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Creating Communities of Mathematical Thinkers in the Pre-Kindergarten Classroom

A thesis

Presented to

The faculty of the Department of Mathematics

East Tennessee State University

In partial fulfillment

Of the requirements for the degree

Master of Science in Mathematical Science

by

Robin Penley Herndon

August, 2006

Dr. Daryl Stephens, Chair

Dr. Rhona Cummings

Dr. Michel Helfgott

Keywords: Mathematics, Curriculum, Pre-Kindergarten

ABSTRACT

Creating Communities of Mathematical Thinkers in the Pre-Kindergarten Classroom

by

Robin Penley Herndon

This thesis describes a standards-based pre-kindergarten mathematics curriculum. The purpose of this thesis was to create a series of original lesson plans for the pre-kindergarten classroom that would address defined standards with instructional and other materials appropriate for teaching and assessing student understanding of the concepts. The curriculum is based on standards set forth by the National Council of Teachers of Mathematics and the Virginia Department of Education's Foundation Blocks for Early Learning. The body of the work introduces the foundation for the thesis with theoretical underpinning, defines the content strands and learning objectives, establishes a pacing schedule for meeting the objectives, and includes lessons for thirty weeks of instruction. Included in the appendices are parental newsletters, black line masters, literature and technology resources, and a student assessment.

DEDICATION

“And it shall come to pass, when I bring a cloud over the earth, that the bow shall be seen in the cloud” Genesis 9:14.

While working on my thesis, I had the distinct pleasure of attending a lecture given by Dr. Maya Angelou. She spoke fondly of rainbows in her life; those people who cast a light of hope in good times and bad. Dr. Angelou believes that each of us have had rainbows that have shaped our lives. At that lecture, she charged us with the task of thanking our rainbows. To all my rainbows I dedicate this thesis.

First and foremost, I thank God, the creator and giver of salvation, for forgiving my failures and loving me in spite of them. May His glory shine through my life for He alone is worthy of praise.

I must thank my husband Rusty and my daughters Tori and Lexie. I could not have done this without you. I appreciate your patience and love. We did this together. I love you all to the moon and back.

Thank you to my parents, Jamie and Pat, for supporting me and encouraging me when I got so tired I wanted to quit. It is your example of hard work and perseverance that kept me going. You are my inspiration.

Thank you to all of my extended family. Without your support, I would not have been able to pursue this dream. I love you.

Finally, I want to thank my church family at Swords Creek Community Baptist Church, my coworkers at Lebanon Primary School, and all my former teachers. Thank you to all the teachers who shared ideas with me and allowed their names to be part of this work.

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CHAPTER 1

INTRODUCTION

Research, as described by the Pre-K Now web site in the article *Why All Children Benefit from Pre-K*, demonstrates that high-quality pre-kindergarten programs increase a child's chances of succeeding in school and in life. Children who attend such programs are less likely to be held back a grade, less likely to need special education, and more likely to graduate from high school. The earlier students are exposed to meaningful, engaging mathematics instruction, the greater the likelihood the students will be successful in future educational endeavors. This awareness, of the tremendous, enduring impact of pre-kindergarten, mandates that pre-kindergarten programs strive to provide high quality instruction to these young learners.

In order to provide a high quality education to young learners at the pre-kindergarten level, established goals and objectives that target age-appropriate concepts through age-appropriate methods are fundamental. With today's rigorous curricula being driven by the No Child Left Behind legislation, it is imperative that any mathematics curriculum be aligned to those same standards from the beginning of formal education. The skills taught at the pre-kindergarten level are the very building blocks for all the subsequent years and skills to follow. The National Council of Teachers of Mathematics and the National Association for the Education of Young Children, in a joint position statement titled, *Early Childhood Mathematics: Promoting Good Beginnings*, affirm that high-quality, challenging, and accessible mathematics education for three-to-six-year-old children is a vital foundation for future mathematics learning (National Association for the Education of Young Children).

According to Jean Piaget’s concept of active learning in the preoperational stage, in which most preschoolers are located developmentally, experiences are crucial to the development of thought processes because the child’s logic develops from the effort to interpret the information gained through such experiences. “Piaget’s theory is based on the idea that the developing child builds cognitive structures—in other words, mental ‘maps,’ schemes, or networked concepts for understanding and responding to physical experiences within his or her environment.... The child is not yet able to conceptualize abstractly and needs concrete physical situations.... Educators must plan a developmentally appropriate curriculum that enhances their students’ logical and conceptual growth. Teachers must emphasize the critical role that experiences—or interactions with the surrounding environment—play in student learning” (“Piaget”). Active learning is both a concept and a process. As a concept, active learning means a child can construct knowledge through physical and mental activities. As a process, it means that a child is actively involved with a variety of manipulatives in problem-solving activities. When applying both aspects, active learning becomes an inherent part of constructivism (Morrison 114).

Through simple observation of young children, one can see how active participation is synonymous with learning. When a child is interested in what he or she is doing, learning naturally occurs. Such observations support the constructivist theory that suggests children must be active participants in the development of their own understanding. The theory also provides us with insights concerning how children learn mathematics and guides us to use instructional strategies that begin with children rather than ourselves (Van De Walle 22). From the constructivist point of view, children learn mathematics the same way they learn everything else, by constructing their own knowledge through experiences. Huitt summarizes this position in

Educational Psychology Interactive in his article “Constructivism” by stating, “The basic premise is that an individual learner must actively ‘build’ knowledge and skills and that information exists within these built constructs rather than in the external environment.”

Children come to pre-kindergarten with varying degrees of mathematical knowledge based upon experiences they have had to that point. Given that children enter school with such a unique mix of temperamental, learning, and intellectual profiles, they should not be expected to conform to a uniform approach to learning any more than adults would be expected to enter a single career track (Olfman 197). Educators must simply develop this range of prior knowledge by building connections in the classroom to form mathematical foundations. The National Council of Teachers of Mathematics expresses support for this approach in *Principles & Standards for School Mathematics*.

Developing a solid mathematical foundation from pre-kindergarten through second grade is essential for every child. In these grades, students are building beliefs about what mathematics is, about what it means to know and do mathematics, and about themselves as mathematics learners. These beliefs influence their thinking about, performance in, and attitudes toward mathematics and decisions related to studying mathematics in later years. All students deserve high-quality programs that include significant mathematics presented in a manner that respects both the mathematics and the nature of young children.... They must be grounded in a knowledge of child development and provide

environments that encourage students to be active learners and accept new challenges.

Ensuring that these goals are met requires using a variety of teaching techniques and always accounting for the child's current level of cognitive development. In an article titled, "Piaget's Theory of Cognitive Development," found in *Educational Psychology Interactive*, W. Huitt and J. Hummel describe this approach.

Discovery learning and supporting the developing interests of the child are two primary instructional techniques to be considered when forming a high-quality pre-kindergarten curriculum. It is recommended that parents and teachers challenge the child's abilities, but NOT present material or information that is too far beyond the child's level. It is also recommended that teachers use a wide variety of concrete experiences to help the child learn (e.g., use of manipulatives, working in groups to get experience seeing from another's perspective, field trips, etc.).

Lev Vygotsky, a Russian psychologist, outlines this approach in his theory of the "zone of proximal development." The zone of proximal development is defined as the difference between an individual's cognitive development and his/her level of potential development for problem solving (Coles 170). There is a distance between what a child can do on his/her own and what he/she can accomplish with the guidance of the teacher or in collaboration with more capable peers. Collaboration by a community of learners is indispensable for cognitive growth. Teachers who wish to maximize what a child accomplishes will minimize the time he/she works

alone. In this approach, the other students as well as the teacher become instructional resources (Thousand, Villa, and Nevin 9).

Any effective pre-kindergarten mathematics curriculum must also account for the individual differences in learners. Researchers in the field of “individual differences” suggest that children’s intellectual abilities are not easily classified into a single entity and may be composed of many differing abilities. In fact, Howard Gardner has identified as many as nine different types of intelligence or competence. A child may be highly capable in one or several and below average in others (Golant and Golant 100-103). Gardner’s work supports the idea that intelligence is multidimensional, and that there are many ways of knowing and expressing knowledge (Morrison 126-127). Therefore, classroom activities should be geared to appeal to all or at least most of these intelligences so that all students will have a chance to succeed.

This thesis outlines a standards-based, age-appropriate pre-kindergarten mathematics curriculum with all these aspirations in mind. Taking into account the theories of Piaget, Vygotsky, Gardner, and constructivism, the curriculum accommodates the diverse learning styles of students with lessons that engage the senses, incorporate music and art, and promote guided discovery practices. The lessons are primarily hands-on activities with the teacher serving as the facilitator of learning. With this curriculum, based upon the *Virginia’s Foundation Blocks for Early Learning* and the *Principles and Standards for School Mathematics* prescribed by the National Council of Teachers of Mathematics, one can be assured that the focus is on concepts that will continue to be important as the student progresses through school. Joining the spirit of the pre-kindergarten classroom with a solid mathematics curriculum fosters both conceptual skills and a natural curiosity and love for mathematics.

CHAPTER 2

STATEMENT OF STANDARDS AND OBJECTIVES

Pre-kindergarten standards place emphasis on developing the concept of numbers by counting, combining, sorting, and comparing sets of objects; recognizing and describing simple repeating patterns; and recognizing shapes and sizes of figures and objects. Students will investigate nonstandard comparisons, collect data, and create graphs. The following standards are adapted from the kindergarten “Mathematics Standards of Learning” listed on the Virginia Department of Education web site at www.doe.virginia.gov.

Understanding the concept of number is fundamental to mathematics. Children come to school with rich and varied informal knowledge of number. A major goal of the pre-kindergarten curriculum is to build upon this informal base toward more thorough understanding and skills. Children move from basic counting techniques to an understanding of number size, relationships, and operations.

Recognizing patterns and relationships among objects is an important component in intellectual development. Learning to organize by patterns leads to an eventual application of patterning in problem solving, forming generalizations, and developing concepts of number, operation, shape, and space. Pattern recognition is the first step in the development of algebraic thinking.

Geometry helps young minds systematically represent and describe the world around them. Through geometry, children learn to name and recognize the properties of various shapes and figures, to use words that indicate direction, and to use spatial reasoning to analyze and solve problems.

Measurement is one of the most widely used applications of mathematics. Early learning experiences with measurement should focus on direct comparisons of objects. Children make decisions about size by looking, touching, and comparing objects directly while building language to express the size relationships. Sensory involvement is a key component in making comparisons for young learners.

Sorting allows children to recognize similarities and differences among objects. This recognition leads to pattern recognition and consequently formation of generalizations. As children begin to use language to describe these similarities and differences, they begin sharing their ideas and their mathematical thinking. It is imperative that children be actively involved in collecting, sorting, organizing, and communicating information.

Mathematical learning builds upon children's natural curiosity and enthusiasm and challenges children to explore ideas about patterns and relationships, order and predictability, and logic and meaning. Consequently, quality instruction occurs in environments that are rich in language, encourage children's thinking, and nurture children's exploration and ideas. These ideas include the concepts of number pattern, measurement, shape, space, and classification. Quality instruction engages children in individual, small group, and whole group activities that focus on discovery through guided learning. This plan is clearly suggested by the Texas Education Agency's "Pre-Kindergarten Guidelines Mathematics."

The following standards are designed to help students develop a wide range of skills and strategies for solving a variety of problem types. Students should be encouraged to use correctly the concepts, skills, symbols, and vocabulary identified in the standards adapted from the Virginia Department of Education's *Virginia's Foundation Blocks for Early Learning: Standards*

for Literacy, Mathematics, Science, and History and Social Science. These standards are available for viewing at www.doe.virginia.gov.

Pre-Kindergarten Mathematics Objectives

Number and Number Sense

- PK.1 The student, given two sets containing 10 or fewer concrete items, will identify and describe one set as having more, fewer, or the same number of members as the other set, applying the concept of one-to-one correspondence.
- PK.2 The student, given a set containing 10 or fewer concrete items, will
- A) tell how many are in the set by counting the number of items orally;
 - B) select the corresponding numeral from a given set; and
 - C) write the numeral to tell how many are in the set
- PK.3 The student, given an ordered set of three objects and/or pictures, will indicate the ordinal position of each item, first through third, and the ordered position of each item from left-to-right and top-to-bottom.
- PK.4 The student will count forward to 20 and backward from 10.

Computation and Estimation

PK.5 The student will investigate the concepts of addition and subtraction of whole numbers, using up to 10 concrete items.

Measurement

PK.6 The student will recognize a penny, nickel, dime, and quarter.

PK.7 The student will identify the instruments used to measure length (ruler), weight (scale), time (clock: digital and analog; calendar: day, month, and season), temperature (thermometer).

PK.8 The student will compare two objects or events, using direct, nonstandard comparisons according to one or more of the following attributes: length (shorter, longer), height (taller, shorter), weight (heavier, lighter), temperature (hotter, colder).

Geometry

PK.9 The student will identify, describe, and draw two-dimensional (plane) geometric figures (circle, triangle, square, and rectangle).

PK.10 The student will describe the location of one object relative to another (above, below, next to) and identify representations of plane geometric figures (circle, triangle, square, and rectangle) regardless of their position and orientation in space.

PK.11 The student will compare the size (larger, smaller) and shape of plane geometric figures (circle, triangle, square, and rectangle).

Probability and Statistics

PK.12 The student will gather data relating to familiar experiences by counting.

PK.13 The student will display objects and information, using objects graphs and pictorial graphs.

Patterns, Functions, and Algebra

PK.14 The student will sort and classify objects according to similar attributes (size, shape, and color).

PK.15 The student will identify, describe, and extend a repeating relationship (pattern) found in common objects, sounds, and movements.

CHAPTER 3

PACING GUIDE AND LESSONS

Meeting the needs of young learners requires much more than defined objectives and standards. While establishing objectives is the first critical step to successfully educating young learners in the discipline of mathematics, fulfilling these goals requires extensive planning. It is important that the teacher set a timeline for completing instruction and that the instructional materials and lessons be age-appropriate and engaging for the learners. This aspect of planning is perhaps best accomplished by using a pacing guide and prepared plans for teaching. Pacing guides, when followed, allow the teacher to complete the objectives in the prescribed amount of time. Prepared lesson plans assure that the material is being taught in a cohesive and meticulous manner that targets the interests and abilities of the learners.

This chapter is dedicated to this planning process. It is comprised of a pacing guide to meet all of the objectives outlined in chapter two and lesson plans to teach those objectives. The pacing guide gives a week-by-week description of the topics to be learned, objective numbers for reference, description of lessons and skills, and suggested resources for meeting the objectives. The pacing guide, in its entirety, is seen in Table 1. The pacing guide is followed by lesson plans designed for teaching each week's skills.

An effective classroom teacher is able to adapt ideas previously seen in textbooks, curricular models, other classrooms, mentors, workshops, and professional development seminars into something that is practical for his/her own classroom. The process of acquiring ideas for teaching mathematics as well as other areas of the curriculum is an ongoing process. Likewise, the lessons in this thesis must change as the standards and new studies on methodology bring more insight into the classroom. The current lesson plans are the best effort

of the author to address the current standards and research; however, the lessons are dynamic and will continue to evolve as necessary.

The lesson plans in this thesis are lessons developed by the author to teach mathematical concepts and have been created using a variety of sources for inspiration. While some ideas are borrowed from resources such as those previously mentioned, all have been altered and tailored for use in the pre-kindergarten classroom. Ideas that have been borrowed from other sources will be noted on the applicable lessons. All other lessons, to the best of the author's knowledge, are original ideas developed and used in the author's classroom. The lessons are to be taught semi-weekly and are consecutively numbered to match the week numbers on the pacing guide. It is recommended that the lessons be taught in sequential order as each lesson builds upon knowledge and skills learned in previous lessons.

Table 1

Pacing Guide

Instructional Week Number	Objective	Lessons/Skills	Suggested Resources
<p>WEEK 1 (ongoing)</p> <p>CALENDAR, SEASONS, AND SHAPES</p>	<p>PK.7</p> <p>PK.9</p> <p>PK.10</p>	<ul style="list-style-type: none"> • Students will identify the components of a calendar including days, months, and seasons. • Students will identify a circle, triangle, square, and rectangle. • Students will describe the properties of triangles, squares, and rectangles including the number of sides and number of corners. 	<p>Curriculum</p> <p>Modules</p> <p>Manipulatives: Calendar, cut out shapes, pattern blocks, shape bingo</p>

Table 1 (continued)

		<ul style="list-style-type: none"> • Students will describe a circle. • Students will draw a circle, square, triangle, and rectangle. 	
<p>WEEK 2</p> <p>SHAPES</p>	PK.11	<ul style="list-style-type: none"> • Students will compare and group plane geometric figures (circle, triangle, square, and rectangle) according to their relative sizes (larger, smaller). • Students will compare and group plane geometric figures (circle, triangle, square, and rectangle) according to their shapes. 	<p>Curriculum</p> <p>Modules</p> <p>Manipulatives:</p> <p>Pattern blocks, tangrams, attribute blocks</p>

Table 1 (continued)

<p>WEEK 3 WEEK 4 COUNTING COUNTING WITH CONCRETE ITEMS</p>	<p>PK.2</p>	<ul style="list-style-type: none"> • Students will count orally the number of items in a set of 10 or fewer concrete items, using one-to-one correspondence, and identify the corresponding number. • Students will identify the numbers 0-10 in random order. • Students will select numbers from a given set of numbers that corresponds to a set of 10 or fewer concrete items. • Students will write the numbers from 	<p>Curriculum Modules Manipulatives: Counting Objects (counting teddies, fruits, beans, etc.) Birthday cake counters, ladybug counters, trail mix cooking, flash cards,...</p>
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Table 1 (continued)

		<p>0-10.</p> <ul style="list-style-type: none"> Students will write a number that corresponds to a set of 10 or fewer concrete items. 	
<p>WEEK 5 MORE, FEWER, SAME</p>	<p>PK.1</p>	<ul style="list-style-type: none"> Students will match each member of one set with each member of another set, using the concept of one-to-one correspondence to compare the number of members between sets, where each set contains 10 or fewer items. Students will 	<p>Curriculum Modules Manipulatives: Linking cubes and counters</p>

Table 1 (continued)

		<p>compare and describe two sets of 10 or fewer items, using the terms more, fewer, and the same</p>	
<p>WEEK 6 SORT/CLASSIFY</p>	<p>PK.14</p>	<ul style="list-style-type: none"> Students will sort objects into appropriate groups based on one attribute, such as size, shape, or color. Students will classify sets of objects into three groups of one attribute (e.g., for size-small, medium, large). 	<p>Curriculum Modules Manipulatives: Pattern blocks, colored macaroni, colored cubes, colored tiles, linking blocks</p>
<p>WEEK 7 COUNTING</p>	<p>PK.4</p>	<ul style="list-style-type: none"> Students will count forward 1-20. Students will count 	<p>Curriculum Modules Manipulatives:</p>

Table 1 (continued)

		backwards from 10-1.	Counters and number cards
WEEK 8 WEEK 9 PATTERNS COUNTING 1-20	PK.15 PK.2	<ul style="list-style-type: none"> Students will observe and identify the basic repeating pattern found in repeating patterns of common objects, sounds, and movements that occur in real-life situations, where there are four or fewer elements in the basic repeating pattern. Students will extend a repeating pattern by adding at least two repetitions to the 	Curriculum Modules Manipulatives: Pattern blocks, colored macaroni, colored cubes, colored tiles, linking blocks, calendar, etc.

Table 1 (continued)

		<p>pattern.</p> <ul style="list-style-type: none">• Students will count orally the number of items in a set containing 10 or fewer concrete items, using one-to-one correspondence, and identify the corresponding number.• Students will identify written numbers from 0-10 presented in random order.• Students will select the number from a given set of numbers that corresponds to a set of 10 or fewer	
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Table 1 (continued)

		<p>concrete items.</p> <ul style="list-style-type: none"> • Students will write the numbers 0-10. • Students will write a number that corresponds to a set of 10 or fewer concrete items. 	
<p>WEEK 10</p> <p>POSITIONS</p> <p>(Above, Below, Next to)</p>	<p>PK.10</p>	<ul style="list-style-type: none"> • Students will identify pictorial representations of a circle, triangle, square, and rectangle regardless of their position and orientation in space. • Students will describe the location of one object relative to another 	<p>Curriculum</p> <p>Modules</p> <p>Manipulatives:</p> <p>Geometric shapes</p>

Table 1 (continued)

<p>WEEK 11</p> <p>COUNTING FORWARD</p> <p>COUNTING BACKWARD</p>	<p>PK.4</p>	<ul style="list-style-type: none"> • Students will count forward 1-20. • Students will count backward from 10-1. 	<p>Curriculum</p> <p>Modules</p> <p>Manipulatives:</p> <p>Counting objects and number cards</p>
<p>WEEK 12</p> <p>SCALE</p>	<p>PK.7</p>	<ul style="list-style-type: none"> • Students will identify the instrument used to measure weight (scale). • Students will identify different types of scales as instruments to measure weight. 	<p>Curriculum</p> <p>Modules</p> <p>Manipulatives:</p> <p>Scale, blocks, Unifix cubes, Cuisenaire rods, miscellaneous objects.</p>
<p>WEEK 13</p> <p>THERMOMETER</p>	<p>PK.7</p>	<ul style="list-style-type: none"> • Students will identify the instrument used to measure temperature (thermometer). • Students will identify different 	<p>Curriculum</p> <p>Modules</p> <p>Manipulatives:</p> <p>Thermometers</p>

Table 1 (continued)

		types of thermometers as instruments used to measure temperature.	
WEEK 14 RULER	PK.7	<ul style="list-style-type: none"> Students will identify a ruler as an instrument used to measure length. 	Curriculum Modules Manipulatives: rulers, measuring tapes, blocks, pencils, paper clips, Unifix cubes, etc.
WEEK 15 COMPARISON OF LENGTH, WEIGHT, TEMPERATURE	PK.7 PK.8	<ul style="list-style-type: none"> Students will compare and describe lengths of two objects (as longer or shorter) using direct comparison or nonstandard units of measure (e.g. foot length, hand span, new pencil, 	Curriculum Modules Manipulatives: Ruler, scale thermometer, blocks, pencils, paper clips, beans, Unifix cubes, Cuisenaire rods, balances, objects, weights

Table 1 (continued)

		<p>paper clip, and block).</p> <ul style="list-style-type: none">• Students will compare and describe heights of two objects (as taller or shorter), using direct comparison or nonstandard units of measure.• Students will compare weights of two objects as heavier and lighter using direct comparison or nonstandard units of measure.• Students will compare and describe temperatures of	
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Table 1 (continued)

		two objects or environments as hotter or colder using direct observation.	
WEEK 16 TIME/CLOCK	PK.7	<ul style="list-style-type: none"> • Students will identify the clock as an instrument used to measure time. • Students will recognize both analog and digital clocks. 	Curriculum Modules Manipulative: Analog clock, digital clock, stop watch, class pack of clocks
WEEK 17 ADDITION NUMBERS 0-5	PK.5	<ul style="list-style-type: none"> • Students will investigate the concept of addition of whole numbers using up to 10 concrete objects. 	Curriculum Modules Manipulatives: Counting objects such as counting bears
WEEK 18	PK.5	<ul style="list-style-type: none"> • Students will 	Curriculum

Table 1 (continued)

<p>ADDITION NUMBERS 6-10</p>		<p>combine two sets with known qualities in each set, and count the combined set to determine the sum, where the sum is not greater than 10 concrete objects.</p>	<p>Modules Manipulatives: Counting objects such as counting bears, linking cubes, abacus counters</p>
<p>WEEK 19 ORDINAL POSITION</p>	<p>PK.3</p>	<ul style="list-style-type: none"> Students, given an ordered set of three objects and /or pictures, will indicate the ordinal position of each item, first through third, and the ordered position of each item from left-to-right and top-to-bottom. 	<p>Curriculum Modules Manipulatives: Miscellaneous everyday objects and pictures</p>

Table 1 (continued)

<p>WEEK 20</p> <p>COUNTING DATA</p>	<p>PK.12</p>	<ul style="list-style-type: none"> Students will gather data on given categories by counting (favorites, number of days of various types of weather, types of pets, types of shoes, etc.). 	<p>Curriculum</p> <p>Modules</p> <p>Manipulatives:</p> <p>Weather symbols, student drawings of favorites, color cubes, shoes, etc.</p>
<p>WEEK 21</p> <p>WEEK 22</p> <p>COUNTING DATA</p> <p>GRAPHING DATA</p>	<p>PK.12</p> <p>PK.13</p>	<ul style="list-style-type: none"> Students will gather data relating to familiar experiences by counting. Students will display objects and information to create simple objects graphs and simple pictorial graphs. 	<p>Curriculum</p> <p>Modules</p> <p>Manipulatives:</p> <p>Various graphing grids, objects, and pictures</p>

Table 1 (continued)

		<ul style="list-style-type: none"> Students will display information in columns or rows. 	
<p>WEEK 23</p> <p>MONEY</p> <p>(penny)</p>	PK.6	<ul style="list-style-type: none"> Students will recognize a penny. Students will describe the characteristics of a penny (color, relative size). 	<p>Curriculum</p> <p>Modules</p> <p>Manipulatives:</p> <p>Pennies</p>
<p>WEEK 24</p> <p>MONEY</p> <p>(nickel)</p>	PK.6	<ul style="list-style-type: none"> Students will recognize a nickel. Students will describe the characteristics of a nickel (color, relative size). 	<p>Curriculum</p> <p>Modules</p> <p>Manipulatives:</p> <p>Nickels</p>
<p>WEEK 25</p> <p>MONEY</p> <p>(dime)</p>	PK.6	<ul style="list-style-type: none"> Students will recognize a dime. Students will describe the characteristics of a 	<p>Curriculum</p> <p>Modules</p> <p>Manipulatives:</p> <p>Dimes</p>

Table 1 (continued)

		dime (color, relative size).	
WEEK 26 MONEY (quarter)	PK.6	<ul style="list-style-type: none"> Students will recognize a quarter. Students will describe the characteristics of a quarter (color, relative size). 	Curriculum Modules Manipulatives: Quarters
WEEK 27 WEEK 28 PROBABILITY/STATISTICS	PK.10	<ul style="list-style-type: none"> Students will conduct investigations of probability through hands-on activities such as dropping a two-colored counter or using a multi-colored spinner. Students will describe verbally 	Curriculum Modules Manipulatives: two-colored counters, multi-colored spinner, two-colored lima beans, marbles, colored chips

Table 1 (continued)

		and/or pictorially the outcome of dropping a two-colored counter or multi-colored spinner.	
WEEK 29 SUBTRACTION	PK.5	<ul style="list-style-type: none"> Students will investigate the concept of subtraction of whole numbers using up to 10 concrete items. 	Curriculum Modules Manipulatives: Counting objects such as counting teddies
WEEK 30 SUBTRACTION	PK.5	<ul style="list-style-type: none"> Students will remove, “take away,” or separate part of a set from a given set to determine the result of subtraction. 	Curriculum Modules Manipulatives: Counting objects such as counting teddies, linking cubes, abacus
WEEKS 31-36	PK.1-	<ul style="list-style-type: none"> Review all PK 	

Table 1 (continued)

	PK.15	standards and objectives	
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Lessons

Lesson 1A

Objectives: PK.7 Calendar (Daily Activity)

Materials:

Calendar Grid

Days of the week strips

Months of the year strips

Numbered icons

Year numerals

Season icons

Numbered icons to record days in school

Dr. Jean Feldman songs “Days of the Week” and “Months Macarena” (any days or months song will work)

Lesson Preparation:

Prepare calendar labels for days, months, year numeral, daily numbered icons 1-31, seasons, and colored counting icons (such as arrows or seasonal items like school buses and pumpkins) to record the number of days in school. Ready-made calendar sets may be purchased or sets may be made from poster board, bulletin board, or construction paper materials.

Overview:

Begin the calendar lesson on the first day of school and make it a daily activity for circle time.

Seat students in a circle on the carpet in clear view of the classroom calendar. Explain the rules for circle time activities stressing the importance of listening to teachers and other students when they are speaking and raising hands to participate in the discussion. Use positive reinforcement phrases such as “good try” and “that was close” to encourage student participation. Point to the appropriate areas of the calendar during the lesson.

Lesson Directions:

- Seat students in a circle on the carpet.
- Point to the calendar.
- Ask if anyone knows its name.
- Explain that a calendar tells us the day of the week, the month of the year, and the year number. Point to each of these as you name them.
- Place the new month, “August,” at the top and have students echo the word “August.”
- Point to the other months arranged along the side of the calendar and explain that there are 12 months in one year and that the months will change with the passing of the days. Reinforce this idea by asking students to name the month of their birth dates.
- Point to the year at the top of the calendar. Call the current year’s number and have students echo that number (e.g. “2005”). Explain that when all 12 months, beginning with January and going through December, have come and gone, the year number will change.
- Point to the days of the week arranged along the side of the calendar opposite the months.

Explain that seven days comprise one week. Name the seven days, beginning with Sunday. Note to the students that we attend school Monday-Friday and stay home on Saturday and Sunday. You may want to reinforce this idea by placing small bus icons beside the days Monday-Friday and not beside Saturday and Sunday. Choose the appropriate day of the week and have students echo that day.

- Explain that each day of each month is numbered, and the month begins with number “1.” (Have numbers already placed on the calendar up to the current date.) Encourage students to count with you from “1” up to the current date and place that number on the calendar in the column of the current day (Monday-Friday).
- Once the calendar is complete, have students echo the entire date in the following format: “Today is” (echo), “Monday” (echo), “August 15” (echo), “2005” (echo).
- Explain that there are four seasons each year and name them while pointing to appropriate icons (seasonally specific trees work well). Briefly describe some of the nature and weather related changes of each season. Choose the current season and place its icon on the calendar.
- Explain that we will count to keep track of the number of days we have attended school using numbered icons such as buses, arrows, or other seasonally specific items like fall leaves and snowmen. Each month we will change our icon or icon color to signify the beginning of the new month. Place the “1” icon on a wall to begin the count. Explain that tomorrow the “2” icon will go beside “1.”
- Finish the lesson with a fun, physically engaging calendar related song such as Dr. Jean Feldman’s “Days of the Week” and/or “Months Macarena.”
- Repeat this lesson daily to begin circle time activities. It will become quicker as days pass

and students grasp the calendar concepts.

- **Additional Activities:** Place a paper wall calendar in the housekeeping center, place an interactive Velcro type calendar in a center for student access, mark significant dates and activities on a calendar for students to look forward to, create a countdown wall or bulletin board to countdown to upcoming events such as removing paper packages from underneath a paper tree to countdown to Christmas break.

*This method of conducting calendar activities was adapted from a technique used in the kindergarten classroom of Jeanene Compton, Honaker Elementary School, Honaker, Virginia.

Lesson 1B

Objectives: PK. 9, PK.10 Identify and describe plane geometric figures regardless of orientation

Materials:

Crackers (or similar snack food) in shapes of square, circle, rectangle, and triangle

Ready-made or poster board cutout shapes

Lesson Preparation:

Place one cracker of each shape in snack size Ziploc baggie for each student

Cut out poster board shapes

Overview:

Seat students in a circle on carpet. Review rules for circle time including listening and raising hands. In this lesson, students will actively engage the senses of sight, touch, smell, and taste in exploring shapes and attributes of the shapes.

Lesson Directions:

- Perform calendar activities for the day, month, date, year, season, and number of school day.
- Introduce today's lesson by pointing to the four pre-cut cardboard shapes.
- Show the circle individually and ask if anyone knows its name. Name the "circle" and have students echo "circle." Describe the circle as a continuous curved line that begins

and ends at the same point with no corners. Pass the shape around the circle for student observation.

- Show the square and ask if anyone knows its name. Name the “square” and have students echo “square.” Describe the square as a figure with four sides all the same size and four corners. Show the circle and square side by side to demonstrate the idea of sides and corners. Pass the square around the circle of students for observation.
 - Show the triangle and ask if anyone knows its name. Name the “triangle” and have students echo “triangle.” Describe the triangle as a figure with three sides and three corners. Show the square and triangle side by side and have students count the sides of each with you to demonstrate the difference. Pass the triangle around for student observation.
 - Show the rectangle and ask if anyone knows its name. Name the “rectangle” and have students echo “rectangle.” Describe the rectangle as having two long sides and two short sides and four corners. Show the rectangle and square side by side and point out the differences in the lengths of the sides. Pass the rectangle around for student observation.
 - Distribute baggies of snack crackers and a napkin to each student. Explain that the baggies contain one of each of the shapes just studied. Have students lay crackers out on napkins for observation.
 - Instruct students to show each shape as you call them.
 - Allow students to enjoy eating each shape as you call them.
- Additional Activities: Shape art collages, dough fun with shape cookie cutters, shape blocks for free play, pattern blocks with reproducible tangram designs, shape stories on

CD in the listening center, make body shapes on floor (e.g. three students lay down on floor to form triangle), arrange precut shapes in a line and have students identify which has been removed while eyes were closed, and shape scavenger hunts.

*This lesson on shape attributes was adapted from a method used in the kindergarten classroom of Jeanene Compton, Honaker Elementary School, Honaker, Virginia.

Lesson 2A

Objectives: PK.9, PK.10, PK.11 Identify, describe, and compare plane geometric shapes regardless of orientation in space

Materials:

Precut shapes (various sizes)

Pattern blocks (various sizes)

Lesson Preparation:

Place a small collection of shapes at each student's circle activity seat

Overview:

Seat students in a circle on the carpet. Review shapes using cardboard cutouts. Students will explore collections, sort by shape and size, and create freestyle designs/collages using shapes.

Lesson Directions:

- Allow students free time to explore, discover, and create with precut shapes or pattern blocks.
- Review each shape by name and description using large precut shapes.
- Inform students that today's activity will be sorting blocks. Explain that sorting means to group or put things together that are alike in some way.
- Demonstrate sorting by creating groups of circles, squares, triangles, and rectangles.

- Instruct students to create groups for each shape using their blocks/shapes. It is important to do one group at a time. First, have students find all circles and put them aside. Second, have students find all squares and put them aside. Continue with triangles and rectangles in the same manner.
 - Inform the students that items such as their shapes can also be sorted by size, big/larger and little/smaller. Allow for some degree of variance in student perception of size, but be sure students can pick out the largest and smallest in each group. Demonstrate how to choose the largest circle and the smallest circle. Proceed to have students choose the largest and smallest of each of their shape groups.
 - Allow some additional time for students to explore and play creatively with shapes/blocks.
- Additional Activities: Sort students by hair color, eye color, gender, shoe style, etc., sort shapes by color, sort trail mix or cereal by shape/color, sort craft foam shapes and create collages, create a sensory table full of 3-D shapes and provide sorting buckets

Lesson 2B

Objectives: PK.9, PK.10, PK.11 Identify, describe, and compare plane geometric shapes regardless of orientation in space

Materials:

Precut wooden shapes with painted faces

Lesson Preparation:

Create hinged, wooden shapes (circle, square, triangle, rectangle) and paint happy faces on each. Paint boy faces for rectangle and square and girl faces for circle and triangle. Cardboard shape faces can be substituted.

Overview:

Students will learn to sing shape themed songs that reinforce shape characteristics.

Lesson Directions:

- Introduce students to the wooden shape faces by the given names: “Squirmy Square,” “Rocky Rectangle,” “Sarah Circle,” and “Trixy Triangle.”
- Inform students that we will learn a song to help us remember each shape and its name as well as what it looks like.

- Teach each of the following verses to the students by singing the verse, reading the verse, having students echo the verse, and singing the verse with the students. Teach one verse at a time while holding the appropriate shape and tracing its shape.
- (Sing to the tune of *Mary Had a Little Lamb*)
 1. Squirmy is a happy square, happy square, happy square. Squirmy is a happy square. His sides are the same size.
 2. Rocky is a rectangle, rectangle, rectangle. Rocky is a rectangle, two long and two short sides.
 3. Sarah is a smooth circle, smooth circle, smooth circle. Sarah is a smooth circle. She just goes round and round.
 4. Trixy is a triangle, triangle, triangle. Trixy is a triangle. She only has three sides.
- Repeat the song periodically throughout the next few weeks to reinforce shape characteristics.
- Additional Activities: Place the shape faces in the dramatic play center with a puppet stage, allow students to finger paint shapes and design their own faces, create puppets on craft sticks for each student to use during singing, use felt shapes on the flannel board and allow students to add facial features, have students draw shapes and faces in shaving cream or colored sand as a small group activity.

*This method of teaching shape attributes was adapted from a method used in the pre-kindergarten classroom of Sharon Wicker, Honaker Elementary School, Honaker, Virginia; however, all musical lyrics are original.

Lesson 3A

Objectives: PK.2 Counting 0-10 with concrete items

Materials:

Counting items such as bears or beans

Five bowls programmed with numbers 1-5

Five snack mix items such as goldfish crackers, M&Ms, cheerios, pretzel sticks, gummy animals, mini marshmallows, popcorn, etc. (Be cautious of food allergies)

Snack sized plastic bags

Lesson Preparation:

Program five bowls with the numerals 1-5. Fill each bowl with one kind of snack item.

Overview:

In this lesson, students will explore one-to-one correspondence by counting items as a group and then individually.

Lesson Directions:

- Seat students in a circle on the carpet.
- As a group, count orally 1-10.

- Ask if anyone knows why we have numbers (i.e. “What is their purpose?” or “How do we use numbers?”).
- Explain that numbers allow us to count or know how many of something we have. Demonstrate by counting a group of counting bears with no more than ten bears. Line the bears up in a row, and point to each bear as you say its number.
- Conduct a second demonstration using a different number of bears and have students count with you as you point to each bear.
- Conduct a third demonstration using a different number of bears and have students count without your assistance, as much as possible, as you point to each bear.
- Distribute a number of bears, ten or fewer, to each student.
- Instruct students to line up the bears in a straight row in front of them so everyone in the circle can see.
- Conduct one final demonstration of counting by pointing to each bear while calling its number.
- Ask each student in the circle to count his/her bears. Be sure to provide encouragement and assistance as needed.
- Allow students free time with the bears as you proceed with the next step in this lesson.
- Reinforce this lesson by having each student create a bag of trail mix by counting out the appropriate number of snack items from each numbered bowl. For example, Bowl 1 contains marshmallows, so the student should place 1 marshmallow in his/her bag. Bowl 2 contains M&Ms, so the student should place 2 M&Ms in his/her bag. Repeat this process with each remaining bowl. Allow students to enjoy eating the snack at the end of the activity.

- Additional Activities: Have students create play dough cakes and add a number of straw candles, draw or color ladybugs and add a given number of dots, do outdoor scavenger hunts to find a number of items such as leaves, rocks, acorns, etc., count the doors on a given hallway, count the number of gummy snacks in a pack, etc.

Lesson 3B

Objectives: PK.2 Counting 0-10 with concrete items

Materials:

Cardstock ladybugs with differing numbers of spots 0-10

Index cards with numerals 0-10

Pocket chart

Lesson Preparation:

Prepare eleven ladybugs with 0-10 spots. These may be ready made, but can easily be created by copying a ladybug shape on cardstock paper and coloring each with a different number of spots.

Write the numerals 0-10 on separate index cards. Place the numeral cards in a horizontal row at the top of the pocket chart. Randomly place the ladybugs on the lower portion of the pocket chart.

Overview:

Students will continue to explore one-to-one correspondence by counting spots on ladybugs and matching that result to the corresponding numeral.

Lesson Directions:

- Seat students in a circle on the carpet.
- Have students count orally with you 1-10. Point to each numeral as you call its name.

- Explain that each ladybug has a different number of spots. Our task is to count each ladybug's spots and find its numeral, placing that numeral on top of the ladybug.
 - Demonstrate by counting a ladybug's spots and selecting its numeral.
 - Allow each student a chance to select a ladybug and find the numeral that corresponds to its number of spots. Reorganize the numeral row and ladybugs as necessary to allow each student an opportunity to participate.
 - Repeat the activity as long as student interest permits. Leave the pocket chart activity in an area that is accessible for individual student practice during center time or free play time.
 - Follow up the activity by reading the story *The Grouchy Ladybug* by Eric Carle.
- Additional Activities: Provide each student with a ladybug coloring sheet and allow him/her to put on black dot stickers up to 10 to create its spots, use a flannel board ladybug and put on Velcro dots, finger paint ladybugs, draw ladybugs with sidewalk chalk, place ladybug costumes in a center for dramatic play, etc.

Lesson 4A

Objectives: PK.2 Counting 0-10 with concrete items

Materials:

Book *The Very Hungry Caterpillar* by Eric Carle

Blank Page Booklets for student art and dictation

Plastic fruit counters

Lesson Preparation:

Prepare blank page booklets for students to illustrate and retell the story.

Overview:

Students will explore one-to-one correspondence through the reading and retelling of the story *The Very Hungry Caterpillar* by Eric Carle. After hearing the story, students will create their own counting books using the numbers and foods eaten by the caterpillar in the story. Students will draw the appropriate numbers of fruits to correspond to the numerals.

Lesson Directions:

- Seat students in a circle on the carpet.
- Begin lesson by posing the questions “What happens if we eat too much?” and “How many apples, strawberries, oranges, etc. are ‘too much’?” Explore the students’ answers by displaying plastic fruits or counting fruits in the given numbers up to ten.

- Lead the discussion to the reading of *The Very Hungry Caterpillar* by asking the students, “How many apples, strawberries, etc. can a caterpillar eat before being too full?”
- Introduce the story by showing the cover and pointing out the name of the author (the person who writes the words to tell the story) and the illustrator (the person who draws the pictures). Build prior knowledge by asking if anyone can tell what a caterpillar is, what they eat, what happens to them as they grow, etc.
- Read the story taking time to name each food item, point to each member of each set of foods, and count orally applying the concept of one-to-one correspondence. Encourage students to count with you.
- After completing the story, tell students that today’s table time art activity will be to create personal retellings of *The Very Hungry Caterpillar*. Explain that this means each student will create his or her own book to share with family and friends by writing the numerals and drawing the correct number of foods just as in the story. Tell students that they will be the authors, because they will tell the story, and the illustrators, because they will draw the pictures.
- Adjourn to small table groups and complete pages one numeral page at a time with small groups or individuals. Allow students to create drawing guides by aligning the correct number of plastic fruits/foods on the table.
- Follow up activities: Have each student read his/her story at circle times throughout the next few days or in the quiet/library center at play time. Have students tell the story to you as you write dictation on the pages of the student created books. Have students read

the stories to other students/teachers in the school such as the librarian, the principal, other classes of students, or each other.

- **Additional Activities:** Purchase or create from a sock a caterpillar and have students feed the caterpillar the appropriate number of foods using the book as a guide, share the video *The Very Hungry Caterpillar*, go on an outside caterpillar hunt and count the number of caterpillars found, create a fruit graph using the students favorite foods/fruits and compare the numbers to those in the story (may also introduce concepts of most/least/equal if students are ready at this point), create play dough caterpillars with a given number of spherical body sections, etc.

Lesson 4B

Objectives: PK.2 Counting 0-10 with concrete items

Materials:

Bingo grid (see Appendix D)

Crayons

Counting objects

Numeral cards 1-10

Lesson Preparation:

Copy Bingo grids included in the appendix for each student. Write the numerals 1-10 on index cards, one for each numeral.

Overview:

In this lesson students will practice one-to-one correspondence by counting concrete items.

Students will practice writing the numerals 1-10 by filling in a Bingo grid. Students will match counting to numerals by playing Bingo.

Lesson Directions:

- Seat students in small groups around tables.
- Review numerals by showing the index cards and having students call out the given numeral.

- Explain that today’s activity will be “Counting Bingo.”
- Show a completed Bingo grid and ask if anyone has played Bingo. If someone answers “yes,” give him/her the opportunity to explain how Bingo is played.
- Using the completed grid, inform students of the following rules:
 1. The object of the game is to cover each number on your card with a Bingo chip.
 2. To play, a number of counting items such as bears will be displayed (For example, display 5 bears).
 3. Together the students will count the bears and decide how many there are and will cover that numeral on the card. (Demonstrate this by covering the numeral 5 after the students have counted the bears.)
 4. Play will continue in this manner until someone has covered all the numerals on his/her card.
 5. The first person to do so is the “winner” (Everyone’s card will be covered at the same time with our game so everyone wins!).
- Check for understanding by asking for questions.
- Distribute blank Bingo grids and crayons. Instruct students to not make any marks until told to do so.
- Tell students that we will fill in the numerals ourselves one at a time together.
- Display the numeral “1.” Have students sky write the numeral (write the numeral in the air using a pointed finger).
- Instruct students to choose any one empty box and write the numeral “1.” Instruct students to write the numeral “1” only one time in one box.

- Continue with this process for numerals 2-10, checking after each numeral for understanding and readiness to proceed.
- When grids are complete, collect crayons and begin play by displaying a number of counting items no greater than ten and continuing until everyone gets Bingo. Small prizes such as stickers or stamps may be given.

- Additional Activities: Have students trade cards for play, have students take turns choosing an index card numeral and setting up the counting display for the game, have students play with peers in center time settings, etc.

Lesson 5A

Objectives: PK.1 Compare sets of 10 or fewer items using the terms more, fewer, and the same

Materials:

Classroom Students

Lesson Preparation:

N/A

Overview:

In this lesson students will participate in sorting activities based upon student characteristics of clothing, hair color, eye color, gender, etc. Students will then use one-to-one correspondence to compare the sets in terms of more, fewer, and the same quantities.

Lesson Directions:

- Seat students in a circle on the carpet or area where there is plenty of room to move as this will be a kinesthetic learning activity.
- Explain to students that today's lesson will be a two-part activity. The first activity will be to sort the students, or put students into groups where something is the same about each member of the group, as directed by the teacher.
- Complete a student sorting activity using gender as an example by asking all boys to stand on one side of the teacher and all girls to stand on the other.

- Reinforce the concept of sorting by asking students what is the same about all the members in each group (i.e. all in group 1 are boys, all in group 2 are girls).
- Next, explain that part two of the activity will be to count the members of each group and compare using the terms more, fewer, and the same. Explain that more means one group is bigger or has a bigger number of members. Explain that fewer means one group has a smaller number of members. Explain that same means the two numbers are equal or exactly alike.
- Have the group of boys line up in a straight line. Count the group by touching each boy on top of the head and saying the corresponding counting number. This demonstrates one-to-one correspondence.
- Have the group of girls line up in a straight line. Encourage students to help you count the girls as you touch each girl on the head.
- Once both groups have been counted, ask students to tell which group has more (the bigger number), fewer (the smaller number), or if they are the same.
- Further demonstrate the concept of more, fewer, and same using the two groups and having them pair off one boy/one girl and seeing if either group has extra members. Explain that members of a group that do not have a partner mean the groups cannot be the same. The group with extras is the group with more members while the other group has fewer members.
- Explain that we will continue to sort ourselves into groups using other characteristics.
- Have students return to original seats on the carpet.

- Continue the sorting and comparing activity using the characteristics of hair color & eye color (choose two colors such as blonde and brown, and repeat activity until each child has had an opportunity to participate).
 - Continue sorting and comparing until students seem to grasp the concepts presented. Other ideas for sorting include clothing types or colors, shoe types, age, favorite foods or sports, lunch box or tray, etc.
- Additional Activities: Have students sort any manipulatives you have on hand and classify as more, fewer, or the same. Some suggestions for sorting are counting bears by size or color, pattern blocks by shape, crayons by color, craft supplies such as pom-poms, craft pasta, or beads with a defined attribute, etc. Centers may also be created to sort seasonal items such as sorting apples by color, fall leaves by color or shape, Christmas packages by bow or no bow, weather symbols for rain or snow (can be done in conjunction with daily calendar activities as fall changes to winter or winter to spring), Valentine hearts by color or size, etc.

Lesson 5B

Objectives: PK.1 Compare sets of 10 or fewer items using the terms more, fewer, and the same

Materials:

Green construction paper lily pads

Counting frogs in a basket

Blue vinyl tablecloth (optional)

Lesson Preparation:

Cut 20 green construction paper lily pads. Program one side of the lily pad with a numeral 1-10, and program the opposite side with a corresponding number of black dots. Create two of each number lily pad. Laminate for repeated usage in centers if possible.

Overview:

In this lesson students will practice the concepts of 1 to 1 correspondence and comparisons using the terms more, fewer, and the same. Students will begin by placing a counting frog on each dot of a given lily pad and counting the quantity. (Frogs may be replaced with fish, insects, etc. if frogs are not available.) Frogs will be placed on two lily pads each round and compared using the terms more, fewer, and the same. As students become more familiar with the numerals, the numeral side of the lily pads can be used as opposed to the dotted sides.

Lesson Directions:

- Seat students in a circle on carpet or around a blue vinyl tablecloth if available.
 - Set the stage for the lesson by describing the blue tablecloth as a pond. Ask for suggestions as to what animals might live in a pond. If no one answers “frogs,” offer that as an answer.
 - Explain that today’s lesson will be counting frogs that live in the Pre-K pond on top of lily pads.
 - Establish the rules for the activity as follows:
 1. Two children will be chosen to count frogs each round.
 2. Each student will choose a numbered lily pad and identify the numeral if possible.
 3. Each student will then turn the lily pad to the dotted side and place one frog on each dot.
 4. Each student will point to each frog on his/her lily pad while counting the total quantity.
 5. Once both sets of frogs have been counted, ask the student with “more” frogs to leap once. If the two quantities are the same, ask both students to leap twice.
 - Once this round is complete, have students return frogs to the basket, flip lily pads back to numeral side showing, and return to their seats around the pond.
 - Repeat this process, two students at a time, until each student has had at least one opportunity to participate.
- **Additional Activities:** Place frog counters and lily pads in the math center for individual/small group practice, play leap frog outside if weather permits, place frog

counters in the water table and time students as they catch frogs in a net, count their catch, and compare the quantities using the terms more, fewer, and the same.

Lesson 6A

Objectives: PK.14 Sort objects into groups based upon one attribute, and classify into three groups of one attribute such as small, medium, large

Materials:

Fruit Loops cereal

Yarn

Paper towels or placemats

Lesson Preparation:

Cut lengths of yarn long enough to make a necklace, one for each child. Wrap tape around one end of yarn to prevent unraveling. Knot the second end of the yarn to catch Fruit Loops as they are threaded onto the yarn. Laminate card stock paper to use as a placemat/work mat. Paper towels may be used instead of work mats.

Overview:

In this lesson, students will sort according to the attribute color. Students will sort Fruit Loops and thread them onto a piece of yarn creating an edible necklace to be enjoyed at snack time.

Lesson Directions:

- Seat students at worktables with a placemat or paper towel down to serve as the work mat.

- Begin lesson by reviewing colors. Show crayons or color cards while asking students to name each color.
- Review sorting as a way to separate items into groups in which each member has something in common like hair color, eye color, shoe type, etc.
- Explain that today's lesson will be sorting Fruit Loops cereal into groups that are all the same color.
- Show a Fruit Loop of each color while prompting students to name each color.
- Demonstrate how to sort the Fruit Loops by creating piles of each color on a work surface visible to students. This may also be done by hanging plastic sandwich bags from the chalkboard and filling with the sorted colors of Fruit Loops.
- Explain that once all Fruit Loops have been sorted, the students will create a necklace by threading the Fruit Loops onto a piece of yarn. Each color will be threaded as a group. Instruct students not to eat Fruit Loops until the necklace is complete and instructed to do so.
- Give each child a sample of approximately twenty Fruit Loops.
- Tell students to begin sorting by color as demonstrated.
- Allow students time to explore and attempt the process independently. Provide individual guided instruction as necessary.
- Once each student's work has been checked for accuracy, distribute yarn to each student and demonstrate the threading process.
- Instruct students to begin making necklaces. As you name a color, the students should thread all of the Fruit Loops on the work mat that are the given color.
- Once all necklaces are complete, allow students to enjoy eating the Fruit Loops snack.

- Additional Activities: Sort pattern blocks by shape, color, and size if possible, sort other types of blocks or counting manipulatives by color, place colorful small, medium, and large cutout shapes in the math center for individual sorting practice, sort a variety of dried beans, pasta noodles, fruit snacks, or other cereals based upon shape, size, or color, etc.

Lesson 6B

Objectives: PK.14 Sort objects into groups based upon one attribute, and classify into three groups of one attribute such as small, medium, large

Materials:

Ping Pong balls

Tennis balls

Soccer or basketballs

Three boxes

Lesson Preparation:

Label one box “small,” one box “medium,” and one box “large.”

Overview:

In this lesson, students will sort balls according to the attributes small, medium, or large.

Lesson Directions:

- Seat students in a circle on the carpet.
- Review the concept of sorting as a way of putting things into groups where each member of the group has something in common (a common attribute) such as the colors of the Fruit Loops.

- Introduce the attributes of small, medium, and large by showing one of each type of ball and asking students to identify the ball that is the smallest and the ball that is the largest or biggest. Explain that the tennis ball falls in the middle of the two sizes so it is called a medium sized ball.
 - Display other items such as counting bears or blocks in three distinct sizes. Demonstrate the size sorting process while encouraging students to call out the appropriate size attribute of each item.
 - Show students the labels on the fronts of the boxes. Read and point to the words “small,” “medium,” and “large.”
 - Explain to the students that they will be sorting a collection of balls and putting them into the appropriate box.
 - Show the ping-pong ball and ask into which box it should go. Once students have answered “small,” place the ball into the appropriate box. Repeat this process with the tennis ball (medium) and the soccer ball (large).
 - Allow students to ask questions and check for understanding.
 - Give each student a chance to choose a ball and place it in the appropriate box.
 - Continue the process until each student has had a turn and each ball has been sorted.
- **Additional Activities:** Place the balls and boxes into the math center for additional individual or small group practice, use the sorting activity as a relay game outside where two teams are given a collection of balls to sort, sort dried beans into cups as a table activity for small groups or as an at home activity, etc.

Lesson 7A

Objectives: PK.4 Count forward 1-20 and backward 10-1

Materials:

Number cards programmed with commands

Lesson Preparation:

Prepare numbered index cards or colored cardstock cards for the numerals 1-20. To each card add a command such as clap hands, jump, hop, touch toes, etc.

Overview:

In this lesson, students will practice numeral recognition and counting by performing commands given on numeral cards the corresponding number of times.

Lesson Directions:

- Seat students in a circle on the carpet.
- Review the numerals 1-20 by displaying number cards and asking students to chorally name the numeral.
- Explain that in today's lesson the students will receive a card from the deck and will name the numeral on that card. The teacher will then read the command on that card such as "clap hands," and all the students will clap their hands the number of times on the card.

- Demonstrate by drawing one card, having students call out the numeral, read the command, and perform the action.
 - Pass out the remaining cards.
 - Go around the circle having each student hold up his/her card and all students should call out the numeral. Read the commands one at a time. Students and teacher will perform the given action the designated number of times before moving on to the next student.
 - Repeat this process until every card has been used.
- Additional Activities: Use the cards as a playground activity or have the Physical Education teacher do similar number related activities during P.E., send home a couple of numeral cards with each student and have parents help the student come up with new commands to use on another day to reinforce the activity.

Lesson 7B

Objectives: PK.4 Count forward 1-20 and backward 10-1

Materials:

Cardstock rockets programmed with the numerals 0-10

Picture card of a space shuttle (if available)

Lesson Preparation:

Color or purchase cardstock grade rocket ships and write on each one a numeral 0-10. If cardstock is not available, laminate coloring sheets for future use. Rocket ship images can be found in Internet clip art files.

Overview:

In this lesson, students will learn to count both forward 1-10 and backward 10-0 while role-playing as a rocket.

Lesson Directions:

- Seat students in a circle on the circle time carpet near a bulletin board or chalkboard.
- Explain to students that in today's lesson we will be counting from 1-10 and backward 10-0.
- Arrange rockets bearing the numerals 0-10 in ascending order on a chalkboard or bulletin board.

- Point to the numeral “0.” Name the numeral. Explain that when counting, we normally do not begin with “zero,” but rather begin by saying, “one.” However, “zero” is a number that means there are not any. Give an example of an empty box where balls should be kept. If it is empty, how many balls are in it? “Zero”
- Point to each rocket’s numeral as the students chorally name each one, 0-10.
- Point to each rocket’s numeral in descending order as the students chorally name each one 10-0.
- Show the picture of a space shuttle if one is available. Ask if anyone knows what it is, and has anyone watched a rocket go into space.
- Explain to students that when a rocket is ready to launch into space, the command center on the ground has a way of counting down that tells the captain/pilot it is time to “blast off” or leave the launch pad.
- Demonstrate a launch countdown by counting backward and pointing to each numeral rocket in descending order. After saying, “zero,” say the word “blastoff” to reinforce the shuttle launch procedure.
- Explain to students that as a way to practice counting backwards, we will all pretend to be rockets waiting for liftoff instructions.
- Demonstrate by squatting on the carpet, counting 10-0, saying “blastoff,” and jumping up while saying “blastoff.”
- Check for student understanding by asking for questions.
- Have students sit in a squat position on their spots on the carpet.
- Instruct students to assist in the countdown procedure.
- All students should count and “blastoff” as make believe rockets.

- Repeat blastoff activity at least two more times.
 - Repeat blastoff activity as a transition to lining up for lunch, library, recess, going home, etc. each day for at least one week to practice counting 10-0.
- Additional Activities: Place numbered rockets in the math center for students to practice arranging them in ascending/descending order, create a rocket coloring book and have students write a numeral 0-10 on each page and arrange the pages in ascending order before stapling (each page may also contain the corresponding number of rockets), have students take turns being the control room operator and counting down to blastoff in the classroom, use small numbered rocket ships for practice on a pocket chart or as an at home activity, etc.

*This lesson was adapted from a lesson used in the kindergarten classroom of Sherry Dowdy, Honaker Elementary School, Honaker, Virginia.

Lesson 8A

Objectives: PK.15 Identify, describe, and extend a repeating pattern found in common objects

Materials:

Two colors of paper

Calendar

Linking cubes

Lesson Preparation:

Cut small squares, approximately 2 inches square or a size to fit calendar numeral spaces, from two different colors of construction paper.

Overview:

In this lesson, students will learn to identify, describe, and extend a repeating pattern beginning with linking cubes and continuing as part of the daily calendar activities.

Lesson Directions:

- Seat students in a circle on the carpet.
- Explain to students that in today's lesson we will begin learning about patterns.
- Describe patterns as a relationship between two items where the two items take turns or alternate. Give the example of lining up the students in a boy/girl pattern where one boy

lines up, then one girl, then one boy, then one girl, etc. Demonstrate this by actually having six students stand in a line in this pattern.

- Show the linking cubes in two distinct colors such as red and yellow.
- Explain to students that the red cubes are like the “boys” in the first pattern and the yellow cubes are like the “girls” in the first pattern. They will take turns lining up.
- Take one red cube and “line it up” on a table or somewhere in plain view to all students.
- Ask the question, “Now, if red lines up first and we are taking turns, which color should line up next?”
- Allow time for suggestions. Remind students of the boy/girl pattern if necessary. Line up yellow next.
- Continue asking, “Which color should line up next in our pattern if we’re taking turns?” until at least five red cubes and five yellow cubes have been used.
- Repeat the process once more using two new colors.
- Tell students that this type of pattern is called an “A-B” pattern.
- Give each student three each of two colors of cubes.
- Instruct students to create an “A-B” pattern by taking turns lining up the colors.
- Allow time for students to create the pattern independently. Assist as necessary using reminders of the boy/girl and two color patterns done earlier.
- Once each student has successfully arranged an “A-B” pattern, demonstrate how to read the pattern by color and by using A/B. For example, red/yellow, red/yellow, red/yellow can also be read as A/B, A/B, A/B.
- Ask for volunteers to read the student created patterns. Allow each student who wants a turn to read his/her pattern.

- Explain to the students that we will be creating an “A/B” pattern on our calendar. Each day we will write the current day’s number on a colored square. We will use two colors of paper and take turns the same way we did with the linking cubes.
 - Demonstrate by showing the two colors of squares to be used on the calendar and writing the current day’s number on a blue (or other color) square and affixing it to the calendar. (You may wish to wait and begin the calendar pattern at the beginning of a new month.)
 - Ask students to guess what tomorrow’s color is while showing a square of each color; use the taking turns prompt if necessary.
 - Allow additional time for students to create linking cube patterns independently or in small groups. Follow through with the calendar pattern during each day’s calendar activities.
- Additional Activities: Create other “A/B” patterns by making bead necklaces or paper chains, by using concrete items such as crayons/scissors, or by using seasonal paper cutouts in a pocket chart such as red/green apples, apple/pumpkin, orange leaf/yellow leaf, shamrock/heart, or snowflake/Santa. Shape cutouts are a good way to review the “A/B” pattern in conjunction with colors and shapes.

*This method for teaching A/B patterning was adapted from the kindergarten classroom of Jeanene Compton, Honaker Elementary School, Honaker, Virginia.

Lesson 8B

Objectives: PK.15 Identify, describe, and extend a repeating pattern found in common objects

Materials:

Paper party hats (assorted colors)

Lesson Preparation:

Purchase or make birthday party type paper hats in assorted colors with at least three hats of each color.

Overview:

In this lesson, students will actively take part in creating and/or extending an A-B pattern by wearing colored party hats and lining up as directed.

Lesson Directions:

- Seat students in a circle on the carpet.
- Review the concept of an A-B pattern. Ask students for suggestions or examples.
- Add the next colored day square to the calendar, and have students chorally read the calendar pattern thus far.
- Explain that in today's lesson, we will create an A-B pattern by using colored party hats and lining up in the correct order. Remind students that only two colors will be used each time, but everyone will have a chance to participate.

- Distribute one party hat to each student.
 - Choose two colors to use for the first pattern, for example, red and blue.
 - Ask all students wearing either a red hat or a blue hat to line up. Remind students that these two colors will be the colors used in our first pattern and the colors must take turns lining up to make an A-B pattern.
 - Ask a student with a red hat to line up first.
 - Ask students, “Which color hat should line up next?” Use clues as necessary, but allow time for students to offer answers independently.
 - Continue in this manner until all students with red and blue hats have lined up in an A-B pattern (red/blue, red/blue, red/blue).
 - Ask students to return to their seats.
 - Choose the next two colors.
 - Tell students that for this pattern, the teacher will begin the pattern and the students will take turns as they are called upon to tell which color hat is next in the pattern.
 - Begin the next pattern by lining up the first three students, for example, green/yellow/green.
 - Choose one student to give the next color hat. Give clues or reminders as necessary.
 - Continue in this manner until all students with green and yellow hats have lined up.
 - Continue creating A-B patterns, alternating colors so all students are actively engaged for two more patterns or as long as students are participating enthusiastically.
 - Collect hats for use on another day.
- Additional Activities: Place party hats in the math center for students to practice A-B patterns independently. Provide a “party hat” coloring sheet with six small party hats.

Give directions for colors of the first three hats and have students complete the coloring pattern in small groups at tables. This may be done as an at home coloring activity as well. Divide students with hats into two teams and do relay races by calling two colors. Students on the teams wearing those colors should race to line themselves up in an A-B pattern.

Lesson 9A

Objectives: PK.2 Count concrete items up to 10 items, choose the corresponding numeral, and write the numeral to tell how many are in a set

Materials:

3"x5" white index cards (11 per student)

Red paint or stamp pad (ink will dry quicker)

Black fine point markers

Metal shower curtain rings (1 per student)

Lesson Preparation:

Prepare booklets for each child by corner hole punching 11 index cards for each student and binding them together using a metal shower curtain ring. Large paper clips can be substituted for the shower curtain rings if needed. Label the first page as a title page as follows:

“_____’s Ladybug Counting Book.” Write or have each student write his/her name in the blank.

Overview:

In this lesson, each student will create his/her own counting book by writing the numerals 1-10 on 10 index card pages. The student will then make the corresponding number of red fingerprints on each page applying the skill of one-to-one correspondence.

Lesson Directions:

- Seat students at small group tables or at a spacious work area. It may be necessary to do this in small groups depending upon the ability of the students to listen and follow directions independently. If small groups are more desirable, explain the activity as a whole and then divide students into small groups with learning center activities such as creating patterns with linking cubes, counting/sorting counting bears, lacing beads, or creating designs with pattern blocks.
- Explain that in today's lesson, each student will become an author and illustrator by creating a counting book. Each student will "write" the numerals 1-10 on ten pages of a booklet and then "draw" the number of ladybugs to match that numeral. This is what authors and illustrators do to create books.
- Show the index card booklets. Point out the words on the title or cover page. Indicate where each student should write his/her name if this has not been done ahead of time.
- Turn to the next page and demonstrate writing the numeral one and make one red fingerprint using the red stamp pad.
- Next, using a black marker, draw a small black dot for the head, a black line down the middle of the red dot, and black spots to create a ladybug.
- Point to the numeral one on the page. Have students chorally name the numeral.
- Point to the ladybug on the page and have students chorally count the ladybug.
- Explain that each numeral will have its own page and the number of ladybugs on the page must match the numeral.

- If necessary, demonstrate another page of the book to reinforce the directions. Ask for student assistance in choosing a numeral, writing the numeral, and deciding how many fingerprint ladybugs to draw on the page.
 - Explain that each student will have a turn to create a book, but that the activity will be done in small groups. Show and review the activities for the other learning centers.
 - Divide the students into small groups and proceed with creating the counting books one group at a time beginning with the cover page as needed.
 - Complete one page at a time with each group for the numerals 1-10.
- Additional Activities: Similar booklets can be created around holidays with a matching theme such as chick booklets at Easter, create poster board number strips of birthday cakes using crayons or a stamp if available and have students draw on straight line candles to match the numerals, create poster board headbands, mark off 10 sections, have students write the numerals 1-10 in the sections and apply the corresponding number of small stickers.

*This method for teaching numeral recognition and one-to-one correspondence was adapted from the pre-kindergarten classroom of Sandy Jenks, Lebanon Primary School, Lebanon, Virginia.

Lesson 9B

Objectives: PK.2 Count concrete items up to 10 items, choose the corresponding numeral, and write the numeral to tell how many are in a set

Materials:

Play dough

Straws

Index cards with the numerals 0-10

Circle cookie cutter (optional)

Lesson Preparation:

Each child will need a ball of play dough to shape as a small birthday cake or a circle shaped cookie cutter can be used as well. Cut colorful straws into lengths of approximately two inches long. Cut enough straw pieces so that each child can have ten pieces to use as candles.

Overview:

In this lesson, students will practice numeral recognition and one-to-one correspondence while creating play dough birthday cakes to match numeral cards.

Lesson Directions:

- Seat students at small group tables.

- Explain that today's lesson will be to create birthday cakes out of play dough and put the correct number of candles on the cake to match a numeral card being shown by the teacher.
- Demonstrate by shaping or cutting play dough to resemble a cake shape. Randomly choose a numeral card and ask students to identify the numeral. Model counting aloud and placing the appropriate number of straw candles in the top of the play dough cake one at a time.
- Check for understanding by asking for questions.
- Show the remaining numeral cards one at a time and instruct students to chorally name the numerals.
- Distribute a small amount of play dough to each student.
- Instruct the students to shape the play dough into a circle or cake shape while singing "Happy Birthday to me."
- Once each student has successfully created a cake to work with, distribute straws, 10 per child, and have each student count his/her straws to verify that he/she has 10.
- Explain directions once more by telling students that the teacher will hold up a numeral card, the students will name the numeral, and each student will place the correct number of straw candles in the top of the play dough cake to match the numeral shown.
- Proceed to do each numeral card 0-10 in a random order.
- Allow time for students to practice independently by placing a number of candle straws on the cake and having a friend sitting nearby count the candles.

- Additional Activities: Place the play dough and numeral cards in the math center for additional practice, have students draw cards for each numeral with the numeral on one side and a cake with the corresponding number of candles on the reverse, add additional numerals up to 20 as students become more advanced.

Lesson 10A

Objectives: PK.10 Identify plane geometric figures regardless of position and orientation in space; describe the location of one object to another using the terms above, below, and next to

Materials:

Work mats that imitate a scarecrow head

Pattern blocks or construction paper cutouts of circles, squares, rectangles, and triangles

Lesson Preparation:

If pattern blocks are not available, cut several plane geometric figures from colored construction paper in various sizes.

Overview:

In this lesson, students will design scarecrow faces using plane geometric figures while giving relative positions using above, below, and next to.

Lesson Directions:

- Seat students in a circle on carpet.
- Explain that in today's lesson the students will be creating scarecrow faces using the shapes circle, square, rectangle, and triangle.
- Demonstrate making a face on one of the work mats using at least one of each of the four shapes.

- Name each shape as it is being placed.
- Once the scarecrow face is completed, point to the eyes and describe them as being “above the nose.”
- Point to the nose and describe it as being “below the eyes.”
- Point to one eye and describe it as being “next to the other eye.”
- Clear the work mat.
- Check for understanding of the terms above, below, and next to by asking for questions.
- Reinforce the concepts by asking students to hold both hands above their heads, below their chins, and next to their ears.
- Explain that each student will now receive a work mat with a scarecrow head pictured on the front and a collection of shapes. Explain that students will listen for the teacher’s directions on which shapes to use for the scarecrow’s eyes, nose, and mouth. Explain that directions will be given using the terms above, below, and next to.
- Distribute one work mat and a collection of shapes to each student.
- Give directions for the first face. Begin by having students place two circle eyes next to each other. Have students place a triangle nose below the eyes. Have students place three squares for the mouth above the chin.
- Observe each student’s work providing encouragement and redirection as needed.
- Have students clear the work mats and provide directions for the next face. Begin by having students place a rectangle nose in the middle of the face. Have students place a circle mouth below the nose. Have students place two square eyes above the rectangle nose.

- Continue checking and creating new faces while varying the shapes and positional words used.
 - Allow time for students to explore and create faces independently.
- Additional Activities: Use other work mats such as jack-o-lantern, Santa, snowman, Leprechaun, sunshine, etc., use work mats with a star in the middle and have students place shapes above, below, and next to the star, use a house template and have students draw windows next to the door, flowers below the windows, and clouds above the roof, place work mats and shapes in centers for independent/small group practice, at Christmas place a vinyl tablecloth with a Christmas tree shape drawn on it on the floor and have students decorate the tree with ornaments while following directions using the terms above, below, and next to.

Lesson 10B

Objectives: PK.10 Describe the location of one object in relation to another using the terms above, below, and next to

Materials:

N/A

Lesson Preparation:

Compile a list of body movements that include the terms above, below, and next to.

Overview:

In this lesson, students will apply the terms above, below, and next to while engaging in a kinesthetic game of “Simon Says.”

Lesson Directions:

- Have students stand in a circle or in rows at least an arm’s length apart.
- Ask if any of the students have ever played a game called “Simon Says.” If any student has played give him/her the opportunity to explain the game to the other students.
- Explain the rules for today’s game. The teacher will be “Simon.” All good listeners do everything Simon says, because Simon is the teacher. Only directions given with the words “Simon says” should be done.

- Give the example “Simon says touch your nose.” Place a finger on your nose and wait for all students to follow.
- Give a second example “Simon says touch your toes.” Touch your toes and wait for students to follow.
- Praise the students for being such good listeners and doing as Simon directed. Explain to the students that if commands do not include the words “Simon says...” they should not do them.
- Give the example “Close your eyes.” Allow time for students to decide what to do and praise those who keep eyes open.
- Give a second example “Pat your head.” Allow time for students to decide what to do and praise those who do not pat heads.
- Remind students to only do commands when “Simon says” to do them.
- Practice a few rounds using commands such as flap your arms, shake your hands, march in place, etc. using “Simon says” occasionally to check student understanding of the game.
- Continue playing the game using simple commands and interjecting the terms above, below, and next to. Some examples are “Place your hands next to your feet, Place one hand above your head, Clap your hands below your knees, Snap your fingers next to your ears, Rub your arm above your elbow, Pat your legs below your pockets, touch your face below your nose, etc.”
- Continue the game until students demonstrate understanding of the concepts above, below, and next to or until students lose interest.
- Repeat the game during free time or transition times to reinforce the positional concepts.

- Additional Activities: Allow students to take turns being Simon and call out a command, increase the difficulty by combining concepts (for example, play the game and give numbered commands such as clap three times above your head), give students two plane geometric shape such as a circle and a square and give commands like “hold the circle above your head, hold the square below your knees, etc.

Lesson 11A

Objectives: PK.4 Count forward 1-20 and backward 10-1

Materials:

Sheets of construction paper numbered 1-20 (laminated if possible to prevent tearing)

Lesson Preparation:

Prepare numbered sheets of construction paper with numerals 1-20 if ready-made numeral cards are not available. Place a masking tape line along the floor to simulate a number line and provide a guide for students when lining up in order.

Overview:

In this lesson students will practice number recognition using numeral cards and arranging the cards into an ascending and descending number line.

Lesson Directions:

- Seat students in a circle on the carpet.
- Explain that in today's lesson the students will create a number line by arranging the number cards in the correct order beginning with one and counting up to twenty.
- Review counting 1-20 by having students count chorally.
- Review the actual numerals by having students count chorally a second time while the teacher holds up the numeral card for each number as it is named.

- Mix up the numeral cards and have students name the numerals as the teacher holds up the cards in random order.
- Explain to the students that in today's lesson each student will be given a numeral card with a number 1-20. Students will line themselves up in the correct order creating a number line.
- Demonstrate the process by having five students stand up. Give each student a numeral card for the numbers 1-5. Assist the students as they line up in order 1-2-3-4-5. Once students have lined up in the correct order, have the remaining students say the numeral on each student's card as he/she holds it up working from the student with the "1" to the student with the "5."
- Check for understanding and questions.
- Collect the cards from the students and instruct them to return to their seats.
- Inform students that now each student will get a card and they will line up along a tape-line on the carpet when his/her number is called.
- Mix up the cards and randomly distribute the cards one per student.
- Begin lining up by calling the number "one" to line up. Next, call number "two" to line up. Continue with this process until all students have lined up through number "twenty." (If there are not twenty students in the class use as many numbers as possible. The entire twenty cards can be arranged on the floor as an alternative with some students placing more than one card.)
- When all students have lined up in the correct positions, have the entire group count to twenty with each student raising his or her numeral card when that number is called.
- Collect cards, redistribute, and repeat the activity a second time.

- Inform students that this is one way of creating a number line. Number lines are used to help us count both forward and backward.
 - Demonstrate how to use the line to count backward 10-1 while the students are still lined up in order. Remind students of the “blastoff” activity from the previous lesson where students pretended to be rocket ships launching into outer space.
 - Allow time for students to ask questions and reflect upon the exercise before placing the cards in the math center for independent/small group practice on the carpet.
- Additional Activities: Create smaller cards to be sent home for additional practice, place number puzzles in the math center, cut numbers from old calendars and have students glue them onto poster board strips in the correct order, have students follow a number line drawn on the bulletin board or floor to count forward 1-20 and backward 10-1, repeat the blastoff activity by having students count 10-0 and say “blastoff” as they spring up from a squat position to simulate a rocket launch, construct number lines on the floor using masking tape or sidewalk chalk and have students draw numbers from a bowl, walk forward to that number, naming each numeral he/she steps on along the way and then walk back to 1 naming each number stepped on along the way.

Lesson 11B

Objectives: PK.4 Count forward 1-20 and backward 10-1

Materials:

Laminated cardstock paper with numbers 1-20

Lesson Preparation:

Write the numerals 1-20 on twenty pieces of colorful cardstock paper and laminate for durability.

If unable to laminate, other alternatives to use that hold up well are circular rubber disks available in most P.E. equipment catalogs, carpet samples (possibly donated as discontinued carpets from flooring stores), or vinyl placemats.

Overview:

In this kinesthetic activity, students will play a game similar to musical chairs to practice number recognition. This game requires a large area for students to move around in a circle with the numbered cards in the middle.

Lesson Directions:

- Seat students in a circle on the carpet.
- Explain that in today's lesson the students will practice recognizing and naming numerals 1-20.

- Begin lesson with a review of the numeral cards. Hold up each number in ascending order as the students chorally name the numeral.
- Shuffle the number cards and show again in a random order as students chorally name each numeral.
- Explain that the students will be playing a game where they must name the numeral to stay in the game. The game will be like musical chairs. Ask if any students have played musical chairs. If so, give the students an opportunity to explain the game to the class. If not, proceed with the following directions.
- Name our game “Musical Numbers.” Give the directions. In our game, the students will stand in a large circle. In the middle of the circle will be all the number cards for the numerals 1-20. The teacher will play music as the students walk around the circle. When the music stops, each student will hurry but not run or shove to stand on top of one of the number cards. (If more than twenty students are playing, the students who do not have a number card to stand on will automatically be out.) The teacher will randomly call out two numbers and the two students standing on those numbers will be out for the remainder of this round. Those two number cards will be removed from the floor so they will not be called again. (If fewer than twenty students are playing, there will be extra cards with no one standing on them so remove those cards along with the two called numbers.) Continue in this manner until only one student remains standing.
- Practice a round of the game by placing the number cards in the middle and having the students form a large circle around the outside of the cards. Start playing music and instruct students to walk in a circle around the cards. Allow students to make at least one complete circle and then stop the music. Encourage students to go to the nearest number

card and stand on it. Randomly call two numbers and identify the students standing on those numbers. Remind students that once the game begins, the students standing on the called numbers will be out for the rest of this round, but will play again in the next game.

- Practice one additional round then begin the game.
 - Continue playing until a winner is declared. When an even number of students are playing, two students will be left on the last round, so it will be necessary to call only one number to declare a winner.
- Additional Activities: This game also works well with colors, shapes, and the alphabet. With colors and shapes it will be necessary to have more than one card for each color or shape and more than two people will be set down each round. Play the game outside when weather permits for renewed interest.

Lesson 12A

Objectives: PK.7 Identify scales as instruments used to measure weight of an object

Materials:

Bathroom Scale

Balance Scale

Various Manipulative Blocks/Counting Items

Lesson Preparation: Assemble collections of small manipulatives such as counting bears, linking cubes, paper clips, beans, etc. for demonstrating weight using the balance scale.

Overview: In this lesson, students will learn that the term “weight” refers to how heavy an object is. Students will recognize different types of scales and identify them as instruments used to measure weight.

Lesson Directions:

- Seat students in a circle on the carpet.
- Explain that in today’s lesson the students will learn about weight and how to measure weight.
- Begin lesson by asking for a volunteer to define the term weight. If necessary, prompt the students by asking what it means when we want to know how much something weighs.
- Allow time for multiple student explanations.

- Define weight as how heavy something is. Expand the definition by saying that some things are heavy like elephants, cars, rocks, etc. and that some things are light like feathers, cotton balls, a sheet of paper, etc.
- Ask students for other examples of heavy and light. Allow for several examples before proceeding.
- Ask the following question: “If I want to know how heavy something is, what would I do?” Acknowledge all answers such as pick it up, weigh it, or carry it.
- Explain that we have tools or instruments that help us determine how heavy an item is and help us determine when one item is heavier than another.
- Show the balance scale. Identify the name of this tool as a “balance scale” and that its purpose is to show when one item or group of items is heavier than another by tilting sideways.
- Show two groups of blocks or other manipulatives. Ask students to guess which group is heavier.
- Demonstrate using the balance scale by placing one group on each side and identifying the heavier group is on the side that “sinks down” the farthest.
- Demonstrate with two additional groups of items allowing students to predict which group is heavier and then testing the guess using the balance scale.
- Inform students that we also have scales that tell us how heavy an item is using a number value. Provide real world examples like a 5-pound bag of sugar, a 10-pound bag of flour, or a 50-pound boy or girl.
- Show the bathroom scale. Identify the name of the item as a “scale.” Tell students that this type of scale gives a number in pounds to tell us exactly how heavy something is.

Provide examples of times things are weighed such as when we go to the doctor, when tractor-trailer trucks are hauling big loads, when we buy meats and vegetables at the grocery store, and when babies are born.

- Demonstrate using the scale by having students take turns standing on the scale. Read each student's weight using the number and the term "pounds." Read the weights to the closest whole number. For the purposes of this lesson, we are not concerned with the marks between numbers, only that students are able to identify a scale as an instrument used to measure weight.
 - Review by showing the balance scale and asking students to echo the name of the instrument, "balance scale." Ask, "What does the balance scale do?" It compares two things to see which one is heaviest.
 - Show the bathroom scale and ask students to echo the name of the instrument, "scale." Ask, "What does this type of scale do?" It tells how much something weighs in a number of pounds.
 - Allow time for students to ask questions and reflect upon the exercise before placing the two scales and collections of manipulatives into the math center for individual and small group practice.
- Additional Activities: Have students bring small items from home to weigh and compare on the balance scale, have students compare weights of additional items in the classroom, create a list of items such as cars, dogs, trees, pillows, etc. and make predictions about which items would be heavier, have students weigh and compare the members of the family or common household items as an at home activity.

Lesson 12B

Objectives: PK.7 Identify scales as instruments used to measure weight of an object

Materials:

Bathroom Scale

Balance Scale

Various Manipulative Blocks/Counting Items

Various small items such as fruits, vegetables, toys, shoes, etc.

Lesson Preparation: Assemble collections of small items to be weighed on a balance scale and/or bathroom scale. Create a comparison chart with two columns labeled “heaviest” and “lightest.” Pictures can be used to assist pre-reading skills. For instance, a picture of an elephant can go in the heaviest column and a picture of an ant can go in the lightest column. Allow enough rows to make at least five comparisons. This chart can be made on a vinyl tablecloth for multiple uses and can be used as a floor mat during the activity.

Overview: In this lesson, students will predict which of two items is heaviest and which of the two is lightest. Students will record the guesses on a chart and then test the items using a balance scale and/or a bathroom scale to check.

Lesson Directions:

- Seat students in a circle on the carpet.

- Explain that in today’s lesson the students will continue to learn about weight and how to measure weight by making guesses about which items are heaviest and lightest and then checking to see if the guesses are correct.
- Begin lesson by asking a volunteer to define the term weight (how heavy something is). Ask a volunteer to identify the instrument used to measure weight (scale). Ask a volunteer to identify the unit or term used to tell how much something weighs (pound-if necessary give an example such as “The dog weighs 10 _____.” What word goes in the blank?).
- Display the five distinct collections of objects. Each group has two items. Explain that we will make guesses about which item in each group is the heaviest or weighs the most and which item in each group is the lightest or weighs the least.
- Show the chart. Explain that each item will be placed on the chart as we guess either in the “heaviest” column or in the “lightest” column.
- Inform students that once all items have been placed on the chart, we will check our guesses by weighing the items. We will move the items if necessary.
- Proceed to weigh each group of two items, reviewing the predictions for each group just before weighing the items. Weigh some of the smaller items on the balance scale asking students to identify the heavier of the two items by noticing which side sinks the farthest. Weigh heavier items on the bathroom scale, call out the number of pounds, and have students identify the heaviest item as the largest number of pounds and the lightest as the smallest number of pounds. After each comparison, ask, “Which item is heaviest? Which item is lightest? Look at our chart. Was our prediction correct?” Do not forget to make corrections on the chart as needed.

- When all items have been weighed, compared, and charted correctly, review the corrected chart by naming the heaviest and lightest item from each group. Remind students that we use scales to determine how much something weighs and that we compare weights by looking at the number of pounds.
 - Ask for questions or comments.
 - Place the chart, the scales, and miscellaneous items that can be weighed into the math center for individual or small group practice.
- **Additional Activities:** Use the chart as an interactive activity by asking students to choose a buddy. Each group of two students will decide which student will stand in the heaviest column on the chart and which student will stand in the lightest column on the chart. Check each student's weight in pounds using the bathroom scale and allow the students time to self-correct their positions if necessary. This can be done over and over by selecting different partners each time. Be cautious not to embarrass any student by commenting on weight with opinionated terms. Simply refer to the numbers with comparison words such as heaviest/lightest or largest/smallest.

Lesson 13A

Objectives: PK.7 Identify thermometers as instruments used to measure temperature of an object

Materials:

Different Thermometers, Liquid and Digital

A Glass of Ice Water

Lesson Preparation: Assemble a collection of thermometers used to measure room or outdoors temperature as well as thermometers used to measure a person's temperature. Try to have both liquid and digital thermometers on hand.

Overview: In this lesson, students will learn that the term "temperature" refers to how hot or how cold something is. Students will recognize that a thermometer is used to measure temperature.

Lesson Directions:

- Seat students in a circle on the carpet.
- Explain that in today's lesson the students will learn about temperature and how to measure temperature. Ask students to echo the term "temperature."
- Begin lesson by asking for a volunteer to define the term temperature. If necessary, prompt the students by asking what it means when we want to know what the temperature is outside, or what it means if we are running a fever when we are sick.

- Allow time for multiple student explanations.
- Define temperature as how hot or how cold something is. Expand the definition by saying that some things are hot like coffee or fire and that some things are cold like ice cream or snow.
- Ask students for other examples of hot and cold. Allow for several examples before proceeding.
- Ask the following question: “If I want to know how hot something is, what would I do?” Acknowledge all answers such as touch it, feel it, or hold hands near it, but caution students never to touch hot items without adult permission and supervision.
- Explain that we have tools or instruments that help us determine how hot or cold something is.
- Show a typical thermometer used to measure room temperature. Identify the name of this tool as a “thermometer.” Ask students to echo “thermometer.”
- Identify the purpose of the thermometer as a way to measure temperature, or how hot or cold something is. Use the doctor’s office as an example. Students will relate to having their temperature checked at a visit to the doctor. This tells the doctor how hot or how cold the body is.
- Point out the numbers on the side of the thermometer. Note that there are two ways to measure temperature, Celsius and Fahrenheit, but for the purpose of simplicity and familiarity, use the numbers on the Fahrenheit side in this lesson.
- Point to the red line in the center of the thermometer. Inform students that this red line is actually liquid alcohol inside the thermometer that rises or goes up as it gets warmer and falls or goes down when it gets colder.

- Demonstrate reading the thermometer at the top of the red line by calling out the number closest to the top of the line and using the term Fahrenheit. Take time to show the number reading to each student around the circle.
- Demonstrate how the thermometer will change as it gets colder by placing the thermometer in a glass of ice water. Wait for one minute. Ask for predictions about the red alcohol line while waiting. Ask students if they think the line will go up or down. Remind students that if the water is warmer than the room, the line will rise, and if the water is colder than the room, the line will fall.
- Remove the thermometer and ask for a volunteer to read the number of degrees in Fahrenheit. Assist with the reading as necessary. Note the position of the top of the red line and confirm the predictions. Allow students to observe the red line rising as it returns to ambient room temperature.
- Show a typical thermometer to measure body temperature. Note that some “people” thermometers use a line just like room or outdoor thermometers but that others use numbers to simply tell the temperature (digital thermometers). Show both kinds if possible.
- Explain that both types of thermometers work by measuring how hot or how cold something is. Demonstrate the digital thermometer using a student volunteer. Read the number and use the term “degrees Fahrenheit.”
- Allow time for students’ questions or comments. Explain that in the next lesson, students will participate in measuring temperatures of different items and comparing to see which items are hotter and which items are colder.

- Close the lesson by asking, “What is temperature?” and “How do we measure temperature?”
- Additional Activities: Have students check around the house and the community for places where temperature is being measured. Note those responses on a classroom chart or bulletin board. Also, a poster board thermometer can be created by drawing on numbers and adding a zipper with a red pull that can be adjusted for daily, outdoor temperature readings as part of calendar/weather activities.

Lesson 13B

Objectives: PK.7 Identify thermometers as instruments used to measure temperature of an object

Materials:

Different Thermometers, Liquid and Digital

Glasses of cold and hot water

Lesson Preparation: Assemble a collection of thermometers used to measure room or outdoors temperature as well as thermometers used to measure a person's temperature. Try to have both liquid and digital thermometers on hand. Have large enough glasses of hot water and cold water into which thermometers can be inserted. Place a thermometer outside a classroom window in a position so it can be read from inside the classroom and a thermometer actually inside the classroom.

Overview: In this lesson, students will learn that the term “temperature” refers to how hot or how cold something is. Students will recognize that a thermometer is used to measure temperature. Students will participate in making predictions about temperature and taking actual temperature readings.

Lesson Directions:

- Seat students in a circle on the carpet.

- Explain that in today’s lesson the students will continue to learn about temperature and how to measure temperature. Ask students to echo the term “temperature.”
- Begin lesson by asking for a volunteer to define the term temperature. Remind students that temperature tells how hot or how cold something is.
- Ask students for examples of hot and cold. Allow for several examples before proceeding.
- Ask the following question: “If I want to know how hot something is, what would I do?” Remind students that the best and safest way to determine temperature is by using a thermometer.
- Give practical examples of measuring temperature in our everyday lives such as the refrigerator, the oven, the car engine, signs that display outdoors temperatures, and when we are sick.
- Show a typical thermometer used to measure room temperature and a thermometer used to check body temperature. Point to and review the parts of the thermometer, the number line, degrees Fahrenheit, the red alcohol line, and the number display on the digital thermometer.
- Demonstrate reading the thermometer at the top of the red line using the term Fahrenheit. Demonstrate reading a digital temperature as well.
- Show the glasses of ice cold and hot water. Ask students to predict which glass will cause the alcohol line to rise or go up. If necessary, remind students that the alcohol line goes up when the temperature gets warmer. Follow by asking for a prediction for which glass will cause the alcohol line to fall.

- Insert a thermometer into each glass. Allow small groups of students to watch each thermometer and observe changes in the alcohol line.
- Remove the thermometer from the cold glass and ask for a volunteer to read the number of degrees in Fahrenheit. (Allow students to read the thermometer by the closest number to the alcohol line. We are not concerned with reading the lines between numbers for exact measurement, only that students recognize a thermometer as a tool for measuring temperature.) Assist with the reading as necessary. Note the position of the alcohol line and confirm the predictions. Allow students to observe the alcohol line rising as it returns to ambient room temperature.
- Remove the thermometer from the hot glass and ask for a volunteer to read the number of degrees in Fahrenheit. Assist with the reading as necessary. Note the position of the alcohol line and confirm the predictions. Allow students to observe the alcohol line falling as it returns to ambient room temperature.
- Ask a student volunteer to read the temperature of the classroom thermometer in degrees Fahrenheit. Allow students to predict if the outside temperature will be hotter or colder than the classroom temperature. Once the students have made a prediction, ask if the alcohol line will be higher or lower than the classroom alcohol line based upon that prediction.
- Allow a student volunteer to go to the window and read the outside temperature in degrees Fahrenheit. Assist with the reading as necessary. Confirm the predictions.
- Allow time for students' questions or comments about the lesson.
- Review and close the lesson by asking, "What is temperature?" and "How do we measure temperature?"

- Additional Activities: Create paper thermometers and have students color in the alcohol line as part of the daily calendar/weather activities, send home a sheet with five thermometer images, have students, with parental assistance, color in the temperatures for each day Monday-Friday to the closest number; if they do not have a thermometer at home, have them check the local weather on television, radio, or newspaper and chart the expected daily temperatures on their thermometers, or the students can chart and color refrigerator temperatures each day.

Lesson 14A

Objectives: PK.7 Students will investigate length using non-standard units of measure and/or a ruler

Materials:

Items to Measure

Paper Clips

Blocks (all the same size)

Linking Cubes

Rulers

Lesson Preparation: Gather a collection of non-standard measuring items such as paper clips or linking cubes. Gather a collection of at least five items to be measured. Items that lay flat such as books and dollars work best. Be sure to gather enough measuring units, for instance paper clips, to go the entire length of the items being measured. Provide rulers for independent investigation and comparison.

Overview: In this lesson, students will learn that the term “length” refers to how long or short an object is. Students will use non-standard measuring devices to explore length.

Lesson Directions:

- Seat students in a circle on the carpet.

- Explain that in today’s lesson the students will learn about length and how to measure it. Have students echo “length.”
- Begin lesson by asking for a volunteer to define the term length. Assist as necessary to define length as a way to tell others how long or how short something is.
- Ask the following question: “If I want to know how long something is, what would I do?” Acknowledge all answers but acknowledge, “measure it” as the best answer.
- Explain that we need a way to tell others how long something is so they will understand. We can do this by using items we have around the house or classroom.
- Show the dollar bill. Tell students that you want to tell them how long the dollar bill is by measuring it using paper clips. Show the clips and point out that they are all the same size.
- Demonstrate using paper clips to measure by placing the dollar bill flat on the floor and lining up paper clips alongside it. Point out that the first paper clip must line up evenly with one end of the dollar. Continue lining up clips end-to-end until you reach the other end of the dollar bill.
- Count the number of clips required to be the same length as the dollar bill (or as close as possible) and read the length as that number of “clips.” For example, “My dollar bill is 5 paper clips long.” Remind students that now we all could line up five paper clips end-to-end and know how long the dollar bill is.
- Demonstrate using clips to measure another item from the collection using the same procedure.
- Have volunteer students use the clips to measure the remaining items. Assist as necessary.

- Explain that we could do the same thing using linking cubes. Demonstrate how to measure the dollar bill using linking cubes in the same manner as used with the paper clips.
 - Allow volunteer students to measure items in the collection using linking cubes. Assist as necessary.
 - Remind students that we can use other items to measure something as long as all the items are the same size. Some examples are M&Ms, dried beans, sticks of gum, and uncooked pasta.
 - Place the paper clips and linking cubes in the math center and encourage students to measure other classroom items during center time with each. Remind the students that the length should be read as a number of clips or linking cubes used.
 - Review and close the lesson by asking, “What is length?” How long or short an item is. “How do I determine the length of something?” Measure it with a number of items such as paper clips or linking cubes.
- Additional Activities: Keep a small box of flat, easy to measure items in the math center. Have students bring a small baggie of items from home to use in measuring the length of these items. Some suggestions are dried beans or pasta, small candies such as Skittles or M&Ms, Cheerios or Fruit Loop type cereals, or small toys such as dominoes or blocks. This can also be given as an at home assignment to be completed with parents. Choose a small item to send home with each student and have him/her measure the item using something at home and bring both back to school. This is an excellent opportunity for Show and Share time as students demonstrate measuring using non-standard items they

found at home. Place the rulers in the math center as well. Demonstrate using a ruler during center time before actually introducing using the rulers to measure in the next lesson. Students can use the rulers to explore measurement independently.

Lesson 14B

Objectives: PK. 7 Students will identify a ruler as an instrument used to measure length

Materials:

Ruler

Yard Stick

Measuring Tape

Items to Measure

Paper Clips

Lesson Preparation: Gather a collection of measuring devices such as rulers, yardsticks, and measuring tapes. Gather a collection of at least five items to be measured. Items that lay flat such as books and combs work best.

Overview: In this lesson, students will learn that the term “length” refers to how long or short an object is. Students will recognize different types of measuring devices and identify them as instruments used to measure length.

Lesson Directions:

- Seat students in a circle on the carpet.
- Explain that in today’s lesson the students will learn about length and how to measure it.

- Begin lesson by asking for a volunteer to define the term length. Assist as necessary to define length as a way to tell how long or how short something is.
- Expand upon the definition by stating that some items are really long like a road or sidewalk and some things are short like a paper clip or crayon.
- Allow time for students to share ideas about things that are long and short.
- Ask the following question: “If I want to know how long something is, what would I do?” Acknowledge all answers including using non-standard units of measure such as paper clips, blocks, crayons, etc.
- Review and demonstrate non-standard units by aligning paper clips alongside the teacher’s foot from tip to tip. Have a volunteer student count the number of paper clips to determine the length of the foot in “paper clips.”
- Explain that we have special tools or instruments that help us determine how long an item is in inches. This is the best way to measure because paper clips come in different sizes, but inches are always the same.
- Show the ruler. Identify the name of this tool as a “ruler.” Have students echo “ruler.” Its purpose is to use numbers to give length in inches. Have students echo “inches.”
- Demonstrate using the ruler to measure the teacher’s foot from tip to tip. Be sure students understand that the end of the ruler closest to number “1” should be lined up evenly with one end of the foot; use the heel for this demonstration. Point to where the tip of the toes are on the ruler and identify this number, or the closest whole number, as the number to read in inches. (Just read the nearest whole number. We are not interested in reading fractional parts of inches, only identifying the ruler as a way to measure length.)

- Review using the ruler by demonstrating the process again with a block or other manipulative. Reinforce the concept of placing the number “1” end evenly at the end of the object being measured and checking where the other end extends to on the ruler. Read the closest number in inches.
- Show other tools that are used for measuring length such as a yardstick and measuring tape. Reiterate that each of these tools does the same thing, measure length in a number of inches.
- Display a number of items to measure such as a book, a piece of paper, a shoe, a block, a pencil, a comb, a paper clip, a belt, etc.
- Ask for a student volunteer to help measure each item. Allow the student to align the end of the ruler with the end of the object and point to the number he/she needs to read in inches. Assist as necessary. Allow the student to call out the length in inches.
- Continue this process until at least five items have been measured. Use the yardstick and measuring tape on some of the items with the ruler to show how the length of the item is the same because an inch is the same no matter which tool one uses.
- Allow students to give practical, real life examples of times we measure length. Some examples are measuring ourselves to see how we have grown, measuring the length of fish we catch, necklaces, baseball bats, how far we can jump, fabric we buy to make clothes, how far a baseball is hit, curtains, tablecloths, bicycles, etc.
- Place the ruler, yard stick, and measuring tape in the math center and encourage students to measure classroom items during center time with each of the tools. Remind the students that the length will be the same number of inches with each tool.

- Review and close the lesson by asking, “What would I use to know how long something is?” A ruler can tell me how long something is. Acknowledge other correct answers of standard and non-standard units as well.

- Additional Activities: Cut a length of green crepe paper streamer to match each student’s height. Have him/her draw a flower blossom to go on top of the streamer. Put the student’s picture in the center of the blossom if possible or have him do a self-portrait. Place the flowers on a bulletin board or along the wall with a heading “Look how tall we have grown!” Identify each student’s height in inches on a leaf attached to the stem of his/her flower. Share the story *How Big is a Foot?* By Rolf Myller to expand upon understanding of standard versus non-standard units of measure.

Lesson 15A

Objectives: PK.7, PK.8 Make direct comparisons of weight using terms heavier and lighter and make direct comparisons of temperature using terms hotter and colder

Materials:

Balance/Bathroom Scales

Liquid/Digital Thermometers

Objects to Weigh (beans, centimeter cubes, linking cubes, blocks, etc.)

Objects to Measure Temperature (place some in the freezer to alter temperatures)

Clear Plastic Cups

Comparison Chart from Lesson 12B

Lesson Preparation: Gather one each of a balance scale, a bathroom scale, a liquid thermometer, and a digital thermometer. Create picture cards of an elephant and a mouse to represent heavier and lighter and picture cards of fire and ice to represent hotter and colder. Picture cards can also be used for the temperature portion of this exercise, for example pictures of fire/ice, beach/artic region, hot chocolate/ice cream, etc., but cannot be measured. The exercise is more effective if concrete materials are used and felt by the students. Ordinary items can be used and placed in the freezer for a period of time to artificially alter the temperature. The point is for students to notice a difference and be able to make a prediction.

Partially fill clear plastic cups with the items to be weighed, beans, cubes, blocks, etc. to allow for easier weighing. Try to keep the height of the materials at about the same level in each

cup so the students will receive a clearer understanding of weight and how it varies even though items might appear to be the same size.

Overview: In this lesson, students will make comparisons of heavier/lighter and hotter/colder using measurement instruments. This lesson can be split into two shorter lessons if needed.

Lesson Directions:

- Seat students in a circle on the carpet around the comparison chart.
- Explain that in today's lesson, the students will use what they have learned about weight and temperature to make predictions and test those predictions. Students will guess and then measure to see which items are heavier/lighter and which items are hotter/colder. We will begin with weight comparisons.
- Review weight as a measure of how heavy something is. Give an example comparison of an elephant and a mouse using the picture cards. Ask, "Which of these animals is heavier? Which is lighter?" Once students have responded appropriately place the two picture cards on the chart creating a column for "Heavier" and a column for "Lighter."
- Explain that in this lesson, the students will be asked to guess or predict which of two cups is heavier and which is lighter. The students will then place the two cups on the chart in the corresponding columns. This will be done until all cups (approximately 10 cups) have been placed. Our goal is to make comparisons of heavier/lighter.
- Randomly choose two students to pick the first two cups. Allow time for the students to make their predictions and place the cups on the floor chart. Encourage them to work together when deciding where each cup should be placed.

- Continue choosing groups of two students until all cups have been placed on the chart.
- Once all cups are placed, ask students for suggestions on testing the guesses. Give prompts as needed until someone suggests using a “scale.” Possible clue: “I need an instrument or tool to help me with weight. Which tool could I use?”
- Review the two types of scales, the balance scale and the weighing or bathroom scale, pointing to each as it is named. The balance scale works as one side sinks farther than the other, but gives us no measurement of pounds, and that the bathroom scale gives us an actual number of pounds an item weighs.
- Ask students for suggestions on which type of scale to use. Restate the goal, “I need to find out which cup is heavier and which cup is lighter. Which type of scale best suits my situation?” If balance scale is not suggested, remind students that we only want to know which cup is heavier, and we can see that quickly with the balance scale. We do not need to know the actual weight.
- One by one review the predictions for each group of cups. Test the two cups on the balance scale to verify the predictions. Make changes in the chart as necessary.
- Allow time for questions.
- Clear the chart.
- Explain that in the next part of our lesson we will make comparisons with temperature. We will make predictions about which cups are hotter and which are colder. Then the cups will be placed on the floor chart as well.
- Show picture cards of fire and ice. Tell students that our chart needs to have a column for hotter and a column for colder.

- Ask, “Which picture best represents hotter? (fire) Which picture best represents colder? (ice).” Place the cards at the top of the columns to designate a “Hotter” and a “Colder” column.
- Explain that in this lesson, the students will be asked to guess or predict which of two cups is hotter and which is colder. The students will then place the two cups on the chart in the corresponding columns with teacher assistance if needed. Do not use really hot substances for this exercise. This will be done until all cups (approximately 10 cups) have been placed. Our goal is to make comparisons of hotter/colder.
- Randomly choose two students to pick the first two cups. Allow time for the students to make their predictions and place the cups on the floor chart.
- Continue picking groups of two students until all cups are placed.
- Once all cups are placed, ask students for suggestions on testing the guesses. Give prompts as needed until someone suggests using a “thermometer.” Possible clue: “I need an instrument or tool to help me with temperature. Which tool could I use?”
- Review the thermometer by showing a digital thermometer and a liquid thermometer, pointing to each as it is named.
- Ask students for suggestions on which type of thermometer to use. Restate the goal, “I need to find out which cup is hotter and which cup is colder. Which type of thermometer best suits my situation?” If the digital thermometer is not suggested, make that suggestion because it gives us a quicker reading of temperature and it is smaller and will fit into the cups more easily; however, either thermometer would work.
- Remind students that the bigger the number is on the reading, the hotter the temperature is. So, we need the cup with the biggest number to be in the hotter column.

- One by one review the predictions for each group of cups. Test the two cups with the digital thermometer to verify the predictions. Make changes in the chart as necessary.
 - Allow time for questions.
 - Close the lesson with these review questions: “How can I measure how heavy something is?” and “How can I measure how hot or cold something is?” “Sometimes I just need to compare weights and temperature. I might be able to do that by just observing or feeling an object, but I might also need a tool to help me. I can use a scale for comparing weights, and I can use a thermometer for comparing temperatures.”
- Additional Activities: Encourage students to sort items or pictures using the picture cards and the floor mat during center time. Picture cards will be necessary for independent practice of the temperature sorting (hotter/colder), but picture cards or concrete items can be used for weight sorting (heavier/lighter).

Lesson 15B

Objectives: PK.7, PK.8 Make direct comparisons of length using terms shorter/longer or shorter/taller

Materials:

Ruler

Yardstick

Measuring Tape

Markers

Large Roll of Paper

Comparison Chart from Lesson 12B

Name Cards for Each Student

Picture Cards for Giraffe and Spider

Lesson Preparation: Gather one each of a ruler, a yardstick, a measuring tape, and picture cards for a giraffe and a spider. Have each child lie down on a large sheet of paper. Trace the outline of his/her entire body. Allow each child to decorate himself/herself and cut out the likeness. Write or have each student write his/her name on an index card.

Overview: In this lesson, students will make comparisons of taller/shorter using measurement instruments and/or observations.

Lesson Directions:

- Seat students in a circle on the carpet around the comparison chart.
- Explain that in today's lesson, the students will use what they have learned about length to make predictions and test those predictions. Students will guess and then measure to see who is taller and who is shorter among the students.
- Review length as a measure of how long or in this case how tall something is. Give an example comparison of a giraffe and a spider using picture cards. Ask, "Which of these animals is taller? Which is shorter?" Once students have responded appropriately place the two picture cards on the chart creating a column for "Taller" and a column for "Shorter."
- Explain that in this lesson, the students will be asked to guess or predict which of two students is taller and which is shorter. The students will then place their two name cards on the chart in the corresponding columns. This will be done until all name cards have been placed. Our goal is to make comparisons of taller/shorter.
- Randomly choose two students. Ask them to remain seated while the other students predict or guess which one is taller and which one is shorter. Allow time for predictions, and then have the two students stand up back to back. Encourage students to observe and decide who is actually taller.
- Have the two students place their name cards on the chart in the appropriate column.
- Continue choosing groups of two students until all name cards have been placed on the chart. Try to pair students with obvious height differences as much as possible.
- Once all names are placed, ask students for suggestions on testing the guesses. Remind students that we simply made observations of height, but if we wanted to actually

measure our heights we could use an instrument to help us. Ask, “What tool could I use to measure how long or tall something is?” (ruler)

- Review the types of measuring devices showing each as it is named: ruler, yardstick, and measuring tape. All of these give us an actual number measurement in inches. Today, we did not really need to know the number of inches. We can see who is taller and who is shorter unless two people are exactly the same height.
 - Allow time for questions.
 - Clear the chart.
 - Explain that in the next part of our lesson we will make comparisons of height using the self-portraits.
 - Allow each student to stand up and hold his/her self-portrait.
 - Assist students as they arrange themselves shortest to tallest.
 - Once everyone is in line, assist students with hanging the self-portraits around the classroom or in the hallway in shortest to tallest order.
 - Review and close the lesson with the question, “What would I use to measure how tall or how long something is?” Acknowledge all correct responses, but reiterate that a ruler gives us a number measurement in inches.
- Additional Activities: Send home construction paper with students, one sheet per family member. Have the student trace and cut out each family member’s footprint and arrange them in shortest to tallest order. The footprints can be glued onto a bulletin board or arranged as hanging mobiles and displayed in the classroom.

Lesson 16A

Objectives: PK.7 Identify analog and digital clocks as instruments used to measure time

Materials:

Various Analog and Digital Clocks Including Wall or Table Top Clocks and Wristwatches

Blackboard or Chart Paper and Marker

Optional:

Stopwatch

Sand Hourglass

Lesson Preparation: Gather a collection of clocks both analog and digital.

Overview: In this lesson, students will learn to recognize clocks as instruments used to measure time. Students will recognize both analog and digital clocks. Students will brainstorm a list of why we need to know about time.

Lesson Directions:

- Seat students in a circle on the carpet.
- Show a clock. Ask students to echo, “Clock.”
- Explain that in today’s lesson we will be learning about clocks, what they do, and why we need them.

- Pose the question, “Why do we need a clock?” while showing a typical clock or watch seen around the home or classroom. If necessary, prompt students to respond, “To tell what time it is.”
- Assist students in brainstorming a list of reasons we need to know the time. Some possible answers are to know when to get out of bed for school/work, to know when to eat lunch, to know when to go to recess, to know when it is bedtime, etc. Write the list on a blackboard or piece of chart paper as students build ideas. Allow each student to give an idea if possible. This activity helps to solidify the concept of measuring time and why it is important.
- Display the various clocks. Define the purpose of a clock as “an instrument used to measure time.”
- Inform students that while all clocks measure time in the same way, not all clocks look the same. Clocks can be many different shapes, colors, or designs. Clocks can be big like grandfather clocks or they can be small like a wristwatch. However, all clocks work in the same way.
- Show an example of a digital clock and an analog clock. Point out that the digital clock displays numbers that tell us what time it is. Analog clocks have hands that point to numbers to tell us what time it is. Read the time from each clock and emphasize that they are showing the same time.
- Use an analog clock with a second hand or a stopwatch to demonstrate the next portion of the lesson.

- Describe using a clock as a way to measure how much time passes. Give the example; if we know we are going to play outside for fifteen minutes, we need to use a clock to know when those fifteen minutes have passed.
 - Perform the following exercise with the students: Students should sit with legs tucked, hands in lap, and eyes closed. Tell the students they are to remain sitting this way for one minute and no talking is allowed during this time. Use a clock to measure one minute and signify that time is up by saying, “Open your eyes.”
 - After the exercise, allow students to comment about the exercise. Did it seem like a long time or a short time?
 - Perform the same exercise again but allow students to keep eyes open and watch the clock with the second hand. Tell students that the second hand must make a complete circle around the clock to be a full minute. Choose a number to start and stop on and be sure the students understand they are not to talk or move until they see the second hand back on that number.
 - Again, allow time for student reflection and/or questions after the exercise.
 - Close the lesson by asking, “Why do we need a clock?” (To tell what time it is) and “What does a clock measure?” (Time)
- Additional Activities: Have students do different activities for one minute like hop, skip, dance, etc. Use a stopwatch or a timer to signify the end of one activity and beginning of another, such as center time, timeout, story time, or have students take turns with a toy in 1-5 minute increments. Point out the clock at various points in the day so that students

learn to recognize the clock as a way to know where to be at a given time, like 11:00 is lunchtime, 1:00 is P.E., 2:00 is naptime, etc.

Lesson 16B

Objectives: PK.7 Identify analog and digital clocks as instruments used to measure time

Materials:

Various Analog and Digital Clocks

Judy Clock (Teaching Clock)

Paper Plates

Stiff paper (poster board, greeting cards, index cards, etc.)

Paper Fasteners

Markers

Hole Punch

Lesson Preparation: Gather a collection of clocks both analog and digital to display around the classroom. Allow one paper plate per student. Cut paper clock hands, one long and one short, for each student. Use a heavy paper such as poster board, cardstock, index cards, or recycled greeting cards or postcards to prevent tearing. Punch a hole in the center of each paper plate and at one end of the short clock hand. Use a marker to write the clock numbers around the paper plate. Glue the long clock hand from the center of the plate up to “12.” We are only going to use our clocks to tell time to the hour, so it is not necessary that the minute hand be moveable.

Overview: In this lesson, students will learn to recognize clocks as instruments used to measure time. Students will construct paper plate clocks and use them to match the time the teacher displays on a teaching clock or Judy Clock.

Lesson Directions:

- Seat students in a circle on the carpet.
- Show a clock. Ask students to echo, “Clock.”
- Explain that in today’s lesson we will continue to learn about clocks. We will make a clock using a paper plate. We will use the clock to practice showing time with hands pointing to numbers the same way a real analog clock does.
- Pose the question, “Why do we need a clock?” (To tell what time it is).
- Show students the Judy Clock and explain that this is a clock used to teach telling time. Explain that each time the hands move, a new time is being shown. It is not a real, working clock. It is only for practice reading and telling time.
- Put both hands on “12.” Explain that this is 12 o’clock. Move the short hand to “1.” Identify this time as 1 o’clock. Explain that when the long clock hand, or minute hand, stays at “12,” we read the number the short hand, or hour hand, is pointing to in order to know what time it is. If the hour hand is pointing to “1,” we read this time as “1 o’clock.”
- Practice additional times to the hour. Move only the hour hand and ask students to read the time by naming the number and saying “o’clock.” Remind students this is only true when the long hand is pointing at “12.” Continue this activity until it seems students understand the concept.

- Tell students that we will be making clocks with paper plates and paper hands to continue practicing.
 - Give each student a paper plate with numbers already written on it, a hole punched in the center, and the minute hand glued in the “12” position. Remind students that on a real clock, both clock hands move, but we are going to practice telling time with ours only pointing to “12.”
 - Give each student one short paper clock hand and a paper fastener, or metal brad.
 - Demonstrate putting the brad through the hole in the hour hand and down through the front of the clock face. Allow time for students to do the same.
 - Demonstrate turning the clock over while holding the brad in place, laying it flat on the floor, and separating the brads to lock the hand in place. Allow students to do the same, assisting as needed.
 - Once all clocks are assembled, demonstrate how the hour hand will move around the clock.
 - Explain that in this activity, the teacher will show a time on the Judy clock and the students will show the same time on their clocks. The students will then name the time by reading the number the hour hand is pointing to and following it with “o’clock.”
 - Practice times in this manner until students seem to master the concept.
 - Close the lesson by asking, “Why do we need a clock?” (To tell what time it is) and “What does a clock measure?” (Time)
- Additional Activities: Keep the paper plate clocks for additional classroom practice during transition times, or send them home for students to practice with parents. Hang a

paper plate clock above a picture of food and set it to lunchtime, so students will know when the classroom clock matches the paper clock, it is time for lunch. Do the same for recess with a picture of the playground or for library using a picture of a book. Any resource class or activity can be used in this way. Students can even do this at home for dinner, bath, and bedtime.

Lesson 17A

Objectives: PK.5 Investigate addition of whole numbers with up to ten concrete objects

Materials:

Counting Bears or Other Animals

Work Mats (Placemats or Student Drawn Playgrounds Work Great)

Lesson Preparation: Gather enough counting bears for each student to have five and a work mat for each student. If work mats are not available, have each student draw a playground with grass, trees, flowers, and sunshine instead.

Overview: In this lesson, students will investigate the concept of addition through storytelling and play using counting bears.

Lesson Directions:

- Seat students in a circle on the carpet.
- Explain that in today's lesson we will use counting bears to tell stories about playing on a playground. The teacher will read a story and the students will act it out using the counting bears and the work mat. We will stop now and then to see how many bears are playing on the playground.
- Model this activity while reading the story.

- Instruct students to listen carefully to the story and do what the story says by placing a number of bears on the playground.
- Begin story: “Once upon a time, it was a bright, sunny day and the Rainbow Bears wanted to go out and play. There was a playground nearby, so they decided to go there and have a picnic. All five bears went to the playground and stood in the grass. (Place all 5 bears on the mat.) They saw it was too crowded and that they would have to take turns on the playground, so all five bears moved off the playground. Next, the Rainbow Bears decided that three bears would play first. (Place 3 bears on the mat.) That worked much better. While the three bears were playing tag, one more bear joined them. (Place 1 additional bear on the mat.) Now there were ____ (count 4) bears on the playground. It was a little crowded, but it was still okay. The four bears played a while and decided they were hungry, so they left. (Take all bears off the mat.) There was still one bear that had not played yet, so he went to the playground. (Place 1 bear on the mat.) He was having fun, but he really wanted someone to play with him. So after eating, two friendly bears came back to join the fun on the playground. (Place two additional bears on the mat.) Now, there were ____ (count 3) bears on the playground. That was okay. After eating and resting a while, the last two bears came back to the playground. (Place 2 more bears on the mat.) But now there was a problem, because there were ____ (count 5) bears back on the playground! That was too crowded. By this time it was starting to get dark, and the bears were getting tired. They had had a wonderful day taking turns and playing at the playground, so they decided to go home. They would return again on the next sunny day. The End.”

- Review the lesson by explaining that when we put groups of items together we get one larger group. For example, place your bears into two groups. One group has three bears and the other group has two bears. Line them up in straight lines. Allow time for students to set up groups. Assist as needed. Next, instruct students to count the first group by pointing to each bear while counting, 1-2-3. Next, count the bears in the second group by pointing to each bear while counting 1-2. Now instruct students to put the two groups together in one larger straight line. Count the bears in the larger group by pointing to each bear while counting, 1-2-3-4-5. Restate, “When we take two smaller groups of bears or items and put them together, we get one larger group.”
- Allow time for student questions or comments.
- Allow time for free play with the bears and playground mats.
- Additional Activities: Act out similar stories with the students being the characters either on a real playground or an imaginary setting. Play musical spots: students dance freely while music is playing and when the music stops, the students rush to line up on one of two tape lines on the floor. After all students are lined up, count each line. Then combine the two lines and count all the students. This can be done as a whole class or in smaller groups if necessary.

*This lesson was adapted from a lesson used in the *Saxon Math K*, a product of Saxon Publishers, Inc. and Nancy Larson.

Lesson 17B

Objectives: PK.5 Investigate addition of whole numbers with up to ten concrete objects

Materials:

Linking Cubes

Lesson Preparation: Gather enough linking cubes for each student to have five. If linking cubes are not available, building blocks will work as well.

Overview: In this lesson, students will investigate the concept of addition through storytelling and play using linking cubes.

Lesson Directions:

- Seat students in a circle on the carpet.
- Explain that in today's lesson we will use linking cubes to tell stories about a special building. The teacher will read a story and the students will act it out using the linking cubes. We will stop now and then to see how many cubes are in our building.
- Model this activity while reading the story.
- Instruct students to listen carefully to the story and do what the story says by placing a number of linking cubes together to make a building.

- Begin story: “Once upon a time, a little boy named Ollie moved to a building called Magic Tower. The building was magic because it never ran out of space. Each time a new family came to live in the building, the building would simply grow a new floor. Before Ollie came, the building only had two families living there, so there were two floors. (Put 2 cubes together for your building.) The day Ollie moved in, the building grew one new floor, just for Ollie’s family. (Add 1 linking cube to your building.) Now the building had ____ (count 3) floors. Ollie lived there happily for many years, but he longed for someone new to play with him. Finally, he heard the best news—two new families were moving into Magic Tower! Ollie could hardly wait. When the big moving in day arrived, Magic Tower grew two new floors! (Add 2 linking cubes to the building.) Ollie was so excited! Now he not only had new friends, but he also lived in a bigger building. Magic Tower now had ____ (count 5) floors! It was the tallest, best building in the world! Ollie was very happy! The End.”
- Review the lesson by explaining that when we put groups of items together we get one larger group. For example, place your cubes into two groups. One group has four cubes and the other group has one cube. Line them up in straight lines. Allow time for students to set up groups. Assist as needed. Next, instruct students to count the first group by pointing to each cube while counting, 1-2-3-4. Next, count the cubes in the second group by pointing to each cube while counting, 1. Now instruct students to put the two groups together in one larger straight line. Count the cubes in the larger group by pointing to each cube while counting, 1-2-3-4-5. Restate, “When we take two smaller groups of cubes or items and put them together, we get one larger group.”
- Allow time for student questions or comments.

- Allow time for free play with the linking cubes.
- Additional Activities: Have students bring collections of five items from home and tell stories using those items. Arrange a snack bar with bowls of two items, like marshmallows and M&Ms. Allow students to build their own snack mix of five items, by choosing a number of items from each bowl. The number of items they choose cannot exceed five. Have students count each item as they add it to their mixes. For more advanced learners, allow students to build towers with additional linking cubes and tell their own stories. Encourage students to have people move in and out with the tower growing and shrinking appropriately each time.

Lesson 18A

Objectives: PK.5 Investigate addition of whole numbers with up to ten concrete objects

Materials:

Counting Bears

Numeral Cards for 1-9

Index Card Labeled “+” for Addition

Lesson Preparation: Gather a collection of counting bears or other counters with enough pieces for each student to have ten. If numeral cards are not available, write the numerals 1-9 and the symbol “+” on index cards.

Overview: In this lesson, students will expand upon previous lessons exploring the concept of addition. Students will now work with ten concrete items as they match, count, and add.

Lesson Directions:

- Seat students in a circle on the carpet.
- Explain that in this lesson, we will begin to add numbers using counting bears to help us. Have students echo the word, “Add.” Define adding as combining smaller sets of items to create one larger set.

- Demonstrate by placing two of the numeral cards in view of all the students. (Be sure that the sum of the two cards does not exceed ten. The numeral cards will be our addends.)
For example, use “3” and “5.” Ask students to identify each numeral. Near the “3,” line up three bears. Near the “5,” line up five bears. Identify the two distinct sets and have students chorally count the members of each set as the teacher points to each member.
- Show a card with “+” and tell students that this sign lets us know to add. Place the “+” between the two sets of bears.
- Next, explain that when we add numbers, we are combining the two groups or sets into one larger set. Remind students of the bears on the playground from a previous lesson.
- Combine the two sets, “3” and “5”, into one larger set. Be sure to place the bears in a single row for easier counting. Explain that the two sets of bears have just been added together. Now, we no longer have “3” and “5.” We have one larger set.
- Instruct students to count chorally as the teacher points to each member of the new set, 1-2-3-4-5-6-7-8. “Our new set has eight members because we added our two smaller sets.”
- Choose two more numeral cards and repeat the same process.
- Ask for questions.
- Inform students that they will now add sets. The teacher will show two numeral cards. Students will arrange the appropriate number of bears for each set. Remind students that it is easier to count the bears if they are all in a straight row.
- Choose two new cards and allow time for students to build the two sets. Assist as needed.
- Once each student has correctly built the two sets, instruct students to now add, or combine, the two groups to build one larger set by holding up the signal card “+”. After each student has combined sets, chorally count the number of bears in the new set.

- Continue in this manner for at least five rounds.
 - Ask for questions.
 - Allow free time to play with the bears.
 - During free play, work with small groups or individuals to assess understanding with more addition problems.
 - As a final activity, place sets of students at four tables, two tables with boys and two tables with girls. The number of students at each table does not need to be the same. Tell students that the boys will get blue napkins at snack time and the girls will get purple napkins at snack time. Ask the questions, “How many blue napkins will we need?” and “How many purple napkins will we need?” Allow students to suggest ways to figure out this problem. Prompt as necessary by reminding students of the activity we just completed with bears. Assist students as they chorally count the number of boy students and the number of girl students to finally determine the sum of napkins needed in each color.
 - Close the lesson with the following, hold up the “+” card and ask, “What does this sign tell us to do?” (Add sets) “And what does ‘adding’ sets mean?” (We combine the sets and count the total number of members in one larger set.)
- Additional Activities: Place the counting bears, numeral cards, and “+” card in the math center. Allow students to make up their own addition problems during center time. Also, use the numeral cards and line up sets of students to make addition problems.

Lesson 18B

Objectives: PK.5 Investigate addition of whole numbers with up to ten concrete objects

Materials:

Graham Crackers

Cake Icing

Fruit Loop Type Cereal

Coffee Stirrers or Small Diameter Straws

Numeral Cards for 1-9

Index Card Labeled “+” for Addition

Lesson Preparation: Gather the following items: graham crackers one per student, one or two canisters of cake icing and a spreading utensil, cereal pieces ten per student, coffee stirrers two per student, and napkins. Spread a layer of icing on each graham cracker. The icing should be thick enough to support the coffee stirrers to stand vertically. Place two stirrers vertically on the graham cracker, one near each end.

Overview: In this lesson, students will expand upon previous lessons exploring the concept of addition. Students will build an abacus to use for counting and adding numbers.

Lesson Directions:

- Seat students at tables for this activity.
- Explain that in this lesson, we will add numbers using cereal to help us. Have students echo the word, “Add.” Ask, “What does it mean to add numbers?” (To combine sets into one larger set)
- Explain that each student will create an abacus to use for counting. An abacus is a way to build sets of items, in our case sets of cereal pieces, and count the total number of pieces when the sets are combined, or added. When we count all the pieces of the new set, this number is called the “sum.” Have students echo, “sum.”
- Show students one of the graham crackers with two vertical stirrers. Explain that each stirrer or straw represents a set. We will pick two numeral cards just like we did with the counting bears in the last lesson. We will build a set for each numeral by placing that many cereal rings around a stirrer.
- Demonstrate by placing two of the numeral cards in view of all the students. (Be sure that the sum of the two cards does not exceed ten. The numeral cards will be our addends.) For example, use “2” and “4.” Ask students to identify each numeral. On one stirrer, place two pieces of cereal and on the other stirrer place four pieces of cereal. Identify the two distinct sets and have students chorally count the members of each set as the teacher points to each member.
- Show a card with “+” and ask students, “What does this sign tell us to do?” (Add sets)
- Next, remind students that when we add numbers, we are combining the two groups or sets into one larger set. Remove the two pieces and add them to the stirrer with four pieces to visually combine the two smaller groups.

- Lead the students in counting all the cereal pieces, 1-2-3-4-5-6, while pointing to each one. We now have one larger set with six pieces of cereal.
- Choose two more numeral cards and repeat the same process.
- Allow time for students to ask questions or comment about the activity.
- Inform students that they will now add sets. Show two numeral cards. Instruct students to arrange the appropriate number of cereal pieces for each set on an abacus. Remind students to put one set on each stirrer.
- Distribute the appropriate materials to each student.
- Choose two new cards and allow time for students to build the two corresponding sets. Assist as needed.
- Once each student has correctly built the two sets, signal students to add the two sets to build one larger set by holding up the “+” card. Remind students to move all pieces to one stirrer. Chorally count the total number of cereal pieces on the abacus while pointing to each piece.
- Continue in this manner for at least five rounds.
- Ask for questions.
- Allow free time to explore with the abacus before enjoying the abacus as a snack.
- Close the lesson by holding up the “+” card and asking, “What does this sign tell us to do?” (Add sets) “And what does ‘adding’ sets mean?” (We combine the sets and count the total number of members in one larger set.) The number of members in the new set is called the “sum.”

- Additional Activities: Use seasonal items as counting and adding activities. For example, place plastic Easter eggs in a sensory table. Have students draw two numeral cards and count the appropriate number of eggs for each numeral. Place both sets of eggs into a basket and find the sum. The same can be done with cotton balls in winter, flowers in spring, seashells in summer, and leaves or plastic apples in fall.

*This lesson for teaching addition was adapted from an idea presented in a mathematics instruction workshop, *Mathematical Strategies and Manipulatives for Primary Teachers*, conducted by Diana Freeman, Center for Teaching Excellency, University of Virginia at Wise, Wise, Virginia.

Lesson 19A

Objectives: PK.3 Identify ordinal position of a set of three objects

Materials:

Paper or Silk Ribbon Awards

Two Slices Bread

One Slice Cheese

Paper Plate

Lesson Preparation: Use silk ribbons for First, Second, and Third positions if available. If not available, draw and cut out paper ribbons blue for first, red for second, and white for third. Label each ribbon appropriately using numerals “1st,” “2nd,” and “3rd.” Gather food items and a paper plate.

Overview: In this lesson, students will explore ordinal positions first-third. Students will learn to arrange items in the correct order left to right and top to bottom.

Lesson Directions:

- Seat students in a circle on carpet.
- Explain that in today’s lesson, the students will learn to put things in order using the positions first, second, and third.

- Show the labeled ribbons. “We will look at each ribbon.” First, show the blue ribbon. Inform students that this ribbon is for the “first” position. Ask a volunteer student to identify the number on the blue ribbon. (1)
- Show the red ribbon. Inform students that this ribbon is for the “second” position. Ask a volunteer student to identify the number on the red ribbon. (2)
- Show the white ribbon. Inform students that this ribbon is for the “third” position. Ask a volunteer student to identify the number on the white ribbon. (3)
- Explain that when we put things in order first, second, third, we are really lining up the counting numbers one, two, three. We just use different words to name the positions.
- Demonstrate by randomly giving the ribbons to three students.
- Pose the question, “If I want to line up these students in first, second, third, order, who should line up first?” (The blue ribbon, 1st) Have that student stand up in an area visible to all students facing the class.
- Ask, “Now I have my first position, who should line up next?” (The red ribbon, 2nd) Have that student stand to the left of the first student facing the class.
- Ask, “Now I have my first position and my second position, who should line up next?” (The white ribbon, 3rd) Have that student line up to the left of the second student facing the class.
- Review, “I now have students lined up in order by positions. (Name) is in first position, (Name) is in second position, and (Name) is in third position.”
- Retrieve the ribbons and ask the volunteers to return to their seats.
- Repeat the same procedure with three different students.
- Allow time for questions.

- Tell students that now the teacher will pass out the ribbons and the students will line themselves up in first, second, third order. Do this until each student has had a turn to participate. Make corrections or assist as needed.
- Point out that we do not always position things side by side. Sometimes things are lined up top-to-bottom, like when we make a sandwich, because it makes more sense. Show students two slices of bread and a slice of cheese. Say, “I want to use these items to make a sandwich. Can you help me?” (Yes)
- For the purpose of making the point clear build the sandwich by laying the items side by side as the students decide which item should be used first, second, and third.
- Ask, “If I want to make a cheese sandwich, which item do I need to put on my plate first?” (A slice of bread) “Which item do I need to put on my sandwich second?” (A slice of cheese) “Which item do I need to put on my sandwich third?” Show the bread-cheese-bread arrangement side by side and ask, “Am I ready to eat my sandwich?” (No) “Why not?” (Because you have to stack the pieces on top of each other.)
- Rebuild the sandwich with students guiding, as the items are stacked first, second, third building from the bottom up.
- Show the completed sandwich. Point out that a slice of bread is on top, the cheese is in the middle, and a slice of bread is on the bottom. Although we put the items in order first, second, third, they are stacked up top-to-bottom instead of left-to-right or side-to-side because that makes it easier to eat. Sometimes we use a side-to-side arrangement for positions and sometimes it is better to use top-to-bottom arrangement.
- Allow time for questions or comments.

- Close the lesson by reviewing the three ordered positions. “What is number one position called?” (First) “What is number two position called?” (Second) “What is number three position called?” (Third)

- Additional Activities: Have students build block towers with a specific color in each ordinal position. Tell stories using stuffed animals in ordinal position. Reinforce ordinal position by allowing students to line up at the water fountain in groups of three naming which student should line up first, second, third. Have students listen and follow directions to build their own sandwiches or salads at snack time.

Lesson 19B

Objectives: PK.3 Identify ordinal position of a set of three objects

Materials:

Story *The Three Bears*

Three Stuffed Bears

Three Bowls

Three Chairs

Three Beds or Blankets

Lesson Preparation: Pre-read the story to become familiar with it. Gather three each of stuffed bears, bowls, chairs, and doll beds or blankets to symbolize beds. Doll sized items may be easier for students to handle. Make sure the items are different sizes so they clearly represent small, medium, and large for baby bear, mama bear, and papa bear.

Overview: In this lesson, students will practice ordinal position by retelling a familiar children's story.

Lesson Directions:

- Seat students in a circle on the carpet.

- Tell students that in today’s lesson we will share a familiar story, *The Three Bears*. We will listen to the story and then retell the story. We will use what we have learned about ordinal positions, first, second, third, to help us retell the story.
- Read the story.
- Show the students the collection of items from the story, the bears, the bowls, the chairs, and the beds. Point out that, just like in the story, we have three sizes of each item. Show the bears to illustrate.
- Tell students that in retelling the story using these items, we want to be sure we arrange them in the correct positions first, second, and third. Review the numbers for each position, first (1), second (2), and third (3).
- Distribute each item randomly to a student. Take time to note which item each student is receiving, the baby bear, the mama sized bowl, the papa sized bed, etc.
- Read the story again and have each student line up when he/she hears the item he/she is holding.
- Read the story and allow the students to line up appropriately. After each group has lined up correctly, for instance all the bears, have the students place the bears on the carpet in the same order and return to their seats. Be sure the students and the bears are lined up in the correct order small, medium, large. Do this for the entire story.
- When the story is completed, review the arrangements of the items. Begin with the bears. Ask, “Who came home first?” (Baby Bear) “Who came home second?” (Mama Bear) “Who came home third?” (Papa Bear). Repeat this process for each of the other groups of items, “Which bowl did Goldilocks try first, second, third?” “Which chair did she try first, second, third?” “Which bed did she try first, second, third?”

- Allow time for student questions or comments.
 - Close the lesson by reviewing the three ordinal positions. “What is number one position called?” (First) “What is number two position called?” (Second) “What is number three position called?” (Third)
- Additional Activities: Retell other common stories like *The Three Little Pigs* or *The Billy Goats Gruff*. Divide the students into relay teams and give paper ribbons for first, second, and third, making sure that each student receives a ribbon. Use ordinal ribbons when taking turns playing in centers or with a shared toy. Each student will get a five minute turn in first, second, third order. As an at home project, have students draw three family members (arranged left-to-right on the paper) in birth order. Who was born first, second, third?

Lesson 20A

Objectives: PK.12 Collect data by counting

Materials:

Poster Board

Markers

Clothespins

Lesson Preparation: Divide a poster board in half with a vertical line. Add the headings “Pack” and “Tray” at the top. It might also be helpful for pre-readers to attach pictures of a lunchbox and a lunch tray as well. Gather clothespins, one per student. It may be helpful to write each student’s name on a clothespin in order to identify who has and has not participated in the activity. The clothespins can then be used for attendance as well.

Overview: In this lesson, students will participate in gathering data by counting. Students will actively participate in a lunch count activity.

Lesson Directions:

- Seat students in a circle on the carpet.
- Explain that in today’s lesson, the students will assist the teacher in obtaining a lunch count for the day.

- Show the poster board with the headings “Pack” and “Tray.” Identify each heading and explain that these are the lunch options available at school. Students either pack a lunch from home, or they purchase a tray of food prepared in the cafeteria.
- Today’s goal is to collect information that tells us how many people are eating packed lunches and how many trays the cafeteria will prepare.
- Ask for student suggestions on how to find this information. Acknowledge all answers. Prompt as necessary until a student suggests counting.
- Ask for suggestions about counting, “What should we count?” Possible answers are lunchboxes or raised hands if you brought a lunchbox.
- Explain to the students that we want to know both how many lunches have been packed and how many trays will be purchased. In order to find both numbers by counting, we will use the poster. Each student will be given a clothespin. If the student brought a lunch from home, he/she will clip the clothespin to the side of the poster that says “Pack.” If the student wishes to purchase a tray, he/she will clip the clothespin to the side of the poster that says “Tray.”
- Allow time for questions.
- Distribute one clothespin to each student. Remind the students to clip the clothespin on the appropriate side. Point to each side while reading the heading.
- Call students one at a time to clip on the clothespins.
- Once the chart is completed, say, “Now we have a clothespin for each student on our chart. What should we do to decide how many lunchboxes we have?” (Count) “What should we do to decide how many trays we need?” (Count)

- Have students count chorally while the teacher points to each clothespin on one side of the chart and then on the other side of the chart.
 - Review by stating, “We used our chart to help us gather information about our lunches. Each student placed a clothespin on the chart to show if he/she packed a lunch or needed to purchase a tray. Counting the clothespins is a good way to determine a total number of lunchboxes and a total number of trays needed.”
 - Allow time for additional questions or comments.
 - Inform students that using the lunch count poster will now become part of the daily calendar routine. Each day, students will clip a clothespin to the poster to assist the teacher with the daily lunch count.
 - Repeat the activity daily during calendar or morning activities.
- Additional Activities: Use a similar chart for counting the number of students present or absent, choosing between two snack options, choosing centers, voting on choices offered in the classroom etc. As an at home activity, have students count the number of people in the home to determine the number of place settings needed for dinner. Encourage parents to let the students set the table using the correct number of plates, napkins, and utensils. This place setting can be done in the classroom for snack time as well.

Lesson 20B

Objectives: PK.12 Collect data by counting

Materials:

Colored Blocks (two colors)

Brown Paper Bag

Lesson Preparation: Collect blocks in two colors, red and blue for example. There should be one block per student for the first portion of the lesson with additional blocks available for the last portion of the lesson. Place the blocks inside a brown paper bag. Any container will work as long as it is not transparent. The goal is for the students to not be able to see the colors of the blocks inside.

Overview: In this lesson, students will participate in gathering data by counting. Students will actively participate in a block counting activity.

Lesson Directions:

- Seat students in a circle on the carpet.
- Explain that in today's lesson, the students will continue to practice collecting information and counting.
- Show the paper bag. Explain that inside the bag are red blocks and blue blocks.

- Today's goal is to collect information that tells us how many blue blocks are inside the bag and how many red blocks are inside the bag.
- Ask for student suggestions on how to find this information. Acknowledge all answers. Prompt as necessary until a student suggests counting.
- Explain to the students that we want to know both how many red blocks there are and how many blue blocks there are. To help us do this, each student will, without looking inside the bag, pull out a block. We will create two rows of blocks on the carpet, a red row and a blue row.
- Allow time for questions.
- Call students one at a time to pull a block from the bag. Have students name the color each time a block is pulled. Assist as each student places the block in a row on the carpet. Make sure the rows are parallel to one another so an accurate visual image is created as well. This will be important in upcoming lessons.
- Once each student has pulled a block and placed it in the correct row, say, "All the blocks are now on the carpet. What should we do to decide how many red blocks we pulled out of the bag?" (Count) "What should we do to decide how many blue blocks we pulled out of the bag?" (Count)
- Have students count chorally while the teacher points to each block in the red row and then in the blue row.
- Review by stating, "We used rows of blocks to help us gather information about the number of each color we pulled from the bag. Counting the blocks is a good way to determine how many red blocks and how many blue blocks were in the bag."
- Allow time for additional questions or comments.

- Place all blocks back inside the bag. Add a few extra blocks of each color.
 - Ask students to make predictions about the number of blocks in each color. Do they think the numbers will be the same as before? Will the numbers be equal, or will there be more of one than the other?
 - Repeat the activity to confirm predictions.
 - Allow time for questions and review.
 - Allow free time with the blocks if possible.
- Additional Activities: Use a similar activity with colored counting bears or pattern blocks.

Lesson 21A

Objectives: PK.12, PK.13 Collect data by counting and graph results

Materials:

Graphing Grid (see Appendix F)

Index Cards

Lesson Preparation: Create a graphing grid on a large sheet of paper or a vinyl tablecloth. The graph should have at least four columns. This grid will be used for the next few lessons, so it would be advisable to make the grid on something like a tablecloth for durability. Prepare index card headers for shoe types such as boots, sneakers, sandals, slip-on and Velcro, buckle, tie, slip-on.

Overview: In this lesson, students will participate in gathering data by counting. Students will create simple graphs to display information in columns and/or rows.

Lesson Directions:

- Seat students in a circle on the carpet.
- Explain that in today's lesson, the students will continue to practice collecting information and counting. The information will be displayed on a graph. Have students echo, "Graph."

- Ask a volunteer student to explain why we use graphs. (They help us create a picture and make a prediction about information without counting.)
- Tell students, “Today’s goal is to use the graph to learn things about the shoes we are wearing.”
- Explain that the first graph will tell us about what type of shoes we are wearing. They might be boots, sneakers, sandals, or slip-on shoes. Show the header cards for these and place them at the top of the columns.
- Hold up one of the teacher’s shoes and say, “I am wearing a (type) shoe. I will put my shoe in that column.” Place the shoe in that column.
- Allow time for questions.
- Allow each student to take off one shoe and place it in the appropriate column on the graph. Assist with choosing the correct column as needed. Remind students that arranging the shoes in straight rows helps us use the graph and count easily.
- Once each student has placed his/her shoe on the graph ask, “Which type of shoes do most of us have?” “Which type of shoes is the least amount?” “How do we know this?” (By looking at the height of the columns.) “What should we do to decide how many shoes of each kind we have?” (Count)
- Have students count chorally while the teacher points to each shoe in each column. Verify the previous predictions while counting.
- Allow time questions or comments.
- Return all shoes to the students.
- Place new headings on the graph and tell students that we will now use the graph to learn about how our shoes fasten. Create columns for Velcro, buckle, tie, and slip-on. Repeat

the same procedure for placing shoes in the appropriate columns beginning with the teacher. Once all shoes are on the graph, ask students look at the graph and make predictions. Count each column to verify predictions.

- Return all shoes to the students.
- Allow time for questions.
- Close the lesson by reviewing, “Graphs are used to organize information. We can look at a graph and make predictions. Without counting, we can use the graph to see which column will be the most, the least, and which if any are equal.”

➤ **Additional Activities:** Use the graphing grid to graph clothing colors. Use the graphing grid to graph ways of coming to school like walk, bus, car, bike, etc. The same activity can be used to increase cultural awareness by graphing skin color in multi-ethnic classrooms. As an at home activity, have students graph the number of boys/girls in the home by drawing small portraits and gluing them in columns on a sheet of construction paper that has been folded in half vertically, one side for boys and one side for girls.

Lesson 21B

Objectives: PK.12, PK.13 Collect data by counting and graph results

Materials:

Graphing Grid

4"x4" Squares of Paper

Crayons or Markers

Index Cards

Lesson Preparation: Use the graphing grid from Lesson 21A for this activity. Cut 4"x4" squares of white or light colored paper for students to use to draw self-portraits. Have students draw self-portraits before beginning the lesson. The teacher will need a self-portrait as well for demonstrations. Be sure each student draws an accurate likeness with correct eye color and hair color, as these are things that will be graphed. Create index cards to use as headers for boy/girl (pictures will work fine), hair colors (black, brown, blonde, red), and eye colors (blue, green, brown). Use colored markers for these.

Overview: In this lesson, students will participate in gathering data by counting. Students will create simple graphs to display information in columns and/or rows.

Lesson Directions:

- Seat students in a circle on the carpet.

- Explain that in today’s lesson, the students will continue to practice collecting information and counting. The information will be displayed on a graph. Have students echo, “Graph.”
- Show the graph grid. Explain that a graph is used to organize information so that we can look at it and understand it more easily.
- Tell students, “Today’s goal is to use the graph to learn things about the students in our class. We will use our self-portraits for this activity.”
- Distribute the self-portraits to the students and ask them to wait for further instructions.
- Explain that the first graph will tell us how many boys are in the class and how many girls are in the class. Show the header cards for these and place them at the top of two columns.
- Hold up the teacher’s self-portrait and say, “I am a (boy/girl). My drawing goes in the (boy/girl) column.” Follow by placing drawing in the correct column.
- Allow time for questions.
- Allow each student to place his/her drawing in the appropriate column. Remind students that arranging the drawings in straight rows helps us use the graph and count easily.
- Once each student has place his/her drawing on the graph ask, “What should we do to decide how many boys are in the class?” (Count) “What should we do to decide how many girls are in the class?” (Count)
- Have students count chorally as the teacher points to each drawing in the “Boy” column and each drawing in the “Girl” column. Ask, “Are there more boys or more girls in the class?”

- Direct the students to now look at the two columns on the graph. Ask, “Is one column taller than the other?” If so, “This tells us that there are more boy/girl students. We can simply look at the graph to tell which group has more members because that column is taller. We can know this before we even count.” If not, then “The number of boys and girls must be equal because the columns are the same height.”
- Allow time questions or comments.
- Remove and return all drawings to the students.
- Place new headings on the graph and tell students that we will now use the graph to learn about the hair color of students in our class. Create columns for black, brown, red, and blonde hair colors. Repeat the same procedure for placing drawings in the appropriate columns beginning with the teacher. Once all drawings are on the graph, ask students look at the graph and make predictions. Which hair color appears most, least, and are any colors equal? Count each column to verify predictions.
- Repeat the procedure for eye color.
- Allow time for questions.
- Close the lesson by reviewing, “Graphs are used to organize information. We can look at a graph and make predictions. Without counting, we can use the graph to see which column will have the most, the least, and which if any are equal.”

Additional Activities: Use the graphing grid to graph clothing colors. Use the graphing grid to graph ways of coming to school like walk, bus, car, bike, etc. The same activity can be used to increase cultural awareness by graphing skin color in multi-ethnic classrooms. As an at home activity, have students graph the number of boys/girls in the home by drawing small portraits and

gluing them in columns on a sheet of construction paper that has been folded in half vertically, one side for boys and one side for girls.

Lesson 22A

Objectives: PK.12, PK.13 Collect data by counting and graph results

Materials:

Graphing Grid

Index Cards

Construction Paper (brown, white, pink, orange)

Lesson Preparation: Cut out three ice cream cone shapes from orange construction paper. Cut shapes resembling scoops of ice cream from the brown, white, and pink construction paper.

Write the headings “chocolate,” “vanilla,” and “strawberry” on three index cards. Use crayons or markers in the matching colors brown, yellow, and pink to write the headings.

Overview: In this lesson, students will participate in gathering data by counting. Students will create a simple graph to display information in columns and/or rows.

Lesson Directions:

- Seat students in a circle on the carpet.
- Explain that in today’s lesson, the students will continue to practice collecting data and counting. Have students echo, “Data.” Explain that data is another word for information we collect to make our graph. The data will be displayed on a graph. Have students echo, “Graph.”

- Ask a volunteer student to explain why we use graphs. (They help us create a picture and make predictions about information without counting.)
- Tell students, “Today’s goal is to use a graph to learn what flavor of ice cream most students in our class like best.”
- Place the graphing grid on the floor in the center of the student circle. Show and read the heading cards for chocolate, vanilla, and strawberry. Remind students that there are many other flavors of ice cream, but for our graph we will only use these three. Each student should be deciding which of the three flavors he/she likes best. Place the headings at the top of three columns.
- Place an ice cream cone shape at the bottom of each column.
- Show students the ice cream cone scoops. Tell them, “The brown will be for chocolate. The white will be for vanilla. The pink will be for strawberry. Each student will place a scoop of ice cream on the graphing cones. Each student’s scoop will be in the color of his/her favorite flavor.”
- Allow time for questions.
- Ask each student to name his/her favorite ice cream flavor and distribute ice cream scoops accordingly.
- Instruct students to look around the circle at the scoops. Ask, “Is it easy to tell which flavor is the favorite?” The answer may be yes or it may be no, but remind students that by putting all the scoops onto our graph we will have a better way to look at the data.
- Call the students one at a time to begin assembling the cones. The teacher should demonstrate by placing his/her favorite flavor scoop on top of the correct cone first.

Make sure the ice cream scoops are stacked directly on top of one another, toward the top of the grid, to make visual comparisons easier when the graph is complete.

- After all ice cream scoops have been placed onto the graphing cones, ask students to observe the graph. Ask, “Which flavor do most students in our class like?” “Which flavor does the fewest number of students in our class like?” “Are any of the flavors equal?” “How do we know these things?” (By looking at the height of the cones.) “How can we use our graph to check our predictions?” (Count the scoops on each cone.)
 - Have the students count chorally as the teacher points to each scoop in each column. Review predictions and make corrections if necessary based upon the counts.
 - Allow time for questions.
 - Close the lesson by reviewing, “Graphs are used to organize information or data. We can look at a graph and made predictions. Without counting, we can use the graph to see which column will be the most, the least, and which if any are equal. We can use the information collected on the graph to check our predictions by counting.”
- **Additional Activities:** Use the same activity with other foods such as types of pizza, flavors of potato chips, or flavors of juices.

Lesson 22B

Objectives: PK.12, PK.13 Collect data by counting and graph results

Materials:

Graphing Grid on Poster Board

Weather Cutouts

Lesson Preparation: Prepare a horizontal graphing grid on a poster board. Create three horizontal rows for graphing weather. The weather will be recorded on the graph for two weeks. Prepare row headers on index cards for sunshine, clouds, and rain to use on the graph. It is helpful for pre-readers to use words and symbols on the headers. Prepare cutout symbols, a sun, a cloud, and a raindrop or umbrella, for each category as well. Be sure to prepare enough symbols for two weeks. Place the graphing grid on a classroom bulletin board.

Overview: In this lesson, students will participate in gathering data by counting. Students will create a simple graph to display information in columns and/or rows.

Lesson Directions:

- Seat students in a circle on the carpet.
- Explain that in today's lesson, the students will continue to practice collecting data and counting. Have students echo, "Data." Explain that data is another word for information

we collect to make our graph. The data will be displayed on a graph. Have students echo, “Graph.”

- Ask a volunteer student to explain why we use graphs. (They help us create a picture and make predictions about information without counting.)
- Tell students, “Today’s goal is to use a graph to watch our weather patterns. We will record the weather each day for two weeks. When we complete the graph, we will observe and count the weather symbols to decide if we have had more sunny days, cloudy days, or rainy days.”
- Show students the graphing grid on the bulletin board. Point out that this is the same type of graph we have been using. The only difference is that we will graph our data horizontally, or side-to-side, in rows instead of up and down columns.
- Show students the headers for sunshine, clouds, and rain. Show the headers one at a time and ask students to predict what each header says.
- Place each header on the graph at the beginning of a row.
- Allow time for questions.
- Ask a volunteer student to look out a classroom window and describe today’s weather.
- Have the class decide collectively which symbol needs to go on the graph for today. Place that symbol on the graph in the appropriate row.
- Remind students that this graph will take two weeks to complete. Each day a new symbol will be added to the graph.
- As part of the graphing activity each day, the teacher should review the graph data to that point by asking, “Which weather symbol do we have the most of so far?” “Which weather symbol do we have the least of so far?”

- Allow time for questions.
 - When the graph is completed in two weeks, ask students to observe the graph and make predictions. “Which row has the most symbols?” “Which row has the fewest or least symbols?” “Are any of the rows equal?” “How do we know this?” (By looking at the length of the rows.) “How can we use our graph to check our predictions?” (Count the weather symbols in each row.)
 - Have the students count chorally as the teacher points to each symbol in each row. Review predictions and make corrections if necessary based upon the counts.
 - Allow time for questions.
 - Close the lesson by reviewing, “Graphs are used to organize information or data. We can look at a graph and made predictions. Without counting, we can use the graph to see which row will be the most, the least, and which if any are equal. We can use the information collected on the graph to check our predictions by counting.”
- Additional Activities: Use the same activity with other topics such as the color of car parents own, favorite sport, or favorite color.

Lesson 23A

Objectives: PK.6 Recognize and describe characteristics of a penny

Materials:

Pennies

Paper

Brown Crayons

Lesson Preparation: Gather a collection of pennies, at least one per student. Try to find pennies with a good, raised surface. If pennies are worn and smooth, they do not create good rubbings. Cut 4”x4” squares of white or manila colored paper. Use a thin paper and not construction paper. Gather brown crayons, one per student.

Overview: In today’s lesson, students will observe and describe a penny. Students will understand a penny’s worth is one cent. Students will create coin rubbings using a penny and a brown crayon.

Lesson Directions:

- Seat students at tables for this activity.
- Explain that in today’s lesson, we will begin learning about coins or money.
- Show the penny. Ask students to name this coin. Prompt as necessary to obtain the answer “penny.”

- Ask, “What color is the penny?” (Brown will probably be the most common answer. Acknowledge others such as gold or orange. Explain that as pennies get older and have been used more they turn brown.)
- Ask, “What shape is the penny?” (Round or circle)
- Ask, “How do we use pennies?” (To buy things. Explain that pennies are a type of money. We use money to buy things we need like food or clothes and things we want like toys and games.)
- Distribute pennies one per student. Remind students that money can be very dirty and should never be put into our mouths. It can also cause us to choke. Students should hold the pennies in their hands and look at the pennies.
- Ask, “What else can you tell me about the penny now that you have your own to observe?” (It has a man on it-Abraham Lincoln. It has a building on it- The Lincoln Memorial. It has words on it. It has numbers on it. There may be other answers as well.)
- Inform students that money has value or worth. “When we go to the store to buy things, there is usually a tag or sign that tells us how much those things cost. This also lets us know how much money we need to buy those things.”
- Ask, “Does anyone know how much a penny is worth? What is a penny’s value?” (One cent) “That means if I wanted to buy a piece of candy that costs one cent, I would need one penny.”
- Allow time for questions.
- Tell students, “Today we will be making coin rubbings of the penny. We will put a penny on the table, cover it with a piece of paper, and rub over it with a brown crayon since

pennies are a brown color. We might have to try a couple of times to get a good picture, but our rubbings should show the same pictures that are on a real penny.”

- Demonstrate making a coin rubbing. Make sure students understand that they need to hold the penny still while rubbing over top with the crayon to prevent the penny from sliding. Demonstrate by placing a finger on each side of the penny. Make rubbings of both sides of the penny and show the different pictures.
 - Allow time for questions.
 - Distribute paper and crayons to the students. Assist as necessary with doing coin rubbings of both sides of the penny.
 - Label each student’s drawing with the word “Penny.” Post the word on the chalkboard and allow students to do this if possible. The rubbings can be collected and saved to make a coin-rubbing book, since the same lesson will be completed with the nickel, dime, and quarter in upcoming lessons.
 - Close the lesson with review. Ask, “What is the name of this coin?” (Penny) “What color is a penny?” (Brown) “What shape is a penny?” (Circle) “What is a penny’s value or worth?” (One cent)
- Additional Activities: Place a collection of pennies in the math center with play dough. Students can press the pennies into the play dough to make impressions of the penny. Repeat the coin rubbing activity as a President’s Day activity.

Lesson 23B

Objectives: PK.6 Recognize and describe characteristics of a penny

Materials:

Pennies

Small Items for Shopping

Index Cards or Price Tags

Lesson Preparation: Gather a collection of pennies, ten per student. Set up a small store for shopping with items such as pencils, erasers, small toys, stickers, and candy. These need to be inexpensive items, as students will be allowed to keep them. Prepare index cards or price tags for each item with a price of 10 cents or less.

Overview: In today's lesson, students will observe and describe a penny. Students will understand a penny's worth is one cent. Students will use pennies to purchase goods.

Lesson Directions:

- Seat students in a circle on the carpet.
- Explain that in today's lesson, we will continue learning about the penny. Ask students to echo, "Penny."
- Show the penny. Ask students to describe the penny.
- Ask, "What color is the penny?"

- Ask, “What shape is the penny?”
- Ask, “How do we use pennies?” (To buy things.)
- Ask, “What is a penny’s value or worth?”
- Explain that in today’s activity, we will be shopping with pennies. Each student will be given ten pennies with which to shop. Since each penny is worth one cent, each student will have ten cents to spend.
- Show the items in the school store. Explain that just like in a real store, each item has a different cost. The price tags tell how much an item costs. To buy an item, the student must have that many pennies.
- Demonstrate buying an item from the store by counting out the number of pennies to match the price tag. If possible, purchase a second item in the same manner. Once all pennies have been spent or there are not enough pennies remaining to purchase another item, the teacher’s or the student’s turn to shop is finished. Explain that the students will be allowed to keep the items purchased.
- Allow time for questions.
- Distribute pennies ten per student. Remind students that money can be very dirty and should never be put into our mouths. It can also cause us to choke. Students should hold the pennies in their hands and look at the pennies.
- When each student has ten pennies, ask them to arrange the pennies in a straight row for counting. Demonstrate counting pennies 1-2-3-4-5-6-7-8-9-10 or ten cents.
- Have each student count his/her pennies and state, “Ten cents.”

- Call students one or two at a time to shop in the classroom store until all pennies have been spent or until no further purchases can be made. Assist as necessary as students count the correct number of pennies to purchase each item.
 - Close the lesson with review. Ask, “What is the name of this coin?” (Penny) “What color is a penny?” (Brown) “What shape is a penny?” (Circle) “What is a penny’s value or worth?” (One cent)
- Additional Activities: Set up a small grocery store in the math center with play foods and money. Students can take turns as grocer and shopper in the store. Be sure to label each item with price tags and use pennies for money.

Lesson 24A

Objectives: PK.6 Recognize and describe characteristics of a nickel

Materials:

Nickels

Five Pennies

Paper

Silver/Gray Crayons

Lesson Preparation: Gather a collection of nickels, at least one per student. Try to find nickels with a good, raised surface. If nickels are worn and smooth, they do not create good rubbings. Cut 4"x4" squares of white or manila colored paper. Use a thin paper and not construction paper. Gather silver/gray crayons, one per student.

Overview: In today's lesson, students will observe and describe a nickel. Students will understand a nickel's worth is five cents. Students will create coin rubbings using a nickel and a silver/gray crayon.

Lesson Directions:

- Seat students at tables for this activity.
- Explain that in today's lesson, we will continue learning about coins or money.

- Review the penny. Show the penny. Ask, “What is this coin’s name? What color is the penny? What shape is the penny? What is the penny’s value or worth?”
- Show the nickel. Ask students to name this coin. Prompt as necessary to obtain the answer “nickel.”
- Ask, “What color is the nickel?” (Silver or gray.)
- Ask, “What shape is the nickel?” (Round or circle)
- Ask, “How do we use nickels?” (To buy things. Explain that nickels, like pennies, are a type of money. We use money to buy things we need like food or clothes and things we want like toys and games.)
- Show both the penny and the nickel. Ask, “Which coin is bigger, the nickel or the penny?”
- Distribute nickels one per student. Remind students that money can be very dirty and should never be put into our mouths. It can also cause us to choke. Students should hold the nickels in their hands and look at the nickels.
- Ask, “What else can you tell me about the nickel now that you have your own to observe?” (It has a man on it-Thomas Jefferson. It has a building on it- Monticello. It has words on it. It has numbers on it. There may be other answers as well. Please note that newly minted coins may have varying pictures.)
- Remind students that money has value or worth. “When we go to the store to buy things, there is usually a tag or sign that tells us how much those things cost. This also lets us know how much money we need to buy those things.”
- Ask, “Does anyone know how much a nickel is worth? What is a nickel’s value?” (Five cents) “That means if I wanted to buy a piece of candy that costs five cents, I would need

one nickel. What else could I use to purchase a piece of candy that costs five cents if I did not have a nickel?" (Five pennies) Explain that since a penny is only worth one cent, it would take five pennies to equal one nickel. Demonstrate this by placing five pennies in a row beside one nickel. Count the five pennies, pointing to each one, "1-2-3-4-5 cents" and then point to the nickel and say "five cents." "These are equal amounts of money."

- Allow time for questions.
- Tell students, "Today we will be making coin rubbings of the nickel just like we did with the penny. We will put a nickel on the table, cover it with a piece of paper, and rub over it with a silver/gray crayon since nickels are a silver/gray color. We might have to try a couple of times to get a good picture, but our rubbings should show the same pictures that are on a real nickel."
- Demonstrate making a coin rubbing. Remind students that they need to hold the nickel still while rubbing over top with the crayon to prevent the nickel from sliding. Demonstrate by placing a finger on each side of the nickel. Make rubbings of both sides of the nickel and show the different pictures.
- Allow time for questions.
- Distribute paper and crayons to the students. Assist as necessary with doing coin rubbings of both sides of the nickel.
- Label each student's drawing with the word "Nickel." Post the word on the chalkboard and allow students to do this if possible. The rubbings can be collected and saved to make a coin-rubbing book, since the same lesson will be completed with the dime and quarter in upcoming lessons.

- Close the lesson with review. Ask, “What is the name of this coin?” (Nickel) “What color is a nickel?” (Silver/Gray) “What shape is a nickel?” (Circle) “What is a nickel’s value or worth?” (Five cents) “Which coin is bigger in size, the nickel or the penny?” (The nickel)
- Additional Activities: Place a collection of pennies and nickels in the math center with play dough. Students can press the coins into the play dough to make impressions and compare the two coins. Repeat the coin rubbing activity as a President’s Day activity.

Lesson 24B

Objectives: PK.6 Recognize and describe characteristics of a penny and nickel

Materials:

Nickels

Pennies

Small Items for Shopping

Index Cards or Price Tags

Lesson Preparation: Gather a collection of pennies (five per student) and nickels (one per student). Set up a small store for shopping with items such as pencils, erasers, small toys, stickers, and candy. These need to be inexpensive items, as students will be allowed to keep them. Prepare index cards or price tags for each item with a price of 5 cents or less.

Overview: In today's lesson, students will observe and describe a penny and a nickel. Students will understand a penny's worth is one cent, and a nickel's worth is five cents. Students will use pennies and nickels to purchase goods.

Lesson Directions:

- Seat students in a circle on the carpet.
- Explain that in today's lesson, we will continue learning about the penny and the nickel.

Ask students to echo, "Penny." Ask students to echo, "Nickel."

- Show the penny. Ask students to describe the penny.
- Ask, “What color is the penny?”
- Ask, “What shape is the penny?”
- Ask, “How do we use pennies?” (To buy things.)
- Ask, “What is a penny’s value or worth?”
- Show the nickel. Ask students to describe the nickel.
- Ask, “What color is the nickel?”
- Ask, “What shape is the nickel?”
- Ask, “How do we use nickels?”
- Ask, “What is a nickel’s value or worth?”
- Explain that in today’s activity, we will be shopping with pennies and nickels. Each student will be given five pennies and one nickel with which to shop. Since each penny is worth one cent, each student will have five cents in pennies to spend. Since each nickel is worth five cents, each student will have an additional five cents in nickels to spend.
- Show the items in the school store. Explain that just like in a real store, each item has a different cost. The price tags tell how much an item costs. To buy an item, the student must have that much money in pennies or nickels.
- Demonstrate how to read the price tag by reading the number and the cent symbol; for example, “five cents.” Ask students to chorally read each price tag as the teacher points to them.
- Demonstrate buying an item from the store by counting out the number of pennies to match the price tag or by using the nickel if the cost is actually five cents. If possible, purchase a second item in the same manner. Once all money has been spent or there is

not enough money remaining to purchase another item, the teacher's or the student's turn to shop is finished. Explain that the students will be allowed to keep the items purchased.

- Allow time for questions.
 - Distribute pennies five per student and nickels one per student. Remind students that money can be very dirty and should never be put into our mouths. It can also cause us to choke. Students should hold the coins in their hands.
 - When students have all the necessary coins, ask them to arrange the coins in a straight row for counting. Demonstrate counting pennies 1-2-3-4-5 or five cents. Demonstrate counting the nickel, five cents.
 - Have each student count his/her coins.
 - Call students one or two at a time to shop in the classroom store until all coins have been spent or until no further purchases can be made. Assist as necessary as students count the correct coins to purchase each item.
 - Close the lesson with review. Show the penny. Ask, "What is the name of this coin?" "What color is a penny?" "What shape is a penny?" "What is a penny's value or worth?"
 - Show the nickel. Ask, "What is the name of this coin?" "What color is the nickel?" "What shape is the nickel?" "What is the nickel's value?" "Which coin is bigger in size, the penny or the nickel?"
- **Additional Activities:** Set up a small grocery store in the math center with play foods and money. Students can take turns as grocer and shopper in the store. Be sure to label each item with price tags and use pennies and nickels for money. Set up a bank with pennies and nickels where students can trade in pennies for nickels or vice versa.

Lesson 25A

Objectives: PK.6 Recognize and describe characteristics of a dime

Materials:

Dimes

Nickel

Penny

Paper

Silver/Gray Crayons

Lesson Preparation: Gather a collection of dimes, at least one per student. Try to find dimes with a good, raised surface. If dimes are worn and smooth, they do not create good rubbings. Cut 4"x4" squares of white or manila colored paper. Use a thin paper and not construction paper. Gather silver/gray crayons, one per student.

Overview: In today's lesson, students will observe and describe a dime. Students will understand a dime's worth is ten cents. Students will create coin rubbings using a dime and a silver/gray crayon.

Lesson Directions:

- Seat students at tables for this activity.
- Explain that in today's lesson, we will continue learning about coins or money.

- Review the penny and the nickel. Show the penny/nickel. Ask, “What is this coin’s name? What color is the penny/nickel? What shape is the penny/nickel? What is the penny’s/nickel’s value or worth?”
- Show the dime. Ask students to name this coin. Prompt as necessary to obtain the answer “dime.”
- Ask, “What color is the dime?” (Silver or gray.)
- Ask, “What shape is the dime?” (Round or circle)
- Ask, “How do we use dimes?” (To buy things. Explain that dimes, like pennies and nickels, are a type of money. We use money to buy things we need like food or clothes and things we want like toys and games.)
- Show all three coins. Ask, “Which coin is biggest?” (The nickel) “Which coin is smallest?” (The dime) “The penny and the dime are almost the same size, but what is different about the two?” (The penny is brown and the dime is silver. The penny has a smooth edge and the dime has a rough or ridged edge. They have different pictures. There may be additional answers. Acknowledge all correct answers.)
- Distribute dimes one per student. Remind students that money can be very dirty and should never be put into our mouths. It can also cause us to choke. Students should hold the dimes in their hands and look at them and feel the edge.
- Ask, “What else can you tell me about the dime now that you have your own to observe?” (It has a man on it-Franklin Roosevelt. It has a torch and some plants on it. It has words on it. It has numbers on it. There may be other answers as well.)
- Remind students that money has value or worth.

- Ask, “Does anyone know how much a dime is worth? What is a dime’s value?” (Ten cents) “That means if I wanted to buy a piece of candy that costs ten cents, I would need one dime. What else could I use to purchase a piece of candy that costs ten cents if I did not have a dime?” (Ten pennies. A student might suggest two nickels. Acknowledge that as a correct answer, but explain that we will use pennies for this lesson.) Explain that since a penny is only worth one cent, it would take ten pennies to equal one dime. Demonstrate this by placing ten pennies in a row beside one dime. Count the ten pennies, pointing to each one, “1-2-3-4-5-6-7-8-9-10 cents” and then point to the dime and say “ten cents.” “These are equal amounts of money.”
- Allow time for questions.
- Tell students, “Today we will be making coin rubbings of the dime just like we did with the penny and the nickel. We will put a dime on the table, cover it with a piece of paper, and rub over it with a silver/gray crayon since dimes are a silver/gray color. We might have to try a couple of times to get a good picture, but our rubbings should show the same pictures that are on a real dime.”
- Demonstrate making a coin rubbing. Remind students that they need to hold the dime still while rubbing over top with the crayon to prevent the dime from sliding. Demonstrate by placing a finger on each side of the dime. Make rubbings of both sides of the dime and show the different pictures.
- Allow time for questions.
- Distribute paper and crayons to the students. Assist as necessary with doing coin rubbings of both sides of the dime.

- Label each student’s drawing with the word “Dime.” Post the word on the chalkboard and allow students to do this if possible. The rubbings can be collected and saved to make a coin-rubbing book, since the same lesson will be completed with the quarter in an upcoming lesson.
- Close the lesson with review. Ask, “What is the name of this coin?” (Dime) “What color is a dime?” (Silver/Gray) “What shape is a dime?” (Circle) “What is a dime’s value or worth?” (Ten cents) “Which coin is bigger in size, the nickel or the dime?” (The nickel) “Which coin is about the same size as a dime?” (The penny) “The dime is only slightly smaller.”
- Additional Activities: Place a collection of pennies, nickels, and dimes in the math center with play dough. Students can press the coins into the play dough to make impressions and compare the coins. Encourage students to roll the edges of the coins in the play dough and observe the designs made by each. Repeat the coin rubbing activity as a President’s Day activity.

Lesson 25B

Objectives: PK.6 Recognize and describe characteristics of a penny and dime

Materials:

Dimes

Pennies

Small Items for Shopping

Index Cards or Price Tags

Play Dough

Lesson Preparation: Gather a collection of pennies (ten per student) and dimes (one per student).

Set up a small store for shopping with items such as pencils, erasers, small toys, stickers, and candy. These need to be inexpensive items, as students will be allowed to keep them. Prepare index cards or price tags for each item with a price of 10 cents or less. There should be a few items that cost exactly 10 cents for purchase with the dime. Other items can vary to allow for counting pennies. A small amount of play dough or modeling clay will be used to demonstrate the pattern made by rolling the edges of the coins.

Overview: In today's lesson, students will observe and describe a penny and a dime noting the differences between the two. Students will understand a penny's worth is one cent, and a dime's worth is ten cents. Students will use pennies and dimes to purchase goods.

Lesson Directions:

- Seat students in a circle on the carpet.
- Explain that in today's lesson, we will continue learning about the penny and the dime.
Ask students to echo, "Penny." Ask students to echo, "Dime."
- Show the penny. Ask students to describe the penny.
- Ask, "What color is the penny?"
- Ask, "What shape is the penny?"
- Ask, "How do we use pennies?"
- Ask, "What is a penny's value or worth?"
- Show the dime. Ask students to describe the dime.
- Ask, "What color is the dime?"
- Ask, "What shape is the dime?"
- Ask, "How do we use dimes?"
- Ask, "What is a dime's value or worth?"
- Show a penny and a dime. Ask, "How are a penny and a dime different?" (Color, value, pictures, size) "Note that the coins are almost the same size. We can see that they are different colors and have different pictures on them. However, if we could not see them, for instance if we had our eyes closed, it would be tricky to know which coin we were holding because they are so close in size. There is a way to tell the two apart."
- Have a student volunteer close his/her eyes. Place a penny in one hand and a dime in the other. Tell the student to feel the two coins and try to guess in which hand he/she is holding the dime. After he/she guesses, repeat the procedure with a second student.

- Ask, “Does anyone have an idea of how we would know if we were holding a penny or a dime if we had our eyes closed?” Allow for guesses. Show the edges of the coins.
Explain that the penny has a smooth edge and the dime has a ridged or bumpy edge.
Allow each student to feel the edges of the coins. Roll the coins in play dough to show the patterns made by each.
- Explain that in today’s activity, we will be shopping with pennies and dimes. Each student will be given ten pennies and one dime with which to shop. Since each penny is worth one cent, each student will have ten cents in pennies to spend. Since each dime is worth ten cents, each student will have an additional ten cents in dimes to spend.
- Show the items in the school store. Explain that just as in previous lessons, each item has a different cost. The price tags tell how much an item costs. To buy an item, the student must have that much money in pennies or dimes.
- Demonstrate how to read the price tag by reading the number and the cent symbol; for example, “ten cents.” Ask students to chorally read each price tag as the teacher points to them.
- Demonstrate buying an item from the store by counting out the number of pennies to match the price tag or by using the dime if the cost is actually ten cents. If possible, purchase a second item in the same manner. Once all money has been spent or there is not enough money remaining to purchase another item, the teacher’s or the student’s turn to shop is finished. Explain that the students will be allowed to keep the items purchased.
- Allow time for questions.

- Distribute pennies ten per student and dimes one per student. Remind students that money can be very dirty and should never be put into our mouths. It can also cause us to choke. Students should hold the coins in their hands.
 - When students have all the necessary coins, ask them to arrange the coins in a straight row for counting. Demonstrate counting pennies 1-2-3-4-5-6-7-8-9-10 or ten cents. Demonstrate counting the dime, ten cents.
 - Have each student count his/her coins.
 - Call students one or two at a time to shop in the classroom store until all coins have been spent or until no further purchases can be made. Assist as necessary as students count the correct coins to purchase each item.
 - Close the lesson with review. Show the penny. Ask, “What is the name of this coin?” “What color is a penny?” “What shape is a penny?” “What is a penny’s value or worth?”
 - Show the dime. Ask, “What is the name of this coin?” “What color is the dime?” “What shape is the dime?” “What is the dime’s value?” “The penny and the dime are almost the same size. If I close my eyes what would give me a clue to whether I am holding a penny or a dime?” (The ridges on the edge.) “How are the penny and the dime different?” (The value, the color, the pictures, the penny has a smooth edge and the dime has a ridged edge.)
- Additional Activities: Set up a small grocery store in the math center with play foods and money. Students can take turns as grocer and shopper in the store. Be sure to label each item with price tags and use pennies, nickels, and dimes for money. Set up a bank with

pennies, nickels, and dimes where students can trade in pennies for nickels and dimes or vice versa.

Lesson 26A

Objectives: PK.6 Recognize and describe characteristics of a quarter

Materials:

Quarters

Paper

Silver/Gray Crayons

Lesson Preparation: Gather a collection of quarters, at least one per student. Try to find quarters with a good, raised surface. If quarters are worn and smooth, they do not create good rubbings.

Cut 4”x4” squares of white or manila colored paper. Use a thin paper and not construction paper.

Gather silver/gray crayons, one per student.

Overview: In today’s lesson, students will observe and describe a quarter. Students will understand a quarter’s worth is twenty-five cents. Students will create coin rubbings using a quarter and a silver/gray crayon.

Lesson Directions:

- Seat students at tables for this activity.
- Explain that in today’s lesson, we will continue learning about coins or money.

- Review the penny/nickel/dime one coin at a time. Show the penny/nickel/dime. Ask, “What is this coin’s name? What color is the penny/nickel/dime? What shape is the penny/nickel/dime? What is the penny’s/nickel’s/dime’s value or worth?”
- Ask, “How do we use pennies/nickels/dimes?” (To buy things. Explain that all three coins are types of money. We use money to buy things we need and things we want.)
- Show the penny, nickel, and dime beside each other. Ask, “Which coin is biggest?”
“Which coin is smallest?”
- Show and name the quarter. Have students echo, “quarter.” Explain that a quarter is another type of coin money.
- Ask, “What color is the quarter?” (Silver/Gray)
- Ask, “What shape is the quarter?” (Circle)
- Distribute quarters, one per student. Remind students that money can be very dirty and should never be put into our mouths. It can also cause us to choke. Students should hold the quarters in their hands and look at the quarters.
- Ask, “What else can you tell me about the quarter now that you have your own to observe?” (It has a man on it-George Washington. It has words on it. It has numbers on it. There may be other answers as well. Have students note that the back of the quarter can have many different pictures; they are not all the same. Allow time for a few students to describe the back of his/her quarter.)
- Remind students that money has value or worth. “When we go to the store to buy things, there is usually a tag or sign that tells us how much those things cost. This also lets us know how much money we need to buy those things.”

- Ask, “What value, in cents, does a quarter have?” Allow time for student guesses. If the correct answer is not given, explain that a quarter’s value is “twenty-five cents.”
- Show the quarter’s value compared to the other coins by placing side-by-side twenty-five pennies, five nickels, and two dimes and one nickel in distinct groups. Explain that each group of coins is twenty-five cents. That is equal value to one quarter. Place the quarter beside the other groups of money. “That means if I wanted to buy a piece of candy that costs twenty-five cents, I would need one quarter or either of these other groups of coins, because these groups contain equal amounts of money.”
- Allow time for questions.
- Tell students, “Today we will be making coin rubbings of the quarter just like we did with the penny, the nickel, and the dime. We will put a quarter on the table, cover it with a piece of paper, and rub over it with a silver/gray crayon since quarters are a silver/gray color. We might have to try a couple of times to get a good picture, but our rubbings should show the same pictures that are on a real quarter.”
- Demonstrate making a coin rubbing. Remind students that they need to hold the quarter still while rubbing over top with the crayon to prevent the quarter from sliding. Demonstrate by placing a finger on each side of the quarter. Make rubbings of both sides of the quarter and show the different pictures.
- Allow time for questions.
- Distribute paper and crayons to the students. Assist as necessary with doing coin rubbings of both sides of the quarter.

- Label each student’s drawing with the word “Quarter.” Post the word on the chalkboard and allow students to do this if possible. The rubbings can be collected and saved to make a coin-rubbing book, since the same lesson has now been completed with each coin.
 - Close the lesson with review. Ask, “What is the name of this coin?” (Quarter) “What color is a quarter?” (Silver/Gray) “What shape is a quarter?” (Circle) “What is a quarter’s value or worth?” (Twenty-five cents) “Which coin is biggest in size the penny, the nickel, the dime, or the quarter?” (The quarter)
- Additional Activities: Place a collection of coins in the math center with play dough. Students can press the coins into the play dough to make impressions and compare the coins. Repeat the coin rubbing activity as a President’s Day activity. Place one coin of each type in a brown paper bag and have students guess which coin they are feeling without looking inside the bag.

Lesson 26B

Objectives: PK.6 Recognize and describe characteristics of a penny, nickel, dime, and quarter

Materials:

Pennies

Nickels

Dimes

Quarters

Bowls or Cups

Lesson Preparation: This lesson will involve a relay type race to sort coins. Make sure to clear an area for students to move freely across the room. Assemble a collection of fifty assorted coins.

Divide the coins evenly into two bowls or boxes. Label two sets of bowls or cups with the words “Penny,” “Nickel,” “Dime,” and “Quarter.” Use pictures with the labels if possible. Place the bowl of assorted coins at one side of the room. Mark a starting line near the bowl of coins. Place the labeled bowls to be used for sorting at the opposite side of the room.

Overview: In this lesson, students will practice recognizing pennies, nickels, dimes, and quarters while participating in a kinesthetic game.

Lesson Directions:

- Seat students in a circle on the carpet.

- Explain that in today's lesson the students will be sorting coins while playing a relay game.
- Review the four coins by holding up each coin as students name the coin.
- Establish the following rules: The students will be divided into two teams. Each team will have a bowl of coins. The bowl will contain pennies, nickels, dimes, and quarters. There will also be four bowls labeled penny, nickel, dime, or quarter. The team members will take turns choosing a coin, walking to the sorting bowls, and placing the coin into the correct bowl. The first team to correctly sort all the coins in the team's bowl wins the game.
- Show the large collection of coins and the four bowls labeled penny, nickel, dime, and quarter. Point to and name each sorting bowl.
- Demonstrate randomly choosing a coin, walking to the sorting bowls, and placing the coin into the correct bowl.
- Allow time for questions.
- Divide the students into teams and begin the game.
- Stand in view of the sorting bowls to offer assistance as needed. Have students make corrections as necessary.
- Continue play until one team wins the game.
- Divide the students a second time and play again.
- Close the lesson by reviewing. Hold up each coin and have the students chorally name the coin.
- **Additional Activities:** Place assorted plastic coins into the sensory table with sorting bowls. Play the relay game outdoors as weather permits and have the students balance

and carry the coin on one finger or while walking backward. Have students identify coins blindfolded. As an at home activity, have students sort and name coins with parents.

Lesson 27A

Objectives: PK.10 Conduct investigations of probability through hands-on activities

Materials:

Quarters

Chart Paper

Markers

Lesson Preparation: Create a paper chart for recording outcomes of dropping a coin. (see Appendix E) The headers should read “Heads” and “Tails.” Draw a line between the two columns/rows. Choose one color marker to represent heads and a second color marker to represent tails. These colors will be used to make tally marks for recording drop outcomes.

Overview: In this lesson, students will investigate probability by participating in a coin dropping activity. Students will record outcomes using tally marks.

Lesson Directions:

- Seat students in a circle on the carpet.
- Explain that in today’s lesson, students will investigate what happens when a quarter is dropped many times. There are two possible outcomes, heads or tails.
- Show a quarter. Ask, “What is the name of this coin?” (Quarter)

- Explain that on one side of the quarter is a picture of George Washington. We will call this side “heads” because it has a picture of a head. The other side of the quarter can have many different pictures. We will call this side “tails.”
- Explain that when we drop a quarter, one of two things will happen. Either the heads side will be showing or the tails side will be showing. These are the only two outcomes. Have students echo, “Outcomes.”
- “Today, we will take turns dropping a quarter to see which side turns up most often. We will record each outcome on a chart.”
- Show the chart. Point to and read the headings for heads and tails.
- Tell students, “If the heads side is showing when we drop the coin we will make a short, straight mark in the heads column/row. If the tails side is showing when we drop the coin we will make a short, straight mark in the tails column/row. We will place the marks close to each other until we have four marks for that outcome. For the fifth, or number five, mark we will draw a diagonal line across the other four to make the marks easier to count when we are finished. These marks are called ‘tally marks.’”
- Have students echo, “tally marks.”
- Demonstrate making tally marks on scrap paper or the chalkboard. Count the marks while making them, “1-2-3-4 straight marks and number 5 mark goes across the other four.”
- Allow time for questions.
- Choose two students to make tally marks on the chart. One student will mark heads outcomes the other will mark tails outcomes. It may be helpful to have these students practice making tally marks on the scrap paper or chalkboard before beginning. Have the other students count as marks are being made, 1-2-3-4 and a diagonal 5.

- Allow each student to drop the coin one time and name the outcome. The teacher will assist with recording outcomes on the chart.
- When all students have had a turn to drop the coin, the teacher will demonstrate counting the tally marks on the chart. Count by fives and tell the students that this is a way to count called “skip counting.” Write the corresponding numbers on the chart.
- State, “We know that each set of tally marks has five in it because the diagonal line shows us that. So if we know how to count by fives we do not have to say all the numbers in between. However, if we do not know how to count by fives, we can count each tally mark on the chart to find our total number of outcomes.”
- Demonstrate counting each mark to show students that the numbers are the same.
- Allow time for questions.
- Ask, “Which outcome did we have most often heads or tails?” “How do we know this?” (Because heads/tails has more tally marks.)
- Ask, “What do you think would happen if we did the same activity again?” “Would heads/tails still have more outcomes?” “Would the number of outcomes be the same?” “What makes you think so?” Acknowledge all answers.
- Ask, “How can we check to see if our predictions about what might happen are correct?” (Do the activity again.)
- Choose two new students to record tally marks with two new colors of markers so the students can differentiate between activities.
- Repeat the activity and the review questions.
- Allow time for additional student questions.

- Review by stating, “We only had two options for what might happen when we dropped the coin, heads or tails. These are called outcomes.” Have students echo, “outcomes.”
 - “We recorded our outcomes by making marks on our chart each time we dropped the coin. These marks are called tally marks.” Have students echo, “tally marks.” Ask, “When do I make the diagonal line on my tally marks?” (For the fifth or number five mark.)
 - “We used our tally marks from the first round of the activity to make a guess or prediction about what would happen if we repeated the activity.”
- Additional Activities: Repeat the above activity with two colored counters or lima beans with one side colored with a marker. Create a number line with every fifth number a different color. This represents counting by fives. Use the number line to explain and practice counting by fives. Only work on fives up to number twenty.

Lesson 27B

Objectives: PK.10 Conduct investigations of probability through hands-on activities

Materials:

Blocks

Paper Bag

Chart Paper

Markers

Lesson Preparation: Create a paper chart for recording outcomes of drawing a block from a bag. (see Appendix E) Choose only two colors of blocks to put into the bag. Allow one block per student with a few extras, but make sure to use the same number of each color. The headers will be the names of the colors of the blocks, red and blue for example. Draw a line down the center of the paper to create two columns/rows. Choose marker colors to match the blocks being used. These markers will be used to make tally marks for recording outcomes.

Overview: In this lesson, students will investigate probability by participating in an activity of drawing blocks from a bag. Students will record outcomes using tally marks.

Lesson Directions:

- Seat students in a circle on the carpet.

- Explain that in today’s lesson, students will investigate what happens when we draw a block from a bag without looking.
- Show the blocks.
- Explain that inside the bag will be an equal number of red blocks and blue blocks. We will take turns pulling a block from the bag to see which color we pull. There are only two possibilities, red or blue. We will return the block to the bag after charting the color pulled each time.
- Ask a volunteer to student to recall the word we use for the possibilities of what might be drawn. If necessary, the teacher will prompt by saying, “We can draw either red or blue. These are the two possible (outcomes). Have all students echo, “Outcomes.”
- “Today, we will take turns pulling a block from the bag to see which color we pull most often. We will record each outcome on a chart and return the block to the bag.”
- Show the chart. Point to and read the headings for red and blue.
- Tell students, “If a red block is pulled we will make a short, straight mark in the red column/row. If a blue block is pulled we will make a short, straight mark in the blue column/row. We will place the marks close to each other until we have four marks for that outcome. For the fifth, or number five, mark we will draw a diagonal line across the other four to make the marks easier to count when we are finished.”
- Ask a volunteer student, “What do we call these marks?” (Tally marks)
- Have all students echo, “tally marks.”
- Demonstrate making tally marks on scrap paper or the chalkboard. Count the marks while making them, “1-2-3-4 straight marks and number 5 mark goes across the other four.”
- Allow time for questions.

- Choose two students to make tally marks on the chart. One student will mark red outcomes, and the other will mark blue outcomes. It may be helpful to have these students practice making tally marks on the scrap paper or chalkboard before beginning. Have the other students count as marks are being made, 1-2-3-4 and a diagonal 5.
- Allow each student to pull one block from the bag and name the outcome. The teacher will assist with recording outcomes on the chart.
- When all students have had a turn to pull a block, the teacher will demonstrate counting the tally marks on the chart. Count by fives and remind the students that this is a way to count called “skip counting.” Write the corresponding numbers on the chart.
- State, “We know that each set of tally marks has five in it because the diagonal line shows us that. So if we know how to count by fives we do not have to say all the numbers in between. However, if we do not know how to count by fives, how can we count the tally marks?” (Count each individual line including the diagonals.)
- Demonstrate counting each mark to show students that the numbers are the same.
- Allow time for questions.
- Ask, “Which outcome did we have most often red or blue?” “How do we know this?” (Because red/blue has more tally marks.)
- Ask, “What do you think would happen if we did the same activity again?” “Would red/blue still have more outcomes?” “Would the number of outcomes be the same?” “What makes you think so?” Acknowledge all answers.
- Ask, “How can we check to see if our predictions about what might happen are correct?” (Do the activity again.)

- Choose two new students to record tally marks. Fold the paper or draw a line to separate the two activities for easier counting.
 - Repeat the activity and the review questions.
 - Allow time for additional student questions.
 - Review by stating, “We only had two options for what might happen when we pulled a block from the bag, red or blue. These are called outcomes.” Have students echo, “outcomes.”
 - “We recorded our outcomes by making marks on our chart each time we pulled a block. These marks are called tally marks.” Have students echo, “tally marks.” Ask, “When do I make the diagonal line on my tally marks?” (For the fifth or number five mark.)
 - “We used our tally marks from the first round of the activity to make a guess or prediction about what would happen if we repeated the activity.”
- Additional Activities: Place the bag of blocks in the math center with chart paper or a dry erase board for individual or small group practice recording outcomes with tally marks. Repeat the above activity with two colored counters or lima beans with one side colored with a marker. Draw and copy a chart for a Heads/Tails count and have students do the count as an at home activity. These charts can be used to create a graph for students obtaining more heads or more tails.

Lesson 28A

Objectives: PK.10 Conduct investigations of probability through hands-on activities

Materials:

Two-sided Counters

Tally Charts (see Appendix E)

Markers/Crayons

Lesson Preparation: Copy a tally chart for each student. If counters are not available, coloring one side of a lima bean will work. Each student will need at least five counters. Each student will need a crayon or marker for charting tally marks.

Overview: In this lesson, students will investigate probability by participating in an activity of dropping two-sided counters. Students will record outcomes using tally marks.

Lesson Directions:

- Seat students at tables for this activity.
- Explain that in today's lesson, students will investigate what happens when we drop two-sided counters.
- Show the counters. Point out that each side is a different color, red and yellow for example.

- Explain that each student will have five counters. The student will drop all five counters onto the table at one time.
- Ask a volunteer student to recall the word we use for the possibilities of what might happen when the counters are dropped. If necessary, the teacher will prompt by saying, “The counters will land either on the red side or on the yellow side. These are the two possible (outcomes). Have all students echo, “Outcomes.”
- “Today, we will drop counters to see which color turns up most often. We will record each outcome on a chart.”
- Show the student charts. Point to and read the headings for red and yellow, or whatever colors are on the counters.
- Tell students, “If the red side is showing we will make a short, straight mark in the red column/row. If the yellow side is showing we will make a short, straight mark in the yellow column/row. We will place the marks close to each other until we have four marks for that outcome/color. For the fifth, or number five, mark we will draw a diagonal line across the other four to make the marks easier to count when we are finished.”
- Ask a volunteer student, “What do we call these marks?” (Tally marks)
- Have all students echo, “tally marks.”
- Demonstrate dropping a set of five counters and making tally marks on one of the tally charts. It might be easier for the students to visualize if the teacher separates the two colors after dropping the counters. Make tally marks for one color group at a time. Count the marks. Drop the counters a second time or until a set of five tally marks is made for at least one of the two colors. Remind students to make a diagonal mark for the fifth tally mark.

- State, “Each student will have his/her own chart for making tally marks.”
- Allow time for questions.
- Distribute crayons or markers, tally charts, and five counters per student.
- Instruct students to drop and record the counters one time and allow the teacher to check the work before proceeding. Then, students may drop counters and tally a second time.
- Allow students to drop counters and record the outcomes. Assist with recording outcomes on the charts as necessary.
- Allow time for each student to count his/her tally marks and tell which color he/she had to turn up most often. Assist with counting the tally marks as necessary.
- Allow time for questions.
- Ask, “What do you think would happen if we did the same activity again?” “Would red/yellow still have more outcomes?” “Would the number of outcomes be the same?” “What makes you think so?” Acknowledge all answers.
- Ask, “How can we check to see if our predictions about what might happen are correct?” (Do the activity again.)
- If time permits, repeat the activity and the review questions.
- Review by stating, “We only had two options for what might happen when we dropped our counters, red or yellow. These are called outcomes.” Have students echo, “outcomes.”
- “We recorded our outcomes by making marks on our chart each time we dropped the counters. These marks are called tally marks.” Have students echo, “tally marks.” Ask, “When do I make the diagonal line on my tally marks?” (For the fifth or number five mark.)

- “We used our tally marks from the first round of the activity to make a guess or prediction about what would happen if we repeated the activity.”

- Additional Activities: Place the counters, two colors of blocks, two colors of counting bears, etc. in the math center along with tally charts for individual or small group practice. Have students complete a tally chart as an at home assignment with parents. The students can place two different colored socks into a bag and record the outcomes of pulling out a sock ten times.

Lesson 28B

Objectives: PK.10 Conduct investigations of probability through hands-on activities

Materials:

Paper Plates

Paper Fasteners

Card Stock Paper

Tally Charts (see Appendix E)

Markers/Crayons

Hole Punch

Lesson Preparation: Copy a tally chart from the appendix with appropriate color headers for each student. Card stock arrows will need to be cut for each student. Each student will need one paper plate, one paper fastener, and one spinner arrow for this activity. Students will be making colored spinners by coloring each half of a paper plate a different color and attaching a spinner arrow with a paper fastener. It might be helpful to draw a center line on the paper plates and punch a hole in the center of the plate and in one end of the spinner arrows in advance. Make one spinner in advance for demonstration purposes.

Overview: In this lesson, students will investigate probability by creating and spinning paper plate spinners. Students will record outcomes using tally marks.

Lesson Directions:

- Seat students at tables for this activity.
- Explain that in today's lesson, students will investigate what happens when we spin an arrow on a colored spinner.
- Show the spinner. Point out that each half is a different color, purple and green for example. Have students name common board games they have seen or played that use spinners such as Twister, Candy Land, etc.
- Explain that each student will make a spinner. Students will spin the arrow to see which color the arrow stops on most often.
- Ask a volunteer student to recall the word we use for the possibilities of what might happen when the arrow is spun. If necessary, prompt by saying, "The arrow will stop either on the purple half or the green half of the spinner. These are the two possible (outcomes). Have all students echo, "Outcomes."
- "Today, we will use spinners to see which color turns up most often. We will record each outcome on a chart."
- Show the student charts. Point to and read the headings purple and green, or whatever colors will be used on the spinners.
- Tell students, "If the arrow stops on the purple half we will make a short, straight mark in the purple column/row. If the arrow stops on the green half we will make a short, straight mark in the green column/row. We will place the marks close to each other until we have four marks for that outcome/color. For the fifth, or number five, mark we will draw a diagonal line across the other four to make the marks easier to count when we are finished."

- Ask a volunteer student, “What do we call these marks?” (Tally marks)
- Have all students echo, “tally marks.”
- Demonstrate spinning the arrow and making tally marks on one of the tally charts five times. Count the marks. Remind students to make a diagonal mark for the fifth tally mark.
- State, “Each student will have his/her own chart for making tally marks.”
- Allow time for questions.
- Distribute crayons or markers and a plate to each student.
- Instruct students to color each half of the plate a different color. Post the sample spinner in plain view as a guide. Point out the dividing line if plates have been pre-marked.
- Assist with attaching the arrow spinners with paper fasteners. Do not over tighten the fasteners or the arrow will not spin. Try each spinner after assembly and allow each student to practice with his/her spinner.
- Once all spinners are completed, distribute tally charts. Remind students to make one tally mark for each outcome.
- Allow students spin the arrows ten times and record the outcomes. Assist with recording outcomes on the charts as necessary.
- Allow time for each student to count his/her tally marks and tell which color he/she had to turn up most often. Assist with counting the tally marks as necessary.
- Allow time for questions.
- Ask, “What do you think would happen if we did the same activity again?” “Would purple/green still have more outcomes?” “Would the number of outcomes be the same?” “What makes you think so?” Acknowledge all answers.

- Ask, “How can we check to see if our predictions about what might happen are correct?”
(Do the activity again.)
 - If time permits, repeat the activity and the review questions.
 - Review by stating, “We only had two options for what might happen when we used our spinners, purple or green. These are called outcomes.” Have students echo, “outcomes.”
 - “We recorded our outcomes by making marks on our chart each time we used the spinner. These marks are called tally marks.” Have students echo, “tally marks.” Ask, “When do I make the diagonal line on my tally marks?” (For the fifth or number five mark.)
 - “We used our tally marks from the first round of the activity to make a guess or prediction about what would happen if we repeated the activity.”
- **Additional Activities:** Place a multi-colored spinner or set of spinners in the math center along with tally charts for individual or small group practice. Have students complete a tally chart using the paper plate spinners as an at home assignment with parents.

Lesson 29A

Objectives: PK.5 Investigate subtraction of whole numbers with up to ten concrete objects

Materials:

Counting Bears or Other Animals

Work Mats (Placemats or Student Drawn Playgrounds Work Great)

Lesson Preparation: Gather enough counting bears for each student to have five and a work mat for each student. If work mats are not available, have each student draw a playground with grass, trees, flowers, and sunshine instead.

Overview: In this lesson, students will investigate the concept of subtraction through storytelling and play using counting bears.

Lesson Directions:

- Seat students in a circle on the carpet.
- Explain that in today's lesson we will use counting bears to tell stories about playing on a playground. The teacher will read a story and the students will act it out using the counting bears and the work mat. We will stop now and then to see how many bears are playing on the playground.
- Model this activity while reading the story.

- Instruct students to listen carefully to the story and do what the story says by placing a number of bears on the playground and removing bears when needed.
- Begin story: “Once upon a time, it was bright, sunny day and the Rainbow Bears wanted to go out and play. There was a playground nearby, so they decided to go there and have a picnic. All five bears went to the playground and stood in the grass. (Place all 5 bears on the mat.) They saw it was too crowded and that they would have to take turns on the playground, so three bears moved off the playground. (Remove 3 bears from the mat.) How many bears were left to play on the playground? (2 Bears) That worked much better. While the two bears were playing, they started to feel hungry. So the two bears left the playground. (Remove 2 Bears) How many bears were playing on the playground? (Zero Bears) After they finished eating, four bears went back to the playground. It was a little crowded, but it was still okay. The four bears played a while and three of them decided they were tired, so they left. (Take three bears off the mat.) How many bears were left on the playground? (1 Bear) He was having fun, but he really wanted someone to play with him. So he called out, “Rainbow Bears, please come play with me!” All the bears came to the playground. But now there was a problem, because there were ____ (count 5) bears back on the playground! That was too crowded. By this time it was starting to get dark, and the bears were getting tired. They had had a wonderful day taking turns and playing at the playground, so they would all go home. (Remove all five bears from the playground.) How many bears were on the playground? (Zero Bears) They would return again on the next sunny day. The End.”
- Review the lesson by explaining that when we remove or take away part of a set, we are left with a smaller set. For example, place your bears into a straight line in one large

group. Count the bears in the group by pointing to each bear while counting, 1-2-3-4-5.

Next, instruct students to remove two bears. Count the bears in the new group by pointing to each bear while counting 1-2-3. Restate, “When we start with a set of bears and take away part of those bears, our new group of bears is smaller. It has fewer members.”

- Allow time for student questions or comments.
 - Allow time for free play with the bears and playground mats.
- Additional Activities: Act out similar stories with the students being the characters either on a real playground or an imaginary setting. Play musical spots: students dance freely while music is playing and when the music stops, the students rush to line up on one of two tape lines on the floor. After all students are lined up, count each line. Ask a number of students to sit down and count the remaining students. This can be done as a whole class or in smaller groups if necessary.

*This lesson was adapted from a lesson used in the *Saxon Math K*, a product of Saxon Publishers, Inc. and Nancy Larson.

Lesson 29B

Objectives: PK.5 Investigate subtraction of whole numbers with up to ten concrete objects

Materials:

Linking Cubes

Lesson Preparation: Gather enough linking cubes for each student to have five. If linking cubes are not available, building blocks will work as well.

Overview: In this lesson, students will investigate the concept of subtraction through storytelling and play using linking cubes.

Lesson Directions:

- Seat students in a circle on the carpet.
- Explain that in today's lesson we will use linking cubes to tell stories about a special building. The teacher will read a story and the students will act it out using the linking cubes. We will stop now and then to see how many cubes are in our building.
- Model this activity while reading the story.
- Instruct students to listen carefully to the story and do what the story says by placing a number of linking cubes together to make a building.

- Begin story: “Once upon a time, a little boy named Ollie moved to a building called Magic Tower. The building was magic because it never ran out of space and it was always changing. Each time a new family came to live in the building, the building would simply grow a new floor. If someone moved away, the building got smaller. Before Ollie came, the building only had nine families living there, so there were nine floors. (Put 9 cubes together for your building.) The day Ollie moved in, the building grew one new floor, just for Ollie’s family. (Add 1 linking cube to your building.) Now the building had ____ (count 10) floors. Ollie lived there happily for many years, but one day things changed. Two families were moving away from Magic Tower! When moving day arrived, Magic Tower shrank by two floors! (Remove 2 linking cubes from the building.) Ollie was amazed to see how the building changed! Now he lived in a smaller building. Magic Tower now had only ____ (count 8) floors! A few years later, four more families moved away and the building shrank by four floors! (Remove 4 linking cubes from the building.) Now the building had only ____ (count 4) floors left. Ollie began to worry that Magic Tower might disappear. Later, three more families decided to move, and the building lost three more floors. (Remove 3 linking cubes from the building.) Only ____ (count 1) floor remained, but that did not matter because that floor belonged to Ollie’s family and he was not going anywhere. As long as there was an Ollie, there would be a Magic Tower. It did not matter that the building was smaller. It was still the best building in the world! Ollie was very happy! The End.”
- Review the lesson by explaining that when take away part of the members of a group of items we get one smaller group. For example, place your cubes into one group. Line them up in a straight line. Allow time for students to set up the group. Next, instruct students to

count the group by pointing to each cube while counting, 1-2-3-4-5-6-7-8-9-10. Next, instruct students to take away four of the cubes. Count the cubes that are left in the group by pointing to each cube while counting, 1-2-3-4-5-6. Restate, “When we have a group of cubes or items and we take away part of the group, we have a smaller group left.”

- Allow time for student questions or comments.
 - Allow time for free play with the linking cubes.
- Additional Activities: Have students bring collections of 5-10 items from home and tell stories using those items. Arrange a snack bar with bowls of two items, like marshmallows and M&Ms. Allow students to build their own snack mix of ten items, by choosing a number of items from each bowl. The number of items they choose cannot exceed ten. Have students count each item as they add it to their mixes. Call out instructions for eating the snack 1, 2, or 3 items at a time and stop to recount the remaining items between eating.

Lesson 30A

Objectives: PK.5 Investigate subtraction of whole numbers with up to ten concrete objects

Materials:

Counting Bears

Numeral Cards for 1-9

Index Card Labeled “-” for Subtraction

Lesson Preparation: Gather a collection of counting bears or other counters with enough pieces for each student to have ten. If numeral cards are not available, write the numerals 1-9 and the symbol “-” on index cards.

Overview: In this lesson, students will explore the concept of subtraction. Students will now work with ten concrete items as they match, count, and subtract.

Lesson Directions:

- Seat students in a circle on the carpet.
- Explain that in this lesson, we will begin to subtract numbers using counting bears to help us. Have students echo the word, “Subtract.” Define subtracting as removing or taking away smaller sets of items to create a new set.

- Demonstrate by placing one of the numeral cards in view of all the students. For example, use “5.” Ask students to identify the numeral. Near the “5,” line up five bears. Have students chorally count the members of the set as the teacher points to each member.
- Show a card with “-” and tell students that this symbol lets us know to subtract or take away bears. Place the card beside the set of bears.
- Next, choose a second numeral card, less than five, for subtracting. For example, use number 3. Have students name the numeral. Place the numeral next to the (-) symbol.
- Read the entire problem as “5 subtract 3.”
- Explain that this problem tells us, “We have five bears, but we need to subtract or take away three bears.”
- Remove three of the bears. State, “Now we have a smaller set of bears.”
- Instruct students to count chorally as the teacher points to each member of the new set, 1-2. “Our new set has two members because we subtracted a set of three bears.”
- Remind students that we start with a set of bears and subtract part or all of the bears. This means the second number cannot be bigger than the number of bears in the beginning set.
- Choose two more numeral cards and repeat the same process.
- Ask for questions.
- Inform students that they will now subtract sets. Show a numeral card. Students will arrange the appropriate number of bears for the set. Remind students that it is easier to count the bears if they are all in a straight row.
- Show the card with the subtract symbol (-) to signal students to subtract.

- Choose a second numeral card, with a smaller numeral for subtracting. Allow time for students to remove the correct number of bears. Assist as needed.
 - Once each student has correctly built the new smaller set, instruct students to chorally count the number of bears in the new set.
 - Continue in this manner for at least five rounds.
 - Allot time for questions.
 - Allow free time to play with the bears.
 - During free play, work with small groups or individuals to assess understanding with more subtraction problems.
 - Close the lesson with the following, hold up the (-) card and ask, “What does this symbol tell us to do?” (Subtract sets) “And what does ‘subtracting’ sets mean?” (We start with a larger set and remove part or all of the members to create a new smaller set.) Remind students that the number we subtract must be smaller or equal to the number of members in the original set.
- Additional Activities: Place the counting bears, numeral cards, and “-” card in the math center. Allow students to make up their own subtraction problems during center time. Also, use the numeral cards and line up sets of students to make subtraction problems.

Lesson 30B

Objectives: PK.5 Investigate subtraction of whole numbers with up to ten concrete objects

Materials:

Graham Crackers

Cake Icing

Fruit Loop Type Cereal/Gummy Life Savers Candy

Coffee Stirrers or Small Diameter Straws

Numeral Cards for 1-10

Index Card Labeled “-” for Subtraction

Lesson Preparation: Gather the following items: graham crackers one per student, one or two canisters of cake icing and a spreading utensil, cereal or candy pieces ten per student, coffee stirrers one per student, and napkins. Spread a layer of icing on each graham cracker. The icing should be thick enough to support the coffee stirrers to stand vertically. Place the stirrer vertically on the graham cracker.

Overview: In this lesson, students will expand upon previous lessons exploring the concept of subtraction. Students will build an abacus to use for counting and subtracting numbers.

Lesson Directions:

- Seat students at tables for this activity.
- Explain that in this lesson, we will subtract numbers using cereal/candy to help us. Have students echo the word, “Subtract.” Ask, “What does it mean to subtract numbers?” (To remove part or all the members of a set.)
- Explain that each student will create an abacus to use for counting. An abacus is a way to build sets of items, in our case sets of cereal/candy pieces, and count the total number of pieces when part of the set is removed, or subtracted. When we count all the pieces of the new set, this number is called the “difference.” Have students echo, “difference.”
- Show students one of the graham crackers with the vertical stirrer. Remind students of building an abacus for counting and adding in a previous lesson. Explain that the stirrer or straw represents a set. We will pick a numeral card just like we did with the counting bears in the last lesson. We will build a set for that numeral by placing that many cereal/candy pieces around the stirrer.
- Demonstrate by placing a numeral card in view of all the students. For example, use “7.” Ask students to identify the numeral. On the stirrer, place seven pieces of cereal/candy. Have students chorally count the members of the set as the teacher points to each member.
- Show a card with “-” and ask students, “What does this symbol tell us to do?” (Subtract)
- Next, remind students that when we subtract numbers, we are removing part of the members to create a smaller set.
- Choose a second numeral card less than seven, five for example. Have students identify the numeral. Remove the corresponding number of cereal/candy pieces from the stirrer.

- Lead the students in counting the remaining cereal/candy pieces, 1-2, while pointing to each one. We now have one smaller set with two pieces of cereal.
- Choose two more numeral cards and repeat the same process.
- Allow time for student questions or comments about the activity.
- Inform students that they will now subtract sets. Show a numeral card. Students will arrange the appropriate number of cereal/candy pieces for the set on an abacus. Show a second numeral card and students will remove that number of cereal/candy pieces and count the remaining pieces in the new smaller set.
- Distribute the appropriate materials to each student.
- Choose a numeral card and allow time for students to build the corresponding set. Assist as needed.
- Once each student has correctly built the set, signal students to subtract by holding up the “-” card. Show a second numeral card and instruct students to remove this number of pieces. Chorally count the total number of remaining cereal/candy pieces on the abacus while pointing to each piece.
- Continue in this manner for at least five rounds.
- Ask for questions.
- Allow free time to explore with the abacus before enjoying the abacus as a snack.
- Close the lesson by holding up the “-” card and asking, “What does this symbol tell us to do?” (Subtract sets) “And what does ‘subtracting’ sets mean?” (We remove or take away part of the set and count the total number of members in the remaining smaller set.) The number of members in the new set is called the “difference.”

- Additional Activities: Use seasonal items for counting and subtracting activities. For example, place ten plastic Easter eggs in a sensory table. Have students draw a numeral card, 1-10, and remove the appropriate number of eggs for the numeral. Count the remaining eggs to find the difference. The same can be done with cotton balls in winter, flowers in spring, seashells in summer, and leaves or plastic apples in fall.

*This lesson for teaching the concept of subtraction was adapted from an idea used in a mathematics instruction workshop, *Mathematical Strategies and Manipulatives for Primary Teachers*, conducted by Diana Freeman, Center for Teaching Excellency, University of Virginia at Wise, Wise, Virginia.

CHAPTER 4

SUMMARY

The value of early education is essential to future academic success. Developing a child's intellect is the goal of the pre-kindergarten classroom. Mathematics learning builds from the natural curiosities of young children. New understanding arises from meaningful, engaging experiences with the environment, other students and adults, and observations. By using a standards based curriculum, teachers can better serve the academic needs of four-year-old students preparing for kindergarten and beyond.

This thesis is designed to serve as a guide for high-quality pre-kindergarten instruction in mathematics. It is rooted in the understanding of cognitive development as defined by Jean Piaget and supported by the theory of Constructivism. It is based upon standards outlined by the National Council of Teachers of Mathematics and the Virginia Department of Education.

The materials include established objectives for student learning, a pacing guide for meeting those objectives, semi-weekly hands-on lessons with reinforcing activities, parental newsletters with at home activities, and a student assessment to be administered before and after the program to track progress and achievement. The work is designed to meet the needs of diverse learners through art, music, kinesthetic activities, rich oral language expression, and discovery. The activities are age-appropriate, engaging, and challenging for young mathematical thinkers.

While this work is designed to meet prescribed goals and expectations, much work remains to be done. Future studies on the effectiveness of the program over time are needed to verify its validity as a high-quality program. It would be prudent to evaluate, modify, and study

the success of the program by following individual students and groups of students that have participated in this curricular model.

“We all have the duty to call attention to the science and seriousness of early childhood cognitive development-because the (years) between birth and five are the foundation upon which successful lives are built.” (Laura Bush, July 26, 2001) This quote from the Virginia’s Foundation Block’s for Early Learning assigns responsibility for the future success of our youngest learners to all classroom teachers. As is pre-kindergarten education, this thesis is just the beginning.

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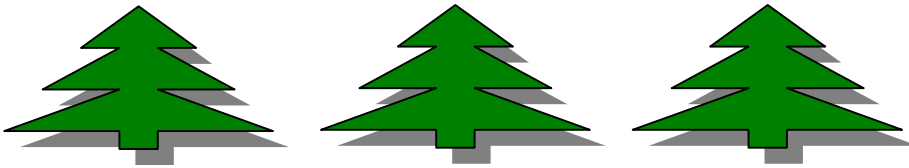
APPENDICES

APPENDIX A

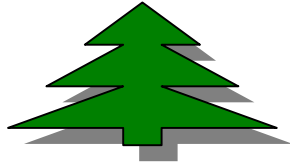
Mathematics Assessment

Directions: This test will be given to students as a pretest before beginning the curriculum and as a post-test to track progress after completing the curriculum. This test should be given to individuals when possible or in groups of five or fewer students. The teacher will read each question and all answers to students before having students mark or signify the correct answer.

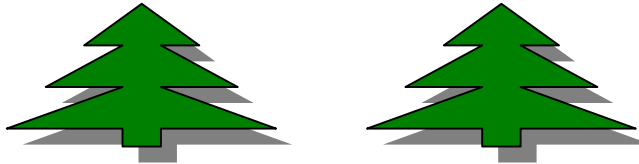
1. (PK.1, PK.2) Circle the group that has the same number of members as this set.



A



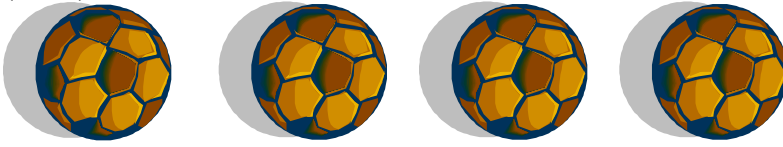
B



C



2. (PK.2) Count the soccer balls.

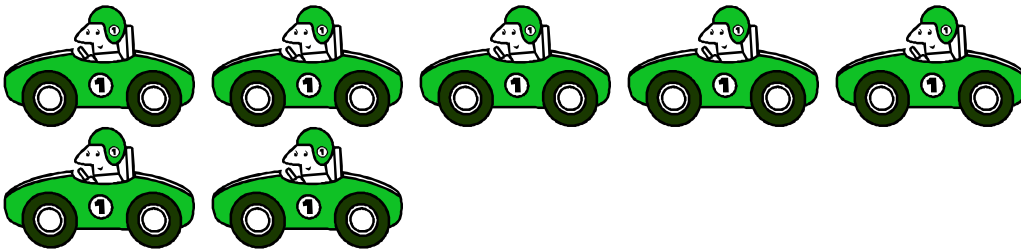


A 3

B 4

C 5

3. (PK.2) Count the cars.

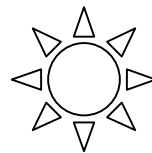


A 5

B 6

C 7

4. (PK.3) Look at this group.

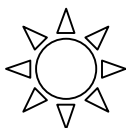


Color the third one from the left.

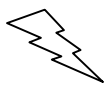
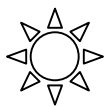
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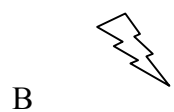
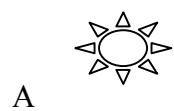
B



5. (PK.3) Look at this group.



Color the second one from the top.



6. (PK.4) When you count to 10, like 1,2,3,...
Circle the numbers that come next.

A 7, 8, 9, 10

B 6, 7, 8, 9, 10

C 4, 5, 6, 7, 8, 9, 10

7. (PK.4) Count backwards 10 to 1, like 10,9,8,7,6,...
Circle the numbers that come next.

A 5, 4, 3, 2, 1


B 5, 6, 7, 8, 9, 10

C 3, 2, 1, 0

8. (PK.5) Circle the sum:



$$3 + 1 =$$

A 3 

B 4 

C 5 

9. (PK.5) Circle the answer:



$$7 - 4 =$$

A 2 

B 3 

Show one each of a penny, a nickel, a dime, and a quarter.

10. (PK.6) Point to the penny.

11. (PK.6) Point to the nickel.

12. (PK.6) Point to the dime.

13. (PK.6) Point to the quarter.

14. (PK.7) Name the one used to measure length.

A scale

B ruler

C thermometer

15. (PK.7) Name the one used to measure weight.

A scale

B ruler

C thermometer

16. (PK.7) Name the one used to measure time.

A scale

B ruler

C clock

17. (PK.8) Circle the one that is shorter.

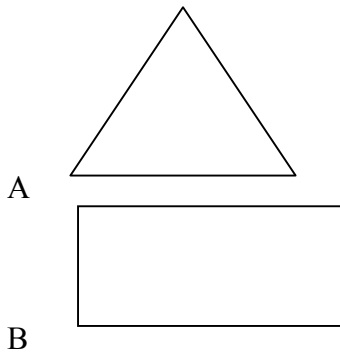


18.(PK.8) Circle the one that is colder.

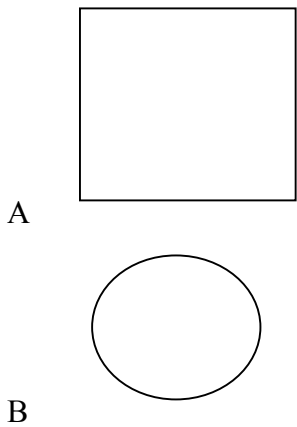
A Ice Cream

B Hot Chocolate

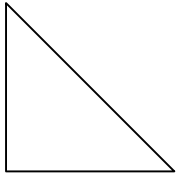
9. (PK.9) Color the triangle.



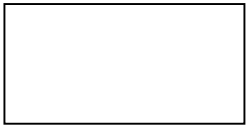
20. (PK.9) Color the square.



21. (PK.9) Color the rectangle.

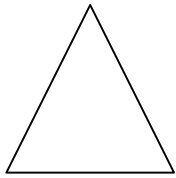


A

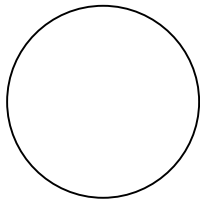


B

22. (PK.9) Color the circle.

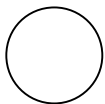


A

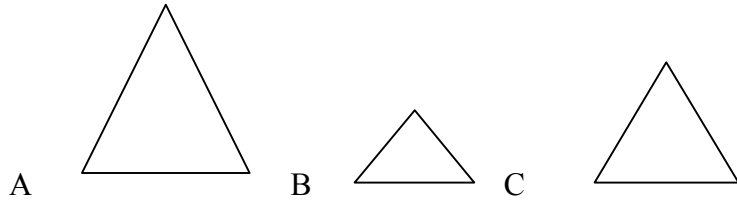


B

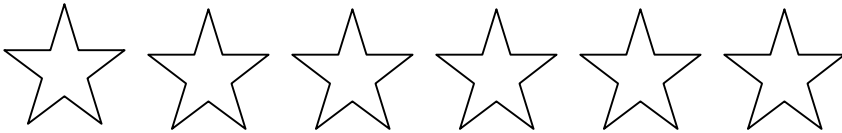
23. (PK.10) Color the triangle that is above the circle.



24. (PK.11) Color the one that is the largest.



25. (PK.12) Count the stars. Draw the correct count by tally marks. Circle the correct numeral.

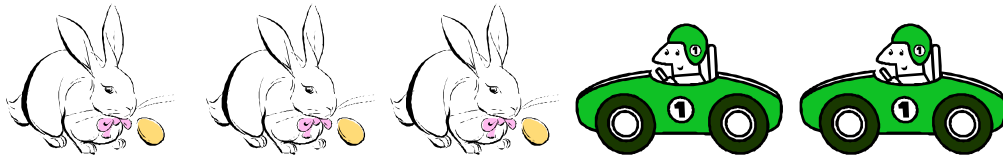


A 4

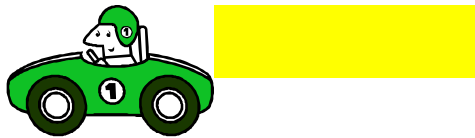
B 5

C 6

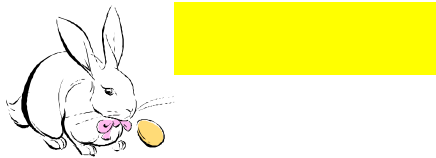
26. (PK.13) Look at the picture. Circle the correct graph.



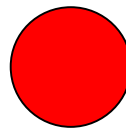
A



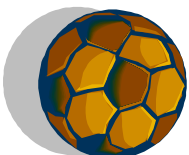
B



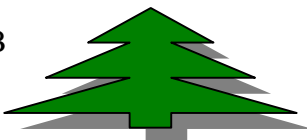
27. (PK.14) Point to the one that is the same shape:



A



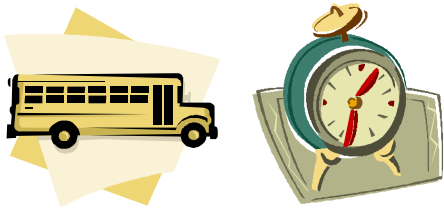
B



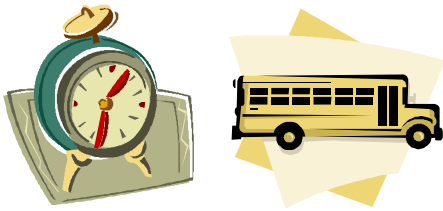
28. (PK.15) Circle the next two.



A



B



APPENDIX B

Literature Enrichment Resources

- I. Numbers and Number Sense
- *An Invitation to the Butterfly Ball: A Counting Rhyme* by Jane Breskin Zalben
 - *Counting in the Garden* by Kim Parker
 - *Count on Clifford* by Norman Bridwell
 - *Counting Sheep* by Dr. Julie Glass
 - *Counting to Christmas* by Nancy Tafuri
 - *Counting to Tar Beach* by Faith Ringgold
 - *Count with Maisy* by Lucy Cousins
 - *How Many Can Play* by Susan Canizares & Betsey Chessen
 - *I Spy Little Numbers* by Jean Marzollo
 - *Icky Bug Numbers* by Jerry Palotta
 - *Let's Count It Out* by Jessee Bear & Nancy White Carlston
 - *Look Who's Counting* by Suse MacDonald
 - *Monster Math* by Anne Miranda
 - *Olivia Counts* by Ian Falconer
 - *One Nighttime Sea: An Ocean Counting Rhyme* by Deborah Lee Rose
 - *One Lonely Seahorse* by Freyemann & Elffers
 - *The Crayon Counting Book* by Jerry Pallotta & Pam Munoz Ryan
 - *The Very Hungry Caterpillar* by Eric Carle
 - *Ten Little Monkeys: Story Counting Book* by Keith Faulkner
 - *Ten Little Rabbits* by Virginia Grossman & Sylvia Long
 - *Ten, Nine, Eight* by Molly Bang
 - *Ten Timid Ghosts* by Jennifer O'Connell
 - *What's For Lunch* by Eric Carle
 - *When Baby Went to Bed* by Susan Pearson
 - *1, 2, 3 to the Zoo* by Eric Carle
 - *10 Dogs in the Window* by Carrie Masurel
 - *10 Little Rubber Ducks* by Eric Carle
- II. Computation and Estimation
- *Addition Annie* by David Gisler
 - *Get Up And Go!* By Stuart Murphy
 - *Just Add Fun* by Joanne Rocklin
 - *Ready, Set, Hop* by Stuart Murphy
 - *The Cheerios Counting Book* by Barbara Barbieri McGrath
 - *Too Many Kangaroo Things To Do!* By Stuart Murphy
- III. Measurement
- *Clifford's Busy Week* by Norman Bridwell
 - *How Many Feet? How Many Tails?* By Marilyn Burns
 - *The Case of the Backyard Treasure* by Judith Bauer Stamper
 - *The Fattest, Tallest, Biggest Snowman Ever* by Bettina Ling

- *Today is Monday* by Eric Carle
- IV. Geometry
 - *Bedtime for Frances* by Russell Hoban
 - *Brown Rabbit's Shape Book* by Alan Baker
 - *Clifford's Fun With Shapes* by Norman Bridwell
 - *Circles, Triangles, and Squares* by Tana Hoban
 - *Color Zoo* by Lois Ehlert
 - *Discovering Shapes* by Henry Pluckhouse
 - *My First Jumbo Book of Shapes* by Melanie Gerth
 - *Pancakes, Crackers, and Pizza: A Book About Shapes* by Marjorie Eberts
 - *Round Is a Mooncake: A Book of Shapes* by Roseanne Thong
 - *Three Pigs, One Wolf, and Seven Magic Shapes* by Eugene Trivizas
 - *Shadow Night* by Kay Chorao
 - *Shape* by Nicola Tuxworth
 - *Shape of Me and Other Stuff* by Dr. Seuss
 - *Shapes* by John J. Reiss
 - *The Wing on a Flea* by Ed Emerley
- V. Probability and Statistics
 - Refer to the list for Numbers and Number Sense
- VI. Patterns, Functions, and Algebra
 - *A Pair of Socks* by Stuart J. Murphy
 - *Beep, Beep, Vroom, Vroom!* By Stuart J. Murphy
 - *Even Steven and Odd Todd* by Kathryn Cristaldi
 - *98, 99, 100! Ready or Not, Here I Come!* By Marilyn Burns and Teddy Slater

* (Please note that some books are listed for reference only. They may be written on a higher grade level, but are excellent resources for generating new ideas for teaching the corresponding concepts.)

APPENDIX C

Technology Enrichment Resources

1. Stickybear Early Learning Activities Deluxe
 - Counting
 - Geometric Shapes
 - Grouping Attributes
 - Colors
2. Jumpstart Advanced Preschool
 - Number Recognition
 - Counting
 - Patterns
 - Sorting
 - Problem Solving
3. Ready for Math with Pooh
 - Number Recognition
 - Addition
 - Subtraction
 - Geometric Shapes
4. Sesame Street Preschool Deluxe
 - Counting
 - Matching
 - Sorting
 - Number Recognition
5. Arthur's Preschool
 - Spatial Relations
 - Counting
 - Number Recognition
 - Sorting
6. Math Rabbit
 - Counting
 - Number Recognition
 - Addition
 - Subtraction
 - Identifying Equalities and Inequalities
7. Adventure Workshop Dr. Seuss Preschool
 - Classifying
 - Matching
 - Sorting
 - Colors
 - Counting
 - Number Recognition
 - Comparing Quantities

- Geometric Shapes

Website Enrichment

- www.playhousedisney.com
- www.pbskids.org
- www.uptoten.com
- www.scholastic.com
- www.internet4classrooms.com
- www.etch-a-sketch.com
- www.funschool.com
- www.learningplanet.com
- <http://bright-productions.com/kinderweb>
- www.wacona.com/kindergartengames/kindergartengames.html
- www.akidsheart.com
- www.teachrkids.com
- <http://nlvm.usu.edu>
- www.CleverIsland.com
- www.illuminations.nctm.org

APPENDIX D

Bingo Grid

B	I	N	G	O

APPENDIX E

Tally Chart

APPENDIX G

Parent Newsletters

Dear Parents,

Welcome to the first six weeks of school. We will begin our year by learning about the calendar. Much of what we do with the calendar centers on counting, recognizing numbers, naming the days and the months, and identifying the seasons of the year. Please try to have a calendar posted in an area of your home for you and your child to look at each day. You can plan many activities using the calendar. Some ideas are planning days to pack lunch or eat at school, counting down to important events at school such as holidays and field trips, or even identifying days at school (Monday-Friday) and days at home (Saturday and Sunday).

We will also study shapes during the first six weeks of school. Have your child identify shapes around your home. For example, have him/her find three things that are a circle, a square, a rectangle, and a triangle. Include these ideas at mealtimes as well by eating cereals or crackers in different shapes, cutting sandwiches into different shapes, or building the shapes using carrot or pretzel sticks.

We will be counting items. Again, you can have your child count cereal pieces, fruit snacks, dried beans, or other foods. A fun idea to involve the entire family is for everyone to line up and have your child count the number of socks, shirts, shoes, etc. being worn by the family. Try to take advantage of any opportunity to count items around your home or even outside in the yard or along the road.

We will sort items by things they have in common such as color and shape. I cannot say enough about using cereal. Fruit Loops type cereals can be used for sorting by color, and children love to eat the cereal when they are finished. Other ideas are sorting blocks by color or

shape, sorting articles of clothing by color, sorting dried beans by color, or sorting paper cutouts of various colors and shapes. Even look for shapes in newspapers that can be cut out and sorted. Have your child tell you which group has the most members, the least members, or if they have the same number of members once all the items are sorted.

I really appreciate all you do at home to help us as we learn new math skills at school. Be creative and come up with your own ideas as well. Allow your child to make suggestions for activities. I think you will be surprised by how creative your child can be as well. This is a wonderful opportunity to spend some quality time with your child. I hope you enjoy this time as much as I enjoy these times at school.

Sincerely,

Dear Parents,

Welcome to the second six weeks of school. We will begin the second six weeks with counting. We will learn to count forward and backward to twenty. Your child can practice counting at home while counting the number of napkins or utensils needed at meals. Have him/her count pieces of cereal, grapes, dried beans, or pasta noodles. It is also a good idea to count things along the road when traveling.

We will work on creating and continuing patterns. This can be practiced at home with Fruit Loops type cereal pieces, M&M candies, or Skittles candies. Begin a pattern of cereal or candy pieces by alternating colors like red, green, red, green, red, green in a straight row and have your child continue the pattern.

We will be learning words to indicate positions of items like “above,” “below,” and “next to.” Your child can practice this at home by helping set the dinner table. Give him/her directions to place a napkin next to each plate. Practice with refrigerator magnets. Cut out paper shapes like triangle, square, rectangle, and circle and give directions to move them such as put the circle above the triangle. Use refrigerator magnets to fix them in place.

Finally, we will be learning about measuring weight with a scale. Use bathroom scales to weigh items around the house or members of the household. Point out other times when scales are being used such as weighing fruits and vegetables at the grocery store.

It truly makes a difference when students practice skills taught at school. By practicing at home with your child, you are showing him/her that you value the things he/she is learning. Practicing at home also helps the child connect the skills learned at school with practical uses in the real world. Thank you for all you do to improve your child’s education.

Sincerely,

Dear Parents,

Welcome to the third six weeks of school. We will begin the third six weeks of school with using thermometers to measure temperature. You can help your child recognize thermometers by pointing them out around the house. You might have a thermometer to measure indoor/outdoor temperatures, a thermometer to measure family members' temperatures, a thermometer used for cooking, a thermometer on your car, or a thermometer in your refrigerator. Point out other thermometers you see such as those on signs outside of businesses that measure outdoor temperatures.

We will learn to recognize a ruler as an instrument used to measure length or height. You can help your child measure things around the house with a ruler, a yardstick, or a measuring tape.

We will use words to compare length such as longer and shorter or taller and shorter. We will use words to compare weight such as lighter and heavier. We will use words to compare temperature such as hotter/warmer and colder.

We will learn to recognize the clock as an instrument used to measure time. Help your child notice the clocks in your house and use them to tell your child when it is dinnertime, bath time, and bedtime. You may also have other time measuring devices such as kitchen or game timers, hourglasses, or wristwatches.

We will begin to learn about adding numbers. You can practice adding with your child using items around your house such as kitchen utensils or food items. Give your child an addition problem such as $3+5=?$, and have him or her figure out the problem by creating a group of three items and a group of five items and then counting all the items in both groups to find an

answer to the problem. Practice with many different addition problems, but keep the total number of items used to ten or less.

By working with your child on these math skills at home, you are improving your child's ability to solve problems independently. Children learn by doing, and practicing these skills helps learning occur more quickly. The fun memories you are creating with your child will help him/her stay interested in mathematics for years to come. Thank you for your continued support at home as we continue to explore the world of mathematics.

Sincerely,

Dear Parents,

Welcome to the fourth six weeks of school. We will begin the fourth six weeks by learning about ordinal positions, first, second, third, and so on. You can help your child practice this skill at home by having him/her line up items in a given order. For example, choose three toys such as a ball, a doll, and a truck. Tell your child to line up the toys by putting the truck in line first, the ball second, and the doll third. You can also have family members line up in first, second, and third positions.

We will be learning to count things by using tally marks and graphs. You can practice at home by marking weather on a calendar and counting the number of days it rains and the number of days it does not rain. You can count and tally each family member's favorite drink such as water or milk. Just make tally marks for each choice and help your child count tally marks when finished to see which answer received more and less marks. Remember to make four straight marks side by side with a fifth mark diagonally across the other four. Each set represents five choices.

We will practice recognizing common coins. We will focus on the penny, nickel, dime, and quarter. Have your child sort and identify coins at home to practice this skill.

Thank you for continuing to practice math skills at home with your child. It helps your child understand the skills when he/she can link the things learned at school with how the skills are used at home. Make your learning activities fun and both you and your child will be rewarded. Use your own creativity to find new ways to practice math skills. I think your child will surprise you with what he/she knows about mathematics.

Sincerely,

Dear Parents,

Welcome to the fifth six weeks of school. We will begin the fifth six weeks by continuing to learn about coins. We are still learning to recognize the penny, nickel, dime, and quarter. We are learning about using coins to buy things we need and want. Please continue to have your child sort and name coins at home.

We will be learning about probability. Probability is how often we expect certain things to happen based upon trials. For instance, if we flip a coin, it will either land on heads or on tails. When we actually flip the coin a number of times and try to predict which side will be showing, we are using probability. We will experiment with this in the classroom by flipping a coin and recording the number of times it lands on each side using tally marks. You can do the same thing with a coin at home.

We will begin learning about subtraction. You can practice subtracting at home by giving your child ten or less cereal pieces, telling him/her a number of pieces to eat, and having him/her count the remaining pieces.

By practicing math skills at home you are helping your child create good habits for lifelong learning. Math is part of our everyday life. We use math when following recipes to cook, to pay bills and balance a checkbook, to shop for things we need, and we even use math when we are setting the table for dinner. Without math skills, we would be unable to do many parts of our daily routine. Thank you for helping your child prepare for the future by practicing commonly used math skills at home.

Sincerely,

Dear Parents,

Welcome to the sixth six weeks of school. During the sixth six weeks, we will review the math skills learned this year. Near the end of the sixth six weeks, you will receive a progress report summarizing skills taught. By looking at the progress report, you will be able to identify your child's strengths and weaknesses in math. I hope some of the at home activities we have done this year will help you continue practicing math skills with your child. Use the progress report as your guide when deciding which skills need improvement. Please feel free to contact me with any questions or concerns you might have.

I truly appreciate all you have done to this point to help your child develop good math skills. The skills we have worked on will continue to be important as your child progresses through school. These same skills will be built upon in years to come. Prior learning enhances future success in mathematics. By supporting your child's learning in these early years of schooling you are helping him/her succeed in the future. Thank you for being dedicated to your child's success.

Sincerely,

VITA

ROBIN PENLEY HERNDON

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 Virginia Intermont College, Bristol, Virginia; Interdisciplinary
 Studies, B.A., 2003
 East Tennessee State University, Johnson City, Tennessee;
 Mathematics, M.S., 2006

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 Paraprofessional, Honaker Elementary/Middle School; Honaker,
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 Teacher, Lebanon Primary School; Lebanon, Virginia, 2003-2006

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 SVCC Graduate Summa Cum Laude
 VIC Graduate Summa Cum Laude