Tennessee 4-H Youth Development

Embryology

Skill Level: Beginner

Learner Outcomes
The learner will be able to:
Identify different aspects of the embryology project and observe the nature of eggs in their natural form

Educational Standard(s) Supported
5.LS4.2: Use evidence to construct an explanation for how variations in characteristics among individuals within the same species may provide advantages to these individuals and their survival and reproduction.
5.ETS2.1: Use appropriate measuring tools, simple hand tools, and fasteners to construct a prototype of a new or improved technology.

Success Indicator
Learners will be successful if they can:
Identify the parts of the eggs and where eggs come from
Identify how the egg is fertilized and how chicks are hatched

Time Needed
30 minutes

Materials List
- Eggs (different colors if available)
- Egg Part printout or digital display
- Flashlight (5, 1 per group)
- Incubator (optional)
- Granola Bar, Helmet, Bubble Wrap, Foam, Milk (1 each)

Introduction to Content

The purpose of this activity is to teach students about embryology as well as give an introduction to poultry science.

An embryo is an animal or plant in its earliest stage of development. –ology is derived from the Greek word logos which means study. Embryology is the study of a plant or animal in its earliest stages… in this case the baby chick.

Introduction to Methodology

This lesson introduces basic scientific principles and allows students to complete a hands-on activity related to egg candling. This lesson can be used to spark interest in an animal science project.

Authors

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Prepared using research based practices in youth development and experiential learning.

Terms and Concepts Introduction

Shell – porous, hard surface that allows oxygen & water in & out of the egg
Inner and Outer membranes – these act as a "gate-keeper" between the shell and the embryo. Allows only water and air to transfer. Prevents bacteria and soil from entering the egg.
Albumen or white – food source for the embryo. Pure protein.
Yolk – food source for the embryo. Protein, fat and vitamins and minerals.
Air Cell – pocket of air between the inner and outer membranes. During incubation the air cell is a shock absorber for the embryo to help protect it. When the embryo is fully developed, the chick first hatches through the inner membrane and takes its first breath of air from the air cell.

Tips for Engagement

- Be sure to keep the attention of all of the youth.
- Ask for volunteers to help show different parts or to show others different eggs or angles.

Setting the Stage and Opening Questions

Explain that this class will focus on the egg, its parts, and how chicks are formed and hatch. Share the learner outcome with the students.

Ask the students the following questions:

Where do our eggs come from? Grocery store or farm.
What is the difference in eggs from the grocery store and ones from the farm? The eggs in the grocery store are not fertilized.

Experience

Lead students through an egg candling experience. This will work best if you turn off the lights in the classroom to create a darker environment. This will allow the students to more easily see the inside of the egg while they are being candled.
Say to the students: "**Today, we are going to start our activity by candling eggs. Candling allows us to see the inside of the egg and determine if it has been fertilized. In just a few minutes, we are going to break into 5 groups and each group will get a couple eggs and a flashlight. You'll use the flashlight to shine light into the egg so you can see the inside."**

Pass out the eggs and flashlights to the students and allow them to complete the candling experiment. After students have finished, discuss the following questions.

Who can tell me what the word "embryology" means? (Study of an embryo or a plant/animal in its earliest stage)
Who can tell me where our eggs come from? (Chickens)
Who can tell me what color eggs we normally see in the grocery store? Please only tell me one. (White or even brown)
Who can tell me if our eggs come from a hen or a rooster? (Hen)
Who can tell me what sex a hen is? (Female)
Who can tell me what sex a rooster is? (Rooster)
Who can tell me why we need the rooster? (He fertilizes the eggs to make a baby)

Share

Ask students the following questions.
"**Who wants to share one thing they learned from the candling experiment?"**
"Why do you think that candling is important?"

Process

Display the photo of the egg with the parts unlabeled. Write the following words on the board: Air Cell, Yolk, Shell, Shell Membrane, and Egg White.
Ask students to identify the parts of the egg using the words you wrote on the board. AS each part is correctly identified, share the definition of that part included in the terms and concepts introduction.

Generalize

Have students return to their groups and pass out one of the following items to each group.
Granola Bar- Yolk
Helmet-Egg Shell
Bubble Wrap-Air Cell
Foam-Shell Membrane
Milk-Albumen
Explain to each group that the item they were given represents a part of the egg they just identified. They are to determine what part it is and share with the class how they are similar to each other.

Apply

After students have shared with the class, ask them to think of 2 other everyday items that could be used to represent that part of the egg. Ask them to share these with the class.

Life Skill(s) from TIPPs for 4-H

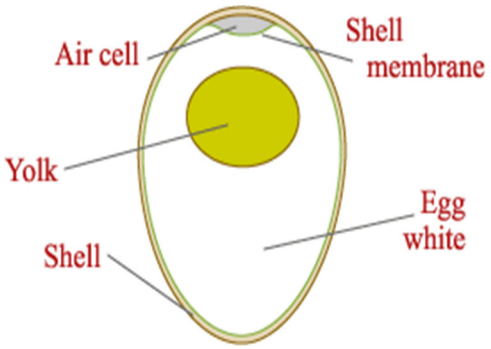
5th Grade

Participate in 4-H club meetings by saying pledges, completing activities and being engaged. (Head)

Select at least one project area in which to focus future 4-H participation. (Head)

Communicate information learned from a specific project area to the larger 4-H club. (Head)

Identify at least one goal as an individual and the tasks or steps necessary to meet that goal. (Head)



Egg Parts Handout