INTRO

First of all, this is my second instructable, so don't be to judgy please.

Ok, here's the thing; I have a two year old daughter and she absolutely adores animals. Her toy animal collection by now is 57 animal toys and counting. By the time I finish this project, that number will probably be much higher. Our favorite TV channel is NatGeo Wild and we watch it together when we can. Since she likes to play with her toy animals, it seemed that the only logical step for me is to make a certain habitat for the toys. I wanted it to be big enough, to be sturdy enough and toxic free, from mainly natural materials.

Since the number of Africa dwelling animals is the highest in her collection, I will start with that. I wanted to make a suitable "toy" for a two year old, not to spend too much, and use as much material from my household.

So, let's get started.

First of all this is a long and repetitive process, so if you are in a hurry, don't even start it.

Materials and tools:

- **base (I used plywood)**
- **Styrofoam (fine granulated)**
- **toilet paper (TP)**
- **paper towels (PT)**
- **old newspaper**
- **scissors**
- **pliers**
- **wire (I used copper)**
- **PVA glue (water based)**
- **blowtorch (optional)**
- **knife**
- **Accu drill (optional)**
- **brushes**
- **masking tape**
- **fine granulated sand (quartz sand)**
- **wood putty (acrylic)**
- **primer (acrylic)**
- **paints (acrylic)**

PROJECT AFRICAN SAVANNAH

PART 1: DIORAMA

Firstly I have to apologize for not taking photos of first three steps. I simply forgot. So here's a quick recap. Get a base.

STEP 1: I figured that it needs to be quite large to accommodate all the animals, and the thing I had laying around was a top part of a long gone table.

By some random chance I had some styrofoam lying around.

STEP 2: Glue the styro to your base. I used PVA glue (or any kind of wood glue will do nicely) because Polychloroprene based glues will dissolve styrofoam.

STEP 3: cut the excess of styro from the base. Just use a sharp knife, or check **STEP 8**.

I wanted for my African Savannah to have a "Lion King-ish" look, therefore the rock formation on one side.

**STEP 4:** Cut the styro to form a base and then advance upwards.

Helpful thing is adding toothpicks between the layers of styro to keep them in place.

STEP 5: When you arrange the rock formation, weigh it down. PVA glue takes time to cure, so as I mentioned before, this is going to be a slow process. But when something is getting dry, you can always do something else. We'll get to that.

You can add more rock formations if you feel like it.
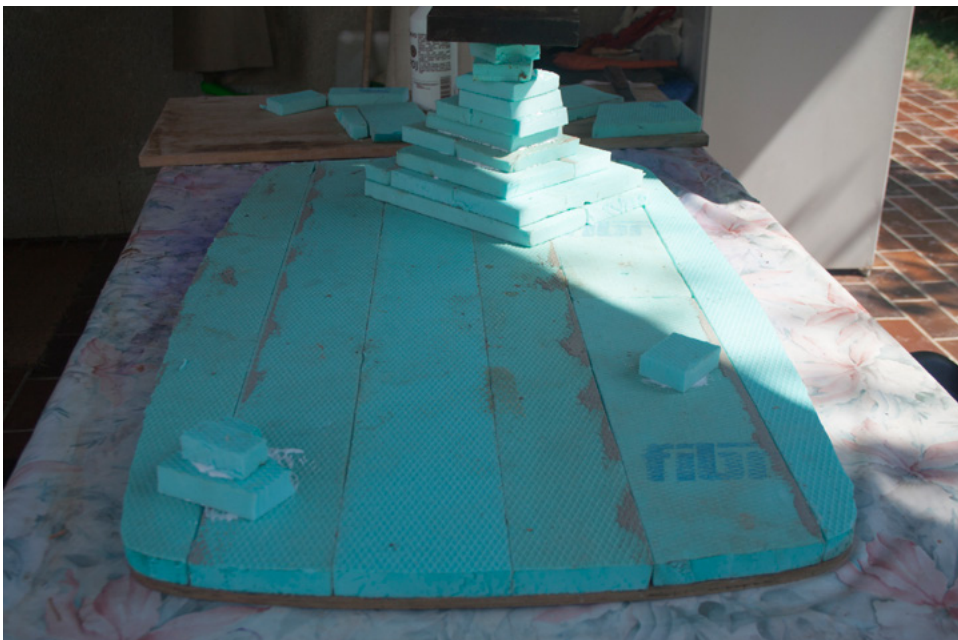
STEP 6: Scoop up the excess glue since it's gonna be a pain in the neck later on if you don't. You can use just about anything: PT, TP, fingers or a spatula.


STEP 7: I wanted to have the afore mentioned Lion King Rock and it kinda came to me to make a little water hole which comes from the waterfall from the rock and a little cave on the backside of the rock. Time to do some crude markings for the cutting of styrofoam.

STEP 8: To cut the styro the easiest way would be with a foam cutter. Since I don't have one, I'm gonna use a rather crude but effective method. Take a blowtorch and heat up a knife. I have one knife that I'm not sorry
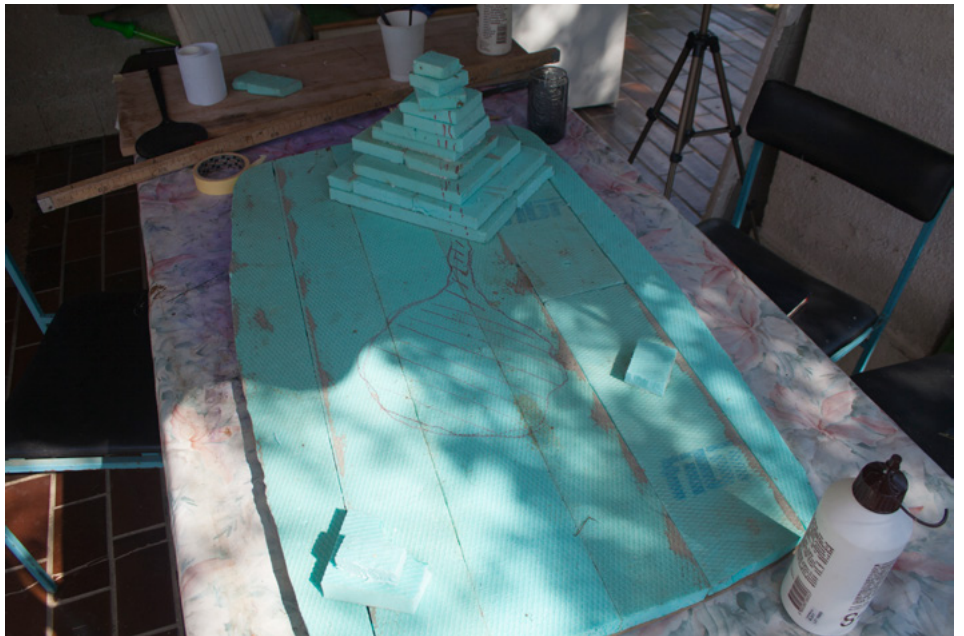
to use for that kind of purpose. You don't have to heat it up for the knife to be glowing red, just keep it over the flame for about 15-20 seconds which will give you about 30 seconds of "work time" with the knife. Wear protective gloves so you don't burn yourself. If you've never done this before, have a few practice cuts on the leftover styro. When it's hot, the knife slices through styro like, you guessed it, a hot knife through butter.
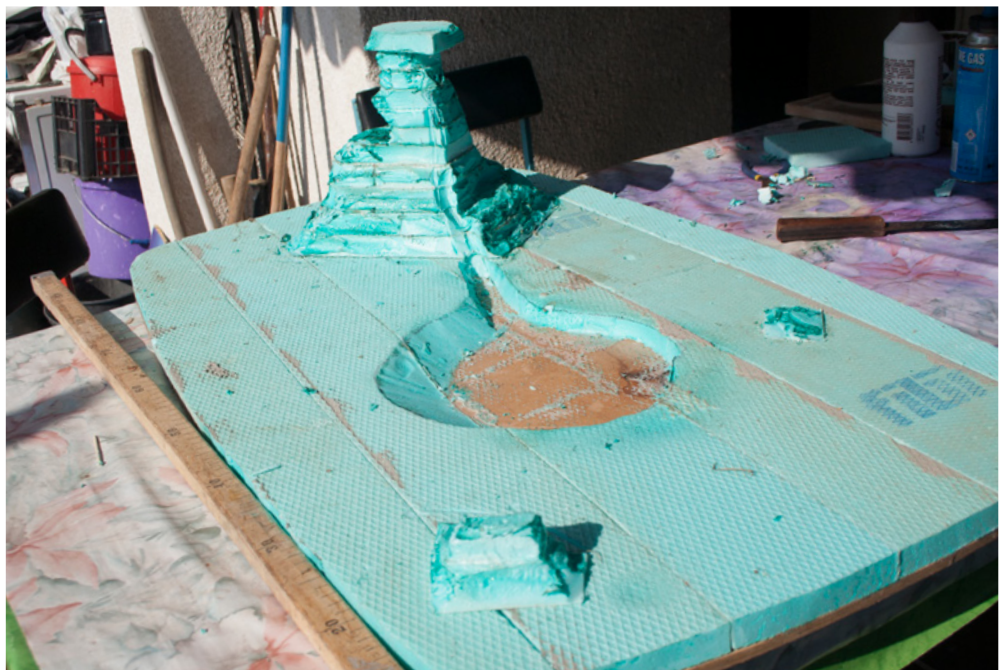
STEP 9: Next, you want to form the rock to give it, well, a rocky shape. Just keep heating up the knife and using the flat side of the knife get rid of right angles and sharp points.

STEP 10: Now comes the long and repetitive process. As I mentioned in the intro, this toy habitat needs to be sturdy. With PVA glue and layers of paper (or paper mac-he) you can achieve that rigidity and sturdiness. For those of you who never did paper mac-he here are a few guidelines: Since paper is mostly cellulose, and wood is cellulose, PVA (or any wood glue) works perfectly with paper. The trick is to soak the paper in glue and then adding another layer, and another, and another, and another.....you get the picture. I found out through trial and error that the best paper for first layer and the best paper for modeling shapes (STEP) is TP because of its' high soaking power. So it's not necessary to soak it up in glue first. Just apply the glue (actually, a mixture of 1:3 of PVA and water works perfectly) to the surface and put the paper on top. Then you can model the paper according to the surface. The tricky part is The Rock (sorry Dwayne Johnson) . Just remember to keep the paper soaked and model it with brushes. If you're left with creases, just smooth them over with a brush. A large brush will do.
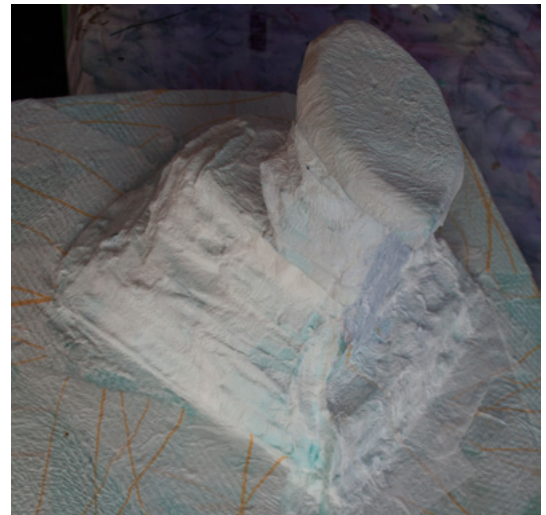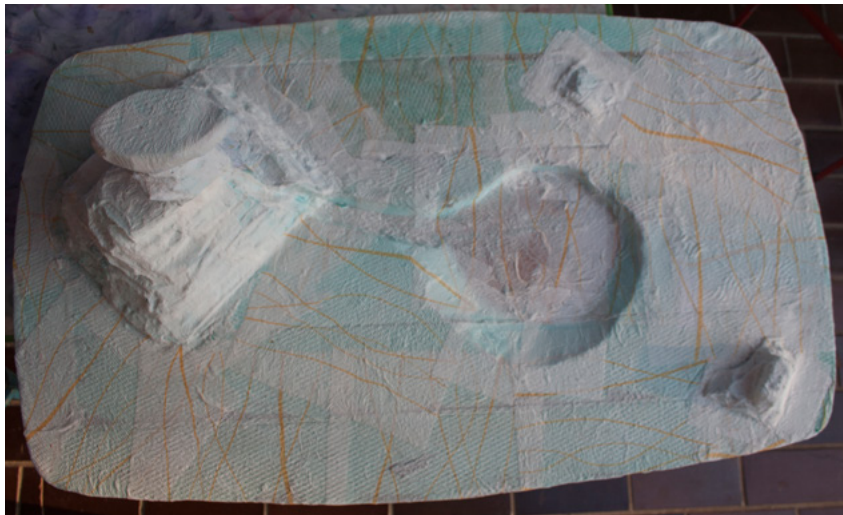
Yup, that's my Tapir coffee mug and beer right next to it. Don't judge me.

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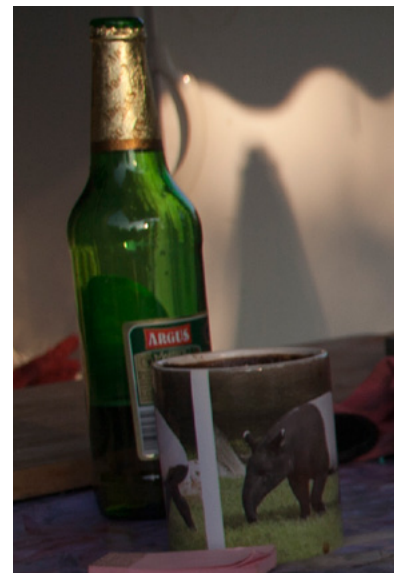
OK, so few layers later (2x PT and 2x old news paper) it looks like this:

Not really good looking, I know, but trust me, as soon as you get the first layer of primer on top of it, it's gonna be a totally different story. After each layer, allow it to dry up completely. Trust me, I will explain that later on. Anyway, the Sun and the heat are your allies in this case.

STEP 11: The Rock needed some extra coating, so I used wood putty mixed with PVA . I used fingers to smooth it over the rock. I don't like to use latex gloves since they kinda numb the feeling.
Once the whole thing is dry, I sanded it a bit just to get rid of sharp edges.

Next, the idea was to add a Termite mound to my diorama. Now, you have to know that the whole thing won't be in scale, since toy animals are not in scale also.

I used a part of egg carton, filled it up with TP soaked in my PVA-water mix, glued it to the base and then added extra layers of TP to make the shape of a ant mound.
You just roll up a piece of TP, soak it in the mix and shape it around. You add another one, and another until you have your desired shape. It turned out pretty ok.

By now it was all wet and soaked so I had to leave it over night to dry. I realized my mistake the next day. Since I didn't let the original cone to dry, outer layers have dried, but the center hasn't (since the outer layers made it air tight) and the mound was all soft and squishy. I gave up on the mound for I didn't want to wait another day. Instead of the ant mound I would place a tree in its' place.

STEP 12: Since I messed up the Termite mound, I decided to make the waterfall and little stream that feeds the lake /waterhole. First, you have to decide where the water should come from and where should it hit the "rocks" . Basically it's just common physics but you can decide on the parameters. You need some kind of support for later modeling, I decided to go with copper wire which I twirled (described in the STEP). Ok, so just form some sort of parabola from the exit point to the bottom of the waterfall. Just puncture a hole and don't be stingy on the wire length. The more you stick it in the styro, the more it will hold. And you get to test the hardness of your previous layers by puncturing the holes.

STEP 13: Now I had to form a waterfall. Again, I used TP, PVA only, wrapped it around the wire and made it look like, well, falling water. A couple of layers later, and adding some foam (cotton swabs) and it started to look like a waterfall.
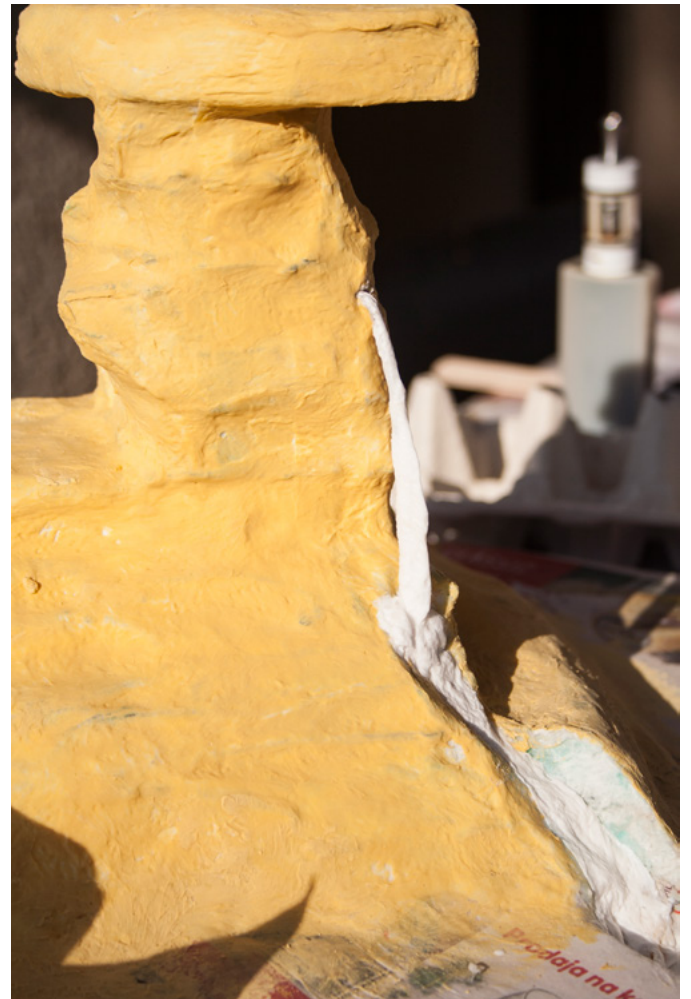
STEP 14: Needles to say, let the whole thing dry, and then move to the next step which is basing. I've been a modeleer for most of my life and I found this Sandy paste made by Vallejo (I use their colors also) which I've never tried. Time to give it a go. I had fun applying it, and since it is water based i did get my hands dirty. When dry (in about an hour) it made a nice texture for further plans.

STEP 15: Although the Sandy Paste did its' thing, I still wasn't satisfied, so I wanted to add some extra texture to the whole thing. Oh, you've noticed the trees? I will describe the process for making the trees later. Anyway, what you need next is fine sand (any color since it's gonna be painted anyway) and our well known ally PVA and water mix, only make it 1:1 ratio. You want to make the sand stick (and hold) to the base. So, just pour the mix, even it out with brush or spatula, and sprinkle sand over it. Try to sprinkle it from at least half a meter above since it will disperse more evenly and it will stick better to the mix.

So, the trick is: where there's glue - the sand will stick and you will get texture. After it's half dried, you can tip over the whole thing to get the excess of the sand of, or you can rotate it on its' sides and tap it from below. You need to get rid of extra sand otherwise it will be everywhere. Note that this diorama is meant for indoors. So, after getting rid of extra sand, you can fill in any spots that you've missed (if any). If you're repeating the process, remember to get rid of extra sand again. When dry, use your brush to completely cover the whole thing (i.e. sand) in you 1:1 mixture of PVA and water. Let dry.

This is what it looks like when it's covered in PVA+water mix.

STEP 16: now that the whole thing is dry, some missed spots will appear. Repeat the procedure from step 15 with the sand.

After I saw the whole thing covered with sand, something was not right. I couldn't put my mind to it what it was and then it hit me in the evening as I was watching Nat-Geo! It was tracks of animals and mud at the edge of the watering hole.
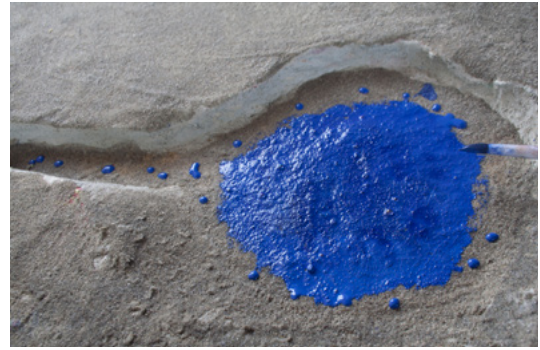

So I made them.

STEP 17: now we've come to my favorite part: Painting!
I decided to paint the lake/water hole first because it's in a depression so it can be easily covered later and it's in the middle of the diorama so it would be hard to get to when "the plain" is getting dry. First of all, African water holes aren't blue like Caribbean lagoons, but this is a diorama for a two year old, and she expects water to be blue. However, I'm not going to just paint it blue and leave it that (though she won't know the difference) but my perfectionism for painting and creating stuff just won't let me. I'm going to make it to appear deep than it really is.

NOTE: I DID THIS THE WRONG WAY. IT'S EASIER IF YOU START WITH LIGHER SHADES ON THE RIM AND MOVE TOWARDS THE CENTRE ADDING DARKER SHADES.
Anyway, here's how I did it.

In order to give it a perspective of depth, the middle of the water hole needs to be the darkest shade and as we move outwards it becomes lighter. Just drop a few drops of your darkest blue (I use Vallejo model colors) in the middle. Then, using your brush, smudge it around a bit. Start adding a lighter shade of blue, adding water sou you can blend the two shades together. Repeat until the whole water hole is painted.

Next, I painted the slopes of the water hole for same reasons I did the water hole first. It has to look like trodden mud, so grab some brown color, 2 or 3 shades and paint the darkest first. Add some smudges with your brush and there you have it. Not what I really intended, but never mind, we'll get to that later. You can see that the tree trunk is already painted, but it's irrelevant since I was just trying to see what it would look like when dry.
Moving on.

I used these three colors for the "plain" and one tree. As you can see they are Pebeo deco colors, and I've had them for years. I use these with large surfaces since they are pretty cheap, their covering ability is awesome and they can easily be diluted with water. Which Acrylic stand for. Duuuh...


STEP 18: I used the most left color, or the darkest shade to cover the whole thing. It doesn't need to be perfectly covered, every spot painted as you can see in some parts, we'll get to that.

Now it's begging to look like something, finally!

Next, I did trees in some basic coat, you can go with anything here, let your imagination go! I wanted the trees to be in that earthy tone in which the entire diorama will be. The white thing in the water hole is PVA glue, no water added. This gives the water hole a kid of texture, it's transparent when dry (well, mostly transparent) and you can paint over it again. You can skip this if you want to. Just cover the water hole with gloss varnish and you do that as the last thing on the diorama.

You can see how it looks when dry (too much of PVA and too thick layers. I mean it looks ok for a sea with foaming waves, but this didn't work for me, I will correct that later on.
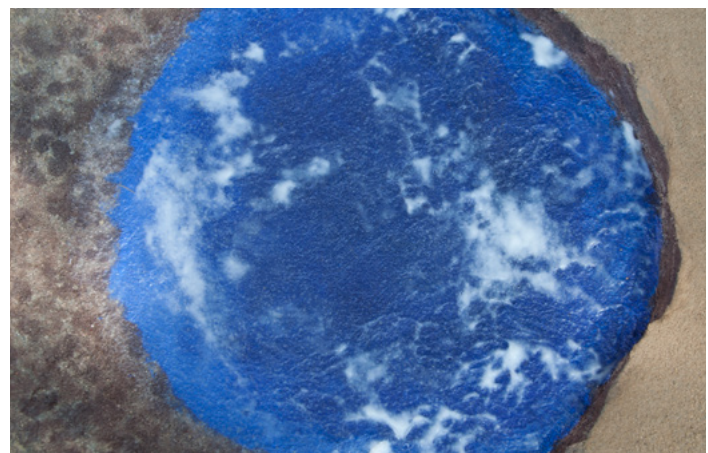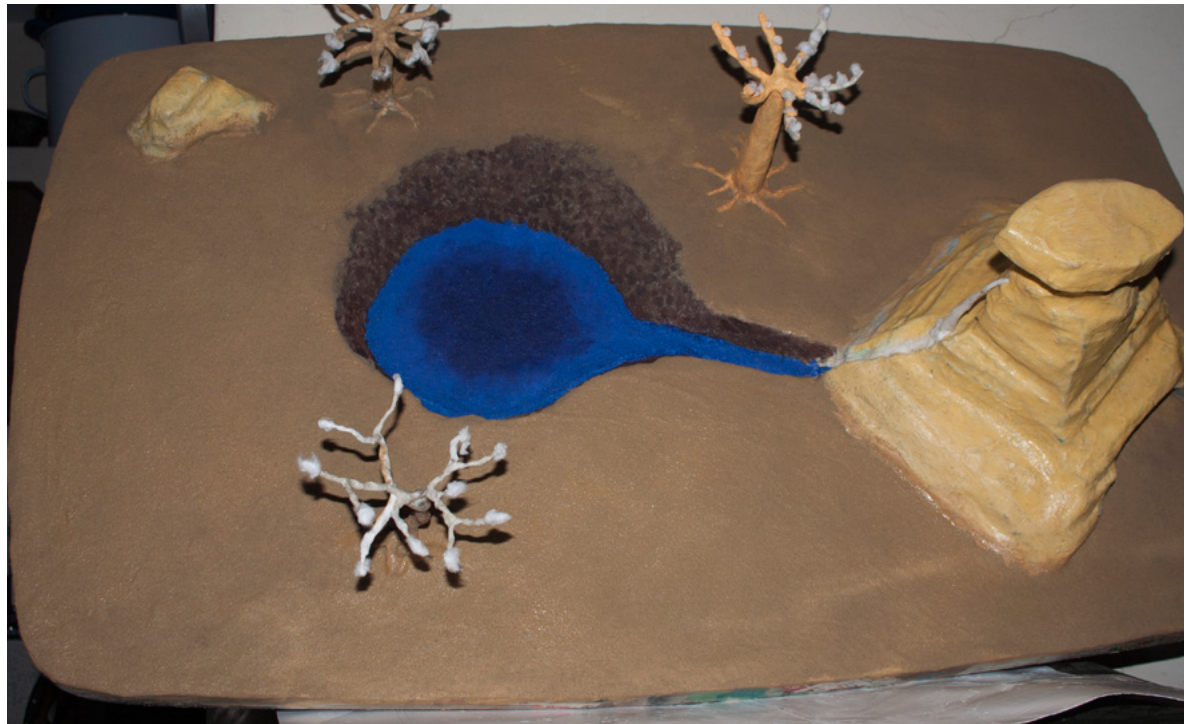
STEP 19: Drybrushing.

The "plain" need some lighter tone so I drybrushed it with yellow. The right part is drybrushed. Drybrushing is a technique which is excellent for bulges, ridges and any parts that literally stand out. What you do is, you take a brush, dip it in paint, and then wipe it almost clean. Keep a rag or a paper near by and then try it. Brush needs to leave a mark of paint when you really press it hard, not sooner.

I used a large brush to get it done quicker.

STEP 20: The rocks. As you can see, I painted those in dark gray tone (remembering Lion King and the famous Rock) but you can really can go with anything. Yellow, red, brown etc. Just Google it.

Next, drybrush it with a lighter tone. Repeat with smaller Rock.

STEP 21: Since I do scale modeling, miniatures and play Warhammer, I used this for dry grass. It's not necessary, but it gives the whole diorama a better "feel" and again, my perfectionism wouldn't let me do it without this. To apply this, check step 15. The only trick is, you have to (when it's dry, of course) scrape the excess grass of. I used an old tooth brush. Scoop it of, and put it back in the bag.

Next, i found an old broom and decided to use it as some form of reeds for my water hole. I just cut the tips of, made hole in the base with an awl, put some of PVA into it and placed my cut pieces in the hole.

STEP 22: Painting the trees. I just covered them up with a basic paint, then using drybrush technique did some highlighting on them and painted the blossoms/ leaves.

STEP 23: Waterfall and the lake/water hole

As any scale modeler will tell you, the hardest thing to do on a diorama is water. I was not satisfied with the way my water hole turned out so I went and bought the effect which is meant for faking water. It's made by Vallejo ,


it's water based and it's easy to handle. You just pour it into pre made space and you wait for 24 hrs. The result is great! However, I wanted to give my little creek from the waterfall a sort of motion, fluidity. So, when I poured in the Still Water effect, I added a bit of blue color (lighter shade followed by darker shade) and made the motion of the water with a brush. This liquid (Still Water effect) is very viscous so the paint really stays where you want it to be. I let the first layer dry, the one with the paint in it, and then added another layer. Layers are about 3mm thick.

After two days of layer drying, it looks like this:

Now, regarding the waterfall, just paint the it white at first and then
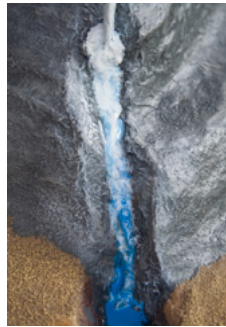
add a bit of blue at the mere end of it. After that, thin your blue with water and paint the lower end of waterfall and the little stream flowing on the rock. Try to use the color with which the creek begins. After everything is dry, just drybrush with white to achieve the foaming effect of the water.

PART 2: MAKING THE TREES

When I did all the shapes on the base, I figured I'm missing something, so I decided to make some trees. As I said on the sart of this project, I wanted to do everything, well, almost everything with the stuff that's avaliable at every household. So here are the tools that I used. A drill isn't neccessary, but it gets the job done pretty quickly. As you can see, these are basic tools, pliers, brushes, masking tape, a piece of wooden rod,wire, and our dear friend: PVA glue.

**STEP 1:** get some inspiration on the trees. I just googled "baobab".

STEP 2: Depending on the size of the tree, you need to cut a lenght of wire. As you can see, this one is about 30cm long, and this will be the tallest tree on the diorama. Cut 5 pieces of approximately the same lenght, it doesn't really matter if you miss an inch, or 2.54 cm.

STEP 3: Fold each piece in half and place the folded end into the drill.
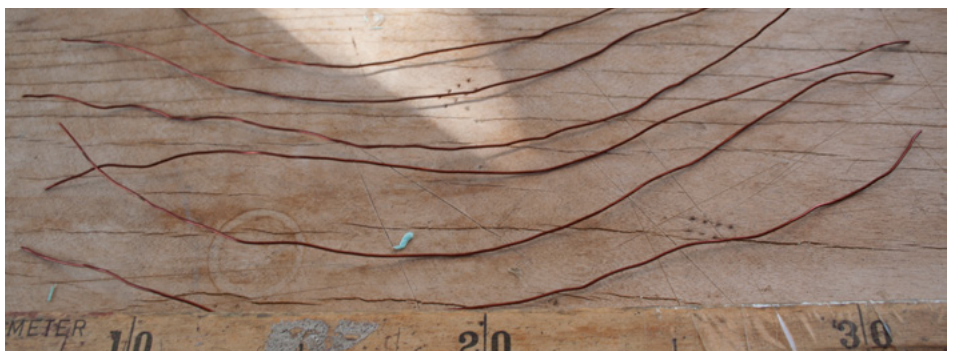
Hold the loose ends of the wire with pliers and turn on the drill. SLOWLY at first, you can increase the speed as the wire twines.. Just keep it gonig and you will end with nice twined wire that looks like this:
I used copper wire which I've salvaged from an old electro motor from an old washing machine, but any kind of not to rigid wire will do.
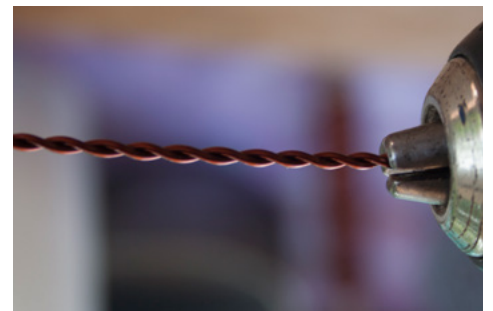
STEP 4: repeat the procedure with remaining pieces.

STEP 5: now that you've made all 5 (or more) pieces, take the wooden piece of rod (acctually it can be anything that has the rigidity to support our tree; metal rod, used pen, a pencil, you get the idea.) and tape it with masking tape, or duct tape (masking tape is cheaper and the papaer mache will stick to it better). Try to press the layers of the tape hard so you won't get a soft base for later steps. Depending on what you want to make (in my case - a Baobab tree), make sure you tape enough layers around your piece of rod. You don't have to do this step, but it saves time which is the only thing that you really abuse in this project. Up to this point, this project has taken me 6 days. Next thing you want to do is to wrap five pieces of wire onto the top of the rod so they are firmly in place. Those pieces will the base for the branches. Just arrange them to be more or less evenly apart. Next: spread hose wires apart to make them in a star shape, and fold them in two to get more surface on which to apply paper mache. You can use the drill again in the same manner as before. When branches are done, form them in shape you wish and apply masking tape to them to make paper mache-ing easier. Make sure that the masking tape is firmly applied. Do this with all branches. Attach the "tree" onto something or just clamp it into a vise. It makes further steps easier.
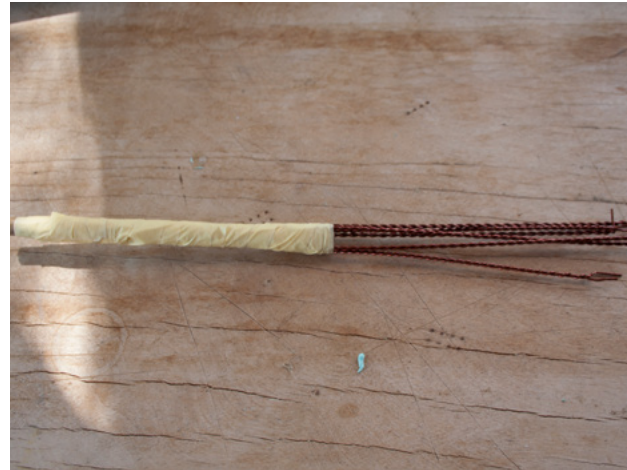
STEP 6: now it's time to get back to PVA + water mix, make it 1:1 this time as it dries up sooner and it's easier to manipulate over branches. Again, use TP for first layers. Start from the top of the tree and move your way up to the tips of the branches. A good thing to do is to sort of spiral wet TP around each branch.

Smooth it over with a brush dipped in the PVA-water mix.

Once all of the branches are done, you can go ahead with the stump of the tree.Apply a leyer of mix, and couple of layers of TP. Repeat.

You should wnd up with something like this:
Let dry.

Now it's time to get the tree trunk really "trunkish" and to get that baobab shape. I took the old noews paper and cut strips of it o make paper mache-ing easier. So, once again apply a layer of PVA+water mix, wrap one strip like a spiral around the trunk of the tree, and repeat. You can go y couple of layers in one direction (from bottom to top) and the other couple of layers in the opposite direvtion (from top to bottom). Since this should resemble a Baobab tree, my tree trunk is much thicker at the bottom and up to one third of the trunk than it it as the top, so, accordingly I applied neewspaper strips around the trunk.

A couple of dozen layers later and it looks like this:

Needless to say: let the whole thing dry.

Once that is dry you may (or may not) add some leaves/folliage to the branches. I used cotton from cottonswabs. I made little balls, and glued them onto branches.

That's it!

Next step is painting of the trees.

FINISHED DIORAMA

That's it! The point of this whole project is to enjoy it and for you child to enjoy it. These instrucions are more guidelines than rules, let your imagination go!

Višen Tadić 2016.