in place. I've already done three, but I'm gonna do the last one together. So you just be careful to align them right to each other, and then just use a small piece of clear tape to hold it in place. The tape will not really cast much of a shadow, so it won't really show up on your final prints. And you're just looking to use enough to hold these negatives together. In order to make your image into tiles, you'll need to use an image editor, like Photoshop or a free online image editor. You'll decide on the final image size that you want to use and then you'll slice it up into printable tiles that you can either print through the app at the 12 by 12 inch size, or print at home at the 8 1/2 by 8 1/2 inch size right onto Inkofilm. Creating custom clothes using photographs is originally what drew me to create this process. There's something so magical about watching an image develop out in the sun and about making one of a kind prints in your own backyard without any expensive equipment. Inkodye prints are actually dyed into the fabric, so they have no feeling to them unlike a silkscreen print, which sits on top. With this process, you have a print shop in your own backyard. You can make permanent prints, and all you need is a bottle of Inkodye and a bit of sunlight.