4-H Embryology: Hatching Quail Resource Guide

The majority of this information is found in the Hatching curriculum and within the resource links provided. However, we like to give teachers a shorter, more condensed list of instructions and other guidelines so that they can keep it handy throughout the project to refer to. Some teachers choose to post this document beside where their incubator is placed so that anyone involved has access.

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- Place incubator away from doors, windows, and any drafty heat/air vents
- Make sure outlet used is not disconnected after hours or weekends.
  **Must be a live outlet at ALL times!**
- Incubator Temperature: 99.5 – 101 degrees F at all times.
  - To change or adjust the temperature up or down in the incubator use the dial on the top of your lid. This dial is very sensitive so when trying to adjust by a few degrees simply start with a quarter of a turn. Wait until your incubator light goes off (signaling that it has reached its desired temperature) and then check the thermometer reading. Depending on your reading you may have to make another quarter turn right or left to adjust your temperature (up/down and turn position are marked on your lids).
  - Be sure to cover and or make a sign to make students and any other visitors that may be in your rooms aware of the incubators presence. The temperature dial used for turning to adjust temperature up and down is very sensitive and if a student or someone bumps it and/or purposely moves it – the temperature will fluctuate and can cause a drastic change in hatch rate. Just keep a watchful eye that once set to correct temperature that your dial does not get moved.
- Water in canals (check for consistent moisture content)
  - Fill middle/center canal full of water and the next innermost canal from the center canal also. Other outer canal like areas do not all have to be filled.
- Humidity Level: 45-55% recommended
  - The most crucial tips surrounding humidity is to just check the water level every 2-3 days to make sure your canals are still relatively full with water. Should you begin to see any ‘beading’ on your incubator windows this is an indicator that your humidity/moisture level is too high. At which point you should remove the lid to let the moisture evaporate off the windows. To remove excess water you can simply place a paper towel in and let it wick up some of the water. Be sure not to leave incubator lid off for too long.
• To adequately prepare your students and enable them to better understand the embryology life cycle, we suggest that prior to beginning the project or during the course of the project it is recommended to have one of a couple conversations with your students so that they can “accept” some of the unfortunate things that can happen/occur during hatching. Granted, we always think positive and typically have great hatch rates, however, at this volatile age it is also helpful to help ease them into the other sides of life cycles in the event you should have a low or zero hatch rate, have deformed chicks, or a prominent display of the pecking order occurring (larger chicks pecking/’bullying’ smaller).
  o For teachers comfortable discussing death as part of the life cycle you may want to talk with students about the possibility of loss and hatch rates.
  o For teachers who feel that ‘survival of the fittest’ is an appropriate biology discussion to have with their students may do so. This can be related to hatch rates as well as post-hatch deformities and other related possibilities.
  o For teachers who would rather not lead discussions on the above we suggest taking the math route and talk about hatch rates in the terms of probability and/or ratios with your students as they relate to hatching.

• Mark eggs with #2 pencil (X on one side, O on the other)
  o Eggs are porous so do not use any kind of ink because of harmful effects to eggs when leaked inside the shell. Lead pencils are ok since they do not leach inside the shell and are largely carbon based/animal friendly.

• Turn eggs three times each day, once on weekend (once on a Sat. OR Sun.)
  o Students should **NOT** wash their hands before turning eggs. Soap and antibacterial agents can contain alcohol and other harmful components that can leach into shells causing damage. After turning then students must wash their hands. For younger students you may want to review best hand-washing practices to ensure maximum cleanliness after egg handling.
  o Eggs should be turned a minimum of two times a today but three times is ideal. Be sure to make sure the eggs after turned are staying in place on the wire floor and not rolling (quail eggs are much smaller than chicken eggs so you’ll need to be especially watchful of this with a smaller egg, more likely to roll. You may wish to break students into groups/teams who take turns turning so that you have a smaller # working to turn so that the incubator lid is not open for very long during each turn.
  o As for turning on weekends you must make sure someone has access to the building on weekends. Please make arrangements prior to receiving your eggs. The first two weekends during the cycle are most crucial.
  o Coturnix quail have a 16 day hatch cycle. **Day 14 is the last day eggs should be turned.** On days 14-15 eggs must **not** be turned so that the chicks can get into their correct hatching position by day 16 for the hatch.
For candling we tell teachers that one trick is to utilize any of the old overhead projectors that may still be hanging around some of your schools, surprisingly these provide great light and a way to look into your eggs. However, for those who no longer have access to one we suggest using a bright LED flashlight at the base of your egg and then place an empty toilet paper roll on the other end to channel the light all the way through the egg, enabling students to see inside.

- When candling, should you find any “bad eggs” it is suggested you go ahead and remove and/or dispose of those eggs as leaving them in the incubator can actually affect the rest of your good eggs. Refer to the embryology egg development stages PDF as a guide as to what you and your students should be seeing depending on which day you candle your eggs. Do **not** candle after day 14 as at this point the chick’s eye has begun forming and the bright light could actually inhibit/damage eye development.

- Pull out and/or uncover ONE ventilation plug after the first 1-2 chicks have “pipped” (beaks are beginning to break through their shells) then once 1-2 have hatched and others are beginning to hatch go ahead and open BOTH plugs

- If you have a few chicks hatch early and dry off sooner than the others it is ok to go ahead and reach in to remove them so they do not overheat. As a rule of thumb it is recommended to leave all chicks in incubator until dried/fluffed out.

- The classroom brooder box can be made from a plastic tub – this is preferred over a paper or cardboard box due to potential overheating/fire risk. Use a flexible lamp for heat. For this, we suggest a ‘clamp on’ flexible desk lamp with an older style, INCANDESCENT bulb for heat in place of a heat lamp due to fire hazards. Lastly, it is suggested schools use pine shavings as the bedding material down inside the brooder box for the chick’s footing. We have also found that red is a calming color for very eager quail (we are not sure of why), however, we suggest lining your box with a red paper of some sort to help keep chicks inside.

- The birds will not need food for the first day (the absorption of the yolk provides their first nutrients). Keep adequate water in the brooder box (use a mayo or equivalent sized jar lid). Use ground up cat or dog food as your food source.

- All birds should be removed from the classroom within 3-5 days of hatching.

- Email or fax class list to 4-H office for certificates if desired for your students.

- Please email, fax, or return evaluation with whomever is bringing your hatched chicks and incubators back to the 4-H office upon completion of program.