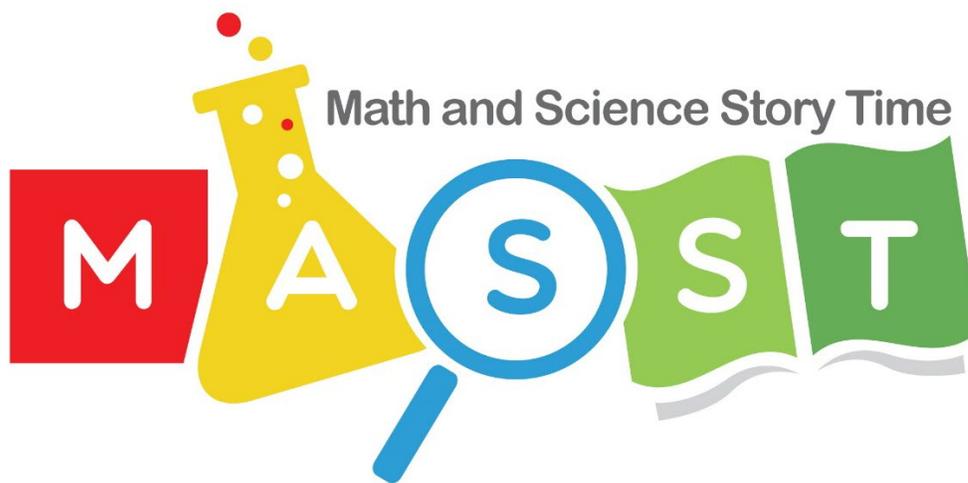


The Preschool Math and Science Storytime Series for Public Libraries



Created to be delivered in Spanish, English, or both!

www.masstprogram.org

Getting Started

Uses

MASST activity plans are available for free for non-commercial use to public libraries. The plans may be delivered in Spanish, English, or both. Please **ONLY** use and adapt these plans for *non-profit* purposes. Any commercial use is strictly prohibited.

Acknowledgements

MASST was started in 2012 by Dr. Alissa A. Lange while at NIEER at Rutgers University, and in collaboration with New Brunswick Free Public Library. Special thank you to these folks and to the many other people and organizations who have supported this project over the years.

- Thanks to Chelsea Woods, Sharon Rawlins, Linda Stork, Irena Nayfeld and others.
- MASST began and was substantially developed at NIEER (www.nieer.org)
- Specific resources and references included at the end of each session plan.
- **A HUGE Thank You** to funders, including Rutgers University Community-University Research Partnership Grant program and Rutgers Research Council Grant programs; PSEG Foundation's Spark initiative; Target Educational Grants program; New Jersey State Libraries; New York State Libraries; and ETSU's RDC Large Grants program

More Information

Contact us for more information about the following:

- Family handouts linked to each session
- Spanish-language translations
- Research impacts of MASST
- Coordinated materials kits
- Training for librarians

Ways to stay connected:

- Emails us: info@ecstemlab.com.
- Visit our website: www.masstprogram.com.
- Follow us on Facebook
- Join our EC STEM Lab mailing list to receive monthly email newsletter about early STEM teaching and learning events, free resources, and training opportunities:
www.ecstemlab.com/contact-us.html

Structure

Included in this document is a general overall guide and eight (8) individual lesson plans for the sessions of MASST. There are 2 that are math focused and 2 focused on science. Each includes links to the New Jersey Early Learning Standards (2014), along with detailed ideas for language and content.

However, please note that MASST only works when it works for you! Feel free to edit the program as needed to suit your library and your community.

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Presenter Guide

This guide includes general suggestions for your use of the MASST lesson plans. The MASST activity plans are quite detailed, including tips about questions to ask and ideas for differentiation. However, the activities must work for your children, your families, and the context within which you work. Contact us with any ideas you have for ways to improve the plans!

Make the Lesson Plan Work for You!

The books and activities listed are suggestions. Feel free to use another book if it is more accessible and change the activities to suit the needs of your children or the materials you have. Try to ensure the adjustments don't change the objective of the unit.

Integrate Spanish and English!

Reading and speaking both English and Spanish may work best to engage children with all levels of language proficiency. One way to do this is to translate key directions and vocabulary words into children's home language whenever possible.

Use the Spanish versions of the activity plans for translation tips or ask one of the children or parents to be your translator. Libraries have chosen to present MASST in different ways: Spanish only, English only, or a mix. The program should meet the needs and interests of your children and families!

Time It!

Some activities build on each other (e.g., reading a book, then doing a project to create something mentioned in the book), while others share the math/science theme but can stand independently.

Based on how much time you have, adjust which activities you do in a session, and the order. You can also split them up into multiple sessions!

Make it (Culturally) Relevant!

Ask parents and children about their cultures and prior experiences and adjust the books and activities as needed to make it relevant and interesting for THEM! Using children's interests and their cultural knowledge will ensure that they can relate to the activities and that the learning sticks.

Bring in the Family!

Each lesson plan has suggestions for how parents can help during the creative activity. Extend this to other activities by encouraging parents to sing along, read, count, and move with the children. Many of the activities can also be repeated or extended at home!



Session 1

HOW MANY HATS?
(Math: Counting)

¿CUÁNTOS SOMBREROS?
(Matemáticas: Conteo)



Session 1 - HOW MANY HATS?

(Math: Counting)

Sesión 1 - ¿CUÁNTOS SOMBREROS? (Matemáticas: Conteo)

OVERVIEW	
<p>Summary</p> <p>In “How Many Hats?” children practice counting and build numeracy skills by counting small numbers of objects in books, such as the number of different colored hats in <i>Caps for Sale</i>. Children sing songs (e.g., Five Little Monkeys) and do hands-on activities that involve counting.</p> <p>Topics</p> <ul style="list-style-type: none"> • Numbers, numerals • Counting <p>Objectives (depending on children’s age and level)</p> <ul style="list-style-type: none"> • Practice counting verbally up to and beyond 10 • Compare numbers (more than, less than, same as) • Count on from a number (e.g., how many is 1 more than 4?) • Recognize numerals • Produce a small set of objects (e.g., give me 5 blocks) 	
STANDARDS & BACKGROUND	
<p>NJDOE Preschool Teaching and Learning Standard(s)</p> <p>EXPECTATION 1: Children demonstrate an understanding of number and numerical operations.</p> <ul style="list-style-type: none"> • Make materials and books that promote number exploration accessible to the children (e.g., collections of small objects, cash registers with money, number puzzles, counting books and games, egg cartons and plastic eggs, etc.). • Foster one-to-one correspondence throughout the day 	
<p>Research Background</p> <p>Key Ideas that Develop in Counting</p> <ul style="list-style-type: none"> • 1-1 correspondence (one number goes with one object) • Number sequence (1,2,3, 4....etc.) • Cardinality (last number tells how many total) • Numbers later in the sequence are higher than those before it. • Ordinal numbers (1st, 2nd, 3rd) 	<ul style="list-style-type: none"> • When comparing the size of two groups, the group with the higher number has more objects. • Difference between ordinal (1st, 2nd, etc. representing order) versus cardinal numbers (1, 2 representing quantities) • Producing a set (e.g. give me 4) is harder than counting a set that is there
TEACHING TIPS	
<p>Teaching Tips: Strategies for Children</p> <ul style="list-style-type: none"> • Use fingers and objects to count • Arrange objects in a row to help keep track of which they have already counted. • One number goes with one object (1-1 correspondence) • A number is the quantity or amount. A numeral is the written symbol representing that quantity. Children can count objects and develop number sense even if they cannot recognize or write the numeral yet. 	



Session 1 - HOW MANY HATS?

(Math: Counting)

Sesión 1 - ¿CUÁNTOS SOMBREROS? (Matemáticas: Conteo)

Teaching Tips: Strategies for Presenters

- When reading and doing activities, **be sure to ask questions that require more than one-word answers, such as “How do you know?” or “Why?” For example, say, “How many monkeys are there?” (Five.) “ How do you know there are five? How can we check if that’s right?”**
- Children may need explicit instruction that the last number counted when counting a set of objects tells how many altogether; it’s special (this is called cardinality)

Differentiation

- If children can recognize numerals and know how to count beyond 10,
 - Challenge them to start counting from a given number - Count on from N (e.g., How many is 1 more than 4?, or Count up 4 from number 6)
 - Have them do simple addition or subtraction
 - Ask them to compare larger numbers
 - Challenge them to counter larger sets and recognize larger numerals
- If children have difficulties doing the tasks as written,
 - Focus on smaller groups of numbers
 - Count to small numbers
 - Don’t focus on numerals - count dots and represent with fingers, but do not focus on the written numerals

MATERIALS

General Materials Needed

Markers, crayons, tape, glue
 Computer/speakers
 Construction paper/other paper
 Key words in Spanish and English
 Parent handouts
 Sign in sheet

Materials Specific to Session

Large visual number line
 Monkey props
 Dot stickers
 Monkey stickers
 Hats to decorate (construction paper cut in half lengthwise, taped together) or construction paper

Books

- *Ten Black Dots/ Los Diez Puntos Negros* (English & Spanish), by Donald Crews
- *Caps for Sale/Se Venden Gorras* (English & Spanish), by Esphyr Slobodkin
- *Cinco Monitos Subidos a Un Árbol / Five Little Monkeys Sitting in a Tree*, by Eileen Christelow

Alternative Books

- *I Spy Two Eyes*, by Lucy Micklethwait
- *Build a Burrito - A Counting Book in English and Spanish*, by Denise Vega
- *Fiesta!*, by Ginger Foglesong Guy & Rene King Moreno (bilingual)
- *Cinco monitos brincando en la cama/ Five Little Monkeys Jumping on the Bed*, by Eileen Christelow & Victoria Ortiz
- *Counting Ovejas*, by Sarah Weeks (bilingual)
- *Feast for 10/ Fiesta para Diez*, by Cathryn Falwell (avail in Spanish or English)
- *Great and Mighty Nikko*, by Xavier Garcia (bilingual)
- *Zoo Day Ole! A Counting Book*, by Phillis Gershator
- *Siete Ratones Ciegos (Spanish Edition) (Spanish) (Seven Blind Mice)*, by Ed Young
- *My Numbers / Mis números* (Board book), by Rebecca Emberley
- *Animals To Count (Cuántos animales hay?)*, by Brian Wildsmith
- *El Gusto Del Mercado Mexicano / Taste of the Mexican Market*, by Nancy Maria Grande Tabor
- *Anno’s Counting Book*, by Mitsumasa Anno
- *Mouse Count*, by Ellen Stoll Walsh
- *One Little Chicken*, by David Elliot



Session 1 - HOW MANY HATS?

(Math: Counting)

Sesión 1 - ¿CUÁNTOS SOMBREROS? (Matemáticas: Conteo)

- *Ten Little Puppies = Diez perritos* - counting book, by Alma Flor Ada and F. Isabel Campoy. English version by Rosalma Zubizarreta
- *Five Creatures*, by Emily Jenkins
- *The Button Box*, by Margarett S. Reid
- *Counting on the Woods*, by DK Publishing

INSTRUCTIONS

Introduce (2-5 minutes)

SAY: Today, we'll talk about COUNTING AND NUMBERS.

- Let's count to 10 together - use your fingers to show me the numbers
 - 1, 2, ...
 - How many fingers did we count all together?"
- We will read some books, sing some songs, and then do an activity at the end - all about counting.

Read (10-15 minutes)

Book: *Ten Black Dots/ Los Diez Puntos Negros*, by Donald Crews

READ in Spanish or English, or both

- Let children count the dots with you, or to guess how many will be on the next page (e.g., "there were 5 dots on this page, how many will be on the next page?")
- Be sure to show only one page or point out the one page, when one number of dots is only on one page, and show both pages when the total number of dots is spread across two pages.

Sing (3-5 minutes)

Song "5 Little Monkeys Jumping on the Bed".

SING song and play Youtube video, sing and act it out, or have children be the monkeys pretending to jump.

USE plastic or plush monkeys and a toy or paper bed as props (if available) and let kids make the monkeys jump.

Read (10-15 minutes)

Book: *Cinco Monitos Subidos a Un Árbol / Five Little Monkeys Sitting in a Tree*, by Eileen Christelow

USE monkey props, let 5 children hold them and act out the book

Move (5 minutes)

Let's Count and Move!

DO movement activities with children to get them thinking about counting, such as

- The Find Two challenge (especially good for younger children)
 - Ask children to find something they see that there are TWO of in the room (e.g., my ears, arms, two books, etc.) Children can get up to look. Try it with bigger numbers if appropriate.
- How many are we?
 - How many of us all together?
 - How many of us are wearing long sleeves / ponytails / sneakers?
 - Do we have more people wearing red shirts or purple shirts?
- Let's Move!
 - Ask children to move a set number of times (e.g., stomp, clap, spin, tap toe)
 - SAY: "Ok, now I'm going to have you all stand up. I will say a number and I want you to clap that many times" (identify one child first)
 - If it works with one kid, see if the whole group can do it with small numbers



Session 1 - HOW MANY HATS?

(Math: Counting)

Sesión 1 - ¿CUÁNTOS SOMBREROS? (Matemáticas: Conteo)

- Remind kids to STOP when they get to the target number. Sometimes kids will keep counting beyond the target number.

Read (10-15 minutes)

Book: *Caps for Sale (Se Venden Gorras)*, by Esphyr Slobodkina

Note: This book is a bit long. Depending on the time you have, you may want to focus on a few particular pages.

READ book

- Have some hats as props, if possible
- On pages with caps, have children tell you how many of each color hat, and how many he has in all.
- When you get to the pages with the monkeys in the tree, ask first, “If every monkey has one hat, and we have sixteen hats, how many monkeys are there?”

Optional Activities (5-15 minutes, as needed)

READ other books on counting, if time allows (see alternative book list above).

- Ask children to come up and show you the objects mentioned on each page.
- Ask children follow-up questions like, “How do you know there are 3 frogs?”

Older/advanced groups

- Blastoff! Rocket ship counting. Kids start standing up straight and reaching high with 10, then count down to 0 scrunching down a little with each number, and jump up saying, “Blast off!” after reaching zero.
- Do operations with children’s claps. For example, Billy clapped two times, and Isabel clapped 1 time. How many claps were there altogether?
- Hold up numeral cards or write numerals and ask children to do an action that many times without saying the numeral

Younger/less advanced groups

- Sing or play a counting song or do finger plays – “1, 2, 3, there’s a bug on me”.
- *Number Search*. Look around the room to see if children can find 2 of something, 3 of something.

Create (15-25 minutes)

Making hats

Children will make hats (ASK: “Remember the book about hats?”) and decorate them with dots (like the book *10 Black Dots*.) Use a sample hat so children can see what they will be doing. Keep the books out or otherwise help children think of what they could make with the dots.

- 1) Make hats with dots (like *10 Black Dots/Diez Puntos Negros*)
 - Children use a sheet of construction paper cut in half and taped together, then wrapped around their head to make the hat.
 - Use the dot stickers to make something like they did in the book.
 - They can decorate it with dots, shapes, crayons, and/or markers!
- 2) Create dot pictures
 - Use the dot stickers to make something like they did in the book on construction paper
 - They can decorate it with dots, shapes, crayons, and/or markers!

Parents/Teachers/Facilitators

Can help children to:

Count out dots correctly

Session 1 - HOW MANY HATS?

(Math: Counting)

Sesión 1 - ¿CUÁNTOS SOMBREROS? (Matemáticas: Conteo)

Think about what to create with the dots - *look at books from session for ideas!*

Tape the hat so it fits children's heads

Talk about what they are creating, especially using number words and focusing on the numeracy in what they are doing. For example, "Are there more dots on your hat or my hat? How do you know? Let's count to check that you're right!"



HANDOUTS FOR PARENTS/TEACHERS

- Ideas for related activities to do at home
- Key vocabulary in English and Spanish

REFERENCES/SOURCES/ACKNOWLEDGEMENTS

- *Learning and Teaching Early Math: The Learning Trajectories Approach*, by Doug Clements & Julie Sarama
- Thanks to Chelsea Woods, Sharon Rawlins, and Linda Stork for additional book ideas
- MASST began and was substantially developed at NIEER (www.nieer.org)
- **Thank you** to funders, including Rutgers University Community-University Research Partnership Grant program and Research Council Grant programs; PSEG Foundation's Spark initiative; Target Educational Grants program; New Jersey State Libraries; New York State Libraries; and ETSU's RDC Large Grants program



Session 2

DO YOU KNOW HOW PLANTS GROW?
(Science: Planting and Growing)

¿ SABES COMO CRECEN LAS PLANTAS?
(Ciencia: establecimiento y crecimiento)



Session 2 - DO YOU KNOW HOW PLANTS GROW?

(Science: Planting and Growing)

Sesión 2 - ¿ SABES COMO CRECEN LAS PLANTAS?

(Ciencia: establecimiento y crecimiento)

OVERVIEW
<p>Summary</p> <p>In “Do You Know How Plants Grow?” children learn about what plants need to grow and how each plant comes from a specific type of seed. They read books, sing songs, and decorate a cup to take home and use as a planter.</p> <p>Topics</p> <ul style="list-style-type: none"> • Plants, vegetables, seeds • Growth and needs: water, soil, sun • (OPTIONAL) Life cycles and parts of plants: change, height, size <p>Objectives</p> <ul style="list-style-type: none"> • Discuss what a plant is and what it needs to survive and grow (water, soil, sun), how it takes time to grow • Talk about how different seeds make different plants • Decorate a cup, choose seeds, take home with care instructions
STANDARDS, BACKGROUND, AND DIFFERENTIATION
<p>NJ Early Childhood Education Standard(s)</p> <p>EXPECTATION 1: Children explore the concept of change in both living and nonliving entities and in the environment.</p> <ul style="list-style-type: none"> • “Provide time and the materials necessary for an in-depth investigation of change over an extended period of time (e.g., seeds for planting, journals to record leaf changes in autumn, various organic and non-organic materials for decomposition experiments).” (Preschool Teaching Practice) • Preschool Learning Outcome 3.3 <ul style="list-style-type: none"> ○ “Demonstrates understanding that living things change as they grow (life cycle) (e.g., “When we first got our fish, they were small. Now they are big and have spots.”).” <p>EXPECTATION 2: Children observe and investigate the properties of objects, both living and nonliving.</p> <ul style="list-style-type: none"> • “Allow children to discuss, participate in, and share responsibility for the care of living things during and outside of school time (e.g., fish and fish tank, plants, hermit crabs, ladybugs, butterflies, etc. in the classroom), including themselves (discuss nutrition and exercise).” (Preschool Teaching Practice) • “Compare and contrast living and nonliving objects regarding the capacity for self-directed movement, origins and capacity for growth and change.” (Preschool Teaching Practice) • Preschool Learning Outcome 2.2 • “Explains that living things have specific needs (e.g., water, air, food, light).” <p>Differentiation</p> <ul style="list-style-type: none"> • It might be necessary to focus on only one type of plant with younger children • With more advanced children, you could talk about doing experiments with plants to see if they will still grow when they have no light, or no soil, etc. This is a great chance to be a scientist, make predictions, test predictions, make observations, and record results!



Session 2 - DO YOU KNOW HOW PLANTS GROW?

(Science: Planting and Growing)

Sesión 2 - ¿ SABES COMO CRECEN LAS PLANTAS?

(Ciencia: establecimiento y crecimiento)

MATERIALS	
<p><i>General Materials Needed</i></p> <p>Markers, crayons, tape, glue</p> <p>Computer/speakers</p> <p>Construction paper/other paper</p> <p>Key words in Spanish and English</p> <p>Parent handouts</p> <p>Sign in sheet</p>	<p><i>Materials Specific to Session</i></p> <p>Packs of seeds</p> <p>Video of sunflower growing on YouTube</p> <p>Soil in Ziploc bags</p> <p>Cutouts of plant parts to decorate cup</p> <p>Cups that can be decorated</p> <p>Matching seeds to plant game</p> <p>Watering can and plants as visual aid (optional)</p>
<p>Books</p> <ul style="list-style-type: none"> • <i>Zinnia's Flower Garden</i>, by Monica Wellington • <i>The Carrot Seed/La Semilla de Zanahoria</i> (English and Spanish), by Ruth Krauss • <i>Cultivamos sopa de verduras, (Growing Vegetable Soup)</i>, by Louis Ehler <p>Alternative books</p> <ul style="list-style-type: none"> • <i>How a Seed Grows/Cómo Crece una Semilla</i> (English and Spanish), by Helene J. Jordan • <i>The Cazuela That the Farm Maiden Stirred</i>, by Samantha R. Vamos • <i>Ugly Vegetables</i>, by Grace Lin • <i>The Patchwork Garden / Pedacitos de huerto</i>, by Diane de Anda • <i>Seeds, Seeds, Seeds!</i>, by Nancy Elizabeth Wallace 	
INSTRUCTIONS	
Introduce (5 minutes)	
<p>SAY: Today, we'll talk about PLANTING AND GROWING!</p> <ul style="list-style-type: none"> • Show green beans, sunflower, radish • ASK: What are these? <ul style="list-style-type: none"> ○ Plants! Plants can be flowers, or vegetables or fruit. We eat some of them. • ASK: But where do these come from? <ul style="list-style-type: none"> ○ Grocery store/market? Before this. (Where do stores get them?) • Farms or gardens! They grow! From SEEDS! <p>SHOW: Seeds and/or seed packets</p> <p>SAY: We're going to read some books, do some activities, and watch a video to learn more about seeds, plants, and growing!</p> <ul style="list-style-type: none"> • We'll see how plants start, how they grow, and what you can do to help them grow tall and healthy. • Then, you will be able to take home your own cup and seeds to try to grow at home! 	
Read (5-8 minutes)	
<p><u>Book: <i>Zinnia's Flower Garden</i>, by Monica Wellington</u></p>	
<p>ASK: Before showing pg. 31, as if children know what plants need to grow?</p> <p>REVIEW: Do you remember what the plants start with? SEEDS!</p>	



Session 2 - DO YOU KNOW HOW PLANTS GROW?

(Science: Planting and Growing)

Sesión 2 - ¿ SABES COMO CRECEN LAS PLANTAS?

(Ciencia: establecimiento y crecimiento)

Do (5-10 minutes)

Seed and Plant Match Game

ASK: How do these vegetables and plants start?

- SEEDS!

SAY: Let's look at some seeds!

ASK: Can any plant come from any seed?

- NO - only 1 plant will come from each type of seed.

SHOW: poster with different seeds and their plants

- Tell children to match the seed pictures to the type of plant it grows into

GIVE children

- Seed cards with pictures of seeds
- Sheet with plant pictures

SAY: You can use the pictures of real seeds to help you!

Read (5-10 minutes)

Book: *Cultivamos sopa de verduras* (Growing Vegetable Soup), by Louis Ehler

ASK: What do the vegetables start as?

- SEEDS!

What do they need to grow?

Sing (3 minutes)

Song: *The Mulberry Bush.*

ACT OUT each part as you sing.

"The Mulberry Bush" ("La Morera")
(chorus-join hands & walk in a circle)

Here we go round the mulberry bush, the mulberry bush, the mulberry bush.

Here we go round the mulberry bush, so early in the morning.

Demoles vuelta a la morera, la morera, la morera.

Demoles vuelta a la morera, temprano en la mañana.

**This is the way we dig a hole, dig a hole, dig a hole.
(act out)**

This is the way we dig a hole, so early in the morning.

*Así es como cavamos el hoyo, cavamos el hoyo,
cavamos el hoyo.*

Así es como cavamos el hoyo, temprano en la mañana.

(chorus)

This is the way the rain falls down, the rain falls down, the rain falls down.

This is the way the rain falls down, so early in the morning.

Así es como cae la lluvia, cae la lluvia, cae la lluvia.

Así es como cae la lluvia, temprano en la mañana.

This is the way the sun comes out, the sun comes out, the sun comes out.

This is the way the sun comes out, so early in the morning.

Así es como sale el sol, sale el sol, sale el sol.

Así es como sale el sol, temprano en la mañana.

This is the way the seed sprouts up, the seed sprouts up, the seed sprouts up.

This is the way the seed sprouts up, so early in the morning.

Así es como brota la semilla, brota la semilla, brota la semilla.

Así es como brota la semilla, temprano en la mañana.

Session 2 - DO YOU KNOW HOW PLANTS GROW?

(Science: Planting and Growing)

Sesión 2 - ¿ SABES COMO CRECEN LAS PLANTAS?

(Ciencia: establecimiento y crecimiento)

This is the way we plant the seed, plant the seed, plant the seed.

This is the way we plant the seed, so early in the morning.

Así es como plantamos semillas, plantamos semillas, plantamos semillas.

Así es como plantamos semillas, temprano en la mañana.

This is the way the bush grows tall, the bush grows tall, the bush grows tall.

This is the way the bush grows tall, so early in the morning.

Así es como crece la morera, crece la morera, crece la morera.

Así es como crece la morera, temprano en la mañana.

Read (5-10 minutes)

Book: *The Carrot Seed/La Semilla de Zanahoria*, by Ruth Krauss

ASK as you read:

- Why did he have to wait? It takes time for seeds to grow into plants
- What did he do to take care of his seed? Planted in soil, watered it, protected it.

Watch (3-5 minutes)

Video of sunflower on fast forward

Before

- Review: "Are they alive? YES! THEY GROW! They get bigger and bigger!"
- Kids need food and water to grow. So do plants! Plants need water, sun, and soil.
- Introduce video: This video shows a real sunflower growing, but it is on FAST FORWARD - it shows you how a plant grows very quickly

During

- Watch video - Link: SUNFLOWER growing:
<http://www.youtube.com/watch?v=zst08tm9s6M&feature=related>

After

- ASK: Do sunflowers really grow this fast? No, but if you're patient, like the boy in *The Carrot Seed*, your seed can grow too!
- ASK: What happens when they die? See the flower has seeds? What do you think happens to those?"

Create (10-20 minutes)

Making Planters

Note: Prepare children for the fact that it will take time for the plants to grow. "Remember the boy in *The Carrot Seed*?" Ask children about seeds at next session, if applicable.

Decorate cups and take them home to plant seeds

- You could create/draw what they need to grow, or
- You could create/draw or make what the plant should grow into, and/or
- You could create/draw the seeds

Alternative activity

- Make grass heads. See materials and procedure here:
<http://www.homemadegiftsmadeeasy.com/grassheads.html>

Parents/Teachers/Facilitators

- Can help children decorate by drawing what will grow in the cup, what plants need to survive, and/or what the seed looks like before it grows
- Remind kids about what they learned, such as



www.parents.com/fun/arts-crafts/kid/crafts-made-from-paper-plates-cups/?page=6



Session 2 - DO YOU KNOW HOW PLANTS GROW?

(Science: Planting and Growing)

Sesión 2 - ¿ SABES COMO CRECEN LAS PLANTAS?

(Ciencia: establecimiento y crecimiento)

- Different seeds make different plants
- What do you need to take care of plants?
- Try related extension ideas on handout

HANDOUTS FOR PARENTS/TEACHERS

HANDOUT has:

- Ideas for related activities to do at home
- Key vocabulary in English and Spanish

REFERENCES/SOURCES

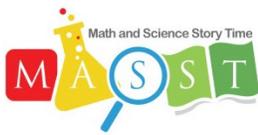
- Linda Stork - *The Mulberry Bush* song idea
- Expands on C4L: Connect4Learning preschool curriculum project, *Zinnia's Flower Garden* Book idea
- Thanks to Chelsea Woods, Sharon Rawlins, and Linda Stork for additional book ideas
- MASST began and was substantially developed at NIEER (www.nieer.org)
- **Thank you** to funders, including Rutgers University Community-University Research Partnership Grant program and Research Council Grant programs; PSEG Foundation's Spark initiative; Target Educational Grants program; New Jersey State Libraries; New York State Libraries; and ETSU's RDC Large Grants program



Session 3

WHERE IS A SQUARE?
(Math: Geometry)

¿DÓNDE ESTA UN CUADRADO?
(Matemáticas: Geometría)



Session 3 - WHERE IS A SQUARE?

(Math: Geometry)

esión 3 - ¿DÓNDE ESTA UN CUADRADO? (Matemáticas: Geometría)

OVERVIEW									
<p>Summary</p> <p>In “Where is a Square?” children talk about and identify common 2D shapes. Activities, books, and songs provide opportunities to talk about the properties of shapes and to think about how shapes fit together to make other shapes. Children create their own shape picture just like in the books.</p> <p>Topics</p> <ul style="list-style-type: none"> • Geometry: Beginning shape recognition, shape composition • Shapes: Triangles, circles, squares (could add rectangles, rhombuses, ovals) <p>Objectives</p> <ul style="list-style-type: none"> • Recognize what is a triangle, circle, and square • Recognize these shapes even when not in typical orientation • Begin to know the attributes of the shapes • Practice shape composition 									
STANDARDS & BACKGROUND									
<p>NJ Early Childhood Education Standard(s)</p> <p>EXPECTATION 5: Children develop competence and confidence in activities requiring fine motor skills.</p> <ul style="list-style-type: none"> • “Provide support and encouragement while children engage in fine motor activities (e.g., identifying shapes or pictures in a puzzle, locking links together to make a necklace).” (Preschool Teaching Practice) <p>EXPECTATION 2: Children develop knowledge of spatial concepts, e.g., shapes and measurement.</p> <ul style="list-style-type: none"> • “Provide materials both indoors and outdoors, for children to develop a spatial and geometric sense (e.g., items to fill and empty, fit together and take apart, arrange and shape; materials that move; tunnels to crawl through; photos and pictures that show different views).” (Preschool Teaching Practice) • “Introduce the vocabulary relating to two-dimensional and three-dimensional shapes and instructions (circle, sphere, square, cube, triangle, rectangular prism, pyramid etc.).” (Preschool Teaching Practice) • Preschool Learning Outcome 2.1 - “Identifies basic shapes in the environment (e.g., circle, square...)” 									
MATERIALS									
<p><i>General Materials Needed</i></p> <p>Markers, crayons, tape, glue Computer/speakers Construction paper/other paper Key words in Spanish and English Parent handouts Sign in sheet</p>	<p><i>Materials Specific to Session</i></p> <table border="0"> <tr> <td>Shape song on YouTube (shapes are everywhere)</td> <td>Shape/pattern blocks & puzzles</td> </tr> <tr> <td>Pattern block puzzles</td> <td>Shape stickers and/or crayons</td> </tr> <tr> <td>Painting tape/Shape printouts</td> <td>Small paper cutouts of each shape</td> </tr> <tr> <td>Large visual of a circle, square, triangle with words</td> <td>Large printout of letter <i>b</i> and triangle and square</td> </tr> </table>	Shape song on YouTube (shapes are everywhere)	Shape/pattern blocks & puzzles	Pattern block puzzles	Shape stickers and/or crayons	Painting tape/Shape printouts	Small paper cutouts of each shape	Large visual of a circle, square, triangle with words	Large printout of letter <i>b</i> and triangle and square
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<p>Books</p> <ul style="list-style-type: none"> • <i>Mouse Shapes/Figuras y ratones</i>, by Ellen Stoll Walsh • <i>The Shape of Things/La Forma De Las Cosas (Spanish Edition)</i>, by Dayle Ann Dodds • <i>Color Zoo</i>, by Lois Ehlert <p>Alternative Books</p> <ul style="list-style-type: none"> • <i>My Shapes/Mis Formas (English and Spanish)</i>, by Rebecca Emberley 									



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- *Circle, Square, Moose*, by Kelly Bingham and Paul O. Zelinsky
- *Grandfather Tang's Story*, by Ann Tompert
- *Shapes, Shapes, Shapes*, by Tana Hoban
- *The Greedy Triangle*, by Marilyn Burns
- *Hello, Círculos!: Shapes in English and Spanish Board book*, by San Antonio Museum of Art
- *I Spy Shapes in Art*, by Lucy Micklethwait
- *Round as a Mooncake: A Book of Shapes*, by Roseanne Thong
- *Shapes All Around*, by DK Publishing
- *Shape Capers*, by Cathryn Falwell
- *The Wing on a Flea*, by Ed Emberley
- *Shapes in Art/Formas en el Arte (English and Spanish)*, by Rebecca Rissman
- *Tortillas Are Round / Las tortillas son redondas*, by Roseanne Greenfield Thong

INSTRUCTIONS

Introduce (8-10 minutes)

SAY: "Today, we'll talk about SHAPES."

- "Shapes are everywhere! We will look around and find what shapes we see."
- TWO POSSIBLE STARTS
 1. Start with "*Let's talk about Shapes*" below
 2. Play *Shape Stomp* first (see below). Point out the shapes on the ground, ask children what they notice, and what they know about the shapes.

Let's Talk about Shapes!

SHOW a triangle, ask, "What shape is this?" (Help, if needed; give English and Spanish word for shape)

- Then, ask "How do you know it's a triangle?"
- Scaffold, if necessary:
 - It's a shape with 3 straight sides, and 3 corners – all connected
 - (When you say 3 straight sides, trace each side as you say the number, then hold up 3 fingers)
 - (When you say 3 corners, all connected, point to each corner when counting the corners, then hold up 3 fingers)
 - It does **not** have spaces between lines at the corners

SHOW picture of a triangle, with label in Spanish and English on board

- (Trace three sides, when saying "3 straight sides, let's count them, 1, 2, 3.")
- (Point to each corner, when saying "3 corners, let's count them...1, 2, 3 – and look how they're connected...no spaces here.")
- Can you draw one in the air with your finger?
- Is this a triangle? (Show spaces between corners, or upside down triangle, or one side curvy with board and magnetic shapes)

SHOW a circle, ask "What shape is this?" (Help, if needed; give English and Spanish word for shape)

- Then, ask "How do you know it's a circle?"
- Scaffold, if necessary:
 2. It's a shape with 1 curvy line all the way around, **not** squished like an oval, **no** corners
- Show a picture of one, with label in Spanish and English on board
- 3. (Trace the circle with your finger when describing the circle)
- Can you draw one in the air with your finger?



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- Is this a circle (Show spaces between two halves with board and magnetic shapes, or draw an oval)

SHOW a square, ask, “What shape is this?” (Help, if needed; give English and Spanish word for shape)

- Then, ask “How do you know it’s a square?”
- It’s a shape with 4 straight sides all the same length, 4 corners – all connected, 4 RIGHT angles
 4. Not with curvy sides
- Show picture of one, with label in Spanish and English on board
 5. (Trace four sides, when saying “4 straight sides, let’s count them, 1, 2, 3,4” - then hold up 4 fingers – “all the SAME size.”)
 6. (Point to each corner, when saying “4 corners, let’s count them...1, 2, 3,4” - then hold up 4 fingers – “and look how they’re connected...no spaces here.”)
- Can you draw one in the air with your finger?
- Is this a square? (Show one side longer, rotate the square, or make a rhombus)

REPEAT for other shapes, as appropriate (e.g., rectangle)

Extension

SAY: One more COOL THING about shapes...we can turn shapes and they will still be that same shape! (in other words: ORIENTATION doesn't matter!)

START with letters:

- HOLD up the big letter **b**. Ask, “What letter is this?” **b**
- ROTATE it so it is upside down. Ask, “What letter is this now?” **q**!
- So, when you turn a letter, it can change what the letter is!

What about turning shapes??

- Hold up each shape and turn it.
- SAY: When you turn a square, it is still a square! It is not a diamond. This is a diamond (show rhombus)
- When you turn a triangle, it is still a triangle!

So, how do you know what shape you have? By its properties! # sides, # corners, etc.

Differentiation

Higher Level

- If children know some shapes already
 - Proceed with description below (“Show a triangle...”)
 - Be sure to have them tell you **HOW** they know
 - Challenge them with two squares together – a rectangle has 4 straight sides, 4 corners, 4 right angles. *A square is actually a special rectangle - one where all the sides are equal length (but a rectangle is not a square)!*

Lower Level

- For younger children, focus on a few shape names (circle, triangle, square), hold them up, ask children to name them.
 - Ask kids to find shapes in a pile of shapes that are “just like this one” - the one you are holding up
 - Matching is easier than naming or than identifying the properties of shapes



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<p>Sing (5 minutes) <i>Shape Song</i></p>	
<p>Shape song ideas – choose one or sing your own</p> <ul style="list-style-type: none"> The Shape Song Swingalong: https://www.youtube.com/watch?v=Umu58RxnL7I <i>Shape Song</i> <p>Sung to tune of “If You’re Happy And You Know It”.</p>	
<p>ENGLISH VERSION</p>	<p>SPANISH TRANSLATION</p>
<p>Hold a circle in the air, in the air! Hold a circle in the air, in the air! It is oh so very round. Hold it high up off the ground. Hold a circle in the air, in the air!</p>	<p>Pon el circulo en el aire, en el aire Pon el circulo en el aire, en el aire Es muy redondito, con un solo ladito Pon el circulo en el aire, en el aire</p>
<p>Hold a square in the air, in the air! Hold a square in the air, in the air! Its four sides, as you can see, are the same. Don’t you agree? Hold a square in the air, in the air!</p>	<p>Pon el cuadrado en el aire, en el aire Pon el cuadrado en el aire, en el aire Cuatro lados igualitos, y muy derechitos Pon el cuadrado en el aire, en el aire</p>
<p>Hold a triangle in the air, in the air! Hold a triangle in the air, in the air! Its three sides as you can see, are all straight, and not curvy. Hold a triangle in the air, in the air!</p>	<p>Pon el triángulo en el aire, en el aire Pon el triángulo en el aire, en el aire Tiene sus tres lados, que son rectos, no curvados Pon el triángulo en el aire, en el aire</p>
<p>Read (8-10 minutes) <u>Book: <i>Mouse Shapes/Figuras y ratones</i>, by Ellen Stoll Walsh</u></p>	
<ul style="list-style-type: none"> This book along with <i>The Shape of Things</i> will be a nice lead-in to the creative project This is a story, so it is nice to read the full book, if possible Again, <i>be sure to ask questions that require more than 1-word answers, such as “How do you know?” or “Why?”</i> <i>Example questions:</i> <ul style="list-style-type: none"> Ask children to identify shapes on the pages. Ask “How do you know that’s a triangle? How do you know that’s actually a square and not a circle?” “Why do you think this shape is a square?” HIGHER LEVEL: “What’s the difference between a square and a rectangle?” 	
<p>Listen (5 minutes) <u>Video: <i>Shape Song</i></u></p>	
<p>PLAY the “Shape Song”:</p> <ul style="list-style-type: none"> http://www.youtube.com/watch?v=dsR0h50BiFQ If time allows, you can replay this or play the 2nd one on the list in the Additional Activity Ideas section. It also focuses on only circle, square, triangle. It describes them & shows them in familiar objects. Also, it is slower paced & would be good for transitioning to the next part of the lesson. 	



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Read (5-8 minutes)

Book: *Color Zoo*, by Lois Ehlert

SAY: "Just like in the song, we're going to look for shapes too. Let's see what animals these shapes make!"
READ book.

- Focus on the pages that involve the shapes covered today (depending on ability of children. Please note that the diamond is also a rhombus)
- *Be sure to ask questions that require more than 1-word answers, such as "How do you know?" or "Why?"*
- *Example questions:*
 - "Which objects do you see in this room that has a circle shape? How about a triangle?"
 - "How is an oval different than a circle? How are they similar?" (They both do not have corners)

Move (10 minutes)

Shape Stomp Game

PLAY *Shape Stomp*. This game is especially fun! Play music or sing as kids walk or dance around the room. Stop music and say a shape! When they hear the shape, children stop walking/ dancing and step on that shape.

- **Note:** Requires preparation - make different shapes of various sizes on the floor with painter's tape or with laminated shape sheets. Include some foolers – curvy sides, sides not connected, not 90 degree angles, etc.
- Everyone find a triangle to stand in
- Everyone find a square to stand in
- BE SURE TO **ask kids** to tell you how they know it's the target shape. Refer to the attributes of the shape (number and shape of sides, angles,) to check together. If they're wrong, guide them to realize that they need to look for another shape, or ask their friends to help them.
- Adapted from Clements & Sarama, 2009

Move (5-10 minutes)

Shape Hunt Game

SAY: "We saw shapes in the book *Color Zoo*. Can you find shapes in this room?" (if time allows)

- "Find something in the room that is shaped like a circle" (and bring it here, if possible)
- "Find something in the room that is shaped like a square (and bring it here, if possible)"

MAKE shapes with kids as the shape part (if time allows)

- Whisper a shape
- Have a group of kids make it with their bodies on the rug (e.g., 3 kids lay on rug in a triangle)
- Make sure sides are touching at corners.
- Other kids guess what shape they made.
- Let kids make one with a problem that needs to be fixed (e.g., not straight, too many sides, not connected), and ask other kids how to fix it

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Read (8-10 minutes)

Book: *The Shape of Things/La Forma De Las Cosas*, by Dodds

READ the book (or certain pages in the book)

- Point out how shapes are put together to make other shapes. If appropriate, show how the shapes in the larger picture on the right can be taken apart to make littler shapes (this is shape composition and decomposition)
- On the page with the triangles, ask children what is made when they are put together.
- Ask children if the shapes in the boat are both triangles. One is rotated. Is it still a triangle?...Yes! Because turning it doesn't matter – it's still a triangle!
- Tell kids that soon they will have a chance to put shapes together to make their own pictures, just like in the book!

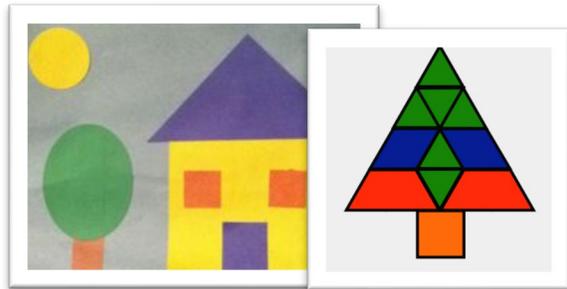
Be sure to ask questions that require more than 1-word answers, such as "How do you know?" or "Why?"

Create (15-25 minutes)

Creating Our Own Shapes

Show kids what will be done, and provide family members with suggestions about how to support their children's shape recognition, shape composition, and shape language during these activities. Children can do one or more of these, depending on time.

- 1) Make shape pictures (like *The Shape of Things*)
 - Make a picture with shapes using foam shapes, glued on construction paper, or foam sticker shapes
 - Show some examples we made (e.g., a train, like in the *Shape of Things*), or have books out to give kids ideas
- 2) Do pattern block puzzles
 - Children complete pattern block puzzles with pattern blocks (reusable) or with shape stickers
 - Note: puzzles are easier or harder depending on the amount of outlines or colors provided in puzzles



Parents/Teachers/Facilitators

Can help children remember shape names and talk about the properties of the shapes (e.g., "How do you know that's a triangle? How many sides does it have? Are they all connected?")

Put shapes together to make other shapes

Think of what kind of picture to make with shapes. Break shapes apart to make new shapes.

ADDITIONAL OPTIONAL ACTIVITY IDEAS

Books

- *My Shapes/Mis Formas* (English and Spanish), by Rebecca Emberley

Shape songs

- <http://www.youtube.com/watch?v=lj-Z3f2pdCE>



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- http://www.youtube.com/watch?v=lkZs2_1-YJU

Shape Quiz: Show a shape...what is it?

- Have words showing shapes too (Spanish and English)
- Show some typical- Show some atypical (e.g., base at top)
- Show some foolers (e.g., rectangles, pizza slice, triangle) or maybe just typical and non-typical for now to make it easier, or the foolers could be the unconnected, curvy, or slanted sides we showed in the lesson

I Spy Shapes - Play *I Spy Shapes* with objects in the room:

- Describe the properties, and kids can guess
- Triangle, Square, Circle

MORE CHALLENGE: Have kids “build” a triangle with objects (e.g., coffee stirrers). For more challenge, parents let kids work on their own, but help them tell if it is or not.

- Will need extra materials for this
- This is quite hard (constructing shapes) so only do this if kids are advanced

HANDOUTS FOR PARENTS/TEACHERS

HANDOUT has:

- Activity ideas
- Key words in Spanish and English

REFERENCES/SOURCES

- *Learning and Teaching Early Math: The Learning Trajectories Approach*, by Doug Clements & Julie Sarama - Shape Stomp, development
- Linda Stork - song ideas
- Thanks to Chelsea Woods, Sharon Rawlins, and Linda Stork for additional book ideas
- MASST began and was substantially developed at NIEER (www.nieer.org)
- **Thank you** to funders, including Rutgers University Community-University Research Partnership Grant program and Research Council Grant programs; PSEG Foundation’s Spark initiative; Target Educational Grants program; New Jersey State Libraries; New York State Libraries; and ETSU’s RDC Large Grants program



Session 4

DO BEARS WEAR COATS?
(Science: Seasonal change and animal
adaptations)

¿LOS OSOS USAN ABRIGOS?
(Ciencia: Cambio estacional y adaptación
animal)



Session 4: DO BEARS WEAR COATS?

(Science: Seasonal change and animal adaptations)

Sesión 4- ¿LOS OSOS USAN ABRIGOS?

(Ciencia: Cambio estacional y adaptación animal)

OVERVIEW	
<p>Summary</p> <p>In “Do Bears Wear Coats?” children explore seasonal change and how animals adapt to changes in seasons. Activities, books, and songs allow children to learn about changes such as growing heavy fur or camouflage that help animals adapt to changes in their environments.</p> <p>Topics</p> <ul style="list-style-type: none"> • Seasons and change • Animals adapting to or doing things to survive the seasons <p>Objectives</p> <ul style="list-style-type: none"> • Talk about what are the seasons, and what changes at each season (especially summer and winter) • Discuss what animals do in the summer and the winter, such as to stay cool or warm • Connect what animals do to what people do to deal with changing temperatures 	
STANDARDS & BACKGROUND	
<p>NJ Early Childhood Education Standard(s)</p> <p>EXPECTATION 3: Children explore the concept of change in both living and nonliving entities and in the environment.</p> <ul style="list-style-type: none"> ii. Provide books and activities that introduce children to seasonal changes, related vocabulary and facts. (Preschool Teaching Practice) iii. Preschool Learning Outcome 3.5: Associates the seasons with changes in the climate and environment. 	
MATERIALS	
<p><i>General Materials Needed:</i></p> <p>Markers, crayons, tape, glue</p> <p>Computer/speakers</p> <p>Construction paper/other paper (brown, white, orange)</p> <p>Key words in Spanish and English</p> <p>Parent handouts</p> <p>Sign in sheet</p>	<p><i>Materials Specific to Session:</i></p> <p>Clothing items as props (e.g., coat, hat, shorts)</p> <p>Popsicle sticks</p> <p>String (for animal masks)</p> <p>Animal pictures in different seasons (for matching game)</p> <p>Sheet of summer vs winter to paste animal pictures in</p> <p>Animal pictures to enact what they do in each season</p> <p>Bunny/hare ears, bear ears, butterfly wings cardstock cutouts (for making animal masks)</p>
<p>Books</p> <ul style="list-style-type: none"> • <i>Animals in Fall/Animales en Otoño</i> (English and Spanish), by Martha E. H. Rustad • <i>Animals Should Definitely Not Wear Clothing</i>, by Judi Barrett • <i>Fredrick</i>, by Leo Lionni / <i>Fredrick</i> (Spanish edition), by Leo Lionni <p>Alternative Books</p> <ul style="list-style-type: none"> • <i>Las estaciones del año/Seasons of the Year</i> (English and Spanish), by Margaret Hall • <i>Let’s Look at Summer/Veamos el Verano</i>, by Sarah L. Schuette • <i>Todos a Dormir / Time to Sleep</i> (2 separate books), by Denise Fleming 	



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(Science: Seasonal change and animal adaptations)

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(Ciencia: Cambio estacional y adaptación animal)

- *Veamos la Primavera/Let's Look At Spring*, by Sarah L. Schuette
- *Veamos el Otono/Let's Look At Fall*, by Sarah L. Schuette
- *Snow Rabbit, Spring Rabbit: A Book of Changing Seasons*, by Il Sung Na
- *De Colores: Bright with Colors (Spanish Edition) (Spanish)*, by David Diaz
- *Old Bear*, by Kevin Henkes

INSTRUCTIONS

Introduce (5 minutes)

SAY: "Today, we'll talk about ANIMALS and SEASONS!"

- "We'll read some books, do some activities, and make a project about animals and seasons at the end".

Seasons

ASK: "What are the SEASONS?"

2. Seasons are times in the year when the temperature and our environment change
3. There are 4 seasons (Note: depending on where you live, the weather might change a lot from season to season, or it might not change very much).

- SHOW and READ book: *Las estaciones del año/Seasons of the Year*, by Margaret Hall (or similar book)
 1. Talk about what changes happen
- ASK: "What season are we in right now? How do you know?"

Animals and adaptation

ASK: "If it's cool in the winter, what do YOU have to do to stay warm?"

- Possible answers: Wear a coat, stay inside, go somewhere warmer for vacation
- "What do animals do?" Grow thicker coats, hibernate, go somewhere warmer! (kind of like humans)

ASK: "When it's warm or hot in the summer, what do YOU do to stay cool?"

- Possible answers: Wear less clothing (e.g., no coats, shorts instead of pants), go in the pool, stay inside
- "What do animals do?" Shed heavy fur, go somewhere less hot

SAY: "Let's look at some animals and see more about what THEY do to keep warm in the winter and cool in the summer!"

Read (5-8 minutes)

Book: *Animals in Fall/Animales en Otoño* by Martha E. H. Rustad

READ book (all or or some pages, as appropriate):

EMPHASIZE how some animals

- grow warmer coats in winter, shed the fur in the summer
- go somewhere warmer in winter, go somewhere cooler in summer
- hibernate in the ground or in a cave in winter, come out of the cave or spend time in the water in the summer



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- *(If there's time):* have fur that changes color to match their environment - ASK: "Why do you think they do this?"
- Connect these to what humans do (at least first 3!)
- *Be sure to ask questions that require more than 1-word answers, such as "How do you know?" or "Why?"*

Play (8-10 minutes)

Animal and Seasons Game

GIVE each child a picture of each animal

- a grizzly bear
- a monarch butterfly
- a snowshoe hare

ASK kids to hold up the picture for each animal, ask them to tell you what is the name of each animal

DEMONSTRATE what each animal does in the Fall and Winter (see below), and have kids practice acting it out with you

TELL CHILDREN

- When I hold up a picture, and say a season, all kids must do what that animal does in that season
- For example, in Fall, what does the Bear do? Eats a lot to store up energy for the winter. Kids walk around and pretend to pick up food and eat it.

ACT it out. Hold up a picture, let children act out what the animal does in fall, then winter. Go through 1-3 times, depending on interest.

- Grizzly bears - have all kids hold up image
 - Fall: eat a lot to get ready for winter
 - Winter: Have bears curl up on the floor (or put hands up to face and pretend to sleep) - *hibernate* - until Spring
- Monarch butterflies - have all kids hold up image
 - Fall: butterflies flutter away (flap wings and fly away) when it's winter to a warmer place (migrate)
 - Winter: flap wings, live in warmer weather until spring
- Snowshoe hare - have all kids hold up image
 - Fall: They start to grow heavy coats (have kids touch their arms and bellies, to show growing thick fur), and change color to match the snow
 - Winter: keep on hopping - because they don't hibernate or migrate!

Read (5-8 minutes)

Book: *Frederick*, by Leo Leoni

READ book

ASK how the mice prepare for winter

- Gather food

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- Gather materials to keep their homes warm when it's cold outside
- What is Frederick gathering? What did he share in the winter?
- *Be sure to ask questions that require more than 1-word answers, such as "How do you know?" or "Why?"*

Read (5-8 minutes)

Book: *Animals Should Definitely Not Wear Clothing*, by Judi Barrett

- READ This is a cute, silly book of animals trying to wear clothes, and how it doesn't really work for animals to wear clothing
- We can emphasize that it's silly, because they don't really wear clothes, but they have their own way to keep warm!
- *Be sure to ask questions that require more than 1-word answers, such as "How do you know?" or "Why?"*

Create (15-20 minutes)

Note: Have enough sets for all kids to do all activities. They can choose one or more of these to do.

- 1) Children can create winter and summer animal scenes
 - Use images of the animals in winter and in summer
 - Children make a scene with an animal from summer on one side and the same animal from winter on the other
- 2) Children can make their own animal mask or wings
 4. Using pre-cut thick paper (or parents can help) or paper plates and piece of string or popsicle sticks to decorate and take home one of the following:
 5. Bear mask, snowshoe hare mask, or monarch wings
 6. Can do one side brown, one side white for hare; one side of brown bear with eyes open, one with eyes closed



Parents/Teachers/Facilitators

Can help children:

- remember what the animals do in each season
- Find the correct side to put each animal
- Glue the pictures together
- Make masks

ADDITIONAL IDEAS

CREATE activities:

- Create puppets with animals on each side



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- Glue the pictures of each together on the top of a popsicle stick

BOOK activity:

READ *Animals in Fall*

ASK: "Where do animals get food in the summer?"

SHOW: Picture with animals eating:

7. Grass and fruit from trees (groundhog)
8. Catch fish in the stream (bear)
9. Nectar from flower (butterfly)

ASK: "When it is cold outside, where do animals get food?"

10. Some have to store up food - like in a pantry!
11. Some eat a lot before winter and don't need a lot when they are hibernating
12. Some have to dig in the snow or cold ground!

Song (Optional)

- a. SING the song: Grey Squirrel / La Ardilla, and kids act out each part of the song
- b. Sing song through about 3 times; kids could do motions faster each time

Grey Squirrel

Grey Squirrel, grey Squirrel,
Swish your bushy tail.
Grey squirrel, Grey squirrel,
Swish your bushy tail.

You search for acorns all around,
Then you hide the ones you've found.
When the snow is on the ground,

You're eating acorns by the pound.

Repeat Chorus

The coat you grow so thick and warm
Protects you in a winter storm.
We think that you are really smart-
We have to buy ours at K-Mart!

Repeat Chorus

La Ardilla (dif. Music - Mex. Hat dance)

En Otoño la ardilla trabaja
Buscando y juntando bellotas
Corriendo se sube y se baja
Moviendo su cola grandota

HANDOUTS FOR PARENTS/TEACHERS

HANDOUT has:

- Ideas for related activities to do at home
- Key vocabulary in English and Spanish

REFERENCES/SOURCES

- Kim Brenneman - *Animals Should Definitely Not Wear Clothing* book idea
- Linda Stork - *La Ardilla and Grey Squirrel* song ideas
- Thanks to Chelsea Woods, Sharon Rawlins, Mia Cabana, and Linda Stork for additional book ideas
- MASST began and was substantially developed at NIEER (www.nieer.org)
- **Thank you** to funders, including Rutgers University Community-University Research Partnership Grant program and Research Council Grant programs; PSEG Foundation's Spark initiative; Target Educational Grants program; New Jersey State Libraries; New York State Libraries; and ETSU's RDC Large Grants program



Session 5

WHAT'S NEXT: RED FISH, BLUE FISH,
REDFISH, BLUE FISH...?
(Math: Patterns)

¿QUÉ SIGUE DESPUÉS: PEZ ROJO, PEZ
AZUL, PEZ ROJO, PEZ AZUL...?
(Matemáticas: Patrones)



Session 5 - WHAT'S NEXT: RED FISH, BLUE FISH, REDFISH, BLUE FISH...? (Math: Patterns)

Sesión 5 - ¿QUÉ SIGUE DESPUÉS: PEZ ROJO, PEZ AZUL, PEZ ROJO, PEZ AZUL...? (Matemáticas: Patrones)

OVERVIEW
<p>Summary</p> <p>In “What’s Next: Red Fish, Blue Fish, Red Fish, Blue Fish...?” children explore the basics of repeating patterns in the context of books, activities, and songs about fish. Children identify the part of a pattern that repeats, and look for and make different kinds of patterns (e.g., ABAB; AABBAABB).</p> <p>Topics</p> <ul style="list-style-type: none"> • Patterns • Repeating, core unit <p>Objectives</p> <ul style="list-style-type: none"> • Learn/review that a pattern is something that repeats • Learn/review that the part that repeats in a pattern is a core unit (so, the AB is the part that repeats in this pattern: ABABAB. When asking what comes next, the answer should be “AB”, not just “A”) • Practice finding patterns and finding core units in various types of patterns (e.g., ABAB, AABAAB) • Explore different types of patterns (sound, color, movement), and extending patterns (if appropriate) • Apply knowledge of patterns to make pattern with beads
STANDARDS & BACKGROUND
<p>NJ Preschool Teaching and Learning Standard (2014)</p> <p>Standard 4.3: Children begin to conceptualize measurable attributes of objects. Preschool Learning Outcome 4.3.1. “Sort, order, pattern, and classify objects by non-measurable (e.g., color, texture, type of material) and measurable attributes”</p> <p>NJ Early Childhood Education Standard(s)</p> <p>EXPECTATION 1: Children understand patterns, relationships and classification.</p> <ul style="list-style-type: none"> • Create a simple pattern and ask children to repeat or insert missing elements (e.g., “I made a pattern in my tower: red block, blue block, red block, blue block. What color block should go next?”). (Preschool Teaching Practice) <ul style="list-style-type: none"> ○ Call attention to patterns in the environment, including visual and non-visual patterns (e.g., stripes on a child’s shirt, flowers outside, songs and chants). (Preschool Teaching Practice) <p>EXPECTATION 4: Children develop knowledge of sequence and temporal awareness.</p> <ul style="list-style-type: none"> • Preschool Learning Outcome 4.2 <ul style="list-style-type: none"> ○ Describes the sequence of the daily routine and demonstrates understanding of basic temporal relations (e.g., “We will go outside after snack time.”).
<p>Background</p> <ul style="list-style-type: none"> • Matching patterns (“Which two pictures have the same pattern?”) is easier than extending (“What comes next?”) or creating one’s own pattern. • When asked “What comes next?” in a pattern, we identify the entire core unit (eg: AB in an ABAB patter) not just A.



Session 5 - WHAT'S NEXT: RED FISH, BLUE FISH, REDFISH, BLUE FISH...? (Math: Patterns)

Sesión 5 - ¿QUÉ SIGUE DESPUÉS: PEZ ROJO, PEZ AZUL, PEZ ROJO, PEZ AZUL...?
(Matemáticas: Patrones)

<ul style="list-style-type: none"> Learning what part of a pattern is the repeating part (i.e., the core unit) teaches children to look for rules in mathematical thinking and can lay the foundation for later algebra. 		
TEACHING TIPS		
<p>Strategies for Children</p> <ul style="list-style-type: none"> Many children are not able to identify the core unit of a pattern (Which part repeats in an ABAB pattern? AB.) Do activities with children that ask them to fill in the entire core unit in “What comes next?” problems. For example, what comes next: ABAB__? The answer should be AB, not just A. <u>BE SURE to ask questions that require more than 1-word answers, such as “How do you know?” or “Why?”</u> 		
<p>Differentiation</p> <ul style="list-style-type: none"> If children need a challenge <ul style="list-style-type: none"> Give them more complex patterns to work with (e.g., ABCABC) Ask them to abstract patterns: What does an ABCABC pattern look like with the color cubes? (e.g., red, blue, green, red, blue, green) Encourage children to extend patterns If children have difficulties doing the tasks as written <ul style="list-style-type: none"> Focus on just one or two pattern types Use a variety of ways to illustrate the one or two focal patterns (e.g., ABAB) - clapping, colors, animals, etc. 		
MATERIALS		
<p><i>General Materials</i></p> <p>Books Key words in Spanish/English Family handouts</p>	<p><i>Materials Specific to Session</i></p> <p>Beads (fish, if possible) String Fish cutouts (blue and red)</p>	<p><i>Optional Materials</i></p> <p>Markers and crayons Sign in sheet Computer/Speakers Stickers to make patterns Construction paper</p>
<p>Books</p> <ul style="list-style-type: none"> <i>A-B-A-B-A – a Book of Pattern Play</i>, by Brian P. Cleary <i>Pattern Fish</i>, by Trudy Harris (Spanish translation, if available) <i>One Fish, Two Fish, Red Fish, Blue Fish/Un Pez, Dos Peces, Pez Rojo, Pez Azul</i>, by Dr. Seuss <p>Alternative Books</p> <ul style="list-style-type: none"> <i>Muchas, Muchisimas Rayas de Cebra/Lots And Lots Of Zebra Stripes</i>, by Stephen R. Swinburne <i>Stripes of All Types / Rayas de Todas Las Tallas</i>, By Susan Stockdale <i>Marisol McDonald Doesn't Match/Marisol McDonald No Combina</i>, by Monica Brown and Sara Palacios <i>Healthy Foods from A to Z: Comida sana de la A a la Z</i>, by Renee Comet <i>Hairs/Pelitos</i>, by Sandra Cisneros and Terry Ybanez <i>Pattern Bugs</i>, by Trudy Harris <i>Max Found Two Sticks</i>, by Brian Pinkney <i>Jonathan and His Mommy</i>, by Irene Smalls <i>Stripes, Spots or Diamonds</i>, by Patricia M. Strickland <i>Largos, Cortos y Pequeños: Un Libro de Animales Opuestos</i>, by Lisa Bullard <i>The Little Red Hen</i>, by Margot Semach <i>Tortillas and Lullabies/Tortillas y Cancioncitas</i>, by Lynn Reiser and Corazones Valientes 		



Session 5 - WHAT'S NEXT: RED FISH, BLUE FISH, REDFISH, BLUE FISH...? (Math: Patterns)

Sesión 5 - ¿QUÉ SIGUE DESPUÉS: PEZ ROJO, PEZ AZUL, PEZ ROJO, PEZ AZUL...?
(Matemáticas: Patrones)

- *Growing Patterns*, by Sarah C. Campbell
- *Teddy Bear Patterns*, by Barbara McGrath

INSTRUCTIONS

Introduce (5-8 minutes)

SAY: "Today, we'll talk about PATTERNS!"

- Does anyone know how to say patterns in Spanish? Patrones.

ASK: "Does anyone know what is a pattern?"

- Allow children to give their definitions.
- SAY: A pattern is something that repeats
 - Explain "repeat", if kids don't know
 - Use examples
 - Find a pattern in the room, on someone's shirt as an example. If there is a shirt with blue-red stripes, the core unit is blue-red. The pattern is blue-red, blue-red, blue-red.
 - Show a geometric pattern (triangle-square-triangle-square) using shape tiles or magnets
 - Or, bring in objects that have different types of patterns to show!
- There are different kinds of patterns
- They all have a "core unit", which is the part that repeats (for a younger group, it is ok to ask kids "what is the part that repeats?", rather than using the "core unit" terminology)
- So, in an ABAB pattern, the 'AB' is the core unit. So, if you see a pattern that has ABAB, and you are asked what is next? The answer is AB! Because the whole chunk or core unit is what is repeating. (Only use with children who already had experience with patterns)

Differentiation

If children know patterns and core units

- Challenge them to **extend** patterns
- Give them more difficult patterns to try (e.g., AAB, or ABC)

If children are younger

- Have children focus on **copying** existing patterns
- Ask them to identify the core unit in simple patterns

Read (5 minutes)

Book: *Book of Pattern Play*, by Brian P. Cleary

READ pages 4-18: A-B-A-B-A

- This is a nice rhyming introduction of patterns
- Ask children to tell you what is next on some of the pages
- If there is time and interest, kids can tell you what patterns they see on pages 30&31.

Move (5-8 minutes)

Let's Make Patterns

SAY: "Let's make different patterns".

- This activity can be as long or short as there is interest and time for. Physically making patterns is a great way to learn about them, so try different patterns if kids can do it!



Session 5 - WHAT'S NEXT: RED FISH, BLUE FISH, REDFISH, BLUE FISH...? (Math: Patterns)

Sesión 5 - ¿QUÉ SIGUE DESPUÉS: PEZ ROJO, PEZ AZUL, PEZ ROJO, PEZ AZUL...?
(Matemáticas: Patrones)

- Directions: Decide how you will make patterns. Model the pattern, and have children follow. After a few examples, have children take turns leading by making up the pattern for the group to do.
- We said there are different types of patterns - let's try to make a few.
 - Children (e.g.: long hair, short hair, long hair, short hair)
 - movement (e.g.: clap, stamp; clap, stamp)
 - sound (e.g.: beep, beep, honk; beep, beep, honk)
 - colors (e.g.: blue, white; blue, white)
- When asking what comes next, try to emphasize the core unit that is repeating - so in the sound example, the core unit that repeats is 'beep, beep, honk'

Read (5-10 minutes)

Book: *Pattern Fish* by Trudy Harris

READ the whole book

- Be sure to emphasize the CORE UNIT in patterns - the whole bit that repeats
- The core unit is spread across two pages in this book, but that's ok. You can still ask what part repeats? For example, on the first page, the fish is yellow-black, yellow-black, yellow...and kids have to say black. If appropriate, you flip back and ask, what part repeated?? Yellow-black!
- As always, be sure to ask questions such as "How do you know?" or "Why?"

Sing (3-5 minutes)

Sing and Move

SING and ACT OUT either song, or both

ASK what part of the songs is repeating when singing it through the first time. Repeat if interest.

Head To Shoulders, Baby (CHANT)

Head to shoulders, baby, 1,2,3 (touch head, then shoulders, clap 1,2,3)

Head to shoulders, baby, 1,2,3

Head to shoulders, head to shoulders,

Head to shoulders, baby, 1,2,3

Repeat with knees to ankles

(The other verses do not have AB pattern)

Shape Pattern Song (tune of HEAD, SHOULDERS, KNEES & TOES)

(recommended to be written as a rebus song on chart paper)

Circle, square, and triangle, triangle.

Circle, square, and triangle, triangle.

Heart and star and rectangle,

Circle, square, and triangle, triangle.

Read (5-10 minutes)

Book: *One Fish, Two Fish, Red Fish, Blue Fish/Un Pez, Dos Peces, Pez Rojo, Pez Azul*, by Dr. Seuss

READ up to page 13

- *Although this book does not have patterns explicitly, parents and/or teachers can see how to use books to extend STEM learning even when they don't explicitly address the topic in the text*

Session 5 - WHAT'S NEXT: RED FISH, BLUE FISH, REDFISH, BLUE FISH...? (Math: Patterns)

Sesión 5 - ¿QUÉ SIGUE DESPUÉS: PEZ ROJO, PEZ AZUL, PEZ ROJO, PEZ AZUL...?
(Matemáticas: Patrones)

- Ask children if there was a pattern.
 - The words rhymed, but the fish didn't repeat.
 - Can we make a pattern with fish from the book?

Move (5-8 minutes)

Fish Patterns

SAY: "Let's make patterns with fish, using fish from the book".

- Use large full-page fish printouts, like those on the first page (e.g., red and blue)
- Give each child a red and blue fish
- Start by laying down a red then blue fish on the floor. Ask children what comes next? RED and BLUE comes next (not only red)!
- Let each child come up and lay down their fish and say the pattern out loud together

Create (15-25 minutes)

Making Patterns

Note: This activity needs to be closely supervised, and/or limited to 2 elements.

Have children pick 2 colors of beads or kinds of stickers and then get them started by doing a core unit (or 2!) together. Then support children as they make the pattern repeat.

- 1) Make patterns using beads
 - Children first make a pattern with the beads or stickers
 - Then, they use beads to make a necklace, bracelet, or key ring with a pattern
- 2) Make a pattern on construction paper with fish/animal stickers or drawings.
 - Draw your own pattern on paper
 - What is a pattern?
Has parts that repeat.
 - What part of a pattern repeats?
The core unit.

Parents/Teachers/Facilitators

- Help children check to make sure they're actually making repeating patterns.
- Reinforce the concept by asking children what is the part that is repeating

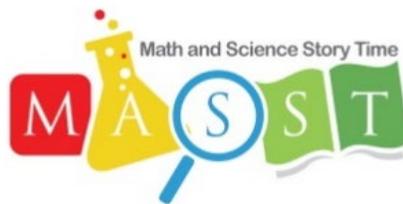




Session 5 - WHAT'S NEXT: RED FISH, BLUE FISH, REDFISH, BLUE FISH...? (Math: Patterns)

Sesión 5 - ¿QUÉ SIGUE DESPUÉS: PEZ ROJO, PEZ AZUL, PEZ ROJO, PEZ AZUL...?
(Matemáticas: Patrones)

HANDOUTS FOR PARENTS/TEACHERS
<ul style="list-style-type: none">• Activity ideas• Key words in Spanish and English
REFERENCES/SOURCES
<ul style="list-style-type: none">• Linda Stork - song and chant ideas. Chelsea Woods, Sharon Rawlins, and Linda Stork for additional book ideas• <i>Learning and Teaching Early Math: The Learning Trajectories Approach</i>, by Doug Clements & Julie Sarama, introduction/development/background• MASST began and was substantially developed at NIEER (www.nieer.org)• Thank you to funders, including Rutgers University Community-University Research Partnership Grant program and Research Council Grant programs; PSEG Foundation's Spark initiative; Target Educational Grants program; New Jersey State Libraries; New York State Libraries; and ETSU's RDC Large Grants program



Session 6

DO YOU SEE WHAT I SEE?
(Science: Senses)

¿USTED VE LO QUE VEO?
(Ciencia: Sentidos)



Session 6 - DO YOU SEE WHAT I SEE?

(Science: Senses)

Sesión 6- ¿USTED VE LO QUE VEO? (Ciencia: Sentidos)

OVERVIEW	
<p>Summary</p> <p>In “Do You See What I See?” children learn about the 5 senses and how to describe what they sense by reading books, playing games and doing activities in which they use different senses to figure out what’s in front of them.</p> <p>Topics</p> <ul style="list-style-type: none"> • 5 Senses - hearing, sight, smell, touch, and taste • Parts of body used for each sense <p>Objectives</p> <ul style="list-style-type: none"> • Talk about what are the senses • Learn/remember what part of the body is used for each • Learn some words to describe what you sense with each sense 	
STANDARDS & BACKGROUND	
<p>NJ Early Childhood Education Standard(s)</p> <p>EXPECTATION 1: Children listen with understanding to environmental sounds, directions and conversations.</p> <ul style="list-style-type: none"> • “Provide a variety of age appropriate, curriculum referenced listening activities including stories, songs, rhymes, chants and individual conversations.” (Preschool Teaching Practice) <p>EXPECTATION 2: Children converse effectively in their home language, English or sign language for a variety of purposes relating to real experiences and different audiences.</p> <ul style="list-style-type: none"> • “Engage in many individual and small-group conversations with children throughout the day (e.g., lunch-time, playground, while preparing for rest time), as well as during formal instructional time.” (Preschool Teaching Practice) • “Organize a variety of age appropriate, curriculum referenced activities that encourage oral language development (e.g., joining in pretend play, encouraging children to talk about their experiences in small groups, providing hands-on science activities)”. (Preschool Teaching Practice) • Preschool Learning Outcome 2.3. “Provide opportunities for children to converse with peers throughout the day and help children initiate the conversations.” <p>EXPECTATION 1: Children develop inquiry skills, including problem-solving and decision-making.</p> <ul style="list-style-type: none"> • “Provide a supportive classroom climate that will encourage children to develop inquiry skills, solve problems and make decisions as part of their daily activities both indoors and outdoors.” (Preschool Teaching Practice) • “Facilitate individual and small-group discussions about reflections and observations.” (Preschool Teaching Practice) <ul style="list-style-type: none"> ○ Preschool Learning Outcome 1.2 <ul style="list-style-type: none"> • “Makes observations (e.g., "Look, this tree has big, green leaves. That one has needles.").” 	
MATERIALS	
<p><i>General Materials Needed:</i></p> <p>Markers, crayons, tape, glue</p>	<p><i>Materials Specific to Session:</i></p> <p>Cups and tops, opaque bags, or small boxes for sensory experiences</p>



Session 6 - DO YOU SEE WHAT I SEE?

(Science: Senses)

Sesión 6- ¿USTED VE LO QUE VEO? (Ciencia: Sentidos)

Key words in Spanish and English Parent handouts Sign in sheet	Objects for listening activity (opaque bag, keys, wooden items, soft-sounding items) Objects for I Spy game (furry, soft, rough, smooth, bumpy, etc.) Materials for sensory experiences: food to taste (salty and sweet provided) smelly stuff, items to shake (like above)
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Books

- *Mis Cinco Sentidos*, by Alik

Books, continued

- *Listening Walk*, by Paul Showers
- *Polar Bear, Polar Bear, What Do You Hear?/Oso polar, oso polar, ¿qué es ese ruido? (Spanish Edition)*, by Bill Martin

Alternative Books

- *You Can't Taste A Pickle With Your Ear*, by Harriet Ziefert
- *My Five Senses*, by Margaret Miller
- *My Abuelita*, by Tony Johnston & Yuyi Morales
- *Jazz Baby*, by Lisa Wheeler & R. Gregory Christie
- *The Tiny Tortilla*, by Arlene L. Williams
- *Sense Suspense: A Guessing Game for the Five Senses*, by Bruce McMillan
- *My Cold Plum Lemon Pie Bluesy Mood*, by Tameka Fryer Brown
- *Rain*, by Manya Stojic
- *Nosy Rosie*, by Holly Keller

INSTRUCTIONS

Introduce (5 minutes)

SAY: Today, we'll talk about OUR SENSES. We'll read some books, do some activities, and play some games using our senses at the end.

ASK: What are the senses? How many are there?

- There are 5 [Hay 5]
 - They are hearing, sight, touch, taste, and smell.
 -

ASK: What body parts do we use for each sense?

Read (5 minutes)

Book: *Mis Cinco Sentidos*, by Alik

READ in Spanish

- If kids are ready, you can ask them what do they think the object on the page sounds, tastes, feels like?
 - For example, what would the airplane sound like?
- *Be sure to ask questions that require more than 1-word answers, such as "How do you know?" or "Why?"*



Session 6 - DO YOU SEE WHAT I SEE?

(Science: Senses)

Sesión 6- ¿USTED VE LO QUE VEO? (Ciencia: Sentidos)

Move (5-8 minutes)

I Spy - TOUCH Game

Play in Spanish and English, if possible

SAY: Has everyone played I SPY? We're going to play, but it's going to be a little different. We're going to play it with SIGHT and TOUCH!

- I will use words like this.
 - rough [*áspero*] - Object(s): Sand paper, carpet.
 - smooth [*liso*] - Object(s): Surface of tables, book covers, smooth stone
 - bumpy [*desigual/con baches*] - Objects: Keyboard, Legos, rocks, pinecones, shells
 - furry [*peludo*] - Object(s): Stuffed animals
 - soft [*suave*] - Object(s): Shirt, scarf
 - pointy [*puntiagudo/con puntas*] - Object(s)- Corner of books, triangle blocks
- If I say, I spy something smooth, you have to find something smooth! You have to look around with your EYES, and maybe you have to get up and TOUCH it to check that it's smooth (like the table!)

Read (8 minutes)

Book: *Listening Walk*, by Paul Showers

READ book

- This book is very cute and encourages children to listen carefully to see what they can hear
- At the end, suggest that children listen carefully and tell you what they hear in the room. They could also try it on the way home or at home with their parents.
- *Be sure to ask questions that require more than 1-word answers, such as "How do you know?" or "Why?"*

Play (5-8 minutes)

Do you hear what I hear? (based on *Listening Walk*)

PLAY in Spanish and English, if possible

SAY: In the *Listening Walk*, what did the girl do? She walked around quietly and listened! What did she hear?" (if needed, remind them of some of the objects she heard)

- I have some objects in my bag. I'm going to ask you to tell me what you think they are but you won't be able to see them.
- Can you guess how you will know what they are? (BY LISTENING!)
- Ready?
 - SHAKE your bag and ask kids to guess
 - ASK: "Why do you think it's a [...]?" What makes you think that? Does it sound heavy? Loud? Maybe it's made of metal?"

Read (8 minutes)

Book: *Polar Bear, Polar Bear, What Do You Hear?/Oso polar, oso polar, ¿qué es ese ruido? (Spanish Edition)*, by Bill Martin

READ in Spanish if possible

- Link to other activities from the session, as appropriate

Session 6 - DO YOU SEE WHAT I SEE?

(Science: Senses)

Sesión 6- ¿USTED VE LO QUE VEO? (Ciencia: Sentidos)

Create/Explore (20-30 minutes)

Senses detectives

Note: At least one adult will need to supervise each station.

More than one sense can be at each station, or you can focus on the 3 senses not explored (smell, taste, sight) during the *move* activities above. Children can rotate among the stations.

1. Children visit each table to do a game with a sense. Equally distribute children across stations.
 - Smell (4 opaque containers, 4 different smelling objects)
 - There will be 4 closed jars with different smelling objects (orange peel, soil/flowers, vinegar, coffee)
 - Kids must describe what they smell (What does it smell like? Sweet? Fruity? Does it remind you of anything? Do you like the smell?)
 - Then, they will guess what they think it is, or match it to the picture (if scaffolding needed)
 - Taste (4 types of foods, blindfolds) Note: Check that parents are aware that children will be eating here, check for allergies.
 - Kids will get to taste test (no peeking!) 2-4 foods
 - They have to describe what they taste, and take a guess about what it is
 - Kids can check whether they were right, then pick a salty or a sweet snack
 - Sight (Play I Spy)
 - Ask children to look carefully with their eyes to figure out an object in the room
 - Describe objects that children can see by properties such as color, size, location
 - Ask children if they could have found the object with their ears instead of eyes. Why or why not?

Note: The two below replicate activities done during the session. They are optional at the end.

- Hearing (4 opaque containers, 4 different objects)
 - There will be 4 closed containers with different objects
 - Kids must decide what they hear, describe it, then open it up to check
- Touch (different objects, at least 2 feely boxes or 2 opaque bags)
 - There will be a box with a hole. Kids put their hands in, not look, and guess what they feel (put in objects with different textures, etc.).
 - They should describe what they feel before they pull it out (Is it pointy? Furry? What shape? Smooth? Hard?) *¿Es puntiagudo, peludo, que forma tiene, duro?*
 - Once they have a guess, they pull their hands out to check, then put object back in



Session 6 - DO YOU SEE WHAT I SEE?

(Science: Senses)

Sesión 6- ¿USTED VE LO QUE VEO? (Ciencia: Sentidos)

2) Children draw or color

- Option 1: Draw a sense organ (e.g., ear) and what they sensed with that sense today (e.g., presenter reading, cars honking, etc.)
- Option 2: Divide a page into 5 sections and have children draw something they sensed with each sense today

Parents/Teachers/Facilitators

Can help children to:

- Describe in detail what they're sensing or what something they know looks or sounds like
- Use descriptive words like fuzzy, soft, loud, hard, prickly to describe what they sense
- Practice careful listening while being read to or exploring the environment
- See the connection between each sense organ and what it can tell you about what you observe (e.g., you can sometimes hear quantity with your ears! Is there more than one coin in the jar?)



HANDOUTS FOR PARENTS/TEACHERS

- Ideas for related activities to do at home
- Key vocabulary in English and Spanish

REFERENCES/SOURCES

- Connect4Learning/Kim Brenneman - *Listening Walk* book idea
- Thanks to Chelsea Woods, Sharon Rawlins, and Linda Stork for additional book ideas
- MASST began and was substantially developed at NIEER (www.nieer.org)
- **Thank you** to funders, including Rutgers University Community-University Research Partnership Grant program and Research Council Grant programs; PSEG Foundation's Spark initiative; Target Educational Grants program; New Jersey State Libraries; New York State Libraries; and ETSU's RDC Large Grants program



Session 7

ARE YOU TALLER THAN A TIGER?
(Math: Measurement)

¿ESTAS MÁS ALTO QUE UN TIGRE?
(Matemáticas: Medida)



Session 7 - ARE YOU TALLER THAN A TIGER?

(Math: Measurement)

Sesión 7 - ¿ESTAS MÁS ALTO QUE UN TIGRE? (Matemáticas: Medida)

OVERVIEW	
<p>Summary</p> <p>The “Are You Taller Than a Tiger?” session focuses on the basics of length measurement. Children listen to books and do hands-on activities to apply these ideas. Children compare their own hand to the hand of a gorilla in <i>Actual Size</i>, and make objects out of play dough of different lengths.</p> <p>Topics</p> <ul style="list-style-type: none"> • Measurement - different kids • Focus on length measurement <p>Objectives</p> <ul style="list-style-type: none"> • Talk about what is measurement • Practice comparing lengths, measuring objects 	
STANDARDS & BACKGROUND	
<p>NJ Early Childhood Education Standard(s)</p> <p>EXPECTATION 1: Children develop knowledge of spatial concepts, e.g., shapes and measurement</p> <ul style="list-style-type: none"> • Provide standard and nonstandard measurement materials both indoors and outdoors (e.g., unit blocks, inch cubes, rulers, cups, buckets, balance scales, water and sand tables, etc.). • Preschool Learning Outcome 2.2 • Uses standard and nonstandard measurement units (e.g., measuring body length with unifix cubes, using a tape measure to gauge height of block construction, counting the number of cups it takes to fill a bucket with water). 	
MATERIALS	
<p><i>General Materials Needed:</i></p> <p>Markers, crayons, tape, glue Computer/speakers Construction paper/other paper Key words in Spanish and English Parent handouts Sign in sheet</p>	<p><i>Materials Specific to Session:</i></p> <p>1 inch squares or cubes Sheets with inch-long increments (at least 1 foot long) Ruler, measuring tape, etc. Poster or cutout of tiger (accurately measured) Play dough</p>
<p>Books</p> <ul style="list-style-type: none"> • <i>Vamos A Encontrar Lo Mas Corto y Lo Mas Largo (Finding Shortest and Longest)</i>, by Amy Rauen • <i>Actual Size/Tamano Real</i>, by Steve Jenkins • <i>Inch by Inch</i>, by Leo Lionni <p>Alternative Books</p> <ul style="list-style-type: none"> • <i>Am I small? Soy Pequeño?: Children's Picture Book English-Spanish (Bilingual Edition)</i>, by Philipp Winterberg and Nadja Wichmann • <i>Perro Grande... Perro Pequeño / Big Dog... Little Dog</i>, by P. D. Eastman • <i>How Tall, How Short, How Faraway</i>, by David Adler • <i>The Librarian Who Measured the Earth</i>, by Kathryn Lasky • <i>Measuring Penny</i>, by Loreen Leedy 	



Session 7 - ARE YOU TALLER THAN A TIGER?

(Math: Measurement)

Sesión 7 - ¿ESTAS MÁS ALTO QUE UN TIGRE? (Matemáticas: Medida)

- *Great Estimations*, by Bruce Goldstone
- *Millions to Measure*, by David Schwartz
- *Cook-A-Doodle-Do*, by Janet Stevens
- *Millions, Billions, and Trillions*, by David Adler

INSTRUCTIONS

Introduce (10 minutes)

SAY: Today, we'll talk about MEASUREMENT. We'll read some books, do some activities, and do an art project at the end.

SAY: Today, we want to find out 'Are You Taller Than a Tiger?' How can we find out the answer?

- We need to know how tall is a tiger. Adult males can be as tall as 4 feet (SHOW poster or cut out) from their feet to their shoulders.
- We need to compare how tall you are to how tall a tiger is
- We can use MEASUREMENT to help

ASK: Does anyone know what is measurement?

- It can tell us how long, how short, how heavy, how hot it is!
- We can measure length (how long, how tall, or how short), weight (how heavy or light), or even temperature (how hot or cold)!

SAY: Today, we're going to talk about measuring length.

- Remember what that is? Right, how long, tall, or short something is.
- Let's create a movement to help us remember! Everyone standing: LONG (arms all the way out), TALL (arms all the way up), SHORT (crouch down)

SAY: We can compare the lengths of things to see which one is the longest or tallest.

- Ask a few children to stand next to the poster as you hold it up (you can also lay it down and have the child lay down). Discuss if they are taller or shorter than a tiger!
- We have to line up one end, and then look at the other end. This is a FAIR comparison.
- If we don't line up one end, is it fair? (Show a child lying next to tiger poster, but not lining up one end)
- Measure the rest of the children, or tell them they can do it with their parents later, depending on time.

Optional Extension

- We measured if we are as TALL as a tiger...what about finding out if we are as LONG as a tiger?
- Lay down poster of length of tiger to compare. From nose to tail, a FEMALE tiger can be as long as 9 FEET LONG! Is that longer or shorter than us? Than children? Than adults? HOW CAN WE FIND OUT?

Read (8 minutes)

Book: *Vamos A Encontrar Lo Mas Corto y Lo Mas Largo (Finding Shortest and Longest)*, by P.D. Eastman

READ in Spanish

- Give kids a chance to tell you which one is longest, shortest, medium
- After you're done, you can say "I wonder if my hand is longer or shorter than this book. How can I find out?"



Session 7 - ARE YOU TALLER THAN A TIGER?

(Math: Measurement)

Sesión 7 - ¿ESTAS MÁS ALTO QUE UN TIGRE? (Matemáticas: Medida)

Move (5 minutes)

Who is Taller?

SAY: We're going to play a game where we compare the lengths of things.

- We can compare the lengths of things. We can see which one is the longest or tallest, which are longer, taller, or shorter, or if two things are the SAME length.
- Bring up two children and have the shorter one stand on a chair. Have the other child stand next to him.
 - ASK kids if the child on the chair is taller. Why or why not? Is this a FAIR measurement?
 - Help them see that to COMPARE lengths of two objects, you must LINE UP one end of the objects, in this case the children's feet.
 - How can we fix it? Try again with both kids on the ground. Now, which one is taller?

SAY: Now we'll compare the lengths of other things.

- Let's see who has the shortest foot! How can we check? Try it with someone sitting next to you. REMEMBER that you have to line up one end (on the floor is easiest!)
- Ask whose hand is bigger, yours or your mother's, sister's, brother's? Let kids go to family members and compare lengths of their hands. Remember to line up the hands at the palms and look at the fingers to compare!

Read (8 minutes)

Book: Actual Size/Tamaño Real, by Steve Jenkins

READ in Spanish

- Show kids the cover and tell them that this book shows them the REAL size of REAL animals and animal parts
 - Read the book
 - During reading, let kids compare their parts to these animal parts
 - Remind kids to line up one end of each object and look at the other end to compare!

Discuss & Do (5 minutes)

Measuring Tools

SAY: When we want to know HOW TALL, LONG, or SHORT something is, how can we measure it?

- Ruler
- Measuring tape (show cover of Dog book)
- Something else - like inch blocks!

SAY: Rulers have little lines on them. Do you know what they are? The lines on this ruler measure things in INCHES.

- Between each big line is AN INCH!
- An INCH is THIS LONG!
- SHOW other things that are an INCH long (like the inch blocks, fish bead, an example play dough creation)

SAY: Now, I want you to try to measure your hand with the inch cubes/squares. This is how you do it". (Show them by measuring one child's hand, how you start at one end, end at the other, put them right next to each other [no spaces]).

- SAY: "Now, you try it!"
- Measure your hand. How many inches long is it?

Session 7 - ARE YOU TALLER THAN A TIGER?

(Math: Measurement)

Sesión 7 - ¿ESTAS MÁS ALTO QUE UN TIGRE? (Matemáticas: Medida)

- IF NEEDED, younger children can try to put them next to the foot with help from parents

Read (5 minutes)

Book: *Inch by Inch*, by Leo Lionni

READ in English

- Show kids the cover and tell them the worm on the cover is called an Inch Worm.
- ASK if anyone knows why he is called an Inch Worm? Right - because he's an inch long!
- Read the book, and show how he measures with your fingers (one inch, then another one next to it, and so on)

Create (20-30 minutes)

Make it, Measure it!

Children can practice measuring in this session. They can create something with play dough that is different lengths, compare their hands to different objects. Leave out the standard measuring tools (e.g., ruler) for children to explore if interested.

- 1) Older children try to make something that is 1-inch, 2-inches, 3- inches long with play dough.
 - Ideas can be from the book (toothbrush, shoe)
 - They can look at examples of items we make
 - They can use the inch cubes to help
- 2) Younger children try to make something that is longer, shorter, or the same size as their own hands.
 - First, they trace their hand on a piece of paper
 - Then, they make something that is the same length (or longer or shorter)
 - It could be their own hand!



Parents/Teachers/Facilitators

Can help children to:

- Discuss how they know something is taller, longer, etc., than something else
- Compare the size of their own hands to others'
- Measure correctly by putting units (e.g., inch units) end to end, with no spaces between, starting and stopping at each end of the object to be measured

HANDOUTS FOR PARENTS/TEACHERS

- Key vocabulary in English and Spanish
- Ideas for related activities to do at home

REFERENCES/SOURCES

- SciMath-DLL Project - *Actual Size* book idea



Session 7 - ARE YOU TALLER THAN A TIGER?

(Math: Measurement)

Sesión 7 - ¿ESTAS MÁS ALTO QUE UN TIGRE? (Matemáticas: Medida)

- Chelsea Woods, Sharon Rawlins, and Linda Stork for additional books, and LS for songs.
- *Learning and Teaching Early Math: The Learning Trajectories Approach*, by Doug Clements & Julie Sarama, introduction/development/background
- MASST began and was substantially developed at NIEER (www.nieer.org)
- **Thank you** to funders, including Rutgers University Community-University Research Partnership Grant program and Research Council Grant programs; PSEG Foundation's Spark initiative; Target Educational Grants program; New Jersey State Libraries; New York State Libraries; and ETSU's RDC Large Grants program



Session 8

WHY DO OUR FINGERS BEND?
(Science: Form and Function)

¿POR QUÉ NUESTROS DEDOS DOBLAN?
(Ciencia: Forma y función)

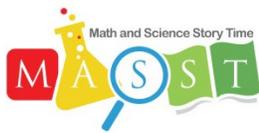


Session 8- WHY DO OUR FINGERS BEND?

(Science: Form and Function)

Sesión 8- ¿POR QUÉ NUESTROS DEDOS DOBLAN? (Ciencia: Forma y función)

OVERVIEW
<p>Summary</p> <p>“Why Do Our Fingers Bend?” helps children examine shape and form of objects, and how these relate to function. They read books, do activities and an art project comparing different types of tools and how each one’s form makes it well- or ill-suited for performing certain tasks.</p> <p>Topics</p> <ul style="list-style-type: none"> • Form and function • The form of objects relates to their function <p>Objectives</p> <ul style="list-style-type: none"> • Talk about what are the forms of things • Try out using objects of the wrong form to learn why form is important
STANDARDS & BACKGROUND
<p>NJ Early Childhood Education Standard(s)</p> <p>EXPECTATION 1: Children develop inquiry skills, including problem-solving and decision-making.</p> <ul style="list-style-type: none"> • Provide a supportive classroom climate that will encourage children to develop inquiry skills, solve problems and make decisions as part of their daily activities both indoors and outdoors. • Facilitate individual and small-group discussions about reflections and observations. <p>EXPECTATION 2: Children observe and investigate the properties of objects, both living and nonliving.</p> <ul style="list-style-type: none"> • Provide opportunities for children to investigate living and nonliving things in their natural environments (e.g., outdoor walks with appropriate supervision and guidance, field trips). • Compare and contrast living and nonliving objects regarding the capacity for self-directed movement, origins and capacity for growth and change. <p>EXPECTATION 3: Children explore the concept of change in both living and nonliving entities and in the environment.</p> <ul style="list-style-type: none"> • Develop activities that promote the measurement and recording of changes over time (e.g., measuring plant growth with rulers and recording changes on a classroom graph or in children's journals). • Provide short-term activities, such as color mixing or ice melting or to explore the concept of change. <p>EXPECTATION 4: Children develop an awareness of the environment and human responsibility for its care.</p> <ul style="list-style-type: none"> • Use classroom experiences to assist children in developing an awareness of environmental concerns (e.g., use recycling bins, use both sides of sheets of paper, turn off the faucets). • Model behaviors that show concern and respect for the environment (e.g., cleaning up indoors and outdoors, reusing materials for projects and other activities).



Session 8- WHY DO OUR FINGERS BEND?

(Science: Form and Function)

Sesión 8- ¿POR QUÉ NUESTROS DEDOS DOBLAN? (Ciencia: Forma y función)

MATERIALS	
<p><i>General Materials Needed:</i> Markers, crayons, tape, glue Computer/speakers Construction paper/other paper Key words in Spanish and English Parent handouts Sign in sheet</p>	<p><i>Materials Specific to Session:</i> Spoons, forks, and knives (plastic) Block Challenge Sheets Beads Rubber bands Legos Popsicle sticks</p>
<p>Books</p> <ul style="list-style-type: none"> • <i>Hands/Manos</i>, by Cynthia Klingel • <i>Spoon</i>, by Amy Krouse Rosenthal • <i>Do Whales Have Wings? A Book About Animal Bodies</i>, by Michael Dahl <p>Alternative Books</p> <ul style="list-style-type: none"> • <i>What Do You Do with a Tail Like This?</i>, by Steve Jenkins (paperback) • <i>Francisco's Kites / Las cometas de Francisco</i>, by Alicia Klepeis • <i>We Are Girls Who Love to Run/Somos Chicas y a Nosotras Nos Encanta Corer</i>, by Brianna K. Grant • <i>Flying Frogs and Walking Fish</i>, by Steve Jenkins and Robin Page • <i>Umbrella</i>, by Taro Yashima 	
INSTRUCTIONS	
Introduce (2 minutes)	
<p>SAY: Today, we'll talk about FORM AND FUNCTION! We will see how the shape and form of something is important for what it does!</p> <ul style="list-style-type: none"> • We'll read some books, do some activities, and do a project at the end. 	
Read (8 minutes)	
<u>Book: <i>Hands/Manos</i>, by Cynthia Klingel</u>	
<p>READ in Spanish, if possible</p> <ul style="list-style-type: none"> • ASK: What makes our hands goof for picking things up? • ASK: What makes hands good for clapping? 	
Discuss (10 minutes)	
<u>Using our Hands and Fingers</u>	
<p>ASK: "What do we use to pick things up?" OUR HANDS and FINGERS!</p> <ul style="list-style-type: none"> • Why are they good for picking things up? • You have fingers that close and bend around things, and you use your thumb to pinch things! • What if your fingers didn't bend? 	
Move (8 minutes)	
<u>Finger Splints Activity</u>	
<p>TAKE OUT finger splints. Have a few kids try out the finger splints on the pointer finger and thumb, then ask them try to pick up a handful of beads off the floor and put them in a cup.</p>	



Session 8- WHY DO OUR FINGERS BEND?

(Science: Form and Function)

Sesión 8- ¿POR QUÉ NUESTROS DEDOS DOBLAN? (Ciencia: Forma y función)

- You can also have them try to hold a crayon and write their name (or the first letter)

ASK: Is it hard?

- Why?
- So, **we need our fingers to bend** to pick things up. The shape and form of them is important to what they do!

OPTIONAL Book - *Do Whales Have Wings?: A Book About Animal Bodies*, by Michael Dahl (Read in English, if time allows)

- This book is about forms of body parts and how they're related to what the animals do.

Read (8 minutes)

Book: Spoon, by Amy Krouse Rosenthal

READ in English

- Point out how shape of Spoon helps it to do neat things that other utensils can't do
- Mention how the form of the other utensils makes them good for what they do.

Discuss (5 minutes)

Spoons and Forks

SAY: Now, we're going to do another activity where we try to pick things up - this time, not with our fingers and hands. We'll use a tool.

ASK: What is this? (SPOON)

- What is it for?
 - To eat! But what does it help us do? How does it help us eat?
 - Scoop things
 - Pick up things
- Why is it good for that?
 - The end is cupped
 - Has a handle
- What about this? (KNIFE)
 - It has a handle and we use it to eat - is it also good for scooping up things? What do you think will happen?
 - Not as good as a spoon. ASK: Why not?
 - What is it great for? (Cutting things.) Why?

SAY: "So, you see, the SHAPE and FORM of objects is important when thinking about the FUNCTION of it or WHAT YOU USE IT FOR.

Move (5 minutes)

Scoop It Up Activity

Divide kids into two groups

- One group uses spoons, one group uses forks (or knives, if they're child-safe)
- Put beads on floor and give a cup to each group
- When you say go, kids try to put all beads into cup using their tool (NOT their hands!)
- ASK: Which group finished first? Why did the spoon group finish first?

Create (15-20 minutes):

Note: There will be different challenges for different kids, depending on age and level

Session 8- WHY DO OUR FINGERS BEND?

(Science: Form and Function)

Sesión 8- ¿POR QUÉ NUESTROS DEDOS DOBLAN? (Ciencia: Forma y función)

Older children: Legos building challenges

1. Build something that can hold some beads. What shape should it be? What works well to hold beads? Why?
2. Build something that a ball can be rolled under or into - what parts does it need? How should it be shaped?
3. Build a spoon. What parts does it need? Why?



Younger children: Building blocks challenges

1. Build a house. What parts does it need? Why does it need walls? A door? A roof?
2. Build a fence for an animal. What do fences do? What parts do we need?
3. Build a garage for a car. What parts does it need?



Parents/Teachers/Facilitators

Can help children to:

- Think about the structure of things that allow them to perform tasks
- Discuss what form tools will need to accomplish a goal and why
- Build tools

HANDOUTS FOR PARENTS/TEACHERS

- Key vocabulary in English and Spanish
- Ideas for related activities to do at home

REFERENCES/SOURCES

- Kim Brenneman - *Spoon* book idea; split activity ideas
- Thanks to Chelsea Woods, Sharon Rawlins, and Linda Stork for additional book ideas
- MASST began and was substantially developed at NIEER (www.nieer.org)
- **Thank you** to funders, including Rutgers University Community-University Research Partnership Grant program and Research Council Grant programs; PSEG Foundation's Spark initiative; Target Educational Grants program; New Jersey State Libraries; New York State Libraries; and ETSU's RDC Large Grants program