

Oregon Agriculture in the Classroom Incubator Handbook



Oregon Agriculture in the Classroom Foundation
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Section 1: Introduction

Thank you for using one of the Oregon Agriculture in the Classroom Foundation's incubators! We are excited to provide this amazing tool for you and your students. To help you along the process of incubating eggs, we developed this handbook to answer questions you might have. Read this brief handbook before you begin the incubation process.

Oregon Agriculture in the Classroom Foundation is dedicated to helping students grow in their knowledge of agriculture, the environment, and natural resources for the benefit of Oregonians today and in the future. To find more information about our program, visit oregonaitc.org.

Section 2: What Your Students Will Learn

Utilizing the Oregon Agriculture in the Classroom Foundation's incubators in an educational environment will enhance students' learning significantly in the area of animal life cycles. For any grade level, there are key concepts that can be taught by the process of hatching eggs. Some suggestions include:

- The life cycle of a chicken, from the time the egg is laid into adulthood and beyond
- The different stages of development of an egg
- How humidity and temperature levels can affect the hatching success rate
- The difference between birds and mammals
- The structure and function of the different organs found in a chicken and how they compare to mammals'
- Reproduction and heredity
- Domestic animals and their environments versus wild animal counterparts and their environment (i.e.: ducks raised for human consumption versus wild ducks)

Our incubators tie in well to the following NGSS:

- Disciplinary Core Ideas
 - LS1.B: Growth and Development of Organisms
 - LS3.A: Inheritance of Traits
 - LS3.B: Variation of Traits
 - LS4.B: Natural Selection

- Cross Cutting Concepts
 - Patterns
 - Cause and Effect
- Grade Specific Standards
 - 1-LS1-2: Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.
 - 1-LS3-1: Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.
 - 3-LS1-1: Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.
 - 3-LS3-1: Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.
 - 4-LS1-1: Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
- Science and Engineering Practices

Section 3: Preparing for Your Incubator

Ordering Eggs

Your hatching success starts with where and when you purchase your eggs. Eggs bought at the grocery store, eggs laid with no rooster in the area, or any other eggs that are not fertilized will not produce a chick. We suggest going to a source with proven fertilization success. Check out these contacts as a potential source for fertilized eggs*:

- Murray McMurray Hatchery: www.mcmurrayhatchery.com
- Carolina: www.carolina.com/living-organisms/
- Stromberg's Chicks and Game Birds Unlimited:
www.strombergschickens.com/
- Your local feed store or pet supply shop

Normally, eggs take 21 days from fertilization to be hatched in optimal conditions. This means that you should have a source picked out before your incubator arrives, so that you can purchase your eggs and get them incubated in a timely manner. Look at your calendar, make sure that your eggs have a high chance of hatching on a day when your students will be around (that is part of the fun!). We suggest starting incubation with freshly fertilized eggs on a Monday or Tuesday so that in 3 weeks you and your students will have a few days of leeway in case your

eggs take longer than 21 days to hatch. **Only purchase eggs of the same species. Different species have different hatching times and will emerge from their eggs at varying sizes. Combining species could result in crowding and unsafe conditions for the hatchlings.**

* Oregon AITC does not guarantee egg hatching success.

Where to Put Your Incubator

Your incubator will have the best results in a room that is free from wide temperature variations and with generous ventilation. Make sure that the room temperature does not drop on a cold night. Ideally, room temperature should stay between 68 and 77 degrees Fahrenheit. Furthermore, do not place the incubator in direct sunlight. The incubator will need to be near a power source that will remain on for the duration of incubation. Avoid plugs or rooms that often lose power. Power loss for long periods of time will result in unsuccessful incubation. Incubators should also be used on a flat and level surface.

Additional Resources:

Check out these Oregon Agriculture in the Classroom Foundation resources to accompany incubator projects:

Chicken and Eggs Commodity Page - oregonaitc.org/resources/oregon-resources/oregon-grown-commodities/

Oregon AITC Egg Production and Nutrition Video – on YouTube search “Get Oregonized – Egg Production and Nutrition” or follow this link

<https://www.youtube.com/watch?v=XloI3ZQVprM&t=11s>

Free Loan Library Items - oregonaitc.org/resources/library/ (use the search bar to find many different books and DVDs on chickens and eggs)

Check out these resources from other organizations to accompany incubator projects:

American Egg Board - www.aeb.org/

Brinsea (manufacture of the incubator) - www.brinsea.com/

National Agriculture in the Classroom - www.agclassroom.org/teacher/matrix/

Utah Agriculture in the Classroom: utah.agclassroom.org/hatching/

Section 4: Setting Up Your Incubator

Set Up

Once your incubator arrives and you open the box the following materials should be inside:

- Oregon Agriculture in the Classroom Foundation Incubator Handbook
- Brinsea User Instructions
- Check Out Papers
- Participation Form
- Return Address Label
- Any additional materials you requested
- Packing Material (bubble wrap, packing paper, etc.)
- Incubator Box Containing:
 - Incubator (includes removable lid)
 - Egg Disc
 - Water Pot Guard
 - Power Supply Unit

If any of these items are not present or appear to be broken when you receive your package please contact Oregon Agriculture in the Classroom Foundation as soon as possible. We can be reached at 541-737-1318 or aitc@oregonstate.edu.

Once you have evaluated the materials with the package, set the incubator up as if you were to start incubation. The incubator must be on for 24 hours prior to placing eggs in the incubator. This will help ensure that the equipment is running right and is heated to the correct temperature for optimal incubation.

Pre-Incubation Check

It is important to check that your incubator's settings are correct. Check humidity, temperature, and rotation settings before placing the eggs. Please utilize the Brinsea User Instructions to set and adjust controls appropriately.

Starting Incubation

Place eggs on egg tray. **Remember to NOT combine bird species.** Do not overcrowd. Refer to the Brinsea manual to how many eggs can be placed in the incubator; the number of eggs depends on the species you are incubating.

Incubation

For 3 weeks your eggs will incubate. Check the systems at least once a day to make sure that heat and humidity are staying consistent.

Section 5: Hatching

Starting to Hatch

As mentioned before, in optimal conditions, eggs take 21 days from fertilization to be hatched. If eggs are incubated in less than perfect conditions, there is still a chance that they will hatch. If your eggs did not hatch after 21 days, give them a few extra days. If they do not hatch this could mean that they were either unfertilized, or that conditions were unsuitable for the chick to grow to hatching conditions. Unhatched eggs are never fun, however, remember that this is a part of life. Often times chicks don't hatch for a reason.

Two days before eggs are due to hatch, remove the egg disc from the incubator; the auto-rotate should turn off automatically when the countdown gets to day 2, but make sure to double check the motor is not still turning after the egg disc is removed. Be careful while handling the eggs. Make sure the water pot is full and the water pot guard is on to prevent chicks from drowning. When most of the chicks have hatched (should be 12-48 hours after the first egg hatches), remove the chicks; it is important to note that they need to be kept warm. A cardboard box with a heat lamp would be sufficient to house the chicks in until they go to their forever home. Remember to supply them with plenty of water and food. Consult with your local pet shop or feed store to find the right waterers, feeders and food.

When the hatching process starts you will see the shell begin to crack open. It may be a slow process. It is important not to break the shell open or try to help the chick. Hatching will take several hours once the shell has been pipped. The chick knows by instinct what to do, and in trying to help it, you will do more harm than good.

What's Next

Before you decide to hatch eggs, you should have decided what you will do with the chickens after they leave your classroom. If you are having trouble finding homes for your chicks contact your county extension agency. You can find contact information at: extension.oregonstate.edu/

Section 6: Clean Up and Return

Cleaning the Incubator

Once your chicks have hatched, clean the incubator as much as possible. Do not rinse any part of the incubator electronics. All shell particles, feathers, dust, or other contaminants should be removed, using only water. **Do not use any type of bleach cleaner; it is toxic to future eggs.** You/your school will be charged if the incubators are returned if extensive cleaning is required. We will disinfect all incubators once they return to our office.

Returning Your Incubator

Once you are finished with your incubator pack all of the materials back into the shipping box. Use this checklist to ensure all materials are returned:

- Oregon Agriculture in the Classroom Foundation Incubator Handbook
- Brinsea User Instructions
- Filled Out Participation Form
- Packing Material (bubble wrap, packing paper, etc.)
- Incubator Box
- Incubator (includes removable lid)
- Egg Disc
- Water Pot Guard
- Power Supply Unit
- Any additional materials you requested

Cost of Missing Parts

- Incubator: **\$199.99**
- Egg Insert: **\$19.99**
- Plug Top and Transformer: **\$19.99**
- Water Pot Guard: **\$4.99**
- Instruction Manual: **\$1.50**
- Oregon AITC Incubator Handbook: **\$1.50**
- If the incubator is not returned thoroughly clean, a **\$25** fee will be charged

Return Information

Ship or deliver the box to:

**Oregon Agriculture in the Classroom
200 Strand Ag Hall
Corvallis, OR 97330**

Thank you for using Oregon Agriculture in the Classroom's incubators. We hope your project is a success and your students enjoy watching chicks hatch!

Oregon Agriculture in the Classroom Mission:



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