

We Have Eggs!

Expected Learning Outcomes

Students will have an understanding that birds and some animals are hatched from eggs. Students will have an understanding that eggs come in different sizes, shapes and color. Students will have an understanding that not all eggs will hatch and students will be able to chart and graph percentages and ratios related to egg viability and gender of offspring. Students will understand the concept of phenotypes and genotypes using Polish and English Mute Swans as an example and will understand leucism and albinism.

Materials

Paper and pen, Hard Boiled Eggs or plastic eggs, Uncooked eggs (3 dozen), colored string

Learning Strategies (K-3)

Explain to students that birds and some animals are hatched from eggs. Eggs come in different sizes, shapes and colors which depend greatly on the species of bird or animal. Show photos of different types of eggs to the students. Show the students a real chicken egg.

1. Show the students photos of different types of eggs. If a real chicken egg is available, let the students hold the egg and make observations about its size, shape and color. Have the student make the same observations from the photos of eggs.
2. Have the students draw and color different sized and shape eggs. Ask the students whether their drawings of eggs come from birds or animals and ask them what kind.
2. Have the students go outside. Have one student stand approximately 10 yards from the rest of the class. This student will be designated as the nest. The rest of the students will have a hard-boiled egg or a plastic egg. The nest student turn his/her back on the rest of the students and will call out bring me some eggs at which time the students with eggs will run toward the student nest. Suddenly, the student will say Stop, stay away from my nest and immediately turn toward the group of students. All eggs should immediately freeze in position. If a student continues to run after stop is called and the nest student sees them running, the student has to start back at the beginning of the line. The object is to see how many eggs can be brought to the nest without being observed running toward the nest.
3. Introduce the concept of what the cygnets should look like (phenotype) upon hatching and what they might actually look like (genotype) based upon their Genetic make-up. Introduce Polish and English mute swans and the concept of leucism and albinism.

Assessment

The instructor will administer a paper and pen test appropriate to grade level.

Learning Strategies (4-8)

Explain to the students that eggs come in varying sizes, weights, shapes and colors.

1. Have the students break into four groups. The first group will be responsible for researching and drawing the largest animal egg relative to weight and size. The second group will be responsible for researching and drawing the smallest animal egg relative to weight and size. The third group will be responsible for researching and drawing the largest bird egg relative to weight and size and the last group will research the smallest bird egg relative to weight and size. Groups will share their results to the class.
2. Have the students go outside and observe the habitat. Ask the students to make a list of those items found in the immediate area and what type of animal or bird might live in the area. Based upon these observations, have the students provide a list of the possible size, color, weights and appearance of the eggs.
3. Have students measure a chicken egg (not boiled) for weight, size, diameter, length. Have the students chart the measurements.
4. Discuss with the students the components of an egg. Have the students draw and label parts of an egg.
5. Have students research why egg whites turn white when beaten for cooking.
6. Explain genotypes and phenotypes. Use the example of English Mute & Polish Mute Swans and define leucism and albinism. Have students chart and explain ratios between the two phenotypes of swans. Have students chart a possible genetic graph of the attributes of the swan parents.

Related Activities

1. Have students research the nutritional value of an egg to a young bird while in the egg.
2. Have students research why the consistency and coloring of an egg can take on so many different qualities and appearances based upon the way that it is cooked.
3. Have students chart and explain ratios between male and female offspring based upon nest temperature in reptiles.

Assessment

The instructor will administer a paper and pen test for the appropriate grade level.

Learning Strategies (9-12)

Explain to the students that not all eggs will hatch. Briefly explain the conditions that can cause an egg to become infertile or if an egg is fertile the conditions that may prevent a viable cygnet from hatching. Provide a mute swan as a case study for this lesson. A mute swan usually lays one to ten eggs in one clutch. A mute swan in England was known to lay 13 eggs in a clutch. Based upon this fact, we will use 12 eggs for the lesson so that we have an even dozen. A male mute swan weighs approximately 30 lbs with the female weighing between 17-22 lbs depending on diet during incubation of the eggs. The average weight of a swan egg is 9 ounces and average size is 4 inches in length and 3 inches in diameter. A good reason that some eggs do not hatch is

that the eggs may get broken in the nest by the parents. Swan parents can kill their cygnets by accidentally stepping on them.

1. Have the students go outside. Divide the class into 3 groups. Provide each group of students with 12 chicken eggs. Have the students make a circle approximately 10 inches in circumference on the ground with the colored string. Have the students gently place all 12 eggs into this circle carefully stacking the eggs. Have the students count the number of broken eggs versus the number of unbroken eggs. If an egg rolls out of the nesting area, it is considered lost or broken and must be counted as such. Based upon these numbers, have the students chart the total number of eggs (laid) versus the number of viable eggs remaining. Have the students convert to percentages and ratios and chart the results.
2. Assuming that all eggs remained unbroken, have the students conduct the following exercise with the eggs. Appoint a timekeeper for each group. The timekeeper will announce when 5 minutes has expired and the eggs must be rotated. (Explain to the students that normal time of rotation depends on the mother's comfort, need for heat to eggs at the bottom of the pile or the bird's inherent knowledge of when an egg should be rotated. For brevity sake, we will use the arbitrary number of 2 minutes). Rotation of eggs should be conducted as follows. Designate a student egg rotator for each group. The student's hand must reach under the bottom egg while cupping the top eggs with the forearm and gently rotate the bottom eggs to the top and the top eggs to the bottom of the nest. (The student CANNOT receive any help from other students. Mother bird does this rotation by herself, and so must the student!). After one or two of these rotation sessions, there will be some broken eggs to count. Now, have the students count the number of eggs (laid) versus the number of eggs broken. Have the students convert to percentages and ratios the number of eggs laid and the number of eggs not viable and chart their results to share with the class.
2. Have the students research the size, weight and length of various bird eggs and compare and contrast to the weight, size and length of a swan egg. Have the student's explain the size, weight and length of a bird's egg relative to a bird's eventual size, habitat and life expectancy.
3. Have students mark the remaining unbroken egg and chart/graph possible genetic ratios of phenotypes and genotypes that might apply to the swan parents.

Related Activities

1. Have the students compare and contrast a bird egg's nutritional value to its young in relation to that of a reptile.
2. Have the students research egg yolk peritonitis in birds and explain what causes the condition.

Assessment

The instructor will administer a paper and pen test appropriate to grade levels.