The Ultimate Incubator

By Dan Scalf

(click mouse to change screens)
After looking at countless WebPages and surfing around various forums dedicated to the keeping and breeding of reptiles it became apparent that there was very little information on building your own incubator. While I did find some wonderful, even ingenious examples I didn’t find anything that was presented as a thorough, step by step procedure on building an incubator. After doing a lot of research and paying attention to what everyone thought was important in an incubator, I put this one together. So, this is a culmination of several years worth of research on what makes the ultimate incubator. I am very interested in hearing any comments or suggestions so feel free to contact me. Thanks! mkgiver@earthlink.net
I designed this incubator to hold twenty clutches of ball python eggs. It can be used for any kind of reptile egg and the size can easily be modified as long as you keep the same principals that were used with this one; well insulated and control over temperatures.

The items needed are as follows:
- (2) 22x85x5/8” white melamine
- (2) 22x30x5/8” white melamine
- (1) 30x85.5x1/4” melamine
- (5) Wire shelves
- (2) 24x48x3/16 clear acrylic
- (20) 12 quart plastic tubs with lids.
- (1) Thermostat
- (2) Thermometers (one pictured)
I decided to use a rabbet joint with wood glue and 1–5/8” screws.
Add some wheels to make the unit mobile – very handy when space is limited. Make sure that two of them are the locking type.
This is what you should have so far.
Add the ¼” piece of melamine (or whatever size you choose to use) to the back, nailing tacks every 3–4”. This is a very important step because it will square up the frame. Don’t nail anything down until you are sure it is square.
Add 1–1/2” strips of wood to the back to keep the incubator square. Having a square unit will make installing the door much easier.
This is how things look up to this point.
Next you will want to insulate the walls. I used ½” foam sheets because I live in a warm climate and am not concerned with chilly drafts. You may want to consider something thicker to suit your needs. Foam insulation is available at most large hardware stores.
Cut the foam to fit and apply to all five walls using spray adhesive.
To ensure that the foam panels do not come loose during incubation, secure five 1–1/2” washers to each wall.
This is a close up of the washers and screws used to secure the foam.
Use spray foam (available at any hardware store) to fill the gaps where the foam meets. The idea here is to make the incubator as air tight as possible. You are striving to maintain constant temperature and humidity and do not want any hot/cold air entering. You should open each tub at least once a week to allow the eggs to receive oxygen.
If you go a little crazy with the spray foam let it dry overnight. It is then an easy task to touch it up with a razor blade. It is a good idea to leave the majority of the foam on because this will give you a better seal.
Another shot of the foam and washers.
If you want to make it look a little neater, spray paint the foam and washers white.
Now you are ready to add a heat source. Pictured above is 11”x5 feet of heat tape, one roll of foil tape (both of these items can be found at most reptile supply businesses on the internet.) and a 61” piece of your favorite brand of aluminum foil.
Though the heat tape only has a total of 100 watts, I wanted to be safe and create a fire shield. Center 61” of aluminum foil on the back wall with foil tape. The incubator is lying on its back at this point to make installation easier.
Next, wire the heat tape using the included instructions. Then drill a hole in the bottom of the incubator and run the wires through. This will eventually be connected to a thermostat.
Then attach the heat tape to the foil using foil tape.
It is nice to have light so that you can just glance in without disturbing the eggs or temperatures. I used a 22” florescent light and mounted it to the top of the incubator. Cut the plug off and drill a hole through the top. Pull the chord through this hole. A new plug and a light switch will be added later.
This is what you should have so far.
Next, you will need to install shelving. Start the first shelf 8” off the floor. This will allow room for air circulation under this shelf as well as provide a place for some water bottles. Water holds heat well and helps to stabilize the temperatures quicker when you need to open the door. Cut a groove into the foam so that you can firmly attach the screws. Space the rest of the shelves 14–1/2” apart.
Then fill in the gaps with spray foam and paint white if you wish.
Next, decide where you want the Plexiglas to be located and using a jigsaw, cut a hole $23\frac{1}{2}'' \times 47\frac{1}{2}''$. 
Here is the incubator lying on its back. The Plexiglas was laid on top of the opening in the door after applying an adhesive with a caulking gun. The door is lying on the incubator for support at this point.
Place another piece of Plexiglas on the inside. Secure both sides with small screws. Having two pieces of Plexiglas will create an air barrier providing good insulation. It’s the same principal as a storm window.
Glue some white trim around the outside piece of Plexiglas. Don’t worry about the excess glue. It can be cut off with a razor blade when it dries.
While the trim is drying, you can put a roller switch on the florescent light. Then, splice on an old extension chord so that you have a way to plug it into the wall.
These are the items that you will need to secure the door to the incubator: At least three chest type hinges with nuts, bolts and washers. I decided to bolt these on because it will be more secure than screwing into melamine.
Put some ½” adhesive foam on the frame of the incubator so that when the door is closed you get a good seal.
Install three hook latches to the front door. Set these tight to pull in the foam insulation so that you will get a good snug fit.
Choose a handle for the incubator. This plastic handle was purchased at a hardware store for $1.50. Mounting it at around 48” high is a comfortable height.
For an incubator this size, I decided to go with two fans. You can purchase a computer fan at Radio Shack. Make sure that it is 115 volt. This will allow you to simply wire a plug to it and plug it into any outlet.
Place one fan at the top…

and one at the bottom to provide good air circulation. You will have to experiment with fan placement to achieve the desired temperature.
Here are some pictures of the finished product with tubs added. You are now ready to plug the heat tape into the thermostat of your choice and bring it up to temperature.
And a couple more...
And there you have it. Remember that this can be modified to hold as few as two clutches. Just try to apply the same principals. I hope that this was useful and good luck with your projects!