Full STEAM ahead with 4-H!

Poultry

Learn the different parts of eggs, how their size and shape varies, and do experiments on eggs.

Background

Most American families have eggs in the fridge, but how much do you really know about them? They are complex structures that are often overlooked.

An egg's shell covers and protects what's inside the egg. An egg's yellow center is called the **yolk**. It contains about half the egg's protein, most of its vitamins, some of its minerals, and all of its fat. The clearish-white liquid around the yolk is called the egg white or **albumen**. It contains a little more than half of the egg's protein, plus some of its vitamins and minerals.

Eggs range in size from peewee to jumbo. Younger hens tend to lay smaller eggs. The size increases as the hen grows older and bigger. Here is how much a dozen of each size weighs:

- Peewee - 15 oz (425 g)
- Small - 18 oz (510 g)
- Medium - 21 oz (595 g)
- Large - 24 oz (680 g)
- Extra large - 27 oz (765 g)
- Jumbo - 30 oz (850 g)

There are 7,000 to 17,000 tiny pores on an eggshell's surface, with more pores located at the large end. As the egg ages, these tiny holes permit moisture and carbon dioxide to move out and air to move in to form the air cell. The egg can also absorb refrigerator odors through the pores.

Egg Detective

Supplies

- Paper and Writing utensils
- 1 dozen Eggs (different sizes preferably)
- Bowl
- Ruler
- String
- Kitchen scale
- Clear container or jar
- Hot water
- Magnifying glass (optional)

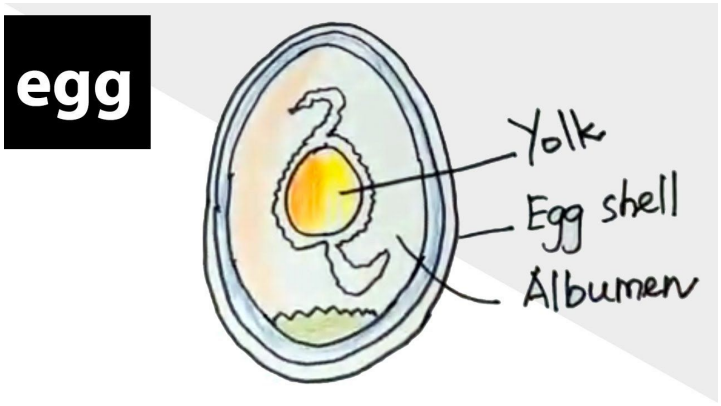
Directions

Activity 1: What do eggs look like on the inside?

How might you learn what is inside of an egg? One way is by cracking open an egg to look at the different parts. Complete the following demonstration to see what the inside of an egg looks like.:

- Crack a raw egg into a bowl and observe what's inside.

- Describe to a partner what you see.
- Draw and label each of the following egg parts:
    - Shell - Protects and covers the egg. Made of calcium carbonate.
    - Yolk - Yellow center. Produces food for the embryo. Major source of vitamins and nutrients.
    - Albumen - Clear white liquid around the yolk. Protects the yolk and provides additional nutrition.



Activity 2: Are all eggs the same size?

How might you find out if all eggs are the same size? One way to compare egg size is to measure them. Brainstorm different ways to measure the egg. Ideas include measuring length, width, and even weight. For each measurable attribute, come up with ideas of objects youth could use as a measuring tool. For example, an egg could be measured with a ruler, their finger, a piece of string, or even a set of blocks. Once you have several ideas for ways to measure the egg, follow the steps below:

- Pick out three or four eggs that appear to be the same size.
- Use string to measure the eggs vertically and horizontally. Put a ruler down on the table or desktop. Use a piece of string to go around the middle or horizontal area of an egg. Put a felt-tip mark on the end of the string that matches up with the beginning of it. Then, put the string along the edge of the ruler and see how long it is. Write down this measurement of egg 1.
- Repeat the process to measure the egg vertically, mark and measure. Record the measurements.
- Measure the rest of the eggs, keeping measurements and observations written down.
- Use the scale to weigh each egg and record the weight.
    - Note: To prevent eggs from rolling off of the scale, you may want to weigh a cup and then have students weigh the eggs inside of the cup.

Activity 3: Do egg shells have holes in them?

How could you figure out if egg shells have holes in them? Complete the following steps to find out::

- Place the egg carefully into the glass or jar.
- Carefully pour hot water into the glass or jar until it is nearly full.
- Leave the glass or jar on a table or flat surface and watch the egg closely for a few minutes (the glass may become hot so be careful).
- Record or draw your observations.
    - Note: After surrounding the egg with hot water, they should observe tiny bubbles forming on the egg shell which eventually bubble their way to the surface. Eggs contain a small air pocket at its larger end between the shell and egg white. When the air trapped inside this small pocket begins to heat up it expands and tries to find a way out of the shell. How do you think the air escapes?
- Take turns using a magnifying glass (if available) to examine the egg. Can you identify small pores on the shell? Add this to your observations.

Reflect:

- What is the function of the different parts of an egg?
- How do you think the measurements would be affected if the egg was hard boiled instead of raw?
- Do you think the size of egg affects the taste of the cooked egg?

Want to extend your learning? Try out these ideas!

- For more project ideas or information about poultry projects visit, https://extension.umn.edu/projects-and-more/4-h-poultry-project

Source

- https://minnesota.agclassroom.org/teacher/matrix/lessonplan_print.cfm?lpid=605