

Hatching and Brooding Chicks in the Classroom

Obtaining Fertile Eggs

Fertile eggs are necessary for hatching chicks. Eggs sold in grocery stores are not fertile and cannot be hatched. Fertile eggs may be obtained through Utah Agriculture in the Classroom (Utah teachers only) at utah.agclassroom.org search keywords, *fertile eggs*.



Fertile eggs should be incubated within 7 to 10 days after they are laid. Hatchability declines rapidly when incubation is delayed for more than 10 days. Until they are incubated, fertile eggs should be stored in cartons or cases—large end up—at 40 to 70°F with a relative humidity of about 75%. If the eggs are to be stored for more than 2 to 3 days before they are incubated, they should be rotated each day to prevent the yolks from sticking to the shells.

Preparing the Incubator

An incubator with controlled temperature, humidity, and ventilation is used to hatch the fertile eggs. Small incubators can be purchased new or used.

Before incubating the eggs, make sure the incubator is working properly and that you know how to operate it. Pour warm water into the humidity reservoir, and adjust the heat source until the incubator temperature stays between 99 and 102°F. Check the thermometer frequently for at least 24 hours before incubation to ensure the correct temperature is being maintained.

When eggs are placed into an incubator operating at the proper temperature, the temperature will drop. Do not adjust the thermostat during this warming up period. The time that the temperature in the unit will remain below normal depends upon the temperature of the eggs and the capacity of the heating unit. Warming the eggs to room temperature prior to placing them in the incubator will reduce this lag time.

Operating the Incubator

Temperature—Maintain the temperature in the incubator between 99-102°F (100-101°F is ideal). Place the thermometer level with or slightly above where the center of the egg will be. Overheating the embryo is much more damaging than under heating. However, long periods of low temperatures will reduce the rate of embryo development. Avoid temperatures below 99°F or above 102°F.

Humidity—The moisture level in the incubator should be about 50–55% relative humidity, with an increase to about 65% for the last 3 days of incubation. Moisture is provided by a water reservoir in the incubator. Add warm water to the pan as necessary. If more humidity is needed, increase the size of the pan or add a wet sponge. Humidity adjustment can also be made by increasing or decreasing ventilation.

Ventilation—Ventilation is adjusted by increasing or decreasing openings in the sides or top of the incubator. Normal air exchange is needed during embryo development and should be increased as the chicks begin to hatch. The embryo needs oxygen and carbon dioxide. However, the correct relative humidity must be maintained until most of the chicks are out of their shells. Unless absolutely necessary, do not open the incubator during the last 3 days of incubation.

Turning—The eggs should be placed into the incubator on their sides. During the first 18 days of incubation, the eggs must be turned at least 3 times a day. Stop turning the eggs during the last 3 days. If you are hatching 18-day eggs, they do not require turning. Turn the eggs an odd number of times so the position that is up the longest (at night) will be changed daily. Mark an X on each egg so you can tell if the eggs have been turned. When turning the eggs, move them to a different part of the tray to minimize the effects of temperature variation in the incubator.

Safe Handling

Practicing safe handling techniques in the classroom protects both students and chicks. Wash hands with soap and water before handling eggs or chicks and use an alcohol-based hand sanitizer afterwards. For more information or answers about sanitation concerns, visit the Utah Agriculture in the Classroom Hatching Science wiki at <http://chickembryology.wikispaces.com/Sanitation+Concerns>.

Candling the Eggs

“Candling” is the examination of the contents of the eggs using a shielded light in a darkened area. Eggs should be checked for development; if fertility is poor, you do not have to wait the entire incubation period to learn you are going to have a poor hatch. With candling, students can observe the development of the embryo.

Instructions for building a classroom candler can be found online or from Utah Agriculture in the Classroom at utah.agclassroom.org search keyword *candling*.

Candling the eggs gently will not affect embryo development. Only remove the eggs a few times from the incubator, and do not allow them to cool.

Preparing for the Hatch

When the eggs are turned for the last time (3 days before the hatch), place a layer of crinoline or cheesecloth on the screen under the eggs. This will make cleaning the incubator easier after hatching.

Most chicks should hatch within a 24-hour period. Late-hatching chicks may lack vigor or be abnormal. After the chicks have dried and fluffed up completely, they can be removed from the incubator and placed in a brooder (rearing box).

Clean the incubator after the hatch. Remove and dispose of the crinoline or cheesecloth, the shells, and other remains. Clean the inside of the incubator with soap and water, and let it dry completely before storing.

Brooding the Chicks

A brooder, or rearing box, is a temporary home for baby chicks up to one week of age. Newly hatched chicks must be kept warm and free from drafts, be properly fed and watered, and be protected from predators.

A cardboard box approximately 2' x 2' x 1' provides a home for up to 12 chicks. The size and shape of the box is not critical, but there should be enough space for the chicks and equipment to feed and water them. A screen or wire mesh should cover the box to restrict handling and to protect the chicks from cats and other predators.



Keep the temperature at the level of the chicks at about 90–95°F. In most rooms, a light bulb placed over the box will provide enough heat. A clamp-on desk lamp works well. The chicks' behavior can be a guide to their comfort: when they are cold, they bunch up and give a distressed “cheep;” if they are too warm, they stand apart with their beaks open and their throats may have a pulsating or panting motion.

The bottom of the brooder should contain about 2 inches of litter material to give the chicks better footing and help keep the box clean. Soft pine wood shavings, untreated cat litter, chopped straw or paper, or sand are suitable materials. *Do not use newspaper.* Newspaper is too slippery for the chicks to gain traction. Replace the litter when necessary to keep the box clean and dry.

Feeding and Watering the Chicks

Waterers made from canning jars are often available at farm supply stores. They should be placed onto a wooden block to help keep them free from litter. A small dish—with marbles

or pebbles on the bottom to keep the chicks from drowning—can be used for a waterer. You can also use a saucer with a heavy cup or mug placed upside down in the saucer; add water to the saucer so the chicks can drink without getting in the water. Replace the water at least twice a day to keep it clean and fresh. Clean the waterer during each change, and refill it with lukewarm water.

Although chicks don't need food or water for the first 48 hours after hatching, both are usually provided as soon as the chicks are placed into the brooder. Use a small box or tray for the feeder. The chicks will scratch around in the feed the first few days; this will introduce them to the feed and prevent them from eating too much litter.

Chicks are best started on a chick starter mash available at most farm supply stores. This mash contains the proper combination of protein, fats, vitamins and minerals required for proper growth and development.

Finding a Home for the Chicks

Make sure you have a plan for finding a home for the chicks after they hatch. You might contact a farmer or neighbor who is equipped to properly care for the chicks. It is not advisable to send chicks home with students.

Questions?

For more information or answers to frequently asked questions, visit the Utah Agriculture in the Classroom wiki at chickembryology.wikispaces.com.

Information adapted from Utah State University Extension and University of Minnesota Extension.