
Pattern Drafting: T-Shirt with Cal Patch

Chapter 1 - Introduction

Overview

- T-shirts are one of the most universal items of clothing. So, today we're going to learn how to draft a pattern for a basic T-shirt. The first thing you'll need to do is take some measurements. ^So why don't we grab our tape measures and go and do that.

Chapter 2 - Materials

Materials

- In front of me are the supplies you're going to need. You'll need a pad of paper. Just plain old drawing or sketchpad paper. I like an 18 by 24 inch pad because it's a great size to work with and most of your pieces will fit on it easily. You'll also need just a regular old pencil with eraser, a sewing ruler which is the clear kind that's two inches wide, 18 inches long 'cause it's really easy to work with, nice and lightweight and flexible. You'll need a pair of regular scissors for cutting paper. You don't wanna use your sewing shears for that because you'll dull the blades. You'll need a tape measure for taking measurements and optional but helpful is a hip curve like this. It's useful but I wouldn't rush out and buy one right now. You may also need some transparent tape in case you need to put two pieces of paper together. So let's go take our measurements.

Chapter 3 - Draft Pattern

Take measurements

- Before we begin drafting our T-shirt pattern, we're going to need to take some measurements, so either measure yourself or grab a friend and you can make a T-shirt for her. So the first thing you'll need is a length and we're gonna take that measurement from a spot called high shoulder point, which is actually where your shoulder line meets your neckline. It may not really seem like an exact spot on the body but it's going to be where the T-shirt reaches its highest point. So we're going to measure from high shoulder point straight down to wherever you want the T-shirt to hit. So, let's say 23 inches. Next we'll do the bust measurement, so if you could raise up your arms. You want to measure around the fullest point. Make sure you're holding the tape measure parallel to the floor, and that's your bust measurement. Then we can slide down to the waist and in this case, we can go for the true waist, which is probably a lot higher than what you normally think of as the waist. So, the smallest point. And then, for the hip measurement, you're going to go down to wherever you decided you were ending the T-shirt. So it may or may not be exactly at the hip. We said 23 inches for our length, so that was about down here, so you can measure the body at that point. Then we can go up and measure our shoulder width and so that is going to be from point to point, straight across the shoulders. If you're wearing something with shoulder seams, armhole seams, you actually wanna measure from seam to seam. Just make sure that the seams you're measuring are in a good place. If they're a drop shoulder or too far in, it won't work, so you're really deciding where you're going to place the seams on your T-shirt. So this is a little bit of a design choice measurement but I'm gonna go with 14 here for Julie. Then the next measurement we need is a neck width, so this one is again, a straight line and it's from where you want the width of the neck to sit on her shoulders. This one you might just sort of look and decide or if the shirt she's wearing is a good example, I'm gonna go with nine inches for our neck width, but it's really up to you how wide you wanna make

your neck. Then we need a neck drop, so that again, thank you, is from high shoulder point, straight down, and you wanna look at center front and kind of figure over from there how low the neckline is going to be. You don't want to hold it at an angle, 'cause that's gonna make the measurement too long, so it needs to come straight down but I need to eyeball over from the center, how low we're getting for the neck drop. Next we need to figure out how far down the waist was from high shoulder point, so we're gonna again start from the shoulder and measure down, and just figure approximately where it was you measured the waist, and we'll call that one waist down from shoulder. So let's say that was about 14 and a half. And that's all of our body measurements but we still need to measure for a sleeve. So, from the top of the shoulder, we're going to measure how long you want to make your sleeves down to the wrist. So let's say 21. And then we'll also need a bicep measurement, highest part of the bicep, just under the armpit. Wrap the tape measure around and get your circumference there and then, the last one is our wrist measurement. So this one it's usually good to add a little bit of extra because a sleeve is rarely going to fit super close to the wrist. You want to make sure you have room to get it on and off over your hand. So let's say something like seven and a half. And that's all the measurements you'll need and we can begin drafting our T-shirt.

Calculate measurements

- Before we start drafting, we need to take a look at our measurements and do just a little bit of math. So we have our bust, waist and hip or hem circumference, which is the same measurement. Those three are full body circumferences. So we need to divide them by four. I like to circle those after I've done that 'cause that's the number I'm going to be using. And I'll refer to those as quarter bust, quarter waist and quarter hip or hem. Then there are a few that we need to divide in half, like your shoulder width that wasn't a full circumference, it was just a half measurement. So we're dividing that by two. We had 14 and that gives us seven. And then we want to also divide the neck width by half. And then also the bicep and wrist measurements are divided by two, so we have half measurements there. There's also one additional measurement that we didn't measure on the body because it's kind of tricky and that's the armhole height for a medium-sized t-shirt, I'm gonna give you a measurement of about seven and a half. You can adjust a quarter to a half inch up or down from there if you're particularly small or large, but that's probably a good place to start. It's just the height of the armhole, not around the curve, so it's good at seven and a half. Now we're ready to begin drafting.

Draft your pattern

- We're ready to start drafting our pattern. I just want to point out that I'm going to be using a pen today 'cause it'll show up a little better for you to see. Normally, though, I would be using a pencil so I can erase any marks I make that I don't like. I'm gonna designate the left side of my paper as center front, so I'll label it CF for center front, and I'm going to start by making a mark right up near the top of the page, just to indicate the top of my shirt. The length of my shirt is going to be 23 inches and I saw that I didn't have enough paper, so I've added on some at the bottom with a piece of tape. So now I can measure down the length, I've got 18 on the ruler and five more gives me 23 inches. So now I have the top and bottom marked and I know that my T-shirt pattern is going to fit on the paper. So I can go up to the top of the paper and at my mark is where I'll plot my half-shoulder line, which I see is seven inches, so using my ruler to find perpendicular, I'm going to draw a line exactly seven inches long. And then, down at the bottom is where I'll draw my

quarter-hip line, and that is $9 \frac{1}{4}$ inches, so $9 \frac{1}{4}$. Next, I have my waist line and I have a measurement called waist down from shoulder, that's 14 and a half, so that's how I will determine where to draw the waist line, marking $14 \frac{1}{2}$ right along center front and there, I'll plot my quarter waist, which is $7 \frac{1}{4}$ inches. Okay, so I have three of my main horizontal circumference lines. The last one needed is the bust, and you might wonder, "Where do I put the bust line?" It's actually at the armhole height. So I'm going to mark $7 \frac{1}{2}$ inches down and that's where I can place the quarter-bust, which is $8 \frac{1}{2}$. Now we can connect the dots for three of our lines, connecting the bust line to the waist and the waist to the hip. So we're making progress. We've got the beginning of our pattern and now we can begin to address the armhole section. Before we begin drafting the armhole, we need to give our shoulder line a little bit of slope. Right now, we have it drawn so that it's a horizontal line parallel to the floor, but our bodies have shoulders which have a little bit of an angle to them. So we're just going to add $\frac{1}{4}$ inch of shoulder slope to the shoulder line. Our half-neck width is $4 \frac{1}{2}$, so I'm just making a little mark there, and then we need to give our shoulder line a little bit of slope, so I usually just go up $\frac{1}{4}$ inch and make a mark. Then, I can connect that mark out to the shoulder point like that. Now I've got a little bit of slant to my shoulder and I can proceed with the armhole. The armhole is going to utilize the principle we learned in Pattern Making One, which is that all of our corners need to be square. So I find if I just start out by beginning and ending the armhole with 90-degree angles, it's a lot less intimidating to fill in the curve in between. So up, using the ruler to find 90 degrees from the slanted shoulder line, I'm just gonna give myself a little bit of a starting line. It doesn't really matter how long it is, it's just giving me an indicator of where 90 degrees is. Same thing down here at the armpit, I'm finding perpendicular to my angled side seam, holding the ruler there and just giving a little bit of a line to start off the armhole. So, to draw in my armhole, it helps if you have a little bit of previous experience with sewing patterns and you know what an armhole looks like. I can give you a little preview is that it's going to look something like this, basically, most of the curving is happening in the lower third of the armhole area and the upper $\frac{2}{3}$ is going to be not too far off from a straight line. So if you have a hip curve handy, you might try to use it or you can also feel free to just freehand this. So, I think something like that looks pretty good. I'm gonna go ahead and draw it. Maybe I will clean up this line to connect it a little more smoothly. So the line that I just drew is starting and ending on the 90-degree angle lines that I gave myself at the beginning. And that's our armhole. Next, we'll draw our neck line. We're going to need our neck drop measurement which is seven inches and you can mark the neck drop on your pattern right at center front. Now you might notice that, since we did raise the shoulder line up $\frac{1}{4}$ inch, technically, we should begin measuring from $\frac{1}{4}$ inch above the shoulder line. But if you didn't notice that, it wouldn't really make a big difference. So I'm marking my neck drop of seven inches, and then I can give myself a little bit of a 90-degree angle to start off the neck line, and the same thing up, coming from the shoulder, I'm gonna just give a 90-degree angle to start off the neck. Now I just need to connect with a curve in between those two points, so let's see if the hip curve is gonna help me there. And it looks like something like that will be very helpful, and I'm just going to flip it over to complete the curve. So there I've got a nice, gently-curving neck line. It is important that it intersects at center front with a 90-degree angle again, otherwise you'd have a V-neck, which is fine except that they're a little bit tricky to sew. Before we proceed to the next step, I need to explain a concept to you. On a garment, all of the corners need to be 90-degree angles so when you have an intersecting seam like this, your hem line is still going to be a straight line. If this was not square, if it wasn't 90 degrees like that, we would have a point either down or up at the intersection of the seam, so we need to adjust our pattern so that this angle, which is not

square, becomes 90 degrees. So let me show you how to do that. To begin squaring our lower corner of our shirt pattern, we need to divide the hem line into thirds and make a mark about 1/3 of the way over from the side seam, and then take your ruler and hold it perpendicular to your angled side seam. Slide it down until the ruler meets the mark where you marked 1/3, and then you're gonna draw a line across. So now I'm drawing a line across. Now we've squared that lower corner and all we need to do is blend this section into a little bit of a curve so it's a nice, smooth line and not two straight lines connected by a corner. Then we can do the same thing at the hip point, just blend it into a nice, gentle curve. Hip curve is helpful for this, but if you don't have one, you can just use any curved item you have laying around or just freehand it is fine, too. Okay, that looks much better and our T-shirt pattern is pretty much done. We just can go ahead and add our seam allowance.

Add seam allowance

- I like to use a 1/2 inch seam allowance. That's what the clothing industry uses and it's also really easy to find on your ruler because you'll see that it's a heavy blue line, so I'm going to line that line up with the seam line that I've drawn and follow along at half an inch. When I get to this curved section, I'm going to keep fending the ruler, so that I am accurately reflecting the curve, but a half inch over. And back to the straight line here, I can just finish that off in one fall swoop. So, I needed to add seam marks to the armholes also half an inch, making sure that I keep my corner nice and square, just like the actual corner of the seam line. You might also find that on a curve, it can be easier sometimes to just mark a dotted line by holding the ruler perpendicular. Whichever method seems more comfortable to you is fine. And then up where it gets straighter, you can do it continuously. Your shoulder line's a straight line so we can just do that easily, and for neck lines, I usually just add a quarter inch, because you're probably going to be sewing a binding onto it, or some kind of finish that doesn't require a whole lot of seam allowance. So, standard procedure is to just add a quarter there. If you feel like you need a half inch, go ahead, but usually a quarter's going to be enough for most neck finishes. And then, moving back to the hemline we can use a full inch of seam allowance down there, so that we have enough to do a double turned hem. I like to do a half inch and half inch double turned, but if you have a different preference for how you like to hem, it's totally up to you. You're the designer. And we're done adding seam allowance so we can move on to the back pattern piece.

Chapter 4 - Finish Pattern

Create back pattern

- Our back pattern piece is going to be nearly identical to the front. So I've cut out my front piece, traced it onto a new piece of paper, and I can take it away and this is what will become the back. I can label center back just so I know. And all I need to really adjust is the neckline, because that's the only part that is different for the back. So to begin drawing the back neck, I'm just going to find my original shoulder seam line, because it needs to join up with the front at that point. And I need to establish a back neck drop. And this isn't really something we took from our body measurements, because it's not a very, it's not really something you can measure on the body, and it's not a very exciting design decision. Gonna find my shoulder line, which I just now, I can follow over from the shoulder point. So my back neck drop can probably be something like one to two inches. I'm just going to go with one and a half. We really, the back neck just kind of is there to keep the shirt on. You can make a lower back neck drop if you feel like it, but then the shirt tends to have a tendency

to slip off the shoulders. So going to give myself a little bit of 90 degree horizontal there, and I've got a corner there, I just need to blend one line to the other. I'm gonna grab my hip curve. See if it'll help me make a nice curve to connect those two lines, something like that looks good. Just gonna draw that in, and there's my back neck line. Clean that up a little. And then we just need to add our quarter inch seam allowance, so that the seam allowance line will also join up with the front neck seam allowance line. And there's our back t-shirt pattern.

Create sleeve pattern

- We're almost done with our T-shirt pattern. We just need to make the sleeve. So I'm going to do that on a folded piece of paper. The reason why is that we need to make a complete sleeve pattern, because when you cut it out, you'll want to cut two sleeves, whereas the other pieces we only need one each, so we do them as half patterns. So I've got my folded paper, fold is on the left side. And I am ready to start drafting the pattern. So just like usual, I'm going to make a mark near the top of the page. And then measure down my sleeve length, which I have as 22 inches. And mark that on the fold as well. So I've got a mark indicating the top and the bottom of the sleeve. So now I need my half-wrist measurement, which is three and three-quarters. And I'm going to plot a line perpendicular to the fold, three and three-quarter inches long. In order to draft our bicep line, we need to first determine our cap height. The cap is the top part of the sleeve pattern, which will become sewn into the arm hole of the body of the T-shirt. So the cap is sort of shaped like an S curve, and I use a formula, which is two-thirds of our arm hole height, to determine the cap height. Our arm hole height was seven and a half, so something like four and three-quarters will work fine, and we can go ahead and start drawing that out. You may or may not know that the shape of a sleeve pattern looks something like this. I tend to think of it as sort of like an ice cream cone. And the top part here is what we call the cap. We're just drafting half of the sleeve pattern. So the cap seam that we're about to draft is going to look like this part right here. And from here to here is what we call our cap height, and that's we've determined by figuring two-thirds times the arm hole height. So we're gonna use four and three-quarter inches from our arm hole of seven and a half. So now we can draft our cap. So we've determined that the cap height is going to be four and three-quarters. Gonna mark that there. And that's where we'll plot our half bicep width, which is six and a half. So here's my bicep line, six and a half inches, and now I can connect the bicep point down to the wrist point. So we can connect the dots, bicep point to wrist point. And we're ready to draw in this curve of the cap. As usual, we need to establish square corners to start off, so we'll put one up at the top and down at the armpit, you're going to give yourself 90 degrees from your angled underarm seam line, which is what this is here. All we have to do now is connect from this to this in a nice, gently sloping S curve. I'm going to sketch it out because you may not be as familiar as I am with what the shape should look like. Something pretty much like that. You want a nice full curve on the top half, and then a gentler curve on the lower half, but it's approximately a flattened out S curve, something like that, so let's see if I can fill that in a little better. It might take a little practice, but you'll get the hang of it. You've drawn your sleeve cap, but to some degree at this point, it's really just a guess. So now I'm going to show you how to check that it fits into your arm hole and make corrections if necessary. You'll wanna take your tape measure and measure along the seam line exactly. It helps to hold the tape measure up like this so you can really bend it and get an accurate measurement of the curve. So I'm getting about eight and three-eighths there. Write that down on your pattern. And then you wanna go back to your T-shirt front arm hole. And do the same thing, just on the seam line. You don't wanna measure the seam allowance, and you don't wanna

extend all the way to the end of the seam allowance. You just stop right at the seam point. So that's getting about eight and five-eighths. I am a quarter inch bigger on the arm hole than I am on the sleeve cap, and that's not going to work, so we need to make a little bit of an adjustment. Ideally, you'd either be the same on both, or it's fine to be up to a half-inch bigger for the sleeve cap than the arm hole because you can always ease that amount in. You don't want an arm hole that's bigger than the cap, though. So what we're going to do is just beef up the curve a little bit, and try to get a little bit more length there. It's also fine to raise it up just a little bit. And if you want, you can even add a little bit down at the bottom. So let's try measuring this again and see what we get. And it looks now we're at eight and three-quarters. So we're all set, and we just need to adjust the wrist and add seam allowance, and then we'll be done. We need to adjust our wrist seam line, just as we've done on the other lower corners of our pattern pieces. So I've found the third mark of my wrist line, and I'm lining up the ruler with your angled underarm seam line. Slide it down until you hit that point. And then trace around it. And there we've corrected that corner so it's 90 degrees. And this is really just a slight angle, but we can just smooth it out and do a little bit of a curve. And now we can add our seam allowance. So this entire underarm seam is just one long straight line. Easy to add our half inch. And we just carved it out a little bit at the top. Up here, we can use the dotted line method to follow the curve. And you can go back and fill that in with your pen or pencil, or you can even just cut on that line. Let's just make sure we have a nice clean corner here. Okay, and then down at the bottom, just like on all of our pieces, I put a full inch of hem allowance so that you can do a nice double turned hem. And our sleeve is done.

Label pattern pieces

- Our pattern pieces are finished. We have our front t-shirt piece, our back, and our sleeve. All we need to do now is label them and then we're ready to make a t-shirt. So I'm going to use my ruler to make a line parallel to center front that will become my grain line. Some arrowheads to indicate that it is the grain line, and then I can use that line to label. So we can call this t-shirt. The piece is the front. This time we've got one of three, and our cutting instruction would be cut one on the fold. And you might want to use this symbol to indicate that center front is the fold line, just to reinforce it. You'd label the back exactly the same way. And then the sleeve, the center fold is going to be your grain line. So you may just want to fill it in so you can see it better. The grain line is what you'll use to determine your correct placement on the fabric. The grain line will follow the lengthwise grain of the fabric, which is the direction that's parallel to the selvage. Selvage is the woven edge alongside a piece of fabric, so if you order, well if you buy three yards of fabric, the selvage will be the three yard long edge, as opposed to the cut edge, which would be your cross grain. So this piece is t-shirt sleeve. I'll call this three of three, front was one, back was two, and the sleeve is three. And this time we have a cutting instruction of cut two. And this is our first piece that will just be placed in the middle of the fabric and not on a fold. Everything else so far has been on the fold. You've made your first t-shirt pattern, and now you're probably really excited to make your first t-shirt. So let me just give you a few tips on how to proceed. We made this pattern thinking of it as a knit, and so you'll want to be sure to use a knit fabric for your muslin. Knits have a lot of stretch, so you're going to need to use seams that stretch. I would suggest either a stretchy straight stitch on your sewing machine or a narrow and short zigzag, such as one millimeter by one millimeter. With those tips, you can probably go ahead and test out your pattern and see how it fits.