PITTSBURGH BOTANIC GARDEN

Raising horticultural standards.

Educating our visitors.

Inspiring people to grow.

Incredible Eggs Lesson Plan

Grades K-4

Pittsburgh Botanic Garden

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1 Incredible Eggs

Time: 90 Minutes

Materials:

Materials will be based on individual projects. See projects sheets for materials lists.

Overview

Eggs are an important part of our daily lives; used in baking and cooking, agriculture and farming and are important to continue certain species. This lesson will introduce children to what an egg is, how it is formed, and which animals lay eggs. It will also give information about how eggs are used in our local region and allow children to create a craft project using eggs.

Content Background

Humans have used eggs for thousands of years. It is even believed that Columbus carried the first chickens related to those now in production on his second trip to the New World in 1493. Nearly 200 breeds and varieties of chickens have been established worldwide.

Eggs are used in baking and cooking, in agriculture and farming and ensure the continuation of certain species. Eggs can also be used in vaccine manufacturing. Not only have eggs been used as a source of nutrition, they have also historically been regarded as a symbol of fertility, life and the coming of spring, particularly around Easter. The western Pennsylvania region has many cultures where eggs are important. The Pennsylvania Germans created elaborate decorated eggs by dying them first with natural materials and then decorating them with wax or wrapping them in reeds. Many other European immigrants to the Pittsburgh region

also created elaborately decorated eggs; one of the most notable are the Ukrainians. Using wax, special pens and a series of egg dyes, they created detailed geometric designs. These eggs are called Pysanky and take many hours to complete.

Learning Goals

PA State Science & Technology Standards-Biological Sciences
3.3.4.A
Identify the life processes of living things

PA State Environmental & Ecology Standard 4.4.4.C
Know that food and fiber originate from plants and animals

PA State Environmental & Ecology Standard 4.7.4.A
Identify differences in living things

PA State Arts & Humanities Standard 9.1.3.B
Recognize how to use the elements and principles of visual art: Balance, contrast, emphasis, proportion.

The overall goal of this lesson is to teach children that eggs are an important part of our daily lives and introduce them to the multi-cultural symbolism of the egg while allowing them to explore their creativity.

Objectives

Children will be able to explain where an egg comes from.

Children will be able to explain how eggs are formed.

Children will be able to describe which animals lay eggs

Children will be able to describe at least two local cultures in which eggs are important.

Using eggs, children will create a final craft project.

Logistics

Groups should be no more than 10-15 participants to ensure access to materials.

Children will sit on the floor or ground in a circle for the discussion portion of the workshop,.

Materials and tools will be set up on tables either in a classroom or outside, if weather permits.

Motivational Techniques

Ask children what types of things they use eggs for. Do they eat them for breakfast? Do they help their parents bake or cook with them? Start a discussion on where eggs come from. Do all eggs come from chickens?

Let them know that today, they are going to learn what an egg really is, how it is formed and which animals lay eggs. They will also learn a little bit about how local cultures use eggs and will get a chance to create a project using eggs.

Procedures

Choose which projects you'll use from the included instruction sheets. This should be done in advance so you can gather the appropriate materials.

Gather children together and follow the above motivational techniques to start the session.

Information:

Eggs can come in all shapes, colors and sizes and not all animals that lay eggs are birds. (Ask children if they know of any other animal that lays eggs.)

Some eggs are round, others are oval. Some have hard shells and some have rubbery shells. Some are rough and chalky and some are smooth and shiny.

Ostrich eggs are very large and the eggs of most insects are very tiny.

Many different creatures lay eggs including insects, birds, amphibians (ask children if they know what an amphibian is - a cold-blooded vertebrate that includes frogs, toads and salamanders), and most fish. Examples are Tortoise and turtles, snakes, frogs, goldfish, hens and blackbirds and robins.

What makes up a chicken egg?

The shell - is the very outside part of the egg. In chicken eggs it is very hard and has a lot of calcium, the same mineral that makes your bones strong. It's job is to protect the inside of the egg. It has many tiny pores to allow air in and out of the egg.

The outer membrane - the first membrane (or skin) inside the shell. Its job is to keep things like bacteria out of the egg.

The inner membrane - also helps keep dangerous things from entering the egg.

The air cell - is very important. It helps the egg stay in one piece by absorbing shock. It also helps the baby chick breathe when it starts poking the egg to get out.

The chalazea - are part of the egg white that keeps the yolk in the center of the egg white. You may have seen them after you've cracked an egg - they are the little white strings in the egg white.

The albumen - is a fancy name for the egg white. It is made up of protein and an embryo (or organism in the early stages of development) develops here.

The vitteline membrane or yolk membrane - surrounds the yolk and makes sure that the yolk and egg white don't mix.

The yolk - is the yellow center of the egg and has many nutrients. It is held in place by the chalazea and provides nutrition for the embryo.

How are eggs formed:

The egg starts as a yolk inside the hen (or female chicken). The yolk then goes into the oviduct (a long spiraling tube in the hen's reproductive system) to be fertilized. Some eggs are fertilized here, which means that they can go on to develop into chicks but most aren't. As the egg continues down the oviduct, it is covered with a membrane (the vitteline membrane) and layers of albumin, or egg white. As the egg moves down the oviduct, it is constantly spinning which twists the structural fibers (the chalazae) and makes up the rope-like strands that anchors the yolk. The eggshell is deposited around the egg in the lower part of the oviduct right before it is laid. The shell is made of calcite, a crystalline form of calcium carbonate. The whole trip takes about one day. If an egg has been fertilized, the embryo develops inside for 21 days until a chick pecks its way out of the eggshell and is hatched.

History of egg decorating in Pennsylvania:

Many cultures use eggs as a symbol of fertility, life and the coming of spring. Here in Pennsylvania, two different cultural groups are well known for their egg decorating. In Eastern PA near Philadelphia many German-speaking immigrants settled and became known as the Pennsylvania Dutch, or Pennsylvania Germans.

The Pennsylvania Germans would hard-boil their eggs and then dye them with natural ingredients like dried onion skins, which colors the eggs a deep red-brown color. Other ingredients like alder catkins and hickory bark made a yellow color and coffee and walnut shells gave the eggs a brown color.

Some of the Pennsylvania Germans would tightly wrap raw eggs in calico and place in boiling water, transferring the pattern to the egg or allow their children to use a hard tallow candle to draw patterns or pictures on uncooked eggs and then boil them

in the dye. The wax would keep the dye from coloring the egg. Still others were dyed a very dark color, usually black, and then their surfaces were scratched with a sharp knife to expose the white shell. These eggs were called scratch-carved.

Here in Western PA, many Europeans immigrated to the Pittsburgh areas. Among them are the Ukrainians, who are especially famous for their egg design.

These eggs are called Pysanky and are made by dividing the egg into geometric areas and filling them with traditional symbols and patterns. Patterns are drawn with wax, using a tool called a Kistka, and then dipped multiple times into different colored dyes to create very detailed designs. These eggs can take many hours to complete and are quite beautiful.

Eggs can be dyed with a variety of natural ingredients to create gorgeous colors. For instance, carrots can be used for orange, purple cabbage for blue, beets for red/pink, onion skins for brown, tumeric for yellow and spinach for green. Dyeing eggs with natural ingredients requires boiling the eggs and letting them soak in the dye for quite a while. This is how many people dyed eggs before commercial dyes were available.

Today, we're going to create a project(s) using eggs.

Using the instruction sheets for the projects that you have chosen, walk the children through the craft portion of the workshop. Move them to the tables that are set up and show them where materials can be found. Show them a finished example of the project and go through the steps necessary to create it.

As children work on their projects monitor them for difficulty and aid any who need help.

Closure

Ask children what they learned during the lesson. What parts of the egg do they remember? What people decorate eggs? What types of animals lay eggs? How are eggs formed?

Modifications and Adaptations

More difficult projects can be offered from the instruction sheets for older or more advanced learners, or children can complete more than one project. Parents can also be included in the lesson to aid the children. Images have been included in the instruction sheets for children who have difficulty reading.

Students with physical disabilities can be aided by a parent or guide.

If time is short, the lesson portion of the workshop can be condensed, possibly removing the parts of the egg. If more information on eggs is desired, the book *An Egg Is Quiet* by Diana Aston could be read. This book is suited for children K-3.

Resources

WQED Eduction: Pysanky Ukrainian Easter Eggs
http://www.wqed.org/education/pghist/units/arts/pysanky.php

Incredible Egg: https://www.incredibleegg.org/egg-facts

Monroe County Historical Assoc.: The History and Art of the Easter Egg
http://www.monroehistorical.org/articles/files/2012_04.html

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