Egg Toss Math

Grades PreK-2

Math, Physical Education

Objectives

Students practice counting by playing a game with an egg carton and plastic eggs. Students estimate and measure distances in a game of "Egg Toss" with real boiled eggs or alternative. Students use plastic eggs as manipulatives for sorting, patterning, and to estimate and measure volume.

Vocabulary

albumen—proteins consisting primarily of amino acids found in milk, blood, egg whites, muscle and vegetables
bloom—the coating or covering on an egg shell that seals its pores, prevents bacteria from getting inside, and reduces moisture loss
calcium carbonate—a compound which gives strength and shape commonly found in eggshells and chalk
hatch—to emerge from an egg, pupa, or chrysalis
incubation—the development of a fertile poultry egg within a shell
lay—to produce and deposit eggs
yolk—the yellow part of a fowl's egg that has a germinal disk located on its outer edge from which the embryo develops.

Background

Most of the eggs we eat come from chickens. Chickens are in the poultry family, along with ducks, geese and turkeys. Farmers raise poultry for their eggs and for their meat. Chicken producers place nests in their hen houses so the hens will **lay** their eggs in places that are safe and protected. If the farmer didn't provide a nest, the hen would hide her own nest so carefully that the farmer might not be able to find it. Most chickens weigh between 7 and 10 pounds. Some weigh as much as 13 pounds. Some weigh as little as 1.5 pounds.

Hens start laying at 22 weeks of age. Laying hens produce about 240 eggs each year. During the hen's most productive period, she may lay an egg about six out of every seven days. Eggs **hatch** in 21 days. The hen requires at least 25 hours to produce an egg. Thirty minutes later, she starts all over again. Chickens do not lay eggs until they receive a light cue, either from natural sunlight or artificial light. The light stimulates a gland near the chicken's eye, which triggers the release of an egg cell from the chicken's ovary. A chicken will lay bigger and stronger eggs if the lighting is changed to make her think a day is 28 hours long.

Eggs are a good source of protein. Research shows that eating high-quality protein foods like eggs for breakfast can help you feel more satisfied and energized throughout the day. Eggs help build and maintain muscles.

THE EGG SHELL

The eggshell is a hard, three-layered container composed of **calcium carbonate**. Its purpose is to protect the enclosed embryo from the weight of the parent's body while the bird develops inside. With the exception of those birds that warm their eggs in mounds of dirt, all birds use body heat to **incubate** their eggs and turn them regularly to keep the temperature even. In natural incubation the hen turns the eggs as she gets off the nest and moves them with her beak while she is sitting on them. Like all living things, the developing chick must have three things to live—food, water and air.

The food is provided by the **yolk**, which is mostly protein. Protein helps to build strong bones and muscles. Water comes from both the yolk and the **albumen**. The albumen is the clear portion of the egg, most commonly called the "egg white." The albumen is 85 percent water, and the yolk is about 50 percent water. Air passes through the shell and the membrane. The chicken uses the oxygen and passes carbon dioxide back through the shell.

Each egg shell has a coating or covering, called a **bloom**, that seals its pores, prevents bacteria from getting inside and reduces moisture loss. Eggs are washed before they are sent to the market. This is necessary for cleanliness but removes the bloom. To restore this protection, packers give the eggs a light coating of edible mineral oil. Properly handled and stored, eggs rarely spoil but will simply dry up if kept long enough.

Although the exact shape of an egg is as individual as the hen herself, most eggs are roughly egg-shaped. Some abnormalities that can be found in the shells of fresh eggs are ridges, bulges and rough texture. Eggs having any of these abnormalities would get poor eggshell ratings from the US Department of Agriculture (USDA). Some extreme oddities in eggshell shapes include shells that are long, appear bent, or look as though they have been mashed in on one side. It would be very rare to find any of these shapes on grocery store shelves. Wild birds have shells that are more pointed than those of most domesticated varieties.

The size of an egg is an inherited characteristic, and poultry breeders spend large amounts of time and effort to select strains for egg size. When a pullet (a young hen less than a year old) first begins laying eggs, her eggs are small. After 15 to 20 days of laying, the size of her eggs will reach the size of a standard grocery store egg. Egg size varies greatly from one kind of bird to another. The eggs of domestic chickens weigh an average 58 grams. Those of domestic turkey are about 85 grams. Hummingbirds lay eggs weighing a half a gram. Quail eggs weigh an average nine grams, and ostriches lay eggs weighing an average 1,400 grams.

Additional Reading

Black, Vickie, Young Chicken Farmers, Beaver's Pond Press, 2012.
Crelin, Sherry, My Chickens Lay Eggs, FriesenPress, 2018.
Dickman, Nancy, A Chicken's Life, Heinemann, 2010.
Heller, Ruth, *Cickens Aren't the Only Ones (Worls of Nature Series),* Puffin Books, 1999.

Videos

Chicken Laying an Egg: https://youtu.be/e2VXYFwtE51
Chickens! Learn about Chickens for Kids: https://youtu.be/wYKJkHcaMzE

Activity 1: Sorting and Patterning with Eggs, (Math) 1 50 minute class period

Students will sort plastic eggs by size, color, or other attributes.

Oklahoma Academic Standards

Activity 1: Sorting and Patterning with Eggs (Math)

PK.A.1.1 K.A.1.1	Sort and group up to 10 objects into a set based upon characteristics such as color, size, and shape. Explain verbally what the objects have in common.
PK.A.1.2 K.A.1.2 1.A.1.1 2.A.1.1	Represent, recognize, describe, duplicate, identify, create, complete, and extend repeating, growing, and shrinking patterns with quantity, numbers, or shapes in a variety of real-world and mathematical contexts.

Materials:

- plastic eggs in variety of shapes and colors

Procedures

1. Bring plastic eggs to class.
   —Students will sort the eggs by color.
   —Students will sort the eggs by size.
   —Students will explain what groups have in common.
2. Students will create patterns using the eggs.
3. Students will recognize patterns created by others and duplicate them.
4. Students will extend patterns created by others.

Activity 2: Counting Eggs, (Math) 1 50 minute class period

Students will recognize numbers and/or number words and place the eggs in the correct order.

Oklahoma Academic Standards

Activity 2: Counting Eggs (Math)

PK.N.1.2	Recognize and name written numerals 0-10.
K.N.1.5	Count forward, with and without objects, from any given number up to 10.

Materials:

- egg cartons
- Hard boiled eggs or plastic eggs
- marker for numbering egg carton spaces and eggs

Procedures

1. Hard-boil 12 eggs ahead of time or use plastic eggs.
   —Number the eggs with a marking pen.
   —Students will place the eggs in numerical order in an egg carton.
2. Write number words in the sections of an egg carton and the corresponding numerals on plastic eggs.
   —Students will place the plastic eggs in the matching egg carton section.

Activity 3: What's in the Egg, (Math) 1 50 minute class period

Students will count objects inside eggs and write the amount of items in the corresponding eggs.

Oklahoma Academic Standards

Activity 3: What's in the Egg (Math)

PK.N.1.2	Recognize and name written numerals 0-10.
K.N.1.5	Count forward, with and without objects, from any given number up to 10.
1.N.1.1	Recognize numbers to 20 without counting (subitize) the quantity of structured arrangements.
K.N.1.6 1.N.1.3 2.N.1.1	Read, write, discuss, and represent whole numbers up to 1,000. Representations may include numerals, words, pictures, tally marks, number lines and manipulatives.

Materials:

- plastic eggs
- small items to fill the eggs
- Activity 3 Worksheet 1 **"What's in the Egg?"**

Procedures

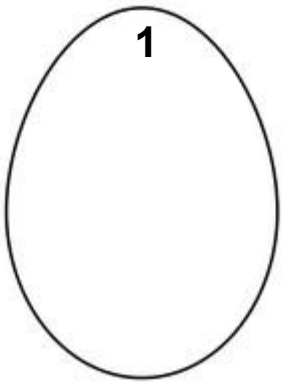
1. Place small objects inside plastic eggs.
   — Students will count and record the number of objects on the **"What's in the Egg?"** worksheet.
2. If working on grouping objects by tens and ones, have students record their answers in that manner.

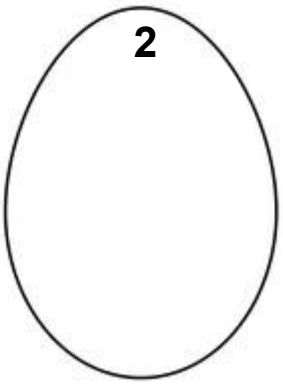
Egg Toss Math

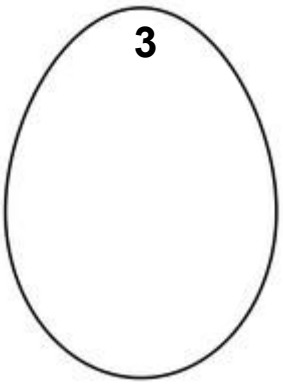
Activity 3 Worksheet 1: What's in the Egg?

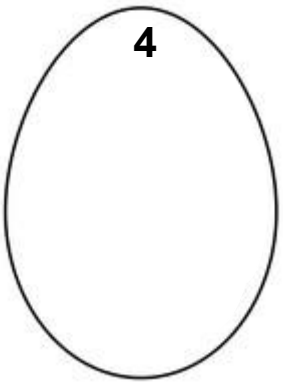
Name: _____ Date: _____

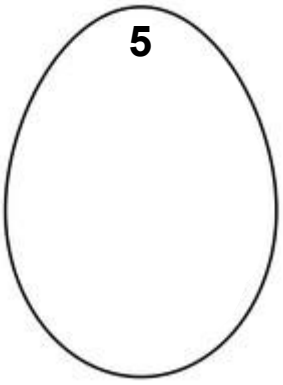
Open each egg and write down how many items are inside in the egg on this paper with the matching number.

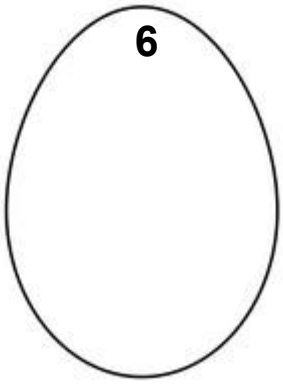


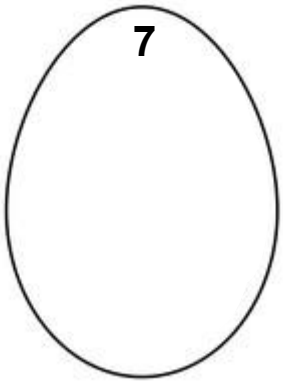


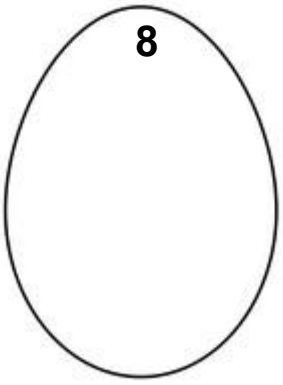


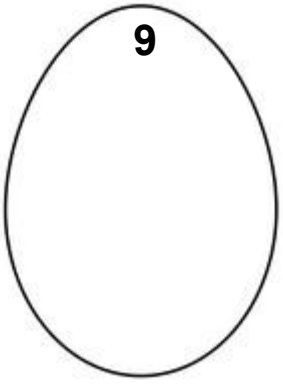


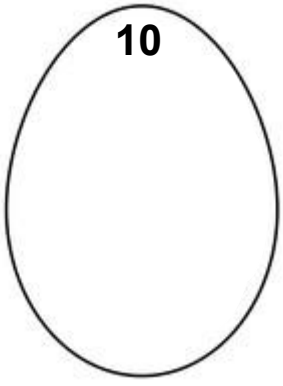


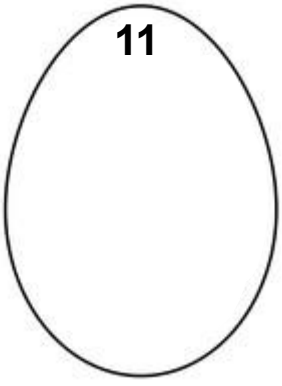


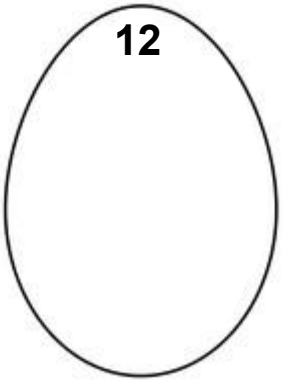












Activity 4: Fill the Basket, (Math) 1 50 minute class period

Students will determine how many eggs will fit in a variety of baskets.

Oklahoma Academic Standards

Activity 4: Fill the Basket (Math)

K.GM.2.4	Compare the number of objects needed to fill two different containers.
1.GM.2.5	Use standard and nonstandard tools to identify volume/capacity. Compare and sort containers that hold more, less, or the same amount.
2.GM.2.3	Explore how varying shapes and styles of containers can have the same capacity.

Materials:

- plastic eggs
- varying sizes and shapes of baskets and containers

Procedures

1. Bring plastic eggs and an assortment of containers in different sizes to class.
   —Students will estimate how many eggs it will take to fill one of the containers.
   —Students will fill the container and count the eggs.
   —Students will estimate how many eggs it will take to fill a different-sized container, based on how many it took to fill the first container.
   —Repeat with the remaining containers.

Activity 5: Plastic Egg Toss, (Math, PE) 1 50 minute class period

Students will take turns tossing eggs into an egg carton, identifying the number written in the carton, and recording how many times their eggs land in each space.

Oklahoma Academic Standards

Activity 5: Plastic Egg Toss, (Math, PE)

PK.N.1.2	Recognize and name written numerals 0-10.
K.N.1.6 1.N.1.3 2.N.1.1	Read, write, discuss, and represent whole numbers up to 1,000. Representations may include numerals, words, pictures, tally marks, number lines and manipulatives.
S1.E13	Throw underhand and overhand showing a mature pattern.

Materials:

- egg cartons
- plastic eggs or ping pong balls
- marker for numbering egg carton spaces
- Activity 5 Worksheet 1 **"Plastic Egg Toss"**

Procedures

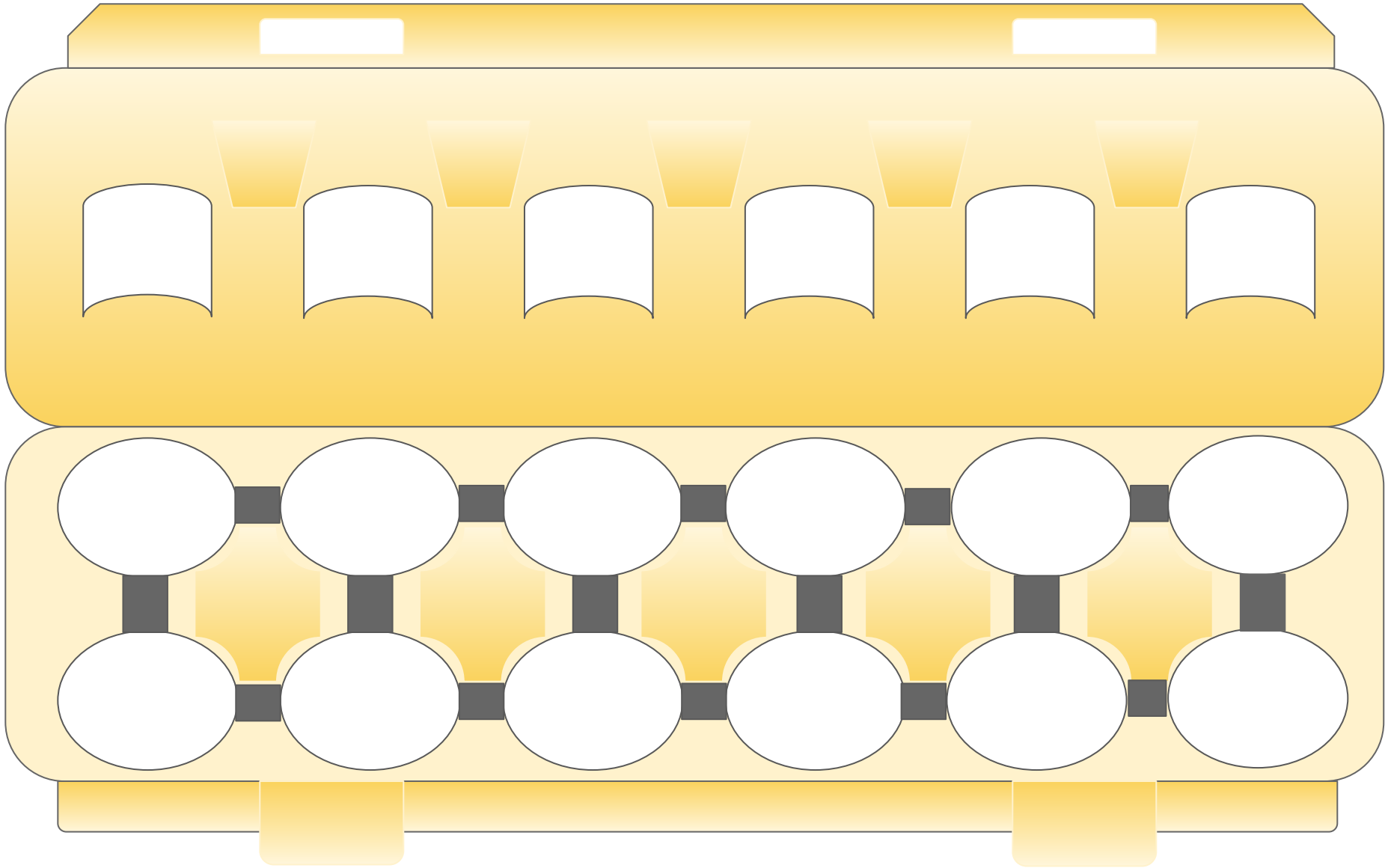
1. Divide your class into groups of four or five.
   —Provide each group with an egg carton
   —Number the sections with a marking pen. Use the numbers one through 12 or any numbers you wish to teach.
   —Provide a plastic egg or ping pong ball for each group.
   —One student from each group will toss the plastic egg into any section of the egg carton.
   —The other members of the group will call out the number of the section in which the egg lands.
   —Students will take turns tossing within their groups.
   —Students will use tally marks to keep track of the numbers and record their results on the **"Plastic Egg Toss"** worksheet.
   —Instead of writing numerals or tally marks, students may also use the worksheet as a mat and use unifix cubes to show how many times they land on each number.

Egg Toss Math

Activity 5 Worksheet 1: Plastic Egg Toss

Name: _____ Date: _____

Write the numbers that are inside the egg carton you are using on the eggs on this worksheet. Then, each time that your egg lands in the matching space of your egg carton, make a tally mark on this worksheet.



Activity 6: Egg Toss Graphing, (Math, PE) 1 50 minute class period

Students will try to toss an egg into a basket and then use a ruler to determine how near to the basket their egg landed. They will then record the data on a graph.

Oklahoma Academic Standards

Activity 6: Egg Toss Graphing, (Math, PE)

1.GM.2.4	Describe a length to the nearest whole unit using a number and a unit.
2.GM.2.2	Explain the relationship between length and the numbers on a ruler by using a ruler to measure lengths to the nearest whole unit.
1.D.1.2	Use data to create picture and bar-type graphs to demonstrate one-to-one correspondence.
2.D.1.2	Organize a collection of data with up to four categories using pictographs and bar graphs with intervals of 1s, 2s, 5s or 10s.
S1.E13	Throw underhand and overhand showing a mature pattern.

Materials:

- hard boiled eggs (or plastic or wooden eggs)
- large trash bags
- basket
- ruler, yardstick, or tape measurer
- Activity 6 Worksheet 1 **"Egg Toss Graphing"**

Procedures

1. Have an egg toss outdoors.
   —Hard-boil eggs ahead of time, or use plastic or wooden eggs to avoid the mess.
   —Place large trash bags under baskets to help contain the mess.
2. Students will stand a short distance from a basket.
   —Students will toss an egg and try to land the egg in the basket.
   —After each toss, students will use a ruler to measure the distance from the egg to the basket.
3. Students will make a bar graph to show how near the egg landed to the basket on each toss.
   —The goal is to land in the basket or close to the basket.
   —If the egg lands in the basket, they will complete that box on their graph.
4. Students will complete steps 2-3 at least five times and will record how near the basket they tossed the egg each time.
   —Students will create a graph showing the results and post it in the classroom.
   —Compare each groups graphs to determine which student was able to toss the egg the closest to the basket.
   —Compare each graph to determine which student was able to toss the eggs the most consistently.

Egg Toss Math

Activity 6 Worksheet 1: Egg Toss Graphing

Name: _____ Date: _____

Place a basket in front of you. Toss an egg and try to land the egg in the basket. After each toss, use a ruler to measure the distance from the egg to the basket. Make a bar graph to show how near the egg landed to the basket on each toss. The goal is to land in the basket or close to the basket.

30 INCHES					
28 INCHES					
26 INCHES					
24 INCHES					
22 INCHES					
20 INCHES					
18 INCHES					
16 INCHES					
14 INCHES					
12 INCHES					
10 INCHES					
8 INCHES					
6 INCHES					
4 INCHES					
2 INCHES					
IN BASKET!					
	FIRST EGG TOSS	SECOND EGG TOSS	THIRD EGG TOSS	FOURTH EGG TOSS	FIFTH EGG TOSS