

Chickens in the School Garden

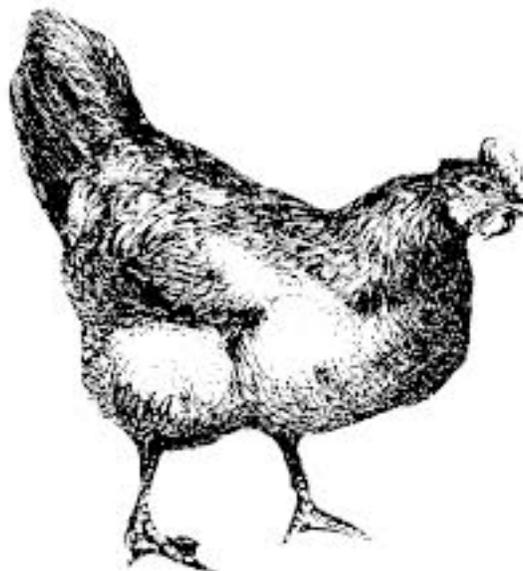


Northeast Agricultural Education Foundation, Inc.
Growing ideas. Feeding minds.

Massachusetts Agriculture in the Classroom 2015.
All text and photos by Alice Posner unless otherwise noted.

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Introduction

"Ah, that is interesting! Are there chickens?"

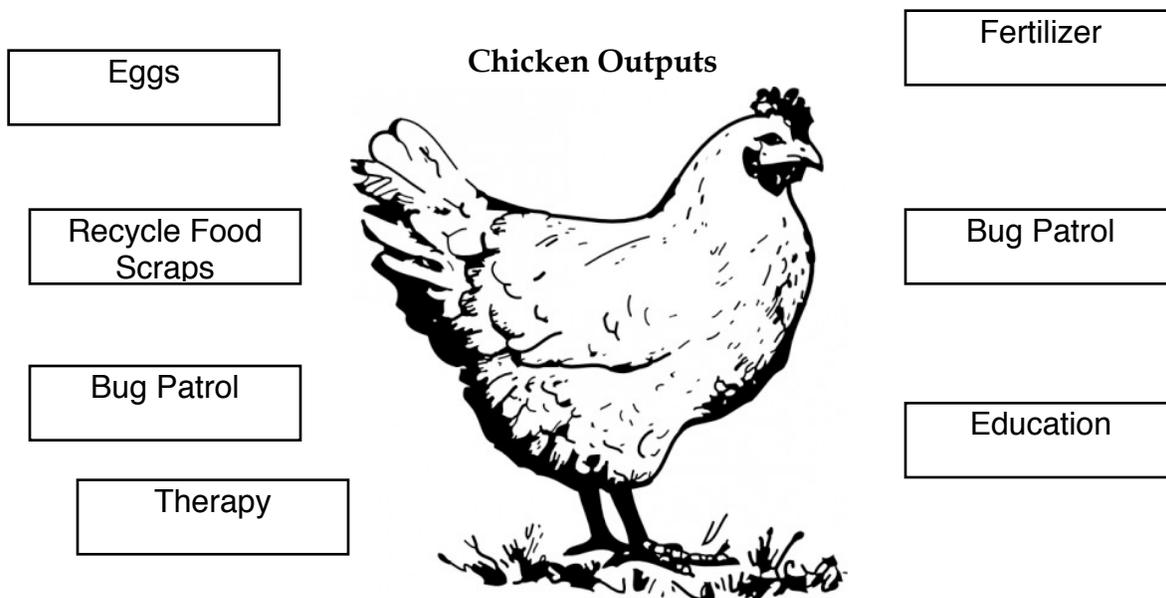
"No."

"Nothing is perfect," sighed the fox."

The Little Prince - Antoine de Saint Exupery

Every chicken owner knows how great chickens are for a garden. Chickens might just be the perfect next addition to your school garden program. How would this work in a school setting? This guide will give you some ideas.

Chickens are multi-functional assets in your garden. Let's look at how. Here are some of the things chickens give us:



Use the blank version of this image in the appendix to have your students fill in their own version of chicken "outputs," and then try the same exercise for chicken "inputs" (e.g. food, water, scraps, care)

There are many ways to bring chickens into your school garden. Our approach in this guide is to invite chicken visitors to your school, in other words, have loaner chickens from an experienced chicken owner that stay at your school as visitors for a few weeks to the whole school year.



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Some other ways to bring chickens into your classroom:

- *Hatch chicks! A time-tested classroom activity. (*See resources*)
- *Invite day time visitors to your garden.
- *Take a field trip to see chickens.
- *Keep school owned chickens. Make arrangements for a staff member or a school chicken committee to oversee care of the chickens.

Who in your community might have chickens? Perhaps it is a local community educational farm. Many people are keeping chickens in cities now so your chicken source might even be a student. Your agricultural or technical high school might have a flock or your 4H group or a local commercial farm.

A good candidate will be excited to enter into a relationship with your school, not only to lend you the chickens, but also to be a source of information and trouble shooting. They should be knowledgeable and experienced with chickens and serve as a mentor for you and your students.

You and the chicken farmer should have a clear idea about who is responsible for what. See the chart below for an example of how to identify individual and shared responsibilities:

Designated Responsibilities Chart	
School	Chicken Owner
Builds adequate housing, fencing and dust bathing area.	Lends school a chicken flock that they keep at their house or farm.
Gets waterers, feeders and a heat lamp.	Ensures a good breed and assesses the health of the birds
Buys food of the chicken owner's choice.	Takes chickens back to their home or farm during holidays.
Provides food, water and bedding to the chickens while they are at the school.	Reviews and approves school chicken activities.
Collects eggs.	Visits the school to train helpers.
Reports chicken health issues to chicken owner.	Oversees health of chickens and deals with any health issues that comes up
Offers volunteer baby sitting help to chicken owner during holidays and weekends.	Culls the flock as needed, e.g. roosters or aggressive chickens.



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Curriculum Standard Connections

“People who count their chickens before they are hatched act very wisely, because chickens run about so absurdly that it is impossible to count them accurately.” - *Oscar Wilde*

The techniques and information in this guide can be adapted to any grade level. Below are examples of curriculum connections for grades 1-4 and middle school.

Grades 1 & 2	Grades 3 & 4	Sample Activities
<p>Earth and Space Science: 4. Recognize that the sun supplies heat and light ... and is necessary for life.</p>	<p>Earth and Space Science: 4. Explain and give examples of the ways in which soil is formed. 5. Recognize and discuss the different properties of soil...</p>	<p>Add chicken manure to your compost pile and understand how this in turn nourishes your garden.</p>
<p>Life Science: 1. Recognize that animals and plants are living things that grow, reproduce, and need food, air and water. 3. Recognize that plants and animals have life cycles... 7. Recognize changes in appearance the animals and plants go through as the seasons change.</p>	<p>Life Science: 1. Classify plants and animals according to the physical characteristics they share. 3. Recognize that plants and animals go through life cycles.</p>	<p>Understand where chickens fit in the animal kingdom and who they are closely related to Understand the life cycle of the chickens, by learning in the classroom and also observing outside in the coop.</p>
<p>History and Social Studies: 1.9 Explain that Americans have a variety of different religious, community and family celebrations and customs. 2.8 ...give examples of traditions or customs from other countries that can be found in America today.</p>	<p>History and Social Studies: 3.2 Identify the Wampanoags and ...describe their way of life. 3.4 Explain how the Puritans and Pilgrims differed... describe the daily life, education and work of the puritans in the Massachusetts Bay Colony.</p>	<p>Look at the keeping of chickens in early European settlements in this country. Were their chickens already here when they came? Look into the role of food in family celebrations.</p>
<p>Math: Measurement and Data. 1. Work with time and Money. 7.</p>	<p>Math: Geometric measurement 5, 6, 7</p>	<p>Measure growth by weighing the chickens as they grow. Keep data on this year to year to determine variability and compare this to weather patterns, age of chickens etc. Measure your chickens egg production from month to month.</p>
<p>English and Language Arts: 2. Write informative/ explanatory texts</p>	<p>English and Language Arts: 7. . Participate in shared research writing projects</p>	<p>Write a step by step chicken keeping guide for next year's class. Write an article about your favorite chicken and make a school chicken newsletter or blog.</p>

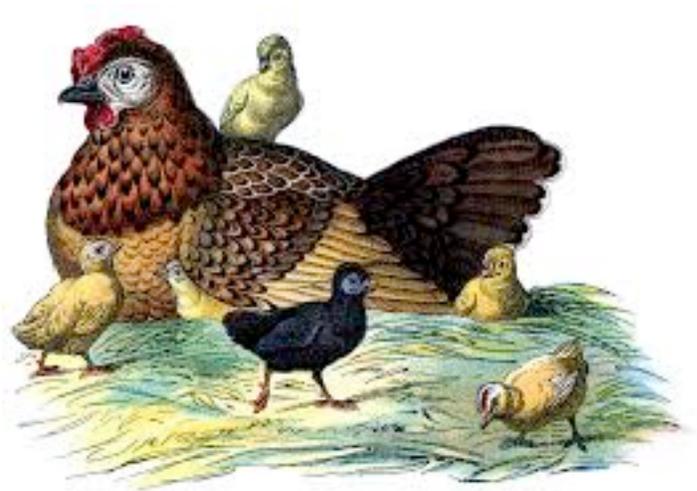


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Grade 6	Grade 7	Sample Activities
<p>6.MS-LS1-1. Provide evidence that all organisms (unicellular and multicellular) are made of cells.</p>	<p>17.MS-LS1-4. Construct an explanation based on evidence for how characteristic animal behaviors and specialized plant structures increase the probability of successful reproduction of animals and plants.</p>	<p>Look at chicken egg membranes under a microscope. Observe chicken behaviors and explain why they might have evolved to do that.</p>
<p>6.MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution. Include potential impacts on people and the natural environment that may limit possible solutions.</p> <p>6.MS-ETS1-5(MA). Create visual representations of solutions to a design problem. Accurately interpret and apply scale and proportion to visual representations.</p>	<p>7.MS-ETS1-2. Evaluate competing solutions to a given design problem using a decision matrix to determine how well each meets the criteria and constraints of the problem. Use a model of each solution to evaluate how variations in one or more design features, including size, shape, weight, or cost, may affect the function or effectiveness of the solution.</p>	<p>Design a chicken coop model based on a chickens needs and your school's needs. Hold a class design charette to give your design recommendations to your coop builders.</p>
<p>6.MS-ETS2-3(MA). Choose and safely use appropriate measuring tools, hand tools, fasteners, and common hand-held power tools used to construct a prototype.</p>	<p>Geometry: Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.</p>	<p>Help build your chicken coop. Determine how much area the chickens will need in their house and yard.</p>
<p>History and Geography 3. Interpret geographic information from a graph or chart and construct a graph or chart that conveys geographic information (e.g., about rainfall, temperature or population size data). (G)</p>	<p>Human Origins 7.4 Explain the importance of the invention of metallurgy and agriculture (the growing of crops and the domestication of animals). (H) 7.5 Describe how the invention of agriculture as it relates to settlement, population growth and the emergence of civilization. (H)</p>	<p>Learn about the history of keeping livestock. Trace the evolution of chickens from wild chickens to their current breeds.</p>
<p>English and Language Arts: 2. Write informative/ explanatory texts.</p>	<p>English and Language Arts: Conduct research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation.</p>	<p>Write a step-by-step egg production guide for next years class. Write an article about the chickens and the part they play in agriculture in the U.S. today.</p>

Some Chicken Facts

- ★ The Latin name for chicken is *Gallus gallus domesticus*.
- ★ Chickens' ancestors include the Red Junglefowl, a member of the pheasant family that is native to Asia.
- ★ Chickens are thought to have been some of the first animals domesticated.
- ★ Chickens can fly short distances, such as over a fence or into a tree to roost.
- ★ Chickens are omnivores. They will eat seeds, plants and insects and also sometimes larger things like small mice and lizards.
- ★ There are more than 24 billion chickens in the world. They outnumber humans by more than three times!
- ★ Chickens are related to the Tyrannosaurus Rex! Tests on dinosaur bones reveal that their amino acid sequences are remarkably similar to the ones in chicken bones, bolstering this theory.
- ★ Chickens swallow gravel to help digest their food.
- ★ Chickens usually cluck after they lay an egg. Some people call this the “egg song.”
- ★ Chicks hatch from their eggs in about 21 days.
- ★ Hens who are sitting on eggs will turn them up to 50 times a day to stop the yolk from sticking to the side.
- ★ Hens usually start laying at 20 weeks of age.



Prepare for your chickens

Before your chicken visitors arrive, you will need to prepare. Set up their housing, fencing, food and water and make sure you and your students are fully educated in what you are going to do when they arrive. Make sure you have already worked out how you are going to care for them as a school community.

Providing housing for your visitors

When constructing housing for your chickens, keep the following in mind:

Location considerations

1. Are there any city ordinances around chickens in your town? These may include how many chickens can legally be kept in residential areas, and may set buffer zones between your chicken coop and your neighbors. A great resource for this is on the "Backyard Chickens" website (*see resources*). Look for the "laws" area of the "learning center" where there is a link to Massachusetts and the ordinances of many towns.
2. How long will it take your students to get to the coop? What would be the travel time for classes of younger students to get from their classroom to the coop to do chicken activities?
3. Is your coop away from stressors like cars, flying balls, running kids and loud noises?
4. Is your coop out of the direct sun? A shady location is better than full sun for heat. Chickens are most comfortable at 70 -75 degrees. If temperatures in their coop get over 95 degrees, birds may die.
5. Does the ground where you intend to site your coop have good drainage? Chickens may develop health problems if their coop or run are damp.
6. Is your coop out of the wind? Wind chill could make your chickens too cold and blow around their food or bedding.

Coop Considerations

You might fundraise to buy a chicken coop, or get one donated. A team of parent volunteers could build a coop with older students from a good coop design. Whatever route you take, be sure your coop has the following:

1. Space: A **minimum area** of 3-4 square feet per chicken if they spend their time outside, and 10 square feet if they are inside a lot. Plan for those days when they need to be inside by designing a bigger coop. Bigger is better. This is especially important if you plan to put your chickens in at the end of the school day and they will spend the rest of their day indoors.



2. **Ventilation:** Your coop will need adequate ventilation, as well as provide protection from the wind. Vents under the roof awnings can be a good way to achieve this.
3. **Warmth:** Your coop should provide warmth for your chickens, especially in the winter. You could consider adding insulation in the walls for regulating the internal temperature. You could also stack hay bales along the north wall in the winter.
4. **Protection from water:** Design to keep out the moisture and the rain. Your coop needs to keep out the rain both from above and below. A raised floor and a good roof are good ways to do this.
5. Your coop should have plenty of **natural light**. This will help keep your chickens warm, happy and healthy.
6. **Nesting boxes:** Laying hens need nesting boxes. These should be comfortable places where your chickens feel safe to lay eggs. Your boxes should be:
 - Soft: Line boxes with hay or other nesting material.
 - Dark
 - Dry: Boxes should be built off the ground.



7. Roosts: Chickens instinctively roost above ground level at night, to protect themselves from predators in the wild. Be sure your hen house has some roosts. They can be made out of dowels, branches or any strong, chicken foot-sized material. You should have at least 10" of roost per bird. Chickens will produce a lot of droppings at night, so some people like to put a "dropping board" under their roost. This can be a simple board directly under the roost that keeps the chicken poop off the floor.

8. Protection from Predators!: Predators are a big consideration in coop design. Be sure to take predators seriously! They take eating your chickens seriously. Here are some steps you can take to protect your chickens.

- **Put a lock on the door.** A simple latch is sometimes not enough to stop dexterous animals like raccoons. A spring-lock latch or similar will be safest.
- **Check for chinks, crannies and thin wood:** Predators will squeeze through any small hole, and gnaw through thin wood. Try going inside your coop at night with a flash light and have someone stand outside to see where the light escapes.
- **Solid Flooring:** Make sure your chicken coop has a good floor so that predators cannot dig under it.

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- **Secure windows** as you do the door. Your predators don't know the difference between doors and windows!
 - **Hardware cloth** is a good way to secure your coop.
 - **Automatic doors** are an option to consider. They work by closing your coop door in the evening usually based upon a light sensor. They provide a great way to secure your chickens if the evening person is late to shut the coop. They can also be tricky. You need to be sure your chickens are adequately trained to go in at night. There is often one chicken who decides to go on a dusk foraging adventure and gets shut out. An automatic door is a better option for a coop door inside of an already secured outdoor run and can be a good back up as long as you check regularly to see that all is well with the coop.
- 9. Fencing:** Good fencing is important to contain your chickens and protect them. There are many different kinds of fencing to choose from. It is worth asking around to hear different opinions as there are many. One good option is electric "flexi net." This is a light, movable electric fence that gives you the option to move your chicken run around. When you are able to move your chicken run around you can use your chickens to prepare garden beds, eat bugs in different areas, and give pasture a chance to grow when your birds are not on it. Keep in mind that this fencing is not enough to protect them at night. You need to shut them up in their coop!
- 10. Dusting area:** Chickens dust for mite control. Give them a good dusty space in which to bathe.
- 11. Foraging:** Chickens are natural foragers. If you are moving them around onto new pasture with flexible netting, they will have lots to forage. If they have a fixed fence chicken yard, consider throwing them some scraps and bringing them worms.
- 12. Water and food supply:** Make sure you have a good source of potable water easily accessible to your chicken coop and a good place, such as a shed or area of your coop, to store food.



Feathered Guest Checklist

(what to make sure you have before your chickens arrive)

- Chicken feeders
- Chicken food
- Secure storage for food
- Feed scoop
- Waterers
- Water source Set Up
- Bedding supply
- Adequate housing
- Any supplements you might need
- Care and feeding plan
- Egg collecting basket
- Egg cartons
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Care and feeding

Keep the following in mind:

- **Feed:** What type of feed will you give them? Ask the chicken farmer what they want you to buy. People often suggest pellets for less mess as chickens like to stir up their food
- **Food Storage:** Where will you store the food? Your food storage will need to be rodent and water proof. You will need both bulk storage, such as a metal trash can, and a bucket (e.g. gamma seal) in or near the coop that is easy for whomever is feeding them to open. Don't forget the scoop!
- **Feeders:** What kind of chicken feeders will you use? There are many options. Your chicken farmer may have suggestions. Try hanging feeders to minimize mess, and look for ones with open tops. That allows students to fill with a scoop instead of having to pick up a heavy feeder.
- **Waterers:** The same design for waterers will be helpful to avoid heavy lifting. Make sure you have a good source of water for your chicken coop.

Idea! Install a gum ball machine to dispense food for visitors to throw

- **Supplements:** Does your chicken farmer want you to provide supplements? If so, put them in a trough or other heavy container that won't get flipped over.
- **Rocks:** Your chickens will need a rock supply. Chickens need to eat small rocks as they store these in their gullets for help with digestion. Add a trough of these if they do not already exist in your chicken yard.
- **Scraps:** You can give your chickens fruit and vegetables and non-processed, non-fatty/oily leftovers. Only give them as much as they can eat in a day to avoid food build up. It can attract rodents and other animals.





Other Chicken Tasks

- **Refresh bedding:** You will need to make sure your chickens have a constant supply of clean bedding. Pine shavings are a great bet. You can use them for bedding and also put them on the ground outside if it is soggy.
- **Put them in at night:** You will need to make sure that someone puts them in EVERY day. Consider a coop that allows them enough space to be inside from the end of the school day until the next morning and occasional weekend days.
- **Socialize:** Picking up your chickens on a regular basis keeps them friendly and used to human contact.
- **Collect eggs!** Chicken eggs should be collected daily. This reduces breakage, chicken droppings on the eggs and the likelihood that the hens will break and eat their eggs.
 1. **Get an egg collecting basket:** It is worth getting an “official one” from a feed store or farm supply. These baskets are designed to help reduce breakage. Any basket is ok if you line it with paper towels to keep the eggs from knocking around.
 2. **Collect egg cartons** from your student’s families to put your eggs in. You could have fun decorating these.
 3. **Be alert for a broody hen:** Hens, when sitting on their eggs, can peck. They are just trying to be good mothers and protect their eggs. If you have a broody hen, wear gloves to stop any painful pecks.
 4. **Wash your eggs** in warm water if they are dirty
 5. **Refrigerate** your eggs. Eggs must be stored **between 33°F and 45°F** to decrease bacterial growth.
 6. **Label** egg cartons with the date collected. Consider making pre-made stickers with spaces on them to fill in this information.
 7. **Keep records** on daily egg counts. This is a great way to gather data about the chickens to work with in the classroom.

Sample Weekly Jobs for students

JOB	TIME	WHO
Let chickens out	Before school	Sam
Check and fill food	During homeroom	Janaiya
Check and fill water		
Bedding refresh		
Feed snack scraps		
Socialize		
Collect eggs		
Write in log book		
Health check		
Check and fill supplements		
Lock chickens in		
Sell eggs at pick-up time		

Health and safety practices

Below are some practices and suggestions for health and safety. Be sure to read the MDAR guide on home chicken safety (*see resources*) and develop your own health and safety plan.

- Have a collection of **designated rubber boots** for working with the chickens that are not used elsewhere.
- Install a **foot bath** at the entryway of your chicken coop. Different floor mat foot baths and other kinds are sold at farm supply stores. Ask.
- You should have easy access to **hand washing**. Require it before and after working with the chickens.

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- Keep an **apron/big old shirt** collection for chicken holding and working with the chickens.
- **Disinfect all equipment** that goes into our out of use with your chickens.
- Have a designated **egg collecting basket** to prevent breakage.
- Keep a **safety checklist and laminated how-to sheet** for students.

During your chicken stewardship, you should report any health issues to the chicken farmer. Go through the following checklist with your chickens often.

Healthy Chicken Check List

- aware and alert
- upright posture
- scratching, digging and pecking at the dirt
- laying if the right age
- eggs have thick shells
- roosting and flying up to a roost
- making noises such as “hen song” after laying an egg
- pruning and preening behaviors
- shiny feathers
- bright clear eyes
- comb and wattle deep red (or breed specific color)
- Fully feathered (unless molting)
- Eats and drinks regularly
- droppings uniform: firm, usually light brown to grayish green, occasional molasses texture/color



Sick Chicken Signs

- Increase in unexplained deaths in your flock, with or without symptoms
- Sneezing, gasping for air, coughing, and/ or runny nose
- Watery, green diarrhea
- Lack of energy and poor appetite
- Drop in egg production or soft or thin-shelled, misshapen eggs
- Swelling around the eyes, neck, or head

If you see any of these sick chicken signs, quarantine your birds, close off the area and contact your chicken owner.

Other things to watch out for and tell your chicken farmer:

- ***Excessive bullying:** You may need to divide a hen from the others if it is being excessively pecked.
- ***Molting:** Chickens will sometimes go through a molt, often as the days start to get shorter in the fall. When chickens molt they stop laying eggs and lose some (or a lot) of their feathers. This feather loss usually starts around the neck area and moves down the back, onto their breast and finally to the tail feathers. In 1-3 months new feathers will grow. Don't panic during this time, but do avoid picking a molting bird up as this may be painful for it.
- ***Broody hens:** One or more of the chickens might become "broody." Broody hens change their behavior to protect and incubate a clutch of eggs. This is a natural part of a chicken's behavior and usually not a problem. On occasion, they will stay broody for a long period, even with no eggs to hatch. Tell your chicken farmer about it. Some hens may stay broody for a long time. The potential problem is that they will only get up to drink and eat once a day or even less and may peck out a lot of their own neck feathers to "feather" their nest. Over a long period of time this may lead to malnutrition, excessive feather loss, and/or bullying by other hens.



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Resources and Sources

Massachusetts Agriculture in the Classroom Guides: Can be found at www.aginclassroom.org under "Classroom Agriculture"

Mass 4H resource on hatching eggs in your classroom: <https://mass4h.org/programs/embryology>

MDAR Chicken Health Guide <http://www.mass.gov/eea/agencies/agr/animal-health/poultry/>

Backyard Chickens Website: <http://www.backyardchickens.com/>

Northeast Organic Farming Association, Urban Poultry: <http://www.nofamass.org/content/urban-poultry>

Backyard Poultry Magazine: <http://countrysidenetwork.com/bp-issues/>

Massachusetts 4H poultry project and the Massachusetts 4H heritage Breeds project: <https://mass4h.org/programs/heritage-breeds>

Want to acclimatize your school to the idea of chickens? Check out the Massachusetts "Hen Cam" : <http://hencam.com/>

Sick birds: Have your chicken owner call right away!

Mass. Dept. of Agricultural Resources, Animal Health Division - 617-626-1795

Smithsonian Magazine: <http://www.smithsonianmag.com/science-nature/14-fun-facts-about-chickens-65848556/?no-ist>

<http://www.livescience.com/1410-rex-related-chickens.html> - On chickens relationship to the T Rex!

<http://www.ansc.purdue.edu/faen/poultry%20facts.html> - Purdue University Chicken Facts

"Flexinet" electric fencing source in Southern NH: <http://www.wellscroft.com/>

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About the Author:

Alice Posner's favorite chicken is the New Hampshire Red. She has kept 50 chickens at one time and has over ten years of farming experience on diversified farms in Western Massachusetts. She has over ten years of experience teaching in school gardens, and has also designed curriculum for summer and vacation programs on farms. She has been writing garden guides and working in school gardens with MAC since 2012. Currently she works independently, consulting and installing educational gardens in schools and community settings. You can contact her at alice.flood@gmail.com



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