Embryology Terminology

Grade Level: 4-8

Lesson Overview

Use this lesson as an interest approach to spark student interest in the incubation process and to become familiar with terms that may be used during an embryology unit. This may also be used as an assessment tool.

Student Objective

1. Identify and define terms that may be used during a poultry embryology unit.

Materials

- ✓ Terms and definitions strips

Vocabulary

- **air cell** – pocket of air found at the large end of an egg, between the inner and outer shell membranes.
- **air exchange** – when air and/or carbon dioxide pass in and out of the shell through pores.
- **albumen** – the clear white of an egg that provides food and water for the growing embryo.
- **candling** – the process of using light to examine the inside of an egg to determine the stage of development.
- **chalazae** – two thick spiral strands at each end of the yolk that anchor the yolk in the center of the egg. These strands serve as a rotating axis to keep the germ cell on top of the yolk next to the heat of the hen's body.
- **chick –** a young chicken.
- **egg –** a round or oval object that contains what may become a young bird, reptile, insect, or other animal. Chicken eggs are comprised of a calcium-carbonate hard shell that is covered with tiny pores. Inside are the albumen, yolk, membranes, chalazae, air sac and germinal disc.
- **egg tooth –** a hard, sharp appendage on the beak of an unhatched bird that is used to break through the eggshell.
- **embryo** - an animal in the early stages of development; prior to hatching.
- **embryology** – branch of biology that studies the development of embryos.

- **fertilize** – to make an egg able to grow and develop.
- **germinal disc** - also called blastodisc; the area where the embryo will begin to grow if the egg is fertilized (then called a blastoderm).
- **hatch** – to emerge from an egg.
- **hen** – a mature female chicken.
- **humidity** – water in the air; keeps the egg from losing too much or too little moisture during the incubation process.
- **incubation** –the process in which the embryo in a fertilized egg develops into a chick and hatches out. Successful incubation of chicken eggs requires proper temperature, humidity, ventilation and time. The incubation period for chickens is 21 days. Other poultry may have different incubation periods.
- **incubator** – an apparatus used to provide a controlled environment for eggs to develop until hatching.
- **omnivore** – animals whose diets are made up of plants and small animals. Chickens eat seeds and insects but will also eat larger prey like small mice and lizards.
- **oviparous** – producing young by means of eggs that are hatched after they have been laid by the parent. All poultry are oviparous.
- **pipping** - the process the chick goes through to peck a hole and break out of the shell.
- **pores** – tiny holes in the shell that allow the passage of air and water in and out of the egg.
- **poultry** – refers to chickens, turkeys, ducks, ostriches, emus quail, pheasants, geese, or pigeons that are raised for meat, feathers and/or eggs.
- **rooster** – a mature male chicken.
- **setting** – starting the process of hatching chicks by providing consistent heat and humidity, which means placing the eggs in an incubator.
- **shell** – the outside protective layer of the egg.
- **shell membranes** – thin membranes inside the shell that help cover and protect the developing embryo.
- **temperature** – how hot or cold something is; Temperature is the most important factor to consider that influences the developing embryo. The perfect temperature is 100.5 degrees Fahrenheit but should not drop below 99 or go above 103 degrees Fahrenheit.

- **thermometer** – a tool to measure temperature.
- **turning** – the process of rotating the egg several times a day to prevent the yolk from settling to one side and to exercise the embryo; Eggs should be turned no less than 3 times per day during incubation.
- **ventilation** – the provision of fresh air; Ventilation is important to provide air circulation within the incubator. Growing embryos absorb oxygen and release carbon dioxide.
- **yolk** - yellow portion of the egg; primary food source for developing embryo.

Procedure

1. Cut apart each "Embryology Terminology" term and definition. Provide each student with either a term or definition. Students will search for their match among their classmates.

   OR

   Place each term or definition inside a plastic egg. Provide each student with an egg. Students will open their eggs and search for their match.

   OR

   Place terms on the backs of students. Play "20 Questions" for students to determine their term.

2. Line Up: Once all students have been correctly matched, all the matched pairs should form a line by aligning the terms into alphabetical order. From this line, ask students to step forward or back for various questions such as:
   students who are parts of an egg; students who are factors that influence the incubation success; students who are names for poultry; terms that students were not familiar, etc.

(Answers are noted in the "Vocabulary" section of this activity.)

Extension Activities

1. Terms and their definitions may be used to become a memory game.
2. Terms may be used as a bingo game. Provide each student with a blank bingo board and direct students to select terms and place on the bingo board. As definitions are called, students can mark off the terms.
3. Use the terms to develop a crossword puzzle or word search

4. Slap-It Game: Place the terms on a wall and provide a swatter to two students. As the definition is read, the first student who swats the correct term receives a point. Play continues until all terms are defined.

Additional Resources

- University of Illinois Embryology 101: https://web.extension.illinois.edu/chick/101/
- American Egg Board: http://www.aeb.org
- https://www.incredibleegg.org/professionals/k-12-schools/eggs-in-the-classroom/eggs-101-videos Eggs 101 - American Egg Board
- Eggs in the Classroom videos and worksheets from the American Egg Board: https://cdn.agclassroom.org/media/uploads/2018/01/17/egginsert.pdf
- Illinois Agriculture in the Classroom Poultry Ag Mag http://agintheclassroom.org/TeacherResources/AgMags/Poultry%20Ag%20Mag%20-%20Online%20Version%20Pages_3.26.2020.pdf
- Illinois Agriculture in the Classroom Ag Reader/Terra Nova http://agintheclassroom.org/TeacherResources/terra_nova_poultry.shtml
- Illinois Agriculture in the Classroom lesson: Egg-cellent Embryology https://beyondthebarndoor.files.wordpress.com/2021/06/egg-cellent-embryology-1.pdf
- National Ag in the Classroom lesson – Hatching Science with Classroom Chicks https://www.agclassroom.org/matrix/lesson/470/ (This lesson contains the "Countdown to Hatch Inserts for 21 plastic eggs, Hatching Science: 21 Days of Discovery PowerPoint and a video: How It's Made: Hatchery Chicks)
- Eggcellent Adventures in Classroom Embryology: An Extracurricular Guide to Chicken Embryology https://edis.ifas.ufl.edu/publication/4h368
- ChickQuest PowerPoint of 21 Days https://ohio4h.org/sites/ohio4h/files/imce/4h_science/Science_Alive_ChickQuest/21-Day%20Calendar%20rebrand.pdf

Standard

Illinois English Language Arts Standard
RI.6.4: Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.

The **M**ultidisciplinary **AG**ricultural **I**ntegrated **C**urriculum (mAGic) was created in 2004 under the leadership of the Illinois State Board of Education (ISBE) and the Facilitating Coordination in Agricultural Education Project (FCAE). Funding was made available through the FCAE grant budget from the agricultural education line item of the ISBE budget. This revision, as printed, was developed in September 2021.

These mAGic lessons are designed to bring agriculture to life in your classroom. They address the Illinois Learning Standards in math, science, English language arts and social studies.

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air cell	pocket of air found at the large end of an egg, between the inner and outer shell membranes
air exchange	when air and/or carbon dioxide pass in and out of the shell through pores
albumen	the clear white of an egg that provides food and water for the growing embryo
brooder	a heated structure used for raising young fowl
candling	the process of using light to examine the inside of an egg to determine the stage of development

chalazae	two thick spiral strands at each end of the yolk that anchor the yolk in the center of the egg
chick	a young chicken
down	soft, fine, hair-like feathers on young birds
egg	a round or oval object that contains what may become a young bird, reptile, insect, or other animal. Chicken eggs are comprised of a calcium-carbonate hard shell that is covered with tiny pores. Inside are the albumen, yolk, membranes, chalazae, air sac, and germinal disc
egg tooth	a hard, sharp appendage on the beak of an unhatched bird that is used to break through the eggshell

embryo	an animal in the early stages of development; prior to hatching
embryology	branch of biology that studies the development of embryos
fertilize	to make an egg able to grow and develop
flock	a group of birds tended to as one unit
germinal disc	also called a blastodisc; the area where the embryo will begin to grow if the egg is fertilized

grit	a mixture of small pebbles or crushed stones which chickens eat to help them digest food. Grit helps grind food into smaller, more digestible particles in the chicken's gizzard
hatch	to emerge from an egg
hen	a mature female chicken
humidity	water in the air; keeps the egg from losing too much moisture during the incubation process
incubation	the process in which the embryo in a fertilized egg develops into a chick and hatches out

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