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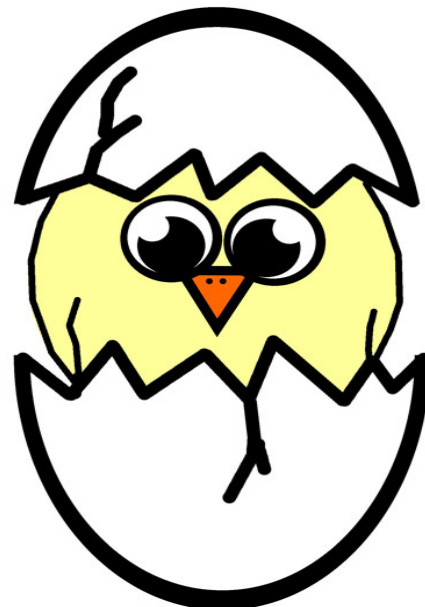


Ford Motor Company Fund

“Cracking” Science  
Cycles to STEM  
Environmental Impact

# ***Cracking" Science Cycles to "STEM" Environmental Impact!***

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## Overview:

With the use of the incubator , the students will be able to see for themselves all that is required to have a "perfect" chick. But, even then with all the right requirements (such as temperature and environment) some of the eggs won't hatch. This would be the perfect introduction to what we can do to help the environment while at the same time cover important science skills. This will then lead to a STEM(Science Technology Engineering and Math) project on identifying environmental factors affecting animals and what solutions they can come up with to solve these problems. The students will read about egg cycles and what is needed to hatch an egg. We will then research different animals and discuss what is needed for them to get to adult and why some animals have become extinct or on the edge of extinction. The students will present each "problem" identified and what solutions their group has come up with. We will then present on morning announcements.

## Materials to purchase

From [www.amazon.com](http://www.amazon.com) :

Egg: Nature's Perfect Package \$17.99

A Chicken Followed Me Home!: Questions and Answers about  
a Familiar Fowl Hardcover \$16.29

A Kid's Guide to Keeping Chickens: Best Breeds, Creating a Home,  
Care and Handling, Outdoor Fun, Crafts and Treats \$11.38

Brinsea Products Complete Incubation Pack for Hatching  
7 Chicks in The Classroom \$349

From the Science Biology Company: [www.carolina.com](http://www.carolina.com) :

Chicken Eggs, Fertile, Unit of 12 \$34.25

Chick Feeding Set \$29.50

## Standards

SC.2.L.16.1 Observe and describe major stages in the life cycles of plants and animals, including beans and butterflies.

Big Idea 1: The Practice of Science

A: Scientific inquiry is a multifaceted activity; The processes of science include the formulation of scientifically investigable questions, construction of investigations into those questions, the collection of appropriate data, the evaluation of the meaning of those data, and the communication of this evaluation.

B: The processes of science frequently do not correspond to the traditional portrayal of "the scientific method."

C: Scientific argumentation is a necessary part of scientific inquiry and plays an important role in the generation and validation of scientific knowledge.

D: Scientific knowledge is based on observation and inference; it is important to recognize that these are very different things. Not only does science require creativity in its methods and processes, but also in its questions and explanations.

SC.35.CS-CC.1.2

Describe key ideas and details while working individually or collaboratively using digital tools and media-rich resources in a way that informs, persuades, and/or entertains.

# Background for a successful project

## Important procedures to consider

- A. Plan the exact dates for your project. Many teachers use this material as a supplement to a specific curriculum like biology, human sexuality, human development or other related topics. It is extremely important that you understand that this is a continuous project for at least a 25-day period. Plan the project around holidays and testing periods. It is usually best to plan to set your eggs on a Tuesday. This allows you to prepare on Monday and insures that the chicks will not hatch on a weekend.
- B. To prevent bacterial contamination, make sure that all students and teachers wash their hands after handling the eggs, raw egg products, incubated eggs, chicks and litter.
- C. Before you order eggs, plan what you will do with the chicks that hatch. Contact a farmer, zoo or other animal caretakers who are equipped to care for the chicks properly. **NEVER** allow chicks to go home with students from your class. It is your responsibility to make sure that the chicks get a good home.



## About the eggs

**A. Obtaining fertile hatching eggs.** Locating fertile eggs may present a problem, especially in an urban area. Most eggs sold in grocery stores are not fertile and cannot be used for incubation. Fertile eggs can usually be obtained from hatcheries or poultry breeding farms. Large hospitals may also be able to provide them. Contact your local Extension office for suggestions.

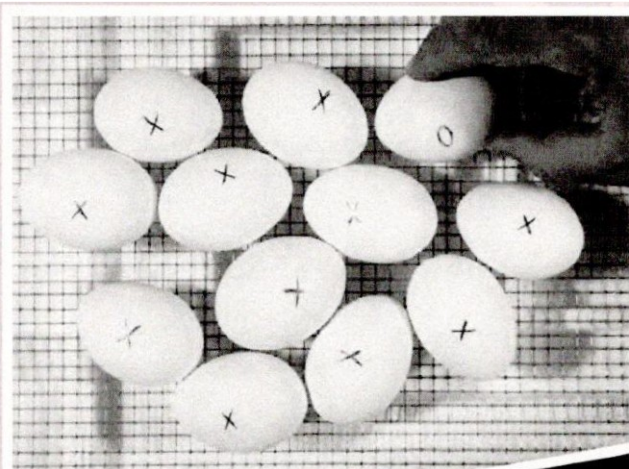
- 1 For a basic observation and hatching project, 12 eggs per incubator are adequate. If you are planning to do an experimenter activities, additional eggs may be required.
- 2 When you obtain fertile eggs from a source that does not routinely hatch its own eggs, you may want to test the eggs in an incubator to ensure that good fertility and hatchability can be obtained before you use the eggs as part of the class project. The presence of a male with a laying hen does not guarantee fertility or hatchability. You are also *strongly* encouraged to use chicken or coturnix quail eggs to hatch in the classroom. Duck, goose, pheasant and other species of fowl can be more difficult to hatch in classroom incubators. Duck and goose eggs often rot and may explode in the incubator.
- 3 When you have located a source of fertile eggs, pick them up yourself, if possible, rather than have them shipped or mailed. It is difficult for hatcheries, the postal service and transportation companies to properly handle small orders of eggs.

**B. Caring for eggs prior to incubation.** Timing, temperature and position are critical to safe storage.

- 1 The eggs should be collected within four hours after they are laid.
- 2 If it is necessary to store fertile eggs before setting, store small end down at a temperature between 50 and 65°F and at 70 percent humidity.
- 3 Never store eggs more than 10 days after the eggs are laid. Hatchability drops quickly if they are stored for more than 10 days.
- 4 Transport fertile eggs in a protective carton, small end down. Do not leave eggs in the sun or a hot car. In winter, don't let the eggs get below 35°F.
5. It is always best to set the fertile eggs in a heated incubator within 24 hours of obtaining them.

## About the incubator and incubation

- C. Preparing the eggs for Incubating.** Fertile eggs from a commercial hatchery are usually already presorted. However, it is usually wise to check your eggs before setting them.
1. Candle eggs prior to setting to check for cracked eggs, thin-shelled eggs and double-yolked eggs. Do not incubate these eggs since they usually do not hatch.
  2. Do not wash the eggs unless necessary. The eggs have a natural protective coating that is removed by washing. Only wash eggs that are visibly dirty. Then wipe the egg clean with a wet cloth warmer (at least 10 degrees warmer) than the temperature on the eggs. Do not set eggs that are excessively dirty.
  3. Bring fresh eggs to be placed in the incubator to room temperature two hours prior to setting.
  4. **Mark** the eggs with "X" and "O" on opposite sides to aid in daily turning. Also, number the eggs on the top of the large end to aid in identification and record keeping during the project. When marking eggs always use a pencil or wax crayon. Do not use permanent or toxic ink pens or markers.
  5. Eggs that are warmed to room temperature should be immediately placed in the incubator.



Setting eggs that are marked with X's and O's.



Do not set cracked eggs.

- A.** Secure an incubator and make sure it is in good working order. You may choose a new or used incubator.
1. If buying a **new Incubator**, order at least one month prior to the start of the project. Forced air incubators (with a fan to circulate the air) are best. Once the new incubator arrives, assemble if necessary and follow instructions for operation.
  2. **Used Incubators** should be checked one month prior to the start of the project. Make sure your equipment is clean and working correctly. This will allow you time to order parts or a new incubator if necessary.
- B.** Turn the incubator on a couple of weeks before the project starts and run it for 48 hours to insure that everything is working properly. Once you know it is in proper working order, unplug and set in a safe area until a few days before the start of the project.
- C.** Inform the administration and maintenance staff that you are doing this project and ask them to tell you if the electricity needs to be shut off for any reason.
- D.** **Proper** incubator placement in the classroom helps avoid problems.
1. **Set** up the incubator in a room that stays above 65 °F.
  2. **Make** sure the electrical outlet that you are using will be "on" 24 hours a day. Some schools turn off entire sections of the school at night and on weekends.
  3. Place the incubator on a sturdy level surface.
  4. Place the incubator at least six inches away from the edge of the surface to avoid accidental bumps.
  5. **Avoid** high traffic areas, hot sunny windows, heating and cooling vents, drafty windows and doors.
- E.** Turn incubator on 36 to 48 hours prior to setting the eggs.
1. Adjust the incubator so it holds the desired temperature. Follow manufacturer guidelines for adjusting the temperature. In still-air units (without fans) adjust the temperature to 101°F. In forced-air units (with fans), adjust the **temperature** to 100°F. Always adjust the thermostat so the heat source goes off when the temperature reaches the desired temperature and comes on when the temperature drops below the desired temperature
  2. Use at least two thermometers to insure you are getting an accurate temperature reading.
  3. Check the temperature often. Improper temperature can result in a poor hatch and weak chicks.



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# EMBRYOLOGY FACTS

Day Set: _____	Number Eggs Set: _ _ _ _
Day Stop Turning: _ _ _ _ _ _ _ _ _ _	Number Eggs Fertile: ____ _
Day Expected to Hatch: _ _ _ _ _ _ _ _	Number Eggs Hatched: ____

Where did you get the eggs?

---

What kind of eggs did you set in the incubator?

---

What temperature is the incubator? \_\_\_\_\_

---

How often do the eggs need to be turned?

---

How will you check fertility? \_ \_ \_ \_ \_ \_ \_ \_

---



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## Individual Egg Progress

Number each egg on the air cell end of the egg. Keep a record of what happens to each egg.

## Addition and Subtraction

- A. If you collect two eggs from one nest, four eggs from another nest and three from the final nest, how many eggs will you have to set in the incubator?
- B. Mary had two dozen eggs in her basket. She dropped the basket and broke seven eggs. How many eggs are still unbroken?
- C. If you set 18 eggs in the incubator and 11 hatched, how many eggs did not hatch?
- D. If a hen laid one egg on 19 different days during the month of March, how many days did the hen not lay an egg?

## Percentages

- E. If a hen laid one egg on 20 different days during the month of April, what percent of April did the hen not lay an egg?
- F. If you tested ten eggs for fertility and found that six were fertile, how many eggs out of 1,000 eggs from the flock would you expect to be fertile?

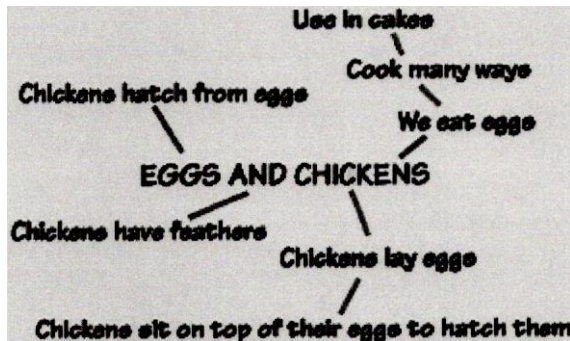
Egg Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Not Fertile																		
Fertile did not pip																		
Fertile and pipped																		
Hatched																		
Died																		

## **Part I: Preliminary discussion: What do you know?**

### **1. What do you know about eggs, chickens & hatching?**

- Discuss what the students know. You can create charts as a group project, as a class project or as individual exercises.

#### **Sample chart**



You may want to include:

1. Physical characteristics of chickens (colors, size, wings, feathers, feet, etc.)
2. Physical characteristics of eggs (color, size, shape, shell, internal parts, etc.)
3. Uses of chicken & eggs (food, decorations, etc.)

#### **Vocabulary**

lay	brood	fowl	class
hatch	embryo	poultry	breed
pip	egg tooth	rooster	variety
egg	development	chicken	bantam
beak	unfertilized	hen	comb
yolk	chick	down	shanks
white	nest	feathers	wattles
shell	clutch	wings	

- Color & label the parts of a chicken
- Make a chicken collage - Find pictures of different chicken breeds. Chickens are not all the same. They are grouped by class, breed and variety. There are also two sizes of chickens: standard and bantam. Bantams being one third to one-fifth the size of standard chickens. The American Poultry Association [www.amplya.com](http://www.amplya.com) recognizes over 300 breeds of chickens.

### **2. What do you know about incubation?**

Eggs have been incubated by artificial means for thousands of years. Both the Chinese and the Egyptians are credited with originating artificial incubation procedures. The Chinese developed a method in which they burned charcoal to supply the heat. They also used the hot-bed method in

which decomposing manure furnished the heat. The Egyptians constructed large brick incubators which they heated with fires right in the rooms where the eggs were incubated.

Over the years incubators have been refined and developed to the point where they are almost completely automatic. The greatest development has occurred in the 20<sup>th</sup> century.

Modern commercial incubators are heated by electricity, have automatic egg turning devices, and are equipped with automatic controls to maintain the proper levels of heat, humidity, and air exchange. Present-day commercial incubators vary in capacity from a few thousand to many thousands of eggs, and they have made possible the development of modern hatcheries which produce almost 100 percent of all the chickens grown in this country.

- Explain to students that during incubation embryos must have certain things to help them develop:
  1. Warmth
  2. Turning
  3. Ventilation
  4. Humidity
- Discuss methods of supplying & regulating heat, humidity & turning comparing a hen and an incubator. Have students identify factors which can keep eggs from hatching.
- You may wish to set up the Mini II Advance incubator and fill out the checklist provided with the students as an exercise on how to follow instructions.
- Have students play the Egg Game individually or in small groups. Each student or group starts with 24 paper eggs. The students flip a coin to move one or two spaces (see game board). The students keep track of their eggs throughout the game. Lost eggs are placed in an envelope. The winners are the ones with most eggs at the end of the game. At the end of the game you can ask students which of the hazards are caused by people and what can be done to protect the eggs.

Additional vocabulary

fan	membrane	candling
temperature	sac	turning
hygrometer	moisture	humidity
incubator	wet bulb thermometer	thermostat
heater	water pan	thermometer

- Teach students how to read thermometers, how to convert from Celsius to Fahrenheit and distribute the Daily incubation chart for them to record temperature, humidity, number of eggs set, clear & hatched.
- With older students you may also want to weigh the eggs the day they are set and then 3 to 4 times during incubation and graph the results as detailed in the Brinsea **Mini II** Advance incubator instructions in the section "Determining correct humidity setting - monitoring egg weight loss".
- You can post a job list assigning students to check temperature, humidity, water and later feed, water, clean the brooder enclosure & help dispose of the chicks (birth announcements to distribute to other classes and take home).

# Incubation Check List

## Obtaining and storing eggs

- D Order fertile eggs from hatchery or breeding farm.
- D Store eggs in cool (50°F/10°C), damp conditions for no longer than 10-14 days.
- D Turn stored eggs daily.
- D Discard cracked and heavily soiled eggs if possible. DO NOT wash eggs unless necessary.
- D Just before setting in the Brinsea Mini II Advance incubator allow the eggs to warm to room temperature.

## Equipment set up

When you receive your Brinsea Mini II Advance Classroom Pack:

- D Read the instructions manual carefully
- D Place the Mini II Advance incubator on a flat surface.
- D Set it up away from drafts , direct sunlight and traffic path.
- D Allow the incubator to run for a few hours to stabilize the temperature before you set the eggs and begin incubation.
- D Maintain room temperature between 68 and 77°F (20 and 25°C).
- D Fill one of the water pots in the bottom of the Mini II Advance incubator.
- D Using the menu of the Mini II Advance set the day count down to the correct incubation period e.g. 21 days for chicken.

## Incubation

- D Set the eggs on their side in the pockets of the egg turning disk ensuring the disk is ribs side up.
- D To avoid week-end hatches set your eggs on a Tuesday or Wednesday.
- D Check the water level every 3 days.  
Top up with water at room temperature.

- D Ensure nothing impedes the turning movement of the eggs e.g. eggs rubbing together or too large for the pockets of the turning disk.
- D Candle the eggs every 3 days with the Brinsea OvaScope supplied to reject clear, infertile eggs or dead in shell embryos after day 9 to avoid bacterial contamination.

### **Pre-Hatching- Day 19**

- D Check that the egg turning has automatically stopped 2 days prior to hatch day and remove the egg disk from the **Mini II** Advance incubator.
- D Lower temperature to 97°F (36°C).
- D Ensure the water pots are full to above the division between them. Humidity needs to be high.

### **Hatching**

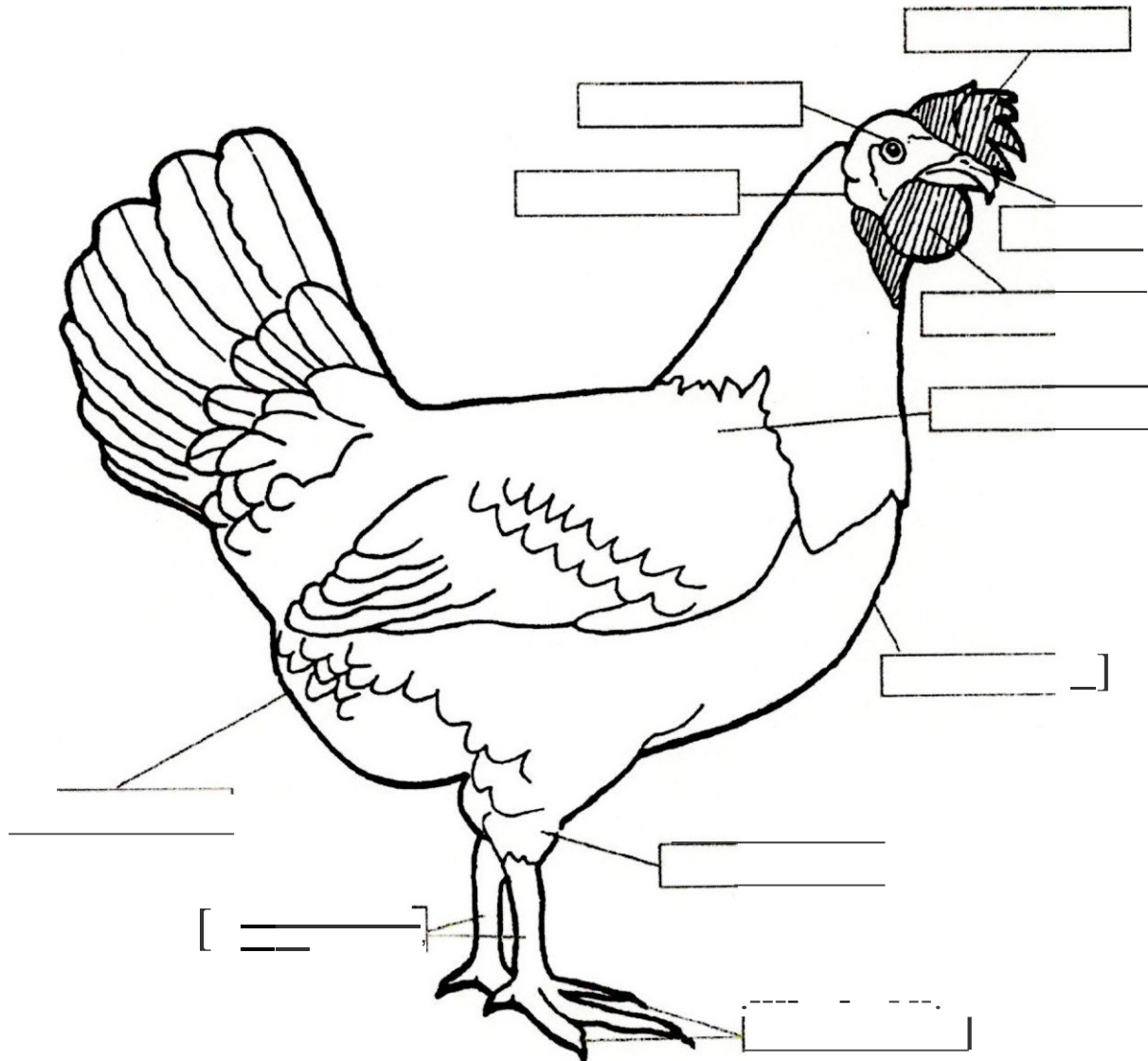
- D Do not open the **Mini II** Advance incubator during hatching . This would drastically reduce humidity endangering the chicks.
- D Do not remove the chicks from the incubator until they are dry and fluffy.
- D Set up the Brinsea Eco Glow brooder and enclosure provided with the Classroom Pack and transfer the chicks to the brooder.
- D Provide water and feed for the chicks.

### **After hatching**

- D Find good homes for your chicks within a couple of days.
  - D Clean your Mini II Advance incubator and Eco Glow brooder with the Brinsea disinfectant provided.
-

# Parts of a Chicken

Color and label the parts of a chicken.



Use each word only once:

beak  
eye

breast  
hock

comb  
shanks

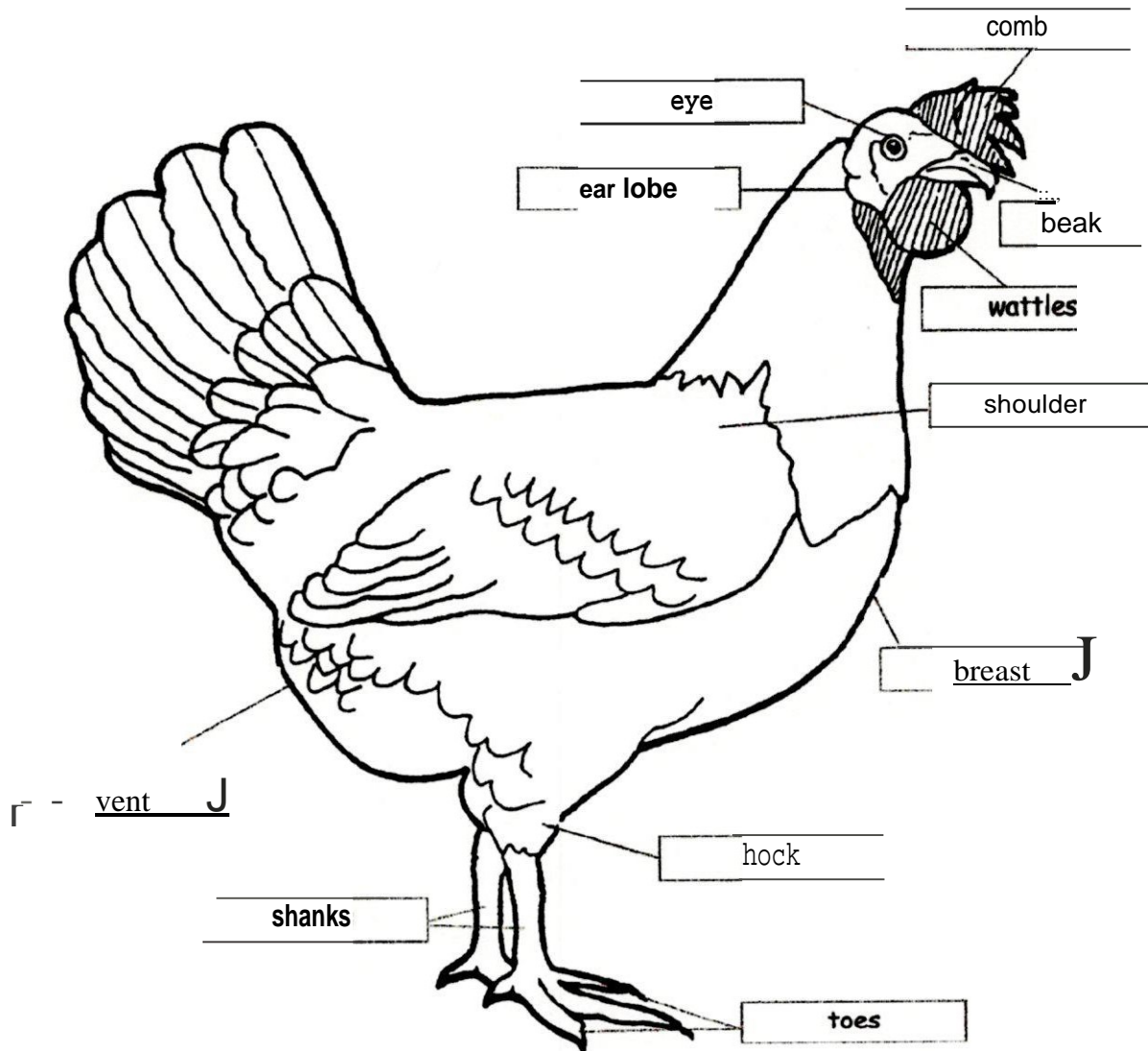
toes

earlobe  
vent

shoulder  
wattles

# Parts of a Chicken

Color and label the parts of a chicken.



Use each word only **once**:

beak  
e.ye.

breast  
hock

comb  
shanks

earlobe  
shoulder



Name: \_\_\_\_\_

## Life Cycle of the Chicken

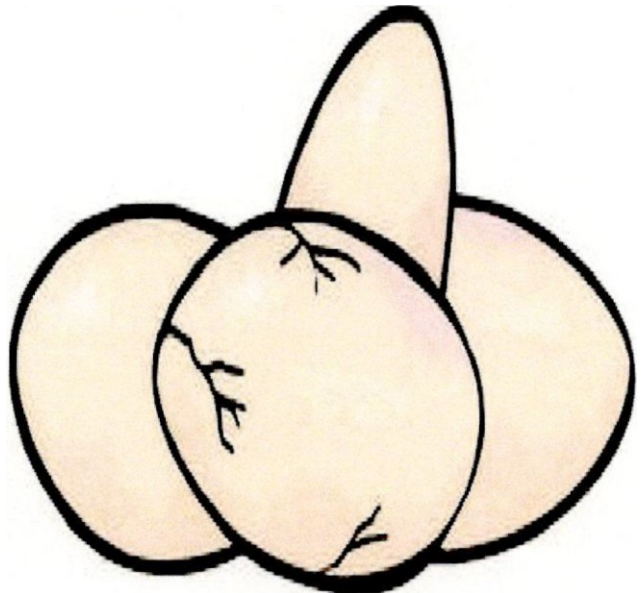
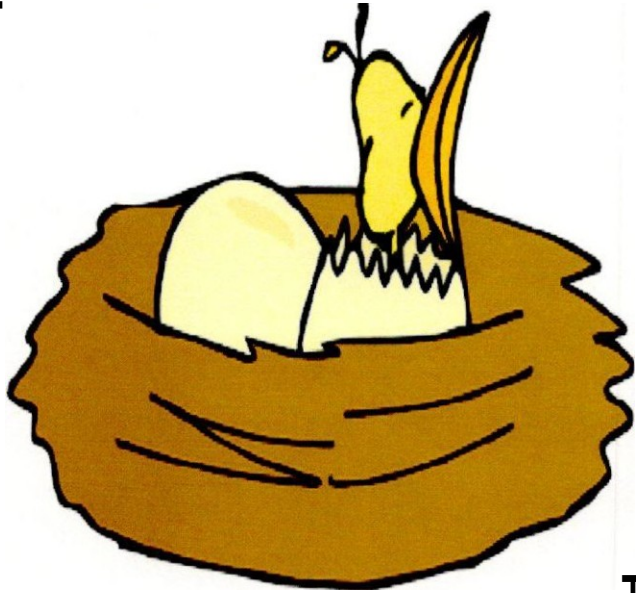
A chicken is a bird. A chicken is born from an egg and looks a lot like its mother. The chicken breathes with lungs. When it is old enough, and strong enough, it leaves the nest.

**Directions:** Cut out the pictures of the chicken's life cycle.

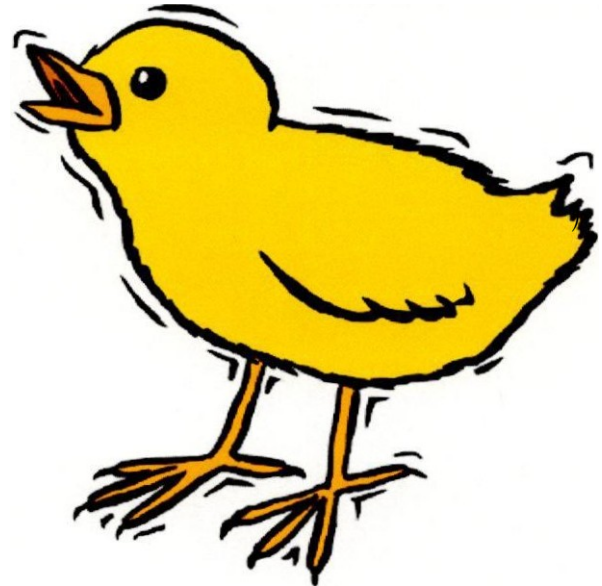
Paste them in order on page 2.

### **Incomplete Metamorphosis**

r



J

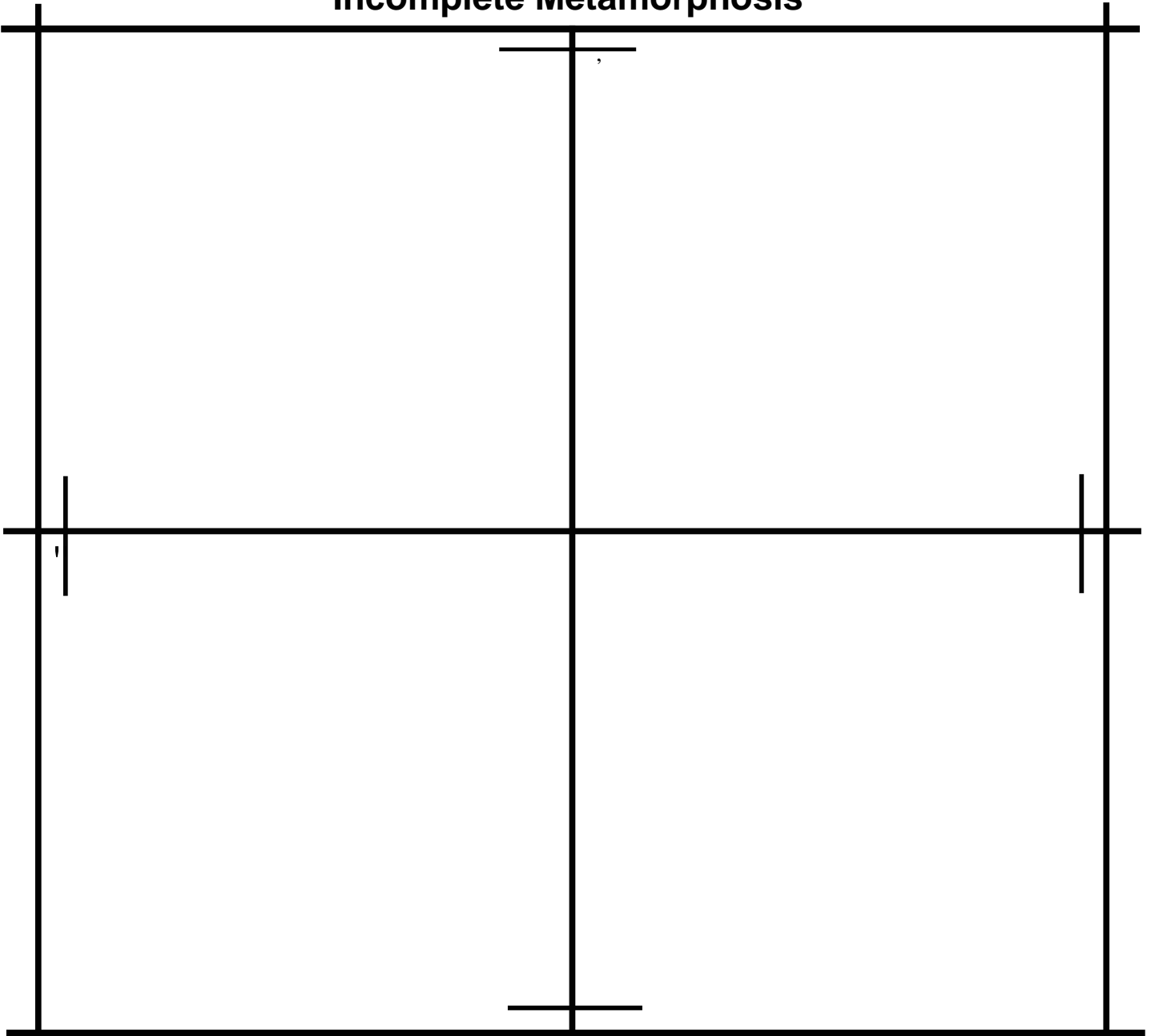


Name: \_\_\_\_\_

## **Life Cycle of the Chicken**

A chicken is a bird. A chicken is born from an egg and looks a lot like its mother. The chicken breathes with lungs. When it is old enough, and strong enough, it leaves the nest.

### **Incomplete Metamorphosis**



## Writing Task - Assessment

There are many things to consider before deciding to buy some chicks. Indicate some of the reasons for and against having chickens as pets.

1. a beginning paragraph that introduces the topic -
  2. paragraphs that give arguments **for and against** having chickens as pets .
  3. a conclusion that makes a final decision about getting chickens ....
- You should write in full sentences.
  - You have time and space for planning, so use it.

## **Part II: What is an egg?**

### Vocabulary

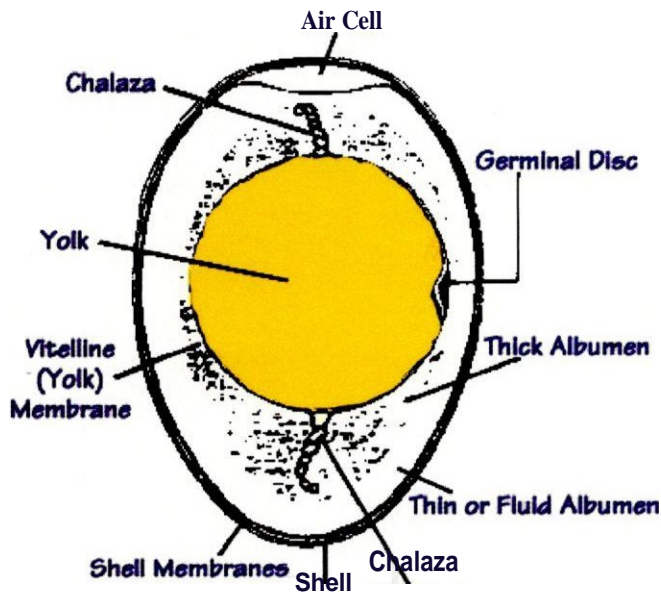
shell  
porous  
membranes  
air cell  
albumen  
vitelline membrane  
yolk  
germinal disc or blastoderm  
chalaza

### Activities:

- Color & label each part of the egg
- Candle an egg with the Brinsea OvaScope supplied or crack a fresh egg and try to locate all the parts listed on the diagram.
- Visit the American Egg Board web site [www.aeb.org](http://www.aeb.org). for further information and activities about egg nutrition, egg grading and sizing.

## What is an egg

### 1. The structure of an egg



The egg is a highly complex reproductive cell, a tiny center of life. It protects and provides a complete diet for the developing **embryo** during the 21 day incubation period.

When the egg is freshly laid it is at the same temperature as the hen, about 107 °F (42°C) and fills the **shell** completely. As it cools to the temperature of its environment, the contents of the egg contract and form an **air cell** between the two **shell membranes**.

The air cell is usually located at the large end of the egg where the shell is most **porous**. The thousands of tiny holes in the shell called **pores** which allow the embryo to breathe are larger and more numerous at the large end than those at the small end and allow the air to enter the air cell easily. The chick punctures and

breathes through his air cell just before hatching. The shell and its membranes protect the embryo and conserve the food and water supply in the egg.

The **germinal disc or blastoderm** from which the chick develops is attached to the **yolk**. Surrounding and protecting the germ cell and yolk is the colourless **vitelline membrane** and the white or **albumen** consisting of several layers. The albumen is a somewhat elastic, shock absorbing thick material with a high water content. The albumen and the yolk serve as food for the embryo during the incubation period.

On opposite sides of the yolk are two twisted whitish cord-like objects known as **chalazae**. They support the yolk in the center of the albumen and serve as a rotating axis to keep the embryo on top of the yolk and therefore next to the heat of the hen's body.

### 2. Composition of an egg

An average size egg weighs about 2 ounces (57 grams). Of this weight the shell constitutes 11%, the white 58% and the yolk 31%.

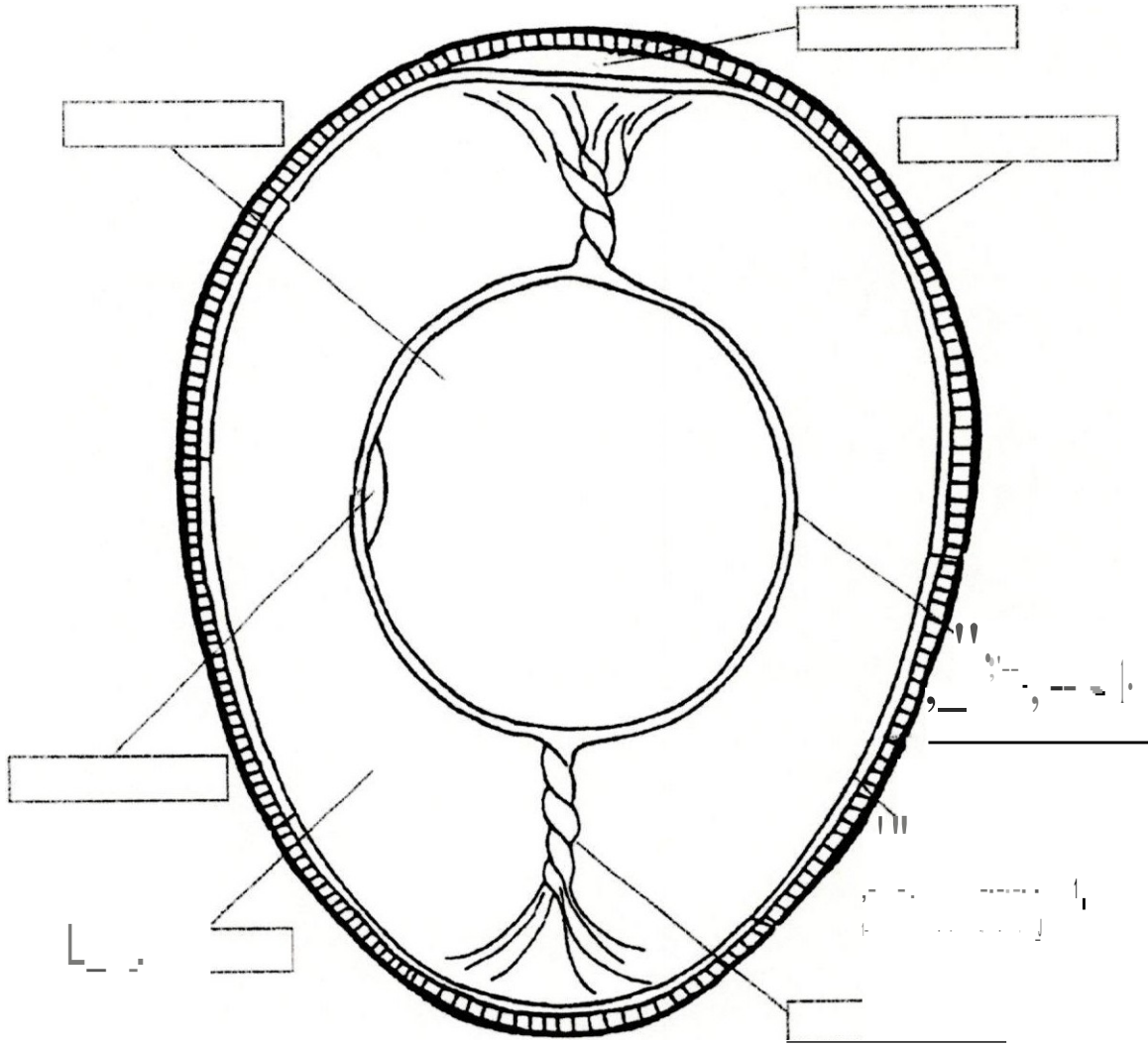
The composition of the edible portion is:

	Water	Protein	Fat	Other
Whole egg	74%	13%	11%	2%
White	88%	11%	0%	<b>1%</b>
Yolk	48%	17%	33%	2%

Eggs are especially valuable as a source of protein (about 0.25 ounces or 7 grams per egg) and fat which provides energy. Eggs contain vitamin A, B and D which are all necessary for growth. Eggs also contain a lot of minerals such as iron and phosphorus which are essential for building and maintaining strong bodies. But they are low in calcium which is mainly stored in the shell. They contain little or no vitamin C.

# Egg Parts

Color each part of the egg a different color and label each part of the egg.



Use each word only once:

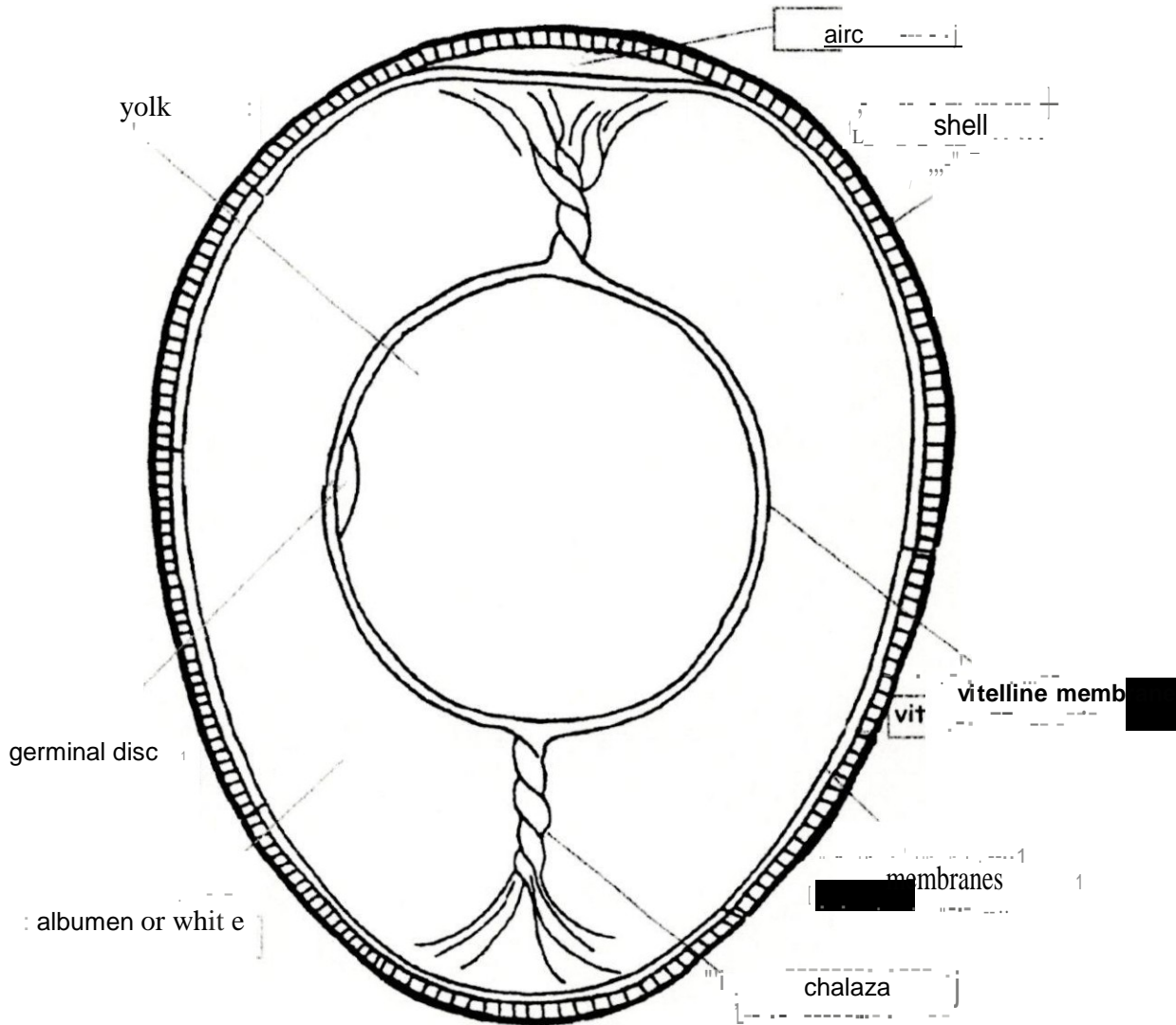
air cell  
germinal disc  
vitelline membrane

albumen or white  
membranes  
yolk

chalaza  
shell

# Egg Parts

Color each part of the egg a different color and label each part of the egg.



Use each word only once:

air cell  
germinal disc  
vitelline membrane

albumen or white  
membranes  
yolk

chalaza  
shell

### **Part III: How hens lay eggs**

#### Vocabulary

lay  
fertilization  
rooster  
mating  
sperm  
ovum  
reproductive cell/s ystem  
ovary  
ovulation  
oviduct  
follicle  
cuticle  
gland  
cell division  
abdomen

#### Activities:

- Which egg is fertile
- Cross word puzzle

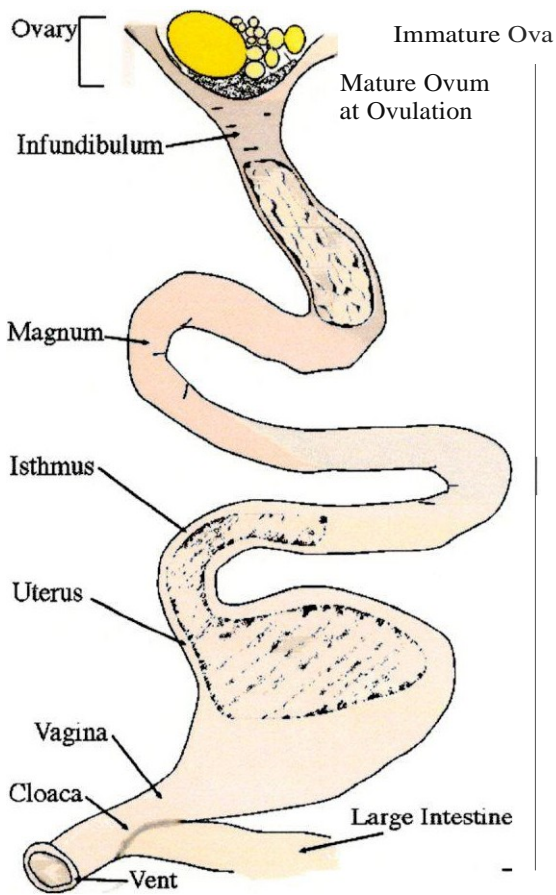


## How hens lay eggs

### 1. How the egg is fertilized

A hen can produce an egg without mating. Such an egg while edible, is not **fertile** and will not hatch. If a rooster mates with and fertilizes a hen, the male reproductive cell or **sperm** swim up the **oviduct** and is stored in a gland in the **infundibulum**. When a yolk is released one sperm penetrates the germinal disc and unites with the female reproductive cell, the **ovum**, to form a single cell that can develop into an embryo. This is called **fertilization**. This egg is fertile and can hatch. When an egg is opened and placed in a dish you can see a light round spot on top of the yolk. This is the germinal disc but at the time of lay it is hard to tell whether or not it is fertile.

### 2. Hen reproductive system



The egg is formed by a **reproductive system** composed of an ovary and an oviduct.

An **ovary** looks like a cluster of grapes and may contain up to 4,000 small eggs or **ova** (singular ovum) which can develop into yolks.

Each ovum is attached to the ovary by a thin membrane sac or **follicle**.

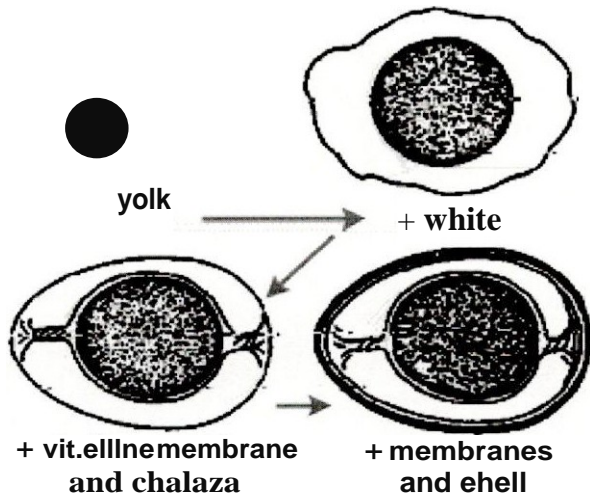
The **oviduct** is a large, coiled tube located in the left side of the hen's abdomen. In this oviduct all parts of the egg, except the yolk, are formed.

It is divided into 5 distinct regions:

- infundibulum
- magnum
- isthmus
- uterus
- vagina

### 3. How the egg is formed

#### Formation of Egg in Hen's Oviduct



The yolk is formed in the follicle by the deposition of continuous layers of yolk material in rings like those of a tree. 99% of the yolk material is formed within 7-9 days before the egg is laid. The germinal disc of a developing yolk contains a single cell, which after fertilization develops into a chick. The germinal disc remains on the surface of the yolk throughout yolk formation. When the ovum has accumulated enough yolk to grow a chick, it is released from the ovary. This is called **ovulation**.

The yolk is kept intact by the **vitelline membrane** surrounding it and moves through the **infundibulum** where **fertilization** of the ovum follows almost immediately.

Sperm cells from the male are stored in **glands** or nests in the infundibulum and are released when the yolk passes by. A sperm cell must enter the thin vitelline membrane and reach the female cell to complete fertilization. The newly formed cell begins to divide immediately and continues until a tiny cluster of whitish cells called the **blastoderm**, appears on the yolk.

The yolk then quickly enters the **magnum** where the dense portion of the albumen is added. The shape of the egg is largely determined in this section.

The **isthmus** is smaller in diameter than the magnum. It is here the two shell membranes form. The shell membranes loosely contain the yolk and dense albumen until the rest of the albumen is added in the uterus.

The chalazae and shell are also added in the **uterus**. It takes about 20 hours for the egg shell to form. If the hen lays brown eggs, the brown pigments are added to the shell in the last hours of shell formation.

In the last portion of the oviduct, the **vagina**, a thin coating called **cuticle** is applied to the shell to keep harmful bacteria from entering the egg shell pores. The egg passes through the oviduct small end first but is laid large end first. In the vagina the egg is turned horizontally just before laying through an opening called the **cloaca**.

### 3. How the embryo begins to develop before the egg is laid and incubated

The embryo starts to develop even while the rest of the egg is being formed. About 3 hours after fertilization, the newly formed single cell divides and makes 2 cells, then 4, 8, 16, 32, etc. Cell division will continue until the egg is laid or if it is kept warmer than 67°F/19°C.

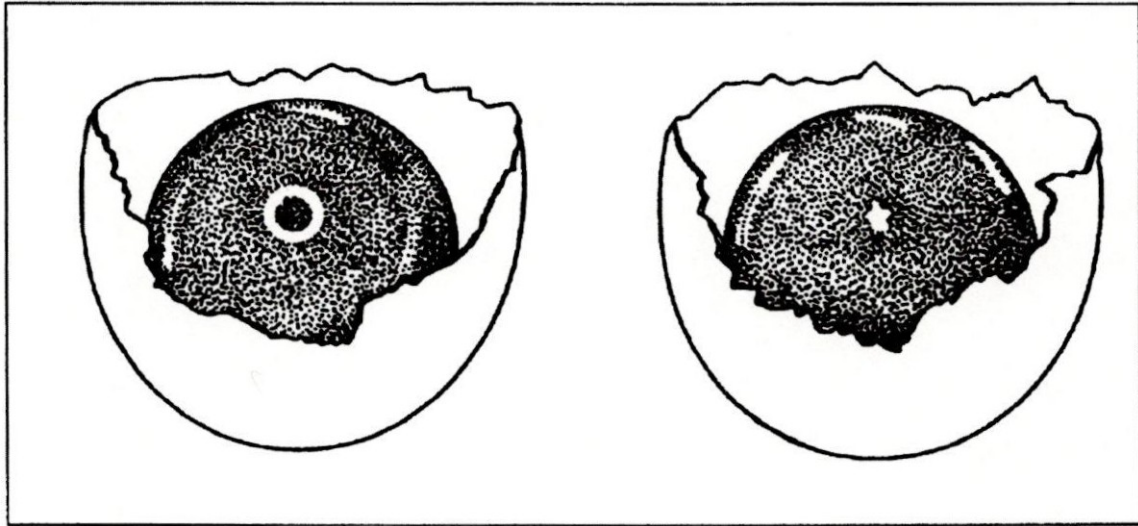
At first all the cells are alike but as the embryo develops cell differences are observed. They divide into groups of specialized function. Some become vital organs such as a heart or a lung, others a wing or a leg.

When the egg is laid and its temperature drops, the embryo stops growing until it is incubated by the hen or in an incubator like the Brinsea Mini Advance in your classroom.

# Which Egg Is Fertile?

When fertile eggs are incubated by either a hen or in an incubator, they grow.  
What is needed to make an egg fertile?

Look at the **pie** below and mark the fertile egg.



How do you know that the egg you have marked is fertile? Explain.

---

# Caring and handling



## Introduction

### Embryology skill:

Handling chicks safely

### Life skill:

Relating to others

### Science skill:

Observing and communicating

### School subjects supported:

Health and safety

Did you know you could be dangerous even though you don't want to be? When you handle something as small and delicate as a chick, you should be extra careful not to hurt it. Give it lots of time to rest after you pick it up. Here's an even bigger surprise. That cute, warm and fuzzy ball of fur could be dangerous to *you*. No, it won't bite or punch you, but it might carry **germs** that could make you sick. That's why it is important to wash your hands after you have picked up a chick. Then both you and the chick will be healthy and strong.

## Get ready

Once the chicks have hatched, students naturally want to hold them. But newly hatched chicks should not be handled much, if at all. Some children may not have the coordination needed to handle chicks appropriately. Proper **handling** is important to keep an animal as fragile as a baby chick from being stressed or harmed.

Most students understand the importance of washing their hands after they go to the bathroom. It is also important to wash after handling a chick. This exercise was designed to ensure proper handling of the chick, proper hand washing for the safety of the child and the prevention of disease in the child or the chick.

Your students should work in pairs or groups of three or four, with one chick per group. Students will have to sit on the floor, so have a blanket or sheet available for them to sit on. Also, set up a hand-washing station in the classroom. This station could be a sink or just a bowl of warm soapy water. Include some paper towels.

### Preparation time:

One hour

### Activity time:

One class period

### What you need:

D Ultraviolet light

O Antibacterial hand soap

O Paper towels

O Water

## - Do it

The students should sit down on their sheet with their feet touching each other. Pass around a wind-up chick, Beanie Baby or stuffed animal the size of a chick until each child has held it. An adult should supervise this activity, so the students learn to handle the object correctly.

After this initial activity, place a real chick in the center of the circle and allow the chick to run around. When the chick goes to someone in the group, he or she may pick it up (under adult supervision) for one minute. Then the student should put the chick down in the circle and let it go to someone else, who may hold it for a minute. This continues until each child has held the chick for a minute. After all the students have held the chick, put it back into the brooder.

After holding the chick, rub "Glitter Bug Potion" on the hands of each student.

*Ask them to hold their hands under a black light and look for signs of germs. Ask them to describe what the germs look like.*

*Then ask your students to wash their hands with antibacterial soap and dry them thoroughly. They should again hold them under the black light to see whether the germs are gone.*



### Share

- How did it feel to hold a baby chick?

### Process

- Why did you handle the Beanie Baby chicken before you handled the real chicken?
- How could improper handling of a chick hurt it?
- Why is it important to wash your hands after handling a chick?

### Generalize

- When you were holding the chick, how did the chick tell you that it was comfortable or uncomfortable?
- How do other baby animals let you know when they are comfortable or uncomfortable?

### Apply

- What do you do when you are uncomfortable?  
Too hot? Too cold?
- Why is washing your hands important?
- What will you do differently the next time you handle chicks?

**Take it home**  
List all the different activities after which you wash your hands.

### Share it

Teach a younger brother, sister or friend to wash their hands properly.

**After the chicks hatch out of their shell, they must stay in the incubator until their down is completely dry. Birds should be moved to an environment (such as a brooder) that provides the following: supplemental heat, food (such as a chick starter diet), and good clean water. Students should not handle chicks a lot because too much handling can stress them and allow them to get sick.**

To pick up a chick, **always** move slowly and gently. Cup your left hand with the fingers pointing upward. Place your right hand around the chick (fingers pointing downward) until you can pick it up. Place the chick in your left hand. Hold your right hand cupped around the top of the chick (fingers still pointing downward) so the chick will not escape.

Some of your students' motor skills may not be fully developed, depending on their ages. For example, a child might hold the chick too tightly, suffocating it. Or a child might hold the chick loosely, allowing it to fall.

Children **and adults** who **handle** chicks **also need to know the importance of hand washing**. All warm-blooded animals, (like dogs, humans and birds) carry salmonella, a bacterium that can cause severe diarrhea and dehydration. You and your students should thoroughly wash with antibacterial soap to prevent contamination. To ensure that students wash properly, place a harmless dye on the students' hands and look at them with a black light.

**Date** \_\_\_\_\_ **Name** \_\_\_\_\_

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## Video Review

Title:

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Facts I learned:

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Questions I have:

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On a scale of 1 to 5 the video was:    1    2    3    4    5

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---

Name: \_\_\_\_\_

Assigned Animal: \_\_\_\_\_

Due Date: \_\_\_\_\_

## Directions for ENDANGERED ANIMAL REPORT

Create a Poster about your endangered animal. Include all of the information from the outline below. Each numbered section of the outline should be written in paragraph form, with complete sentences. (There are 7 numbered sections to the outline, so you should have 7 paragraphs). Remember that it needs to be written in your own words. Make sure to include the additional items listed at the end of the outline. Your poster should not measure larger than 2x3 feet. The poster should be single sided. There will be a sample poster displayed in the classroom if you have any questions.

### 1. Description

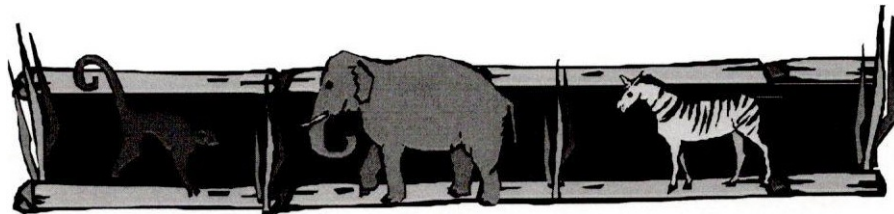
- A. What does your animal look like?
- B. What is its size?
- C. Name some interesting characteristics about your animal?
- D. In which class does your animal belong?

### 2. Habitat

- A. Where in the world is your animal found? (Be Specific)
- B. Describe its habitat.
- C. What is the climate like where your animal lives?
- D. Is your animal's habitat in any danger? Why?

### 3. Food

- A. What does your animal eat?
- B. Where does it find its food?
- C. How does it find or catch its food?
- D. Is your animal the prey of any other animal?
- E. Does your animal hunt in a pack?



4. Reproduction

- A. How many babies does your animal have?
- B. When does she have them?
- C. Where does she have them?
- D. Explain what the babies look like, and tell their size.
- E. Explain any interesting facts about the reproduction of your animal.

5. Activities

- A. What does your animal do during the day?
- B. Is your animal nocturnal?
- C. Describe any interesting activities that your animal participates in.

6. Endangered Species

- A. Is your animal on the endangered species list?
- B. How many of your animal is there in the world?
- C. What is the reason that your animal is on the list?
- D. How can your animal be saved?

7. Conclusion

- A. What are the most amazing or important things that you learned about your animal?
- B. Did you enjoy doing this report? Explain your answer.

Make sure to include:

- \*A formal picture of your animal
- \*A picture of your animal in its natural habitat
- \*A map of where you find your animal in the world
- \*Bibliography

↑ \_\_\_\_\_

Parent Signature: \_\_\_\_\_

Students Signature: \_\_\_\_\_

Date: \_\_\_\_\_



Date \_\_\_\_\_ Name \_\_\_\_\_

---

## Endangered Animals Report

The name of this animal is the \_\_\_\_\_

This animal is a      mammal      bird      fish      reptile      amphibian.

Its endangered species listing is      extinct      endangered      threatened .

The \_\_\_\_\_ lives \_\_\_\_\_

Four words that tell what it looks like are:

\_\_\_\_\_

\_\_\_\_\_

Four facts about this animal:

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

---

Dear \_\_\_\_\_,

We have been working on an endangered species theme. These are some samples of the work I did for this theme.

I would like you to notice \_\_\_\_\_

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I have been trying to \_\_\_\_\_

---

---

This is important because \_\_\_\_\_

---

One thing I did well is \_\_\_\_\_

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One thing I need to work on is \_\_\_\_\_

---

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Love from,

---

**Date** \_\_\_\_\_ **Name** \_\_\_\_\_

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## **My Thoughts About Endangered Species**

Before we studied about endangered species I knew:

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Some new things that I learned are:

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I still wonder about:

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Something we are doing to help endangered species in our classroom is:

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If I met a \_\_\_\_\_ I would ask

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---

**Date** \_\_\_\_\_ **Name** \_\_\_\_\_

---

## **Endangered Animals Pre-test/Post test**

Print true (T) or false (F) beside each statement.

1. \_\_\_\_ An animal that is gone forever is said to be extinct.
2. \_\_\_\_ Eastern cougars are extinct.
3. \_\_\_\_ We can help endangered animals by hunting them.
4. \_\_\_\_ If an animal is close to extinction we say it is endangered.
5. \_\_\_\_ Dinosaurs are extinct.
6. \_\_\_\_ Some problems need to be solved to save threatened animals.
7. \_\_\_\_ The spotted owl is endangered.
8. \_\_\_\_ We can help endangered animals by keeping our air and water clean.
9. \_\_\_\_ Recycling paper will help endangered animals and plants.
10. \_\_\_\_ Many animals are endangered because their habitat is being destroyed.

---

## Food Chains

### Materials

scissors

paper strips 5cm x 30cm

### Procedure

1. Discuss food chains with your students and emphasize the important role of each member of the chain. Choose one animal and establish the links in the food chain on both sides of the animal.
2. Brainstorm things that can influence the food chain such as destruction of habitat, extinction of particular food chain members, poisons in the water supply.
3. Introduce the terms:  
herbivore-an animal that feeds on plants  
carnivore-an animal that feeds on animals  
omnivore-an animal that feeds on both plants and animals
4. Discuss how poisons travel up the food chain and become concentrated in animals at the top of the chain.
5. Have the students choose one of the four animals and make chains from paper strips to represent a food chain that includes that animal. Information about each link in the chain can be written or drawn on paper strips and then glued or stapled together. Challenge the students to make food chains as long as they can.

---

## Home Coming-for any of the endangered animals

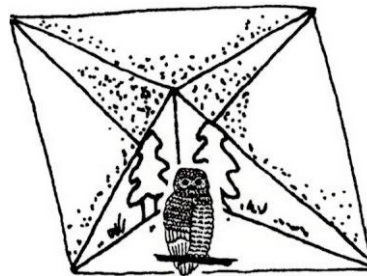
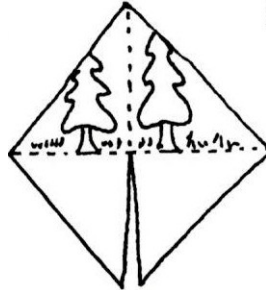
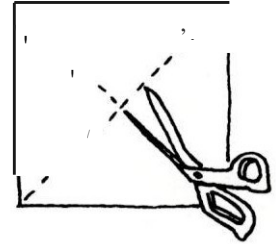
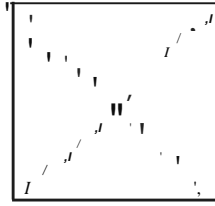
This project could be used to summarize habitat information as the study of each animal is completed. It could also be used at the end of the unit as a concluding activity.

### Materials

construction paper or manila tag squares ( 23 cm by 23 cm)  
construction paper scraps of different colors glue, scissors, crayons, felt pens, pencils clay or play dough  
twigs, small pebbles  
other suitable found objects

### Procedure

1. Look closely at the pictures of the spotted owl in *Spotted Owlets*. Take special note of its habitat.
2. Have the students pay attention to body proportions.
3. Review with students the basic needs of an animal to ensure its survival (water, air, food, shelter).
4. Fold the construction paper squares in half on the diagonal. Open, and fold on other diagonal.
5. Lay flat and cut from one corner to the center.
6. Use scraps of construction paper or crayons to create a forest scene on the top half of the paper (the cut line dissects the bottom half).
7. Overlap the two bottom triangles and glue.
8. Make a model of an owl using clay or playdough .
9. Place the owl on the model and add items that complete the habitat, including moss, twigs, etc.).
10. If scenes for all four of the animals are completed they can be glued together to make a four part model. Students can compare the different habitats and food of the creatures.



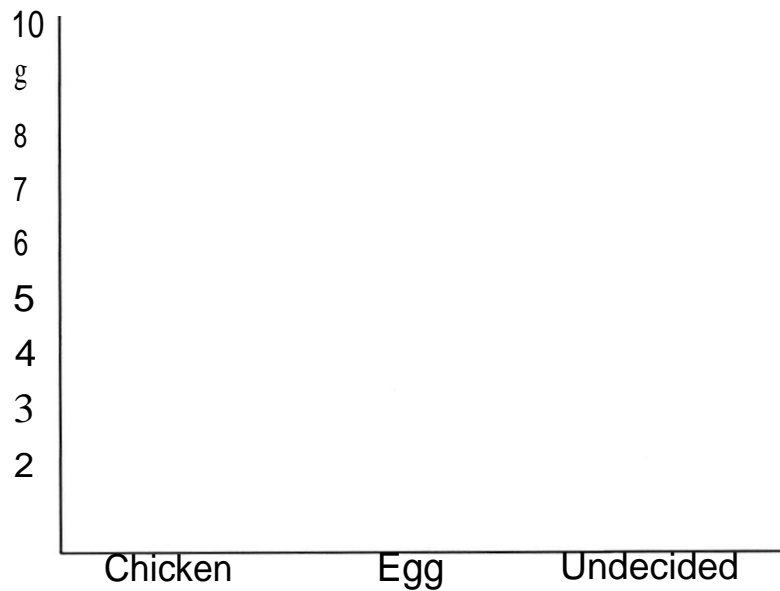
Evaluate the Data

Name \_\_\_\_\_

Tally the classroom results based on the side each student chose.

Chicken	
Egg	
Undecided	

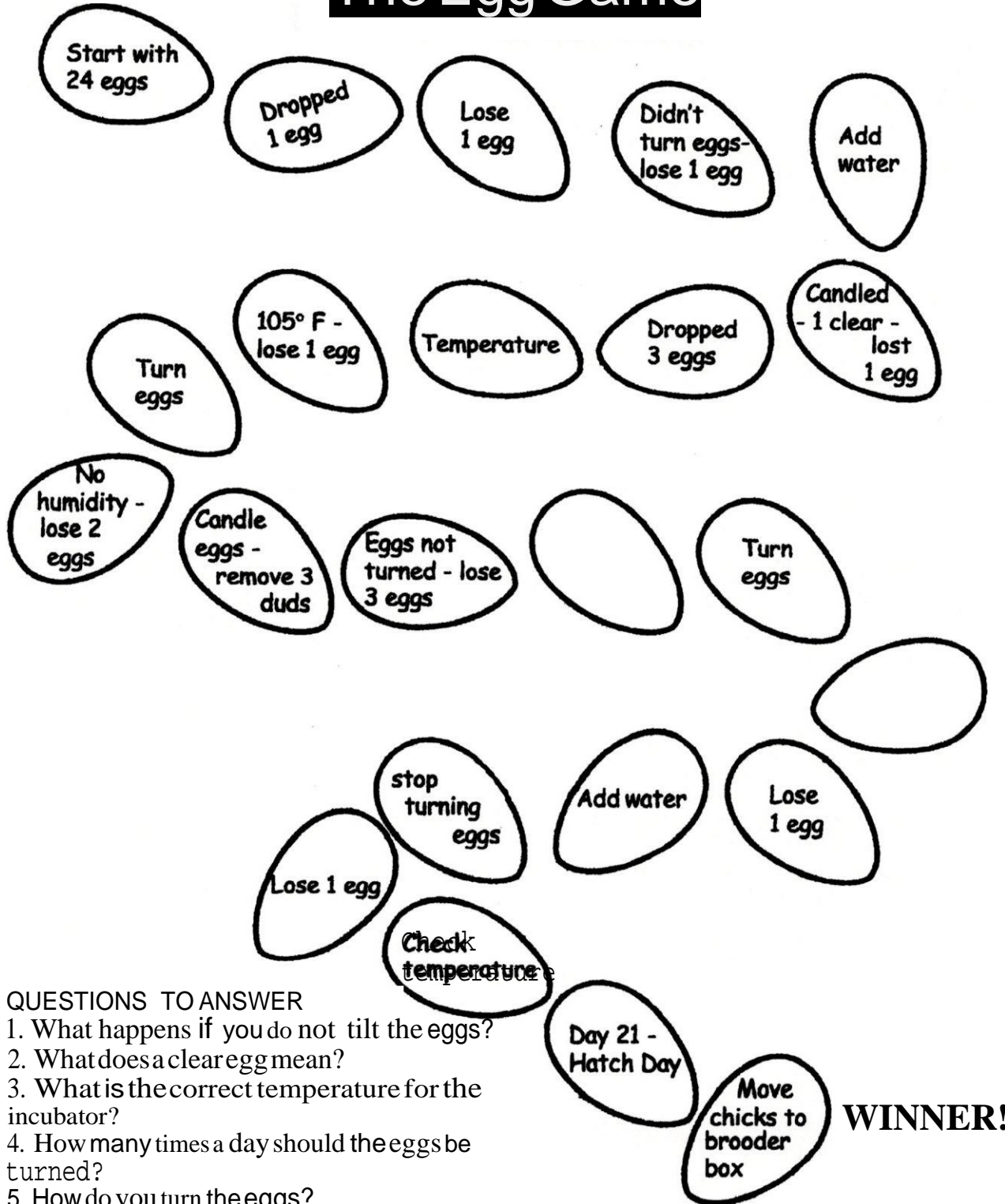
Create a bar graph to show the results.



Write two questions about the graph.

START

# The Egg Game



## QUESTIONS TO ANSWER

1. What happens if you do not tilt the eggs?
2. What does a clear egg mean?
3. What is the correct temperature for the incubator?
4. How many times a day should the eggs be turned?
5. How do you turn the eggs?
6. How do you keep humidity in the incubator?
7. Should eggs be rotated in the incubator?
8. What is candling?
9. When, should you stop turning the eggs?

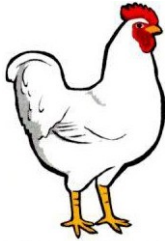

Heads moves 2 spaces.  
Tails moves 1 space.



Name \_\_\_\_\_

# Which came first, "the chicken or the egg?"

Brainstorm a few arguments for each side...

Chicken	Egg
	


Now that you have had a chance to brainstorm some arguments for each side, choose the one you believe in.

I think the \_\_\_\_\_ came first

### Persuasive Essay Outline

I. take the side you believe in and give a few specific reasons for your beliefs.

Reasons:

2. Defend your arguments against your opponents.     Rationale for defense

3. Restate your belief and your strongest reason for this belief.

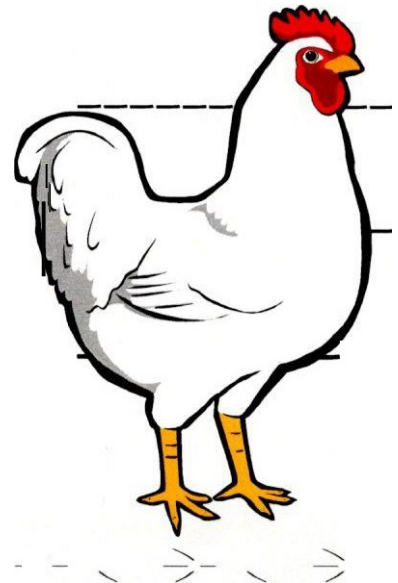
Conclusion:

Using this prewriting sheet, write your essay on the page provided. Read your essay to the members of your group (they may not all be on the same side as you). Listen to the essays of the people in your group. Who has the most persuasive essay, in your opinion? Why?

The Chicken Came First...

Name \_\_\_\_\_

Handwriting practice lines consisting of a solid top line, a dashed middle line, and a solid bottom line. There are ten such sets of lines arranged vertically on the page.



Name \_\_\_\_\_

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