

Quack and Count Mathematics Activities

Presented by Dr. Karol L. Yeatts

This session uses little rubber ducks to teach a variety of mathematics concepts to young children. Participants will be actively engaged in listening to duck stories, singing duck songs, and engaging in hands-on mathematics activities using little rubber ducks. So come prepared to “Quack and Count!”



Spatial Awareness - Little Quack's Hide and Seek

Children's spatial sense is their awareness of themselves in relation to the people and objects around them. Specifically, teachers need to help children develop a variety of spatial understandings such as direction (which way), distance (how far), and location (where). Experiences with positional words are important in the development of spatial sense. Location/position words include: on, off, on top of, over, under, in, out, into, out of, top, bottom, above, below, in front of, in back of, behind, beside, by, next to, between, upside down.

1. Read aloud: *Little Quack's Hide and Seek* by Lauren Thompson.
2. Have children use their rubber ducks to identify various locations/positions.

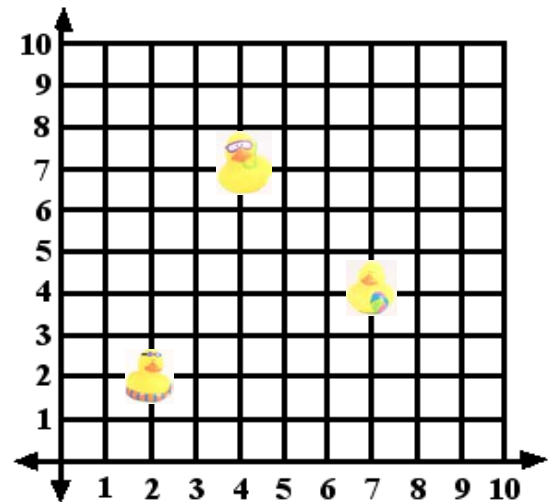
For example:

- Place Little Quack on top of the book.
 - Place Little Quack next to the pencil.
 - Place Little Quack between the book and the pencil.
3. Play Hide and Seek with Little Quack and have children tell where they think the duck is hiding.

Coordinate Geometry – Finding Little Quack

One of the NCTM Geometry expectations for PreK-12 grades is: specifying locations and describing spatial relationships using coordinate geometry and other representational systems. Spatial thinking skills emphasized in geometry are critical to the making and reading of maps which are essential skills in social studies.

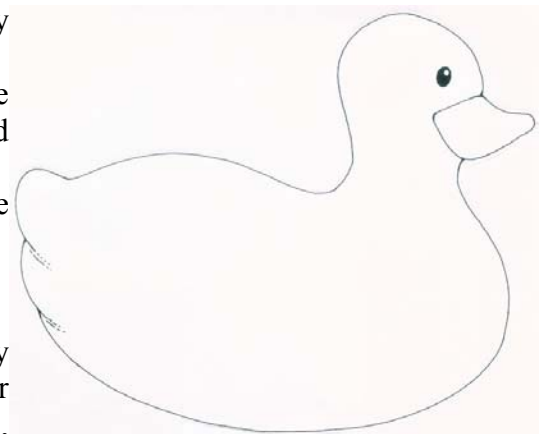
1. Place a large grid on the floor.
2. Have students identify the location of Little Quack and his friends on the coordinate grid.
3. Instruct children to walk along the bottom on the grid the number of steps you instruct them to walk.
4. Then have children turn and walk up to the location of the duck.



Sorting and Classifying - What Sort of Duckling Are You?

Basic to understanding mathematical concepts and operations is the ability to classify or sort objects into categories. This skill helps children organize their thinking. The word “set” is used for a collection or group of objects. The objects in the set are referred to as “members.”

1. Use a variety of little rubber ducks or give each child a copy of the Duckling template.
2. Have students color and cut out their ducklings. Encourage students to be creative in their design of the ducklings. Add stripes, spots, multicolors, etc.
3. Prepare an area in the center of the room using blue construction paper to make a large pond.
4. Have students place all their ducklings in the pond.
5. Gather students around the pond.
6. Have students discuss how the ducks look. Are there any ducks that can be grouped together based on a similar attribute such as the color of the duck, the color of the beaks, the color of the feet, etc?



More Sorting and Classifying

1. Have students create Venn Diagrams with the ducklings.
2. To construct a Venn Diagram, make two overlapping yarn or string circles on the floor.
3. Have students gather around so everyone can see the Venn diagram you are creating.
4. Place a yellow duckling on one side of the Venn diagram. Ask students to describe what they see.
5. Next, place a white duckling with spots on the other side of the Venn diagram. Ask students to talk about that duckling's characteristics.
6. Now hold up a duckling that is yellow with spots. Ask students where the third duckling should go - in the first circle, with yellow ducklings, or in the second circle, with ducklings that have spots?
7. Help children to see that the duckling is placed in the overlapping part of the circles, because it shares characteristics of both of the other ducklings.
8. Repeat the activity with others ducklings. Each time, ask the students to explain the reason for the groupings. What attributes are being used?



Patterning - Duck, Duck, Goose

The ability to recognize and use patterns is a valuable skills for children to learn. Since the underlying theme of mathematics is pattern, this skill is considered a basic building block for future problem solving. Children will also strengthen their understanding of left-to right progression as they reproduce, extend and create patterns.

1. Have the children create repeating patterns with their ducks.
2. Have children identify the “*elements*” of the pattern unit.
3. Have children identify the “*unit*” that is repeating.
4. Have students match their patterns to the symbolic representation of the pattern.

Example:

Pattern elements:



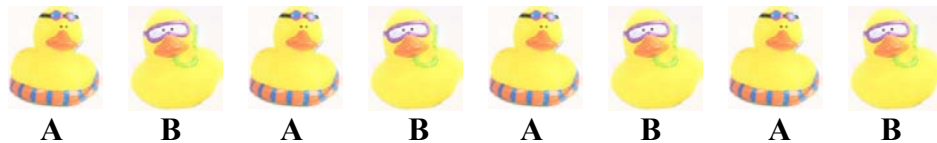
Pattern unit:



Repeating Pattern:



Symbolic Representation:



One-to-One Correspondence

Children begin to count long before they comprehend what the number names mean. Counting in the correct sequence also may not be consistent. Children sometimes count by giving several number names to an object instead of each getting one name. Understanding the concept of one-to-one correspondence is at the heart of all future mathematical operations.

One-to-one correspondence is matching each member of one set to each member of another set and each object has a number name.

1. Use the rubber ducks to help children develop their ability to count in sequential order.
2. Use the rubber ducks to practice counting backward.

Counting Sets – One Duck Stuck

1. Read aloud *One Duck Stuck* by Phyllis Root.
2. Have children sequence the story and identify the numbers sets of animals that tried to help the duck.
3. Use a variety of little rubber ducks and have children create sets of ducks and match the numerals with the corresponding set.



1



2



3

Comparing – One Duck, More or Less

As children begin to observe the differences in objects, they can begin to organize the objects in an orderly arrangement. This understanding of the concepts of sequence and seriation brings order to children's mathematics experiences.

1. Have children make a set of ducks.
2. Next, have two children compare their sets.
3. Ask: "Who has more ducks in their set?" "Who has fewer ducks in their set?" "How many more ducks does Amy have than Jim?"

Ordinal Numbers – Ducks in a Row

When objects are placed in order, we use ordinal numbers to tell their position.

1. Read aloud *10 Little Rubber Ducks* by Eric Carle.
2. Use a variety of little rubber ducks or the paper ducks the children created.
3. Explain to students that when ducklings follow their mother they walk in one straight line.
4. Have students arrange the ducklings in a row according to the directions given by the teacher. The directions will vary according to the way in which the students colored their ducklings.
For example, the teacher may say:
 - "The first duckling in the line is yellow with spots."
 - "The second duckling in the line is all yellow with an orange beak."
 - "The third duckling in the line is white with orange feet."
5. Continue by having students find the ducklings according to the attributes described and place them in a row.
6. After all the ducklings are in a row, have students identify the ordinal position of various ducks.
7. Provide an opportunity for students to arrange the ducks in a row and then to guess the ordinal positions.

Days of the Week – Duck Agendas

1. Read aloud *Giggle, Giggle, Quack* by Doreen Cronin.
2. Have children sequence the days of the week.
3. Have children create a list of things for the ducks to do each day of the week.

Processing Numbers

Children learn the concepts of addition and subtraction through joining and separating sets. One goal in teaching operations is to help children see the interrelationship between the two processes. It is important to move slowly in teaching addition and subtraction. Use numbers from one to three at first, next add numbers four to eight, then add numbers up to ten.

Quack and Count

1. Read aloud: *Quack and Count* by Keith Baker
2. Provide children with seven rubber ducks.
3. Explain to children that they will form the different groups that make up the number 7.
 - Encourage children to count and quack as they make their duck groupings.
4. Assist students in writing the addition sentence that describes their grouping.

Five Little Ducks

1. Read aloud: ***Five Little Ducks*** by Ivan Bates
2. Provide children with five rubber ducks.
3. Explain to children that they will use their ducks to show how many ducks came waddling back.
4. Assist students in writing subtraction sentences that describe each situation.

Finger Poems and Songs

Little Ducks Went Out to Play

*You can use any quantity as children sing along.

Seven little ducks went out to play (children hold up seven rubber ducks)

Over the hills and far away

Mother duck said "quack, quack, quack, quack"

(move hands in quacking motion)

And six little ducks came running back. (hold up six rubber ducks)

Six little ducks went out to play (children hold up six rubber ducks)

Over the hills and far away

Mother duck said, "quack, quack, quack, quack"

And five little ducks came running back. (hold up five rubber ducks)

Continue reducing the number of ducks until "no little ducks came running back".

Last verse:

Sad mother duck went out to play

Over the hills and far away.

Mother duck said, "quack, quack, quack, quack"

And all of her little ducks came back. (hold up seven rubber ducks)

Tip: Invite seven children to act out the song. Increase the numbers and continue singing and acting out variations of the song.

One Little, Two Little Ducklings

sung to Ten little Indians

One little, two little, three little ducklings,

Four little, five little, six little ducklings,

Seven little, eight little, nine little ducklings,

Ten little ducklings on Easter Day.

Six Little Ducks

Six little ducks

That I once knew

Fat ones, skinny ones,

Fair ones, too

But the one little duck

With the feather on his back

He led the others

With a quack, quack, quack

Quack, quack, quack,

Quack, quack, quack

He led the others

With a quack, quack, quack

Down to the river

They would go

Wobble, wobble, wobble, wobble,

To and fro

But the one little duck

With the feather on his back

He led the others

With a quack, quack, quack

Quack, quack, quack,

Quack, quack, quack

He led the others

With a quack, quack, quack

Back from the river

They would come

Wobble, wobble, wobble, wobble,

Ho, hum, hum

But the one little duck

With the feather on his back

He led the others

With a quack, quack, quack

Quack, quack, quack,

Quack, quack, quack

He led the others

With a quack, quack, quack

Five Ducklings in a Bed

Sung to "Five Bears (Monkeys) in a Bed"

Five Ducklings in a Bed and the little one said
"I'm smushed, roll over"

So they all rolled over and one fell out

Four Ducklings in a Bed and the little one said
"I'm smushed, roll over"

So they all rolled over and one fell out

Three Ducklings in a Bed and the little one said
"I'm smushed, roll over"

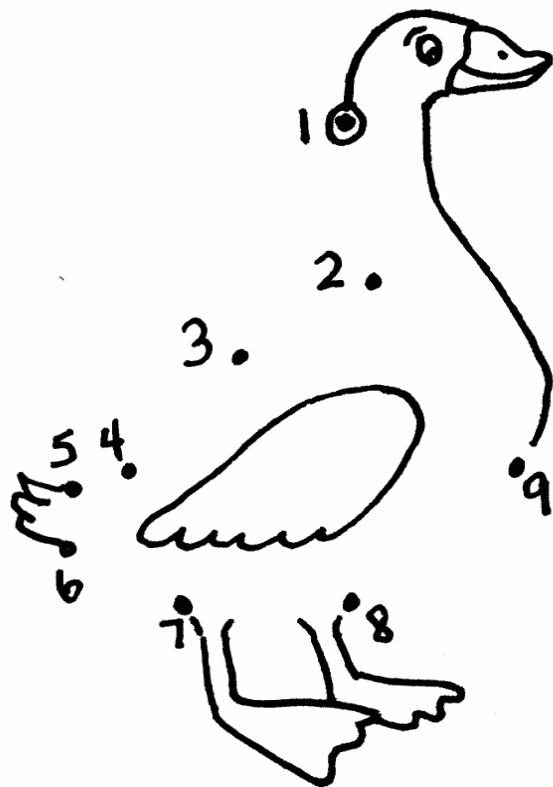
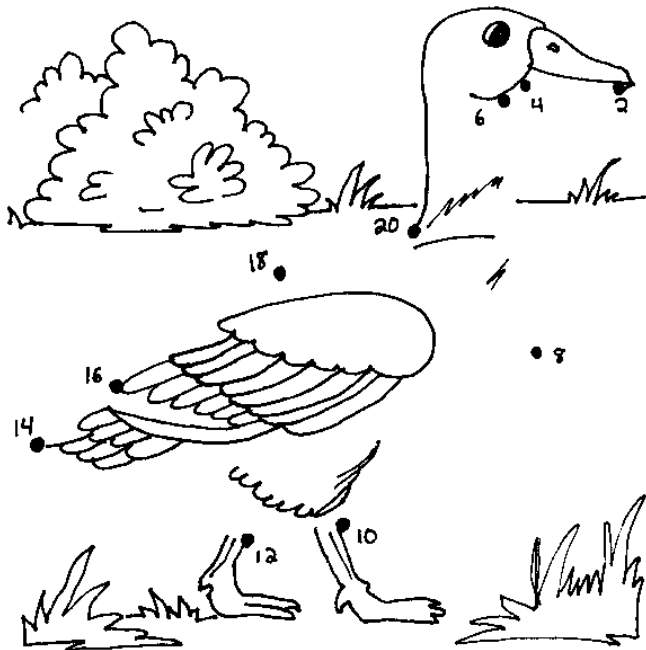
So they all rolled over and one fell out

Two Ducklings in a Bed and the little one said
"I'm smushed, roll over"

So they all rolled over and one fell out

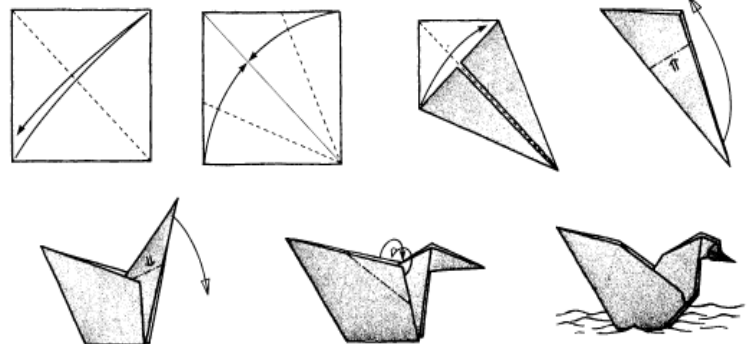
One Ducklings in a Bed and the little one said
"Good Night!"

Dot-to-Dot Ducks



Making Origami Ducklings

1. Use an 8" x 8" square piece of paper.
2. Make a diagonal crease.
3. Fold the two edges to the center crease line.
4. Fold the paper in half again.
5. Raise the pointed end to fold as indicated by the dotted lines.
6. Create a reverse fold to create the neck.
7. Create another reverse fold to form the head.
8. Fold the wings down as indicated by the dotted line.
9. Your duckling is not complete.
10. Color your duckling.



Bibliography

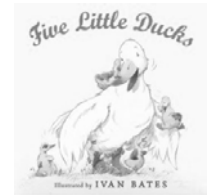
Baker, Keith (1999, reprinted 2004). **Quack and Count**. Orlando, FL: Voyager Books/Harcourt, Inc. ISBN: 0152050256.

“Seven uniquely marked ducklings slide, chase bees, and play peekaboo as they group on double-spread pages to illustrate ways to add up to their sum. “Splashing as they leap and dive/7 ducklings, 2 plus 5” shows five swimmers opposite two divers.”



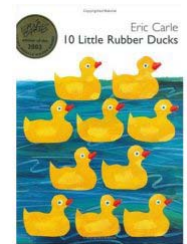
Bates, Ivan (2006). **Five Little Ducks**. New York, NY: Orchard Books. ISBN: 0439746930

This newly illustrated version of the classic song, that clearly represents the subtractive concepts as each of five ducklings wanders off one by one.



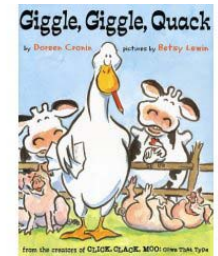
Carl, Eric (2005). **10 Little Rubber Ducks**. HarperCollins Publishers. ISBN: 0060740752

“During a storm, 10 rubber ducks fall into the sea. Each one floats in a different direction - west, east, north, south, left, right, up, down, this way, and that way - and encounters a different animal (a dolphin, seal, polar bear, etc.). The 10th one meets a mother duck with her offspring and bobs along with them to their nest. The ordinal numbers are shown in bold type that stands out from the narrative.”



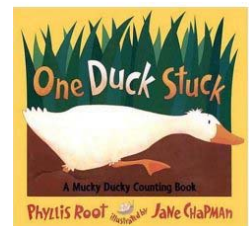
Cronin, Doreen (2002). **Giggle, Giggle, Quack**. New York: NY. Simon and Schuster Books. ISBN: 0689845065.

“Farmer Brown is going on vacation. He asks his brother, Bob, to take care of the animals. “But keep an eye on Duck. He’s trouble. Bob dutifully follows his brother’s written instructions: “Tuesday night is pizza night. The hens prefer anchovies,” and “Wednesday is bath day for the pigs.”



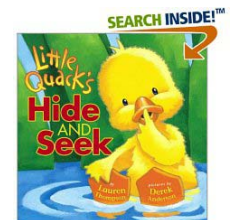
Root, Phyllis (1998). **One Duck Stuck**. Cambridge, MA: Candlewick Press. ISBN: 0763615668

“When, “Down by the marsh, by the sleepy, slimy marsh, one duck gets stuck in the muck,” who comes to the rescue? Two fish, splishing, for starters. Then three moose clomping, four crickets pleeping, and so on. Still, “No luck. Still stuck.” It takes a whole lot of teamwork to get this particular stuck duck unstuck from the muck, but this cheerful bunch is definitely up to the task.”



Thompson, Lauren (2004). **Little Quack’s Hide and Seek**. New York: NY. Simon and Schuster Books. ISBN: 0689857225

“The ducklings are playing hide-and-seek. By the time Mama counts to ten, everyone has found a hiding place...except for Little Quack. Where should he hide?”



Six Little Ducks Lyrics and Music: <http://www.niehs.nih.gov/kids/lyrics/sixducks.htm>

Six Little Ducks Video: <http://www.abc.net.au/children/play/look/default.htm>

Duck Jigsaw Puzzle: <http://www.thekidzpage.com/onlinejigsawpuzzles/duck001.htm>

All About Ducks for Kids: <http://www.kiddyhouse.com/Farm/ducks.html>

Duck Dot-to-Dot 1-9: <http://www.kidzone.ws/math/farm/dotsby1.htm>

Duck Dot-to-Dot Counting by 2s: http://www.kidsrcreativity.com/duck_2-20.htm