Fish Key Holder

Materials:
- 18 gauge sheet steel
- 1/4" steel rod (1.5 feet is enough)
- Rivets

Material cost: $8 (with plenty of leftovers)

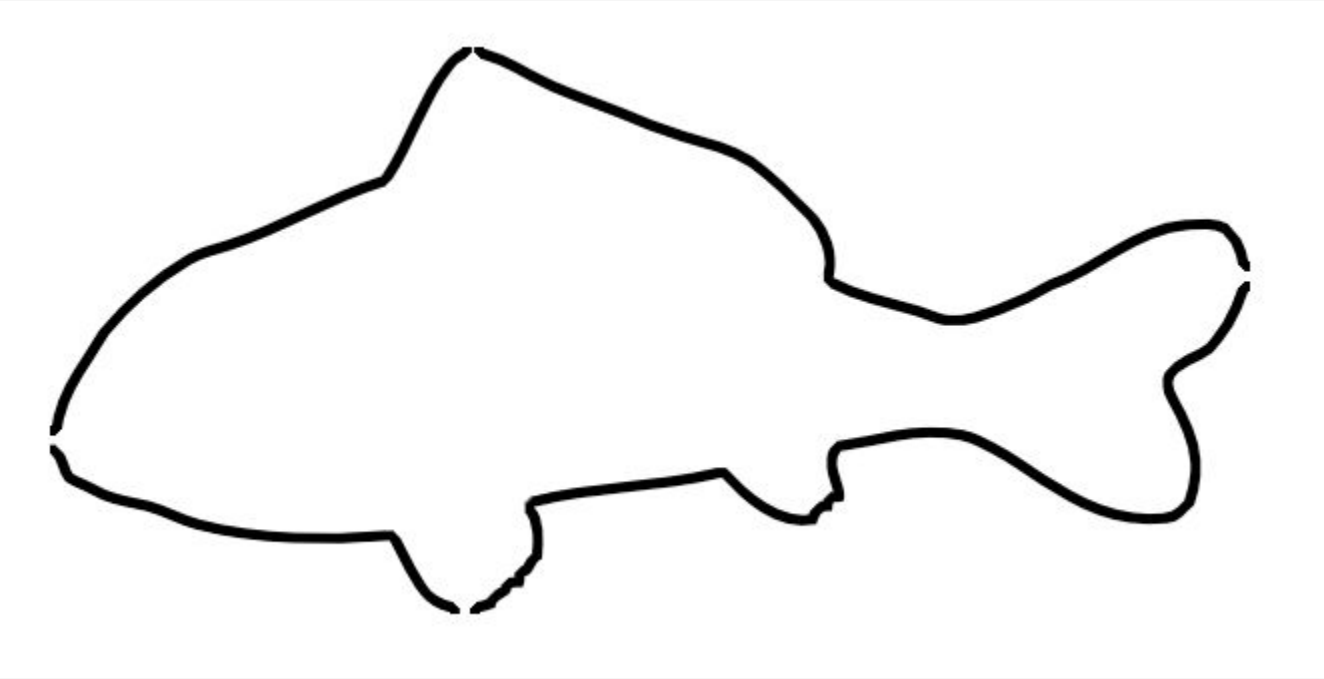
Safety Equipment:

- Thick gloves
- Goggles
- Ear Protection
- Long Sleeves and Pants

A shop apron is probably a good idea, and a well-ventilated area is a must.

Tools:
- Ball-peen hammer
- Anvil
- Pliers
- Tin snips
- Blowtorch
- Drill with 1/8" bit
- Bucket of water
- Vice
- Tape
- Scissors
- Nail for scratching
- Wet cloth
- Locking pliers
- Center punch
- Scrap leather
- Cutter
- Spray-on clear coat sealant

Step 2: Starts with a Plan



We need to start out with a good plan, something that will look cool, but also be possible with our materials and tools available. I found a photograph of a dead fish on the internet, and using Photoshop, erased the background and altered the fish so that all that was left was an outline. You can just as easily print the whole picture of the fish and cut him out with scissors, but my method saves me ink. :)

Print and cut out the fish shape using scissors.

Step 3: Cutting Out The Metal

Now that our pattern is cut out , we need to tape it down so that we can score the metal around the perimeter of the shape, so we have a design on the metal to follow with our tin snips. Tape the fish cutout to the steel, and use the sharp nail or other metal implement to scratch the outline of the fish shape onto the metal. Peel off and discard the paper fish.

Using the tin snips, we are going to cut out the basic shape of the fish. Chomp roughly around the fish shape, freeing it from the rest of the metal sheet. Now, carefully cut along the outline of the shape we want. When using tin snips, its a good idea to not ever close the jaws fully, as this tends to bend the metal at the tip of the jaws. Just inch along using the middle of the blades to cut the metal. Let the excess metal curve upwards as you cut along the outline.

To cut out tight spots, snip into them from both directions, and when the excess is held on only by a tiny bit in the corner, grab the excess and twist it with needle-nose pliers. Then, file the corner to remove any remaining excess.

Step 4: Smoothing The Edges

You'll notice the edges of the fish are razor sharp, and the shape is likely warped. Place the fish on your anvil and hammer it lightly so that the whole fish is flat again. Now, hammer along the edge of the fish shape, which will take the edge off the metal. You'll see it getting smoother, and you'll be able to feel the edge becoming smoother. Flip the fish over and repeat on the back side. Use a file to remove any metal burrs or sharp bits protruding from the metal. The photo below is from a different project, but the material and result is identical.

When you're satisfied that the edges are no longer extremely dangerous, continue to Step 5.

Step 5: Crafting The Hooks

For this key holder, I decided to make my own hooks. To attach them, I wanted to hammer the end of the hook partially flat, then drill a hole through it and rivet it in place on the fish.

Start by taking one end of the rod that I bought and heating it to cherry-red with a blowtorch. Wear gloves as this rod will get hot over time. When its a bright red, place it quickly on the anvil and hammer the tip of it firmly so it begins to flatten out. You will immediately see it flatten into a flat-head screwdriver type of shape.

Now, clamp the rod horizontally in the vice. Take a hacksaw and saw through the rod at about 3.5" from the now-flattened end.

Grip the flattened portion of the hook in the vice, vertically, so that we can soften the sawed-off tip.

Heat the tip using the blowtorch to cherry red. Strike downward on the top of it a few times, and it should become slightly squished and slightly wider. Remove it from the vice and while holding the flattened portion in pliers, hammer the end of the hook so that it becomes rounder and much less sharp, with no sharp snags sticking out anywhere. When the shape is the way you want it, drop the hook into the bucket of water to quench it.

Step 6: Crafting The Hooks, Cont.

Right now, the hook isn't much of a hook. Its straight.

First, grip the hook tightly in a pair of pliers, or use a pair of locking pliers to make sure the piece doesn't get away. Take the blowtorch, and heat the rod about at about 1/3 of the length from the non-flattened end. The rod should be glowing from about the first 25% of the length to 50% of the length.

Holding the rod so that one of the flat faces of the end is facing upwards, place the rounded tip on the anvil and strike the rod at the heated portion so that it bends. You will probably only get a 90 degree bend out of it before it cools too much. Heat both sides of the bend and continue bending, using the horn of the anvil to get a gradual bend and not a sharp "kink" in the metal.

If the results are unsatisfactory, heat up as much of the hook as possible and use the horn to bend it back open,

then hammer it back to fairly-straight by rotating it and hitting it against the face of the anvil. I had to do this once and start the hook bend over again.

When the hooks are exactly how we want them, take a center punch and mark a point in the center of the flat section of the hook. Using that punch mark, drill a hole slightly larger diameter than the diameter of the rivets we have. In my case, i had 1/8" rivets, and a 1/8" drill bit, so to make them fit I just rotated the drill in the hole slightly to remove a little more material.

My hooks did not turn out very equal, each one is quite different in size and curve. This is partly because I wasn't sure how to long to make the first one, so I made it while it was still connected to the entire length of the steel rod, then I cut it off after it was fully shaped. Then I couldn't get a very accurate measurement of the first hook's total length for the other ones. I winged it, but using a 3.5" section should work the best, and if all your sections are pre-measured, your hooks will turn out nicer than mine.

Step 7: Texturing the Fish

Using our 1/8" drill bit, mark with the center punch and drill four holes across the lower portion of the fish's body. I spaced mine at even intervals. Just measure your fish's length and divide by 5 to find the number you want to space them by. The fish's tail may govern where you put the last hook. Drilling the holes for the hooks now will be easier than later.

I didn't put any holes for mounting to the wall because my girlfriend probably won't be allowed to put holes in the wall of any apartment she rents, so using two-sided tape is probably the only bet for it. You can certainly drill one or two holes for wall mounting. I would put one in the top of the head and one below the rear of the top fin. Just make sure they're level.

Right now, our fish is a terribly boring piece of metal. We are going to texture it using the hemispherical side of our ball-peen hammer. Using a piece of leather over our anvil face, hammer the fish firmly, keeping your hits evenly spaced, to create the texture you see below. Flip the fish over frequently, as it will curve from the hammer. When you have the texture you want, remove the leather and use the flat face of the hammer to gently flatten the fish so that the overall shape is a heavily dimpled but flat fish

Step 8: Riveting

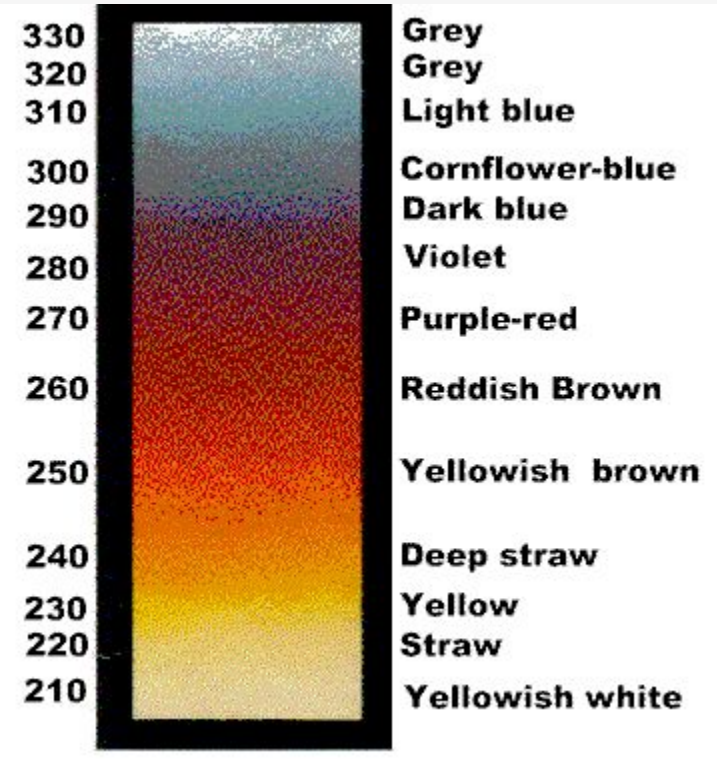
Place a hook over the hole in the fish so that they line up, and put the rivet through the holes. Flip the fish over, then take your cutters and clip the rivet so that only about 5mm (just under 1/4") protrudes from the back of the fish.

Using the flat face of the hammer, with the fish front-down on the anvil, hammer directly down on the protruding rivet. Immediately it will begin to flatten and pan out. Make sure the hook is lined up straight, and as the rivet starts to get close to the metal, flip the hammer over and hit around the rivet to dome it over and tighten up against the metal.

Holding the fish in your hand, you shouldn't be able to rotate the hooks with your hand. If they aren't firmly held in place, keep hitting the rivet. Also hit the rivet from the front side to tighten it up.

Repeat this for all the hooks.

Step 9: Flame-Coloring



For this project, I wanted to give the fish some nice colors whilst still maintaining the reflective color and visible texture of the metal. To do this, I used a technique called flame-coloring.

Steel, at varying degrees of temperature, changes color from its normal shiny grey, to gold, red, purple and blue in that order. The guide below shows the color progressions and approximate temperatures.

To mask the fin from receiving too much heat and changing color, I took a piece of old cloth and dipped it in water, and placed it over the fin during the flame process. The cloth helps keep the temperature of the steel beneath it low enough that it doesn't change color.

Using a blowtorch, gently run it back and forth over the part of the metal you want to color. Be careful and take your time; the colors can come unexpectedly and don't stop changing immediately when you remove the heat. The color is also permanent, so being patient and taking your time is important. You may want to try it on some scrap pieces from the cutout process. To get large bands of color, hold the torch closer, and for total even color, hold it farther away. Make sure you hold the metal in pliers, and wear gloves, as the metal will get extremely hot and your pliers will also heat up.

When the colors are how you want them, don't quench the piece in water. This may alter the colors and take away their luster. Place it in a freezer for a few minutes and it will cool down to room temperature.

For more information on flame coloring, take a look at my other Instructable Flame Coloring and Making a Steel Flower:

Step 10: Clear Coating

The fish is complete, but we need to protect the bare steel. Without a clear coat, it will rust in the air within days, tarnishing it forever. Clear coating should be done as soon as the piece has cooled from the flame-coloring process.

Place the piece on a bed of newspaper, or hang it up if you are so fortunate to have a paint booth. Using a spray can of clear coat (I used Tremclad Clear, designed for use as a metal sealant) spray a generous layer onto the front of the fish. Make sure to get all over the hooks, as any missed spots will rust over time. After an hour or so, when that layer has solidified enough to be handled, flip the fish over and spray the back, making sure the get into all the spots on the hooks. When the back has dried sufficiently, flip it over again and do the front a second time. This time, leave it to sit for 24 hours in a dry, cool place so that the clear can harden.

Immediately, we can see that the colors are must more lustrous and the texture of the metal is still very viewable through the clear coat, and the fish has a highly reflective wet appearance when viewed in the light.

Step 11: The Finished Product

There you have it, a functional set of hooks for holding keys, necklaces or any objects you can think of. You could even scale the project up bigger and make a coat rack, but be sure to screw it into a sturdy wall stud.

Naturally, you don't need to make a fish for this project, any animal or creature can be re-created in 2D steel and have hooks attached to it for a quaint, cottagey, handmade decoration that's also completely useful and functional.