

A Guide for Using
How Much Is a Million?
in the Pre-K Classroom
2009-2010



Ideas compiled by:

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Introduction

The 2009-2010 Pre-K book, *How Much Is a Million?*, was written and illustrated “to help young readers experience the awe of big numbers and to combat the increasingly evident problem of innumeracy” (excerpt from the book’s cover). This guide is a companion piece to the book to help early childhood educators build on and extend the learning beyond mathematical literacy.

The first part of this guide provides specific activities to enhance learning from the book and relates the activities to Georgia’s Pre-K Content Standards. The guide then includes activities on two topics introduced in the book – transportation and the solar system/space – thereby modeling how preschool teachers can take topics introduced in a book and extend learning across disciplines.

We hope this guide is a valuable resource and tool to enrich the teaching and learning that takes place in Georgia’s Pre-K Program classrooms in the 2009-2010 school year. If you have questions or comments about the contents or use of this guide, contact your Pre-K consultant.

About the Author – David M. Schwartz

David M. Schwartz grew up in the 1950’s and 60’s in New York City and Long Island, New York. He attended college at Cornell University where he majored in biology. Before he began writing children’s books, Schwartz had a long line of unusual occupations: elementary school teacher, lumberjack, carpenter’s assistant, veterinary assistant, journalist, writing instructor, college dean, and highway department worker. Schwartz wrote his first book, *How Much Is a Million?* in 1985 and since then has authored many more books focusing on his interests in plants, animals, and numbers.

Schwartz tours nationally and internationally inspiring educators and sharing his innovative teaching strategies for math and science. Schwartz lives in California with his wife and cats. When he is not writing or speaking, he enjoys cooking, gardening, biking, hiking, dancing, star gazing, and blogging about his life and interests in math and science.

Other Books by David M. Schwartz:

How Much Is a Million?

If You Hopped Like a Frog

G Is for Googol: A Math Alphabet Book

If You Made a Million

Millions to Measure

Q Is for Quark: A Science Alphabet Book

If Dogs Were Dinosaurs

On Beyond a Million: An Amazing Math Journey

Look Once, Look Again: Exploring Habitats (a 12-book science series)

Look Once, Look Again: Exploring Plants and Animals (a 12-book science series)

Life Cycles (a 12-book science series)

About the Illustrator – Steven Kellogg

Steven Kellogg was born in October 1941 in Connecticut. From a young age, Kellogg collected books and made up stories of his own. In 1959, Kellogg entered the Rhode Island School of Design, majoring in illustration, and was awarded a fellowship to study in Italy. Several years after graduating, Kellogg published the first of many children's books. The characters in some of his books are animals based on family pets, such as Pinkerton, a harlequin Great Dane, and Rose, a family cat. Kellogg also illustrated books of other children's authors. All told, Kellogg has authored or illustrated over 100 books. Kellogg is a recipient of the David McCord Citation and the Regina Medal for his contributions to children's literature. Kellogg is the vice president of the National Children's Book and Library Alliance, a national not-for-profit organization that advocates for literacy, literature, and libraries. Kellogg and his wife still live in New England.

Books Authored by Stephen Kellogg:

Can I Keep Him?
A Rose for Pinkerton
Pecos Bill
Jack and the Beanstalk
The Three Sillies
Pinkerton, Behave!
Paul Bunyan
Johnny Appleseed Big Book
A-Hunting We Will Go
Pinkerton and Friends: A Treasury of Eleven Stories

Books Illustrated by Stephen Kellogg:

Kisses and Fishes by Liesel Moak Skorpen
Awful Alexander by Judith Choate
The Most Delicious Camping Trip Ever by Alice Bach
The Day Jimmy's Boa Ate the Wash by Trinka Noble
Englebert the Elephant by Tom Paxton
Liverwurst Is Missing by Mercer Mayer
Parents in the Pigpen, Pigs in the Tub by Amy Ehrlich
Frogs Jump! A Counting Book by Alan Brooks
Is Your Mama a Llama? by Deborah Guarino
Ready! Set! Measure! Climb Aboard! by David M. Schwartz

Tips for Reading *How Much Is a Million?* Aloud



The process of learning to read begins when a child looks at books and when she is read to regularly. Research shows that reading aloud to children is the best way to prepare them for learning to read. Reading aloud to children helps them acquire knowledge and skills they will need to be successful in later life situations. It is the single most important activity for building knowledge. Following are some reading aloud strategies to help you provide a successful reading experience for young children.

Prepare and plan

- Think about your children's developmental levels, interests, and current topics of study.
- Think about what you want the children to learn.
- Make sure children are comfortable.
- Read aloud to children frequently (three to four times daily).
- Read in small groups, large groups, and individually.
- Establish regular reading times.
- Become familiar with the author by gathering background information.

Before you read a story

- Preview the book before you read it to children.
- Prepare questions to ask before, during, and after the story.
- Spark children's interest in the book.
- Show the cover and read the title and author of the book.
- Suggest things the children can look or listen for during the story.
- Ask some or all of the following questions:
 - What do you think this book is about? Why?
 - Where do you think the story takes place? How do you know?
 - What do you think will happen in the book?

During a story

- Be enthusiastic: Be excited, and your emotions will transfer to the children.
- Change your voice and facial expressions.
- Speak slowly so children can build mental pictures of what you read.
- Repeat interesting words and rhymes.
- Show the illustrations to the children.
- Move your finger under the words as you read them.
- Help children understand more words and explain the meaning of new words.
- Allow children to ask questions or make comments.

After you read a story

- Ask children questions about the story. For example, ask some or all of the following:
 - What is the title of the story?
 - Who is the author? Illustrator?
 - Where does the story take place?
 - Who is the most important character? Why?
 - What is the problem or conflict in the story? How is it solved?
 - Does this book remind you of another book? Why?
 - How did the story make you feel?
 - Predict a new ending to the story.
 - Has anything that takes place in the story ever happened to you?
 - What is your favorite part of the story? Why?
 - What didn't you like about the story? Why?
- Extend the story with an activity or another book:
 - Dramatize the story by using puppets.
 - Draw a picture of your favorite part of the story.
 - Use manipulatives related to the story for math and science activities.
 - Plan a cooking activity.
 - Read other books that reinforce the subject of the story.
 - Read other books by the same author.
 - Sing a song related to the book.



Pre-K Content Standards and Sample Activities Related to *How Much Is a Million?*

LD 1 d: Listens to stories read aloud and shows understanding.

- Basic read-aloud of the book to the class
- Listens attentively; responds to teacher's questions

LD 1 e: Begins to distinguish fact from fiction in a read-aloud text.

- Teacher asks students if certain parts of the book could really happen ... could they all stand on each other's shoulders? Could they have a goldfish bowl as big as a whale?

LD 1 f: Makes predictions from pictures and titles.

- What can children tell about the story from the cover?
- What do they think a magician could be from looking at pictures on the title page?

LD 1 g: Uses pictures or symbols to identify concepts.

- Notice the huge size of the goldfish bowl
- Count the number of pages with tiny stars

LD 2 a: Differentiates sounds that are the same and different.

- Hear the difference between the beginning sounds of million, billion, trillion

LD 2 c: Recognizes the same beginning sounds in different words (alliteration).

- Hear the same beginning sound in much & million; big & billion; tremendous & trillion

LD 3 b: Uses new vocabulary words correctly within context of play and other experiences.

- New vocabulary: million; billion; trillion; mathematical; magician; whale; Presto!; tower; stadium; miles; tremendous; Moon; Mars; Jupiter; Saturn; harbor

LD 3 c: Connects new vocabulary with prior educational experiences.

- Talk about how high students can count ... how many can count to 10? 20? 100? Relate to million, billion, and trillion.
- Talk about building a tower of blocks ... compare to tall city buildings
- If the classroom has a fish, talk about how big the fish bowl is ... compare to one big enough for a whale, etc.

Changes to Learning Areas for *How Much Is A Million?*

Current topic, interest or study: <i>How Much Is a Million?</i>	
<p>House/Dramatic Play</p> <p>Refrigerator box covered with black paper and glow in the dark stars</p> <p>2 themes/props evident:</p> <p>Magician Prop Box</p>	<p>Blocks</p> <p>Boats, airplanes, and spaceships</p> <p>Plastic cups for stacking</p> <p>People props</p> <p>World and local city maps</p> <p>Real and found materials:</p>
<p>Toys/Puzzles/Math</p> <p>Glow-in-the-dark stars</p> <p>Goldfish estimation jar</p> <p>Linking people</p> <p>Plastic fish</p> <p>Real and found materials:</p>	<p>Art</p> <p>Goldfish and star sponges</p> <p>Star stickers</p> <p>Materials to make magic wands</p>
	<p>Music</p>
<p>Books for current topic or theme:</p> <p><i>Millions of Cats</i></p> <p><i>One Hundred Hungry Ants</i></p> <p><i>If You Made a Million</i></p> <p><i>Millions to Measure</i></p> <p>Books representing cultures, abilities, etc.:</p>	<p>Listening</p> <p><i>How Much Is a Million?</i> book and tape</p>
	<p>Computer</p>

<p>Science</p> <p>Growing fish in water</p> <p>Parachute men</p> <p>Solar system display</p>	<p>Flannel Board</p>
<p>Cooking Experience</p> <p>Million Dollar Pie</p>	<p>Sensory Table</p> <p>Star pasta</p> <p>Writing/Language</p> <p>Register paper roll</p> <p>Star stickers</p> <p>Star stencils</p> <p>Weekly large group literacy activity:</p>
<p>Social Studies</p> <p>Globe</p>	<p>Outside</p>



Vocabulary Related to How Much Is a Million?

million	billion	years	miles
trillion	presto	magician	dog
whale	cat	turtle	unicorn
goldfish	birds	dove	pigeon
if	climbed	shoulders	mountains
airplanes	fly	calendar	stars
bowl	tower	stadium	beets
carrots	human	oars	row boats
goals	ticket taker	city harbor	Mars
Jupiter	Saturn	New York	New Zealand

Comparisons:

taller – tallest
high – higher
big enough
large enough
how big
gigantic

Things to count:

Have the children find each of the items in the following list in *How Much Is a Million?* and then count how many times each item appears in the book.

Dogs (20)
Cats (36)
Unicorns (20)
Hot Air Balloons (13)
Space Ships (4)
Space Creatures (5)

The number of words in the story is four hundred twenty six.

Activities for *How Much Is a Million?*

Phonological Awareness Activities

Print and laminate at least two sets of the photos included with this guide. These photos will be used in a variety of ways. Print a set for the writing area too.

Show and describe each picture to the children and call attention to the sound at the beginning of each word. Explain that you are calling attention to the **sound** that begins each word and not necessarily the **letter** of the alphabet.

Listening Activities

GA Pre-K Content Standard: LD2a

- The ability to listen to and attend to sounds in the environment is an important step in **phonological awareness** and a precursor to **phonemic awareness**.
- Listening requires a wide range of skills from being able to discriminate between sounds in the environment to discriminating between specific speech sounds.
- Listening skills continue to develop throughout all stages of a child's learning.
- Opportunities for listening arise spontaneously, but in preschool classrooms teachers can support children's development by providing a variety of listening experiences.
- A multi-sensory approach provides the range of experiences that will suit all learning styles.

Activity One

Tell children to pretend to take a hot air balloon ride. Let them close their eyes and listen to all the sounds they hear in the classroom. Also encourage them to listen to the sounds while playing on the playground. Once inside ask the children to draw pictures of what they heard.

Activity Two

Record (or find a recording of) the following sounds to demonstrate different sounds and let children play sound identification games. (Other children playing, cat, dog, cow, duck, airplane, car, siren, motorcycle, whale, stadium, rocket lifting off, ship's horn, birds, big city sounds, etc.)

Activity Three

Make picture cards of items in the book and use with this and the following activities. Make a list of as many items that would make good photo cards. Place the word and photo on each card and make 2 of each card.

Activity Four

Place 10 picture cards on a table and tell the group they are going shopping and that they must remember the items they need to buy. Let children take turns picking up the cards named and place them in a container. Start with one item and slowly increase the number of items they need to remember. For example, "You are going shopping and you need a cat, a dog and a whale," etc.

Activity Five

Say a word two times and ask children to tell you if the words were the same or different. Use the pictures to show if they were the same words or different words.

Rhyming Activities

GA Pre-K Content Standard: LD2b

The repetition of words with the same sounds gradually reinforces awareness of the patterning that exists in spoken language and that words can be broken down into smaller units of sound called **onset** and **rime**.

Repetition also helps children recognize the sound and spelling patterns that exist between words in the same rhyming families.

Use the same picture/word cards for the following rhyming activities.

Activity One

Using the target words, provide examples of words that rhyme and words that do not rhyme.

Activity Two

This activity provides opportunities for children to identify words that rhyme and words that do not rhyme. This step is a prerequisite to generating rhyming words. Say two words and ask the students if the words rhyme. Students can respond with yes/no responses or stand up/raise their hands if they think the two words rhyme. Use vocabulary from *How Much Is a Million?*, for example:

Star, gar
Million, billion
Whale, fish
Moon, kids

Activity Three

Give students an opportunity to generate rhyming words. Say a word and ask students to give words that rhyme with the word you said. Remember that nonsense words are acceptable when children generate their own rhyming words, for example: million, zillion, billion, pillion, dillion, jillion.

Activity Four

Objective: Use common objects to creatively make sounds

Materials: Chair (scrape, bump), book (dropping, opening/closing, fanning pages), newspaper (crumpling, tearing, rattling), cans, rubber band, wax paper, retractable pen

Give children common objects and ask them to use the object to make a sound. Give one object at a time and encourage students to respond individually. Ask students to describe their sounds. Prompt as needed. As students demonstrate different ways to make a sound, describe the sounds in words to increase vocabulary.

Alliteration Activities

GA Pre-K Content Standard: LD2c

Alliteration refers to the repetition of sounds at the beginning of words. The following activities relate to a child's ability to recognize the initial sound of a word and relate this understanding to other words with the same initial sound. This ability relates to the sound rather than letter recognition.

Activity One

Pre-K children quickly make connections when they notice that their name starts with the same sound as a friend's name. For example, Rudy noticed that Rebecca's name sounds like his name at the beginning. Teachable moments like this can be used to draw children's attention to

words that are phonemically alike. Use the pictures to find items in the classroom that begin with the same sound.

Activity Two

Sort objects into an interactive display or bag according to initial sound.

Activity Three

Use everyday objects and picture cards to play games of varying difficulty beginning with initial sound identification.

Activity Four

Make up picture books to illustrate alliteration and early numeracy, e.g., one wet whale, two funny fish, and three wacky whales.

Activity Five

Create tongue twisters to illustrate and practice alliteration, e.g., Gus goes golfing. Start with simple ones and then add repetitions or length to make them more challenging.

Activity Six

Identify the beginning sound of children's names and invent alliterative descriptions using vocabulary from the book, e.g., Laughing Linda, Jumping Jack, Flying Frank.

Segmenting Activities

GA Pre-K Content Standard: LD2d

Being able to segment sentences into words, words into syllables, and words into sounds helps children learn about the structure of language.

Counting words in sentences

The sentences in *How Much Is a Million?* are too long for many preschool children to count the words. Create your own sentences using the vocabulary in the story and help children count the words in the sentences.

Activity One

Introduce the concept of syllables using blocks, pennies or plastic chips. Students indicate the number of syllables they hear in a word by clapping, tapping the number of blocks or placing one chip or block on the table for each syllable.

Gus – one clap
Moonbeam – two claps
Camera – three claps, etc.

Demonstrate with each child and ask all the children to clap the syllables along with you.

Say, "Million. That's got two claps."

Ask the children to determine how many claps each name takes.

Activity Two

Introduce pictures from the story

Then:

- Ask the children to determine how many claps each item takes.
- Clap out the word first, saying it at the same time, and get the children to say and clap with you.
- Ask how many claps there were.
- Give the children turns to clap an item on their own.

- Ask the other children to tell how many claps there were.
- Repeat the clap to reinforce it.

Activity Three

- Make a pile of one, two or three blocks.
- Sort items into the number of claps that they have.
- Get the child to put the object/picture beside one, two or three blocks depending on how many claps there are.

Manipulation Activities

GA Pre-K Content Standard: LD2e

Activity One

Simple sound tracking: Say three to five sounds (e.g., /p/, /b/, /b/, /k/). Using the colored blocks to show same and different, ask students to show how many sounds are the same, how many are different, and the sequence of the sounds. The example sequence might be shown by four squares: green, red, red, blue. The actual color does not matter as long as the representative color is the same for sounds that are the same and different for sounds that are different, the blocks represent the right number, and the sequence of sounds given is correct.

Activity Two

Addition of sounds: Start with one sound on the table (represented by a block, a unifix cube, a colored square). Say, "Show me /e/." Introduce addition of sounds by saying, "If that says /e/, show me /be/." The child should place a different colored manipulative in front of the sound already on the table. It could be added at the end, in which case you would say, "If that says /e/, show me /eb/."

Activity Three

Omission of sounds: Start with at least two sounds on the table (represented by blocks, unifix cubes, colored squares). Delete or omit a sound by saying, "If that says /eb/, show me /b/." The student should remove the first manipulative, the one that represents /e/.

Activity Four

Substitution of sounds: Start with three blocks on the table representing /bup/. Substitute a sound by saying, "If that says /bup/, show me /bap/." The student must determine that the sound that changed was the one in the middle, take away that manipulative, and replace it with a different color.

Activity Five

Sound Blending: Using photos from *How Much Is a Million?*, say the name of pictures by segmenting them into individual sounds.

Say the sounds for the name of the picture in a segmented fashion. Ask the students to identify the object (e.g., /f/-/l/-/a/-/g/ would be the flag). Make sure you put enough space between the sounds so the students have to do the auditory processing to put it together.

Activity Six

The Cat Went Over the Mountain
(sung to the tune of "For He's a Jolly Good Fellow")

*The cat went over the mountain,
The cat went over the mountain,*

*The cat went over the mountain,
To see what he could see.
To see what he could see,
To see what he could see,
The cat went over the mountain,
To see what he could see.*

Sing the first four lines of the song with the children. Then say the name of something the cat might see, isolating the sounds in the word. For example: The cat could see a /d/ /o/ /g/.

Change the animal or person that goes over the mountain and what they saw.

Language and Literacy/Writing Ideas

Suggested Activities

- Create your own class book about *How Much Is a Million?* Ask children to draw pictures of what they would like to see a million of. Record the children's thoughts and ideas.
- Complete a class story on chart paper using the lead, "If our class had a million dollars, we would ..."
- Rewrite the book with the children during small group but instead title it, *How Much Is a Penny?*
- Have students draw their favorite planet and display their pictures together on a bulletin board of space.
- Create your own solar system with papier-mâché. Chart the steps it will take to create the solar system, materials needed, etc.
- Create a chart story about what the children think the world was like one million years ago.
- Have children decide how many zeros it takes to write a million in numbers. Write a 1 on chart paper and ask them to add the zeros.
- Ask the students what might be counted in millions (stars, people, money, years, etc.). Record their responses on chart paper.
- Ask children to imagine what one million is and then have them draw a picture of what they wish they had one million of.
- Complete a chart of "We'd like a million of ... but not a million of ..."
- Have the children draw a city harbor and what they think would be in a harbor.
- Cut out simple figures of people and have the students decorate them. Then have them place the cutout figures standing upright on top of each other to see how many it would take to reach from the floor to the ceiling of the classroom.
- Ask children to draw a picture of what they would look like in a million years, a billion years, and a trillion years.
- Create a chart with three columns, and list what the children think they will be doing in a million, billion, and trillion years.
- Allow children to decorate a star and hang them on the ceiling in the room.
- Complete a chart of "What could fit inside a whale?"
- Complete a chart of "If I were in a hot air balloon, I would go ..."

- Writing Center Ideas: Add new vocabulary to the writing area or a word wall: million, billion, trillion, harbor, gigantic, tremendous, tower, tallest, highest, farther, large, stretch, reach, building, mountain, airplane, wizard, ladder, goldfish, bowl, whale, stars, balloon, unicorn, wand, stadium, tiny, miles, children, moon, Jupiter, Mars, Saturn, city, New York, New Zealand.

Additional Books Relating to Topics Introduced in *How Much Is a Million?*



Hot Air Balloons

Flying in a Hot Air Balloon by Cheryl Walsh Bellville

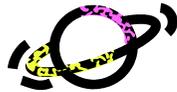
Curious George & the Hot Air Balloon by H.A. Rey

Hot Air Balloons by Ailsa Spindler

The Amazing Air Balloon by Jean Van Leeuwen

Hot Air: The (Mostly) True Story of the First Hot-Air Balloon Ride by Marjorie Priceman (A Caldecott Honor Book)

A Rainbow Balloon by Ann Lenssen



Solar Systems

The Young Astronomer by Harry Ford

The Stars: A New Way to See Them by H.A. Rey

Exploring the Solar System by Bruce LaFontaine

The Magic School Bus by Joanna Cole

There's No Place Like Space: All About Our Solar System by Tish Rabe



Whales

Big Blue Whale by Nicola Davies

Baby Beluga (Raffi Sings to Read) by Raffi

Is a Blue Whale the Biggest Thing There Is? by Robert E. Wells

Baby Whales Drink Milk by Barbara Juster

Humphrey the Lost Whale by Wendy Tokuda and Richard Hall (A Reading Rainbow Book)

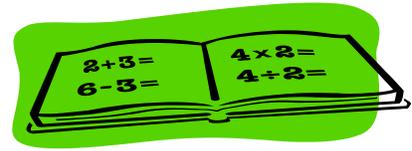


Counting

One Nation: America by the Numbers by David W. Flynn

A Frog in the Bog by Karma Wilson

How Big Is a Foot? by Rolff Myller
Count! by Denise Fleming
Mouse Count by Ellen Stoll Walsh



Math Activities

Math is more than recognizing numerals and counting. Because math is “everywhere,” and math is “living,” Georgia’s Pre-K Program provides a wide variety of opportunities for children to explore and learn math concepts. *How Much Is a Million?* creates the perfect context for introducing certain math concepts to your students.

Children learn best through a hands-on approach to develop basic skills. To become mathematical thinkers, children need to explore, manipulate, and organize concrete materials before they can use abstract symbols. As children play using concrete materials and have opportunities to describe what they are doing, they begin to develop an understanding of mathematical relationships.

Concepts to Be Learned

More/Less

Big/Little

Some/None

Small/Smallest

Least/Most



Activity One

Materials: gallon jar filled with loose crayons, individual cups

Directions: Have the students guess the number of crayons it will take to fill their cup. Using the crayons from the gallon jar, fill the cup and see how close the students’ estimates were. Next, estimate the number of cups of crayons it will take to fill the gallon jar, then re-fill the jar using cups full of crayons.

Have the students also discuss and estimate the following:

- How many gallon jars would fit on the table?
- How many tables would fit in the room?

Activity Two

Materials: loose crayons

Directions: Explain to the students that they are going to estimate and measure objects using an unusual unit of measure ... crayons.

Ask them to first estimate and then measure to find out the answer to the following questions:

- How many crayons long is the table?
- How many crayons will it take to reach the door?
- How many crayons will it take to reach from one end of the room to the other?

Have them find three more things in the classroom to measure, and record those.

Activity Three

Materials: a large supply of small apple erasers

Directions: Explain to students what “sets” are and how sets can be used for counting larger numbers. Have students use small APPLE ERASERS to create sets of 5, then sets of 10. After grouping those sets have them regroup the erasers into sets of 100.

Ask children to look around the classroom or to think about their homes and name other objects that can be grouped together into sets.

The following pages contain math materials taken from the Public Broadcasting System to be used in prekindergarten classrooms. The materials are reprinted by permission from PBS.



NO-BAKE GRANOLA BALLS

Making this tasty treat is a fun, delicious way for your child to explore measurement.

Materials:

baking sheet
wax paper
large mixing bowl
wooden spoon

Ingredients:

1 cup powdered sugar
1 cup creamy peanut butter
1/3 cup milk
1 tsp vanilla extract
1 1/2 cups uncooked oatmeal
1 cup granola cereal
1 1/4 cups chocolate chips

Directions:

1. Talk about the recipe with your child. Gather all the ingredients (not yet measured) and talk about how much you're going to need of each. Line the baking sheet with wax paper.
2. Together with your child, measure out each of the ingredients.
3. Invite your child to pour the measured sugar, peanut butter, milk, and vanilla one at a time into the large mixing bowl. Help your child mix the batter with a wooden spoon and talk about how the batter changes as it is mixed. (For example, it changes from lumpy and separated to smooth and creamy.)
4. When the batter is smooth and creamy, have your child pour in the oats, cereal, and chips. Continue to mix until the dry ingredients are completely coated with the peanut butter mixture.
5. Now prepare to get messy! Together with your child, roll and press the mixture into one-inch balls. Place the balls onto the lined baking sheet about a half-inch apart.
6. Chill in the refrigerator at least an hour or until firm.
7. Store in a tightly covered container in the refrigerator.

Makes about 28 granola balls.

(continued on second page)

NO-BAKE GRANOLA BALLS (continued)

Parent Pointers:

- This activity helps your child learn measurements and how to follow directions/recipes.
- If possible, use an easy to read, see-through measuring cup that has $\frac{1}{4}$, $\frac{1}{3}$, and $\frac{1}{2}$ clearly marked. While using the individual cups for $\frac{1}{4}$, $\frac{1}{3}$, and $\frac{1}{2}$ still works, they do not give your child the same valuable experience with fractions of a whole.
- Discuss the different measurements as you work with them. For example, talk about how one cup is more than a half cup.
- When the balls are lined up on the cookie sheet, invite your child to tell you how many are in each row. How many are there altogether?
- Repeat this activity using other simple recipes. Read the recipe aloud, invite your child to help you measure the ingredients, and talk about how the ingredients change as you mix, stir, chill, or cook.



**NAEYC/NCTM Early Mathematics Position Statement Recommendations
Everyday Math 3-6**

In high-quality mathematics education for 3- to 6-year-old children, teachers and other key professionals *should*:

- 1. Enhance children’s natural interest in mathematics and their disposition to use it to make sense of their physical and social worlds.**
2. Build on children’s experience and knowledge, including their family, linguistic, cultural, and community backgrounds; their individual approaches to learning; and their informal knowledge.
- 3. Base mathematics curriculum and teaching practices on knowledge of young children’s cognitive, linguistic, physical, and social-emotional development.**
4. Use curriculum and teaching practices that strengthen children’s problem-solving and reasoning processes as well as representing, communicating, and connecting mathematical ideas.
- 5. Ensure that the curriculum is coherent and compatible with known relationships and sequences of important mathematical ideas.**
6. Provide for children’s deep and sustained interaction with key mathematical ideas.
- 7. Integrate mathematics with other activities and other activities with mathematics.**
8. Provide ample time, materials, and teacher support for children to engage in play, a context in which they explore and manipulate mathematical ideas with keen interest.
- 9. Actively introduce mathematical concepts, methods, and language through a range of appropriate experiences and teaching strategies.**
10. Support children’s learning by thoughtfully and continually assessing all children’s mathematical knowledge, skills, and strategies.

To support high-quality mathematics education, institutions, program developers, and policymakers *should*:

- 1. Create more effective early childhood teacher preparation and continuing professional development.**
2. Use collaborative processes to develop well-aligned systems of appropriate high-quality standards, curriculum, and assessment.
- 3. Design institutional structures and policies that support teachers’ ongoing learning, teamwork, and planning.**
4. Provide resources necessary to overcome the barriers to young children’s mathematical proficiency at the classroom, community, institutional, and system-wide levels.

Excerpt from:

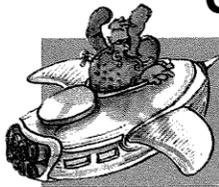
National Association for the Education of Young Children (NAEYC), National Council of Teachers of Mathematics (NCTM). Early Childhood Mathematics: Promoting Good Beginnings.



**Strategies to Support Inclusive Learning Environments
Everyday Math 3-6**

1. Simplify a complicated task by breaking it into smaller parts or reducing the number of steps
2. Model instruction
3. Use pictures/visual aides throughout daily activities
4. Ensure that students understand the meaning of key mathematical words (sorting, counting, adding, and total)
5. Use real items to understand part and whole (real apple cut into pieces)
6. Use modeling clay to form shapes instead of play dough with a child who has low muscle tone
7. Provide raised/textured objects for children with visual impairments
8. Adapt the length of the activity based on the needs of the child

**Georgia's Pre-K Program Content Standards (February 2007).
Georgia Department of Early Care and Learning.**



How Much Is A Million?



26

9

8

20

Illustrations and text from this feature book help readers visualize how much a million, a billion and a trillion really are. LeVar explores ways of counting large numbers as he talks to people who share grouping and estimating techniques. In a visit to the Crayola Crayon Factory, workers show how crayons are made and talk about the large number of crayons they handle in their jobs. Then on to

28 Giants Stadium where vendors and stadium employees use estimation to prepare for game day. 18

Here are several activities you and your child can do together after watching

31 this episode. 11

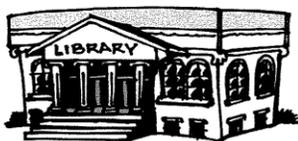
15 How Many Do You Think?

Have some family fun before eating a snack. Whether it is a bag of pretzels, a package of candies, or a jar of jellybeans, before eating, have your children estimate how many pieces they think are in the package. With clean hands, make equal piles of ten. Count aloud by tens and add any extras to determine the full amount. Decide whose estimate was the closest to the actual amount. Then divide the piles up equally among all eager eaters!

Figure It Out 2

You will need:
Catalogs, shopping circulars
Paper
Glue
Scissors
Pencil

Have each family member fold a sheet of paper in half. Label one half "What I Need" and the other "What I Want." Set a budget for the total amount that each can spend. Then cut out pictures and prices of items to glue in each section of the chart. If a price is not given, assign a reasonable amount. When everyone has finished, add up the costs of all the items. If someone has gone over budget, decide which "Wants" can be removed from the list by circling them. Everyone will learn about staying within a budget as well as saving money to buy things you want but can't afford at the moment.



Episode 120

19 23 25 17 4 27 14 13
6 7 22 Using Numbers Everywhere!

- ♦ The next time you go shopping take your child with you and have them help you estimate how much your bill will be. Explain that \$2.98 is almost \$3.00....\$9.50 is nearly a full ten-dollar bill.
- ♦ When you fill your car with gas, have your child help you with how much the gas will be by watching the meter as it counts the gallons and figures the money.
- ♦ Help your young child count the change in your pocket or wallet. Explain the difference between a penny, nickel, dime, quarter, etc. Then have them help you figure out how much is there. If he/she has a bank help them figure out how much they have in their special savings.
- ♦ Have your child help you set the table and count at the same time. It will take four plates and four glasses. Four and four make eight. Now, add four spoons, how much is that...and four forks, etc.
- ♦ Have your child help you organize your cupboards by counting what is there. For example, put together the three cans of soup, two cans of tomato sauce, etc.
- ♦ There are any number of counting books you can read together with your child.
- ♦ If you have steps in your home, count them as you go up and down. Count the number of steps it takes to go from one room to another.

Visit Your Community Library

Here are some books you can check out on your next trip to the library

- ♦ **One Hundred Hungry Ants** by Elinor J. Pinczes
- ♦ **Only One** by Marc Harshman
- ♦ **How Many Stars In The Sky?** by Lenny Hort

Additional Books Relating to Math

Anno's Counting Book by Mitsumasa Anno

Clocks and More Clocks by Pat Hutchins

The Eleventh Hour by Graeme Base

Five Little Monkeys Jumping on the Bed by Eileen Christelow

Grandfather Tang's Story by Ann Tompert

The King's Commissioners by Aileen Friedman

Math Curse by Jon Scieszka and Lane Smith

One Hundred Hungry Ants by Elinor J. Pinczes

So Many Cats! by Beatrice Schenk de Regniers

Recommended Websites:

www.amshq.org

www.aplaceofourown.org

www.naeyc.org

www.pbs.org/parents/earlymath/prek_games.html

www.pbs.org/parents/earlymaht/prek_activities.htm

Social Studies Activities

Millions of Miles

Start the discussion by stating that many states in the United States have millions of people. Some of these people have to travel all over the United States for their jobs. Others travel to different countries. Ask the children what book they are studying this year (*How Much Is A Million?*). Explain that they are going to study ways people travel and how far a million miles is. Ask students to name places they have traveled to. Find the city, state or country on the globe. Chart the distance between the cities or countries the students have traveled to and the city/town where their Pre-K program is located.

Study Topic: Travel around the World

Suggested Activities

- Introduce maps beginning with a map of the neighborhood where the Pre-K program is located. Display a large world map that shows all the continents.
- Contact people who have jobs using different modes of transportation and invite them to speak to the class about what it is like to operate their mode of transportation (truck driver, bus driver, pilot, railroad worker, UPS delivery person, etc.). Use parents and community people when possible.
- Contact a cruise line, airline, railroad company or bus company soliciting a travel "pen pal" for the Pre-K class. After someone has agreed to be the class's pen pal, send them a letter and use the computer to research the number of miles the letter will travel from the classroom to the contact. Ask the contact to send a postcard from each stop on their travel itinerary or to call to let the class know where they are and how many miles they have traveled. In some way mark the map to show the pen pal's travels and keep a running total of the number of miles they have traveled.

- **Large group:** Find out what children know about air travel, rail travel, on-road trucking, and water travel. Ask children what they want to learn about the way people travel. Create a web visual organizer that includes information the children share, people whose jobs require travel, and mode of transportation they use (airline pilots/co-pilots, ship captains/first mates, astronauts, train engineers/conductors, truck drivers/dispatchers, etc.).



Changes to Environment in Social Studies Area

Transportation vehicles

Books about various means of transportation

Pictures of people whose careers involve traveling

Map of continents

Globe



Field Trips

On site – Various modes of transportation

Career day – Parent and community jobs

Ferry and/or train ride

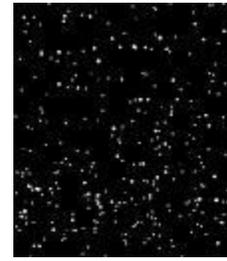
Photos to Use for Various Activities



Money



Planets/Solar System



Stars



City Harbor



Whale



Hot Air Balloon



Million, billion, trillion, etc



Mountain



Airplane

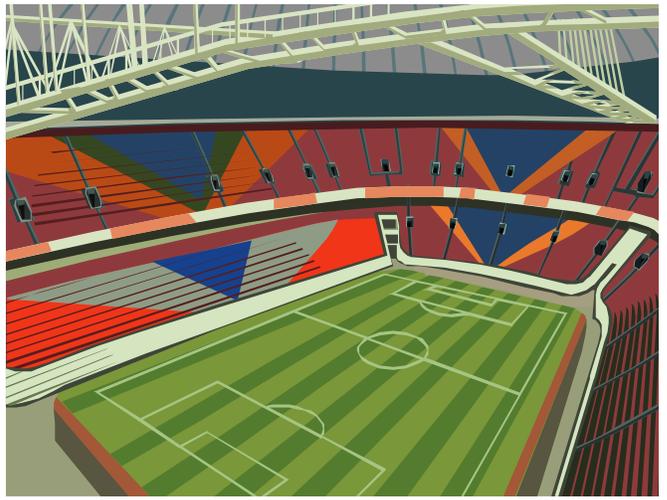


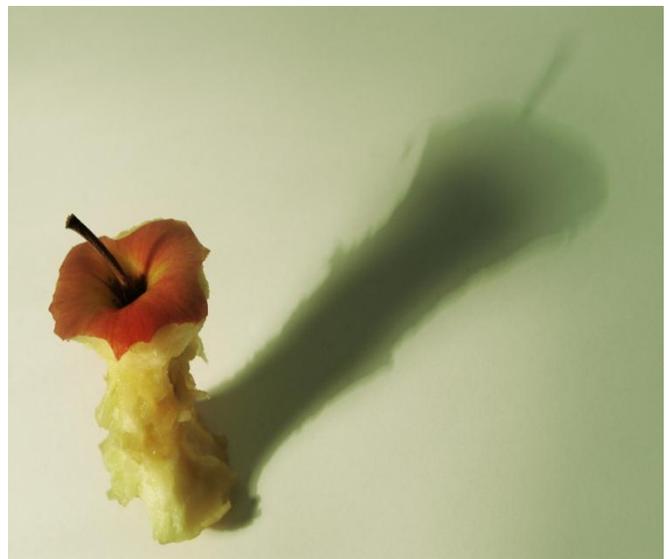
Wizard

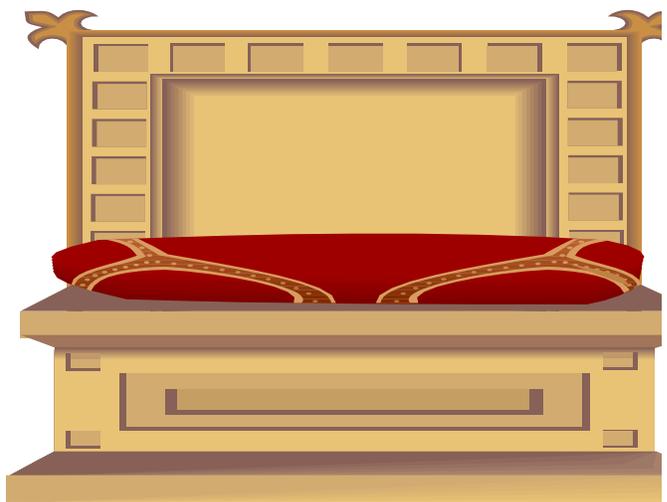
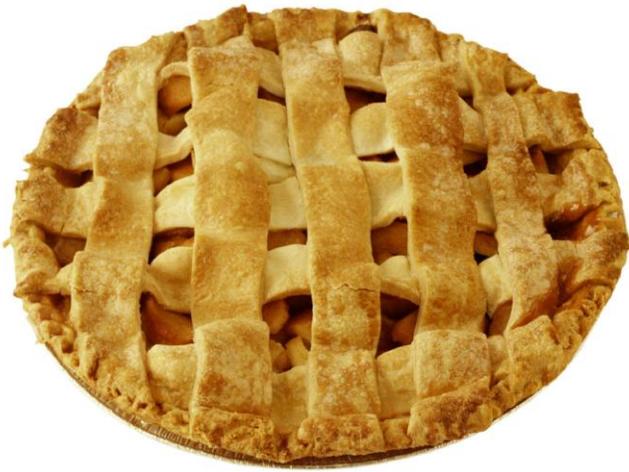


Unicorn

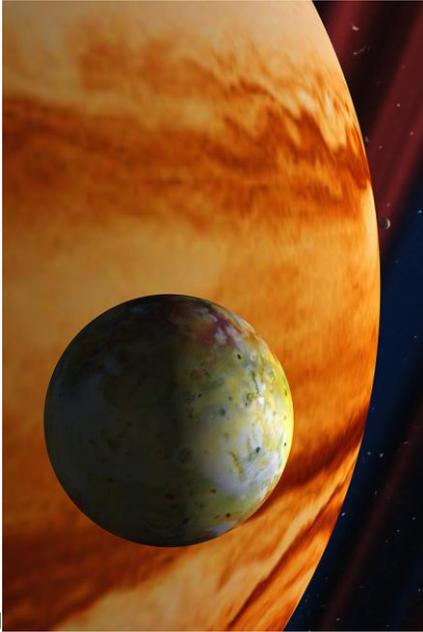








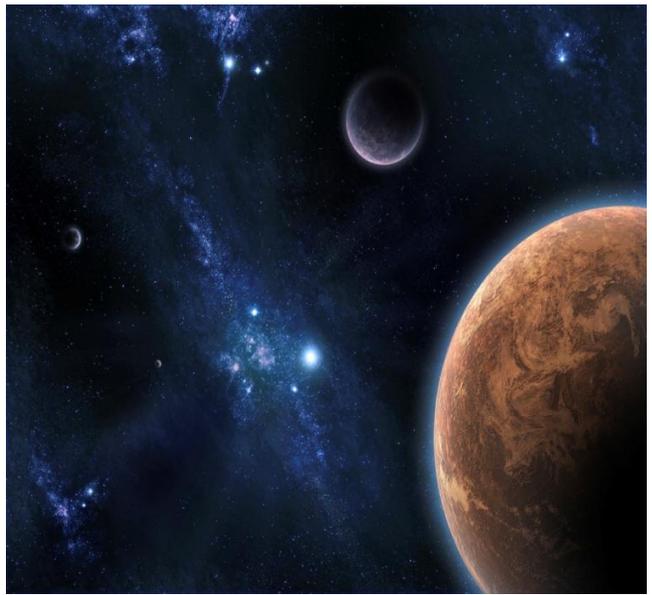




Jupiter 1



Saturn



Mars



Transportation Ideas



Compiled by:



GA Pre-K Content Standard LD 2b: Repeats rhymes, poems and finger plays.

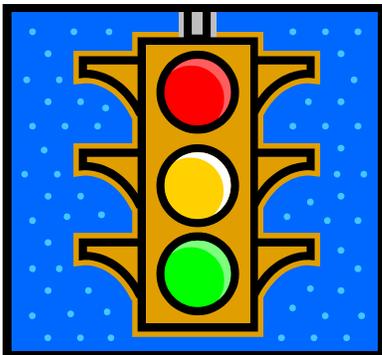
Songs and Finger plays

I'm a Little Airplane (tune: I'm a Little Teapot)

I'm a little airplane,
(Children raise arms at sides to shoulder height)
Now watch me fly!
(They spin one of their arms in front of them as if it were a propeller)
Here are my instruments
From down low to high.
(W/ their other arm, they reach from the ground to above their heads)
First I get revved up,
(Children make engine noises while still spinning their arms)
Then I can fly.
(Children raise arms to shoulder height)
Lifting off the runway
(Children lift arms higher)
Up to the sky!
(Children point arms up towards sky)

Twinkle, Twinkle Traffic Light

Twinkle, twinkle traffic light,
Round the corner shining bright.
Red means stop, green means go,
And yellow means go very slow.
Twinkle, twinkle traffic light,
Round the corner shining bright.



Transportation (tune: The Wheels on the Bus)

The train on the track goes chug, chug, chug,
Chug, chug, chug, Chug, chug, chug,
The train on the track goes chug, chug, chug
all through the day

Other verses:

The boat on the water goes toot...
The car on the road goes beep...
The race car on the track goes zoom...
The airplane in the sky goes way up high...

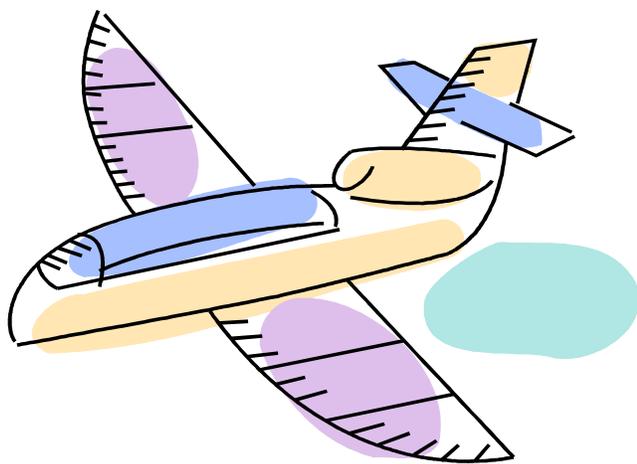


Lonely Bus Driver

One lonely bus driver all alone and blue,
He picked up a passenger and then there were two.
Two people riding, they stopped by a tree,
They picked up a passenger, and then there were three.
Three people riding, they stopped by a store,
They picked up a passenger, and then there were four.
Four people riding, happy and alive,
They picked up a passenger, and then there were five.
Five people riding, open swung the door
Four passengers got off the bus,
The driver's alone once more.

Airplane

I press on the starter,
The propeller whirls around;
My airplane and I
Brush over the ground.
I lift from the field,
The motor roars out loud,
Far below is the earth,
Above me a bright cloud.
I dip, and I drop,
I swoop, and I rise;
Oh, it's fun to be flying way up in the skies!



The Airplane

The airplane has great big wings:
(Arms outstretched)
Its propeller spins around and sings, "Vvvvvv!"
(Make one arm go round)
The airplane goes up:
(Lift arms)
The airplane goes down:
(Lower arms)
The airplane flies high
(Arms outstretched, turn body around)
Over the town!

Transportation (tune: Old McDonald)

Dan the driver has car,
Beep, beep, beep, beep, beep
And on that car he has a horn
Beep, beep, beep, beep, beep
With a beep, beep here,
And a beep, beep there,
Here a beep, there a beep,
Everywhere a beep, beep.
Dan the driver has car
Beep, beep, beep, beep, beep

Pete the Pilot has a plane,
Zoom, zoom, zoom, zoom, zoom.
And on that plane there are some wings,
Zoom, zoom, zoom, zoom, zoom.
With a zoom, zoom here,
And a zoom, zoom there...

Jane the conductor has a train,
Chug, chug, choo, choo, choo.
And on that train there is a caboose
Chug, chug, choo, choo, choo.
With a chug, chug here
And a choo, choo there...

My Bike

One wheel, two wheels on the ground
My feet make the peddles go round and round
Handle bars help me steer so straight
Down the side walk and out the gate



Engine On The Track

Here is the engine on the track

(Hold up thumb)

Here is the coal car, just in back

(Hold up pointer finger)

Here is the box car to carry freight

(Hold up middle finger)

Here is the mail car. Don't be late.

(Hold up ring finger)

Way back here at the end of the train.

(Hold up little finger)

Rides the caboose through the sun and rain.



The Bus

There is a painted bus,

With twenty painted seats,

It carries painted people

Along the painted streets.

They pull the painted bell,

The painted driver stops,

And they all get out together

At the little painted shops.



Trains

Here's a little choo-choo train

Chugging down the track;

Now it goes forward,

Now it goes back.

Now the whistle blows,

Whoooooo, Whoooooo!

What a lot of noise it makes

Everywhere it goes.

Chooo-chooo-chooo!

The train comes running back.



Creative Expression Activities

Car Wheel Painting (www.prekinders.com)

Materials: small cars and trucks, paint, construction paper

Directions: Provide large sheets of construction paper and low flat pans (pie tins) of tempera paint. Allow the children to dip the small cars and trucks in the paint and then make car and truck tracks on the construction paper.

Cars on the Go – Transportation Mural (www.prekinders.com)

Materials: sponges, craft glue, butcher paper, paint, textas/crayons

Directions: Make car stamps by cutting sponges in the shape of cars. Draw a road across the butcher paper. Allow children to dab car stamps in paint and press onto the paper mural. Ask students to also draw trees and other surroundings with textas/crayons to finish off the mural. (Creating this mural outside will result in less mess to clean up at the end.) Hang the finished mural on your classroom wall.

My Map

Materials: maps, paper, paint, various other art supplies

Directions: Show children several different maps and talk about what maps show. Have children design their own maps.

My Favorite Ride

Materials: different types and sizes of cardboard boxes, pictures of different modes of transportation, various collage materials

Directions: Allow each child to pick a box and ask them to design their favorite mode of transportation.

Transportation Mural

Materials: bulletin board paper, crayons and markers, old magazines, glue

Directions: Have students plan and draw a scene on a large sheet of bulletin board paper. Assign students different objects to draw. One can draw train tracks while another draws a road, another clouds, another a lake, house or trees. Allow students several days to gradually fill up the mural with pictures (cut and pasted from old magazines) of airplanes, trains, cars, boats, trucks or even hot air balloons! Children love “large” projects and are always proud of what they did.

Language and Literacy Activities

How Do You Get Around?

Materials: poster/paper for graphing, pictures of different modes of transportation

Directions: Prepare a graph on poster paper with several modes of transportation: car, truck, bicycle, tricycle, boat, motorcycle, airplane, helicopter, ship, school bus. Select the most common modes and place on graph. Have each child place his or her name or picture on the graph to indicate which method he or she uses to get to school, to go to a store, to go on vacation, etc.

Transportation “Concentration”

Materials: photocopy pictures of modes of transportation so you have two copies of each mode of transportation

Directions: Shuffle the pictures and place them face down on a table. Each player turns over two cards in an attempt to find matching pairs. When the cards match, the player continues to play. If the cards do not match, they are placed back on the table, and the next player gets to turn over two cards. The game ends when all cards have been matched.

Map of Your City

Materials: map of your city (AAA will give out-of-date maps), pictures of various landmarks in your city, tape or Velcro

Directions: Laminate the map. Show and discuss with your students the various landmarks in your city; then attach the pictures to the map in their approximate location. For example, a map of Atlanta would have pictures of tall buildings taped or velcroed along Peachtree Street, the Capitol, the Georgia Dome, the Aquarium, the zoo, Stone Mountain, Turner Stadium, Piedmont Park, etc. Once several landmarks have been placed on the map (the more varied the better), prepare direction cards telling children where to go. “Start at Turner Stadium and go to the Capitol.” The children will follow your progress by drawing a line from the stadium to the Capitol. Continue until all landmarks have been connected. This activity can be conducted with a small group. The teacher or assistant can direct until children get the hang of it.

Transportation Flash Cards

Materials: large-sized index cards, pictures of different modes of transportation

Directions: Make transportation flash cards by gluing pictures of different modes of transportation – school bus, car, motorcycle, bicycle, tricycle, airplane, rowboat, sailboat, train, helicopter – on one side of the index cards. Write clues about the mode of transportation on the other side of the card. During large group or small group read the clues and let the children guess the mode of transportation before showing them the picture. A variation on this activity is to let the children draw a picture of a mode of transportation and make up clues for their peers.

What Am I?

Transportation Clues:

“All Aboard!”
Clackity-clack.
We go speeding
Down the track.
What am I? (train)

Big white sail,
Wind in my face.
Over the waves,
We bump and race.
What am I? (sailboat)

The pilot takes us
Up so high,
A giant "bird"
Up in the sky.
What am I? (airplane)

Pedals twirl
And wheels turn.
We ride to school
And then return.
What am I? (bicycle)

With seat belts on,
We drive around.
We stop and go
All over town.
What am I? (car)

Across the lake
I row and row
The harder I pull,
The faster I go.
What am I? (rowboat)

Big yellow doors
Swing open wide.
To get to school,
We ride inside.
What am I? (school bus)

Up in the sky,
Above the clouds,
Propeller whirring,
Fast and loud.
What am I? (helicopter)

License Plate Game

Materials: large card stock paper, markers

Directions: Have children make fake license plates for cars. Children can match by numbers, state, color, etc.

Math Activities

Part to Whole

Materials: 8" x 11" sheets of cardboard or foam board, pictures of different modes of transportation, pictures of individual items/parts associated with each mode of transportation (with Velcro on the back of the pictures)

Directions: Draw a line down the middle of each 8 x 11 inch sheet. On the left side of the sheet, glue a picture of a mode of transportation (e.g., a car). On the right side have Velcro dots on which children will stick items/parts that go with that vehicle (steering wheel, tires, seat belt, etc.).

Other ideas:

Train: conductor, railroad track, coal

Boat: anchor, life vest, sail

Bicycle/Tricycle: helmet, tire pump, basket, seat, pedals

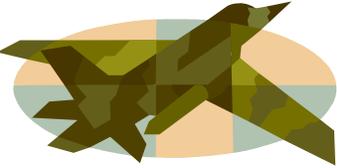
School Bus: numbers, county name, doors from bus, window from bus

Airplane, helicopter: wings, pilot, earplugs, propeller

Sorting Modes of Transportation

Materials: poster/paper for making a chart, pictures of different modes of transportation

Directions: Create chart with three columns; label one column "Air," the next column "Land," and the third column "Water." Prepare pictures of modes of transportation used in air, on land, and on water (have at least six modes of transportation). Have children place pictures on the chart according to where the method of transportation is used. Example: The car is placed in the column labeled Land.

AIR	LAND	WATER
		

Patterning

Materials: plastic transportation vehicles

Directions: Allow children to create patterns using the plastic transportation vehicles.

Science Activities

Gears

Place a variety of gears on the science table for children to examine and handle. Talk about how gears work and where they are found.

Tire Rubber

Place several pieces of rubber from old tires on the science table for children to examine using magnifying glasses. Ask them to describe what they see.

Car Mechanic

Materials: broken riding toys or vehicle parts (such as wheels, tires, etc.), a variety of safe, appropriate tools

Directions: Allow children to use the tools to work on the broken toys/parts.





Boats

Materials: modeling clay, tin foil, water table or small basin to hold water

Directions: Ask children to drop a ball of clay into a small tub of water to see if it will float or sink. Next, have them form a boat from the clay and gently set it on the water to see if it will float. Then have them form a boat from tin foil. Let them place animal counters in each boat to see how many it will hold before sinking. Allow children to observe and talk about their observations. Expand on children's ideas and ask additional questions to extend their understanding and learning. For an additional activity, instead of using plastic animal counters, you might try using animal crackers. This will add a new investigation for the children to consider: what happens to the animal crackers when they get wet?

Ramps

Materials: strips of cardboard or foam board, long narrow blocks, toy cars that roll

Directions: Using the blocks and card/foam board, have children build ramps of different heights. Ask them to put a car at the top of the ramp and then let it go. Discuss which ramp makes the cars go faster and why this happens. Try different size cars and cars made from different materials (plastic vs. metal). You might also try a piece of PVC pipe cut in half for a different experience. Have children make predictions before they begin the activity. Be sure to have children elaborate on their thoughts and observations. Allow children time to experiment and then expand on their ideas with further conversation and open-ended questions.

My Construction Site

Materials: gravel, sand, small river rocks, mulch; sensory tub; toy trucks, bulldozers, etc.

Directions: Place gravel, sand, and other materials in a sensory tub. Provide children with toy bulldozers, trucks, etc. to move the materials from one part of the tub to another. Discuss why gravel, sand, rocks, dirt or mulch have to be moved. You might also add Lincoln logs to the activity to allow children to expand on their construction ideas.



Dramatic Play Activities

Ticket Booth

In your dramatic play area, display pictures of cruise ships and travel brochures about cruises. Have suitcases available for packing. Set up a ticket booth and provide play money with which children can purchase tickets. Before setting up this activity, discuss cruises with the children to see what they know. If their knowledge needs expanding to be able to carry out this activity, visit the Internet and find books to provide more information to the children.

Airplane

Simulate the inside of an airplane by setting up two rows of chairs with an aisle in between. Section off a galley with a three-way play screen or other room divider. Provide TV dinner trays with play food and cups for the flight attendants to serve to the passengers. Before setting up this activity, check for the children's prior knowledge. Poll children to determine if they have ever flown and what they know about airplanes. If necessary, find books and visit the Internet to provide more background information to the children about airplanes and air travel.

Bus

Simulate the inside of a bus by lining up two rows of chairs with an aisle in between. Use anything round to create a steering wheel for the driver (a pizza cardboard works great) or find an old steering wheel from a junk yard. Set up a money bucket next to the driver and provide play money with which the passengers can buy bus tickets. Relate this bus experience to what they know about buses already. Many children will question why you might have to buy tickets to ride the bus because they don't have to buy tickets when they ride the school bus every day. Talk about the differences with the children. Check for prior knowledge to see if anyone has ever ridden on a Greyhound or other bus line. What other differences did they notice?

Taxi

Simulate the inside of a taxicab by setting up two rows of chairs one in front of the other. Provide a steering wheel and hat for the driver. Provide dress-up clothes for the passengers. Make and place a "Taxi" sign on the chairs. Give the passengers play money with which to pay the taxi fare. Check for prior knowledge before preparing this activity. Many children may not have seen a taxi. If necessary, find pictures on the Internet or find books about taxis to expand the children's knowledge.



Block Play

Runway

In the block area build a runway with long planks or unit blocks. Have wooden or unbreakable model airplanes available for takeoffs and landings. Be sure to extend the children's knowledge by talking about runways and their purpose. Find pictures on the Internet or in a book to show children. Ask open-ended questions to further children's thinking: What would happen if airplanes didn't have a runway?

Airport

Have children build an airplane using a plank laid across a wooden box. Add a steering column and a panel with various dials drawn on it. Cut a propeller out of cardboard and tape the propeller to the edge of the plank. Push a step to the side of the plane for passengers to get on or off. Use a wagon or rolling platform to take passengers' luggage to and from the plane. Add pictures of airplanes, books about airplanes, and toy airplanes to the block area.

Additional Books Relating to Transportation

Row, Row, Row Your Boat by Iza Trapani

The Little Sailboat by Lois Lenski

Lisa's Airplane Trip by Anne Gutman

Angela's Airplane by Robert N. Munsch

Amelia's Fantastic Flight by Rose Bursik

Amazing Airplanes by Tony Milton

Busy Boats by Tony Milton, Ant Parker

Captain Duck by Jez Alborough

Airport by Byron Barton

The Little Airplane by Lois Lenski

Terrific Trains by Tony Milton

All Aboard! by Susan Kuklin

The Little Engine that Could by Watty Piper

I Love Trains! by Philemon Sturges

I Love Trucks! by Philemon Sturges

Freight Train by Donald Crews

The Little Train by Lois Lenski

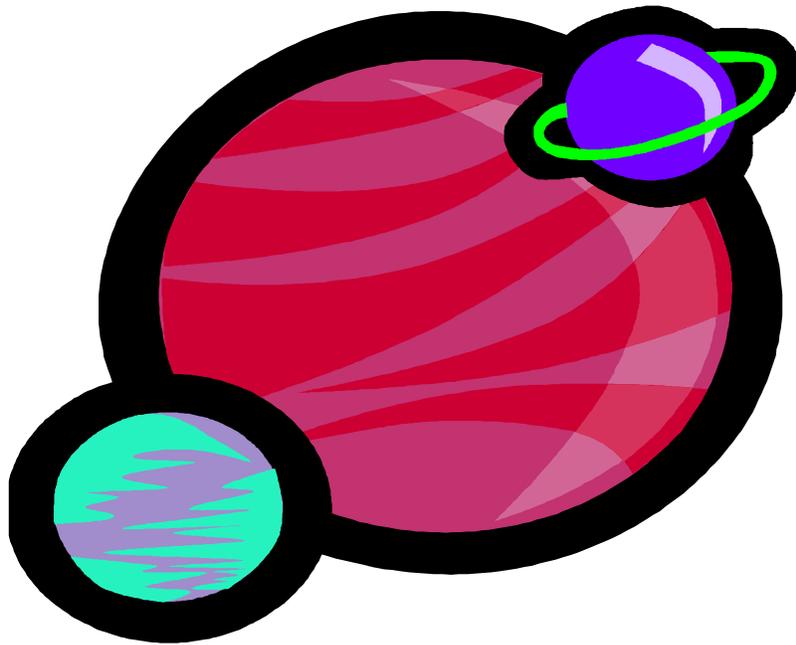
The Little Red Caboose by Marian Potter

The Book of Planets by Clint Twist

Career Day by Anne Rockwell



Space/Solar System



Compiled by:



Georgia Department of Early Care and Learning



Journey Through Space – Millions of Stars

Pre-K Content Standards for Science

- SD 4c: Participates in activities to explore the earth (rocks, soil, air) and sky (clouds, sun, moon, stars).
- SD 1a: Asks questions about objects, organisms, or events in environment.
- SD 1c: Uses language to describe observation.
- SD 1d: Uses simple equipment to experiment, observe, and increase understanding.
- SD 1e: Records observations through dictating to an adult, drawing pictures, or using other forms of writing.

Vocabulary Words

Stars, Milky Way, Constellations – Big Dipper, Little Dipper

Solar system

Planets – Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto

Orbit

Changes to the Environment in the Science Area

Add books, posters and/or pictures of planets, solar system, constellations, etc.

Add a model solar system.

Add binoculars and telescopes to the science area for students to use.

Use a **graphic organizer** to assess students' prior knowledge of space and the solar system.

Ask children what they know and what they want to learn about space. Record their responses on chart paper.



Science Experiments/Activities

What Does a Star Look Like?

Materials: paper, colored pencils/crayons, pictures of real stars

Directions: Have students draw a picture of what they think a star looks like. Compare drawings and discuss. Then show pictures of a real star. Does it look the same? Discuss. Conduct this activity with a small group of children.

Make a Constellation

Materials: blue or black construction paper, 8-10 star stickers per child, chalk

Directions: Talk and/or read books to your students about stars and constellations. Give each child paper, star stickers, and chalk, and have them randomly stick their stars on the paper. Then have them use the chalk to connect the stars. Explain that they have just formed a constellation. Collect the students' papers and display them all together creating the sky stars and constellations! Go to the internet and find websites with pictures of constellations for the children to view. Conduct this activity with a small group of children.

Hole-Punch Constellation

Materials: black paper, hole punch, chalk or pastels

Directions: After showing your children several pictures of constellations, give them a piece of black paper and a hole punch. Tell them to make holes where they want a star to be in their own constellation. Allow them to add other things to the picture using the chalk or pastels. To make the constellation more visible, give the students a piece of yellow paper to put behind their constellation or instruct them to hold it up to the light. Set up this activity in a learning center for children to choose during center time or conduct it with a small group of children.

Personal Planetarium

Materials: round box (oatmeal box), tracing paper/tissue paper, pencil, scissors, glue, small nail, flashlight, detailed pictures of various constellations sized to use as templates

Directions: Have the children do the following steps. Using a pencil, trace the bottom of the round box onto tracing/tissue paper. Then trace the illustration of a constellation (the Big Dipper, Orion, Cassiopeia, etc.) within the circle on the paper. Cut out the circle and glue it to the bottom of the box, making sure that the drawing of the constellation shows. Use a nail to punch holes through the box at each star. Take the planetarium into a dark room and stand facing a wall. Point the box toward the wall and shine a flashlight through the open end of the box. An enlarged image of the constellation appears on the wall.

Turn the box slowly. When you turn the box, you will see the various positions of the stars as they revolve. Conduct this activity with a small group of children.

Coffee Can Galaxy

Materials: black construction paper, large coffee can with lid, white paint/glue, marbles or ping pong balls, star stickers

Directions: Line the inside of a large coffee can with black construction paper. Submerge three marbles or one ping pong ball in a mixture of white paint and glue. Spoon the marbles/ping pong ball into the coffee can and put the lid on the can. Have a student shake and roll the can. After a few seconds of shaking/rolling the can, take the paper out, and let the student put stars on the orbit path created by the marbles. Set up this activity to be completed by the children during center time with adult supervision. Children can choose to do this activity.

Telescope

Materials: black tissue paper; paper towel tubes, rubber bands, pencil/pen, paper clips, glue, various art supplies

Directions: Using a rubber band, fasten two pieces of black tissue paper over the end of a paper towel tube. Make one per child. Use a pencil, pen, paper clip, etc. to punch several small holes in the tissue paper. Allow the children to decorate their telescope using various art supplies. Have the children point their telescope toward the light and look through it. Ask them to describe what they see. Talk about what telescopes are used for. Before beginning this activity, talk about telescopes and show the children pictures of telescopes or a real one to build their knowledge base. Use open-ended questions to extend the children's thinking about how a telescope works and what they might see using a telescope. This activity can be set up for children to choose to complete during center time.

Rocket Launch

Materials: Alka Seltzer tablets, water, 35mm film cartridge

Directions: Place an Alka Seltzer tablet and a small amount of water in a 35mm film cartridge and close the lid tightly. Place the cartridge on the floor and stand back. The top will soon launch. Discuss the experiment with the children (explain the pressure from the gas caused the lid to pop off and fly into the air) and how the experiment relates to rockets. Have children talk about rockets and what they know about rockets. Show the children pictures of rockets in books or from the Internet. Conduct this activity with a small group of children.

Orbit

Materials: metal washers, yarn, popsicle sticks, various colors of paint

Directions: Give each child a washer and a popsicle stick and have them decorate the washer as a planet and the popsicle stick as the sun. Attach the washer to one end of a piece of yarn and the popsicle stick to the other (cut a notch in the stick so the yarn will not come off the stick). Instruct the children to hold the popsicle stick (the sun) and spin the washer around the stick (causing the "planet" to orbit the "sun"). Before conducting this activity, talk with children about the definition of orbit and what it means to us. This activity is to be done as an experiment in the science area during work time.

Lite Brite Constellations

Using a Lite Brite set, demonstrate to the students how to use it to make constellations. Then provide students with illustrations of various constellations and allow them to use the Lite Brite set to copy the constellations. Conduct this activity with two to three children at a time. The Lite Brite can be added to a learning area after small groups of children have had time to explore the use of the Lite Brite.

Sensory Table

Fill the sensory table with sand and glitter. (Caution children not to rub their eyes after handling the sand and glitter mixture.) Have children use magnifying glasses to observe glitter pieces. Add cutouts of planets, moons, space ships, and flying saucers. Discuss with the children what the magnifying glasses do and what they see through the magnifying glasses.

Physical Activity

Have children act out how the solar system works. Assign children roles, i.e., one is the sun; others are the planets. Show how the planets orbit the sun by directing the students who are planets to walk around the student who is the sun. Explain how the orbits of the planets are different and discuss which planets take longer to go around the sun and why.



Art Activities

My Spray Bottle Solar System

Materials: paint, spray bottle, paper, crayons/markers, various art supplies of your choice

Directions: Dilute white paint with water and put it in a small spray bottle. Let the students spray this mixture onto black construction paper. The result will look similar to a picture of the Milky Way. Next show students several pictures of the solar system. Then invite them to design their own solar system on the paper. Set up this activity to be completed by the children during center time with adult supervision. Children can choose to do this activity.

Songs



- *Twinkle, Twinkle Little Star*
- *The Astronaut Song*
Outer space is where I really like to go;
I ride inside a spaceship, don't you know,
I like to travel near the stars,
Wave to Jupiter and Mars;
Outer space is where I really like to go.
- *The Planets Zippidy Doo*
Mercury, Venus, Earth, and Mars;
Then comes Jupiter, oh my stars;
Saturn, Uranus, Neptune too;
Then comes Pluto, zippidy doo.
- *Climb Aboard The Space Ship*
Climb aboard the spaceship, we're going to the moon;
Hurry and get ready, we're going to blast off soon.
Put on your helmets, and buckle up real tight;
Here comes the countdown, let's count with all our might
10 . . . 9 . . . 8 . . . 7 . . . 6 . . . 5 . . . 4 . . . 3 . . . 2 . . . 1 . . . blast off!

- *Planets Around The Sun (tune: "The Ants Go Marching")*

The planets revolve around the sun; hurrah, hurrah.
 The planets revolve around the sun; hurrah, hurrah.
 The planets revolve around the sun and spin on their axis every one,
 And they all go spinning around and around, they go.

Mercury, Venus, Earth, and Mars; hurrah, hurrah.
 Mercury, Venus, Earth, and Mars; hurrah, hurrah.
 Mercury, Venus, Earth, and Mars are whirling and twirling around the sun,
 And they all go spinning around and around, they go.

Jupiter, Saturn are next in line; hurrah, hurrah.
 Jupiter, Saturn are next in line; hurrah, hurrah.
 Jupiter, Saturn are next in line; Uranus, Neptune, and Pluto make all nine,
 And they all go spinning around and around, they go.

- *The Planets (tune: "Ten Little Indians")*

Mercury, Venus, Earth, and Mars,
 Jupiter, Saturn, Uranus, Neptune
 And the very smallest of all...Pluto

- *Orbiting Round the Moon (tune: "She'll Be Coming 'Round the Mountain")*

We'll be orbiting round the moon, yes we will;
 We'll be orbiting round the moon, yes we will;
 We'll be orbiting round the moon,
 We'll be orbiting round the moon,
 We'll be orbiting round the moon, yes we will.

We'll be landing on the moon, yes we will;
 We'll be landing on the moon, yes we will;
 We'll be landing on the moon,
 We'll be landing on the moon,
 We'll be landing on the moon, yes we will.

We'll be walking on the moon, yes we will;
 We'll be walking on the moon, yes we will;
 We'll be walking on the moon,
 We'll be walking on the moon,
 We'll be walking on the moon, yes we will.

We'll be blasting off again, yes we will;
 We'll be blasting off again, yes we will;
 We'll be blasting off again,
 We'll be blasting off again,
 We'll be blasting off again, yes we will.

We'll be landing back on Earth, yes we will;
 We'll be landing back on Earth, yes we will;
 We'll be landing back on Earth,
 We'll be landing back on Earth,
 We'll be landing back on Earth, yes we will.

Cooking and Snacks

- Talk about the types of snacks astronauts eat and provide those snacks for the children.
- Provide miniature Milky Way candy bars when talking about the Milky Way and constellations.
- Provide miniature Mars bars when talking about planets.
- Make cookies or rice krispie treats using star or other space related cookie cutters.

Edible Rockets

Materials: bananas, miniature marshmallows, various flat, edible items for wings (e.g., fruit roll ups)

Directions: Use ½ banana for the body of the rocket. Set it up on the cut end. Cut triangular shapes out of flat food items (e.g., fruit roll ups) and gently insert them into the banana. Use miniature marshmallows for billows of smoke around the base of the banana.

Tasty Stars

Materials: toaster, bread, star-shaped cookie cutters, appropriately colored jam/jelly

Directions: Explain to the children that stars “twinkle” because they are burning and that some stars burn hotter than other stars. Scientists can tell how hot a star is by its color. The coolest stars are red. Orange, yellow, and green stars are hotter. White stars are even hotter, and blue stars are the hottest. Cut toasted bread into star shapes with cookie cutters. Have the children spread jam on their stars depending on how hot their stars are burning. They can choose strawberry jam for a cool star, orange marmalade for an average star, or grape jelly for the hottest star.

Edible Solar System

Materials: Paper plate, black piece of construction paper in the shape of a circle, Fruit Loops, marshmallow, Ritz cracker, glue, plastic spoon

Directions: Children will glue the black circle to the plate first. Then they place the cracker in the middle (Sun); the Fruit Loops randomly placed around the cracker (planets); the marshmallows placed randomly on the plate (moons and stars). Then they take the rocket ship (spoon) and eat the solar system.

Blue Sky Vanilla Milkshakes

Materials (for each milkshake): ¾ cup vanilla ice cream, blue food coloring, ¼ cup milk (2%), ice cream scoop, tall plastic container for mixing, large spoon, small clear drinking glasses, drinking straws

Directions: For each milkshake, place two to three scoops of vanilla ice cream in the tall plastic container. Let the ice cream sit for 10 minutes at room temp. Have the children put one to two drops of blue food coloring into the ice cream and then add ¼ cup of milk. Have the students use a large spoon to gently stir the ingredients together. Add more ice cream or milk depending on the desired consistency. Pour the milkshakes into small, clear drinking glasses for the children to enjoy.



Moon Crater Cookies

Materials:

1 cup butter, softened	2 cups powdered sugar, sifted
2 large eggs	1 large egg, separated
3 1/3 cups flour	½ tsp baking powder
¼ cup granulated sugar	1 tsp ground cinnamon
sliced almonds	

Directions:

1. In large bowl, beat butter at medium speed until creamy; gradually add powdered sugar beating until blended. Add two eggs and one egg yolk beating until combined.
2. In separate bowl, combine flour and baking powder. Add to butter mixture beating at a low speed until blended. Shape dough into a ball, and wrap in plastic wrap. Chill until firm (approximately one hour).
3. Preheat oven to 350 degrees F. Prepare cookie sheets with lightly greased parchment paper.
4. Roll dough to 1/8" thickness on a lightly floured surface. Cut with a 3" round cutter. Place on prepared cookie sheets. Brush with lightly beaten egg white.
5. Stir together sugar and cinnamon, and sprinkle evenly over cookies. Gently press fine almond slices in a spoke design around the center of each cookie.
6. Bake four minutes. Remove pan from oven, and gently press almonds into cookies again. Bake four minutes more or until edges are lightly browned. Place cookies on wire racks to cool.

Dramatic Play Activities

Add space helmets and space gear to the dramatic play area. Turn the dramatic play area into a spaceship or planetarium.

Language/Literacy Activities

- Add stars/solar system flannel pieces or make your own for space related books.
- Create language and experience charts for each topic you discuss (stars, solar system, etc.) or have children create a story about being an astronaut or living in space and what they might find.
- Add related book on tape to listening station.
- Add space-related vocabulary cards, stationery, stickers, etc. to writing center.
- Introduce relevant vocabulary words: solar system, planets, orbit, stars, constellation, telescope, NASA, Milky Way, Little Dipper, Big Dipper, etc.

