



# My Embryology Book



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

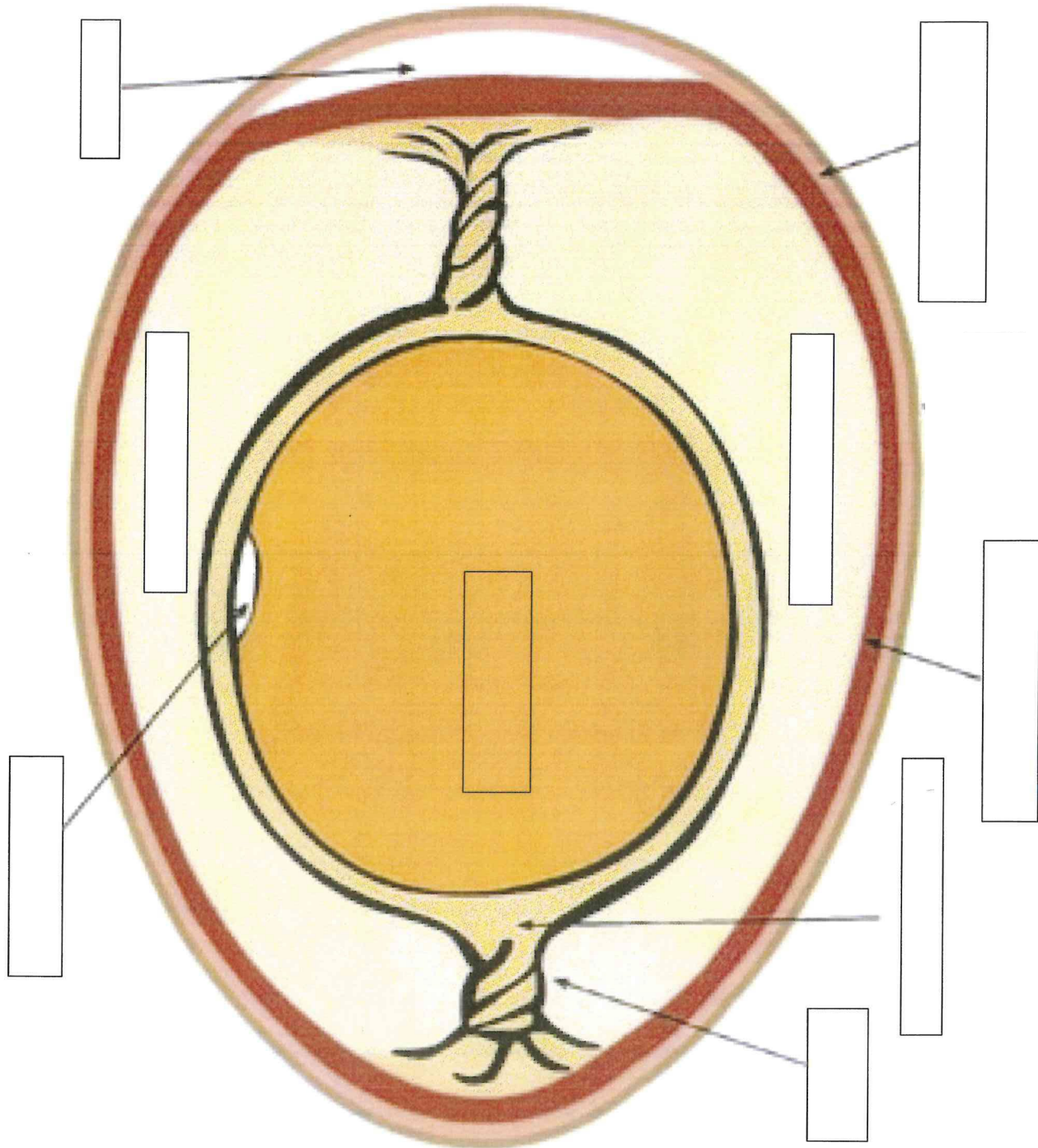
What starts as an embryo?

*animals*   *bugs*   *buildings*   *cars*   *plants*

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## Parts of an Egg



air cell	shell
albumen (used twice)	shell membrane
chalazae	vitelline membrane
germ spot	yolk

# What Does an Egg Need?

Circle whether eggs need or do not need the object pictured. Then fill in the blanks. Use the word list at the bottom of the page to help you.

Need  Not need	_____. Embryos breathe through tiny holes in their shell.
Need  Not need	_____. To stay _____ and not dry out. The _____ evaporates and is transported through the shell in the air.
Need  Not need	_____. Because _____ days in an incubator can get pretty boring.
Need  Not need	_____. Eggs need to stay _____. They will grow and develop when the temperature is _____° F. If it is too cold they will not grow.
Need  Not need	_____. Embryos use the _____ sac to get nutrients and energy to grow.
Need  Not need	_____. If the embryo is in one spot too long, it will stick to the side of the shell and _____ growing. Eggs need to be turned at least three times a day.

water moist stop air heat food water  
21 warm exercise yolk 100 TV



# Hatching Prediction

My prediction is \_\_\_\_\_ chicks will hatch out of \_\_\_\_\_ eggs.

Number of students with each prediction.


Predicted number of eggs to hatch.

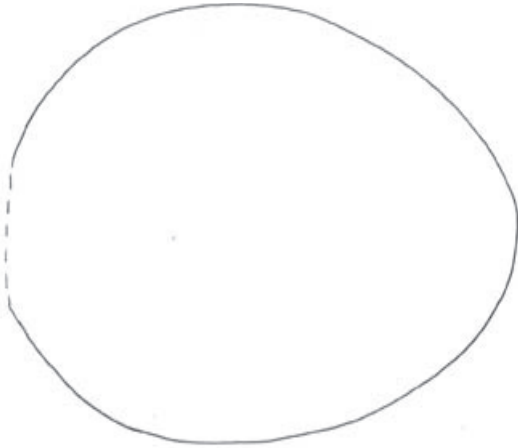
Number of eggs that hatched \_\_\_\_\_.

Hatching percentage: \_\_\_\_\_ out of \_\_\_\_\_ = \_\_\_\_\_%

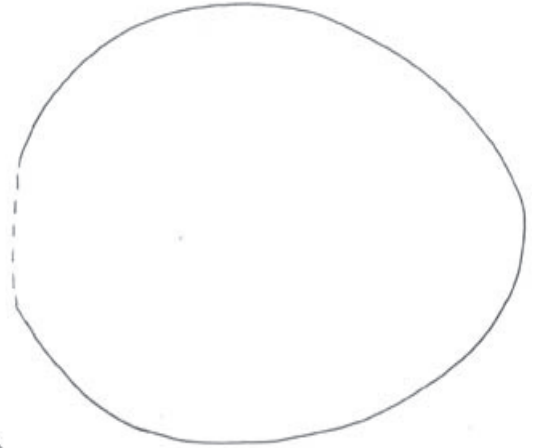


# Embryo Growth Chart

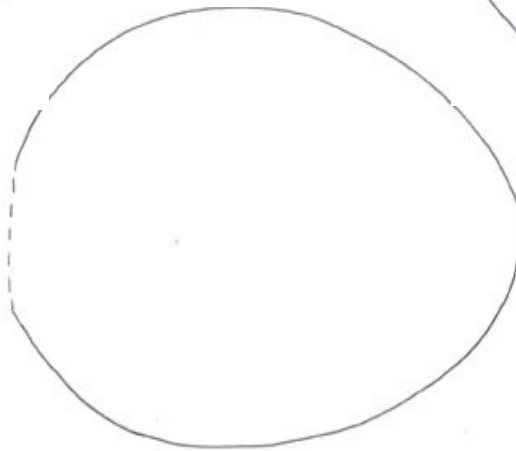
Day \_\_\_\_\_



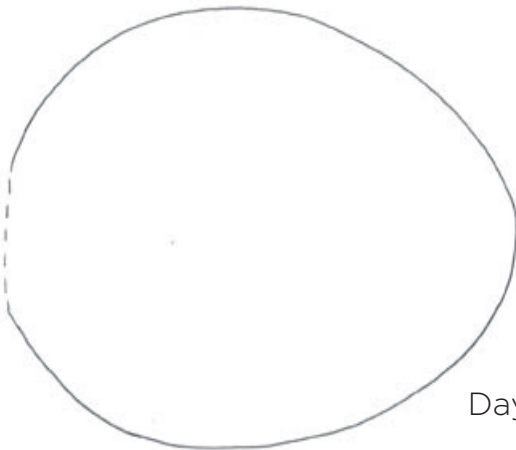
Day \_\_\_\_\_



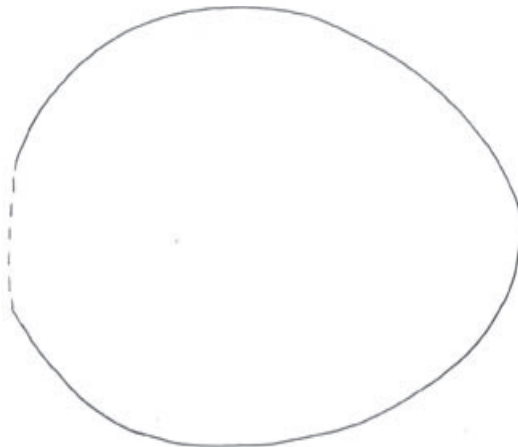
Day \_\_\_\_\_



Day \_\_\_\_\_



Day \_\_\_\_\_



Day 21

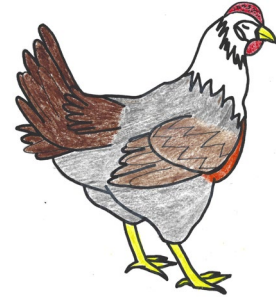
Happy Birthday!  
Draw what you see in the  
incubator today.



# *Comparison Worksheet*



*Rooster*



*Hen*

*Things the rooster and hen have in common are:*

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*Things that are different between the rooster and hen are:*

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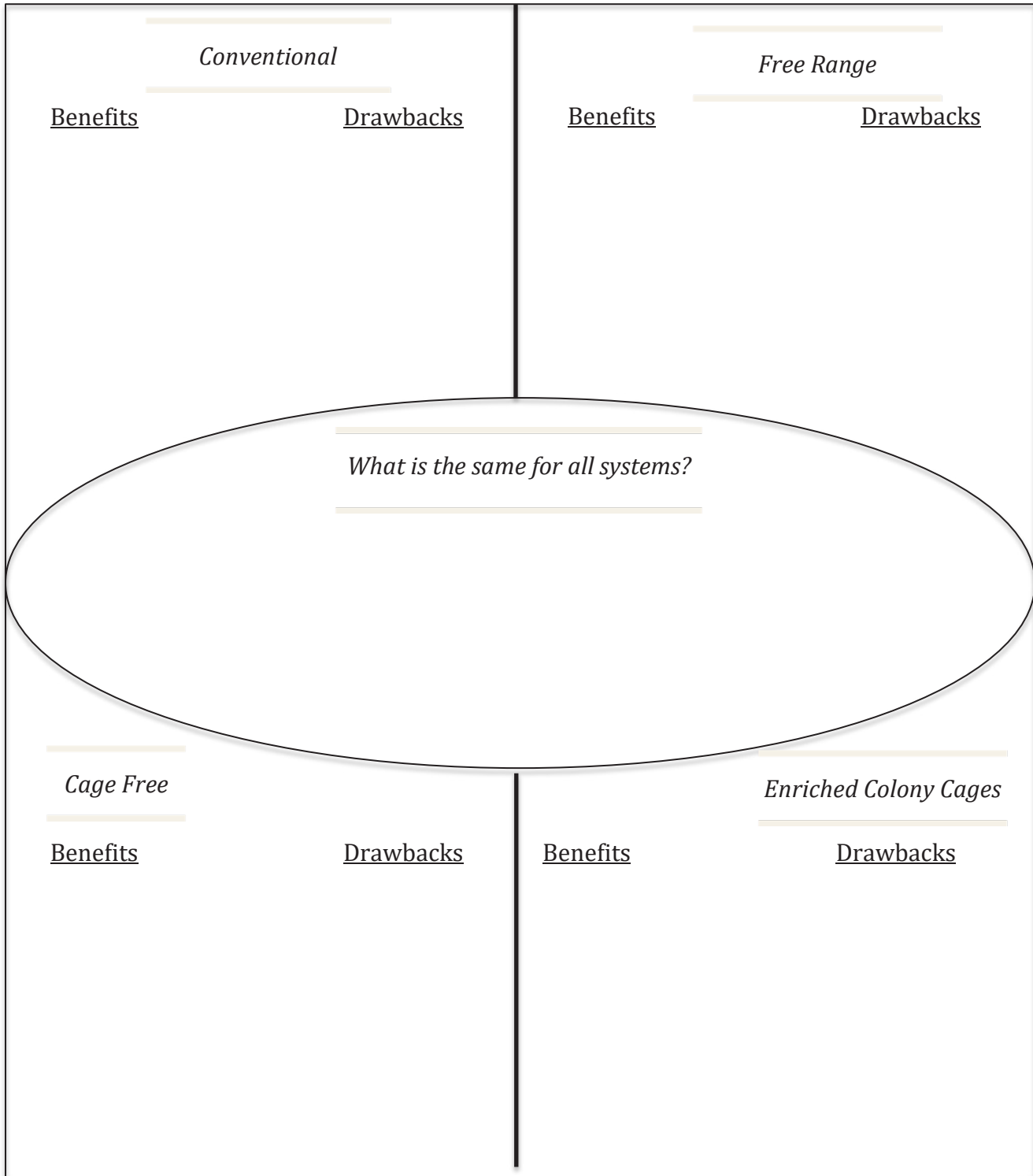
EXTENSION



# *Class-Preferred Chicken Housing*




# Venn Diagram





# Farm to Table Model



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



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



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



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



5. \_\_\_\_\_



6. \_\_\_\_\_



7. \_\_\_\_\_



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# Embryology Journal

(Start of Program) What are three things embryos need to grow and develop? What is one thing you learned about embryology today?

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(Day 10) What was developing inside the eggs?

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(Day 14) How has the embryo changed since last week?

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(Day 21) What are two things the chicks will need after they hatch?

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# *“Eggs”tra Special Words*

## Lesson 1: Egg Discovery

**air cell**- air pocket at the bottom of an egg

**albumen**- the white of an egg; it supplies water to embryo

**chalazae**- the two spiral bands in the white of birds' eggs that extend from the yolk and attach to the shell membrane in order to protect the yolk

**embryo**- unborn or unhatched offspring that is in the process of developing

**embryology**- the study of the beginning of life

**fertile**- capable of producing new life

**germ cell**- cell within the yolk that has the potential of developing into an embryo

**hen**- a female chicken over a year old

**humidity**- water vapor found in the air

**incubator**- a device used to hatch eggs in a controlled environment

**poultry**- birds raised for eggs or meat

**rooster**- an adult male chicken

**yolk**- the yellow part inside an egg; it is a food source for developing embryos

## Lesson 2: Build-A-Chick

**avian**- birdlike

**cockerel**- a young male chicken

**DNA**- large organic molecule that carries genetic information

**gene**- the basic unit by which genetic information is passed from parent to offspring

**geneticist**- a scientist who studies genes

**genetics**- part of biology that focuses on the study of passing of traits from parents to offspring

**mammal**- a warm-blooded vertebrate animal of a class that is distinguished by the possession of hair or fur, ability

to produce milk, and (typically) the birth of live young

**offspring**- an animal's young

**physical trait**- characteristics passed on from parents that can be seen

**pullet**- a hen less than a year old

## Lesson 3: Inside the Shell

**brooder house**- a heated enclosure that provides shelter for young livestock, including chicks

**candling**- process of shining a light inside of an egg to see the developing embryo

**early dead**- embryos that started to develop and died for some reason

**egg tooth**- temporary tooth used for breaking the shell; it is later lost

**fertile**- capable of producing new life

**infertile**- not fertile or productive

**instinct**- behavior that is natural and does not need to be learned

## Lesson 4: The Traveling Egg

**cage-free eggs**- eggs laid by hens enclosed within a barn but that can move about freely

**consumer**- person who purchases food

**conventional hen housing**- style of raising hens in cages within a building

**enriched colony housing**- hens are raised in smaller groups with more perching, room to move, and nesting areas within a cage

**farm to table**- the process of food getting from the farm to the table

**free-range eggs**- eggs that are laid by hens that are allowed to roam outside with barns provided for nesting

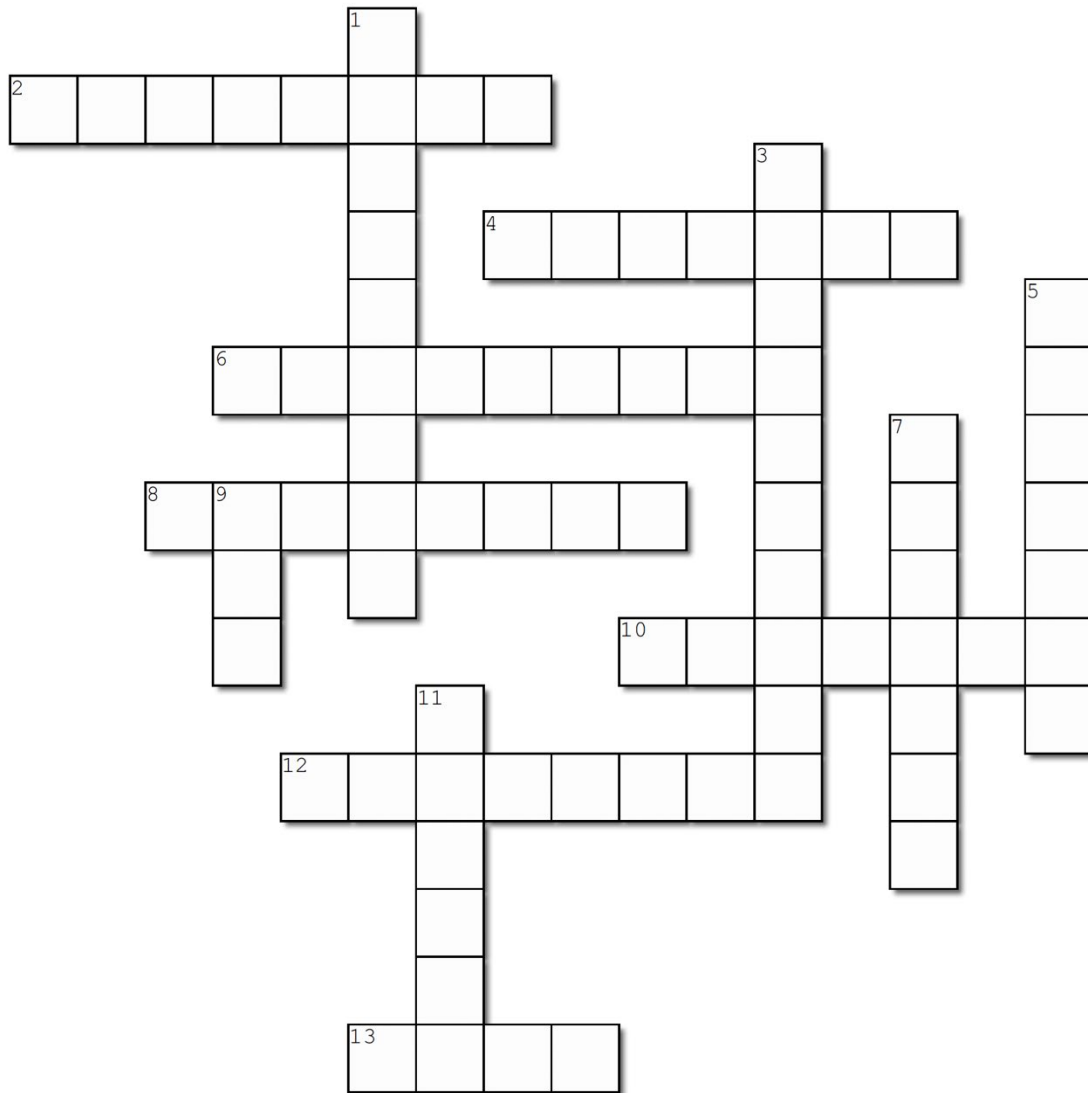
**humane**- having or showing compassion



# *"Eggs"tra Special Words*

## Lesson 1: Egg Discovery

**Directions:** Use the clues below to fill in the crossword puzzle. Hint: When the answer is two words, use one box as a space between the two words.



### Across

- 2. air pocket at the bottom of an egg
- 4. - the white of an egg; it supplies water to embryo
- 6. a device used to hatch eggs in a controlled environment
- 8. two spiral bands that extend from the yolk and attach to the shell membrane in order to protect the yolk
- 10. an adult male chicken
- 12. water vapor found in the air
- 13. the yellow part inside an egg; it is a food source for developing embryos

### Down

- 1. cell within the yolk that has the potential of developing into an embryo
- 3. the study of the beginning of life
- 5. birds raised for eggs or meat
- 7. capable of producing new life
- 9. a female chicken over a year old
- 11. unborn or unhatched offspring that is in the process of developing



# *“Eggs”tra Special Words*

## Lesson 2: Build-A-Chick

**Directions:** Draw a line to connect the “Eggs”tra Special Word to its correct definition.

- |               |  |
|---------------|--|
| 1. gene       | a scientist who studies genes  |
| 2. genetics   | a warm-blooded vertebrate animal of a class that is distinguished by the possession of hair or fur, ability to produce milk, and (typically) the birth of live young |
| 3. geneticist | the basic unit by which genetic information is passed from parent to offspring   |
| 4. mammal     | birdlike   |
| 5. avian      | part of biology that focuses on the study of passing of traits from parents to offspring   |

**Directions:** Use the word bank below to complete the sentences correctly.

<u>Word Bank</u>		
offspring	cockerel	physical traits
pullet	DNA	

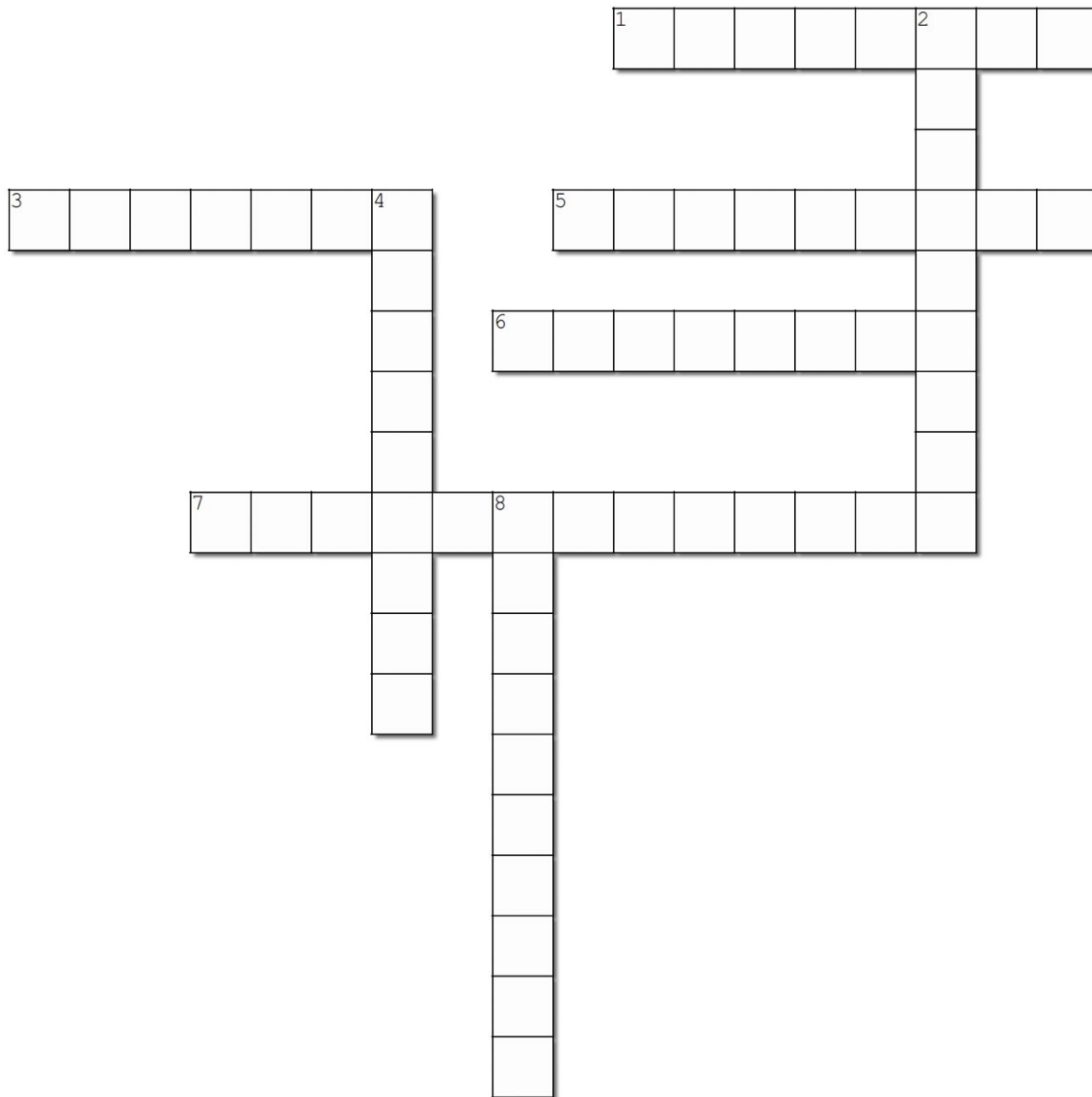
6. Beak shape, feet color, and feather colors are all examples of \_\_\_\_\_ of a chicken.
7. Sometimes shown in pictures as a twisted ladder, \_\_\_\_\_ is the molecule that carries genetic information.
8. When a chick hatches, it is called the \_\_\_\_\_ of the parents.
9. A female chicken that is less than one year old is called a \_\_\_\_\_.
10. A young male chicken is called a \_\_\_\_\_ before it becomes a rooster at the age of one.



# *"Eggs"tra Special Words*

## Lesson 3: Inside the Shell

**Directions:** Use the clues below to fill in the crossword puzzle. Hint: When the answer is two words, use one box as a space between the two words.



### **Across**

1. process of shining a light inside of the egg to see the developing embryo
3. capable of producing new life
5. cell within the yolk that has the potential of developing into an embryo
6. behavior that is natural and does not need to be learned
7. a heated enclosure that provides shelter for young livestock, including chicks

### **Down**

2. not fertile or productive
4. temporary tooth used for breaking the shell; it is later lost
8. embryos that started to develop and died for some reason





# “Eggs”tra Special Words

## Lesson 4: The Traveling Egg

**Directions:** Find the “Eggs”tra Special Words in the word bank in the word scramble. Then use the correct words to complete the sentences at the bottom of the page.

Q	P	Q				S	C	C															
A	E	P	W	L	A		Y	S	H	A	A	X											
O	F	Q	J	N	U	S	L	F		Y	M	D	I	I	R	G	U	O					
S	V	X	X	X	A	X	M	W		D	B	Y	Y	P	T	E	Y	Q					
R	J	P	Y	V	Q	U	E	Z	W	Q	H	L	F	E	P	O	F	A	K				
E	T	G	A	W	I	S	L	L	F	C	O	K	A	N	I	N	R	N	P				
U	X	M	H	D	X	K	T	F	Z	M	X	M	U	F	B	R	N	L	E	G	G		
W	L	E	N	R	I	C	H	E	D	C	O	L	O	N	Y	A	G	G	E	H	F		
	M	O	W	F	A	R	M	T	O	T	A	B	L	E	E	G	B	E	V	Z			
		V	Q	Y	V	E	Z	Z	L	R	A	G	N	C	R	T							
					G	Q	G	E	V	O	I	A	A										
				L	U	C	G	I	G	D	U	M	S	G	P	T							
				F	Y	O	D	Q	C	K	S	U	O	Z	C	Q	J	S					
		S	E	A	X	J	R	U	S	O	H	N	P	U	P	Q	N	P	C	W			
		Q	F	E	P	D	C	O	N	V	E	N	T	I	O	N	A	L	O	N	G	W	
		C	R	J	M	W	W	M	K	R	C	K	S	P	R	P	O	U	L	T	R	Y	
	M	W	E	N	J	P	W	C	K	E	L	E	T	U	P	I	M	P	U	A	W	V	Y
	M	Q	E	C	V	Z	T	Q	A		T	I	O		M	R	B	C	W	U	F	J	O
	K	S	R	K	T	G	S	K	G		Z	W	R		Q	E	I	E	B	Q	R	I	S
	Z	Q	A	D	V	I	I	U			X	F	E		Y	R	J	Q	H	Q	F	N	
	G	C	N	H	K	E	J				V	B	I			R	F	V	Y	G	C	O	
	Z	G	U	Z	J						O	E	Q			W	U	X	F	V			
		E	E	H							K	V	W			A	B	F					
											A	Q	U										
											F	G	B										

**Word Bank**

- cage-free
- carton
- consumer
- conventional
- eggs
- enriched colony
- farm to table
- free-range
- humane
- large
- medium
- poultry
- shipping
- store

- Hens that are found in a barn but can move around freely are in a \_\_\_\_\_ facility.
- \_\_\_\_\_ hens can roam outside within a pen with a barn for nesting areas.
- Cage-laid eggs, sometimes called \_\_\_\_\_ hen housing, are eggs from hens that live inside a small pen within an enclosed building.
- The newest form of housing is called \_\_\_\_\_ and it allows hens to be in large pens with perching and nesting areas within a building.

# A Chick Hatches—Embryo Development Wheel

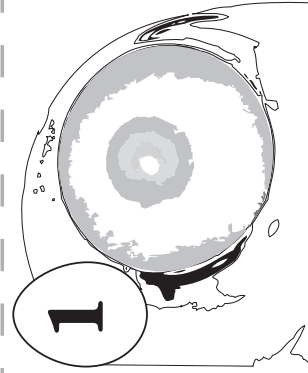
Color the pictures. Use scissors to cut on the dotted lines. Glue the title picture, "A Chick Hatches," in the center of a paper plate, and put that plate aside. Line up each of the remaining pictures in numerical order, starting with Day 1 and ending with Day 21. Glue them in order around the edge of a second paper plate. Place the first paper plate over top of the second paper plate, and place a metal brad through the center of both paper plates. Finally, cut a three-sided hole on the bottom edge of the top plate so that you can see one step of development at a time as you rotate the bottom plate. Now you can tell the story of a chick hatching from an egg.



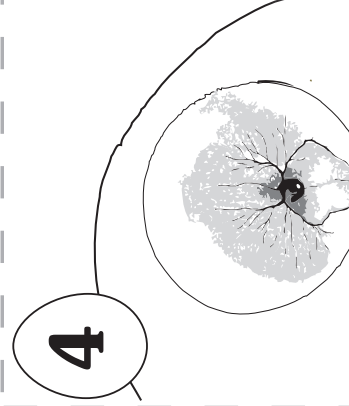
## A Chick Hatches



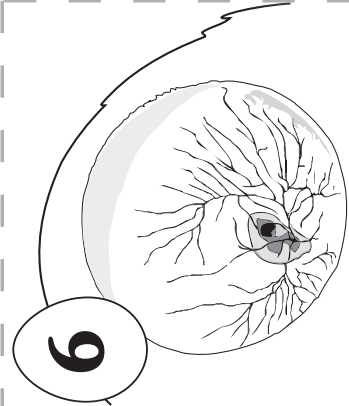
What's inside an egg?



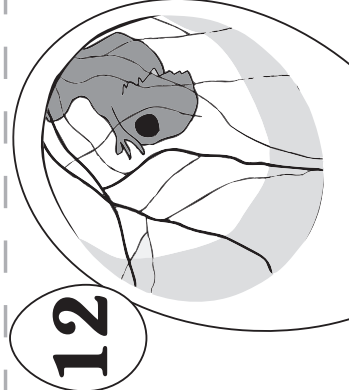
A baby chick begins as a small white patch within the yellow yolk.



Can you see the chicken's head and heart?



Now there are two wings, two legs, and a beak!



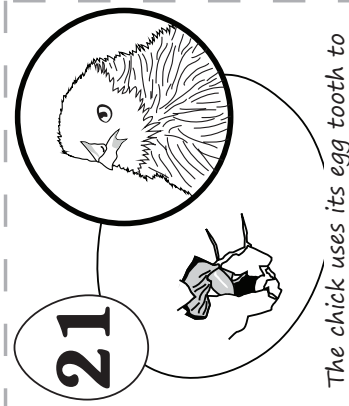
Wow! The baby chick has feathers and claws on its toes.



The baby chick will be born soon because it is getting too big and running out of food.

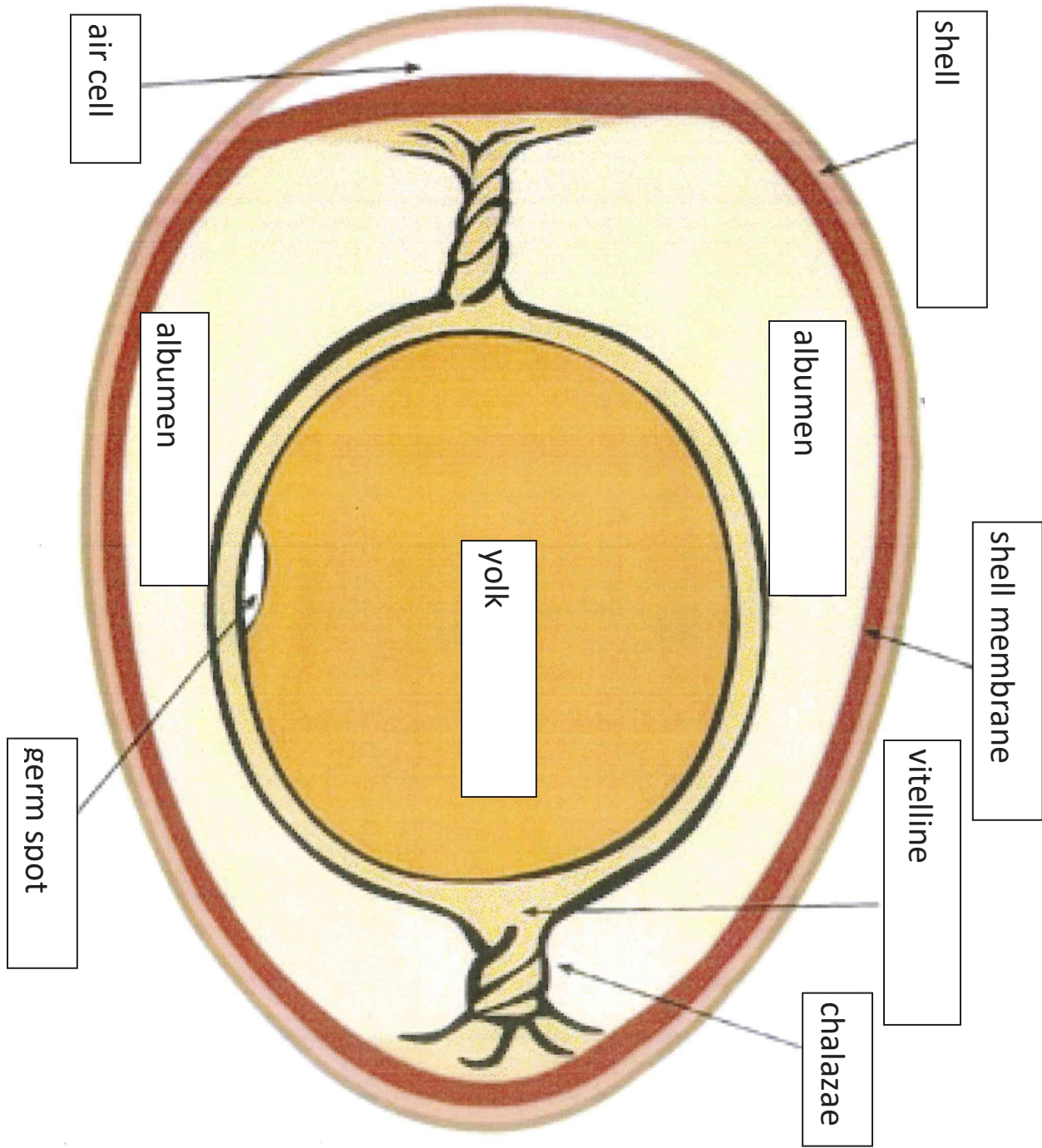


The chick begins to hatch when it breaks into its air cell and takes its first breath.



The chick uses its egg tooth to help break out of the egg. The wet chick will soon dry and have fluffy soft feathers.

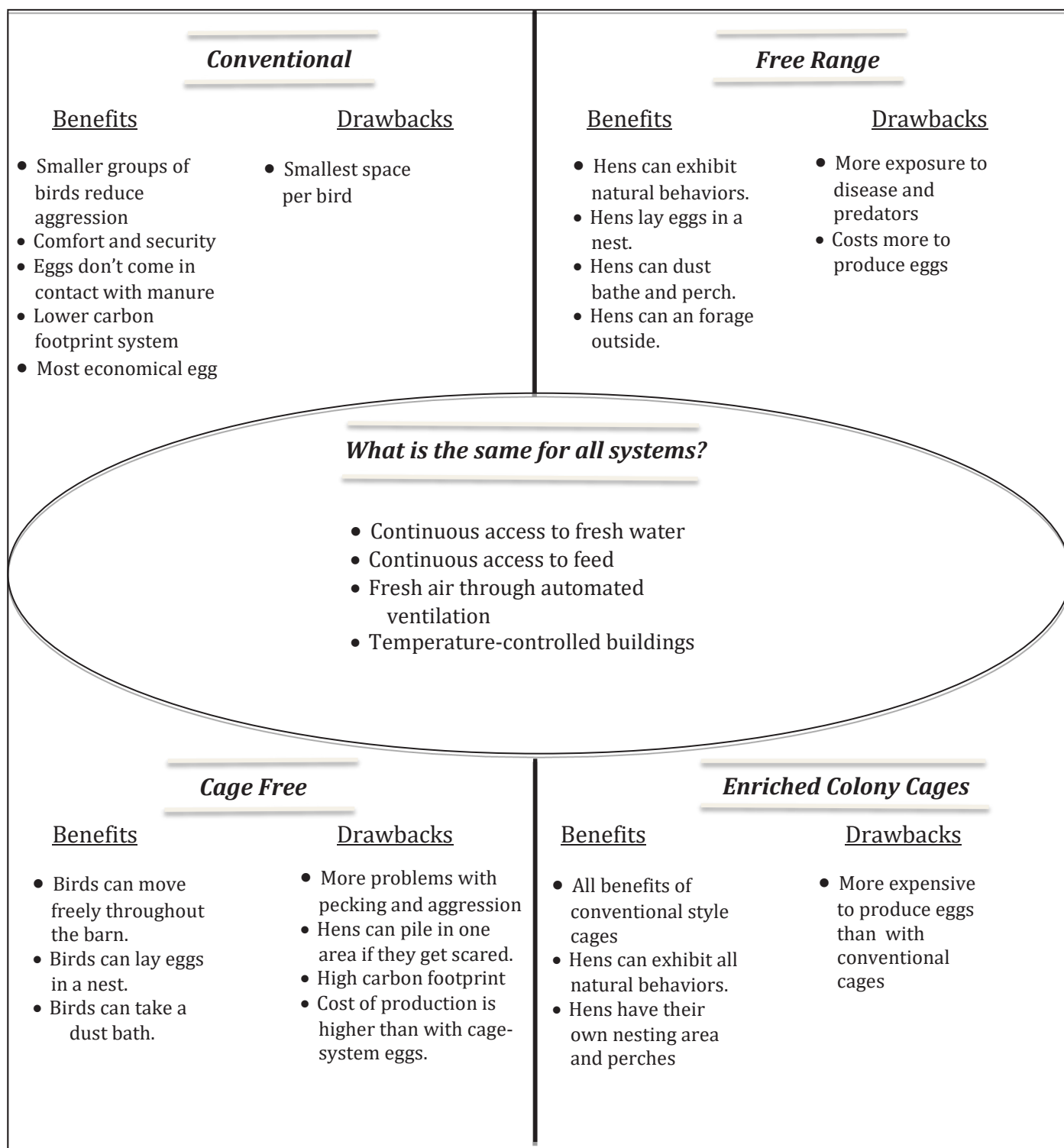
### Parts of an Egg: Key



air cell	shell
albumen (used twice)	shell membrane
chalazae	vitelline membrane
germ spot	yolk



# Venn Diagram (Possible Answers)



## Farm to Table Model



### Egg Production

1. Laying the egg



3. Packaging



2. Sorting the Eggs



4. Transporting



5. Unloading



6. Stocking Shelves



7. Consumer Buys

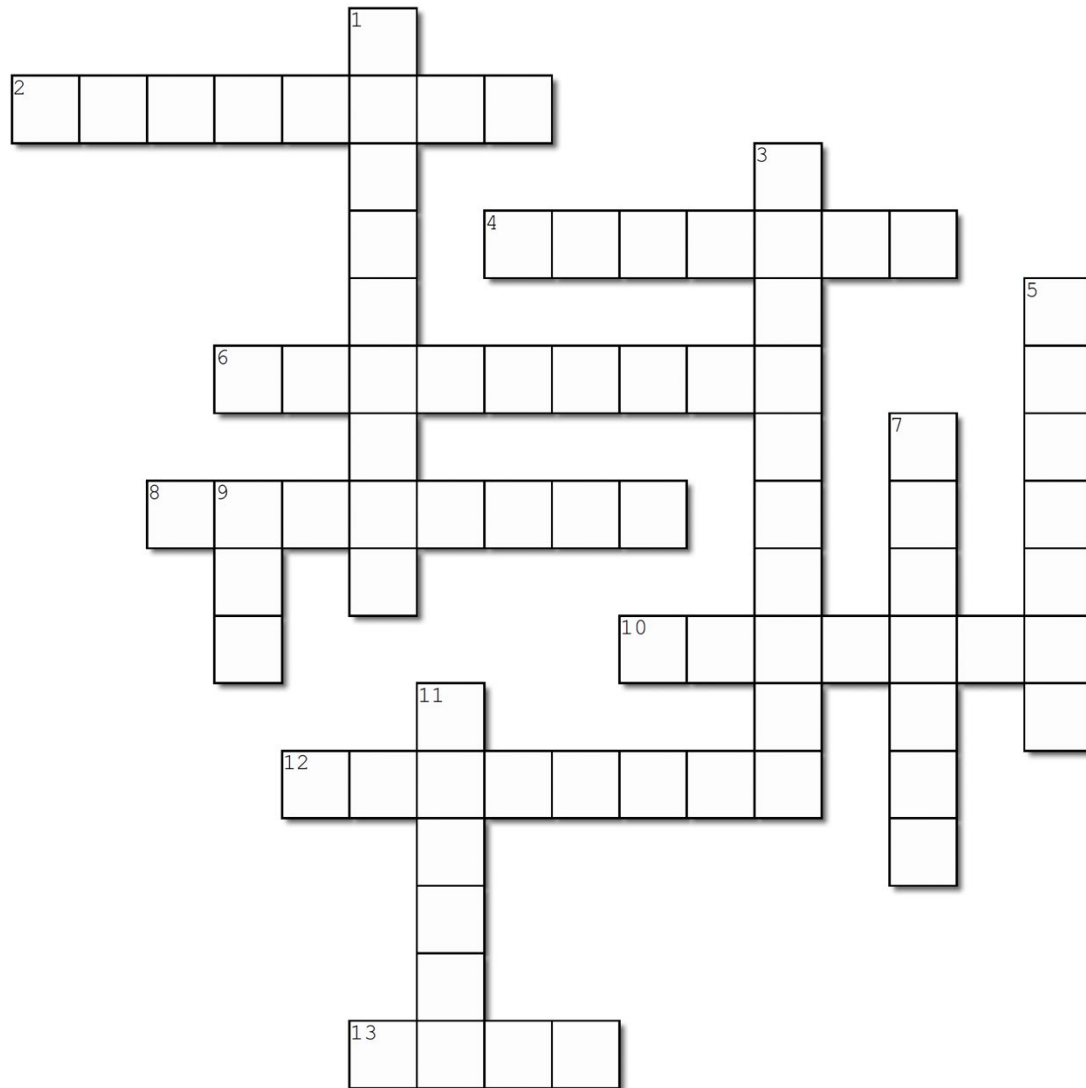
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# *"Eggs"tra Special Words*

## Lesson 1: Egg Discovery

**Directions:** Use the clues below to fill in the crossword puzzle. Hint: When the answer is two words, use one box as a space between the two words.



### Word Bank

rooster  
hen  
poultry  
embryo  
embryology  
incubator  
humidity  
albumen  
chalazae  
fertile  
germ cell  
air cell  
yolk

### **Across**

2. air pocket at the bottom of an egg
4. - the white of an egg; it supplies water to embryo
6. a device used to hatch eggs in a controlled environment
8. two spiral bands that extend from the yolk and attach to the shell membrane in order to protect the yolk
10. an adult male chicken
12. water vapor found in the air
13. the yellow part inside an egg; it is a food source for developing embryos

### **Down**

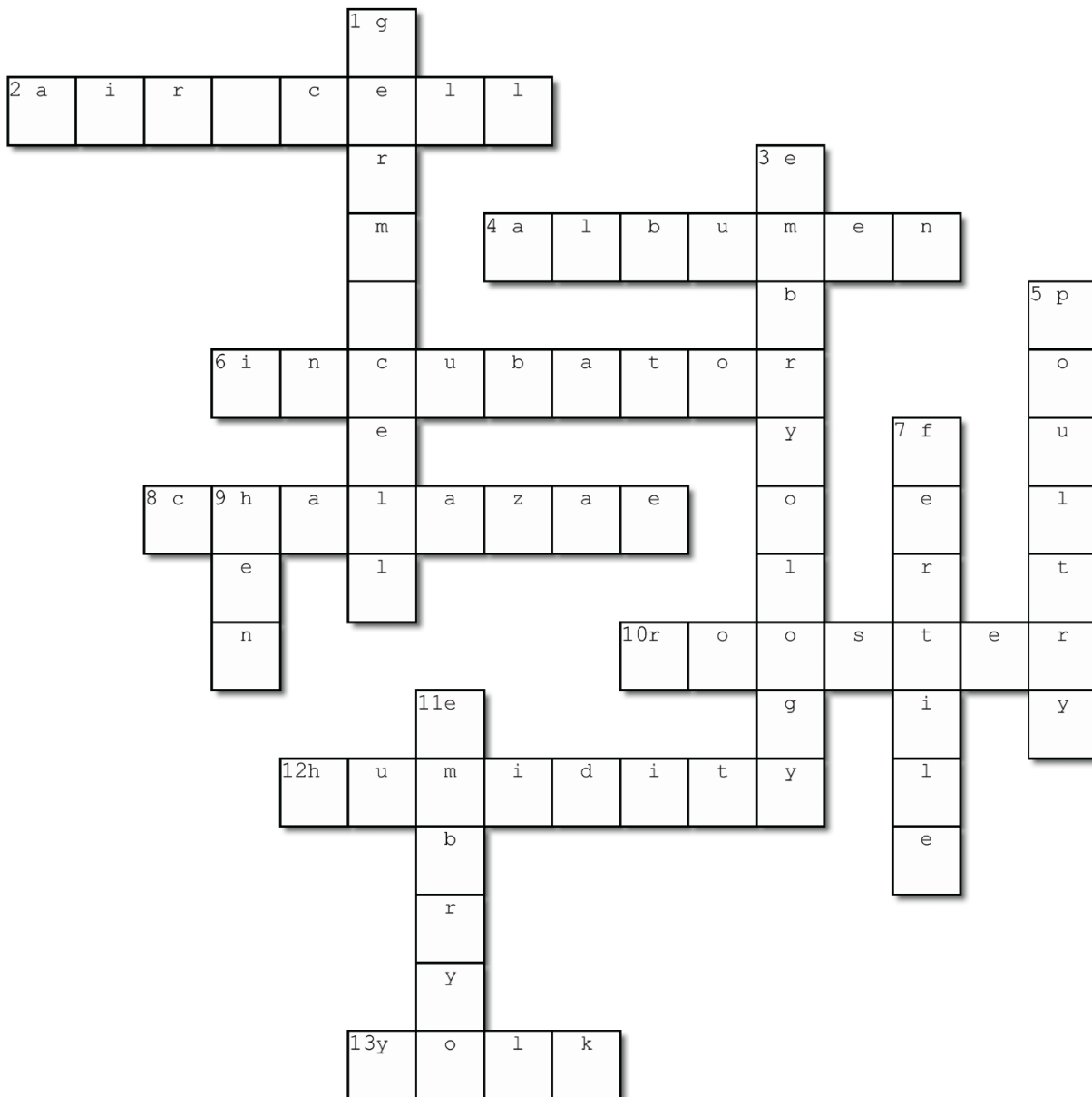
1. cell within the yolk that has the potential of developing into an embryo
3. the study of the beginning of life
5. birds raised for eggs or meat
7. capable of producing new life
9. a female chicken over a year old
11. unborn or unhatched offspring that is in the process of developing



# *"Eggs"tra Special Words*

## Lesson 1: Egg Discovery

### Answer Key





# "Eggs"tra Special Words

## Lesson 2: Build-A-Chick

### Answer Key

Directions: Draw a line to connect the "Eggs"tra Special Word to its correct definition.

- |               |       |  |
|---------------|-------|--|
| 1. gene       | _____ | a scientist who studies genes  |
| 2. genetics   | _____ | a warm-blooded vertebrate animal of a class that is distinguished by the possession of hair or fur, ability to produce milk, and (typically) the birth of live young |
| 3. geneticist | _____ | the basic unit by which genetic information is passed from parent to offspring   |
| 4. mammal     | _____ | birdlike   |
| 5. avian      | _____ | part of biology that focuses on the study of passing of traits from parents to offspring   |

Directions: Use the word bank below to complete the sentences correctly.

<u>Word Bank</u>		
offspring	cockerel	physical traits
pullet	DNA	

6. Beak shape, feet color, and feather colors are all examples of physical traits of a chicken.
7. Sometimes shown in pictures as a twisted ladder, DNA is the molecule that carries genetic information.
8. When a chick hatches, it is called the offspring of the parents.
9. A female chicken that is less than one year old is called a pullet.
10. A young male chicken is called a cockerel before it becomes a rooster at the age of one.

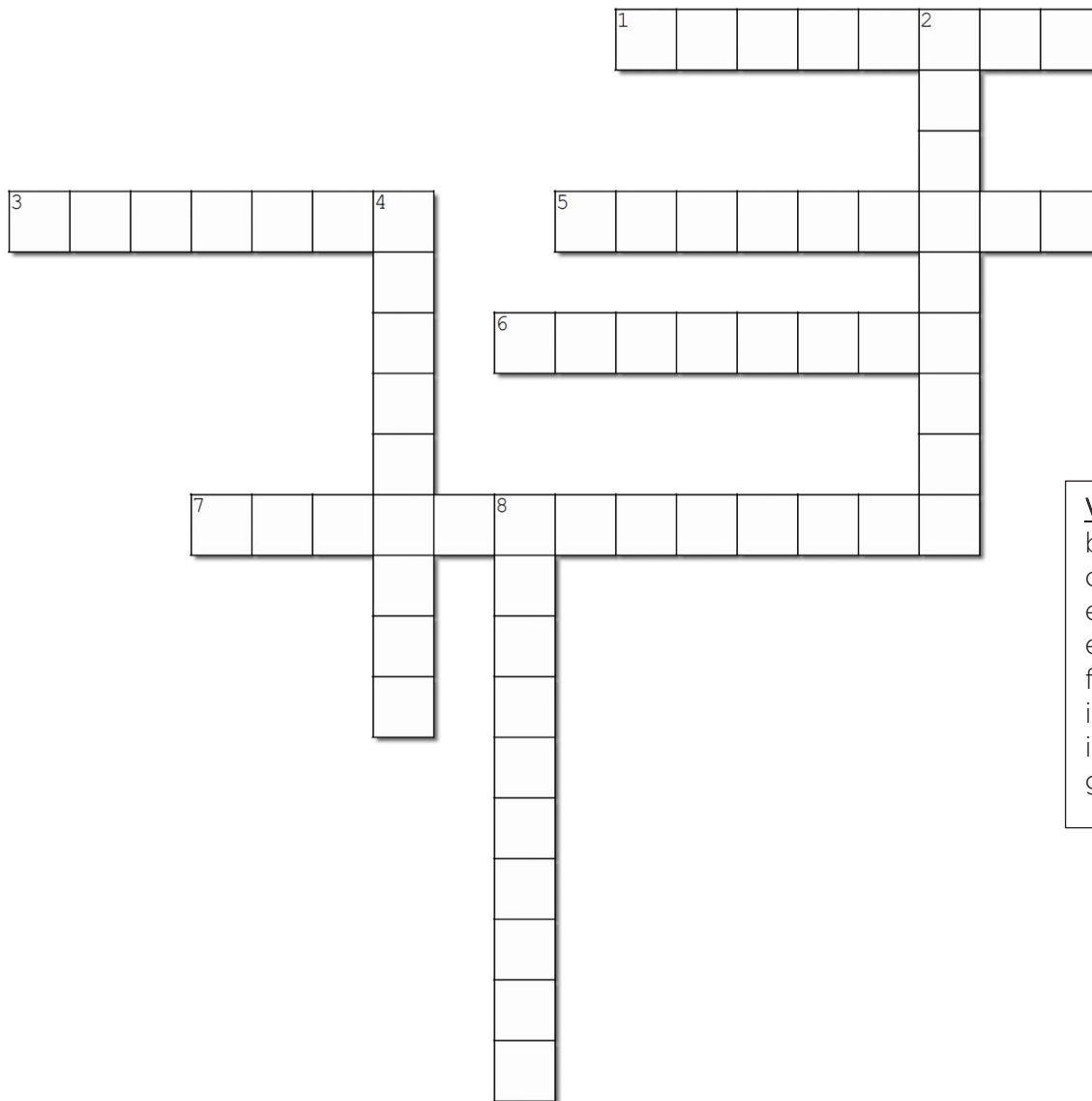




# *“Eggs”tra Special Words*

## Lesson 3: Inside the Shell

**Directions:** Use the clues below to fill in the crossword puzzle. Hint: When the answer is two words, use one box as a space between the two words.



### Word Bank

brooder house  
candling  
early dead  
egg tooth  
fertile  
infertile  
instinct  
germ cell

### **Across**

1. process of shining a light inside of the egg to see the developing embryo
3. capable of producing new life
5. cell within the yolk that has the potential of developing into an embryo
6. behavior that is natural and does not need to be learned
7. a heated enclosure that provides shelter for young livestock, including chicks

### **Down**

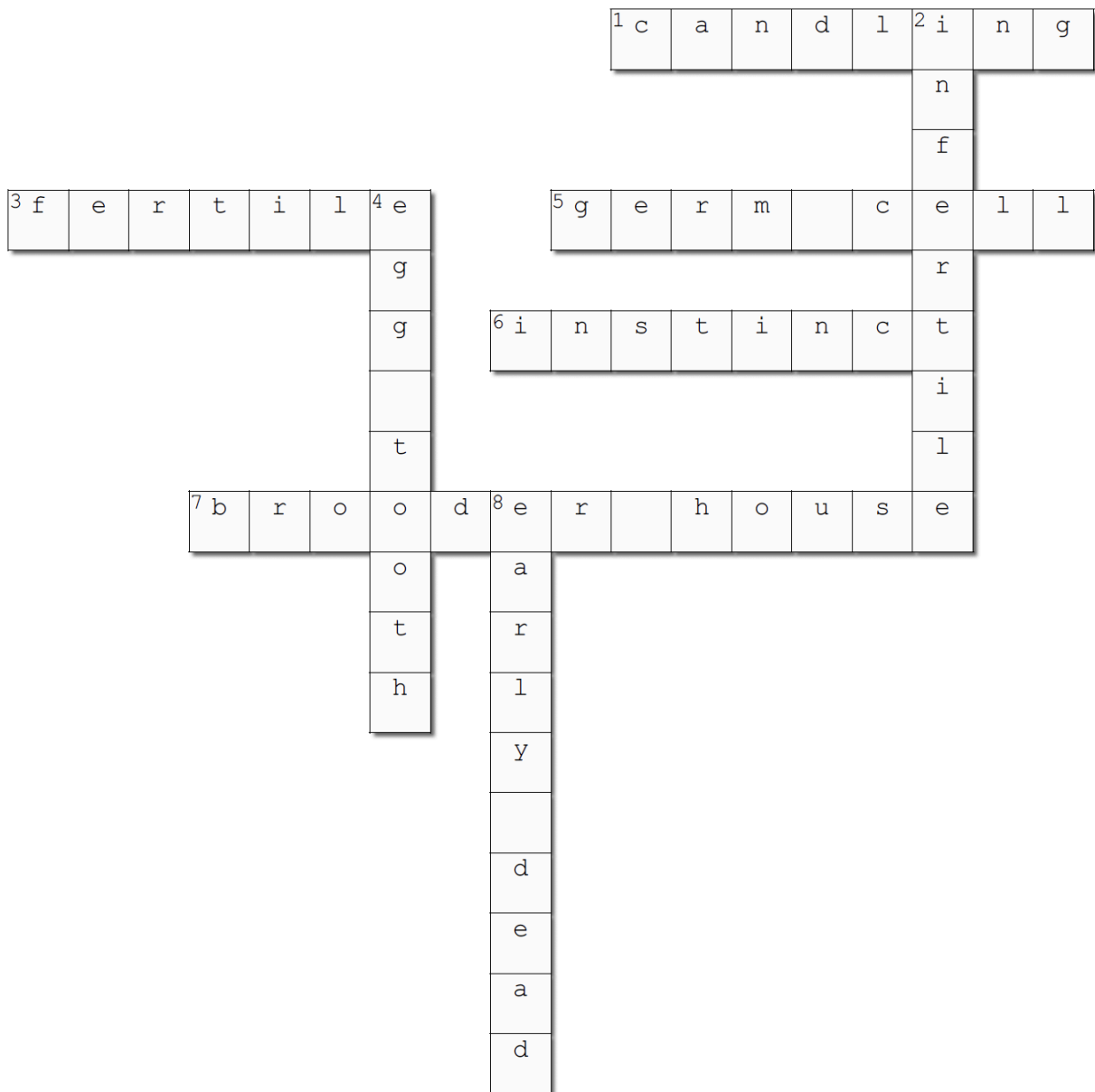
2. not fertile or productive
4. temporary tooth used for breaking the shell; it is later lost
8. embryos that started to develop and died for some reason



# *“Eggs”tra Special Words*

## Lesson 3: Inside the Shell

### Answer Key





# "Eggs"tra Special Words

## Lesson 4: The Traveling Egg

### Answer Key

**Directions:** Find the words provided in the word bank in the word scramble. Then use some of the words to complete the sentences at the bottom.

Q P Q  
A E P W L A  
O F Q J N U S L F  
S V X X X A X M W  
R J P Y V Q U E Z W  
E T G A W I S L L F  
U X M H D X K T F Z M X M U F B R N L E G G  
W L E N R I C H E D C O L O N Y A G G E H F  
M O W F A R M T O T A B L E E G B E V Z  
V Q Y V E Z Z L R A G N C R T  
G Q G E V O I A A  
L U C G I G D U M S G P T  
F Y O D Q C K S U O Z C Q J S  
S E A X J R U S O H N P U P Q N P C W  
Q F E P D C O N V E N T I O N A L O N G W  
C R J M W W M K R C K S P R P O U L T R Y  
M W E N J P W C K E L E T U P I M P U A W V Y  
M Q E C V Z T Q A T I O M R B C W U F J O  
K S R K T G S K G Z W R Q E I E B Q R I S  
Z Q A D V I I U X F E Y R J Q H Q F N  
G C N H K E J V B I R F V Y G C O  
Z G U Z J O E Q W U X F V  
E E H K V W A B F  
A Q U  
F G B

### Word Bank

- cage free
- carton
- consumer
- conventional
- eggs
- enriched colony
- farm to table
- free range
- humane
- large
- medium
- poultry
- shipping
- store

1. Hens that are found in a barn but can move around freely are in a cage-free facility.
2. Free-range hens can roam outside within a pen with a barn for nesting areas.
3. Cage-laid eggs, or sometimes called conventional hen housing, are eggs from hens that are inside a small pen within an enclosed building.
4. The newest form of housing is called enriched colony and allows hens to be in large pens with perching and nesting areas within a building.