

Hatching Chicks in the Classroom



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Preparing for Incubation

Eggs in the grocery store are usually not **fertilized** because they come from hens without a rooster around. To have a fertilized egg you need a **hen** (female chicken) and a **rooster** (male chicken). The grocery store eggs were probably laid by a hen, but not fertilized by a rooster.

The 4-H will supply a dozen eggs for your class. Most of them will be fertilized. Ours came from the Woolly Egg Ranch in Mill Valley.

You need to prepare the **incubator** before you get the eggs. Check if your incubator is a fan or a still air type. You can look on the top lid of your incubator and check with the instruction manual to be sure you know which one you have. The 4-H has both types so be sure you know which one you're using, since they need to be set at a different temperature.

To set up the incubator, place the egg turner into the incubator. The egg turner turns the eggs left and right to move the **embryo**, the growing chick, inside the egg, which simulates the hen turning her eggs. Be sure the egg turner's electrical cord is in a position so that the incubator lid fits snugly.

Place the **thermometer** inside the incubator, in a place where you can see it through the windows in the lid. If you are using a still air incubator, the temperature needs to be around 102 degrees Fahrenheit. An incubator with a fan should have the temperature at 99 degrees Fahrenheit. It's important to get the temperature set a day before you put the eggs in it. The knob on the incubator is very sensitive, so only adjust it a small amount, then check it again in an hour. Keep adjusting it until you get the temperature right. In our class, only our teacher was allowed to adjust the temperature.

Don't place the incubator in a drafty area, or a place where it will be in the sun for part of the day. It's best if the temperature in the room can be fairly consistent, so avoid using an air conditioner or letting the room get really cold at night, as well as getting really hot during the day.

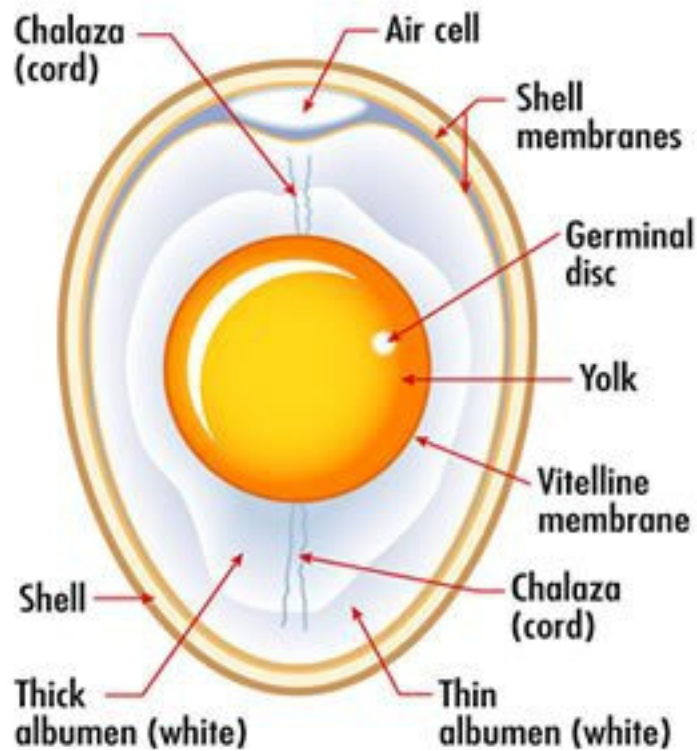
It's important for the inside of the incubator to be humid, which means having moisture in the air. We have read many different recommendations for the ideal **humidity**--anywhere from 45-65%. We kept ours at 50-55% and it worked well. You can monitor the humidity on the thermometer the 4-H lends you (it has both humidity and temperature). Put water in the troughs at the bottom of the incubator to increase humidity. You may have to experiment a bit to get the right amount of water for the correct humidity.

The hatch rate is the percent of chicks that actually hatch. Our teacher has incubated chicken eggs many different times. She's gotten as low as one chick, and as high as ten chicks, out of a dozen eggs. If you get five chicks to hatch, you're doing pretty well.



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Egg Activity

One activity we did was to investigate grocery store eggs. We looked at the outside of the eggs with magnifying glasses, then opened them up and looked at the inside and saw the various parts of each egg that would become a chick if it was fertilized. If you do this, look for the **albumen** (the white in the egg) , yolk, **chalaza** (cord that centers the yolk inside the egg), and the layers of the shell. Also notice that the albumen has a thicker part and a thinner part.



3 During Incubation

Chicks have a 21-day incubation period, which means that it normally takes 21 days for the chicks to hatch. It's important to be very careful with the eggs in the incubator. Don't bump the incubator, make sure to be careful with the thermometer, and have extra thermometer batteries handy in case yours dies because you want to be able to see the temperature every day.

You need to monitor the temperature and humidity to be sure they remain constant. You should record the humidity and temperature daily. On the weekend your teacher should come in and make sure the temperature and humidity are staying at the right levels.

You should keep your humidity steady at around 50-55%. The way you do this is to carefully add warm water to the troughs at the bottom of your incubator if the humidity goes too low. Only open the incubator briefly to do this.

You want to keep the temperature at a steady 102 degrees F for the still air incubator and 99 degrees F for the forced air (fan) model incubator. If it is really cold or hot in the room it will affect the temperature inside the incubator, so you want to keep the outside air at a fairly steady temperature.

A developing chick is called an embryo. A great video to watch the embryo's development can be seen here:

<https://www.youtube.com/watch?v=PedajVADLGw>

On days 8 and 14 you can **candle** your chick eggs so that you can see if chicks are developing correctly. When you candle the eggs, you try to look through the shell to see what is happening inside the egg. To make a simple candling device (like the one we used) all you have to do is attach a toilet paper tube to a flashlight. Then you place an egg on top of the toilet paper tube. It helps to be in a dark room to candle the eggs. When we candled the eggs we went into a fairly dark hallway area in our classroom and put up a sheet to keep out the light from windows. Be sure to wash your hands before and after handling the eggs, and don't keep them out of the incubator for long.

Some of the things you'll see inside the egg on day 8 are veins and the **air sac** on one end of the egg if the embryos are growing properly.

On day 14, the developing embryo will be more visible and will take up most of the inside of the egg. If a chick is growing, it will stay on one side as you slowly turn the egg; if no chick is developing, you'll see the yolk, and it will completely move as you turn the egg.

Here is a link to a website that shows eggs being candled throughout the chick's development:

<http://chat.allotment-garden.org/index.php?topic=73884.0>

4 Hatching

During the days before the chicks hatch, you need to do a few things differently. On day 18 you should start preparing for your chicks to hatch by removing the egg turner. First, you should carefully take the eggs out of the incubator and place them into an empty egg carton. Then, unplug the egg turner and take it out of the incubator. Next, gently put the eggs directly onto the screen in the incubator. While you're doing this, try not to breathe much on the eggs and wash your hands before and after. Don't keep the eggs out of the incubator for very long.

You should also increase the humidity by adding warm water to all the troughs in the bottom of the incubator. In addition, you can get paper towels or sponges and make them wet with warm water and carefully set them below the screen. Add more warm water to them daily. In the last three days of incubation, the humidity in the incubator needs to be 70-75%. The humidity needs to be higher than before because when the chicks are closer to hatching, if the humidity isn't high enough the shell can stick to the chick. If this happens, the chick will probably die, or it will not be strong enough to live, or it may wind up on the bottom of the **pecking order**. The pecking order is when all the strong healthy chicks peck the little weak chicks. This can endanger their lives.

On day 20 or 21 of the egg's incubation the chicks should start pipping. **Pipping** is when the chick is first starting to break into the air sac and breathe oxygen. You will start to see little tiny cracks in the shell--that is where the chick has used its little **egg tooth**, a bump on its beak, to break the shell. The chick will continue to peck its way through the shell, often in a straight line. Then it will push against the shell so it breaks in half and the chick will come out. This process often takes many hours, and the chicks will work then rest, work then rest.

If one or more of your chicks work at coming out for a couple of days, don't help them out of the egg. They may wind up weak, and they may or may not be able to survive. This is nature. This happened to one of our chicks and it was sad.

When they first emerge, chicks are wet and don't look very cute. You may be worried that they aren't OK. But eventually they dry out and fluff up and they're adorable.

You have to remember that the chicks inside the eggs might hatch a couple days early or a couple days late. No matter what, **KEEP THE INCUBATOR ON** until about day 23, just to be sure. The chicks will need to stay in the incubator for several hours after they hatch because they need to dry and their feathers will puff up. They should look fluffy when they are ready to come out of the incubator.

After Hatching

You will need to set up a **brooder**, a place for your chicks to live for a couple of weeks. This can be a box or large plastic container with an old towel in the bottom. The floor of the brooder shouldn't be smooth because their legs can grow "**splayed.**"

You'll need a heat lamp in one end of the brooder, so one side is very warm and the other end is cooler. (Their food and water should go on the other end.) Make sure the temperature is around 90 degrees in the hot end of the brooder at first, then lower that temperature by about ten degrees each week by moving the lamp. The chicks will find the right temperature in the box.

The chicks will need a bowl for water that has low sides with marbles at the bottom so your chicks don't drown. There are also chick waterers that work well. Dip their beaks in the water when you first put them into the brooder to teach them how to drink; make sure they tip their beaks up and swallow the water so you know they know how to drink.

Chicks will also need food. They will eat starter feed, which can be found at feed stores. Make sure that your chicks' water and food is always full. It is normal if your chicks poop and gunk up the water bowl, so you'll need to change it regularly.

After a few days, the chicks may enjoy a stick to perch and walk on. After about a week, they will need a closed top because they'll start to hop up on the side of the box and jump out! We used an old guinea pig cage.

Let the chicks out a lot and hold them. It's best to sit down when you're handling them, and don't chase them. They can easily get under foot so be careful not to step on them.

Chicks do poop a lot, so you'll need to be ready to clean up their poop when they're out. You also need to change the towel in the bottom of the brooder regularly.

Chicks and Chickens

Chicks' behavior can be really funny. A chick may rub its beak back and forth against your clothes or a rug. It looks like the chick is sharpening its beak. Chicks also peck at everything--freckles, shoelaces, or bits of things on the floor. In about one week or so your chicks will probably try to hop out of their brooder. If you let them roam around they may run really fast and flap their wings. When the chicks get bigger, their claws might feel funny if they are on your clothes.

Chicks grow really fast! You will notice new feathers coming in within a couple of days. We got a scale and weighed our chicks every day for the first couple of weeks. They each doubled their weight in a week! They grow and change every day.

Chickens do not have a very well developed sense of smell. Their eyesight is bad at night but it's good during the day.

You can't really tell if baby chicks are boys (**cockerels**) or girls (**pullets**) until they are about three months old. Many towns don't allow people to have roosters (because they **crow**), so when you give your chicks away, people will have to understand that they may not be able to keep them if they turn out to be roosters (full-grown males).

There are many good books and websites if you want more information about chicks and chickens.

We have really enjoyed having chicks in our classrooms. We hope you do too!



Glossary

- Air sac.....the sac of air at the tip of an egg
- Albumen.....the white in the egg
- Brooder.....a heated house for chicks
- Candle.....seeing the inside of the egg while it's developing
- Chalaza.....the umbilical cord
- Cockerels.....male baby chicks
- Crow.....a rooster's call
- Embryo.....the growing chick
- Egg Tooth.....the bump on a chick's beak that they use to break open their shell
- Fertilized.....a fertilized egg is the result of a hen mating with a rooster
- Hen.....a female chicken
- Humidity.....the amount of moisture in the air
- Incubator.....an apparatus used to hatch eggs under controlled conditions
- Pecking Order....when all the strong healthy chicks peck the weak chicks
- Pipping.....when the chick is first starting to break into the air sac and breathe oxygen
- Pullets.....female baby chicks
- Rooster.....a male chicken
- Splayed.....to thrust or spread something (especially limbs)
- Thermometer.....an instrument that measures temperature