



# Hatching in the Classroom Activity Book



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Welcome to your Hatching in the Classroom Activity Book. This Booklet is going to guide you through the process of what is happening inside the eggs in the incubator. Did you know that eggs only take 21 days to hatch? This is a lot of growth in a short amount of time!

In this student activity book we are going to learn about how eggs and chicks grow and develop. We will also learn all about chickens and eggs; and get to do some cool activities along the way!

Day 1— Creating your Egg Tracker

Day 2— Parts of the Egg: Egg Porosity

Day 3—The Air Cell: Creating Your Own Egg

Day 4—Shell Membrane - Dissolving the Egg Shell

Day 5—The Egg Yolk

Day 6—The Albumen

Day 7—Labeling the Parts of the Egg

Day 8—Egg Dissection

Day 9 - Guess What's in the Egg

Day 10 - Candling Your Eggs (Video)

Day 11 - Egg Strength Test

Day 12- Chicken Footprint Maze

Day 13 - Brown Eggs VS White Eggs

Day 14 - CHICK Math Game

Day 15 - Q&A with the Experts (FACEBOOK LIVE) - Everyone

Day 16 - Storybook Time (Video)

Day 17 - Chicken Vocab

Day 18 - Building a Brooder

Day 19 - Path to the Plate - Egg to Table

Day 20 - Getting Ready for Chicks

Day 21 - Chick Cam - Matt

# Day 1—Creating Your Egg Tracker

## Supplies needed:

- 21 plastic (openable) eggs (may need a few sets)
- Paper
- Pencils, map pencils, etc.

## Instructions:

If you have the egg shaped pieces of paper, each day draw what the embryo looks like on the piece of paper and place it in the plastic egg. If you do not have plastic eggs, you can keep them in a notebook at home. Make a drawing every day of the project for the 21 days it takes the baby chick to develop and hatch using the chart below. You can also download the CHICKEN OBSERVATION BOOK for this lesson

### 21 Day Egg Growth Chart



# Day 2— The Shell: Egg Porosity

## Supplies needed:

- Hard boiled eggs (number depends on your group)
- Liquid food coloring (not gel)
- Gloves (optional)
- Newspaper
- Paper towels

## Procedure:

1. Have the students hypothesize about whether eggs have holes in them. Ask them to explain what their hypothesis is based on.
2. Place the hard boiled eggs on the newspaper, have the students put on gloves (optional) and then have them place drops of food color on the outside of the egg shells.
3. Let the eggs sit for 5 to 15 minutes and then have the students wipe of the excess dye with a paper towel and then peel the eggs.
4. Were their hypotheses correct or incorrect?
5. Have them discuss what they have observed and why it would be necessary for eggs to be porous.

# Day 3— The Air Cell: Creating Your Own Egg

## Supplies needed:

- A latex balloon (light colored)
- Water (To fill balloon)
- Cooking oil
- Paper towels
- Black marker

## Procedure:

The air cell is located on the wider side of the egg normally. This is where the chick will try to hatch from after its 21 day growth period. A membrane is like a thin skin that separates one section of a structure from another. It is a membrane that separates the wet parts of the egg from the air cell. While you will be able to see this when the egg is candled, you can also create your own egg and “air cell.”

1. Take about a 1/4 cup of oil and pour it into the deflated balloon. You can use more depending on the size of the balloon
2. Fill the rest of the balloon with water and tie it off
3. Let the oil and water separate. The oil will move to the side of the balloon facing up
4. The “membrane” between the oil and water will help create the “air cell” in the balloon.
5. You can use the black marker to draw a line around the balloon where the “air space is.

NOTE: it is best to do this activity OUTSIDE!

# Day 4— Shell Membrane - Dissolving the Egg Shell

## Supplies:

- White vinegar
- Corn syrup
- Water
- Raw egg(s)
- Food coloring
- Gatorade®
- 3 cups or glasses
- Small scale for weighing eggs



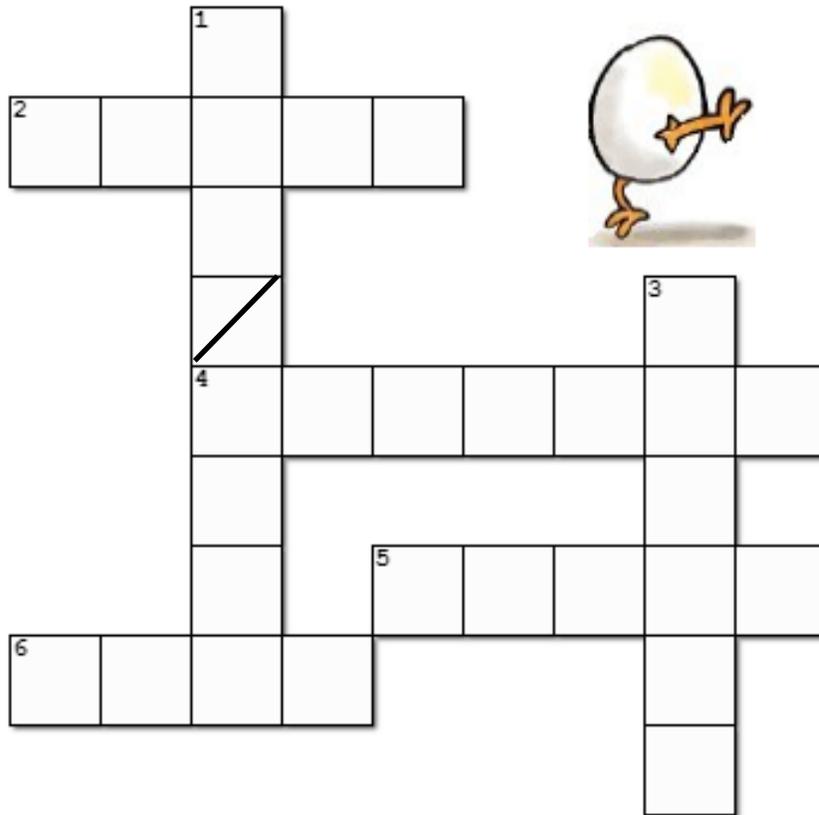
Photo by Bill Watson

## Procedure:

1. Have your students guess what will happen in each solution before you do the experiment.
2. First place the eggs into the vinegar for 48 hours.
3. Weigh each egg after you note the change that has occurred.
4. Fill three glasses with either corn syrup mixed with food coloring, water and food coloring, or Gatorade® and place 1 egg in each.
5. Leave over night.
6. Check on eggs and see what happened, then weigh the eggs.
7. So what happened?
  - First the egg shell should have disappeared after soaking 48 hours in vinegar. This happens because vinegar contains acetic acid which reacts with calcium of the egg shell.
  - The second demonstration shows osmosis. The membrane of an egg is semi permeable allowing certain substances to flow in or out of the egg.
8. For a long term experiment, place an egg in a glass of Coca Cola® for a year. This demonstrates what soda can do to your teeth!

# Day 5— The Egg Yolk

Complete the crossword puzzle below



yellow	chicken	air cell
chick	shell	yolk

## Across

2. What is a baby chicken called?  
What animal lays an egg?  
What is the most outer part of the egg called?  
What is the yellow part in the middle of the egg called?

## Down

1. What is the space at the top of the egg called?
3. What color is the yolk?

# Day 6— The Albumen:

The albumen or white of the egg is the part of the egg that is right under the shell and membrane. This part of the egg is low in fat but high in other nutrients. If you have ever seen a hardboiled egg it is the white part that you see once the shell is off the egg. The chick will get the nutrients it needs to grow in the shell from this and the yolk!

## **Supplies Needed:**

- Egg Separator (You can also use the shell if needed)
- Uncooked Eggs
- Clear glasses or Mason jars
- Liquid measuring cups

## **Procedure:**

- Make a guess as to which part of the egg there is more of, the yolk or the albumen. How much of each do you think there will be. Write down your guesses
- Crack one egg and separate the yolk from the albumen
- Place each in a different liquid measuring cup
- Stir the yolk to make it easier to measure
- Write down the measurements of each cup
- Repeat this with other eggs and determine if different eggs have different amounts of each
- Write down your findings

# Day 7— Labeling the Egg

Did you know that there are several different parts of an egg? Let's take a closer look at what the inside of an egg looks like and what each part is. Label the egg on the next page.

**The Shell-** The shell of the egg is the most outer part of the egg. This helps protect the egg from getting hurt. Just like a turtles shell helps protect it. Another important part of the shell is that it has small pores or tiny little holes all over it. Next time you hold an egg you can feel that it is not completely smooth and has a bumpy texture to it. The tiny holes are so that air can pass through the egg.

**The Membrane-** The membrane of the egg is the very next layer right under the shell. This layer helps protect the egg from bacteria that can make the egg sick. This is like how your skin helps protect you.

**The Air Cell-** The air cell is the space at the top of the egg. This space is so that when the egg cools down and heats up the insides of the egg won't crack the shell. Just think of if you have ever seen a can of soda that has been frozen it can pop the can and overflow.

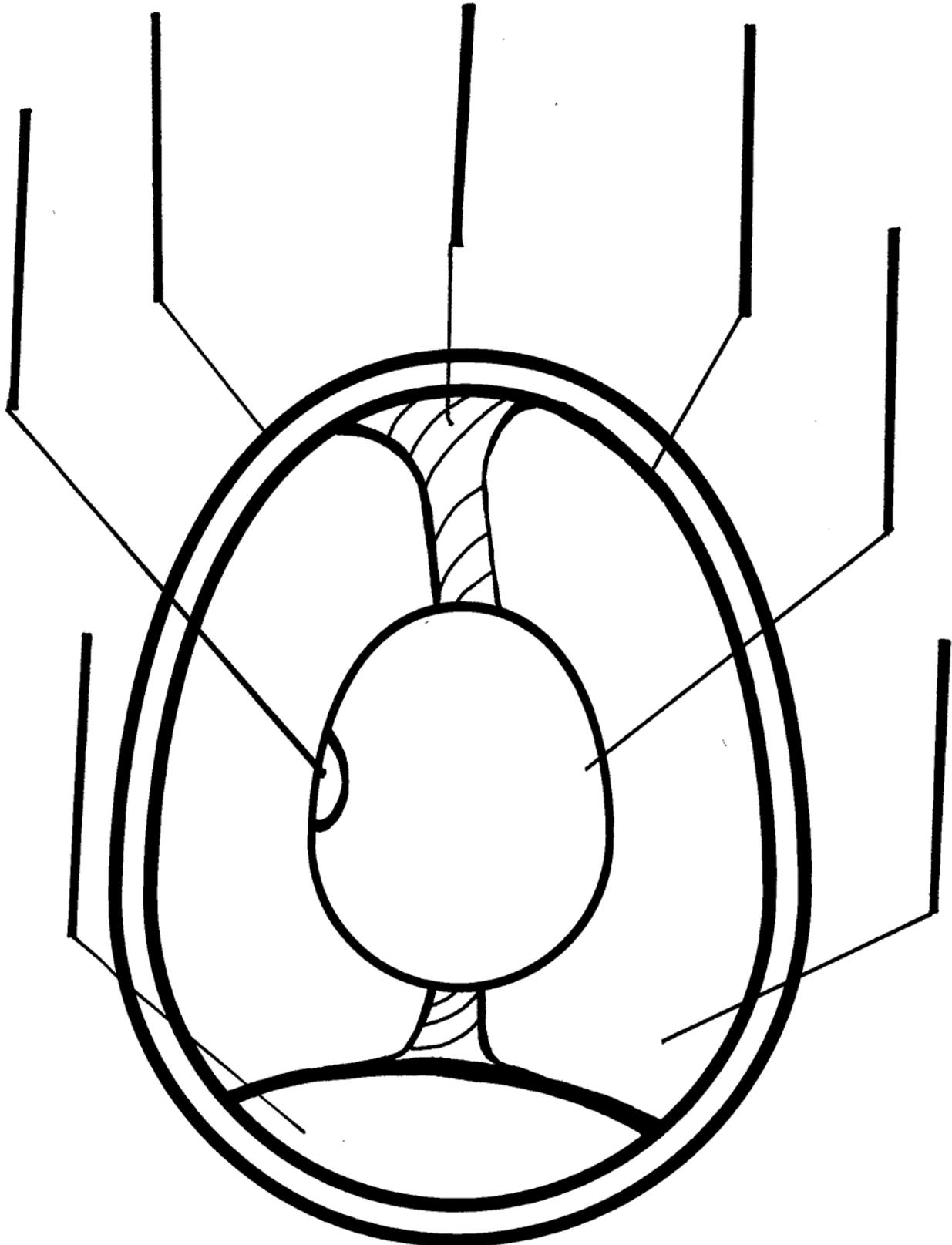
**The Albumen -** The albumen or white of the egg is the part of the egg that is right under the shell and membrane. This part of the egg is low in fat but high in other nutrients. If you have ever seen a hardboiled egg it is the white part that you see once the shell is off the egg.

**The Chalazae-** The chalazae is the part of the egg that looks like a rope. There is one on both sides of the egg to hold the yolk or center part of the egg in place.

**The Yolk-** The yolk is the center part of the egg or the yellow part whenever you crack an egg or look at a hardboiled egg. The yolk of the egg has most of the vitamins and minerals of the egg.

**The Germinal Disc-** the germinal disc is the spot on the side of the yolk. This is the spot where you can tell if the egg is fertilized. This is also where the chick will start to grow if the egg is fertilized.

# Day 7— Labeling The Egg



# Day 9—Chick Observations

## Chick Observations

Day Number:  Number of Eggs:

Draw a picture of what you think is going on inside the egg:



What do you think chicks need to survive?

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Questions: \_\_\_\_\_

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# Day 11—Egg Strength Test

## Experiment 1: Are you stronger than an Egg!

### Materials:

- several raw eggs
- bowl or sink

### Step 1:

Place the egg in the palm of your hand.

### Step 2:

Close your hand around the egg so your fingers are completely wrapped around the outside of the egg.

### Step 3:

Squeeze the egg, making sure to apply even pressure all around the egg shell. What (if you are nervous about this you can complete this task over a bowl/sink)

What do you think will happen? Did it?

### Step 4:

Hold the egg with your thumb and forefinger and then squeeze the top and bottom of the egg. What do you think will happen? Did it?

Discover why the unique shape of an egg makes it stronger than you would imagine! A three dimensional arch is one of the strongest architectural form and that is why architects have used arches to construct bridges and buildings for hundreds of years. In the same why that arches distribute the weight of buildings and bridges an eggshell's curved shape distributes pressure all around the egg making it stronger than you think! Don't believe us -- try these experiments on your own to test the strength of an EGG!



# Day 11—Egg Strength Test

## Experiment 2: Egg Strength Test

### Materials:

- 6 -12 raw eggs
- Books of varying sizes and weights or various house hold object of different weights (You will need one book/flat surface to use as your base to put your objects on)
- Tweezers
- Saran wrap
- Trashcan

### Step 1:

To prepare the egg shells for the strength test, use the tweezers to carefully chip a small circle from the small end of the egg until the egg will "sit-up" on its end. Dump out the yolk and white and rinse the inside of the egg. Try to make the shells of similar heights- it is usually good to have a few extra.

### Step 2:

Set 6 of your shells up in two rows of three. The shells in each row should be about an inch apart and the rows roughly the same. Make a hypothesis about how many books/ which household objects the shells will hold. Slowly start stacking books/using different household items on the shells. If you are using irregular shaped house hold times use a cookie sheet or a book as the first layer for easy stacking.

### Expanded version:

You can do the same test with raw eggs, wrap them in plastic wrap. Make a hypothesis about what might be different with raw eggs vs the shells in the 1st part of the experiment.

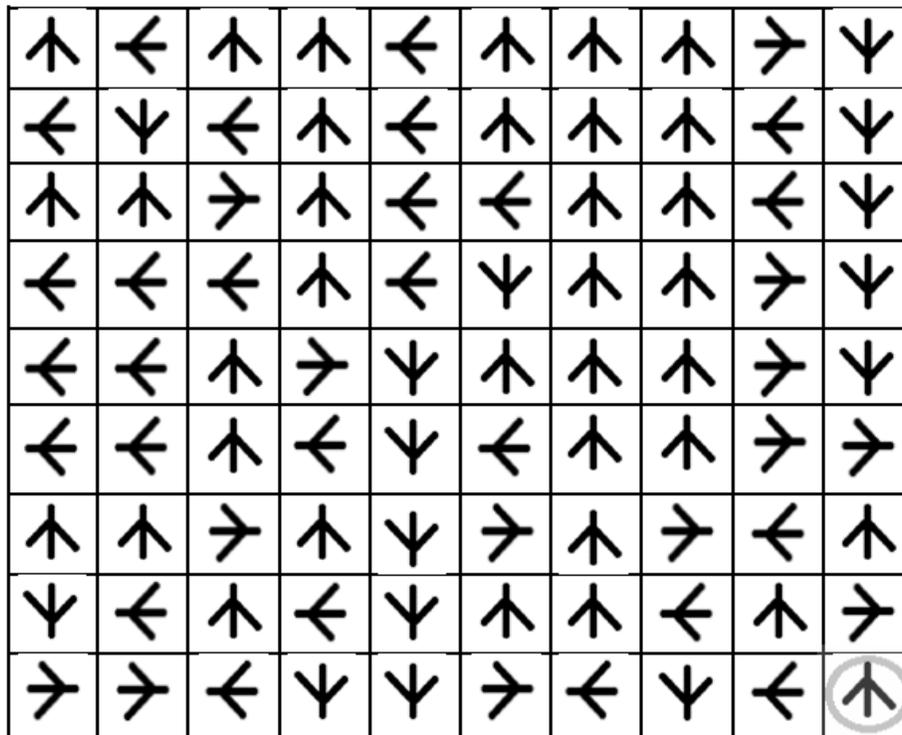
Repeat the experiment steps above and explore the strength of an egg!

# Day 12—Chicken Footprint Maze

## Chicken Footprint Maze

Start in the top left corner and follow the footprint in the direction it is facing. Continue following the footprints until you get to the circled footprint in the bottom right corner.

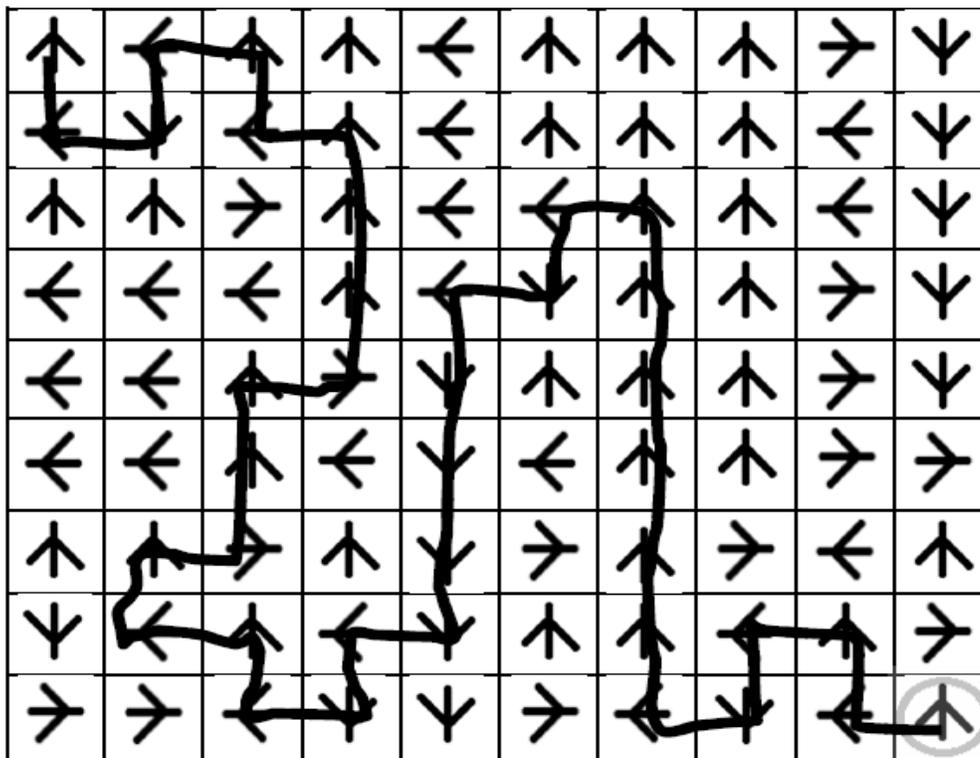
There is only one way to do it!



# Day 12—Chicken Footprint Maze

## Chicken Footprint Maze

Start in the top left corner and follow the footprint in the direction it is facing. Continue following the footprints until you get to the circled footprint in the bottom right corner. There is only one way to do it!



# Day 13—Types of Chickens

## Chickens Lay Different Colored Eggs

Eggshell color is unique to each individual hen and depends primarily on genetics and breed.

It is common for hens with white earlobes to lay white/lightly tinted eggs and hens with red earlobes to lay brown eggs.

Hens with crossed genetics can lay eggs with a variety of colors.

### Brown Eggs:

- Barnevelder
- Cornish
- Marans
- Orpington
- Plymouth Barred Rock
- Rhode Island Red

### Blue Eggs:

- Ameraucauna
- Araucana
- Cream Legbar



### White Eggs:

- Ancona
- Andalusian
- Campine
- White Leghorn

### Cream/Tinted Eggs:

- Cochin
- Faverolle
- Mille Fleur d'Uccles

### Olive Eggs:

- Olive Egger
- Easter Egger



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# Day 13—Types of Chickens

## Match the Hen to the Egg

**Marans**



**Easter Egger**



**Faverolle**



**Andalusian**



**Ameraucana**



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Photo Credit: poultrykeeper.com, chickenbreedlist.com, thehappychickencoop.com

# Day 13—Types of Chickens

## Match the Hen to the Egg

**Marans**



**Easter Egger**



**Faverolle**



**Andalusian**



**Ameraucana**



# Day 14—Chicken Math Game

Each letter of "chick" represents a different round of the game; play begins with the "C" column and continues through the "K" column. The object of "chick" is to accumulate the greatest possible point total over the five rounds. The rules for play are the same for each of the five rounds.

To accumulate points in a given round, a pair of dice is rolled. A player gets the total of the dice and records it in his or her column, unless a "one" comes up. If a "one" comes up, play is over for that round and all the player's points in that column are wiped out. If "double ones" come up, all points accumulated in prior columns are wiped out as well.

If a "one" doesn't occur, the player may choose either to try for more points on the next roll or to stop and keep what he or she has accumulated. Note: If a "one" or "double ones" occur on the very first roll of a round, then that round is over and the player must take the consequences. You can make your own game board or use the printable game boards we have provided!

Inspired by the game SKUNK



C

H

I

C

K

# Day 17—Chicken Vocabulary

- place the words listed below in alphabetical order

shell

fertilized

pip

rooster

chicken

egg

white

hatch

chick

beak

yolk

hen

wings

embryo

comb

sac

feather

development

incubator

thermometer

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_

11. \_\_\_\_\_
12. \_\_\_\_\_
13. \_\_\_\_\_
14. \_\_\_\_\_
15. \_\_\_\_\_
16. \_\_\_\_\_
17. \_\_\_\_\_
18. \_\_\_\_\_
19. \_\_\_\_\_
20. \_\_\_\_\_

# Day 17—Chicken Vocabulary

- Unscramble the letters and place on the correct line

1. geg

13. acs

15. eiwth

8. corbinuta

5. hahct

14. ditferlzei

12. hne

10. lshle

3. setoorr

9. yorbem

11. hatfere

7. gniws

6. ipp

2. yokl

4. ckenihc

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_
11. \_\_\_\_\_
12. \_\_\_\_\_
13. \_\_\_\_\_
14. \_\_\_\_\_
15. \_\_\_\_\_

# Day 17—Chicken Vocabulary

1. Egg
2. Yolk
3. Rooster
4. Chicken
5. Hatch
6. Pip
7. Wings
8. Incubator
9. Embryo
10. Shell
11. Feather
12. Hen
13. Sac
14. Fertilized
15. White

# Day 19—From the Egg to the Plate

## The Egg's Path to the Plate

Follow the path to the plate and label the stops along the way!

- |                          |                                    |             |
|--------------------------|------------------------------------|-------------|
| 1. Laying                | 4. Candling                        | 7. Shipping |
| 2. Collection            | 5. Grading, Sorting, and Packaging | 8. Selling  |
| 3. Washing and Treatment | 6. Cooling                         | 9. Plate    |



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\_\_\_\_\_



\_\_\_\_\_

\_\_\_\_\_



# Day 19—From the Egg to the Plate

## The Egg's Path to the Plate Step by Step!

### Step 1: Laying

The hen lays the egg.

### Step 2: Collection

Next the egg is collected. In a large hen house this is done automatically by a conveyor belt, backyard chicken eggs are collected by hand.

### Step 3: Washing and Treatment

The egg is washed to ensure it's clean and then treated with a colorless, odorless oil to seal the pores

### Step 4: Candling

The egg is candled with a bright light to check for cracks or other defects.

### Step 5: Grading, Sorting, and Packaging

The egg is graded by its appearance and sorted by its size before being packaged with other similar eggs

### Step 6: Cooling

The eggs are then cooled to 45°. This helps keep the eggs fresh while they make their way to your home.

### Step 7: Shipping

The eggs are shipped to the store, in a refrigerated truck.

### Step 8: Selling

The eggs are then put on the shelf ready to be sold.

### Step 9: Plate

The egg is taken home by a consumer to be used on a plate.