

Building A Reptile Incubator

Using a refrigerator for an incubator allows you to both heat your eggs, if the temperature is too low, and cool your eggs, if the temperature is too high. This range of temperature control means that regardless of the location of your refrigerator [ours is in our garage where the temperature fluctuates quite a bit], you'll be able to keep the eggs at the precise temperature that you choose. A refrigerator has a lot of room for egg incubation and it comes already well insulated! The total cost of our refrigerator/incubator was approximately \$400. (NOTE: We eventually disengaged the cooling capacity of our unit since it was never in use (garage temperatures were never over 90F) and without it the refrigerator-turned-incubator had less that could potentially go wrong.)

SUPPLIES:

- * Refrigerator - The best type is one without a freezer, or one with a freezer over or under the refrigerator (versus side by side). There are lots of used refrigerators for sale and the freezer section (if it has one) does not have to work.
- * Thermostat (for controlling the heat source) - Buy one that uses a proportional digital controller and can handle at least 300 watts. These are readily available over the internet.
- * Thermostat (for controlling the refrigerator if it gets turned on because it's too hot inside the incubator) - Greenhouse supply stores carry these. Make sure that the temperature on the thermostat goes high enough to meet your needs (higher than the temperature you'll be incubating your eggs at). It is simplest to have one that has a probe that you can put inside the refrigerator/incubator. It makes it even easier to have a thermostat that allows you to plug it directly into the electrical source and that provides an outlet to allow the refrigerator to be plugged into it. This means you don't have to do any tricky wiring.
- * Adapter - This allows you to plug two heat sources into the thermostat to control the heat.
- * Heat source - It is best to have two heat sources to protect against one failing. Do not use heat sources that generate light since light can interfere with the incubation process. You can use either heat tape, heat pads, or ceramic heat emitters. If you use ceramic heat emitters you will need to wire a ceramic fixture (like the kind used for lamps) to an extension cord. This is very easy to do and any hardware store can provide you with all of the relatively inexpensive parts.
- * Small fan (to circulate the air) - Electronics stores have 2"x 2" fans for cooling electronic equipment (like computers). These fans are perfect for this purpose. All you need to make this kind of fan work is two wiring nuts and an extension cord with two wires (one black and one white). You simply take the wires coming off the fan and screw one to the black wire and one to the white wire of the extension cord using the wiring nuts.
- * Thermometer/hygrometer to measure temperature and humidity - Get one with a remote unit so that you can put the remote unit in the incubator and the base unit somewhere more convenient (outside the incubator, up to several yards away) to see the readings.
- * Power strip without a surge protector - This will allow you to plug in all of the electrical devices but won't kick off if and when the refrigerator turns on.
- * Electric Drill - You'll need a drill, a drill bit that will go through metal and a bit that will cut out a 1" circle. These bits aren't very expensive and you can get them at any hardware store.
- * Sealant - This will seal the holes in the refrigerator once you've cut holes in it to put the cords through. Hardware stores carry all kinds of non-expanding spray insulation or other ways to seal up the holes.
- * Something to affix the probes and wires to the correct locations inside the refrigerator/incubator - There are several different brands of plastic fasteners that are made for this kind of purpose.

PROCEDURE:

Before you drill any holes or affix anything permanently, it is best to assemble everything where

you think you will put it. This will allow you to personalize your set up and make sure that you have everything you need. You will want to mount your thermostats where you can reach them in the space you plan to store your refrigerator/incubator (we put ours on the same side from which the door opens). You will want to experiment with your heat sources, probe placement, and fan placement and make adjustments to fit your needs.

Put the fan towards the inside top of the refrigerator/incubator and put the heat sources at the bottom on the inside. Since heat rises this is the best arrangement so that the fan will help distribute the heat more evenly. Make sure the fan doesn't blow directly on any eggs. To control humidity you may want to put your eggs in sealed containers (the size and type of container you use for your eggs, the substrate you choose, the ratio of substrate to water, etc., are all topics for another article - if you want to know what we do, email us or give us a call). The heat sources and the fan will each have cords that need to be plugged in outside of the body of the refrigerator/incubator.

You will need to drill at least one hole in the body of the refrigerator/incubator. We found it easiest to drill two holes; one at the top and one at the bottom. We put holes in the side so we can access the cords more directly. You can choose to drill in the back if you want the hole(s) out of the way.

Thread the cord from the fan out the hole (in our case, the top hole) on the refrigerator/incubator. Plug the cord of the fan directly into the power strip or other electrical source. Thread the two cords from the heat sources out the hole (in our case, the bottom hole). Plug the two cords from the two heat sources into the adapter that plugs into the thermostat for heat sources. Plug that thermostat into the power strip or other electrical source. Read the directions on the thermostat (and based on what kind of eggs you are incubating) to set your correct temperature. Thread the probe from the thermostat into the body of the refrigerator/incubator. Affix the probe in the location that best meets your needs. We attached ours in the middle under one of the shelves that came with the refrigerator.

Plug the refrigeration thermostat into the power strip or other electrical source. Plug the refrigerator into the back of the refrigeration thermostat cord. Set this thermostat at least one degree higher than the temperature the thermostat for the heating elements is set at (this is so the refrigerator and the heating sources won't battle each other.). Thread the probe for this thermostat into the body of the refrigerator/incubator. Affix the probe in the location that works best for you. Again, we chose the center of the refrigerator/incubator next to the probe for the heating elements.

Once you have experimented with everything to make sure the temperature is correct, and the components are working and in the correct locations, fill the holes you drilled with insulation to create a seal in the refrigerator/incubator. We used plastic fasteners to keep our cords on the sides and back of the refrigerator/incubator and away from egg containers.