

Building your own incubator

Contributed by Lindsay

At some time or another, all chicken keepers are likely to decide to try and hatch some eggs. If they are lucky it's the right time of year for broody hens, which are the best at the job (as nature intended). Otherwise the keeper will be looking at artificial hatching, which means an incubator. In this article I will show that it isn't too difficult to build an incubator for home use out of things you may have lying around. The key thing is to improvise.

{kl_thumbimageimg="animals/chick_on_incubator.jpg" alt="A bought-in chick keeps a beady eye on a batch of eggs"}
 Improvising your own incubator

My incubator is a small polystyrene fish box from the supermarket. The heat source is a heating mat for home brewing, the thermostat is from an old aquarium heater (bi-metallic strip) and the fan is from a computer processor. Also there's a piece of glass in the lid for viewing - this was the glass from a picture frame, about A4 size. Inside there's a basket to hold the eggs, up to 10 at a time, which was one of a set of five bought from Wilkinson's.

What I used:

- A box
- A heat source
- A method of controlling the temperature
- A small fan to blow the air around if wanted - not essential
- A power source for the fan if using
- Something to put the eggs in

I had to check the temperature the heating mat produced. I exploded two alcohol thermometers on mine as I hadn't expected the heating mat to get above 50 degrees C and I had placed the thermometers directly on the mat. Measure the air temperature at about an inch above the mat and it must reach 39 degrees C if you're not using a fan (37.5 degrees C if you are).

One of the most time consuming parts of the construction was cutting into the lid to fit the glass. I put the glass on the lid and drew round it with a felt tip, then removed the glass and took a sharp craft knife. I found the ones with snap-off blades are best because you'll need the extra length and you must keep a sharp edge or you won't get through the polystyrene easily. I drew a smaller rectangle inside the first one, leaving about an inch gap all round, and cut out the inner rectangle, going all the way through the lid. Then I scored into the lid along the line I'd drawn, to the depth of the glass thickness (about 3mm). DO NOT cut all the way through or your glass will not have any support and may fall in onto your eggs. Once the line was cut, I lengthened the blade and cut horizontally from the middle, again about 3mm down from the top.

By going all the way around the lid like this I created a recess into which the piece of glass slotted, but because it was put in from above there was no danger of it falling - even if it came unstuck it wouldn't come out unless the lid was tipped upside down. I then stuck the glass into the recess with duct tape. You may need to cut a little more out to get it flush with the top of the lid but mine isn't flush and it doesn't cause any problems.

Ventilation for the incubator

Next task was to poke some ventilation holes in the lid and sides of the box with a biro - 4 or 6 in the lid, 4 on each long side and 2 on each short side should be enough. You don't want to lose heat but you do need the gases to exchange between the outside and inside.

Heating the incubator

Then the heat source itself. My partner disconnected the thermostat from the heating element of the fishtank (I think he unsoldered it) and wired the cables from the heating mat and the thermostat together in a piece of "choc-block" (don't know the technical electrical term), with a piece of flex running down to a plug. When the thermostat is in "heat" mode it allows the electricity to power the heating mat, then when the bi-metallic strip trips off the circuit is broken. Any further questions on that, please let me know and I will ask him (or learn what to do myself!).

In the bottom of the box are some polystyrene lugs which are sufficient to hold the heating mat off the bottom so it doesn't melt it. Also the thermostat is not encased in anything so it must be where it won't be able to be accessed by the chicks once they hatch, as touching the wrong pieces will get them electrocuted! The thermostat has a screw adjustment to set the temperature and you will need to do a lot of adjusting to get the temperature right, as fish only need up to 27 degrees C.

We tucked the thermostat underneath the heating mat, on its side so the moving part (the bi-metallic strip itself) wouldn't catch on anything to hinder its movement. I have a Testo thermometer (which is for food use) and I monitored the temperature fluctuations in different parts of the incubator with it. I found that the airflow wasn't even so that was when we introduced the computer fan. It's only small, perhaps 3" square, and runs at 12V. We found a Scalextric transformer to power it and fitted it to the inside of the box, at one corner. This evened out the temperature variations so now it was just a case of adjusting the thermostat until the temperature was averaging at 37.5C. This took a good few hours to get right, as I wanted to see how much difference there was between the lower and upper temperatures, and I spreadsheeted the lot.

Eventually I was satisfied, we placed the empty basket in, and we left it running for a couple of days to check it as going to perform as it should before we put any eggs in it.

We haven't had spectacular results with it, due to my inexperience, but it did at least do the job. My partner has now changed it so that it's semi-automatic with the egg turning (it was manual before) and since then I've not been very happy with it so I think I'll get him to change it back!

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