

# Fun with Incubation

*Dr. Susan E. Watkins*  
*Center of Excellence for Poultry Science*  
*and*  
*Arkansas Cooperative Extension Service*

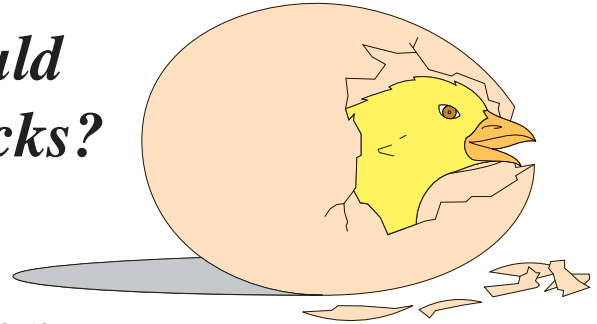
*Cheryl Esters*  
*Poultry Science Major*

*University of Arkansas*  
*Fayetteville, AR 72701*

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This booklet is available from Dr. Susan E. Watkins, University of Arkansas Poultry Science Department Faculty and Extension Specialist for the Cooperative Extension Service, Division of Agriculture. Write: Center of Excellence for Poultry Science, University of Arkansas, Attention: Susan Watkins, POSC 0-114, Fayetteville, AR 72701 or e-mail [swatkin@uark.edu](mailto:swatkin@uark.edu)

## *How Many of You Would Like to Hatch Baby Chicks?*



### *Success with Incubation*

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- Know how embryo develops
- Use large, well shaped, fertilized eggs
- Use the right incubator settings
- Check incubator often
- Keep records of incubator checks

Remember, eggs from the grocery store are NOT fertilized. Contact a hatchery.

### *Embryo Development*

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- In 21 days, embryo develops from smaller than a pin head to a 40-gram chick (1.5 oz.)
- Egg contents will supply all nutrients
- Shell will protect embryo and exchange gases with atmosphere

## *What do Chick Embryos Need?*

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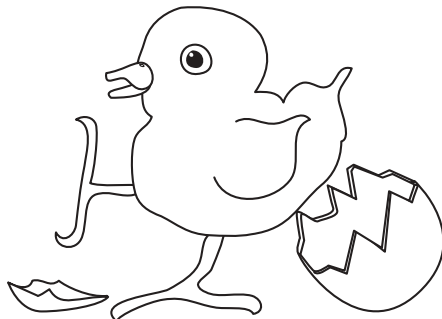
- Source of heat
  - 99.5 Degrees F for forced air incubator
  - 100 to 101.5 Degrees F for still air incubator
- Moisture
  - Relative humidity 50 to 75%
- Egg movement
  - Turn eggs to make growth uniform

## *How Heat Influences Development*

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- Under 75°F, embryo doesn't grow
- Over 75°F, embryo starts developing
- 99.5°F is the ideal temperature

It's o.k. if the egg gets cool, but too many times will harm the embryo.

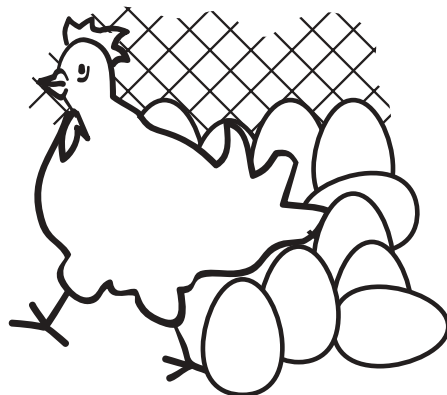


## *How Air Moisture Influences Development*

- Egg moisture lost through tiny pores in shell
- Rate of moisture loss is controlled by heat and relative humidity (RH)
- Low RH
  - rapid evaporation, egg may dry out
- High RH
  - evaporation slows, embryo could drown

## *Why Turn Eggs?*

- Egg turning helps the embryo grow uniformly
- Left in one position, gravity would force heaviest growth downward
- Might not kill the embryo, but would make it weaker



## *How Can Your Project be Successful?*

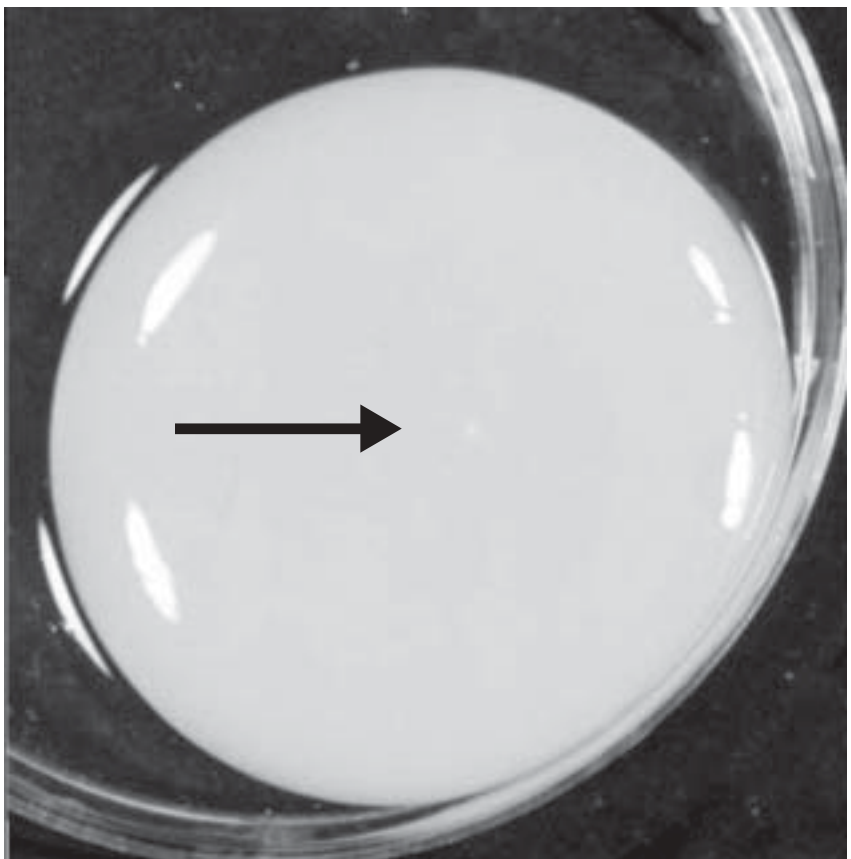
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- Check temperature often
  - keep daily temperature chart
- Keep evaporated moisture available, but don't put too much water in incubator
- Mark eggs with an "X" in pencil to help keep track of egg turning

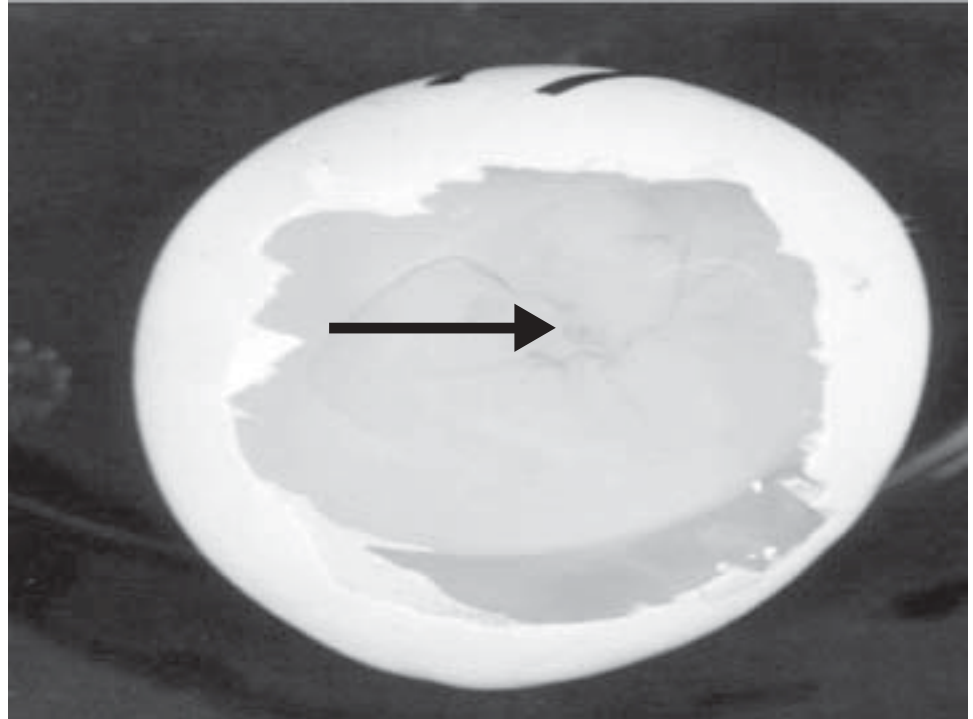
## *Photo Gallery:*

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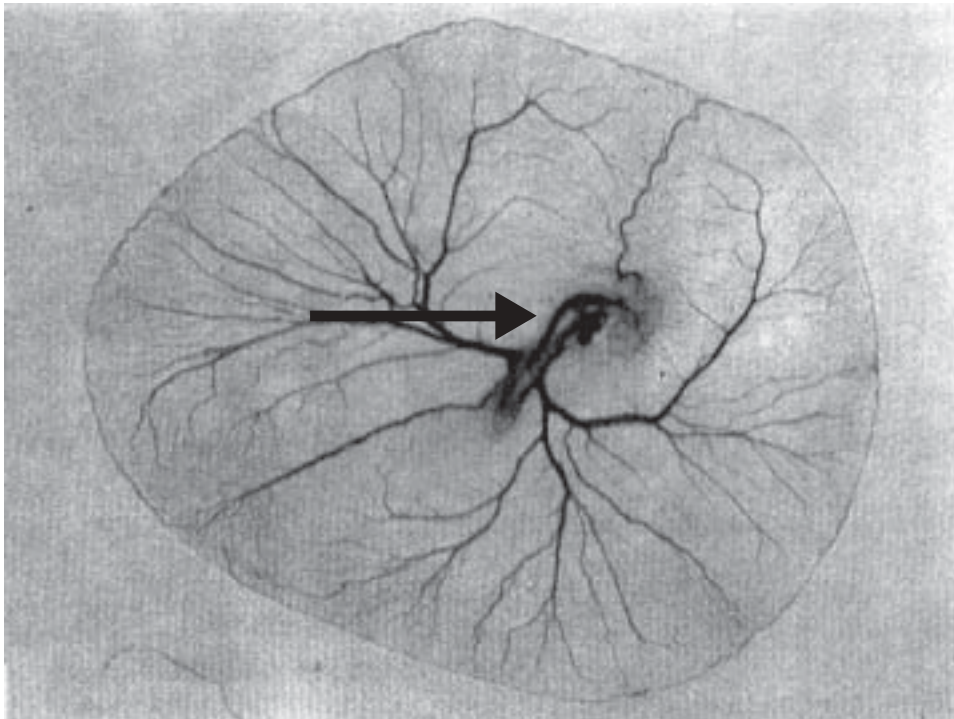
Where the arrow is pointing, you can barely see the embryo starting to develop. It is the size of a pin head.



**This is a three-day-old embryo. You can still barely make it out.**

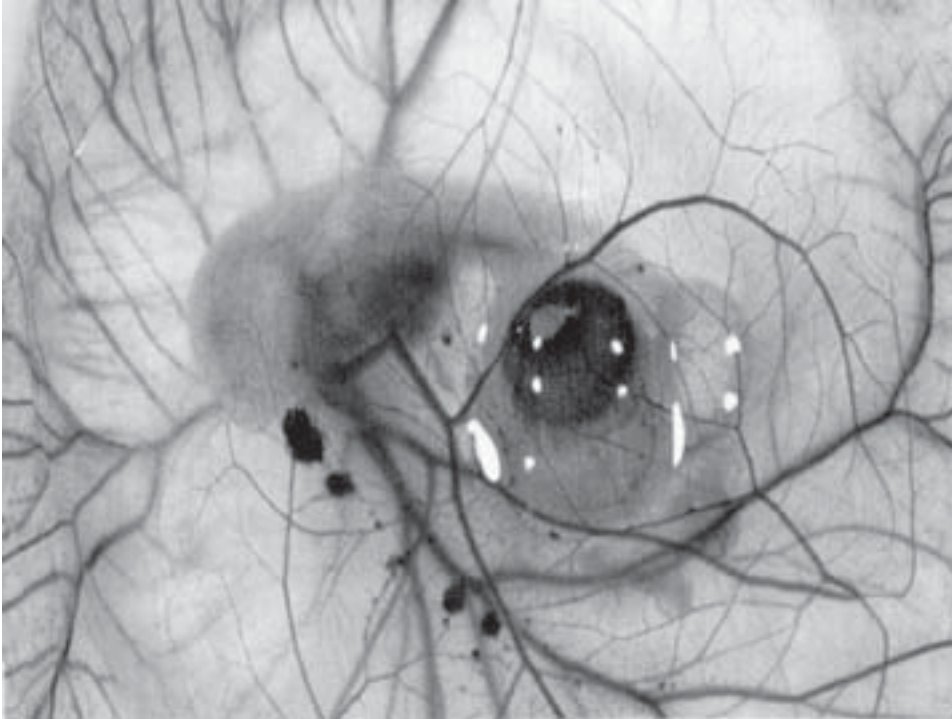


### ***Three-day-old embryos***



**In this picture of a three-day-old embryo, it has been enhanced so that you can see it better...**

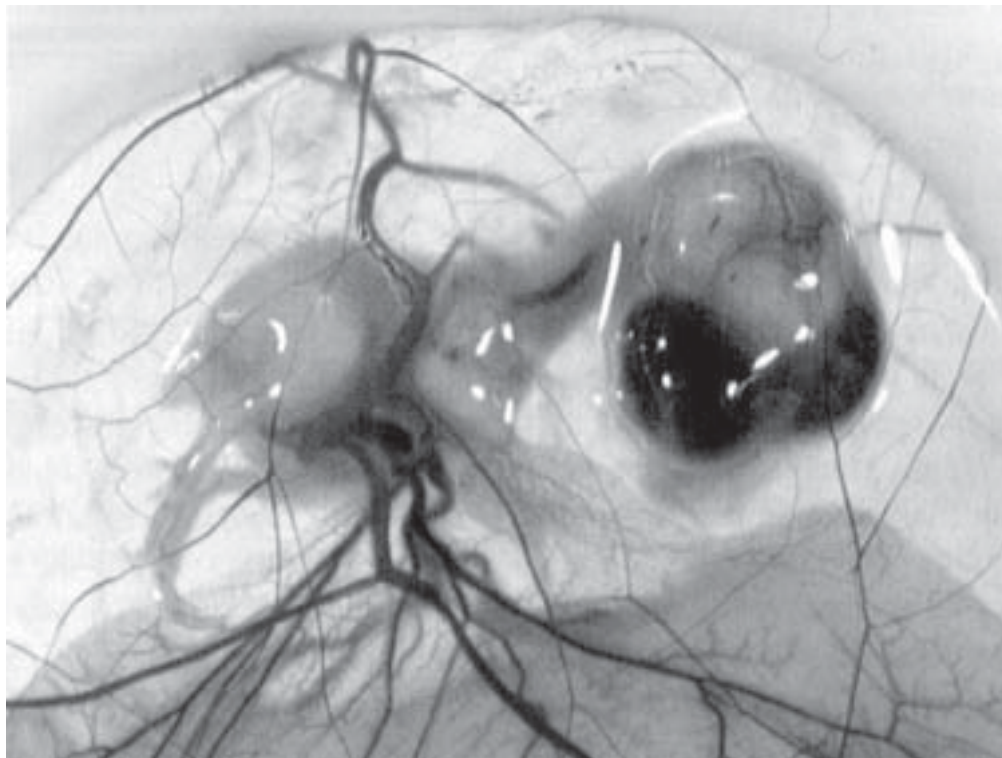
**it has a heart, brain and backwards shaped body.**



**This is a six-day-old embryo.**

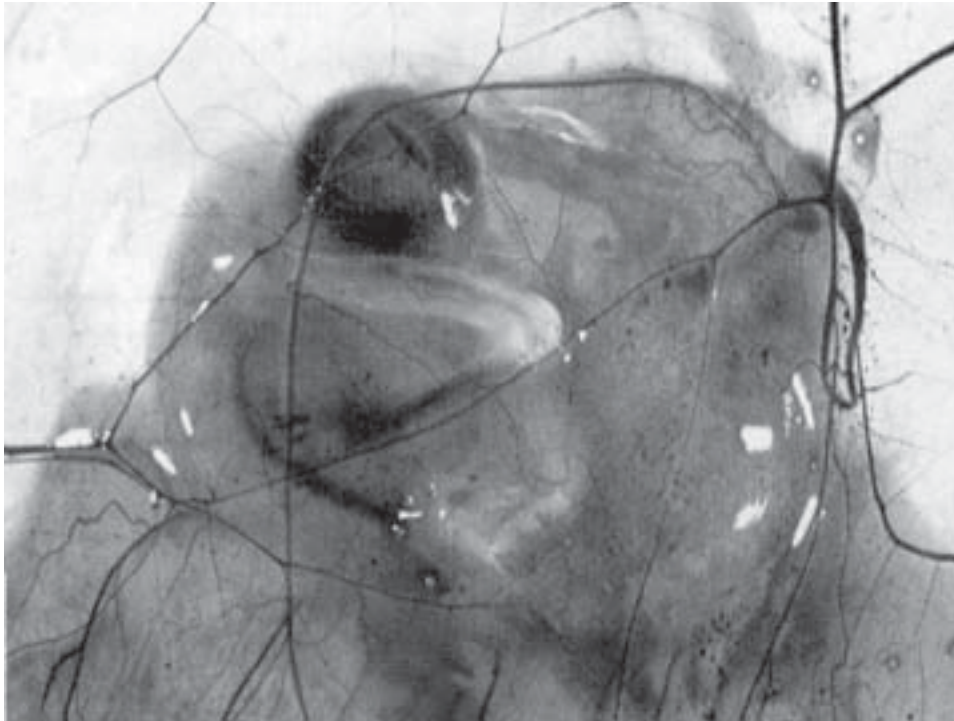
**It has:**

- **Bird-like shape**
- **Eyeballs**
- **Legs**
- **It's a boy or a girl**
- **Lots of blood vessels**



**This embryo is nine days old.**

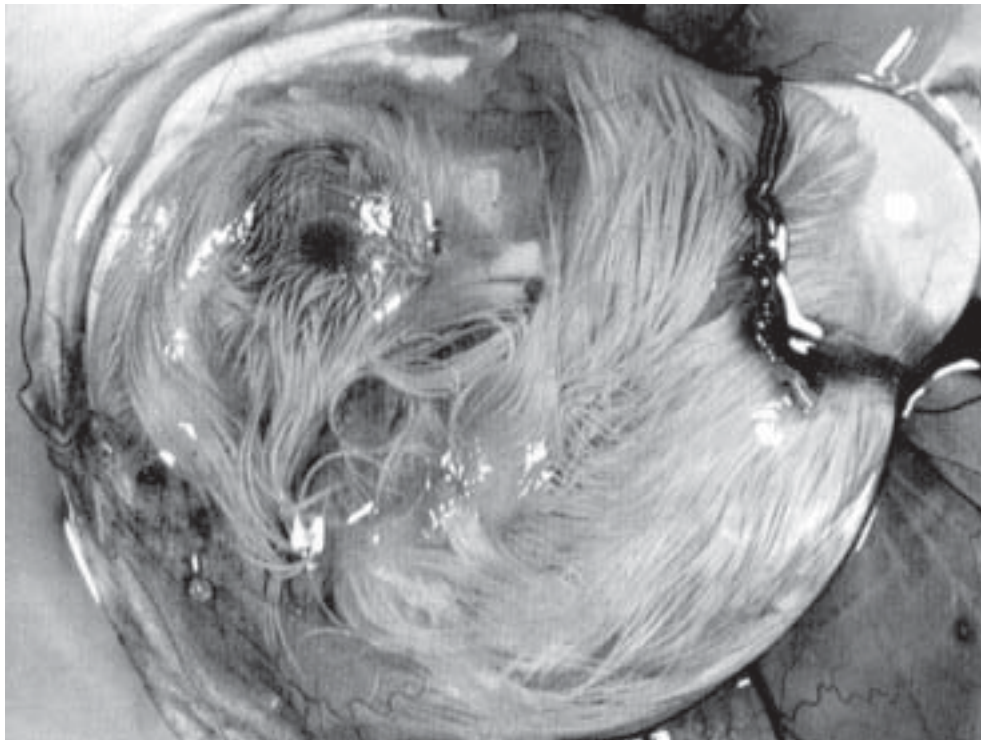
**The skull is forming, the limbs look like legs and wings and there are feather follicles.**



**This is a 12-day-old embryo.**

**It has:**

- **Eyelid covers**
- **Hair-like feathers**
- **and it's growing very fast**



**This embryo is 15 days old.**

**It has down feathers, egg tooth, toe nails and is still growing.**



**This is an 18-day-old embryo.**

**It is fully grown and ready to begin hatching!**

## ***Embryo Development - Day 19***

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- Yolk sac draws into body cavity
- Remaining yolk material will supply nutrients for chick during first few days
- Chick finds position necessary for pipping the shell

## *Embryo Development - Day 20*

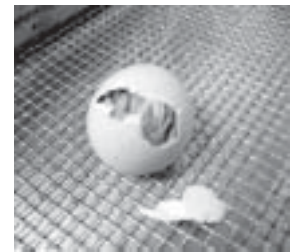
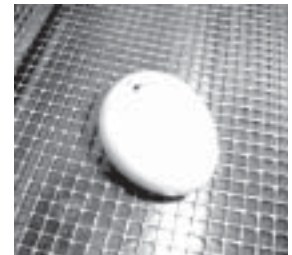
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- Yolk sac is now in the body
- Embryo occupies all the area within the shell, except for the air cell
- Beak of chick enters air cell, chick takes a breath of air
- Next, chick pips to gain entrance to outside air
- Lungs are now functional, chick must break out to survive

## *Embryo Development - Day 21*

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- After first pipping the shell, the chick rests for several hours
- Chick now cuts a circular line around the eggshell by striking shell with its eggtooth
- In 10 to 20 hours after initial pipping, chick will become free
- Chick will be tired and wet



## *Caring for New Chicks*

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- Chicks need a source of warmth
- Chicks need fresh water in a small pan, which will not easily turn over
- Chicks need food (chick starter)
- If chicks huddle together and “cry,” they are too cold
- If chicks try to get away from heat and act drowsy, they are too hot. They also may chirp very loudly.

### *Photo Gallery:*

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**Chicks need care after hatching. These chicks are walking on material called “shavings” it makes it more comfortable and warm for the chicks.**





**Chicks need fresh water. This is how they give chicks water in a chicken house through nipple drinkers.**

**Chicks also need food called chick starter. Here is how they feed chicks in a house.**



**It is important that no matter how you feed or water the chicks, it is in a container that **WON'T** tip over, such as the one shown here.**



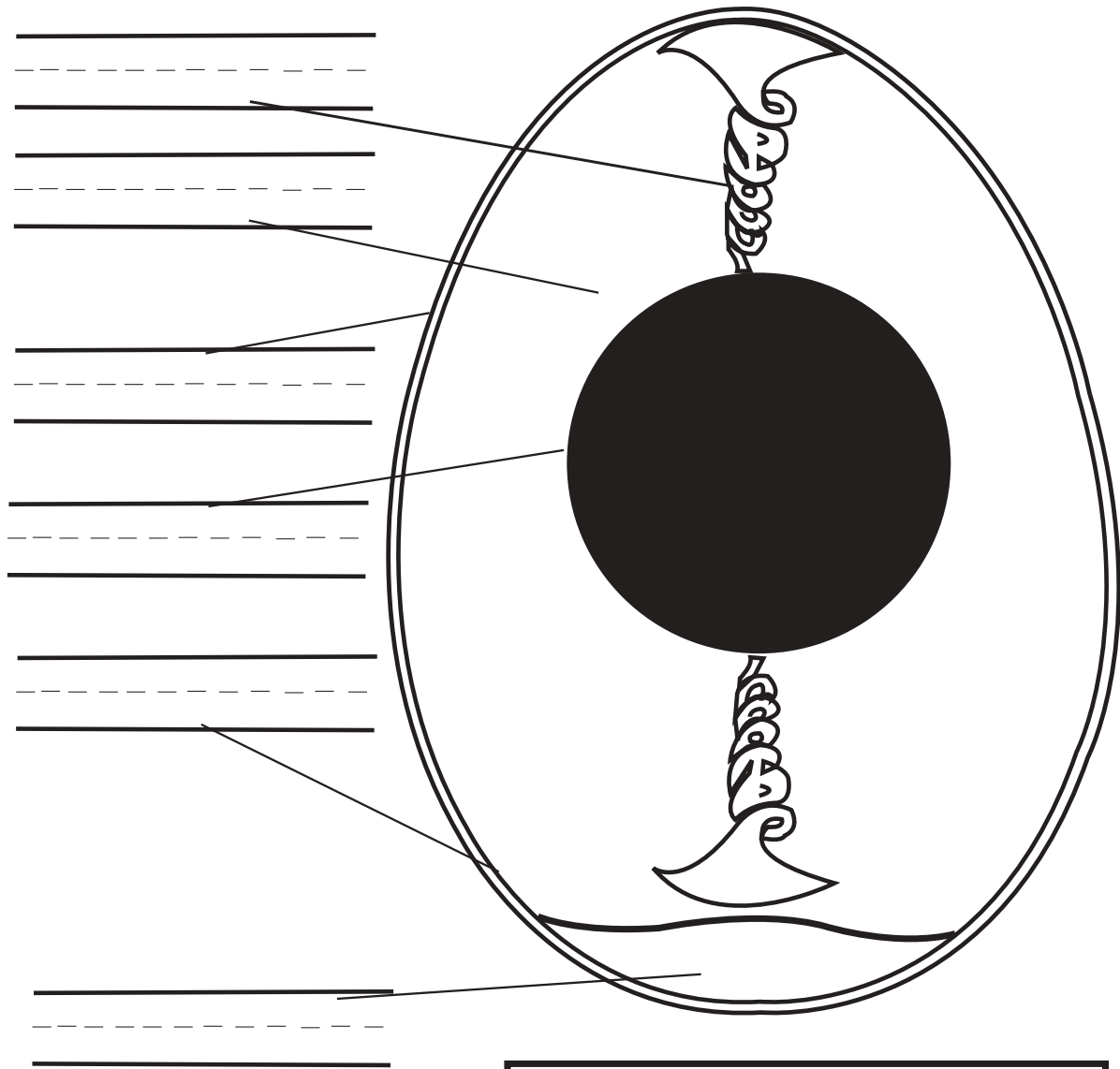
**Chickens and turkeys (shown above) are well cared for in their houses. Lots of people work together to make sure they are well fed and free from illness from the time they are hatched.**



# Fun Activities for You

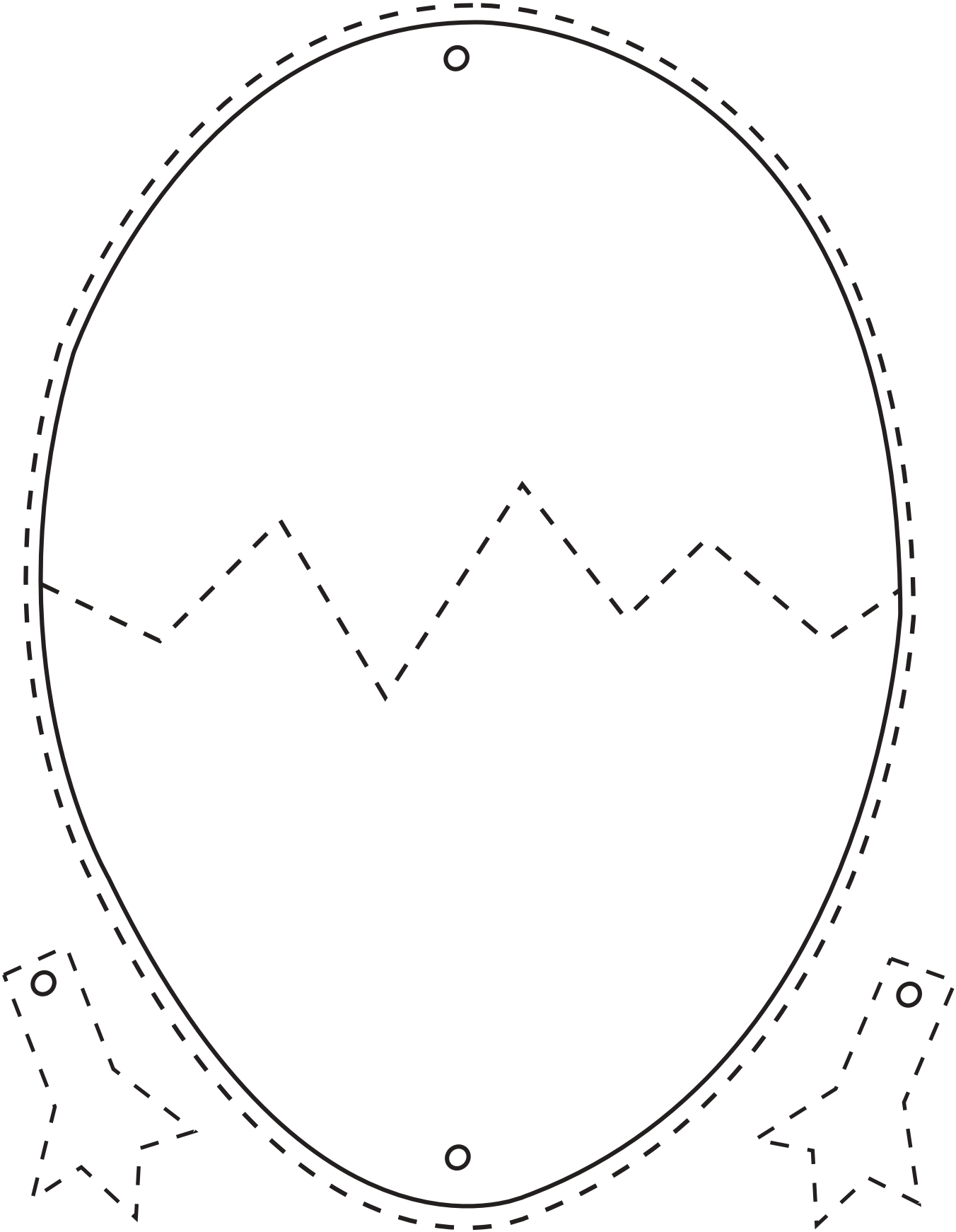
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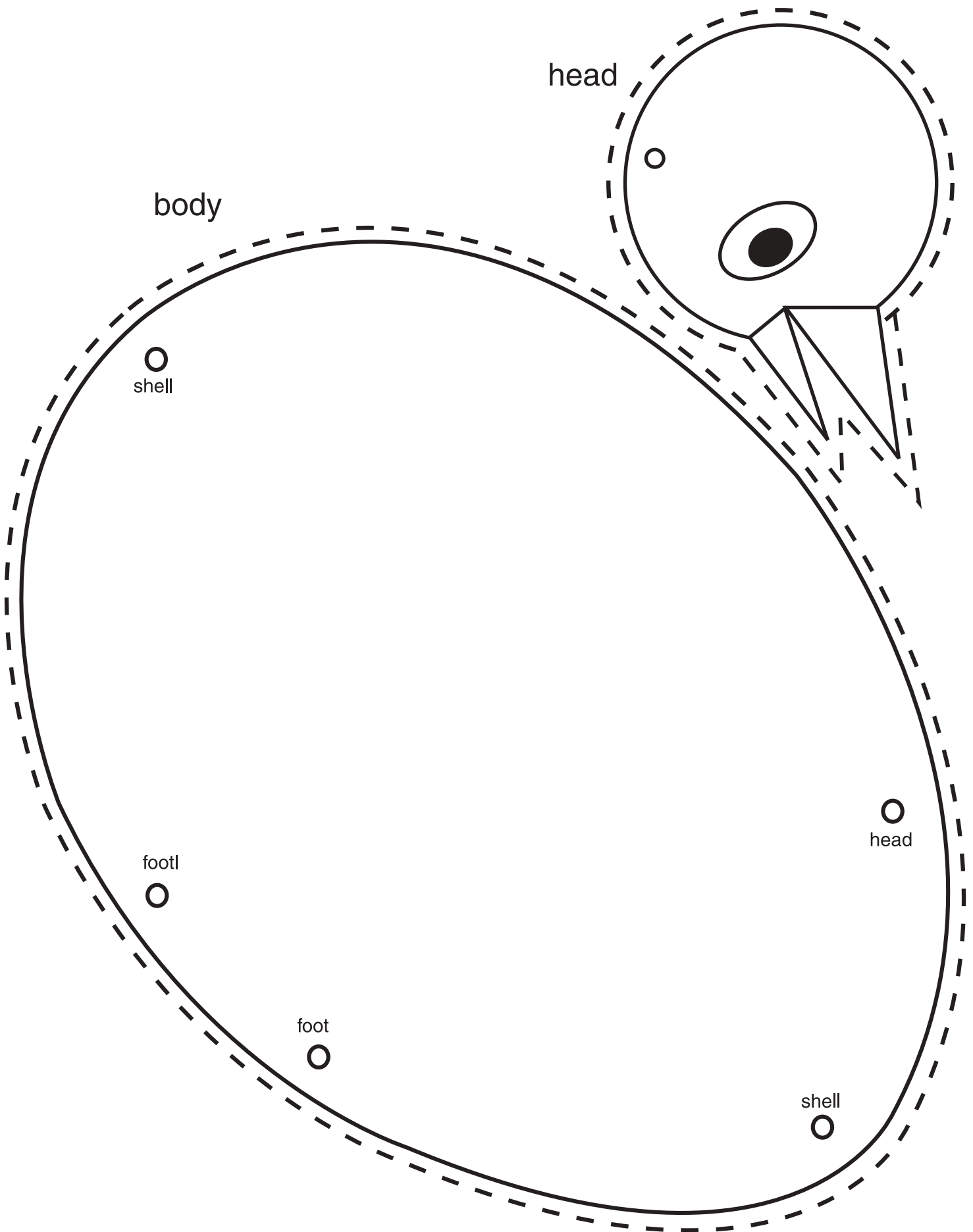
## Let's Look Inside



air sac	chalaza
membrane	yolk
egg white	eggshell

What is inside this shell?





head

body

○  
shell

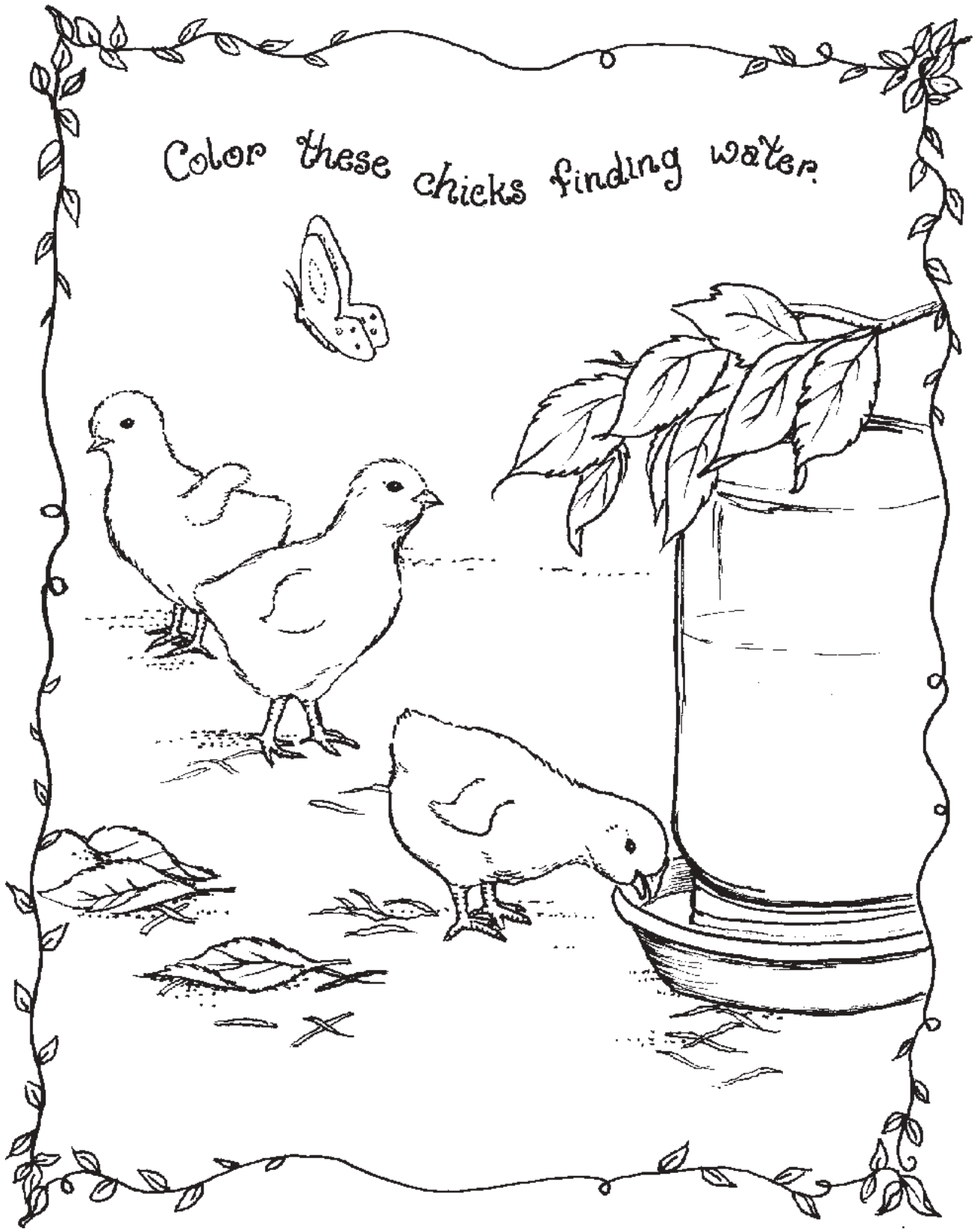
foot  
○

foot  
○

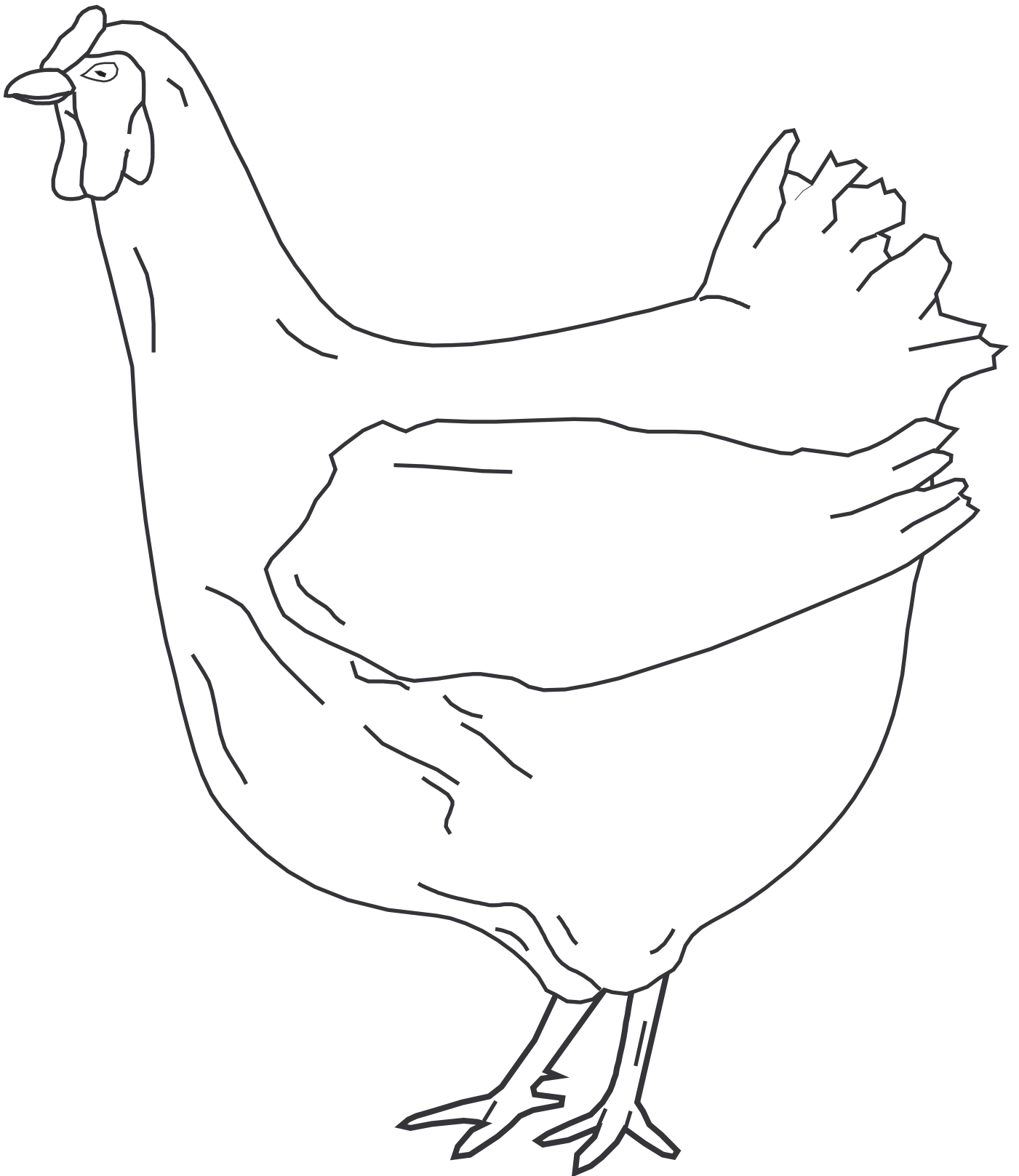
○  
head

shell  
○

Color these chicks finding water.



Color this chicken.



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