Metalworking will probably be one of the biggest aspects of body work as well as one of the ones that really requires experience to master. I'm still in my infancy in knowing what I need to know about it, but I'll try and touch on everything with a little info of what I've done, seen or heard. Luckily, in my years as a CNC machinist I learned a ton about metallurgy and how metals react to things like heat, impact, etc.

Basically, the two things you'll need to consider when dealing with automotive sheet metal are impact and heat. Impacts, whether they be a door ding or made by your body hammer, will affect the steel in certain ways. Impacts tend to stretch the metal. In the typical dent, there will be the low spot of the dent and also a high ring around the top. Even if you hammer and dolly the dent flat, it likely will still be stretched and have a high ring around it still. Although looking mostly flat now, the metal is still not in it's perfect state. You may notice the dent area has the oil can effect where you can push the area in and out and it will pop similar to the old style oil cans, or a released safety button on the top of a can of corn. The metal reacts this way because it is stretched and loose. This is where heat comes in. By heating it up and letting it cool naturally, or sometimes with quenching, the metal can be shrunk back into a tighter configuration. Of course, you'll also want to be careful not to shrink it too much, as it can become brittle, or possibly warp other areas of the panel if you pour too much heat to it.

Depending on the level of your project, you may approach your metalworking differently. If you're doing a nice makeover but nothing special, you may just want to beat things around a little to get things as straight as possible, maybe shrink any oil canning and start on your filler work. A more thorough project may require you to get your metal near perfect. Of course, it takes practice to get perfection, so if you want perfection and this is your first time, you better have patience and plan on re-doing stuff. I have seen guys who can take out a basketball size dent on a body line with creases, and with the right amount of dent pulling, hammer and dolly work, heating and shrinking, were able to get the dent out enough to be smoothed out perfect with filler primer only. I can't come close to that so I always plan on using a little filler- never more than 1/8" thick though.

Working with metal by impact:
Pulling out the low spots with a puller or other method will be needed, and again, hammering and dollying take practice to get right, but once you experience how it works, it's not hard to do. Having an assortment of body hammers and dollies will help you work different dents in different areas. Harbor Freight sells a decent starter kit. I have about 8 body hammers each can serve a certain purpose, but there are some I use more than others. I like the one with the pick on the back, the one with kind of a ball on the back and a square/round head one. You can hammer down high spots if you want but doing it without a dolly will stretch it more. Even using a dolly will stretch it some too.

Dent pulling- You don't want to be laying on your fillers an inch thick, so you'll be needing to pull the dents as flush as possible. Many times when you can access the back of the dent, you can hammer them out or pop them out with your hand. Otherwise, you can pull them out with some sort of puller. The suction cup extractors can work on some minor dents, but are mostly junk. There are some that will use either a screw and slide hammer or a stud welder and slide hammer. If you use the screw kind you will need to have a plan to fill the holes left behind. Optimally, with a welder, but fiberglass filler can work as a last resort. Never pull your dent higher than the surface it was supposed to be at. Having to deal with a little filler work is easier than messing with a bunch of high spots.

Hammer on dolly- This works good for the smaller dents and dings. If you can access both side of the panels easily the job will be much easier. You'll want to pretty much use the dolly as support and then tap everything smooth as possible. Be careful though, if you are beating the steel to where it makes a *tink* sound when you're hitting the dolly, you're beginning to stretch things.

Hammer off dolly- This can be used on the bigger stuff, again using the dolly where you can for support and hammer things into place as close as you can. Place your dolly on the backside of the low spot in the panel, then tap with the hammer on the high spots surrounding the low. Many times you can use this to get things close enough overall to go around and get some areas even closer with the hammer on dolly technique.

Hammer alone- I rarely go this route, but it can be used successfully for tapping down high spots if you're careful and plan on using fillers. Again, all these techniques take practice before you really know how to use what.

Working with metal by heat:
This is another process that takes lots of practice, more so even than impact metalworking. Heating thin metals can quickly get away from you if you don't know what you're doing. Sometimes you'll have some warps left over from welding that can be reheated and worked to lay better. Sometimes, especially when doing some custom mods, you actually can use the heat and warping to your advantage once you know what you're doing. Unfortunately, I have the least experience in metalworking with heat, so I can't give much info but here's some of what I've seen.

Heating and cooling naturally- This can be used to basically get lightly stretched metal to go back to its original state and shrink up a bit. You can also heat op the metal a bit and work it with a hammer and dolly if needed to kind of massage any tricky areas. You'll want to get the metal to where it's just trying to start glowing and not much more, otherwise it will really start to move and warp.

Heating and quenching- Pretty much used the same as above, but you cool it by quenching it with water to make it cool much faster and shrink much more. You may heat the metal slightly more in some applications too.

You can use torches to heat, which is the most common. For some small areas you can use a stud welder gun to heat an area to tighten it up.

Metalwork for custom applications:
Once you understand what it takes to work metal around with heat, impact, and welding, then you have a great basis to start doing some cool stuff. I've made some custom header panels for SQs and have also had the chance to do some cool mods at work. With enough practice and patience, you can make whatever you can come up with. Maybe you want to make your own scoops or cowl hood for your car, or maybe you want to smooth out some corners. The best way to approach the mod is to at least try and draw out what you want. The next thing I like to do is to kind of build what I want out of cardboard and tape. This can give you a good visual idea of what you'll end up with before wasting time on something you determine isn't going to work. Plus, if you decide you do like it, you have something to use as a rough pattern when you cut your metal pieces. You'll want to consider if you need some sort of frame work underneath the pieces you add. Many times you can bend and weld in a basic frame made of 1/4" round stock, then weld your panels to that. That is how we added this side scoop and contour down the side of this 1960 El Camino.

Also always make sure to make your pieces symmetrical if you are doing any mods that are duplicated from side to side. Another thing that's good to do before any mod is to go to a metal recycling place that sells scrap pieces. You'd be surprised what kind of cool things you can find that can help you. You may find pre pressed pieces that have the exact contour you're looking for without having to form your own panels by hand. With some creativity, the right resources, some patience and practice, the sky is the limit with what you can come up with.