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Playful sciencing and the early childhood classroom

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PLAYFUL SCIENCING AND THE EARLY CHILDHOOD CLASSROOM

A Thesis

Presented to the

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In Partial Fulfillment

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in

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ABSTRACT

Decades of research have documented the crucial role of play in the optimal development, learning, and growth of children in infancy through adolescence. An interest in the impact of early childhood programs on young children's cognitive and social competence has grown. There has been a renewed awareness among the general public and policy makers that early childhood programs can make a difference in children's lives. The purpose of this project is to examine the power of play, guided discovery, and hands-on experiences in the early childhood classroom, specifically as it relates to early childhood science experiences. This paper will also propose a science curriculum encompassing a hands-on, guided discovery, play-based approach.

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TABLE OF CONTENTS

LIST OF TABLES

CHAPTER ONE

INTRODUCTION

Play is fundamental in the early childhood years because it drives a young child's development (Monighan-Nourot, Scales, & Van Horn, 1987). Play is an expression of the child's developing personality, sense of self, social and emotional capacity, cognitive, and physical development (Monighan-Nourot, Scales, & Van Hoorn, 1987). It is through play that children direct their energy towards activities of their own choice. It is these activities that stimulate further development (Monighan-Nourot, Scales, & Van Hoorn, 1987).

Theorists, regardless of their orientation, agree that play occupies a central role in children's lives. Theorists also suggest that the absence of play will create an obstacle to the development of healthy and creative human beings. Major perspectives influencing our understanding of play come from several well-known theorists. Freud (1958) and Erikson (1963) emphasized the emotional significance of play; Piaget (1962) emphasized play's cognitive significance; and Vygotsky (1967, 1978) emphasized its social significance (Isenberg & Jalongo, 1997).

There is a lack of theory-based curricula in early childhood education, especially pertaining to science. The purpose ofthis project is to investigate four science curricula as they relate to the proposed curriculum, *Playful Sciencing*. This proposed curriculum is based on the constructivist theory of play of Piaget (1962) and Vygotsky (1967, 1978).

Theories of Play

Piaget

Piaget believed that learning takes place through constructivist processes. Constructivist education takes its name from Piaget's research showing that children actively interpret their experiences in the physical and social world, therefore constructing their own knowledge, intelligence, and morality. Piaget believed that knowledge and skills are built through a slow, continuous process of construction. Through this process children modify understanding they bring to each situation. Children assimilate; i.e., take in information and using this information with no adaptations, and children accommodate, i.e., they adapt their current information to what is already known and understood.

Piaget created a "model of the development of thinking that incorporates aspects of adaptation: changing the environment to meet one's needs, assimilation and changing oneself to meet the demands of the environment, accommodation" (Piaget, 1962). Piaget poses an interactive process between two aspects of adaptation, which he calls assimilation and accommodation. This interaction is the source of development and learning (Piaget, 1962).

Piaget viewed the growth of cognition as one area of development in which the role of play/hands-on exploration in constructing knowledge is most clearly articulated (Piaget, 1962). Piaget's theory is strongly tied to the study of play/hands-on exploration. Piaget saw play/hands-on exploration as an important and necessary vehicle for children's cognitive development. Piaget believed that the purpose of play/hands-on exploration was to assimilate activities (Berk & Winsler, 1995; Kagan, 1990), incorporate mental structures, practice newly formed representational ideas, and construct meaning from their experience.

Ref: Through the process of assimilation, new elements of experience are incorporated into the existing thought structures. These elements are transformed by the child's thinking process to fit into the structure of that child's thinking.

Accommodation, on the other hand, allows the structure of the child's thinking to change when adapting to a new experience. Accommodation is the process through which new schemas are created, or existing thought patterns are changed in order to incorporate new information.

The assimilation process allows children to consolidate, generalize, and apply their current structures of thinking to new situations and materials. The accommodation process challenges children to change and adapt their mental structures in light of this newly acquired information.

According to Piaget, constant interaction occurs between these processes, and it is through the interactions of assimilation and accommodation that children balance their internal states and meet their personal needs for intelligent adaptation (Piaget, 1962).

The underlying view of Piaget is that children actively construct their own knowledge. Piaget saw the capacity to work developing out of hands-on exploration. In Piaget's view, hands-on exploration becomes more reflective of reality, developing in the direction of constructive activity or work (Piaget, 1962). When children touch and experience the world "hands on," this leads to physical/logico-mathematical knowledge. In this view, action is not just physical, but mental as well. As children observe an objects' reactions, they are constructing logico-mathematical knowledge. For example, a child pushes a ball and observes that it rolls. This is demonstrating physical knowledge. However, the child pushes a cube and notices that it moves differently from the ball. This relation of "difference" is not in the ball or the cube, but in the mind of the child who places them in this relation. One can think simply of the ball or the cube without thinking of the difference between them. Logico-mathematical knowledge can be said to make up the general framework of intelligence. The teacher provides experiences through which children can reorganize their own knowledge. Therefore, the best way to promote children's construction of knowledge is to engage their interest, inspire active experimentation with all its necessary errors, and to foster cooperation between adults and children and among children themselves. Piaget wrote:

> In the course of its own internal development, the play of small children is gradually transformed into adapted constructions requiring an ever-increasing

amount of what is in effect work, to such an extent that in the children's classes of an active school every kind of spontaneous transition may be observed between play and work (1969-1970).

Children's increasing ability to organize information means that their play with other children increases in complexity. The very nature of play changes from orientation to objects to organized themes of social exchange (White, 1975). This play can also be described as child's work. Such a constructivist view of development seeks a curriculum that requires more direction from the child and less from the teacher; hence, a child-centered curriculum. The teacher's responsibility in a child-centered curriculum leans more on setting up the environment for learning and supporting children's interactions with it.

Vygotsky

Vygotsky, as Piaget, has a constructivist approach, but with a difference. Vygotsky believed that the increasingly complex mental activities of the child were derived from social and cultural contexts. Unlike Piaget, Vygotsky believed that through play children construct new schemata. In other words, Vygotsky (1933/1966) believed that play is the process through which the cognitive development of the child is advanced. Vygotsky saw play as a means of developing abstract thought and he saw play as the leading source of development in the preschool years.

Not only did Vygotsky see play as a means of developing abstract thought, but he also saw play as a scaffold for the child. Scaffolding, also known as guided participation, is the idea of supporting children to take steps they might not be able to take without adult intervention. Scaffolding promotes a warm, pleasant collaboration between teacher and a child while the two are engaged in a joint problem solving activity.

During this collaboration the adult supports the child's autonomy by providing sensitive and dependent assistance, facilitating children's thinking, and prompting children to take over more responsibility for the task as their skill increases. It is scaffolding techniques that consistently predict increased learning and positive outcomes in children.

Scaffolding is best conducted in the Zone of Proximal Development. In addition to scaffolding via others, play creates this Zone of Proximal Development.

Play contains all developmental tendencies in a condensed form; in play it is as though the child were trying to jump above the level of his normal behaviour.

The play-development relationship can be compared to the instruction-development relationship, but play provides a background for changes in needs and in consciousness of a much wider nature. Play is the source of development and creates a zone of proximal development (Vygotsky, 1933, p. 552).

As children mature, their social world becomes richer. At first they watch an adult and try to imitate the adult's every movement. When they are three, they pretend to be adults and begin to demonstrate a certain amount of creativity. By age four, the roles they play become more defined and differentiated; an angry adult, a sad adult. Beyond four they create new roles, new people, and perhaps imaginary playmates that satisfy in pretense those needs that are not satisfied in real life (Sutton-Smith & Sutton-Smith, 1974).

Vygotsky believed that play creates this zone of proximal development (ZPD) in the child. The zone of proximal development is the distance between the child's actual developmental level of independent problem solving and the level of potential development of problem solving with adult guidance or working with more capable peers. The Zone of Proximal Development was regarded as a better, more dynamic and relative indicator of cognitive development than what children accomplished on their own. "The only good learning is that which is in advance of development" (Vygotsky 1978, p. 89). Vygotsky believed that through guidance and support, children actively construct new cognitive abilities.

In play, the child behaves beyond his average age, above his daily behavior. In play, it is as though he were a head taller than himself. Play contained all development tendencies in a condensed form and is a major source of development (Vygotsky, [1930-1935] 1978). In this view, a curriculum using Vygotskian concepts would take a bi-directional approach involving teacher-child interaction in planning and implementing the curriculum. In other words, the teacher sets up the environment, initiates the discussion and the continuance of the discussion/theme is based on the child's interest and input. This Vygotskian approach is the adult scaffolding the child. This approach can be taken to a higher level involving the adult scaffolding the adult or so called in-service mentoring.

Guided Discovery

Vygotsky and Piaget believed in the constructivist approach to learning for young children. Piaget held that children actively construct their own knowledge, whereas, Vygotsky believed that learning was accomplished in a social context.

Guided discovery, as defined by Rogoff, holds onto the Vygotskian concept of the zone of proximal development and also incorporates Piaget's ideas about active learning. In guided discovery children play a more active part in their interactions with adults (Rogoff, 1990; Rogoff & Gauvain, 1980; Rogoff & Gardner, 1984), incorporating Piaget's ideas about active learning. Rogoff describes children's interactions with adults using the model of guided discovery, in which children observe and participate in activities, making requests of adults to support them in activities they wish to engage in.

The notion of Guided Participation as stated by Rogoff (1990) involves collaboration and shared understanding in routine problem-solving activities. Interaction with other people assists children in their development by guiding their participation in relevant activities, helping them adapt their understanding to new situations, structuring their problem- solving attempts, and assisting them in assuming responsibility for managing problem solving . . . .Routine arrangements . . . guide children's increasingly skilled appropriate participation in the daily activities valued in their culture (1990,p. 191).

In other words, this model of guided discovery includes four processes. The first process is choosing and structuring children's activities, in which the teacher sets up the environment for optimal learning. The second process is assisting children in their adaptation to new situations, i.e., giving hints. The third process is structuring responsibility in joint problem solving, in which the teacher pairs up a more capable student with a less capable student. The fourth process is transferring responsibility for managing the activities, in which the teacher's role becomes more of a facilitator in the learning process (Mayer, 2004). This process of structuring in joint problem solving includes scaffolding (Bruner, 1983, 1985; Wood et al., 1976; Wood & Wood, 1996) which enables children to complete activities they are unable to complete without assistance. Vygotsky's ideas are stimulating a host of new ways to educate young children that emphasize opportunities for discussion and joint problem solving (Berk, 1992).

Some experts contend that the constructivist view of learning may be supported best by methods of instruction that involve instructional guidance with a focus on curriculum. Although constructivism takes many different forms (Mayer, 2003; Phillips, 1998), an underlying premise is that learning is an active process in which learners seek to build coherent and organized knowledge. Hence, students must be active during learning. In this view, active learning encompasses group discussions, hands-on activities and interactive games.

A review article written by Richard Mayer (2003) discussed four studies which compared two views of learning: 1) pure discovery, in which students have maximal freedom to explore, and 2) guided discovery in which the teacher provides systematic guidance focusing on the learning objective. Throughout this thesis it was apparent that children seem to learn better when they are active and when a teacher helps guide their activity in productive directions.

In a book summarizing research on discovery methods, Shulman and Keisler (1966) found that guided discovery is more effective than pure discovery in promoting learning and transfer to new problems. Guided discovery is effective because it helps students meet two important criteria for active learning. One criterion is that students are able to construct appropriate knowledge to be used when making sense of new incoming information and the second criterion is that students are able to integrate new incoming information with an appropriate knowledge base. Pure discovery can be ineffective in that students may not come into contact with the to-be-learned principle and therefore have nothing to integrate with their knowledge base. In other words, Guided Discovery is more effective than Pure Discovery in promoting student learning.

The following three studies found in the summary article written by Richard Mayer (2003) support the Guided Discovery method of instruction. A study conducted by Craig (1956) investigated how to help students learn to solve logical problems, such as finding the word that doesn't belong among CYCLE SELDOM SAWDUST SAUSAGE CELLAR. Two methods of instruction were used; Pure Discovery in which students had maximum freedom to explore and Guided Discovery in which the teacher provided systematic guidance focused on the learning objective. Students in the Pure Discovery group were given no hints; however, students in the Guided Discovery group were told what to look for (e.g. the initial sound). The Guided Discovery group with the use of giving hints learned, remembered, and transferred to new problems more efficiently than the pure discovery group.

In another study found in the article written by Richard Mayer (2003) Kittel (1957) used similar problems, but in addition to a Pure Discovery group (in which students were given no hints) and a Guided Discovery group (in which students were given a hint about the general rule for each set of problems), there was also an Expository Group that received the rule and the correct answer for each problem. The study found that the Pure Discovery group performed the worst and the Guided Discovery group performed the best on tests of immediate retention, delayed retention and transfer to solving new problems.

Finally, in a study by Gagne and Brown (1961), where students learned to derive formulas and solve sum problems such as how to compute the sum of "1,3,5,7,9..." and write corresponding formulas. Students learned by pure discovery, guided discovery, or expository methods. It was found that although students in the guided discovery group required the most learning time, it resulted in the best performance on solving transfer problems. Children seem to learn better when they are active and when a teacher helps to guide their activity in productive directions.

In summarizing the review article written by Richard Mayer (2003), Guided Discovery is a more effective learning strategy than Pure Discovery. It seems that some students do not learn the principle under Pure Discovery methods (without hints), so some amount of guidance is required to help students mentally construct the desired learning outcome. Students need enough freedom to become cognitively active and students need enough guidance so that their cognitive activity results in the construction of knowledge. Various forms of guided discovery seem to best meet these needs. The findings on Guided Discovery being a better learning strategy than Pure Discovery are consistent with Vygotsky's concept of scaffolding in which children are supported to take steps they may not be able to take without adult or peer intervention. Still other components of this concept of scaffolding are the facilitation by an adult and prompting children to take over more responsibility for the task.

In more detail, Guided Discovery incorporates three processes. The first process is choosing and structuring children's activities (i.e. hinting), as supported by the study conducted by Craig (1956). The second process is structuring responsibility in joint problem solving, as found in the Kittel's (1957) study. The final process is transferring responsibility for managing the activities, which is consistent with the study by Gagne and Brown (1961).

In this view of Guided Discovery methods, cognitive change results as children participate in intelligent actions alongside more experienced partners, whether these be adults or peers. The child becomes the full participant. In many ways, Guided Discovery seems to offer the best method for promoting constructivist learning.

Based on the research documenting the positive learning outcomes of the Guided Discovery method, incorporating the theories of Piaget and Vygotsky, this project will thereafter use "playful" as a term used to support the two theories of play. In other words, play is derived from the hands-on exploration based on Piaget, scaffolding based on Vygotsky, and Guided Discovery, which is a culmination of the two theorists. In more detail, the curriculum is designed to promote a play-based environment. In order to support this concept of play, the environment and the curriculum need to be in place. The success of these two components is contingent on the effectiveness of the teacher as it pertains to setting up the environment and planning the curriculum.

The curriculum of this project focuses on sciencing. Sciencing is the active exploration of the surrounding environment. The quality training of the teachers plays an important role in the success of the playful sciencing.

This project will first focus on sciencing, followed by teacher training.

The following section examines "sciencing" in early childhood classrooms, supporting research and the benefits of using the methods of guided discovery; hands-on experiences combined with adult guidance and scaffolding

Sciencing

The term "sciencing" refers to the child's active participation in learning about science and emphasizes process over product. "Sciencing" is a hands-on, brains-on approach. The three goals of "sciencing' with young children are: 1) To develop each child's innate curiosity about the world around him, 2) To broaden each child's thinking skills for investigating the world, solving problems and making decisions, and 3) To increase each child's knowledge of the natural world (Seefeldt & Galper, 2002).

Young children are more scientists than they are anything else (Zim, 1955). The study of the world is precisely compatible with the nature of children. Children are biologically prepared to learn about their world.

Above all else, this is where science education should begin.

Science is thinking and doing and making the two go together (Holt, 1988). A child physically involved remains the core of science activities for young children (Holt, 1988). Children starting preschool bring with them a sense of wonder and curiosity about their world. Children are highly engaged when they have the opportunity to explore. Strong mental representations of what they have experienced through investigation are created. Vocabulary to describe and share these mental representations and the evolving concepts are acquired. Children are then able to rely on these mental representations as the basis for further learning and for higher intellectual skills such as problem solving and hypothesis testing.

Research has shown that those children who experience the most success and, who carry the love for science and technology into adult life, are those whose early years were spent observing, analyzing, and experimenting in as many ways as possible (Barron, 1996).

With science, as with any other subject, young children learn best by doing. As any scientist knows, the best way to learn science is to do science. In the preschool classroom science needs to be an active, hands-on, open-ended search for new knowledge. Children need to see what goes on. They need to be encouraged to use their senses and their hands and their minds to perceive what happens, to predict what will happen next, to present their findings, and to pose new questions. They can't do this if they just see the end product; they need to see the entire process.

Young children, like scientists, need opportunities to practice cognitive processing skills of predicting, observing, classifying, hypothesizing, experimenting, and communicating (French, 1996). Children need opportunities to reflect on their findings, how they reached them, and how these findings compare to their initial ideas. In doing so, children are encouraged to develop the attitude of a scientist, the curiosity and the desire to challenge what is believed to be true and to share new ideas (French, 1996).

Sciencing, as it is defined, is teaching science using the principles of guided discovery (French, 1996). These principles include hands-on activity, scaffolding, discussion, and free exploration. Within a science curriculum there needs to be opportunities for adult-child interactions that promote learning through trial and error strategies. Children need opportunities to inquire, question, make decisions, and work cooperatively with adults and peers in problem solving activities. When it comes to science education, children are much more likely to construct meaning and to make learning relevant to the real world when they are actively involved. The visions of both state and national standards validate the belief that science is an ongoing process, which empowers children to construct their own knowledge.

Currently there are several early childhood education science programs in existence that follow the principles of guided discovery. These include "Mudpies to Magnets," "Sandbox Scientist," "The Young Scientist Series," and "Science Start!"

Mudpies to Magnets

The first science curriculum; MUDPIES TO MAGNETS was designed to teach science in every part of the classroom, with special attention given to the science center, the heart of the science program (Williams, Rockwell, & Sherwood, 1987). This curriculum focuses on children between the ages of two to five years.

Science, defined by this curriculum, is knowledge gained through the use of observation, study, and experimentation. The role of the teacher is to find out what the children already know and to work from there. The approach to teaching is child-directed, allowing the children to work at levels appropriate to their skills, interests, and needs. The teacher creates a program that covers a wide range of topics, includes repetition, and occurs in a sequence allowing for growth and development.

The MUDPIES TO MAGNETS science manual is divided into nine sections: 1) On your own science center activities, such as, minimuseums, pill bug palace, and dancing droppers. 2) Building with science, construction and measurement, which includes, balancing toys pulley into line, and Can I Make a Shape? 3) Science for group, circle time activities, including, rainbow in a jar, bags of energy, and What's That Sound? 4) Paints and prints, scientific art, such as, color my petals, eye dropper art, and rainbow stew 5) Wet and messy; science for the special place, which includes, the dunking raisins, egg carton rainbows, and floaters and sinkers 6) Science to grow on; health and nutrition, activities include, body game, good and juicy, and My, How You Have Grown 7) Learning about nature, outdoor science, which includes, collect mural, shirts in the sun, and leaf catchers 8) Acting out science in a big way; creativity and movement, such as, dance a garden, sensitive toes, and stepping out, hop, skip, jump and 9) Hodge Podge, where children are given the experiences of building tornados in a jar, oceans in a jar, and critter cages.

The above mentioned nine sections are included in the following four topic areas for learning; 1) Matter and Energy, which includes, heat, wind, electricity, motors, sound, magnetism, growth, and friction. The second section, entitled The Earth, includes, rocks, soil, sand, air, water, and metals. The third section, The Cosmos, includes, sun, moon, stars, and space exploration, and finally the fourth section, Living Things includes, plants, animals, growth, change, seasons, and the human body.

Each topic area develops deeper into words you can use, things you will need, what to do, and want to do more? Also included are illustrations and a brief description of the topic to be discussed with the children.

<u>Sandbox Scientist</u>

Sandbox Scientist, a second curriculum by Michael Ross (1995) offers *Real Science Activities for Little Kids*. This curriculum of science activities follows the principles of developmentally appropriate practice recommended by NAEYC. The philosophy is one in which children make their discoveries through creative activity. They experience and experiment.

Sandbox Scientist uses the guided discovery approach to learning, which involves active learning and scaffolding. Activities must be presented from a constructivist perspective in that the children and adults need to form a hypothesis and keep trying them out through physical manipulatives and social interactions. This process often resembles play. Michael Ross, the Author of Sandbox Scientist, demonstrates how the experience that comes from the activities is more important than the activity itself. It is process rather than product.

This curriculum is divided into ten sections: 1) Water, 2) Matter, 3) Air, 4) Light, 5) Mechanics, 6) Building, 7) Little Critters, 8) Kitchen science, 9) Outdoors, and 10) Parting words. Within each section is a brief description, the activity itself, the set-up, materials needed, the science explaining what the children actually do, and, finally, an illustration of an actual classroom experiencing the process of science inquiry.

Sandbox Scientist also includes a Kid Science Library, which offers educators titles and descriptions of books to be used in the science lesson. The Appendix gives suggestions as to where to get supplies and tools and gives directions regarding how to make devices to add to the science experience.

The purpose of Sandbox Scientist is to introduce science to children between the ages of two to eight years. Sandbox Scientist describes topics related to science, explains events from a scientific point of view, tells how to set up activities, and relates actual anecdotes that Michael Ross observed as children interact with the scientific experience.

A large portion of this curriculum is what Michael calls, "Kid Watching." Michael encourages teachers to watch children and record what they do, and where their interests lie. In doing so, according to Michael, true sciencing begins, as the teacher begins to facilitate further explorations.

Both Mudpies to Magnets and Sandbox Scientist are based on the components of guided discovery, the use of active learning, and scaffolding. In other words, the curriculum is child-centered, and builds on the child's prior knowledge. Both incorporate themes into their daily lessons. Sandbox Scientist has the added component of child-science library, providing teachers the needed resources. The following curriculum, The Young Scientist Series also incorporates themes and the guided discovery component. In addition, this curriculum explains to teachers, in more detail, the scientific process of exploring the child's world and also introduces stages needed to prepare the physical environment.

<u>The Young Scientist Series</u>

The Young Scientist Series, the third science curriculum, was created by Ingrid Chalufour and Karen Worth (2003). The Young Scientist series is a science curriculum for children between the ages of 3-5 years. This curriculum includes; 1) *Discovering Nature with Young Children* in which children observe and learn about plants and animals on the playground and in their classrooms, 2) *Exploring Water with Young Children* which encourages children to examine the properties of water, and 3) *Building Structures with Young Children* which "engages children in investigating the relationships between building materials and design and the strength and stability if the structures," (Chalufour, & Worth, 2003).

The goal of this curriculum is to help the child to understand the natural world. Science, according to this curriculum, is more than knowledge; it is also a process of exploration called science inquiry. The curriculum includes a teacher's guide, which provides background information and detailed guidance on how to incorporate science into the daily program using classroom materials. Each study can take several months to complete.

The Young Scientist series incorporates a hands-on approach to science inquiry, and creates the curriculum based on the child's prior experiences. Both are major components of the guided discovery approach to learning.

Each session includes 3 stages; getting ready, which helps the teacher prepare the physical environment and to think about routines to support children's inquiry. The second stage is titled Open Exploration. During this stage, children explore the indoor, as well as, the outdoor environment. The teacher sets the stage for this exploration, which may include creating a terrarium of live creatures for discovery. In the third stage, focused exploration, children are encouraged to further explore living things. The teacher's role is that of facilitator to deepen children's understanding by asking questions and creating opportunities for discussion.

Science inquiry, according to The Young Scientist series, involves four processes 1) engage, notice, wonder, and question, 2) focus observations, and clarify questions, 3) explore, investigate, and 4) share, discuss, and reflect with the group, draw conclusions, and formulate ideas and theories.

The purpose of these explorations is to encourage children to use their senses through observation. At this stage children learn to use basic tools, such as hand lenses, to help them to become better observers.

The Young Scientist Series conducted a national field test from 2001-2002, in which nineteen early childhood programs participated, including Head Start, Pre-K, childcare centers, and private nursery schools. Program directors, educational managers, and curriculum coordinators from these programs planned and implemented the training activities. Ninety teachers participated in the workshops and used the teacher's guides in their classroom. Results revealed that participants in this test reported evidence of science learning in children's questions, observations, and discussions.

Science Start! Curriculum

Finally, Science Start! Curriculum is an early childhood curriculum was created to meet the need for developmentally appropriate preschool programs. It was developed based on what is known about young children's developmental strengths and limitations during the early childhood years. Science Start! Curriculum bases its philosophy on Piaget's emphasis on the child's construction of knowledge and Vygotsky's emphasis on the day's science activity. Science Start! uses the approach of asking open- ended questions and integrates many 'non-science' activities to the leading science activity. The science activities are also related to math and social studies, art and dramatics, reading and writing centers, blocks and manipulatives.

The implementation of Science Start! in preschool classrooms has clearly shown that science instruction at the preschool level that uses a focused and structured approach can lead to enhanced knowledge about the world, creating an approach to asking and answering questions about the workings of the world, and enhancing development in the areas of language and early literacy, while incorporating Piagetian and Vygotskian principles.

The leading science activity of the day is introduced at large group time and begins with the teacher reading a book related to the day's science activity. Large group time is followed by small group free choice time. Children are free to explore the science activity, typically with adult support. Other activity centers incorporate the science activity. The reading center includes a variety of theme related books.

An extremely important component of Science Start! is the role of the adult in the classroom. This science curriculum is built on the assumption that adult guidance can enrich children's learning while building on the child's competence and motivation to learn about their everyday world. This Vygotskian view holds that children's learning is accomplished through the social interaction of a more knowledgeable person (e.g., Vygotsky, 1978).

Between 1995 and 2001, 195 children attending Head Start programs participated in the Science Start! Curriculum. The children were assessed on the Peabody Picture Vocabulary Test at the beginning and at the end of the school year. Over the 7-month period, the mean score rose from 79 to 87. Gains were also realized in receptive vocabulary.

Science Start! incorporates themes and the guided discovery components, as the other three curricula. Science Start! and the Young Scientist Series both include the scientific model, and the role of the teacher in the classroom. Although many components of Science Start! (i.e., Guided Discovery, scientific model, module/theme) are closely related to the proposed curriculum, Science Start! does not incorporate teacher training. Thus, this proposed curriculum will emphasize the importance of teacher training as a critical component in the science experience. The following chart is a summary of the four science curricula as they relate to the proposed curriculum, *Playful Sciencing and the Early Childhood Classroom*.

Table 1. Sciencing Components

Components Curricula	Guided Discovery	Playful/Hands-on Exploration	Use of Themes	Teacher Training
Mudpies to Magnets	*	*	*	
Sandbox Scientist	*	*	*	
The Young Scientist Series	*	*	*	
Science Start!	*	*	*	
Sciencing and the Early Childhood Classroom	*	*	*	*

Teacher Training

In addition to incorporating aspects of Guided Discovery (as the other science curricula have), *Playful Sciencing and the Early Childhood Classroom* also incorporates specialized training for teachers.

A review article written by Kontos and Wilcox-Herzog (2001) found that teachers with more education and training were more sensitive to children, made more suggestions to children than teachers with less education and training. The studies in this review article also showed that trained and educated teachers were more likely to enhance children's verbal skills and demonstrate responsive involvement with children. This same article summarized that the quality of the classroom correlates with teachers' formal education. Furthermore, specialized education has been shown to be causally related to overall classroom quality. The effectiveness of teacher behavior also is influenced by specialized education. However, there is weak link between teacher experience and the classroom environment and teacher behavior. This finding supports the major contribution of the proposed curriculum in-service teacher training. That is, teacher experience alone is not enough to ensure classroom quality; training and education are necessary components.

A study by Howes, James, and Ritchie (2003) examined pathways to effective teaching within a group of 80 teachers working in childcare programs serving low-income children. Teachers participated in both the observation and interview portions of the study. Interviews were conducted with the lead teacher in the observed classroom. Teachers and classrooms were observed for a total of 3 hours. One observer completed the Caregiver Interaction Scale (Arnett, 1989). The purpose of this scale was to measure the sensitivity of teacher interactions with children. The second observer completed the Adult Involvement Scale (AIS; Howes & Stewart, 1987). This scale measured the point of interaction between the teacher and the focus child for three focus observations. The scale is based on a 6 point system of coding that defines the nature of the teacher's involvement with the child every 20 seconds. The observations took place when the teacher was three feet from the child. The scale points ranged from being ignored to routine care, such as feeding or toileting without any verbal interaction. In order to complete the AIS one boy and one girl were randomly selected. Teachers were interviewed regarding their formal education and training received in ECE.

Less than 25% of the teachers in the study had BA degrees or higher. Twenty percent had preservice training, and almost all of the teachers with preservice experiences were at the BA level. Preservice training is defined as specialized training prior to their teaching experience. Over half of the teachers had been mentored.

This study found that, on average, the participating teachers were responsively involved, engaged with children and created interesting learning activities. The study also found that teachers who were mentored in their early years of teaching were more likely to become effective teachers. The participants with BA degrees and with the mentoring experience were more effective teachers, more effective in their responsive involvement and in being engaged with children in activities that promote language development and emergent literacy. Secondly, and of equal importance, is the finding that teachers without BA degrees who had been mentored and supervised were no different in responsive involvement and engaging children in emergent literacy than the teachers at the BA level. This study clearly demonstrates the need for teacher development to enhance teacher performance. Even though education (BA) is a very important component, training of teachers can be just as effective for teachers in enhancing children's development. Hence, this finding on the importance of training supports the need for monthly in-service trainings, the unique component of the proposed playful Sciencing Curriculum.

The purpose of File and Kontos' (1993) study was to determine which types of program quality were associated with children's play behavior. The three types of program quality measured were structural, global, and dynamic/process quality. Structural quality was assessed by obtaining information about adult-child ratio, group size, and teacher qualifications (which include teacher training, education and experience). Global quality was based on ratings of the environment using the The Early

Childhood Environmental Rating Scale (ECERS). The ECERS assesses seven components of the environment: Space and Furnishings, Personal Care Routines, Language-Reasoning, Activities, Interaction, Program Structure, and Parents and Teacher. Dynamic process quality was measured using time-sampled interactions between child and teacher during the free-play period. Two children from each classroom were observed for 10-second periods, with a 20-second recording period following each observation. Child-teacher interactions were recorded. Twenty-eight children and their teachers were observed in integrated preschool classrooms. Children's behavior was assessed through the observation of frequency and level of play.

This study showed a positive association between specialized training in early childhood and teacher support of children's play. Results showed that teachers with more specialized training were more supportive of children's Play: however, this finding was in relation to children's use of toys and materials and not to their play with peers. The positive correlation between specialized training and the child's cognitive performance suggests that teachers with more specialized training may be more likely to facilitate children's cognitive abilities. This finding may be due to the fact that cognitive development is the major emphasis in teacher preparation courses (Clarke-Stewart, 1987). Again, this study supports the need for specialized, in-service trainings in enhancing the developmental growth of children in early childhood settings.

A third study by Norris (2001) examined the differences in the quality of care offered by providers who never participated in in-service trainings, providers who occasionally participated in in-service trainings, and providers who continuously participated in in-service trainings. Quality of care was assessed using the Family Day Care Environment Rating Scale (FDCERS) (Harms & Clifford, 1989). The FDCERS is a seven point rating scale used to measure the quality in family childcare homes. This instrument has six subscales: space and furnishings, basic care, language and reasoning activities, learning activities, social development, and adult needs. Seventy licensed family childcare providers were recruited from five counties in California. The average provider was a married European-American female, aged 37.5 years.

Each home was visited for approximately two hours. During the visit the providers were given a background questionnaire to complete. The questions focused on their training and education history. Observers completed the FDCERS during the visit.

Results showed that providers with fewer years of experience, but with more formal education and higher in-service attendance offered better quality care as measured by the FDCERS. The significance of these results clearly demonstrates that ongoing participation in in-service trainings and advanced degrees has a positive impact on the quality of care and provider's interactions with children. Once again, this study supports the need for in-service trainings in enhancing the quality of care and the provider's interactions with children.

A fourth study used a pre-test and post-test design (Cassidy & Buell, 1995). This study examined the influence of teacher education and teachers' beliefs on classroom quality. Thirty-four participants (19 scholarship teachers and 15 comparison teachers) completed a pre-test and a post-test using the Early Childhood Environment Rating Scale (ECERS) or the Infant-Toddler Environment Rating Scale (ITERS). The scholarship teachers received scholarship funds to attend a community college program in Early Childhood Education. The comparison teachers had no college level education. The scholarship teachers took courses between the pre-test and post-test. The findings revealed that scholarship teachers who received scholarships to attend a community college program in child development and ECE had significantly improved classroom scores on their ECERS or ITERS than the comparison teachers. In more detail, the classroom quality score of the scholarship teachers had increased approximately .5 or more on the post-test of the ECERS or the ITERS. This study, again qualifies the importance of teacher education/training, which is emphasized in the proposed curriculum.

The above four studies on teacher education/training strongly support the importance of in-service trainings in improving classroom quality, specifically as it pertains to the ECERS, FDCERS and the ITERS.

In addition there is some evidence that education and training may impact teacher knowledge of developmentally appropriate practice. Snider and Fu (1990) examined the relationship between DAP knowledge and college degrees, supervised field experience, early childhood education (ECE) courses completed, and years of employment in child care. Seventy-five teachers participated in the study. The teachers were employed in licensed childcare centers with 3-5 year old children.

The teachers were asked to complete a report including the title of their present position, length of time in that position, titles of past positions, and the length of time spent at each of these positions. The second section included a checklist participants needed to complete checking off the highest level of education completed. In the third section participants were asked to check all content areas covered in college courses. The content areas covered: (1) General Education, (2) Child Growth and Development, (3) Curriculum, and (4) Supervised practicum.

The results of this study showed that the factors having the most effect on teacher's knowledge of developmentally appropriate practice are education in ECE, the number of ECE content areas completed, and supervised practical experience. These results, again, support the importance of supervised practical experience and training in helping teachers acquire knowledge regarding developmentally appropriate practice. In turn, research suggests that the knowledge gained from supervised experience and trainings will enhance classroom quality as measured by tools such as the ECERS. Given these findings, the Playful Sciencing Curriculum incorporates in-service trainings in an effort to maximize children's learning and overall classroom quality.

In general, the findings in the above five studies clearly reveal that teacher education is a critical component in ensuring a quality environment in early childhood classrooms and maximizing children's development. Although teacher education has been proven to enhance the classroom environment, in-service teacher trainings may also be effective in promoting classroom quality. Not only do in-service trainings promote classroom quality, but also trainings in early childhood education and adult scaffolding (modeling) are found to be needed variables to improve classroom quality. Therefore, embedded in the proposed in-service training is a monthly, two-hour, in-service training incorporating adult modeling.

The proposed in-service training is a monthly two-hour training. There are nine components of this training framework: (1) Curriculum Goal, (2) Theme Selection, (3) Special Activities, (4) Material Selection, (5) Setting Up Environment, (6) Discussion Ideas, (7) Curriculum Demonstration, (8) Lesson Planning, and (9) Group Evaluation. This model is similar to the findings of Snider and Fu (1990) on the five critical content areas as related to teacher training. The five areas are: assessing DAP content, selecting materials, setting up the environment, modeling the curriculum, and overall assessment.

Playful Sciencing and the Early Childhood Classroom

Playful Sciencing and the Early Childhood Classroom is a hands-on, playful, theme based approach exploring the child's surrounding world. This curriculum incorporates the concepts of Guided Discovery and in-service teacher training. Guided discovery is a major concept of *Playful Sciencing and the Early Childhood Classroom*. It is through adult support that children are able to receive maximum benefit from their active exploration. *Playful Sciencing and the Early Childhood Classroom* builds on the assumption that adult guidance will enrich children's active involvement with the environment while building on the child's competence and motivation to learn (French, 1996).

Scaffolding usually refers to the relationship between teacher and children, or children and children (i.e., peer). This proposed curriculum introduces hands-on adult-adult scaffolding (i.e., Director-Teacher scaffolding). In other words, the Director-Teacher scaffolding may be referred to as mentoring. Consequently, embedded in the proposed in-service training is a monthly, two-hour, training. This in-service training will be discussed further in the material section.

The Playful Sciencing Curriculum is divided into two modules: Natural Science and Physical Science. Each module lasts approximately 5 months. The Natural Science module consists of five themes. The Physical Science module consists of 10 themes. The following is included within each theme (Appendix A):

- Discussion Ideas
- Special Activities
- Art Ideas
- Literacy Ideas

CHAPTER TWO

METHOD

Participants

Participants are four Anglo and two Hispanic females recruited from the Riverside Community College Child Development Center at the Moreno Valley Campus. The participants are five preschool teachers and one Director. The program services both a half-day and full-day program. The children are between the ages of two to five years. The age of the participants range from 22-48 years. All participants are English speaking. The educational background includes Child Development Permits at the Associate Teacher level (12 units in Early Childhood) to B.S. degrees in Human Development. The years of experience in the field of Early Childhood ranges from eight months to fifteen years.

Materials

Playful Sciencing and the Early Childhood Classroom Curriculum

The Sciencing Curriculum (Appendix A) is divided into two modules: Natural Science and Physical Science. Each module lasts approximately 5 months.

The Natural Science module consists of:

- All About Me, Domestic Animals, Insects/Spiders, Trees/Leaves/Nuts/Fruits, and The Five Senses.

The Physical Science module consists of:

- Weather, Weights/Measures, Magnets, Space, Physiology, Birds/Eggs/Nests, Seeds/Flowers/Plants, Wild Animals, Prehistoric Animals, Sea Life.

Playful Sciencing and the Early Childhood Classroom consists of weekly themes including (Appendix A1):

- Discussion Ideas
- Special Activities
- Art Ideas
- Literacy Ideas

Training Manual

The Training Manual (Appendix B) is designed to train the Trainees (i.e., Director and Teachers) using sciencing strategies to incorporate when introducing science to an early childhood classroom. The proposed training is a bi-monthly, two-hour training. The training manual will offer a brief introduction/overview, and set the framework of the training. There are nine components of this training framework (Appendix B1); (1) Curriculum Goal,

(2) Theme Selection, (3) Special Activities, (4) Material Selection, (5) Setting Up Environment, (6) Discussion Ideas, (7) Curriculum Demonstration, (8) Lesson Planning, and (9) Group Evaluation.

An Event Calendar (Appendix B2), Special/Center Activities Chart (Appendix B3), Discussion, (Appendix B4), a Playful Sciencing Lesson Plan (Appendix B5), the selected themes of Insects/Spiders (Appendix B6), and Birds/Eggs/Nests (Appendix B7) will be provided during the training sessions.

An Author-Director training manual (Appendix B8), and a Director-Teacher training manual (Appendix B9) were developed based on the Training format. The purpose of the training manual is not only to ensure continuity of training between the focus groups (i.e., Director, Teachers), but it is individualized to meet the needs of each group. The only difference between the two manuals is the focus audience (i.e., Director, Teachers).

The initial training will be between the Author and the Director using the Author-Director Training. The Director will, then, train the teachers using the Director-Teacher Training Manual.

Sciencing with Teachers and Children Questionnaire

The purpose of this questionnaire is to evaluate the effectiveness of the Playful Sciencing Curriculum as it pertains to the in-service training. The questionnaire consists of 7 questions rated with a Likert scale where 1 is rated Always and 5 is rated Never. The following are two examples of the questionnaire:

1. Was the mentoring portion of the curriculum helpful?
2. Was the theme workable?

The questionnaire will be distributed to the Director at the end of each Author-Director Training. The questionnaire will also be distributed to the teachers at the end of each Director-Teacher Training.

Demographic Information Form

The purpose of the demographic information form is to learn more about the participants. The participants will be asked to complete a list of questions that include age, gender, marital status, number of children, education level and years of experience in the early childhood field.

Procedure

The Author will train the Director of The Riverside Community College Child Development Center, Moreno Valley Campus on the implementation of *Playful Sciencing and the Early Childhood Curriculum* in the classroom. The Author will train the Director using the Author-Director training manual (Appendix B8). The Director, in turn, will train the teachers using the Director-Teacher training manual (Appendix B9).

The Author will attend the initial training conducted by the Director to ensure the training continuity. Upon completion of the implementation of the first theme (i.e., Insects/Spider) in the classroom, the Author will meet with the Director to refine the training strategies.

Before the training begins, the director and the teachers of the Riverside Community College Child Development Center, Moreno Valley Campus, will complete a consent form. Upon completion of each Author-Director training, an evaluation questionnaire (i.e., Sciencing with Teachers and Children Questionnaire, Kirby, 2005) will be completed by the director. Upon completion of each Director- Teacher training, an evaluation questionnaire (i.e., Sciencing with Teachers and Children Questionnaire, Kirby, 2005) will be completed by the teachers. The questionnaire will take approximately 20 minutes to complete.

Training Manual

Overview

The proposed Sciencing Curriculum is based on research documenting the positive learning outcomes of the Guided Discovery method, incorporating the theories of Piaget and Vygotsky.

Learning is derived from the hands-on exploration described by Piaget, scaffolding outlined by Vygotsky, and Guided Discovery, which is a culmination of the two theorists. In more detail, the curriculum is designed to promote a play-based environment.

Guided Discovery is a major concept of *Playful Sciencing and the Early Childhood Classroom*. It is through adult support that children are able to receive maximum benefit from their active exploration. The same method of Guided Discovery can be implemented when working with early childhood educators. Therefore, embedded in the proposed curriculum is the 2-hour, bi-monthly in-service training for early childhood educators.

Philosophy

Curriculum Philosophy. The Playful Sciencing Curriculum believes that the child is an active participant in learning about science. This curriculum is a hands-on, playful, theme-based approach exploring the child's surrounding world, and emphasizes process over product.

Science, a passive approach, can be described as the teacher conducting the experiment for the children. However, sciencing, an active approach, refers to children's active involvement in the learning process incorporating the five senses. Sciencing is an active process of exploration and learning. The show and tell strategy of teaching is simply not enough.

This curriculum builds on the assumption that adult guidance will enrich children's active involvement with the environment while building on the child's competence and motivation to learn.

Training Philosophy. The Author believes that early childhood educators are generally uneasy with the process of science with young children. Early childhood educators may lack sciencing knowledge. It may be that educators lack early childhood experience in theoretical based sciencing programs. It may be that early childhood conferences are missing this sciencing piece to their trainings. Through this training, the teachers will gain the tools needed to implement sciencing in the early childhood classroom. In doing so, the quality of the environment will be enhanced and the child's development will be maximized.

<u>Objective</u>

To guide early childhood educators in sciencing strategies by providing opportunities to stimulate teachers to find their own means of discovery, to make intelligent guesses, and to speculate.

Participants will gain tools needed to:

- ✓ Increase their awareness of the skills and learning concepts children gain through discussion and activities with science.
- ✓ Identify strategies to expand how children use science.
- ✓ Increase their abilities to evaluate sciencing experiences and the environment.
- ✓ Improve the planning and arrangement of the environment.
- ✓ Develop activities to help children develop literacy, numeracy, communication, and problem solving skills.

The Sciencing Manual Includes

- ✓ Background and theoretical information on the value of utilizing science in the early childhood classroom.
- ✓ Ideas for organizing and preparing sciencing activities in your classroom.
- ✓ Strategies for hands-on practical applications of sciencing in the classroom.
- ✓ Sample discussion ideas to be used with young children.
- ✓ Additional science activities for children to extend the sciencing concepts.
- ✓ List of resources for teacher.

The Framework of Sciencing Training

Curriculum Goal

To improve early childhood educators knowledge of sciencing in the early childhood classroom. To help early childhood educators to better understand sciencing strategies to be used with young children in the classroom.

Introduce Curriculum Themes

The Sciencing Curriculum (Appendix A1) is divided into two modules: Natural Science and Physical Science.

The Natural Science module consists of five themes. The Physical Science module consists of ten themes. Each module lasts approximately 5 months.

The Natural Science module consists of:

- Domestic Animals, Insects/Spiders, Trees, Leaves, Nuts, and Fruits, and The Five Senses.

The Physical Science module consists of:

- Weather, Weights and Measures, Magnets, Space, Physiology, Birds/Eggs/Nests, Seeds, Flowers and Plants, Wild Animals, Prehistoric Animals, Sea Life.

Curriculum Training Plan

The curriculum training plan includes the following nine components of this training (Appendix B1):
1) Curriculum Goal, 2) Theme Selection, 3) Special Activities of the Theme, 4) Material Selection, 5) Setting up the Environment, 6) Discussion Ideas, 7) Sciencing Discussion Demonstration, 8) Lesson Planning, and
9) Process Evaluation.

Theme Selection

The Author will select two themes from the curriculum manual (Appendix A) to implement in the Author-Director training. The Director, in turn, will incorporate both Author-selected themes in the Director-Teacher trainings.

The Teachers, in turn, will use these same themes when implementing the curriculum in the classroom with the children. The first Author-selected theme will be Insects/Spider. The second Author-selected theme will be Birds/Eggs/Nests. Each theme will last for two weeks, or ten school days.

A ten-day, thematic lesson plan is needed. The first day is the Author-Director training. The second day is the Director-Teacher training. On the third day, the teacher will implement the topic (i.e., Ants) used in the thematic lesson plan completed during the Director-Teacher training in the classroom with the children. The teachers will continue to use the same theme (i.e., Insects/Spiders) for the remaining seven days, however the topics of this first two-week theme (i.e., Ladybugs) may vary.

The second two-week theme of Birds/Eggs/Nests will follow the same process for the next two weeks. The Event Calendar will be used as the guide (Appendix B2).

Special/Center Activities of Each Theme

The special activities section includes the process of selecting activities, such as simple explorations of the theme, field trips, cooking, numeracy, and redecorating the dramatic play. This section also includes art and literacy ideas. With the thematic-related activities, the individualized learning of each child will be enhanced. A Special/Center Activities Chart will be provided (Appendix B3).

An example of the special activity of the Farm Animal (i.e., cow) theme would include, taking a field trip to a dairy and actually "milking a cow." Upon completion of milking the cow, the children actually measure the amount of milk in the pail. For the dramatic play component, a big red barn, farm animal puppets, and plastic farm animals will be added to the existing dramatic play area. The cooking experience would include making butter and cottage cheese.

Material Selection for the Centers

The trainees (i.e., Director, Teachers) will determine what materials are needed to enhance the theme-related sciencing experience in the classroom. This section incorporates the "walk about". The Author, with the trainees (i.e., Director, Teachers), will walk throughout the classroom determining theme-related materials needed to enhance the sciencing experience. The Director will list materials mentioned in the "walk about".

Setting Up the Environment

The materials selected for enhancement of the classroom environment will be placed in selected areas. The Author will provide the theme-related materials to the Moreno Valley Child Development Center.

Discussion Ideas

Discussion strategies will incorporate the Scientific Model created by Chalufour and Worth (2003) (Appendix B4). This adapted scientific model has 8 components. These include Explores/Questions, Begins to Investigate, Collects Data, Records and Represents Experience, Synthesizes and Analyzes Data from Experience, Use Language to Communicate Findings, and Collaborates. These eight stages provide building blocks to sciencing inquiry. This sciencing inquiry begins in a free play explorative manner and graduates to a more structured, teacher-guided experience. This is no longer Pure Discovery, but Guided Discovery with the help of an adult. The Author will hand out a sample of the discussion ideas chart (Appendix B4) from the selected themes.

Sciencing Discussion Demonstration

This section will include a "sciencing" discussion. This sciencing discussion demonstration incorporates the eight steps of the scientific model. The key component of this discussion section is presenting it in such a way that a child will not only understand, but also become actively involved in the learning process, and expand this process independently. A sample of the sciencing discussion will be provided (Appendix B4).

Lesson Planning

The trainees (i.e., Director, Teachers) will be given an Event Calendar (Appendix B2), a Special Activities Chart (Appendix B3), a Playful Sciencing Lesson Plan (B5), the theme of Insects/Spiders (Appendix B6), and the theme of Birds/Eggs/Nests (Appendix B7). The trainees (i.e., Director, Teachers) will be instructed to complete the lesson plan and "share out" their completed lesson plan.

The trainees (i.e., Director, Teachers) will use the same theme (i.e., Insects/Spiders) for the two-week training, however the topics (i.e., Ants, Ladybugs) will vary based on the Trainees' interest. These topics will be placed on the Event Calendar and transferred to the Lesson Plan. The trainees (i.e., Director, Teachers) will select activities from the Special/Center Activities Chart and place these on the Lesson Plan. Lastly, the trainees (i.e., Director, Teachers) will select books, art activities, and discussion ideas from the theme of Insects/Spiders (Appendix B6). These selections will be placed on the Lesson Plan. The next theme (i.e., Birds/Eggs/Nests) will follow the same process for the remaining two weeks

Group Evaluation

The trainees (i.e., Director, Teachers) will complete the Sciencing with Teachers and Children Questionnaire (Kirby, 2005) of the entire training process (Appendix C).

Author-Director Training

Introduction

"Good Morning, Judi. Thank-you for allowing me to come to your Center and introduce you to The Playful Sciencing and the Early Childhood Classroom Curriculum and to train you in the strategies you will implementing with your classroom teachers."

Curriculum Training Goal

To set the stage by introducing the Sciencing Curriculum, the philosophy and goals on teaching and learning, and the nature of the work the Director will be doing in the training, and, in turn with the teacher.

"Judi, Playful *Sciencing and the Early Childhood Classroom* is a hands-on, playful, theme based approach exploring the child's surrounding world. This curriculum incorporates the concepts of Guided Discovery and in-service training. Guided discovery is a major concept of *Playful Sciencing and the Early Childhood Classroom*. This curriculum builds on the assumption that adult guidance will enrich children's active involvement with the environment while building on the child's competence and motivation to learn."

Show Video

1. Show an actual sciencing discussion video that provides the Director with a brief vignette of the sciencing experience between the teacher and the children.

"Let's look at a short video entitled Encouraging a Sense of Wonder. This 10-minute video demonstrates the hands-on approach to sciencing and gives examples of setting up the environment to enhance the sciencing experience."

"What did you notice in this video? The video gave you examples of active learning. Can you name three?"

1. Mixing colors with peers
2. Actively exploring the outside environment to find twigs, leaves and flowers to make "nature bracelets."
3. Molding clay with peers

Purpose of Sciencing

2. The Author will discuss the purpose of sciencing with young children and distinguish between science, the noun, and sciencing, the verb.

"Sciencing, as it is defined, is teaching science using the principles of Guided discovery. These principles include hands-on activity, scaffolding, discussion, and free exploration. Within a science curriculum, there needs to be opportunities for adult-child interactions that promote learning through trial and error strategies. Children need opportunities to inquire, question, make decisions, and work cooperatively with adults and peers in problem solving activities."

"Science, a passive approach, can be described as the teacher conducting the experiment for the children. However, sciencing, an active approach, refers to children's active involvement in the learning process incorporating the five senses."

"Typically, in an early childhood classroom you may see science tables. These science tables may include science tools, plants or a fish tank, and maybe a few books. This is simply one piece of the sciencing pie (Transparency 1)."

"Sciencing, on the other hand, is a holistic approach. This is the whole "sciencing" pie. The entire classroom is engulfed in the "sciencing" approach. Science can be seen in all centers of the classroom: art, literacy, dramatic play, blocks, and music and movement (Transparency 2)."

"Sciencing is an active process of exploration and learning. The show and tell strategy is simply not enough. This holistic sciencing approach is based on the constructivist theorists of Piaget and Vygotsky".

"Early childhood educators are generally uneasy with the process of science with young children. Why do you it is so?"

"Early childhood educators may lack sciencing knowledge. It may be that educators lack early childhood experience in theoretical based sciencing programs. It may be that early childhood conferences are missing this sciencing piece in their trainings. Through this training, the teachers will gain the tools needed to implement sciencing in the early childhood classroom."

Theoretical-based Sciencing Curriculum

3. The Author will discuss the theoretical base of the Sciencing Curriculum, the theorists; Piaget and Vygotsky, and the Guided Discovery approach to learning (Transparency 3 for Piaget; Transparency 4 for Vygotsky; and Transparency 5 for Guided Discovery).

"We're going to talk a little bit about theory now. This Sciencing Curriculum is based on the constructivist theory of play of two theorists: Piaget and Vygotsky. You may wonder why we have to talk about theory and research because they are so boring! Theory and research give us the reasons why we do what we do. It is through the understandings of these theories and research that empower, we, the educators' own beliefs. In turn, these beliefs will enhance our teaching strategies and perhaps lessen the chance of teacher burnout."

Piaget

"Piaget believed that children construct their own knowledge through active explorations of their world. Piaget believed that the interaction between assimilation (that is taking in information and using this information with no adaptations) and accommodation (new shemas or organized new thinking are created, or existing thought patterns are changed in order to incorporate new information) is the source of development and learning. Piaget saw the purpose of play to assimilate activities, incorporate mental structures, practice newly formed representational ideas and construct meaning form their experience" (Berk & Winsler, 1995; Kagan, 1990).

Vygotsky

"Vygotsky, on the other hand, believed that children "co-construct" knowledge with their partners. Vygotsky believed that play is the process through which the cognitive development of the child is advanced. Vygotsky saw play as a scaffold for the child."

"Scaffolding is the process of supporting the child to take steps they may not be able to take without adult intervention. Scaffolding can best be conducted thought the Zone of Proximal Development. This Zone is the distance between the child's actual developmental level and the level of potential development."

"Scaffolding is supporting children to take steps they may not be able to take without adult intervention.

Scaffolding techniques consistently predict increased learning and positive outcomes in children."

Guided Discovery

"Vygotsky and Piaget believed in the constructivist approach to learning for young children. Piaget held that children actively construct their own knowledge by means of hands-on exploration, whereas, Vygotsky believed that learning was accomplished in a social context."

"A review article written by Richard Mayer (2003) compared two views of learning: Pure discovery where students have maximal freedom to explore and Guided Discovery where the teacher provides systematic guidance. Results showed that children seem to learn better when they are active and when a teacher helps guide their activity (Transparency 5)."

"Research also showed that children in the Guided Discovery group with the use of giving hints learned, remembered, and transferred to new problems more efficiently than the Pure Discovery group. Although children in the Guided Discovery group required the most learning time, it resulted in the best performance on solving transfer problems (Transparency 5)."

"Let's summarize what we just talked about the Playful Sciencing Curriculum. This curriculum is designed to promote a play-based environment. This play-based curriculum is derived from scaffolding based on Vygotsky, hands-on exploration based on Piaget and Guided Discovery which is a culmination of the two theorists (Transparency 6)."

Curriculum Training Framework

4. The Author will introduce the curriculum training framework (Appendix B1).

"Now, let's look at the curriculum training framework. The overhead in front of you gives you the framework of the curriculum. The framework is as follows: We discuss the curriculum goals. Why have science for young children? Secondly, the themes are introduced. Thirdly, special activities are determined and materials are selected to enhance the theme. The next step is setting up the environment. Using the materials selected, we will determine where in the classroom these materials will be placed to ensure the ultimate learning."

Discussion ideas follow. The curriculum manual will actually spell out what can be said to a class of children. Now, it is important to remember that these are just suggested discussion ideas. Next, follows an actual sciencing discussion demonstration."

At this point, the Author, will actually walk you through a sciencing discussion for young children from start to finish.

"This is your opportunity to watch, ask and adapt. Remember, this experience needs to be meaningful for you so that you may then implement this in your classroom with your children."

"The next step in this framework is the lesson planning session. At this point, you and I will complete a lesson plan together incorporating what was learned in the training session. Finally, you will evaluate the entire process using the questionnaire in your packet. In order for this training to be successful for you and those you train, honest feedback is crucial."

Introduce Curriculum Themes

The Author will introduce themes included in the Sciencing Curriculum (Appendix A1).

"Let's take a look at the themes offered in the curriculum (Appendix A1). The themes either fall under the Natural Science category or the Physical Science category.

If you look at your handout you'll notice that themes are offered according to the time of year. For example, insects are offered in fall and/or spring. This is generally when you'll find insects. The theme Birds is offered in the spring, which is when baby birds are being born. The themes follow in succession of one another, with one theme piggy-backing off the previous theme. This strategy was put in place to help with the re-call process. Even though the training is taking in the summer, the selected themes will still work because there is abundance of Insects/Spiders and Birds."

<u>Theme Selection</u>

The Author will select two themes to be implemented in the trainings sessions. The themes will be used in the Author-Director training and the Director-Teacher sessions. The same themes will also be implemented in the classroom with the teachers and their children.

A ten-day, thematic lesson plan is needed. The first day is the Author-Director training. The second day is the Director-Teacher training. On the third day, the teacher will implement the topic (i.e., Ants) used in the thematic lesson plan completed during the Director-Teacher training in the classroom with the children. The teachers will continue to use the same theme (i.e., Insects/Spiders) for the remaining seven days, however the topics of this first two-week theme (i.e., Ladybugs) may vary.

"The two themes selected for the purpose of the training are Insects/Spiders, and Birds/Eggs/Nests."

"Judi, (the name of the Director) the first two-week theme to be implemented in this training will be Insects/Spiders. In front of you, there is an Event Calendar (Appendix B2)."

"Let's go through the calendar together. June 30th will begin the training between you and I. July 1, you will train your teachers using the same format I used with you."

"I will be present at this training for added support, and also for training continuity. There are eight topics under the theme of Insects/Spiders: ants, ladybug, caterpillars, butterflies, grasshopper, bees, praying mantis, and spiders. These topic will be covered between July 5th and the 14th."

"Upon completion of the Insects/Spiders theme, you and I will meet to refine the training strategies. Then, the second portion of the our training on the theme Birds/Eggs/Nests will begin."

Special/Center Activities of the Theme

The special activities section includes the process of selecting activities, such as simple explorations of the theme, field trips, cooking, numeracy, and redecorating the dramatic play. This section also includes art and literacy ideas.

"For this portion of the curriculum, we will list activities to enhance the theme of Insects/Spiders. One example would be sprinkling sugar on an anthill to explore what the ants will do. Magnifying glasses will help the children to see more clearly."

"Two cooking activities might include eatable insects. The ingredients for this recipe include apples, pretzels, marshmallows, and raisins. Teachers cut the apples in quarters and the children add pretzels, marshmallows and raisins to create their own insect to eat" "Ants on a log involve children spreading peanut butter and raisins on celery pieces.

Adding insect headbands and insect potholders will enhance the Dramatic Play area. Large plastic insects and insect books can also be added."

"This section also includes art and literacy ideas. Art ideas may include string painting spider webs or splatter painting butterfly shapes. As you can see on the overhead (Appendix B3), there are many art ideas to consider."

"The literacy section gives teachers a list of theme related books to read to their children or simply ideas to extend the experience. Again, as you can see from the overhead, there are numerous books to choose from (Appendix B3)."

<u>Material Selection</u>

The Author will demonstrate the "walk-about". The Author will walk to all areas (i.e., Dramatic Play, Block Area, Art Area, Manipulative Area, Literacy Area) of the classroom and determine what materials need to be added to enhance the chose theme. The Director will list materials mentioned in the "walk about".

"The walk-about involves taking a close look at each and every area of your classroom to determine what needs to be added to enhance the theme you will be introducing to your children."

"In the Dramatic Play Area, we can add insect potholders, insect head bands, and books on Insects/Spiders. In the Block Area, we can add large plastic insects and, again, books on Insects/Spiders. In the Art Area, we may want to add insect and spider stencils and pieces of yarn to make spider webs. In the

Manipulative Area, we can add insect and spider puzzles, the cootie game, and insect bingo. In the Literacy Area, we can add many books on Insects/Spiders, felt stories and individual felt boards, and insect and spider puppets."

"You see, we're adding to what is already present in each area. All materials do not need to be new each week, in fact, they should not be new, you are simply adding to what is already there."

Setting up the Environment

The Author will place the theme related materials in the specific areas of the classroom environment. The Author will provide the theme-related materials to the Moreno Valley Child Development Center.

"At this point, selected materials will be placed in the different centers. As you can see, I have brought numerous books from the theme related book list to place on the bookshelf, in the Dramatic Play Area, and the Block Area. The plastic insects I have brought will be placed in the Block Area and on the Manipulative Area. The insect headbands and the potholders will be placed in the Dramatic Play Area."

Discussion Ideas

The Author will hand out a sample of the discussion ideas chart (Appendix B4) from the selected themes.

"Following is a sample of discussion ideas incorporating the themes: Insects/Spiders and Birds/ Eggs/Nests. Our first two-week training together will focus on Insects/Spiders. The following two weeks, we will continue the training using the theme of Birds/Eggs/Nests."

"Appendix B4 adds more detail to the discussion ideas. As you can see from the overhead, it includes eight sections of sciencing exploration: Explores and Questions, Begins to Investigates, Collects Data, Records and Represents Experience, Synthesizes and Analyzes from the Data from Experiences, Use Language to Communicate Findings, and Collaborates".

"Appendix B4 is simply a framework for discussion. It is unrealistic to expect every discussion with every group of children to follow all eight steps in the sequence. Your children will let you know how far they want you to go with the discussion. Follow their lead. As children become more learned in the topic, they will better collaborate with their friends."

Sciencing Discussion Demonstration

This sciencing discussion demonstration incorporates the eight steps of the scientific model. The key component of this discussion section is presenting it in such a way that a child will not only understand, but also become actively involved in the learning process, and expand this process independently. A sample of the sciencing discussion will be provided (Appendix B4).

"This is an actual discussion demonstration incorporating the theme of The Exciting World Of Insects and Spiders."

When you have greeted each child ask the group, "Do you know what you are? Are you a horse? Are you a dog?" Children will enjoy this and will soon enter into this game—by and by one child will say that they are a person. "Yes, you are a person. Are you alive? Do you walk? Do you run? Do you eat?" Continue involving the children, smiling and enjoying the game. "How many eyes do you have? How many heads? How many legs? etc."

Now draw attention to the bulletin board, where pictures of different insects have been placed. Ask anyone if they know what this is? Listen very carefully; as sometimes children speak very quietly, until they have gained confidence, you may overlook the child's answer. If someone mentions insect or bug immediately affirm this answer.

"Can anyone find another insect on the board?" Let children go up to the board and point to different insects, encouraging them to name the insect - if this is too difficult you supply the name. Allow for each child's turn but move on when you notice disinterest. This lesson needs to be repeated the second day.

Follow-up discussion: (can be the next day) Add a felt insect with 3 body parts, 2 antennae, and 6 legs. "Can someone point to the insect's legs? Do you have legs? How many legs do you have? How many legs does the insect have? Who has more? Who has less? Continue this conversation, comparing the insects' body to the children's body.

Now we want to check for understanding. As children are seated on the rug, place the felt insect's body pieces on the felt board, <u>incorrectly</u>. Children love this game, teacher is so silly!

<u>Lesson Planning</u>

The Author and the Director will write the lesson plan together incorporating another topic within the selected theme.

The Author will place a blank lesson plan transparency on the overhead screen and give a blank paper lesson plan to the Director. As the Author and Director discuss the elements of the lesson plan, the Author will place the ideas on the transparency and the Director will place the same ideas on the lesson plan.

"Now it's your turn to create a lesson plan incorporating one insect from the list of insects within the discussion section. In my demonstration, I (Author) enhanced the environment in six areas: Dramatic Play, Block Area, Art, Literacy/Writing center, Manipulative, and Cooking experiences. Using the curriculum (Appendix B6) as our guide, we are going to complete the following sections on the Lesson Plan: art area, language/literacy, and group discussion. Let's see what we can come up with together on the lesson plan for the remaining seven days."

Process Evaluation

The Director will evaluate the sciencing process as to its effectiveness in understanding the sciencing experience, and its usefulness in training the teachers.

"Judi, I want to thank-you for allowing me to come to your site and completing a training on Sciencing and the Early Childhood Curriculum. I would like you to evaluate the process. This has been a learning experience for me as well. Your input will be beneficial for future trainings. I have refreshments in the back for you to enjoy as you complete the evaluation. Again, thank-you."

Birds, Eggs and Nests

Introduce Curriculum Theme

The second two-week training will be identical to the initial training between the Author and the Director. The second training will focus on the theme of Birds/Eggs/Nests. A ten day, thematic lesson plan is needed for this two-week training.

Theme Selection

The Author will select two themes to be implemented in the trainings sessions. The themes will be used in the Author-Director training and the Director-Teacher sessions. The same themes will also be implemented in the classroom with the teachers and their children.

A ten-day, thematic lesson plan is needed. The first day is the Author-Director training. The second day is the Director-Teacher training. On the third day, the teacher will implement the topic (i.e., Ants) used in the thematic lesson plan completed during the Director-Teacher training in the classroom with the children. The teachers will continue to use the same theme (i.e., Insects/Spiders) for the remaining seven days, however the topics of this first two-week theme (i.e., Ladybugs) may vary.

"Judi, in front of you is an Event Calendar. Let's go through the calendar together. The theme for this training will be Birds/Eggs/Nests. On July 14th, I will train you and the following day, July 15th, you will train your teachers using the same format I used with you."

"In the manual there are four lessons within the theme of Birds, Eggs, and Nests to be covered between July 18th and the 27th. One lesson builds upon the other and each lesson lasts two days, for a total of eight days. July 27th will be the conclusion of our project and you and your teacher will complete an evaluation."

Special Activities of the Theme

The special activities section includes the process of selecting activities, such as simple explorations of the theme, field trips, cooking, numeracy, and redecorating the dramatic play. This section also includes art and literacy ideas.

"For this portion of the curriculum, we will list activities to enhance the theme. One example would be hanging a bird feeder from one of the trees on your playground. You may want to bring in a real bird to place in your classroom"

"One cooking activity might include edible bird nests. The ingredients for this recipe include chocolate chips, peanut butter, and Chinese noodles. The teacher melts the chocolate chips and peanut butter in an electric skillet. Children crushed the Chinese noodles and drop them in the skillet. Next, the teacher carefully helps children stir the ingredients. Lastly, place large spoonfuls on a tray making an indentation. Place a small jelly bean in the middle and place in the refrigerator to cool."

"Adding a cloth bird in a bird cage will enhance the Dramatic Play area. Large plastic birds and a basket of bird books can also be added."

"This section also includes art and literacy ideas. Art ideas may include glue sticks with colorful feathers or Play dough with bird cookie cutters. As you can see on the overhead, there are many ideas to consider."

"The literacy section gives teachers a list of theme related books to read to their children or simply ideas to extend the experience. Again, as you can see from the overhead, there are numerous books to choose from."

Material Selection

The Author will demonstrate the "walk-about." The Author will walk to all areas of the classroom and determine what materials need to be added to enhance the chose theme. The Director will list materials mentioned in the "walk about".

"The walk-about involves taking a close look at each and every area of your classroom to determine what needs to be added to enhance the theme you will be introducing to your children.

"In the Dramatic Play area we can place books on birds and nests. We can also place bird nets. In the Block area again, we can place a basket of books on birds and nests. We can also place plastic birds in this area. In the Art area we can place glue sticks with many colored feathers and bird stencils. Play dough with bird cookie cutters is also a favorite. In the Manipulative area we can place bird puzzles. In the Literacy area we can place many books on birds and nests. Felt stories with individual felt boards can also be placed in this area.

Setting up the Environment

The Author will place the theme related materials in the specific areas of the classroom environment. The Author will provide the theme-related materials to the Moreno Valley Child Development Center.

"At this point, materials selected will be placed in the different centers. As you can see, I have brought numerous books from the theme related book list to place on the book shelf, in the Dramatic Play Area, and the Block Area. The plastic birds I have brought will be placed in the Block Area and on the Manipulative Area. The cloth birds, and a bird cage will be placed in the Dramatic Play Area."

Discussion Ideas

The Author will hand out a sample of the discussion ideas chart (Appendix B4) from the selected themes. The Author will briefly explain what this discussion model will provide and what to expect from the children.

"Appendix D4 adds more detail to the discussion ideas. As you can see from the overhead, it includes eight sections of sciencing exploration: Explores and Questions, Begins to Investigates, Collects Data, Records and Represents Experience, Synthesizes and Analyzes from the Data from Experiences, Use Language to Communicate Findings, and Collaborates".

"What does this discussion model provide? It provides building blocks to sciencing inquiry. This sciencing inquiry begins in a free play explorative manner and graduates to a more structured, teacher-guided experience. This is no longer Pure Discovery, but Guided Discovery with the help of an adult."

"This is simply a framework for discussion. It is unrealistic to expect every discussion with every group of children to follow all eight steps in the sequence. Your children will let you know how far they want you to go with the discussion. Follow their lead."

"As children become more learned in the topic, they will better collaborate with their friends."

Sciencing Discussion Demonstration

This sciencing discussion demonstration incorporates the eight steps of the scientific model. The key component of this discussion section is presenting it in such a way that a child will not only understand, but also become actively involved in the learning process, and expand this process independently. A sample of the sciencing discussion will be provided (Appendix B4).

"This is an actual discussion demonstration incorporating the theme of "Birds/Eggs/Nests"

Display different sizes and colors of eggs on a tray. Talk with the children about the different eggs. Ask children about the egg as their food. Ask about the inside of the egg. What do you think is inside the egg?

Open the egg in a pan and pass it around to look at and touch if they like (Reminder; if they touch the egg, they need to go wash their hands). Talk about the shell, yolk, and egg white.

Where do you think we got this egg? Use leading questions until someone mentions a bird. The egg is developed inside the bird's body. The bird lays the egg in a nest through a special opening in her body.

Name different creatures that develop from an egg: Chicken, Duck, Goose, Insects, Spiders, Peacock (All birds), Insects, Reptiles, Fish, and Dinosaurs

Establish what will grow inside each egg by leading questions; "What will hatch from a turkey egg? What will hatch from a snake egg?" (Etc.) Establish where different eggs come from.

<u>Lesson Planning</u>

The Author and the Director will write the lesson plan together incorporating another area (topic) from the Birds/Eggs/Nests theme.

The Author will place a blank lesson plan transparency on the overhead screen and give a blank paper lesson plan to the Director. As the Author and Director discuss the elements of the lesson plan, the Author will place the ideas on the transparency and the director will place the same ideas on the lesson plan.

"Now it's your turn to create a lesson plan incorporating topics from the Birds/Eggs/Nests theme within the discussion section. In my demonstration, I (Author) enhanced the environment in six areas: Dramatic Play, Block Area, Art, Literacy/Writing center, Manipulative, and Cooking experiences. Using the curriculum (Appendix B7) as our guide, we are going to complete the following sections on the Lesson Plan: art area, language/literacy, and group discussion. Let's see what we can come up with together on the lesson plan for the remaining seven days."

Process Evaluation

"Judi, I want to thank-you for allowing me to come to your site and completing a training on Sciencing and the Early Childhood curriculum. I would like you to evaluate the process. This has been a learning experience for me as well. Your input will be beneficial for future trainings. I have refreshments in the back for you to enjoy as you complete the evaluation. Again, thank-you."

Director-Teacher Training

Introduction

"Good Morning, teachers. Thank-you for participating in this training of The Playful Sciencing and the Early Childhood Classroom Curriculum. This is an exciting venture for all of us as we will be evaluating a brand new Sciencing Curriculum. I will be training you in the strategies you will implementing in your classroom."

Curriculum Training Goal

To set the stage by introducing the Sciencing Curriculum, the philosophy and goals on teaching and learning, and the nature of the work the Director will be doing in the training, and, in turn with the teacher.

"Teachers, Playful *Sciencing and the Early Childhood Classroom* is a hands-on, playful, theme based approach exploring the child's surrounding world. This curriculum incorporates the concepts of Guided Discovery and in-service training. Guided discovery is a major concept of *Playful Sciencing and the Early Childhood Classroom*. This curriculum builds on the assumption that adult guidance will enrich children's active involvement with the environment while building on the child's competence and motivation to learn."

Show Video

1. Show an actual sciencing discussion video that provides the Director with a brief vignette of the sciencing experience between the teacher and the children.

"Let's look at a short video entitled Encouraging a Sense of Wonder. This 10-minute video demonstrates the hands-on approach to sciencing and gives examples of setting up the environment to enhance the sciencing experience."

"What did you notice in this video? The video gave you examples of active learning. Can you name three?"

1. Mixing colors with peers
2. Actively exploring the outside environment to find twigs, leaves and flowers to make "nature bracelets."
3. Molding clay with peers

Purpose of Sciencing

2. The Director will discuss the purpose of sciencing with young children and distinguish between science, the noun, and sciencing, the verb.

"Sciencing, as it is defined, is teaching science using the principles of Guided discovery. These principles include hands-on activity, scaffolding, discussion, and free exploration. Within a science curriculum, there needs to be opportunities for adult-child interactions that promote learning through trial and error strategies. Children need opportunities to inquire, question, make decisions, and work cooperatively with adults and peers in problem solving activities."

"Science, a passive approach, can be described as the teacher conducting the experiment for the children.

However, sciencing, an active approach, refers to children's active involvement in the learning process incorporating the five senses."

"Typically, in an early childhood classroom you may see science tables. These science tables may include science tools, plants or a fish tank, and maybe a few books. This is simply one piece of the sciencing pie (Transparency 1)."

"Sciencing, on the other hand, is a holistic approach. This is the whole "sciencing" pie. The entire classroom is engulfed in the "sciencing" approach. Science can be seen in all centers of the classroom: art, literacy, dramatic play, blocks, and music and movement (Transparency 2)."

"Sciencing is an active process of exploration and learning. The show and tell strategy is simply not enough. This holistic sciencing approach is based on the constructivist theorists of Piaget and Vygotsky".

"Early childhood educators are generally uneasy with the process of science with young children. Why do you it is so?"

"Early childhood educators may lack sciencing knowledge. It may be that educators lack early childhood experience in theoretical based sciencing programs. It may be that early childhood conferences are missing this sciencing piece in their trainings. Through this training, the teachers will gain the tools needed to implement sciencing in the early childhood classroom."

Theoretical-based Sciencing Curriculum

3. The Director will discuss the theoretical base of the Sciencing Curriculum, the theorists; Piaget and Vygotsky, and the Guided Discovery approach to learning (Transparency 3 for Piaget; Transparency 4 for Vygotsky; and Transparency 5 for Guided Discovery).

"We're going to talk a little bit about theory now. This Sciencing Curriculum is based on the constructivist theory of play of two theorists: Piaget and Vygotsky. You may wonder why we have to talk about theory and research because they are so boring! Theory and research give us the reasons why we do what we do. It is through the understandings of these theories and research that empower, we, the educators' own beliefs. In turn, these beliefs will enhance our teaching strategies and perhaps lessen the chance of teacher burnout."

Piaget

"Piaget believed that children construct their own knowledge through active explorations of their world. Piaget believed that the interaction between assimilation (that is taking in information and using this information with no adaptations) and accommodation (new shemas or organized new thinking are created, or existing thought patterns are changed in order to incorporate new information) is the source of development and learning. Piaget saw the purpose of play to assimilate activities, incorporate mental structures, practice newly formed representational ideas and construct meaning form their experience" (Berk & Winsler, 1995; Kagan, 1990).

Vygotsky

"Vygotsky, on the other hand, believed that children "co-construct" knowledge with their partners. Vygotsky believed that play is the process through which the cognitive development of the child is advanced. Vygotsky saw play as a scaffold for the child."

"Scaffolding is the process of supporting the child to take steps they may not be able to take without adult intervention. Scaffolding can best be conducted thought the Zone of Proximal Development. This Zone is the distance between the child's actual developmental level and the level of potential development."

"Scaffolding is supporting children to take steps they may not be able to take without adult intervention. Scaffolding techniques consistently predict increased learning and positive outcomes in children."

Guided Discovery

"Vygotsky and Piaget believed in the constructivist approach to learning for young children. Piaget held that children actively construct their own knowledge by means of hands-on exploration, whereas, Vygotsky believed that learning was accomplished in a social context."

"A review article written by Richard Mayer (2003) compared two views of learning: Pure discovery where students have maximal freedom to explore and Guided Discovery where the teacher provides systematic guidance. Results showed that children seem to learn better when they are active and when a teacher helps guide their activity."

"Research also showed that children in the Guided Discovery group with the use of giving hints learned, remembered, and transferred to new problems more efficiently than the Pure Discovery group. Although children in the Guided Discovery group required the most learning time, it resulted in the best performance on solving transfer problems."

Curriculum Framework

4. The Director will introduce the curriculum framework (Transparency 6).

"Let's summarize what we just talked about the Playful Sciencing Curriculum. This curriculum is designed to promote a play-based environment. This play-based curriculum is derived from scaffolding based on Vygotsky, hands-on exploration based on Piaget and Guided Discovery which is a culmination of the two theorists."

"Now, let's look at the curriculum framework. The overhead in front of you gives you the framework of the curriculum. The framework is as follows: We discuss the curriculum goals. Why have science for young children? Secondly, the themes are introduced. Thirdly, special activities are determined and materials are selected to enhance the theme. The next step is setting up the environment. Using the materials selected, we will determine where in the classroom these materials will be placed to ensure the ultimate learning."

Discussion ideas follow. The curriculum manual will actually spell out what can be said to a class of children. Now, it is important to remember that these are just suggested discussion ideas. Next, follows an actual sciencing discussion demonstration."

At this point, the Director, will actually walk you through a sciencing discussion for young children from start to finish.

"This is your opportunity to watch, ask and adapt. Remember, this experience needs to be meaningful for you so that you may then implement this in your classroom with your children."

"The next step in this framework is the lesson planning session. At this point, you and I will complete a lesson plan together incorporating what was learned in the training session. Finally, you will evaluate the entire process using the questionnaire in your packet. In order for this training to be successful for you and those you train, honest feedback is crucial."

<u>Introduce Curriculum Themes</u>

The Director will introduce themes included in the Sciencing Curriculum (Appendix A1).

"Let's take a look at the themes offered in the curriculum (Appendix A1). The themes either fall under the Natural Science category or the Physical Science category. If you look at your handout you'll notice that themes are offered according to the time of year. For example, insects are offered in fall and/or spring. This is generally when you'll find insects. The theme Birds is offered in the spring, which is when baby birds are being born. The themes follow in succession of one another, with one theme piggy-backing off the previous theme. This strategy was put in place to help with the re-call process. Even though the training is taking in the summer, the selected themes will still work because there is abundance of Insects/Spiders and Birds."

Theme Selection

The Director will select two themes to be implemented in the trainings sessions. The themes will be used in the Author-Director training and the Director-Teacher sessions. The same themes will also be implemented in the classroom with the teachers and their children.

"The two themes selected for the purpose of the training are Insects/Spiders, and Birds/Eggs/Nests".

"Teachers, the first two-week theme to be implemented in this training will be Insects/Spiders. In front of you, there is an Event Calendar (Appendix B2). Let's go through the calendar together. July 1 will begin the training between you and I. July 5, you will implement the training in your classrooms using the same format I used with you.

There are eight topics under the theme of Insects/Spiders: ants, ladybug, caterpillars, butterflies, grasshopper, bees, praying mantis, and spiders. These topic will be covered between July 5th and the 14th."

"Upon completion of the Insects/Spiders theme, you and I will meet to discuss the implementation process. Then, the second portion of the our training on the theme Birds/Eggs/Nests will begin."

Special/Center Activities of the Theme

The special activities section includes the process of selecting activities, such as simple explorations of the theme, field trips, cooking, numeracy, and redecorating the dramatic play. This section also includes art and literacy ideas.

"For this portion of the curriculum, we will list activities to enhance the theme of Insects/Spiders. One example would be sprinkling sugar on an anthill to explore what the ants will do. Magnifying glasses will help the children to see more clearly."

"Two cooking activities might include edible insects. The ingredients for this recipe include apples, pretzels, marshmallows, and raisins. Teachers cut the apples in quarters and the children add pretzels, marshmallows and raisins to create their own insect to eat" "Ants on a log involve children spreading peanut butter and raisins on celery pieces.

Adding insect headbands and insect potholders will enhance the Dramatic Play area. Large plastic insects and insect books can also be added."

"This section also includes art and literacy ideas. Art ideas may include string painting spider webs or splatter painting butterfly shapes. As you can see on the overhead (Appendix B3), there are many art ideas to consider."

"The literacy section gives you a list of theme related books to read to your children or simply ideas to extend the experience. Again, as you can see from the overhead, there are numerous books to choose from."

Material Selection

The Director will demonstrate the "walk-about". The Author will walk to all areas (i.e., Dramatic Play, Block Area, Art Area, Manipulative Area, Literacy Area) of the classroom and determine what materials need to be added to enhance the chose theme. The Teachers will list materials mentioned in the "walk about".

"The walk-about involves taking a close look at each and every area of your classroom to determine what needs to be added to enhance the theme you will be introducing to your children."

"In the Dramatic Play Area, we can add insect potholders, insect head bands, and books on Insects/Spiders. In the Block Area, we can add large plastic insects and, again, books on Insects/Spiders. In the Art Area, we may want to add insect and spider stencils and pieces of yarn to make spider webs. In the Manipulative Area, we can add insect and spider puzzles, the cootie game, and insect bingo. In the Literacy Area, we can add many books on Insects/Spiders, felt stories and individual felt boards, and insect and spider puppets."

"You see, we're adding to what is already present in each area. All materials do not need to be new each week, in fact, they should not be new, you are simply adding to what is already there."

Setting up the Environment

The Director will place the theme related materials in the specific areas of the classroom environment. The Director will provide the theme-related materials to the Moreno Valley Child Development Center.

"At this point, selected materials will be placed in the different centers. As you can see, I have brought numerous books from the theme related book list to place on the book shelf, in the Dramatic Play Area, and the Block Area. The plastic insects I have brought will be placed in the Block Area and on the Manipulative Area. The insect headbands and the potholders will be placed in the Dramatic Play Area."

<u>Discussion Ideas</u>

The Director will hand out a sample of the discussion ideas chart (Appendix B4) from the selected themes.

"Following is a sample of discussion ideas incorporating the themes: Insects/Spiders and Birds/ Eggs/Nests. Our first two-week training together will focus on Insects/Spiders. The following two weeks, we will continue the training using the theme of Birds/Eggs/Nests.".

"Appendix B4 adds more detail to the discussion ideas. As you can see from the overhead, it includes eight sections of sciencing exploration: Explores and Questions, Begins to Investigates, Collects Data, Records and Represents Experience, Synthesizes and Analyzes from the Data from Experiences, Use Language to Communicate Findings, and Collaborates".

"Appendix B4 is simply a framework for discussion. It is unrealistic to expect every discussion with every group of children to follow all eight steps in the sequence.

Your children will let you know how far they want you to go with the discussion. Follow their lead. As children become more learned in the topic, they will better collaborate with their friends."

Sciencing Discussion Demonstration

This sciencing discussion demonstration incorporates the eight steps of the scientific model. The key component of this discussion section is presenting it in such a way that a child will not only understand, but also become actively involved in the learning process, and expand this process independently. A sample of the sciencing discussion will be provided (Appendix B4).

"This is an actual discussion demonstration incorporating the theme of The Exciting World Of Insects and Spiders."

When you have greeted each child ask the group, "Do you know what you are? Are you a horse? Are you a dog?" Children will enjoy this and will soon enter into this game—by and by one child will say that they are a person. "Yes, you are a person. Are you alive? Do you walk? Do you run? Do you eat?" Continue involving the children, smiling and enjoying the game. "How many eyes do you have? How many heads? How many legs? etc."

Now draw attention to the bulletin board, where pictures of different insects have been placed. Ask anyone if they know what this is? Listen very carefully; as sometimes children speak very quietly, until they have gained confidence, you may overlook the child's answer. If someone mentions insect or bug immediately affirm this answer.

"Can anyone find another insect on the board?" Let children go up to the board and point to different insects, encouraging them to name the insect - if this is too difficult you supply the name. Allow for each child's turn but move on when you notice disinterest. This lesson needs to be repeated the second day.

Follow-up discussion: (can be the next day) Add a felt insect with 3 body parts, 2 antennae, and 6 legs. "Can someone point to the insect's legs? Do you have legs? How many legs do you have? How many legs does the insect have? Who has more? Who has less? Continue this conversation, comparing the insects' body to the children's body.

Now we want to check for understanding. As children are seated on the rug, place the felt insect's body pieces on the felt board, <u>incorrectly</u>. Children love this game, teacher is so silly!

Lesson Planning

The Director and the Teachers will write the lesson plan together incorporating another topic within the selected theme.

The Director will place a blank lesson plan transparency on the overhead screen and give a blank paper lesson plan to the Teachers. As the Director and Teachers discuss the elements of the lesson plan, the Director will place the ideas on the transparency and the Teachers will place the same ideas on the lesson plan.

"Now it's your turn to create a lesson plan incorporating one insect from the list of insects within the discussion section. In my demonstration, I (Director) enhanced the environment in six areas: Dramatic Play, Block Area, Art, Literacy/Writing center, Manipulative, and Cooking experiences. Using the curriculum (Appendix B7) as our guide, we are going to complete the following sections on the Lesson Plan: art area, language/literacy, and group discussion. Let's see what we can come up with together on the lesson plan for the remaining seven days."

Process Evaluation

The Teachers will evaluate the sciencing process as to its effectiveness in understanding the sciencing experience, and its usefulness in the classroom.

"Teachers, I want to thank-you for allowing me to come to your site and completing a training on Sciencing and the Early Childhood Curriculum. I would like you to evaluate the process. This has been a learning experience for me as well. Your input will be beneficial for future trainings. I have refreshments in the back for you to enjoy as you complete the evaluation. Again, thank-you."

Birds, Eggs and Nests

Introduce Curriculum Theme

The second two-week training will be identical to the initial training between the Director and the Teachers. The second training will focus on the theme of Birds/Eggs/Nests. A ten day, thematic lesson plan is needed for this two-week training.

Theme Selection

The themes used in the Author-Director training will be used in the Director-Teacher training. In turn, the teachers will use these same themes when implementing the curriculum in the classroom with their children. The teacher will use the thematic lesson plan used during the training on the first day of curriculum implementation with the children. The following seven days of implementation of the theme will be prepared by the teachers under the supervision of the Director during the Director-Teacher training. The Event Calendar will be used as their guide.

"Teachers, in front of you is an Event Calendar. Let's go through the calendar together. The theme for this training will be Birds/Eggs/Nests. On July 15th, I will train you and the following day, July 18th; you will implement the training in your classrooms using the same format I used with you.

"In the manual there are four lessons within the theme of Birds, Eggs, and Nests to be covered between July 18th and the 27th. One lesson builds upon the other and each lesson lasts two days, for a total of eight days. July 27th will be the conclusion of our project and you will complete an evaluation."

Special Activities of the Theme

The special activities section includes the process of selecting activities, such as simple explorations of the theme, field trips, cooking, numeracy, and redecorating the dramatic play. This section also includes art and literacy ideas.

"For this portion of the curriculum, we will list activities to enhance the theme. One example would be hanging a bird feeder from one of the trees on your playground. You may want to bring in a real bird to place in your classroom"

"One cooking activity might include edible bird nests. The ingredients for this recipe include chocolate chips, peanut butter, and Chinese noodles. The teacher melts the chocolate chips and peanut butter in an electric skillet. Children crushed the Chinese noodles and drop them in the skillet. Next, the teacher carefully helps children stir the ingredients. Lastly, place large spoonfuls on a tray making an indentation. Place a small jelly bean in the middle and place in the refrigerator to cool."

"Adding a cloth bird in a bird cage will enhance the Dramatic Play area. Large plastic birds and a basket of bird books can also be added."

"This section also includes art and literacy ideas. Art ideas may include glue sticks with colorful feathers or Play dough with bird cookie cutters. As you can see on the overhead, there are many ideas to consider."

"The literacy section gives you a list of theme related books to read to your children or simply ideas to extend the experience. Again, as you can see from the overhead, there are numerous books to choose from."

Material Selection

The Director will demonstrate the "walk-about." The Director will walk to all areas of the classroom and determine what materials need to be added to enhance the chose theme. The Teachers will list materials mentioned in the "walk about".

"The walk-about involves taking a close look at each and every area of your classroom to determine what needs to be added to enhance the theme you will be introducing to your children.

"In the Dramatic Play area we can place books on birds and nests. We can also place bird nets. In the Block area again, we can place a basket of books on birds and nests. We can also place plastic birds in this area. In the Art area we can place glue sticks with many colored feathers and bird stencils. Play dough with bird cookie cutters is also a favorite. In the Manipulative area we can place bird puzzles. In the Literacy area we can place many books on birds and nests. Felt stories with individual felt boards can also be placed in this area.

Setting up the Environment

The Director will place the theme related materials in the specific areas of the classroom environment. The

Director will provide the theme-related materials to the Moreno Valley Child Development Center.

"At this point, materials selected will be placed in the different centers. As you can see, I have brought numerous books from the theme related book list to place on the book shelf, in the Dramatic Play Area, and the Block Area. The plastic birds I have brought will be placed in the Block Area and on the Manipulative Area. The cloth birds, and a bird cage will be placed in the Dramatic Play Area."

Discussion Ideas

The Director will hand out a sample of the discussion ideas chart (Appendix B4) from the selected themes. The Director will briefly explain what this discussion model will provide and what to expect from the children.

"Appendix D4 adds more detail to the discussion ideas. As you can see from the overhead, it includes eight sections of sciencing exploration: Explores and Questions, Begins to Investigates, Collects Data, Records and Represents Experience, Synthesizes and Analyzes from the Data from Experiences, Use Language to Communicate Findings, and Collaborates".

"What does this discussion model provide? It provides building blocks to sciencing inquiry. This sciencing inquiry begins in a free play explorative manner and graduates to a more structured, teacher-guided experience. This is no longer Pure Discovery, but Guided Discovery with the help of an adult."

"This is simply a framework for discussion. It is unrealistic to expect every discussion with every group of children to follow all eight steps in the sequence. Your children will let you know how far they want you to go with the discussion. Follow their lead."

"As children become more learned in the topic, they will better collaborate with their friends."

Sciencing Discussion Demonstration

This sciencing discussion demonstration incorporates the eight steps of the scientific model. The key component of this discussion section is presenting it in such a way that a child will not only understand, but also become actively involved in the learning process, and expand this process independently. A sample of the sciencing discussion will be provided (Appendix B4).

"This is an actual discussion demonstration incorporating the theme of "Birds/Eggs/Nests" Display different sizes and colors of eggs on a tray. Talk with the children about the different eggs. Ask children about the egg as their food. Ask about the inside of the egg. What do you think is inside the egg?

Open the egg in a pan and pass it around to look at and touch if they like. (Reminder; if they touch the egg, they need to go wash their hands). Talk about the shell, yolk, and egg white.

Where do you think we got this egg? Use leading questions until someone mentions a bird. The egg is developed inside the bird's body. The bird lays the egg in a nest through a special opening in her body.

Name different creatures that develop from an egg: Chicken, Duck, Goose, Insects, Spiders, Peacock (All birds), Insects, Reptiles, Fish, and Dinosaurs Establish what will grow inside each egg by leading questions; "What will hatch from a turkey egg? What will hatch from a snake egg?" (Etc.) Establish where different eggs come from.

Lesson Planning

The Director and the Teachers will write the lesson plan together incorporating another area (topic) from the Birds/Eggs/Nests theme.

The Director will place a blank lesson plan transparency on the overhead screen and give a blank paper lesson plan to the Teachers. As the Director and Teachers discuss the elements of the lesson plan, the Director will place the ideas on the transparency and the Teachers will place the same ideas on the lesson plan.

"Now it's your turn to create a lesson plan incorporating topics from the Birds/Eggs/Nests theme within the discussion section. In my demonstration, I (Director) enhanced the environment in six areas: Dramatic Play, Block Area, Art, Literacy/Writing center, Manipulative, and Cooking experiences. Using the curriculum (Appendix B6) as our guide, we are going to complete the following sections on the Lesson Plan: art area, language/literacy, and group discussion. Let's see what we can come up with together on the lesson plan for the remaining seven days."

Process Evaluation

"Teachers, I want to thank-you for participating in the training on Sciencing and the Early Childhood curriculum. I would like you to evaluate the process. This has been a learning experience for me as well. Your input will be beneficial for future trainings. I have refreshments in the back for you to enjoy as you complete the evaluation. Again, thank-you."

CHAPTER THREE

RESULTS

Raw scores were completed for the Director because there was just one. Mean scores were completed for the Teachers because there were five. The Raw Scores of Sciencing with Teachers and Children Questionnaire for Director are shown in Table 2. The Means and percentages of Sciencing with Teachers and Children Questionnaire for the teachers are shown in Table 3.

Following are the questions that were included in the questionnaire.

1. Was the mentoring portion of the curriculum helpful?
2. Was the theme workable? Why? Why not?
3. Were the children engaged in the discussion? In what way?
4. Were the children engaged in the activities? In what way?
5. Did the previous discussion continue in the following weeks?
6. Did the curriculum help you to enhance the environment?

7. Will you continue to use the curriculum? Why? Why not?

Table 2. Raw Scores of Sciencing with Teachers and Children Questionnaire for Director

	1	a-i	2	3	4	5	6	7
Raw scores	5	5	5	5	5	3	5	5

Table 3. Means and Percentage of Sciencing with Teachers and Children Questionnaire for Teacher

	1	a-i	2	3	4	5	6	7
Mean	4.4	4.6	4.6	4.2	4.2	3.2	4.4	4.6
%	88	92	92	84	86	64	88	92

The Director and the teachers completed Sciencing with Teachers and Children Questionnaire. There were two portions to the questionnaire. One portion was rated using the Likert scale (1 almost never true - 5 always true). All participants responded to the Likert portion of the questionnaire. The second portion of the questionnaire was written responses. The Director completed both the Likert Scale and the written portion. Out of five teachers, all completed the Likert Scale, however, only two participants completed the written portion. The remaining three teachers did not complete the written portion at all.Two participants responded to the entire written portion of the questionnaire. One participant responded to question 2 only.

The overall mean of the nine questions completed by the teachers listed in the questionnaire was 4.9 (98%). The first question focused on the mentoring portion of the curriculum. The Director found that the mentoring portion of the curriculum was effective given the raw score of 5 (100%). Nine components of the training framework followed the first question to support the effectiveness of the training. These components are, 1) Curriculum Goal, 2) Theme Selection, 3) Special Activities, 4) Material Selection, 5) Setting up the Environment, 6) Discussion Ideas, 7) Curriculum Demonstration, 8) Lesson Planning, and 9) Group Evaluation. The Director strongly agreed that the training portion was helpful given the raw score of 5 on each of the nine components.

Question two asked if the theme was workable. The Director stated that the mentoring portion of the curriculum was workable given the raw score of 5 (always agree). The Director stated in the written portion, "The theme was extremely workable for the teachers. The Director stated "The theme was *natural* for the children. The *materials* for the teachers were available and they had *prior experience* with the information through the mentoring portion of the training.

Questions three and four addressed the children's engagement in the discussion and the activities. The Director found that the children were engaged in the discussion and the activities with a raw score of 5(always true), respectively. The Director stated in the written portion, "The children identified the things they already *knew about* and asked questions about some of the *new information*. The children responded to the *hands-on* materials and activities."

Question five asked if the previous discussion continued the following week. The Director found that the previous discussion did not always continue the following week with a raw score of 3 (sometimes true) The Director, however, continued to state in the written portion, "The children attending the center five days a week were more likely to continue discussions. The teachers would ask open-ended and reference questions to revisit the information."

Question six asked if the curriculum helped the teachers to enhance the environment. The Director gave a raw score of 5 (always true). The Director stated in the written portion, "The idea that *each area in the classroom must have something related to the theme* was reinforced. By including aspects of sciencing throughout the curriculum, the teachers saw the value in the curriculum."

Lastly, the seventh question asked if the center would continue to use the curriculum? The Director gave a raw score of 5 (always true). The Director's response in the written portion, "Yes, the teachers were excited about the experience they had. We will incorporate it in our planning."

For the teacher, the Sciencing with Teachers and Children Questionnaire was completed which was the same questionnaire used by the Director. For question 1, 88% of the participants found that the mentoring portion of the curriculum was helpful with the mean score of 4.4. Specifically, when the mentoring portion was divided into the nine components; 1) Curriculum Goal, 2) Theme Selection, 3) Special Activities, 4) Material Selection, 5) Setting up the Environment, 6) Discussion Ideas, 7) Curriculum Demonstration, 8) Lesson Planning, and 9) Group Evaluation, 92% of the participants stated that the 9 components of the mentoring portion were helpful. One of the participants stated in the written portion,"The concept of *integrating* the nine components throughout the curriculum was beneficial." Secondly, "The training portion was *organized* and effective due to the concrete materials (i.e., *overheads*) used in the training."

For question 2 related to theme, 92% of the participants found the themes to be workable, with a mean score of 4.6. Three participants stated in the written portion, "The exploration of themes was meaningful to the children, as the themes built on the children's prior knowledge", "The themes were found to be seasonably appropriate", and "The children are always interested in learning about insects, we see them everyday." In sum, the participants point out that the theme was meaningful, seasonably appropriate, and consistently evoking the children's interests.

Question three and four related to engagement in the discussion and the activities. 84% of the participants found children to be engaged in the discussion portion of the curriculum with a mean score of 4.2. The participants stated in the written portion, "Children were *answering questions*, *labeling items* and *talking about prior* *experiences."* "They were interested because they asked questions."

For engaging in the activities, 84% of the participants found that children were always engaged in the activities with a mean score of 4.2. Two participants stated in the written portion, "Children were found to be *investigating*, *exploring*, *creating* and *talking*", and "They love making eatable insects!"

Question 5 asked the participants whether the previous discussion continued in the following weeks. 64% of the participants found that children would recall and tell something about the previous discussion with a mean score of 3.2.One participant had a score of 2 (not often true), and responded in the written portion," Not yet." This low score and "not yet" may imply that the training was only one month in duration.

Question 6 focused on the enhancement of the environment. 88% of the participants found that the curriculum enhanced the environment often with a mean score of 4.4. One participant stated in the written portion, "There were insects everywhere!" The other participant added," It is effective in preparing the environment so that each center of the theme is reinforced."

The final question asked if the participants would continue to use the curriculum. The results showed that 92% of the participants agreed that they would continue with the curriculum. The following are some of the examples of participant responses in the written portion: 1) "The curriculum was appropriate because it involved nature, is hands-on, and reaches all types of learners," "Great tool for setting up the environment to enhance opportunities to enhance the theme," and 2) "The children had a blast!"

CHAPTER FOUR

DISCUSSION

The present project examined the power of play, guided discovery and hands-on experiences in the early childhood classroom specifically as it relates to early childhood science experiences. There is a lack of theory-based curricula in Early Childhood, especially pertaining to science. This project proposed a play-based science curriculum. Play is derived from the hands-on exploration based on Piaget, scaffolding based on Vygotsky, and Guided Discovery, which is a culmination of the two theorists.

Upon review of four science curricula (i.e., Mudpies to Magnets, Sandbox Scientist, The Young Scientist Series, and Science Start!), teacher training was not incorporated. Therefore, this project included a training manual for the early childhood educators (i.e., Director and Teachers). This project offers not only the curriculum, but also a Training Manual (i.e., Author-Director, Director-Teacher).

Research has shown that the knowledge gained from training experience will enhance classroom quality (Snider & Fu, 1990). A Training Manual, therefore, was developed for this project. There are nine components to this manual. These are 1) Curriculum Goal, 2) Theme Selection, 3) Special Activities, 4) Material Selection, 5) Setting up the Environment, 6) Discussion Ideas, 7) Curriculum Demonstration, 8) Lesson Planning, and 9) Group Evaluation.

Transparencies (i.e., written training materials) and charts (i.e., Discussion, Special Activities) were utilized throughout the training. The purpose of the transparencies was to ensure the quality of the training. The purpose of the Discussion Chart was to guide the trainees in the implementation of developmentally appropriate Sciencing language to be used with the children in the classroom. The purpose of the Special Activities Chart was to enhance the thematic approach of the curriculum. Specifically, it included cooking, art, literacy, and dramatic play ideas.

In this project, there were four general findings. The first finding is related to the mentoring portion of the curriculum. The results showed that the mentoring portion of the curriculum (i.e., training manual) was effective for both the Director and the Teachers. The Director stated that the materials used in the training were organized and effective in presenting the curriculum.

Furthermore, the teachers stated that they were comfortable implementing the curriculum in their classrooms, as they had participated in curriculum training prior to the implementation in the classroom. These findings may provide support for the importance of mentoring (i.e., teacher training) in the enhancement of the classroom environment (Mayer, 2003). The nine components of the training framework supported the effectiveness of the training, which is consistent with the Snider and Fu study (1990). The Snider and Fu (1990) study addressed that there are five factors to effective teacher training. There are 1) Assessing Developmentally Appropriate Practice Content, 2) Selection of Material, 3) Setting up the Environment, 4) Modeling the Curriculum and 5) Overall Assessment. Upon reviewing the five factors of Snider and Fu (1990), this project incorporated these same factors and added an additional four components (i.e., factors). The additional components include 1) Theme Selection, 2) Special Activities, 3) Discussion, and 4) Lesson Plan. These additional four components of this project compliment Snider and Fu's (1990) first factor, Assessing DAP Content. The purpose of these additional four components was to ensure the quality of teacher training, specifically, as it pertains to the strategies of Guided Discovery in this, hands-on, in-service training. In turn, research suggests that the knowledge gained from supervised experience and trainings will enhance classroom quality (Snider & Fu, 1990).

The second finding is related to the effectiveness of the curriculum. The effectiveness of the curriculum was determined by the responses in the following three areas: 1) Thematic selection, (as seen in question number two) 2) Engagement in the discussion and the special activities, (as seen in questions number three and four) and 3) Continuance of prior discussion (as seen in question number five).

For thematic selection, the results showed that the theme was workable. According to the Director, the theme was natural for the children because it was information they had already experienced. According to the teachers, the themes were meaningful, seasonably appropriate and consistently evoked the children's interests. This explanation coincides with the philosophy of sciencing according to the author. Sciencing refers to the child's active participation in learning about science and takes into consideration the child's innate curiosity about the world around them. The thematic approach is one of the most effective ways to introduce the sciencing concept to young children. Not only is theme selection developmentally appropriate, it also incorporates the concept of scaffolding, Vygotsky's constructivist theory. The theme selection was also seasonably appropriate to ensure availability of sciencing materials and based on the surrounding natural world.

For engagement in discussion and activities, the results showed that children were engaged in not only the discussion portion of the curriculum, but the activities, as well. According to the Director, children were observed identifying materials they already knew, asking questions, and generating new information. Especially, the hands-on materials and activities provided. According to the teachers, children were observed investigating, creating, exploring, talking about prior experiences, and asking questions. The finding on the children's engagement in activities is parallel to the constructive theory of Piaget. According to Piaget, the interaction between assimilation (i.e., identifying materials they already know) and accommodation (i.e., generating new information) is the source of development and learning. Additionally, the children were engaged in the special activities (i.e., eatable insects).

The finding on the children's engagement in the discussion supports the importance of the implementation of Guided Discovery strategies. Similarly, it also supports the effectiveness of the framework of the discussion. This finding is consistent with the Mayer review (2003) in which children seemed to learn better when they were active and when a teacher helped guide their activity.

For the continuance of the discussion, the results showed that the prior discussion did not always continue the following week. According to the Director, the children were more likely to continue with prior discussions if they attended school for five days a week. According to the teachers, the continuance of the discussion was weak. This weak link may be due to the fact that the curriculum was implemented for only one month. The other possible explanation could be that the teachers and children need more experience in discussion strategies. This is especially true when the teachers ask open-ended questions and reference questions from the previous week.

The third finding is related to enhancement of the environment. The results revealed that the quality of the classroom environment was enhanced through the use of the

Sciencing Curriculum. One needs to be cautious when interpreting this finding because an environment rating scale was not implemented into this project. Both the Director and the Teachers agreed that the thematic selection of the sciencing materials throughout the classroom was reinforced. Thus, the setting up of the environment with thematic materials afforded the teachers the opportunity to appreciate the value of the thematic-based curriculum. In other words, engulfing the thematic sciencing activities throughout the entire classroom is referred to as the Holistic Sciencing approach. In more detail, sciencing activities can be seen in various centers: Art, Literacy, Dramatic Play, Blocks, and Manipulatives.

These findings also provide support for the effectiveness of the Special Activity Chart used in the curriculum. The Special Activity Chart lists activities and offers material suggestions. Due to the effectiveness of the curriculum as it pertains to promoting the quality of the classroom environment; the teachers were more likely to continue implementing the Playful Sciencing Curriculum.

The fourth finding is related to the overall quality of the training and the continued usage of the curriculum in the future. The curriculum was found to be beneficial to all participants (i.e., Director and Teachers). Both the Director and the teachers agreed that they were excited about the experience and will incorporate the curriculum in their planning. The strengths of this curriculum consist of the following elements: developmentally and seasonably appropriateness, and hands-on, incorporating various learning styles (through providing a variety of thematic activities/centers). Thus, the listed strengths suggest that the Playful Sciencing Curriculum within the Teacher Training is an effective tool for the overall quality of the early childhood classroom. Another possible explanation for the continuum of the curriculum may be due to the fact that the mentoring portion provided a support system needed to ensure a positive teaching experience. This support system, especially the curriculum demonstration portion, is parallel to the Vygotskian concept of adult scaffolding. Typically, scaffolding is mentioned in the context of adult-child interaction. However, this project expands the meaning of scaffolding at the adult-adult level (i.e., Director-Teacher training).

In sum, the four findings of this project relate to the effectiveness of the mentoring portion of the curriculum, the Sciencing Curriculum itself, the classroom environment, and the curriculum continuity. Thus, these findings provide support for the nine components of the Teacher Training framework. The Sciencing Curriculum is the critical component of the mentoring experience. In other words, the mentoring experience does not exist if the Sciencing Curriculum is not assessable. Due to the fact that the mentoring experience and the Sciencing Curriculum were co-constructed or integrated, the quality of the classroom environment was enhanced. Therefore, the teachers were more likely to continue using the Sciencing Curriculum.

The key word in the title of this Sciencing Curriculum is playful. Play is derived from the hands-on exploration, which is based on Piaget, scaffolding, which is based on Vygotsky, and Guided Discovery, which is based on a culmination of Piagetian and Vygotskian concepts of play. Therefore, a research- and play-based curriculum was developed.

Limitations of Project

At this point in the development of a Sciencing Curriculum, specifically the training portion of the curriculum there are some limitations. First, it must be mentioned that only one center participated in the project. Future studies should recruit a larger sample of participants; therefore, the validity of the project would have been enhanced. Secondly, the author of the curriculum knew the Director. The Director's comments may be biased to favoritism. Future studies should use numerous centers with various unknown participants. Therefore, the results would have been varied and unbiased. Lastly, the curriculum was only implemented for one month. To add to the validity of the results, future studies should implement the curriculum for at least four to six months.

In terms of future implementation of the project and its validity of findings, it will be important to expand the instruction on the written portion of the questionnaire. For example, it would be beneficial for the participants to document the anecdotal observation in order to enrich the results of the project. In other words, anecdotal observations need to be precisely what the teachers see and what they hear.

Lastly, to enhance the validity of this project, a research-based measure needs to be utilized. The Early Childhood Environment Rating Scale- Revised Edition is an appropriate suggestion to consider.

To sum up, Playful Sciencing and the Early Childhood Classroom Curriculum seems to be an effective tool for Early Childhood educators as well as young children. The training portion was effective and the themes were workable. The children were engaged in the discussions as well as the activities. The classroom environments were enhanced and this is a curriculum the Center would like to continue implementing. The limitations of the project are few, and with the limitations being addressed, the curriculum can add a needed component in the early childhood classroom. *Sciencing and the Early Childhood Classroom* is an effective curriculum. The curriculum could be used in other centers to help teachers and children in the area of science.

APPENDIX A

PLAYFUL SCIENCING AND THE EARLY CHILDHOOD CLASSROOM

Playful Sciencing and the Early Childhood Classroom Curriculum

Playful Sciencing

and the

Early Childhood Classroom

A Hands-On Science Curriculum for Teachers of Young Children

By: Barb Kirby

"Play is not wasted time, but rather time spent building new knowledge from previous experience" (Bruner, 1972; Piaget, 1962).

Acknowledgements

I would like to take this opportunity to thank Louise Villenueve, Director/Owner of The Village Preschool for giving me the opportunity to study science with young children under her guidance. It is only through this experience that I was able truly understand the meaning of science <u>with</u> young children, not science <u>for</u> young children. Children must be equal partners in the quest to explore, experiment, question, and solve the wonders of our world. Thank-you to all the children who helped in the making of this curriculum possible.

Table of Contents

7. Weight and Measures
    - Discussion Ideas
    - Special Activities
    - Art Ideas
    - Literacy

8. Magnets
    - Discussion Ideas
    - Special Activities
    - Art Ideas
    - Literacy

9. Space
    - Discussion Ideas
    - Special Activities
    - Art Ideas
    - Literacy

10. Physiology
    - Discussion Ideas
    - Special Activities
    - Art Ideas
    - Literacy

11. Birds/Eggs/Nests
    - Discussion Ideas
    - Special Activities
    - Art Ideas
    - Literacy

12. Seeds and Plants
    - Discussion Ideas
    - Special Activities
    - Art Ideas
    - Literacy

13. Wild Animals
    - Discussion Ideas
    - Special Activities
    - Art Ideas
    - Literacy

14. Dinosaurs
    - Discussion Ideas
    - Special Activities
    - Art Ideas
    - Literacy

15. Sea Life
    - Discussion Ideas
    - Special Activities
    - Art Ideas
    - Literacy

Playful Sciencing and the Early Childhood Classroom

Theme 1: "All About Me"

Discussion Ideas:

Lesson 1:

Discuss the child's home. Do they live in a house, apartment etc? Who lives there? Talk about their room; do they share with someone? Discuss the people in their family. What does mommy do? What does daddy do?

Lesson 2:

(Review) Do they help mom- how? Who cooks for them, where? Where do they eat? Who washes their clothes? Who makes the yard look nice? Who mows the lawn? Do pets live at their home?

Lesson 3:

(Review) Discuss favorite foods, favorite toys, favorite places to go and why?

Lesson 4:

Review all with great excitement! Compare each of the children; what they look like, what color is their eyes, hair etc.? Each child is the same, but we are different too.

Lesson 5:

(Review) With great enthusiasm uncover the live tortoise. Put tortoise on the rug and look at its house. Compare to children's' homes. Is the tortoise alive? How do you know? Can he see? Look at eyes, eyelashes. Compare to children's eyes. Can he hear? Look at his ears. Compare to children's' ears. Give tortoise some grass. Does he have teeth? No, he has bony gums to help him chew and bite food. Compare to children's' teeth. What can the tortoise do if he gets hot, cold, or scared? What do we do? Spend time with children simply observing the tortoise.

Special Activities

Art Ideas:

(Art at this time needs to be simple; play dough, coloring, brush painting, and collaging).

1.Have children draw a picture of themselves. "Tell me about your picture?" Write down exactly what they tell you about their picture and their family.

2.House pattern- rectangle with triangles drawn on the corners for children to cut off. Encourage the children to draw their homes inside.

3.Collage pictures of families children cut out of magazines.

Literacy:

Clifford's family

By: Norman Bridwell

Just Grandma and me

By: mercer mayer

Just Grandpa and Me

By: Mercer Mayer

Just Me and My Cousin

By: Mercer Mayer

Just Me and My Dad

By: Mercer Mayer

Just Me and My Little Brother

By: Mercer Mayer

Just Me and My Little Sister

By: Mercer Mayer

Just Me and My Mom

By: Mercer Mayer

Little Fur Family

By: Margaret Wise Brown

Our Granny

By: Margaret Wild

The Baby Dances

By: Kathy Henderson

What Daddies Do Best, What Mommies Do Best

By: Laura Numeroff

What Grandpas Do Best, What Grandmas Do Best

By: Laura Numeroff

You're Just What I Need

By: Ruth Krauss

Theme 2: "A Week On The Farm"

Discussion Ideas:

Lesson 1:

Using a big farm poster discuss the scene. Identify buildings on the farm. Who do you think lives in this house? Who do you think lives in the big red barn? Who works on the farm? What work does the farmer do?

Lessons 2-5:

Discuss animals on the farm, either using a big poster or a plastic figure. Discuss a new animal each day. With each discussion name the animal and compare the animal's body to the children's' body. (Exp) How many legs does the horse have? How many legs do you have? Who has more/less? How many eyes? Where are the horse's eyes? Where are your eyes? How many ears? Where are the horse's ears? Where are your ears? Does the horse have a nose? What covers the horse's body? What covers your body? How does the horse help the farmer? The horse pulls the wagon on the farm.

Cow: repeat above process. Cows give milk and meat to the farmer.

Sheep: repeat above process. Sheep give the farmer wool to make slippers, coats, socks, and sweaters etc.

Goats: repeat above process. Goats give us milk.

Pigs: repeat above process. Pigs give us meat; pork chops, bacon etc.

Chickens: repeat above process. Chickens give us eggs.

Dogs: repeat above process. Dogs chase all the bad animals away that want to eat the farmer's animals.

Cats: repeat above process. Cats chase the mice away from the chicken's food.

Special Activities:

Milk the cow: bring a bucket and a stool to class. Poke tiny holes in a latex glove. Pour milk in glove. Children come up one at a time, sit on the stool, and "milk" the glove (cow) into the bucket. Upon the completion of milking the cow, the children actually measure the milk in the pail.

Egg discovery: bring different eggs to class. Feel and talk about the eggshell, egg white, and egg yoke. Scramble up some eggs for snack!

Butter making: chill a pickle jar in the freezer. Fill jar with ½ pint of cream and 1 tablespoon of sour cream. Shake, shake, shake!

Cottage cheese: heat milk in an electric skillet. When milk is heated, pour a teaspoon of vinegar in skillet and that milk will curdle right up!

Art Ideas:

1. Fingerpaint with red paint and save. The following day children cut barn out of painting. (Teacher draws a pattern for children) collage hay on red barn.

2. Collage with eggshells.

3. Cotton collage.

4. Buttermilk and colored chalk painting.

Literacy:

Barn Cat

By: Carol P. Paul

Barnyard Banter

By: Denise Fleming

Big Fat Hen

By: Keith Baker

Big Red Barn

By: Margaret Wise Brown

Can You Make a Piggy Giggle

By: Linda Ashman

Click, Clack, Moo Cows That Type

By: Doreen Cronin

Cock-a-Doodle-Moo

By: Bernard Most

Do Like a Duck Does

By: Judy Hindley

Duck in the Truck

By: Kez Alborough

Farm Counting Book

By: Jane Miller

Farm Noises

By: Jane Miller

Five Little Ducks

By: Pamela Paparone

Inside a Barn in the Country

By: Alyssa Satin Capucilli

Mary Had a Little Lamb

By: Iza Trapani

Mary had a Little Lamb

By: Sarah Josepha Hle

Moo, Moo Brown Cow

By: Jakki Wood

Oink

By: Arthur Geisert

Old Macdonald Had a Farm

By: Carol Jones

Old Macdonald Had a Farm

By: Pam Adams

Over on a Farm

By: Christopher Gunson

Piggies

By: Audrey and Don Wood

Seasons on the Farm

By: Jane Miller

Silly Little Goose

By: Nancy Tafuri

The Cow Buzzed

By: Andrea Zimmerman & David Clemesha

The Cow That Went Oink

By: Bernard Most

The Flea's Sneeze

By: Lynn Downey

The Little Red Hen

By: Paul Galdone

The Pig's Picnic

By: Keiko Kasza

The Pig in the Pond

By: Martin Waddell

The Spotted Pig

By: Dick King-Smith

When Sheep Can Not Sleep

By: Satoshi Kitamura

Theme 3: "The Exciting World Of Insects/Spiders"

Discussion Ideas:

Science Information: Of all crawling creatures, only insects have wings, but not all insects have wings.

- A. An insect has 6 legs
- B. An insect has 3 body parts
  1. Head- with antennae or feelers
  2. Chest or thorax- with all wings and legs
  3. Tail or abdomen
- C. Insects' skeletons are on the outside
- D. Spiders have 8 legs- spiders are not insects.

When you have greeted each child ask the group, "do you know what you are? Are you a horse? Are you a dog?" Children will enjoy this and will soon enter into this game—by and by one child will say that they are a person. "Yes, you are a person. Are you alive? Do you walk? Do you run? Do you eat?" Continue involving the children, smiling and enjoying the game. "How many eyes do you have? How many heads? How many legs? Etc."

Now draw attention to the bulletin board, where pictures of different insects have been placed. Ask anyone if they know what this is? Listen very carefully; as sometimes children speak very quietly, until they have gained confidence, you may overlook the child's answer. If someone mentions insect or bug immediately affirm this answer.

"Can anyone find another insect on the board?" Let children go up to the board and point to different insects, encouraging them to name the insect – if this is too difficult you supply the name. Allow for each child's turn but move on when you notice disinterest. This lesson needs to be repeated the second day.

Day two add a felt insect with 3 body parts, 2 antennae, and 6 legs. "Can someone point to the insect's legs? Do you have legs? How many legs do you have? How many legs does the insect have? Who has more? Who has less? Continue this conversation, comparing the insects' body to the children's body.

Now we want to check for understanding. As children are seated on the rug, place the felt insect's body pieces on the felt board, <u>incorrectly</u>. Children love this game, teacher is so silly!

The following days will find you talking about different insects. Remember, review yesterday's information <u>before</u> introducing new information. Introduce one new insect each day.

Insect Facts:

<u>Ants</u>: 6 legs

2 antennae

3 body parts

Live in ant hill

Worker ants

Queen ant

Red and black ants

Ladybugs: 6 legs

2 antennae

3 body parts

Wings tucked under shell (skeleton)

Round shape

Caterpillars: 6 legs (the rest are suction cups)

2 antennae

3 body parts

Furry bodies

Form cocoon around body = butterfly

Butterflies: 6 legs

2 antennae

3 body parts

Review cycle (caterpillar-butterfly)

Grasshopper: 6 legs

2 antennae

3 body parts

Hind (back) legs for hopping

Wings

Bees: 6 legs

2 antennae

3 body parts

Gather nectar (sweet juices) from flower

Carry nectar on back legs in sacs

Queen bee

Worker bees

Beehive

Different colors

Wings

<u>Praying Mantis:</u> 6 legs

2 antennae

3 body parts

Green color for "camouflage"

Front legs are hooks to catch bugs

<u>Spider:</u> <u>not an insect</u>

8 legs

2 body parts

Many eyes- 2-12

Spiders with poor eyes need to spin webs to catch their food. Spider stays in the center of his web. Web is sticky on the outside; spider "feels" web shaking and catches his food. Spiders with good eyes don't spin webs. They hunt their food on the ground.

Special Activities:

Sprinkle sugar on an anthill. Carry ant away from ant hill- see if he can find his way back.

Eatable insects: apples, pretzels, marshmallows, and raisins.

Ants on a log: celery, peanut butter, and raisins.

Art Ideas:

String painting making spider webs- add plastic spider

Yarn collage spider web - add plastic spider

Fingerpaint with red paint, take a print lift using newspaper. Let your parents cut ants from painting.

Children rip brown paper and collage on huge anthill made out of butcher paper. Place your red ants all around anthill.

Children trace a circle on red paper. now add dots either using thumb prints or cut out black dots (ladybug).

Collage tissue paper on 3-hole egg carton (caterpillar).

Splatter painting using screens, toothbrushes, food coloring, and glue on butterfly shape.

Straw blowing on $\frac{1}{2}$ of butterfly shape using glue and tempra paint. Fold and open = very shiny butterfly.

Go on a ropewalk, collecting twigs, grass, and bark etc. Make a silly insect by sticking your ropewalk treasures in play dough.

Literacy:

Be Nice to Spiders

By: Margaret Bloy Graham

Demi's Secret Garden

By: Demi

Eensey Weensey Spider

By: Joanne Oppenheim & S.D. Schindler

Effie

By: Beverly Allinson & Barbara Reid

Have You Seen Bugs?

By: Joanne Oppenheim & Ron Broda

"I Can't Said" The Ant

By: Polly Cameron

I Know an Old Lady Who Swallowed a Fly

By: Nadine Bernard Westcott

I Know an Old Lady Who Swallowed a Fly

By: Stephen Oulbis

I Love Spiders

By: John Parker & Rita Parkinson

I Love to Eat Bugs

By: John Strejan

In the Tall, Tall Grass

By: Denise Fleming

Ladybug

By: Barrie Watts

Ladybug, Ladybug

By: Ruth Brown

Miss Spider's Tea Party

By: David Kirk

More Bugs in a Box

By: David A. Carter

Old Black Fly

By: Jim Aylesworth & Stephen Gammell

Quick as a Cricket

By: Audrey & Don Wood

The Big Honey Hunt

By: Stanley and Janice Berenstain

The Butterfly Hunt

By: Toshi

The Butterfly Kiss

By: Marcial Boo & Tim Vyner

The Flea's Sneeze

By: Lynn Downey & Karla Firehammer

The Grouchy Ladybug

By: Eric Carle

The Honey Bee and the Robber

By: Eric Carle

The Icky Bug Alphabet Book

By: Jerry Pallotta & Ralph Masiello

The Itsy Bitsy Spider

By: Iza Trapani

The Very Busy Spider

By: Eric Carle

The Very Clumsy Click Beetle

By: Eric Carle

The Very Hungry Caterpillar

By: Eric Carle

The Very Lonely Firefly

By: Eric Carle

The Very Quiet Cricket

By: Eric Carle

There was an Old Lady who Swallowed a Fly

By: Simms Taback

We Like Bugs

By: Gladys Conklin & Arthur Marokvia

When the Fly Flew In

By: Lisa Westberg & Brad Sneed

Theme 4: "Trees and Leaves, Nuts and Fruits

Discussion Ideas:

Lesson 1:

Review previous unit. Ask leading questions as to what insects and farm animals like to eat. When the word leaves is given move immediately into the tree unit. Where do we find leaves? * Trees are the largest plants. Look at pictures of trees with children. Pictures need to be large and "interesting." Call attention to the different sizes and shapes of trees. *Point to tallest, shortest, widest, etc. Point to the trunk, branches, leaves. Go on a ropewalk and look at different trees and leaves. Gather up twigs, leaves, bark etc. to collage.

Lesson 2:

Review last lesson. Today analyze the tree. It is alive. Compare the tree to people. Can it walk? Why? Can it talk? Why? Does the tree have eyes? Can the tree move? What can make the tree move? Using a large dry erase board, draw the tree trunk-draw earth line. Draw roots under earth line. * The roots feed the tree and hold the tree up. What do you think would happen if the tree had no roots? Yes, the tree would fall down...timber! Next add branches, limbs (twigs). Let children add leaves.

Look at bark, talking about how it feels. *The bark is the tree's skin. Do you have skin? Does it feel like the trees' skin? Discuss; smooth, rough etc. The tree's skin protects the tree from insects and keeps in "moisture." Our skin protects our bodies too. Call attention to leaves and how they are attached to the tree. * Leaves manufacture the food for the tree by combining the sap or juice with sunshine and air.

Sit under a tree and look up through the leaves. One by one allow children to put their arms around the tree's trunk. Look at the leaves' different colors and shapes. In the fall leaves fall to the ground. Look at the veins in leaves. We get wood and paper from trees. What can we use this wood and paper for? Discussion: our houses are made out of wood, the furniture in our houses is made out of wood, even our blocks at school are made of wood etc. Allow children to go on a "wood hunt" around the classroom and find items made of wood.

Magical Trees

We're going to pretend that I am a fairy. I'm going to wave my magic wand and say my magic words and turn all
Of you into trees! Am I "really" going to turn you into trees? No, this is just a fun game. Ok, here we go!! *Bibbity boo!! What happens when you hear those funny words? Yes, you turn into trees! Your shoes are the tree's roots that go down, down deep into the ground. Your bodies are the tree's trunk, your arms are the branches and your fingers are the leaves. You're standing in the forest with many other trees.

One day a gentle breeze came into the forest and blew upon your branches. Of course, the trees' roots were tight in the ground and all that could move were the leaves. The breeze blew and blew and the leaves moved and wiggled in the air. Soon a stronger breeze came. Now the leaves and branches could move and twist and dance in the air, but, still, the roots (feet) stood still. All of a sudden the breeze turned into a strong, fast wind. It blew in a storm!!! This moved the leaves, branches, and the trunk of the tree...but, still, the roots stayed firmly in the ground.

By and by the strong wind became a gentle breeze again and the leaves moved ever so slowly.

(You may add music to this activity; Autoharp, tone bars, hand drum, playing softly and then louder and louder and then softly again.)

<u>Lesson 3</u>:

<u>How trees change</u>. Review previous lesson. Have you noticed anything on the ground that has fallen from the trees? Do we walk under trees? What do we see on the ground? Why do you suppose leaves fall from the trees? We said that the leaves help to feed the trees, but when fall time comes the weather begins to get cold, most trees rest so they don't need the food the leaves make. The leaves then begin to change color and soon they fall to the ground. Let's look at these leaves. Look at the colors; green, red, orange, yellow, and brown. Look at the veins, stem, texture and differences.

<u>Lesson 4</u>:

<u>Things that trees give us</u>. Review previous lesson. The last time we were together we talked about the leaves that grow on the trees. Today were going to talk about other things we get from trees. Does anyone know what grows on trees that we like to eat? Talk about different fruits the children mention. Uncover your basket of different fruits. Pass

different fruits around so children have the opportunity to smell and feel the fruits.

Open up different fruits for tasting. Discuss the skin on the outside of the fruit. The skin protects the fruit, just like our skin protects us. Discuss the fact that some skin is for eating, some skin is not. Talk about the seeds inside, sweet vs sour, crunchy vs non-crunchy etc.

Lesson 5:

Review previous lesson. What else do trees give us? Uncover assorted nuts. Pass nuts around so children have the opportunity to smell and feel them. * Nuts are seeds from the tree. Discuss different textures of nutshells. These shells protect the "meat" inside the nut. Crack open different nuts, cut in small pieces for tasting.

Special Activities:

Make pancakes or waffles with maple syrup

Make applesauce: Cut apples in wedges; give each child at the table a plastic knife and encourage them to cut apples in small pieces. Place pieces in an electric skillet with water; heat until apples pieces are soft. Mash apples and add cinnamon and sugar for a very yummy treat! Refrigerate until ready to serve.

Make peanut butter: (although peanuts don't grow on trees, they nonetheless are nuts.) Place 1 cup of shelled peanuts in a blender with 2 tablespoons of oil. Blend well and add another cup of peanuts. When well blended, spoon into a bowl, spread over crackers. Mm good.

Do at home work: Young children get so excited at the prospect of having homework; just like big brother or sister! Type this message on a green piece of paper and staple to a brown lunch sack: "I need to collect leaves and bark from the trees around my house. I need to put these leaves in my sack and bring them to school on Monday. Can you help me?"

Art Ideas:

Classroom tree: Using a large piece of butcher paper encourage children to rip pieces of brown paper and collage over butcher paper. The next day sponge paint green all over a piece of butcher paper. Now cut out your bulletin board tree.

Hand print leaves: Children may choose between red, orange, yellow or brown paint to finger-paint with. While finger-painting take a print lift of their hand and save. Later, let a parent cut out the hands - now you have leaves for your tree. I like to put small photos of the children on the leaves. Following your nature walk, collage all your "findings" on a cut out leaf.

Paint with maple leaves using fall colors of paint.

Visit a construction site; gather wood pieces and 1 larger piece of wood and bring back to center. Color your glue with fall colors, gather up wood chips, craft sticks and set this activity up outside. As the days progress add yarn to your wood gluing, maybe buttons, keys, anything goes here. Let the children bring "gluing" items from home. There are no limits or time frames to this activity!

Skillet coloring: Place a towel around an electric skillet. Heat skillet to 150 degrees. Take paper off large fall colored crayons. Lay a piece of plastic wrap in skillet. Children simply color, watching the crayons melt. Give your parents a leaf-patterned frame to cut out for each child. "Frame" these skillet coloring treasures and place around the classroom.

Nut painting: Place paper in bottom of box; place any nut in box, add paint and roll.

Fruit painting: Cut fruit in half, apples work real well. Let fruit dry overnight. Place paper towels on top of shallow containers, pour a little paint on paper towel and allow time to soak up paint. Dip fruit in paint and place all over a piece of butcher paper.

Nut shell collage

Splatter painting: Place a cardboard leaf on a piece of butcher paper. Place a screen on top of the leaf.
Using a toothbrush and fall colored paint, simply dip brush in paint and rub along screen. When finished, lift off screen and cardboard leaf and you will find a leaf print.

Literacy:

A Tree Can Be

By: Judy Nayer

A Tree is Nice

By: Janice May Udry

Apples and Pumpkins

By: Anne Rockwell

Autumn Leaves

By: Ken Robbins

Clifford's First Autumn

By: Norman Bridwell

Each Peach Pear Plum

By: Janet and Allan Ahlberg

Have You Seen Trees?

By: Joanne Oppenheim

Pumpkin Pumpkin

By: Jeanne Titherington

Red Leaf, Yellow Leaf

By: Lois Ehlert

The Apple Pie Tree

By: Zoe Hall

The Elephant Tree

By: Penny Dale

The Shy Scarecrow

By: Mary Packard

The Tree in the Ancient Forest

By: Carol Reed-Jones

Trees

By: Troll Associates

Theme 5: "Exploring Our Five Senses"

Discussion Ideas:

Lesson 1: Eyes and Sight

Today we are going to start our first lesson on the five senses. This will be a return to the individual child. To begin the lesson, have the children stand and sing to them the directional words:

> Put your hands on your head, on your head, (shoulder, hips, etc.) Return to head, then ears, mouth, nose and eyes.

Have children sit in a circle on the rug. Pass out small individual mirrors to each child. Can anyone tell me the name of these? (Point to eyes) How do we use them? When we look into the mirror, what do we see? What color are your eyes? (Ask each child) When you close your eyes, what closes? Put your finger on the hairs on your eyelid. Look at them and feel them. Can anyone tell me the name of these hairs? Do you see other hairs just above your eye? What are these called? Gently touch eyebrows and eyelashes. What do you think the eyebrows are used for? (The eyebrows, eyelashes, and eyelid protect our eyes) If the wind is blowing sand in your face, what do you do?

Yes, you close your eyes. Your eyelid is protecting your eyes, so sand doesn't get in them.

When you look into your eyes, what do you see? Can you see the black circle in your eyes? We call the black circle a pupil. The pupil is a small window in your eye that lets light into your eye. When you go in the sunshine the black circle gets smaller and smaller to keep out some of the bright light. When you go into a dark room the black circle gets bigger to let the light in so you can see better. What do you see around the black circle? This is called your iris. If you cover up one eye what do you see? When you sleep what do your eyes see? Why do we need eyes? Do animals have eyes? Our eyes are very important, we need to take care of them.

Lesson 2:

Remember the last time we looked at our eyes? Review the entire previous lesson with enthusiasm and mirrors!

What would it be like if we didn't have eyes? How would we move about without bumping into things? Let children try walking a short distance with their eyes closed. (Hold your arms open and ask a child to close his/her eyes tightly and walk into your arms). Let the children discover how it feels to be without this sense. Talk about the word, "blind." Blind means you can't see.

Do you think it would be easy to be blind, to not be able to see? Lead your discussion into things that can help people see or help people be able to move about.

- Glasses
- Cane
- Walking stick
- Hands (to touch things as we walk)
- Seeing eye dog
- Friends to lead us

Introduce the blind fold- place a 5-foot walking board upon 2 X 12 unit blocks. Tell children this story.

Once upon a time there was a beautiful princess named Priscilla. Every day she walked through her lovely rose garden and across a bridge to a little house where her grandmother lived. Now underneath this bridge lived two hungry crocodiles! Priscilla did not care because she could step across the bridge and the crocodiles could never reach her. One day a grouchy fairy touched Priscilla's eyelids and they wouldn't open up and Priscilla could not see where she was going! How do you think she felt about that? Yes, she was very sad. Now she couldn't go across the bridge to her grandmother's house. If she fell off the bridge she would fall into the pond where those hungry crocodiles lived! What was she going to do?

One day Priscilla had an idea. If she used her walking stick and tapped her way across the bridge her ears would help her stay on the bridge. So she very slowly and carefully tap-tapped on the bridge with her stick. When she heard this sound (demonstrate by tapping the board with the stick), she knew the bridge was there. When there was no sound, what do you think that meant? Yes, Priscilla couldn't take one more step or she would fall into the pond where the hungry crocodiles were waiting!

Priscilla walked slowly; slowly tapping across the bridge and never fell into the pond. She was very very happy. Now she could visit her grandmother everyday!

Invite the children to come up and practice walking across the "bridge". Be enthusiastic!

Lesson 3: Touch and Feel

Review the previous lesson. Introduce today's lesson by asking the children to name the skin. As you point to your skin, your question might be: "What do we call this part of our body?" Do you have any part of your body that is not covered with skin? Let's look at our skin. (Pass out magnifying glasses) Do you remember what the tree's skin is called? Do animals have skin? How is it different from our skin? Why do you think we need skin? Our skin covers our body and protects our body from harm.

Can you feel things with your nose? Can you feel things with your elbow? Can you feel things with your forehead? If your bath water is too hot, what do you do? Yes, you get out! What if you put your hands on the hot stove, what do you do? Yes, you take your hands off. You feel with your whole body. Briefly explain that your brain is your thinker. Your brain tells your skin if something is too hot, too cold, or just right. Encourage children to touch different parts of their body; exp. nose, elbow, back, ankle etc. to help them understand the concept.

Lesson 4:

Review last lesson. Talk about skin and touching. Have the children look around the room and find something smooth, rough, bumpy, etc. (Hint: Place items around the room that have different textures).

Lesson 5: Ears and Hearing

Review the other senses. Give each child a small mirror and encourage them to look at their ears. Next have them look at the child's ear sitting next to them. Use leading questions to help children describe their ears.

How many ears do you have? Where are your ears? Why do we have ears? Could you hear if your eyes were closed? Surprisingly say, " Oh my goodness, you have holes in your ears!" Give information that the hole in their ears is the doorway for the sound to get in to the brain. Remember when we talked about our brain; our thinker? Well, guess what? Our brain tells our ears what we hear. Suppose it's dark outside and you're sitting in your house and all of a sudden you hear (make a siren sound). What is that sound? How do you know that, it's dark and you can't see? Yes, your brain tells your ear, that's a siren! Maybe the police are driving by! Continue this questioning as long as the children are willing.

Ask children to cover their eyes and to listen to some sounds; ring a bell, tap a drum, clap your hands, etc. Encourage children to guess sounds.

Follow that sound! Encourage a child to close their eyes and follow the sound of the tambourine. Slowly walk around the room playing your tambourine; the child will follow you using his/her ears!

<u>Lesson 6:</u>

Review previous lesson. Place pictures of different animals on your board. Call attention to the board. Look at pictures of animals. Ask children to choose a picture and put their finger on the animal's ears. Talk about the shape, where it is located, and compare to children's ears. Discuss how the animal uses his ears, and why the animal needs ears.

Have an animal (preferably a bunny) in a covered cage. With great excitement uncover the animal. Take the bunny out and look at the bunny's body, comparing the bunny's body to the childrens' bodies. Lead the discussion to the bunny's ears, and compare to the children's' ears. Try to cause the bunny to turn its ears in different directions by making a sound behind its ears. Discuss why animals need to be able to pick up sounds in all directions. "Is this bunny alive? How do you know? If we were to touch the bunny, how would we touch him? Yes, very gently," (model this). Allow children to touch and feel the bunny.

Ernie's Story

Once upon a time a little boy named Ernie visited his grandparents who lived far out in the country. Ernie liked to visit the farm because it was so quiet that he could hear sounds made by birds and crickets. He could even hear the leaves rustle when the wind blew.

One day Ernie's grandmother bought a fine, big, red rooster. Every morning the red rooster stood on the top of the white picket fence under Ernie's bedroom window and crowed very loudly. Ernie would hear the rooster crow er-er-errrr. Then Ernie would hear the spotted cow moo softly as she waited for grandfather to milk her, moo-moo. Ernie liked these sounds.

One day a big machine came and built a road in front of the house and it made a loud grinding machine noise. Now Ernie would hear the rooster crow er-er-errrr and the cow moo-moo and the big machine grrr.

Days went by and Ernie woke up each morning to these sounds. By and by the road was finished. Now big trucks went by making brrr sounds. Cars would drive by and honk their horns, beep-beep.

One day Ernie woke up to the rooster's crowing er-er-errrr. He heard the cow moo-moo. He heard the truck br-brr. He heard the car honk beep-beep. Then he heard a strange sound squeak, squeak. Ernie jumped out of bed, dressed himself and ran to the front yard. There on the porch he saw his grandfather sitting on the porch, swinging on the porch swing, squeak-squeak. Ernie laughed and laughed, ha, ha, ha! Then Ernie stood straight up and gave a big yell, yow- yow! He was happy because he lived in a world of different sounds.

<u>Lesson 7</u>: Nose and Smelling

Review previous lesson. Today we are going to talk about our nose. Hand out little mirrors and encourage children to look at their nose. "Where is your nose? Is it on the back of your head or the front? Is it on the top, bottom, or middle of your face?" What do we use our nose for? Yes, for smelling. Oh no!! You have 2 holes in your nose!!!! Talk about the nostrils and what they're used for.

Pass around cotton balls saturated with a pleasant odor such as perfume or extracts. (Demonstrate how to sniff) Discuss with the children that we smell with our nose. The smell goes up to our brain and our brain tells us what we smell. Let's name some good smells. Now let's name some bad smells.

<u>Lesson 8:</u> Tongue and Tasting

Review previous lesson. Pass out individual mirrors and encourage children to look at their lips. Discuss the shape and color. Encourage children to wiggle their lips in different shapes while they are looking in the mirror. Ask them to gently touch their lips with their finger and describe how it feels. Ask the children to open their mouths and look at their teeth. Follow children's ideas on discussing teeth. Next discover and examine the tongue. Look at the color and the shape. Wiggle and move the tongue in and out and up and down. See if the children can do tricks with their tongue, such as rolling or folding. * The tongue is a strong muscle and we can make it do many things.

Have children hold down tongue with fingers and try to say these words, "Twinkle twinkle little star."

Give factual information that the tongue helps us to talk. The tongue also helps us swallow food and water.

Have children stick out their tongue and put a small piece of candy (kernel corn candy). "Don't let your teeth chew it, we want our tongues to taste it. Talk about the taste. Now put a piece of dill pickle or lemon on each child's tongue. Talk about the taste. Give factual information that our tongue also helps us to taste our food. We have taste buds on our tongue, and these taste buds tell us if the food tastes good or bad.

<u>Lesson 9:</u>

Review previous lesson, bringing children into the area of information about the tongue and what it does for us. Have an interesting container next to you with a variety of different tasting foods. Call a child up to you and very mysteriously and secretly reach into the container, have the child close his/her eyes and stick out his/her tongue. Place the food on the child's tongue and ask the child to taste it with their tongue and tell you what it is. Continue this activity until all children have a turn.

Direct the children's attention to the board where you have pictures of animals. Let the discussion grow from what the children see. Ask the children if they think animals have tongues? Why would they need tongues? Do animals talk like we do? Give examples.

Introduce the beef tongue. Hold the tongue so all children can see and begin your discussion about the size, color, shape etc. Give factual information that this is a tongue from a real cow. Is this tongue bigger or smaller than your tongue? Why? The cow's tongue is bigger because the cow is bigger. Ask children to decide what size of tongue a bird, dog, elephant, lion, cat, snake would have. What do they use their tongues for? (Cleaning, grooming, to lick sores). Place the tongue on a cookie sheet; offer magnifying glasses to children so they can "study" the tongue. Encourage the children to pick up the tongue to see how heavy it is.

Special Activities:

Guess What's Missing? Fill a tray with many interesting, colorful things. Encourage children to close their "eyelids" while you take something off the tray. Allow children to take something off the tray too!

Feely Box: Children help you find different items for box. Children take turns putting their hand in the box and guess what's inside before pulling it out.

Guess that Smell: Have an abundance of small bottles with extracts inside. Encourage children to come up, close their eyes, and identify the smells.

Oh Those Bins!!! Fill three bins with styra foam, flour or cornmeal, and a rug. Children can either walk through bins blindfolded or not if they're too frightened. They're feeling with their feet!

Cook a beef tongue! Believe it or not, children love it!

Bake gingerbread for snack; not only will the children be smelling it, but they will be tasting it too!

Serve popcorn with salt and sugar, talk about he difference.

Art ideas:

Paint with eyedroppers.
Collage tissue paper on 2 toilet paper rolls. Add yarn and you now have binoculars...go for a walk and "see" what you can "see."
Finger-paint with pudding.
Collage with different textures.
Color on sandpaper.
Sand painting: Add dry tempra paint to bowls of sand and stir. Children make a design with glue and craft sticks on cardboard or paper plate and sprinkle sand on top.
Put extracts in the paint. Your pictures will have such a wonderful fragrance.
Popcorn collage
Finger-paint with pudding
Fruit loop necklaces

Literacy:

Clifford Follows His Nose

By: Norman Bridwell

Goggles

By: Ezra Jack Keats

Listen...What do you Hear?

By: Nicholas Wood and Jennifer Rye

Look Closer

By: Pefer Ziebel

Look Look Look

By: Tana Hoban

Me and My Senses

By: Joan Sweeney

My Five Senses

By: Aliki

The Five Senses

By: Maria Rius and J.M. Parramon and J.J. Puig

The Gingerbread Man

By: Lucky Book Club

The Library of the Five Senses

By: Sue Hurwitz

The Listening Walk

By: Paul Showers

The Noisy Book

By: M. W. Brown

The Biggest Nose

By: Kathy Caple

Too Much Noise

By: Ann McGovern

Touch...What Do You See?

By: Nicholas Wood

What I Hear

By: June Behrens

Theme 6: "Weather: Let it Rain, Snow, Shine and Blow!"

Discussion Ideas:

Lesson 1: Snow

Begin your conversation with a guessing game. I'm thinking of something that's white and cold and if you roll up 3 big balls you can make a snowman! Yes, I'm thinking of snow! Has anyone ever seen snow? Has anyone ever touched snow? Where can we go to play in the snow? Is snow hot or cold? How do you know? Yes, snow is very cold. (If you can bring snow to your center, do so, and allow your children to experience the real thing!) However, if you have no "snow" resources, bring ice cubes to your circle time. Put ice cubes in a large bowl and pass them around your circle allowing children to pick up and to "feel" just how cold ice (and snow) are! What kinds of clothes do you suppose you would wear if you were going to spend a day playing in the snow? Would you wear a bathing suit? No! Would you wear shorts and sandals? No! Children enjoy this "funny" questioning. Teacher is so silly! Have available: mittens, sweaters, and snow boots etc., for the children to try on. These clothes keep our bodies warm. After your sciencing experience, place these clothes in your dramatic play area.

Lesson 2: Snow

Review above lesson. Lead the discussion into the many different activities to do in the snow. Bring in skis, a sled etc. for the children to see and feel.

Lesson 3: Rain

Begin your conversation with a guessing game. I'm thinking of something that waters our flowers and grass and will even get me wet if I don't have an umbrella. Yes, I'm thinking of rain! Is rain hot or cold? Discuss with the children the fact that rain can be hot and cold. If you needed to go out in the rain what would you need? Have a raincoat, umbrella, rain boots etc. ready for the children to try on. When your sciencing experience is over, place these items in your dramatic play area.

Lesson 4: Rain

Review previous lesson. Have a discussion today about how rain helps us. The rain waters our plants, flowers and trees. The rain gives water to animals that don't have a home. Can you think of animals that don't have a home to live in? Yes, lions, and tigers and.....can you think of other ways the rain helps us? Encourage the children to join in the conversation. Praise the "good thinkers."

Lesson 5: Wind

Begin your conversation with a guessing game. I'm thinking of something that blows my hair in my face. This something also blows the leaves off the trees. When this something comes, I take out my kite and it blows my kite high in the air. Yes, I'm thinking of the wind! What is the wind? Give the children the information that wind is "moving air." Bring a basket of scarves to your sciencing circle and allow children to choose one. Encourage children to blow into their scarf; they're making moving air! Now bring out a hair dryer. As the children move around the circle, let the hair dryer blow their scarves. Using the hair dryer as an example, show the children hard blowing air and gentle blowing air. Upon completion of this sciencing experience, let the children take the scarves to the dramatic play area.

Lesson 6: Wind

Review previous lesson. What does it mean to have chapped skin? Encourage all answers. Sometimes the wind blows so much that it makes our skin very dry. What do you suppose we can put on our skin? Yes, we put lotion on our skin. How does this lotion make our skin feel? Yes, it makes our skin feel soft. Sometimes the wind makes our lips chapped too. How do you think that feels? Yes, it hurts.

What do you think we can do about that? Yes, we can put Chap Stick on our lips. Can you think of anything fun we can do on a windy day? How about flying kites? Open up the discussion to kite flying, allowing children to share their experiences.

Lesson 7: Sun

Begin your conversation with a guessing game. I'm thinking of something that is up in the sky. This something is very HOT; sometimes so hot that it burns my skin. Can you guess what this something is? Yes, the sun! Give information that the sun is a "ball of fire." Do you think we could touch the sun? No, that "ball of fire" would burn us up! How would it feel to get a suntan? How would it feel to get sunburn? What can we put on our bodies so we don't get a sunburn? Yes, lotion will "protect" our bodies from the sun. What kind of clothes would you wear on a hot sunny day? Would you wear a raincoat? Would you wear snow boots? Would you use an umbrella? This is a tricky question, because some people do use an umbrella when it's sunny. Why do you think they would do that? The umbrella protects their skin from the sun so they don't get sunburned. Continue the conversation about clothes to wear on a sunny day.

Lesson 8: Sun

Review previous lesson. Let's talk about different things to do on a sunny day. Encourage children to name activities to do on a nice sunny day. List these activities, making a game out of how many you all can think of.

Special Activities:

Video: The Snowman, by: Raymond Briggs

Ice Melting: Place ice with food coloring outside on a nice sunny day and wait for the ice to melt.

Sunshine Pudding: Let the children help you make instant vanilla pudding.

Rainbow Stew: 1/3-cup sugar
1-cup cornstarch
4 cups water

Heat, constantly stirring until it thickens and looks like petroleum jelly. Separate into sandwich baggies, doubled, add food coloring.

Pastel Marshmallow Clouds:

1 box fruit flavored gelatin
2/3 cup boiling water
1-cup sugar

3 tablespoons light corn syrup

Sifted confectioners sugar

Line an 8-inch square pan with waxed paper, grease paper with butter. In a saucepan, combine gelatin, boiling water and sugar. Over low heat stir until sugar and gelatin are dissolved. Do not boil. Stir in syrup and chill until lightly thickened. Beat mixture on highest speed of electric mixer until soft peaks form (at least 5 minutes, probably more). Pour into prepared pan. Lightly cover and chill overnight. Turn out onto a board heavily dusted with confectioner's sugar. If waxed paper does not peel off easily, lightly dampen paper, let stand a few minutes, peel off. Dust candy top with confectioners sugar, cut in 1 inch squares.

Art Ideas:

Magic Winter Pictures: Let children draw pictures using crayons or oil pastels on light blue construction paper. Make a solution by dissolving 4 oz. of Epsom salts in a pint of hot water. When the solution is luke warm use a paintbrush to apply it generously to the entire picture. After the picture dries, shiny crystals of "snow" will appear.

Marshmallow Painting: large marshmallows, white paint on dark blue paper.

Blow Painting: Have the children cut out a kite (diamond) shape. Dip straw in liquid tempra paint, place straw over paper and blow!

Bubble Painting: Have children cut out a cloud shape (any shape). In a bowl, place Dawn dishwashing liquid with water and food coloring. With a straw, blow bubbles and place cut out cloud shape over bubbles. The bubbles will pop on the paper, leaving a colorful painting on cloud.

Mitten Collage: Have children cut out two mittens. Take out all your collaging treasures, and let the children collage all these treasures all over their mittens. Connect the two mittens with yarn.

Sun Puzzles: cut circles out of yellow construction paper. Next cut puzzle pieces out of each circle and save. To make assembling easier for the children, place an x on the back of each piece. Give each child a "sun" puzzle to assemble and decorate anyway they choose.

Classroom Kite Puzzle: Children love this one! Cut a huge diamond shape out of white butcher paper. Next, cut 10-12 puzzle pieces out of this "kite" shape. Gather children around the circle and take turns putting the pieces together, starting with number 1, and counting through to 10 or 12. When your huge kite puzzle is assembled, take it to the art table and sponge paint, bingo marker paint, racecar paint etc. all over your classroom kite. Add crepe paper streamers and hang in a corner of your room!

Literacy Ideas:

A Little Bit of Winter

By: Paul Stewart

A Letter to Amy

By: Ezra Jack Keats

A Rainbow of My Own

By: Don Freeman

A Silly Snowy Day

By: Michael Coleman

Amy Loves the Sun

By: Julia Hoban

Anna Bear's First Winter

By: Roberta Edwards

Big Sarah's Little Boots

By: Paulette Bourgeois

Big Tracks, Little Tracks

By: Millicent E. Selsam

Boots

By: Anne Schreiber and Arbo Doughty

Caps, Hats, Socks, and Mittens

By: Louise Borden

City Storm

By: Mary Jessie Parker

Clifford and the Big Storm

By: Norman Bridwell

Clifford's First Big Snow

By: Norman Nridwell

Cloudy With a Chance of Meatballs

By: Judi Barrett

Emily and the Snowflake

By: Jan Wahl

Franklin and the Thunderstorm

By: Paulette Bourgeois

Geraldine's Big Snow

By: Holly Keller

Gilberto and the Wind

By: Marie Hall Ets

Hello, Snow!

By: Wendy Cheyette Lewison

In the Rain With Baby Duck

By: Amy Hest

It Looked Like Spilt Milk

By: Charles G. Shaw

It's Raining, It's Pouring

By: Kin Eagle

Just a Rainy Day

By: Mercer Mayer

Katy and the Big Snow

By: Virginia Lee Burton

Little Cloud

By: Eric Carle

My Favorite Time of Year

By: Susan Pearson

One, Two, One Pair!

By: Bruce McMillan

Rain Drop Splash

By: Alvin Tresselt

Sadie and the Snowman

By: Allen Morgan

Snow

By: Uri Shulevitz

Snow Dance

By: Lezlie Evans

Snow on Snow on Snow

By: Cheryl Chapman

Stranger in the Woods

By: Carl R. Sams II & Jean Stoick

The Berenstain Bears' Four Seasons

By: Stan and Jan Bernstein

The Biggest, Best Snowman

By: Margery Cuyler

The Black Snowman

By: Phil Mendez

The First Snowfall

By: Anne & Harlow Rockwell

<u>The Mitten</u>

By: Alvin Tresselt

<u>The Snowchild</u>

By: Debi Gliori

<u>The Snowman Storybook</u>

By: Raymond Briggs

<u>The Snowy Day</u>

By: Ezra Jack Keats

<u>The Storm Book</u>

By: Charlotte Zolotow

<u>The Wild Toboggan Ride</u>

By: Suzan Reid

<u>The Wind Blew</u>

By: Pat Hutchins

<u>Umbrella</u>

By: Taro Yashima

<u>When Winter Comes</u>

By: Robert Maass

<u>White Snow Bright Snow</u>

By: Alvin Tresselt

Theme 7: "Weights and Measures"

Discussion Ideas:

Vocabulary:

Bathroom scale yardstick ruler balance scale heavy heavier light lighter balanced unbalanced tape measure

Lesson 1:

Weigh and measure children, place measurements on growth chart the children made. Using a large poster picturing a teacher measuring children discuss everything the children can see. Relate it back to the experience of getting weighed in class. Discuss the scale and measuring equipment used in the poster. Show children the bathroom scale and yardstick. Leading questions: What do you think this is? What do you think we use this for? Is this like the one in the picture? Do you have one of these at home? What part of you is weighed when you stand on the scale? Yes, your whole body is weighed.

Discuss the words heavier and lighter. Are you heavier than me? Are you heavier than a chicken? Are you heavier than your daddy? Are you lighter than a feather? Are you lighter than an elephant? Are you lighter than an eyelash? Demonstrate the balance scale. Discuss the fact that heavier objects cause the scale to drop. Let children take turns being a balance scale. Have child stand in front of you facing the children, arms outstretched. Place two different objects in each hand, encourage the child to "feel" the weight and talk about it.

Lesson 2:

Review previous lesson. Discuss the children getting measured the day before. Example: "Remember yesterday..." choose different children to stand beside each other, compare heights. Teacher stand beside a child, compare the sizes.

Ask the children if they were always the same height as they are today? How tall were you when you were a baby? How much do you think you weighed? A fun "do at home" assignment is to have mommy or daddy look with their child in their baby book and write down how much they weighed when they were born, and bring a baby picture back to school. Were your feet the same size when you were a baby? How big do you think your shoes were? Look at varied shoes and discover together who would wear each size shoe.

Ask: if your body was growing longer bones and muscles do you think you would weigh more? Would all baby animals weigh more or less than their mother? Look at pictures of baby animals with their mothers and point to the "heaviest." lightest," "tallest," "shortest," etc.

<u>Lesson 3</u>:

Vocabulary:

Measuring cups   measuring spoons

Most

Least

Have cooking measurement equipment available, but out of sight. Review previous lesson. Look at the picture of the parent and child cooking. Lead children into language development by discussing what they see in the picture.

Picking up the measuring cups, which you have beside you, ask if anyone knows the names of the cups. Look at the cups; comparing sizes, asking which cup would hold the most, the least. Look at measuring spoons the same way. Ask; "Does anyone know why we need to measure the different ingredients in a recipe of foods we cook?" Introduce the poster recipe and talk to the children about baking cornbread. Everything needs to be measured exactly so the bread will taste good to eat.

Introduce a small container full of cornmeal to the children. Ask if anyone knows what it is? Talk about grinding corn to a meal to cook and bake with. Talk about the corn meal bin and how they can measure the corn meal. "You can feel how heavy a cup of corn meal is when you lift it."

Note: clear plastic glasses and bowls marked with mystic tape will give children a guide line in filling and measuring different materials such as dried peas, rice, or beans.

<u>Lesson 4</u>:

Review the concept of measurement using leading questions; How do we measure people? How do we weigh apples? How do we weigh people? Ask if anyone knows what temperature is? What is the temperature of snow in the winter, hot or cold? What is the temperature of the air at the beach in the summer?

How do you dress in the winter? How do you dress in the summer? How do you think we can measure how hot or cold it is? Bring out a real thermometer. The thermometer tells us how hot or how cold it is. When it's hot the red line goes up, and when it's cold the red line goes down. Encourage children to look at and hold the thermometer. As a class go outside and choose a place to hang the thermometer, and as a class, check the thermometer "daily."

Special Activities:

Measuring, Measuring: your cereal, trail mix, pancakes for snack, muffins for snack.

Bins full of rice or cornmeal or oatmeal with measuring utensils.

Heavy/light boxes; using your scale have children take turns putting different items on the scale and then place in appropriate box.

Art Ideas:

Growth chart: Lay a long piece of butcher paper on the table. Encourage children to cut pictures of children, adults, babies etc. out of magazines and collage on "growth chart."

Self-Portraits: This is a great time to do self portraits. Encourage children to "dress" themselves with cloth pieces; add their measurements to portrait and display in classroom.

Collage "heavy" and "light" objects.

Literacy:

Benjamin Budge and Barnaby Ball

By: Florence Parry Heide

Big and Little

By:

Big Dog Little Dog

By:

George Shrinks

By: William Joyce

How Do we Measure Up?

By:

I'm Growing

By: Aliki

Is It Larger? Is It Smaller?

By: Tana Hoban

Jim and the Beanstalk

By: Raymond Briggs

Me and the Measure of Things

By: Joan Sweeney

Spence Is Small

By: Christa Chevalier

The little Fireman

By: Margaret Wise Brown

The Little House

By: Virginia Lee Burton

Theme 8: "Magnets"

Discussion Ideas:

Vocabulary; attract= pull repel=push

Lesson 1:

With great excitement bring your container of magnets to the circle. I have something with great power in this container. Would you like to see what I have? Take out 1 magnet wand and 5 round magnets. (You don't want too many magnets all at once, with all of them attracting, it will be too distracting.) These are magnets let's watch what they can do. Let the children watch as you "pull" the circle magnets with the magnet wand. What did the magnets do? Yes, they're all together. The magnet wand "pulled" the round magnets up to it and this is called; "attract." Can you say that? Give out the information that magnets "attract" or "pull" only things made of metal. Walk around the room with the children and for this first experience you hold the magnet up against metal and non-metal objects and see what the magnet "attracts" to. Return to the circle and allow the children to come up two at a time and experiment with the magnets in your container. Set the magnets out on a table at work time.

Lesson 2:

Review previous lesson. Today we're going to be scientists. A scientist is someone who studies something very hard and today we're going to study magnets. Invite children to come up 2 at a time, give them a magnet wand and let them walk around the room finding items made of metal. We'll know if the item is made of metal, because what will the magnet do? Yes, the magnet will "attract" or "pull" the item to it. As children find metal and non-metal items, make a "yes/no" chart and write or draw pictures of items that fit in each area. Upon conclusion of this activity, add up items to see how many items were found. Did we find more metal items or more non-metal items? How do you know? Release children with wands and place magnets on a table as well.

Lesson 3:

Review previous lesson. Bring items in a basket to circle time. Place a "yes" box with a big smile drawn on it and a "no" box with a frowny face drawn on it. Encourage children to come up one at a time, choose an item from your basket and test the item out on the magnet to see if it attracts. Child will then place item in appropriate box.

Now it's time to show what the word "repel" means. Using 2 magnet wands, place them in such a way that the one wand is pushing the other wand away. Children think this is so funny!! Explain to the children that the magnet is "repelling," or "pushing" the other magnet away. Let the children come up 2 at a time and practice "attracting" and "repelling" the magnets.

Lesson 4:

Review previous lesson. Today we're going fishing! Set a big piece of blue paper on the rug. Place paper clips on construction paper fish of all colors and set these fish on the blue paper. Attach a small magnet to strings attached to poles. Encourage the children to come up 2 at a time and go fishing for their favorite color fish. Together name the color of fish. You may want to add shapes to the fish for shape recognition or letters of the children's names or the children's names on the fish for name recognition.

Special Activities:

Cookie Sheet Magnet Fun: Set cookie sheets on the table along with an assortment of magnets.

Yes/No Boxes: Encourage children to experiment with different items to see if the magnet will attract. Select appropriate box to place item in.

Horseshoe magnet quesedillas

Art Ideas:

Children cut out a horseshoe magnet and collage foil all over.

Gadget painting on horseshoe magnet; cut out.

Literacy Ideas:

Mickey's Magnet:

By: Franklyn M. Branley and Eleanor K. Vaughan

What Makes a Magnet?

By: Franklyn M. Branley

Theme 9: "Space"

Discussion Ideas:

Encourage children to be watching the moon this week. Review magnets (we will associate the pull of magnetic force with the force of gravity). Review words: heavy-heavier, light-lighter, force, power, energy, attract, and repel.

Look at a picture of the moon. New words: crater, ridges, distance, and space.

Lesson 1:

Have you ever looked at the moon?

What does it look like?

Have you ever been there? Why not?

When do you see the moon?

Can you see it in the daytime?

Could you jump to the moon?

How could you get there?

Would it take very long?

Game of Gravity

Ok, now I want you to listen to my words very carefully. I want you to jump with two feet very high and stay up in the air. (Children try, but of course they can't stay up in the air!) No, no, now I need you to listen to my words. Jump up with two feet and stay up in the air. More giggles, as they continue to come back down. This time, hand children nerf balls and again repeat that you want them to throw the nerf ball up in the air and it needs to stay up in the air. More giggles as the nerf ball comes down too.

Now you need to establish the concept of "gravity." Remember when we were talking about magnets and the power the magnets had? There's a power just like the magnet down in the ground called, "gravity," and this power holds us down. So when we jump up very high, we will always come down because this power called "gravity" pulls us back down.

What do you suppose would happen to our breakfast cereal if we didn't have any gravity? Yes, it would float up in the air. What about the milk we pour on our cereal? Yes, instead of the milk going down in our bowl, it would float up in the air, wouldn't that be silly? Continue the questioning. What would happen to the chairs in our room if there were no gravity? How about our tables? How about people? Children will let you know when they are finished with this questioning- release to work with magnets.

Lesson 2:

Review previous lesson. Who looked at the moon last night? What did it look like? Who goes to the moon? Yes, astronauts go to the moon. Why do you suppose the astronauts go to the moon? The astronauts go to the moon to collect "moon rocks." Why do you suppose the astronauts collect moon rocks? Can we go to the moon? No, we can't, so the astronauts go to the moon, collect moon rocks, bring them back so people can "study" them to find out what the moon is made of.

Together look at a picture of a real astronaut. What is the astronaut wearing? Yes, the astronaut is wearing a space suit. Why do you suppose the astronaut wears a space suit? Encourage all answers. The space suit protects the astronaut. Look at the air tank on the astronauts back. What do you suppose this is? It is an air tank. Do you know why the astronaut would have to wear an air tank on his back? Everyone take a big breath (demonstrate what you mean). What are we breathing? Yes, you're such good thinkers! We are breathing air. Well, up in space there is no air. What would happen if we didn't have any air to breathe? Yes, we would die. What do you think is in the air tank on the astronauts back? Yes, there is air in the tank. What is on the astronaut's head? The astronaut is wearing a helmet on his head. The air from the air tank goes into the astronaut's helmet and this gives the astronaut air to breathe.

Let's look at the astronaut's feet. What is the astronaut wearing? Yes, these are very heavy boots. Remember when I told you to jump as high as you could and to stay up in the air? You couldn't do it could you? Why not? Yes, that big magnet, called gravity holds us down. Out in space there is no gravity to hold the astronaut down, so the astronaut has to wear these big heavy boots to keep him down. What would happen if the astronaut didn't have these heavy boots? Yes, he would fly away in space.

Let's walk like an astronaut with big heavy boots. Demonstrate by walking very slowing as if you have something very heavy on your feet and it is so hard to walk. Encourage children to walk like you. Release.

Lesson 3:

Review previous lesson. How do you suppose the astronaut gets to the moon? The moon is very very very far away. Can he ride a bike? Can he drive a car? Can he go in a boat? How about an airplane? Since the moon is very very very far away, you need something with great power to get to the moon. What do you think the astronaut would need to use to get to the moon? Display a picture of a rocket ship. The rocket ship has great power. 5 4 3 2 1...BLAST OFF and PUSHES right up to the moon!

Remember we talked about the fact that there was no gravity out in space? So how would the astronauts eat and sleep? What would happen if they put food on a plate? Yes, it would fly around the rocket ship! Astronauts eat food in a very special way. Bring out snack baggies with a small amount of instant pudding in each bag. Add a bit of milk to each bag and help children to seal bag up tight. Encourage children to work the bag with their fingers to mix up the pudding. When the pudding is all mixed, open the bag just the tiniest bit, insert straw, and children are able to suck the pudding out. (This will give the children an idea of how astronauts have to eat when up in space. (They can't just sit and eat a hamburger and french fries like we do).

How do you think the astronauts sleep? Can they just put on their Scooby Doo pajamas and lay down in their bed?

No, they have special clothes that they sleep in and special beds too. Bring out a picture of sleeping astronauts and discuss with children what they see. Release.

Lesson 4:

Review previous lesson, centering in on the astronauts' trip to the moon. Review gravity and air; the moon has neither...so what do the astronauts need to wear? Review the space suit and the air tank. Have a discussion with the children about the different sizes of the moon; full moon, half moon, and quarter moon. Draw pictures using the draw erase board of all three sizes as you talk about them. This is a good time to introduce their "do at home moon work." Each child receives a picture of all three sizes of the moon. Their "moon work" is to go outside at night with mommy or daddy and look up in the sky. What size moon do you see? The children need to decorate the moon on their paper that looks like the moon they saw in the sky. They may decorate their moon anyway they choose. This is an activity to do at home with the help of a parent. When they return their "do at home work, everyone receives a sticker! (This activity makes the children feel so grownup, as big brothers and sisters bring homework home, and now they can do the same).

Lesson 5:

Review previous lesson. Today we're going to talk about that big ball of fire in the sky. Can anyone think of what that ball of fire is? Yes, it's the sun! Do you think we could go up to the sun? Could the astronauts go up to the sun? No! No one, not even the astronauts can get close to the sun, they would blow up! How can we protect our bodies from the sun? Yes, we put lotion on our skin so we don't get sunburned. Could we use an umbrella? (The children will think this is silly, because people use umbrellas in the rain, but we can use umbrellas to protect our skin from the sun) How does it feel to get a suntan? How does it feel to get sunburned? We need to protect our bodies from the sun so we don't get burned, because getting sunburned hurts. Thank the children for being such good thinkers and release.

Lesson 6: Big Space Review!

Today we're going to fly to the moon! How are we going to get there? How many people will ride in our space ship? What will they wear? What will they eat? What will they drink? Where will they sleep? How will they breathe? How will they walk in space? What are we going to do when we get to the moon? What are we going to put our moon rocks in? Why are we going to collect moon rocks? What other way can we let people know what the moon looks like? Yes, we can take pictures! The astronauts brought bags to collect their moon rocks, and they brought cameras to take pictures. Look at the picture of the space ship. Show children how the rocket blasts off, count down, 7 6 5 4 3 2 1 BLAST OFF!!! The rocket shoots up in the air and takes off to the moon. Do you think the rocket has a lot of power? Yes, remember the moon is far far away, so the rocket has to have a lot of power to make it all the way to the moon. Walk with the children over to your completed classroom space ship and discuss all that is inside for them to use when they go to the moon, then release children to enjoy their trips to the moon!

Special Activities:

Build Your Own Space Ship: Take a refrigerator box and cut the back off leaving some left on the back top for support. Cut two round holes on each side of the box, make sure they are low enough so the children can see when they are sitting in chairs in the space ship. Cut a rectangle shape out in the front of the box; again make it low enough so the children can see out when sitting in chairs. Now it's time to cover your box. Using a glue gun, glue foil all over your box. The children can help you pull pieces of foil off. Some of the preparation for your space ship is simply the children observing, however they are very excited watching the process as you're talking about the process the entire time. Once you have covered the entire box with foil, you can encourage the children to draw space pictures to place on the outside of your spacecraft. Now comes the fun! Take any gadgets you can find, and that the parents have gathered from home and simply glue them inside your space ship. The film canisters make great hooks for hanging your space bags, earphones etc. the lids to these canisters make great buttons for pushing. Blocks from your block shelf can also be glue gunned inside your space ship; these make great shelves for your space phone, pager etc. Let your imaginations run wild!

Moon Goop:

Mix 1 box of cornstarch with water mixed with food coloring in a large tub.

Moon Goop too:

2 cups of glue

2 cups of water

2 teaspoons of borax

Mix all together in a large tub and enjoy!

Flubber:	Mix together	2 cups of glue
		2 cups of water
	Mix together	2 cups of water
		2 cups of borax

Next, mix all four together in a large container and enjoy!

Alka-Seltzer Rocket: Pour a small amount of water in a film canister. Drop $\frac{1}{2}$ tablet of alka-seltzer in the film canister, close the lid and set the film canister (lid down) on the ground and stand back. The pressure in the canister causes the rocket to blast in about 30 seconds.

Art Ideas:

Earth Collage: Encourage children to collage blue, green, and brown pieces of tissue paper all over a large circle cut out of butcher paper. (This will be the "earth" portion of your bulletin board.)

Self-Portraits: Encourage children to draw pictures of themselves, add language. Cut around these pictures and let the children place them around the "earth."

Rocket Ships: Encourage children to paint a toilet paper roll white. Have sequins, glitter, and red tissue paper set out on the table. The children can decorate these rockets any way they choose. These can also be placed on your "space board."

Space Pictures: Children use oil pastels to draw a space picture. Add glitter.

Star String Painting: Using black paper and a white crayon, trace a large star on the black paper. Encourage children to cut out the star and string paint it using the white paint. They may add glitter or sequins. These stars may be hung from the ceiling in front of your "space board."

Classroom Sun Puzzle: Cut out a very large circle from butcher paper. Next cut puzzle pieces and number them. At circle time, you and the children put the sun puzzle together. At work time, lay the sun puzzle on the table and encourage the children to sponge paint the sun using yellow and orange paint. Add eyes, nose, and a happy face, and you now have a "Sammy Sun" to hang in a corner of your room.

Classroom Moon Puzzle: Same procedure as listed above, only this time use gray, black, and white paint. Add sleepy eyes, nose, and a yawning mouth. You now have "Mr. moon" to hang in another corner of your room.

Robots: This is a must!!!! Have each child bring a shoebox to school. Set out anything you can think of for the children to collage all over their box. Items can include; cotton balls, buttons, keys, film canisters, canister lids, macaroni, squiggly paper, foil pieces, just about anything! When box collage is dry, and children are gone for the day, spray the boxes with silver metallic paint. You now have robots from space! The children absolutely love these!

Literacy Ideas:

Astronaut Critter

By: Mercer Mayer

Bear Shadow

By: Frank Asch

Bugs in Space

By: David A. Carter

Dogs in Space

By: Nancy Coffelt

Dmitri the Astronaut

By: Jon Agee

Goodnight Moon

By: Margaret Wise Brown

Happy Birthday, Moon

By: Frank Asch

Hush, Little Alien

By: Daniel Kirk

Moonbeam's Pet

By: Frank Asch

Mooncake

By: Frank Asch

Moondance

By: Frank Asch

<u>Moondogs</u>

By: Daniel Kirk

<u>Moongame</u>

By: Frank Asch

<u>Papa, Please Get the Moon For Me</u>

By: Eric Carle

<u>Rabbits in Space</u>

By: Diana Noonan

<u>Skyfire</u>

By: Frank Asch

<u>Sun and Moon</u>

By: Marcus Pfister

<u>The Berenstain Bears on the Moon</u>

By: Stan and Jan Berenstain

<u>Twinkle, Twinkle, Little Star</u>

By: Iza Trapani

Theme 10: "Physiology"

Discussion ideas:

Lesson 1:

Pour a container of earthworms onto a piece of butcher paper on the floor. Using a magnifying glass to aide in observing, ask the children, Where are the eyes? Where are the teeth? Do you see a nose? Where are the ears? Do the worms have legs? Do the worms have arms? Encourage (don't force) children to come up, two at a time, and pick up earthworms and study them using the magnifying glasses.

Discuss this factual information: Earthworms live in the ground/dirt. They tunnel in the ground and eat the dirt. Earthworms have no eyes, nose, teeth, and ears. Ask, Why don't the earthworms stand up?" Encourage children to touch different parts of their bodies, feeling the hard bones. Earthworms can't stand up because they have no bones. Bones are so important. Do you know that if you didn't have bones you couldn't sit at circle time; you couldn't climb outside or ride bikes. Without bones you couldn't run and jump and dance at music time. Bring out the wooden skeleton and tell the children that all of our bones together are called a skeleton and this is what a skeleton looks like. Worms don't have a skeleton because.............yes! Because they have NO BONES! Encourage children to move their bodies just like the worms, reminding them not to use their hands, arms, legs, or elbows. Discuss again how important our bones; legs, arms, etc. are to us.

<u>Where Have the Bones Gone?</u>

Once there was a beautiful meadow near a forest. All the children loved to go to this meadow. Here they would sing and dance on the cool grass.

In the forest there lived a mad fairy. She didn't like the children to dance and sing. So, one day, she stomped into the meadow! "I know what I'll do, I'll take away all of the children's bones! They will not be able to dance, hee,hee,hee."

With this, she waved her wand and said the words, ish ka bibble, and sure enough the children fell down on the grass. They could not get up. They tried, and they tried, but they were like the earthworms, wriggling on the ground. They all began to cry, they were so sad.

Just then, a happy fairy came through the forest. "Oh dear! What has happened to my children?" The children told her what had happened and she was so sad. "I know what I'll do, she said, I will wave my wand and give you back your bones and the mad fairy can never take your bones away again. The fairy waved her wand and all the children's bones came back. The children sang and danced all the way home. Release.

<u>Lesson 2:</u>

Review earthworms. Why couldn't the earthworms sit down? Stand up? Do you remember how they moved? Who would like to show us? Encourage any and all to practice moving like a worm. How are we different from the worms? What do we have that the earthworms don't have? Discuss again, the fact that we have bones, arms, legs, hands, feet, a mouth, a nose, ears, and teeth. Let's feel our bones. How do they feel to you? Encourage a thin child to stand by you. Ask the child, "Will you share your chest with us?" (It is very important that at your previous parent meeting you explain to the parents your physiology theme and the fact that children will be sharing and feeling their rib bones) Ask the child if they would lift up their shirt and take a deep breath. This will show the rib cage; talk about the rib bones. Why do we need rib bones? (To protect our lungs and heart) (Bones help us to sit, stand, and move) show different bones; discuss color, texture, size, and weight.

Aunt Molly

Once upon a time there was a little old lady who lived in a small cabin far out in the country. Her name was Aunt Molly. Everyone liked Aunt Molly because she worked so hard and was very kind. Every morning she got out of bed, dressed and ate breakfast. She washed her dishes, made her bed, swept her floor and worked in her wee wee garden. When she came inside her house, she would sit in her rocking chair and knit. Everyday as she rocked and knitted she would cry, "Oh me, oh my I am so lonely, I wish I had some company!"

One day as she was knitting the door opened a wee tiny bit and in came 2 skinny white bony feet and sat down close by the fireside.

"Oh me, oh my what can this be that's come to keep me company? It is true that I am lonely, but what can this scary thing be?"

But, still, Aunt Molly knitted and rocked. The door opened again a wee tiny bit, and in came 2 long white bones. The 2 white leg bones hopped upon the skinny feet bones.

"Oh me, oh my, what can this be that's come to keep me company? It is true that I am lonely, but what can this scary thing be?"

But, still, Aunt Molly knitted and rocked. The door opened again a wee tiny bit and in came white rib bones to sit upon the skinny leg bones.

"Oh me, oh my, what can this be that's come to keep me company? It is true that I am lonely, but what can this scary thing be?"

But, still, Aunt Molly knitted and rocked. The door opened a wee tiny bit, and in came 2 long white arm bones to sit upon the rib bones.

"Oh me, oh my, what can this be that's come to keep me company? It is true that I am lonely, but what can this scary thing be?"

But, still, she knitted and rocked. The door opened a wee tiny bit, and in came 2 white hand bones to sit upon the long white bones.

"Oh me, oh my, what can this be that's come to keep me company? It is true that I am lonely, but what can this scary thing be?"

But, still, she knitted and rocked. The door opened a wee tiny bit, and in came a bony head to sit upon the body.

"Oh me, oh my, what can this be that's come to keep me company? It is true that I am lonely, but what can this scary thing be?"

But, still, she knitted and rocked. The door opened a wee tiny bit and in came some skin to sit upon those bones.

"Oh deary me, now I see, a dear little boy has come to keep me company, but he has no clothes! I must knit and knit and knit. So Aunt Molly knit a shirt and pants and 2 little shoes and put them on the boy. Aunt Molly and the little boy lived very happily in the wee little cabin far out in the country.

Lesson 3:

Vocabulary:

Heart	muscle	blood	pump
Veins	stethoscope		

Review skeleton and skin.

Do you remember when we looked at our rib cage? What is our rib cage made of? Why do we need bones around our chest? What do these bones protect?

Can anyone tell me what the heart looks like? What do you think the heart does? How big is your heart? (About the size of a person's fist) What does it do? What is a pump? What color is blood?

Introduce the beef heart. This is a heart. It is the heart of a cow. It is very big. The cow's heart is bigger than your heart. Why do you think the cow's heart is bigger than your heart? The cow's body is bigger than your body, that's why the cow's heart is bigger. Would a mouse have a heart this big? How about a bunny? Allow the children opportunities to look at the heart using magnifying glasses and to pick it up, if they wish.

If you cut your finger, what comes out? If you cut your arm, what comes out? If you cut your head, what comes out? If you cut your toe, what comes out? If you cut your stomach, what comes out? You have blood all over your body. Your heart pumps blood all over your body. That's why, it doesn't matter where you cut yourself, blood will always come out, because you have blood all over your body.

Facts: the heart is a strong muscle. It is a pump. It pumps blood all over your body.

Holding up a stethoscope, ask the children if they know what it is. Who uses a stethoscope? Why does the doctor use it? How does he use it?

Facts: It is like a telephone. It picks up sounds and the doctor can listen to the sounds your heart makes. Practice listening to the children's heartbeat. Once you find their heartbeat, let the children listen. Release

Lesson 4:

Review previous lesson on the heart and how the ribs protect the heart. Continue the lesson by asking the children to knock on their heads; front, back, top. What is this bone called? What does it do? How does it feel? Why is it hard? What's inside? Why do we have a brain? What does it do?

Facts: Your brain is very important. It is protected by a thick, hard bone called the skull. Your brain is what you think with. Your brain has nerves, like telephone wires. The nerves carry messages to every part of your body. If you hear a fire truck sound it's siren, the noise comes into your ear. The nerves in your ear send messages to the brain, you know a fire truck is passing by.

What happens if you touch a hot popcorn popper? What does your brain tell you to do? What happens when you put your foot in cold ocean water? What happens when your mom is baking cookies?

Does it hurt when you have your hair cut? Does it hurt when you have your fingernails cut? No, because you don't have any nerves in your hair or in your fingernails to send messages to your brain.

Introduce the cow's brain. This brain comes from the meat market, just like the heart. What animal would have a brain this size? A cow has a big heart because he is bigger

than we are, but his brain is smaller because he is not as smart as we are. Encourage the children to come up and to study the brain using the magnifying glasses. They may also pick up the brain. Release.

Second Week:

During the next week talk about the doctor and the dentist. Why do we go to the doctor? Why do we go to the doctor when we're not sick? Why do we get shots when we're not sick? Why does the doctor wear a uniform? What is a waiting room? Why do we have to wait in the waiting room? Why do we go to the dentist? Why do we go to the dentist when our teeth don't hurt? Why do we brush our teeth? What is a cavity? Why does the dentist wear a uniform?

Special Activities:

Set up doctor's office in your dramatic play area. Hospitals/doctors will often times give you old smocks, band aids, rubber gloves, and tongue depressors etc. add a telephone, pads of paper, pencils, play doctor kits etc.

Rhyming' Simon: rhyming' Simon says touch the part of your body that rhymes with pies (eyes). Hose-nose, land-hand, peg-leg, nead-head, nips-lips or hips, lack-back, mummy-tummy, soot-foot etc.

Bone biscuits: take dough and encourage children to roll out a "bone." bake and eat.

Happy-healthy Salad Bar: children will eat up this salad bar! You and the children chop up lettuce, cucumbers, tomatoes, etc. grate some cheese. Place all in small bowls and lay out on the table. Children come up two at a time, fill up their bowls, add dressing and eat it up!

Rubber worms (from fish/tackle store) Put dirt in a bin, add worms. At work time, set the bin out on the table so children can go hunting for worms using magnifying glasses.

Fashion show: Upon completion of your "body" art, set up a ramp using blocks, put on some soft music and encourage the children to walk the ramp showing off their "body" art.

Art Ideas:

Body art: Trace each child's body on large pieces of butcher paper. Each day the children will cut out their body, color their body; add yarn for hair and material for clothes etc. (this project lasts at least 1 week).

Doctor kits: Children cut out doctor kit shape out of black construction paper. Have available; band aids, cotton, plastic gloves, tongue depressors etc. for children to glue inside their kit.

Literacy Ideas:

Dem Bones

By: Bob Barner

Dr. Duck

By: H.M. Ehrlich

Doctor De Soto

By: William Steig

Franklin Goes to the Hospital

By: Paulette Boutgeois

George Shrinks

By: William Joyce

I Know Why I Brush My Teeth

By: Kate Rowan

Just Going to the Dentist

By: Mercer Mayer

Mop Top

By: Don Freeman

The Bernstein Bears Go to the Dentist

By: Stan and Jan Berenstain

The Berenstain Bears Go to the Doctor

By: Stan and Jan Berenstain

The Loose Tooth

By: Gina and Mercer Mayer

When Poppy and Max Grow Up

By: Lindsey Gardiner

Who's Sick Today

By: Lynne Cherry

Wibble Wobble

By: Miriam Moss and Joanna Mockler

Theme 11: "Birds/Eggs/Nests"

Discussion Ideas:

Lesson 1:

Display different sizes and colors of eggs on a tray. Talk with the children about the different eggs. Ask children about the egg as their food. Ask about the inside of the egg. What do you think is inside the egg?

Open the egg in a pan and pass it around to look at and touch if they like. (Reminder; if they touch the egg, they need to go wash their hands). Talk about the shell, yolk, and egg white.

Where do you think we got this egg? Use leading questions until someone mentions a bird. The egg is developed inside the bird's body. The bird lays the egg in a nest through a special opening in her body.

Name different creatures that develop from an egg:

Chicken

Duck

Goose

Peacock

(All birds)

Insects

Spiders

Reptiles

Fish

Dinosaurs

Establish what will grow inside each egg by leading questions; What will hatch from a turkey egg? What will hatch from a snake egg? (Etc.) Establish where different eggs come from.

Lesson 2:

Have a chicken in a cage next to you at circle time.

Leading questions to consider:

What is this animal called?

Is it alive?

How do you know it is alive?

Would it hurt the chicken to hit or squeeze it?

Let's look at the chicken.

Leading questions to consider:

How many legs and feet does the chicken have? How many do you have?

How are the chickens legs and feet different form your lags and feet?

Why do chickens need different feet?

How many arms and hands does the chicken have?

How does the chicken pick up things?

How does the chicken eat without hands?

Spread the wings out so the children can see them. Talk about the feathers. (Teacher information: birds are the only creatures that have feathers)

Leading questions to consider:

There is one thing that a bird has that no other creature has. Can you guess what this is? *Encourage all answers. If no one mentions feathers, give the children BIG hints until someone mentions feathers.*

Why do you think the bird has feathers?

Where is the chicken's body?

What shape is the chicken's body?

What covers the chicken's body?

What covers your body?

Why do we have skin?

Point out the neck of the chicken.

What shape is the chicken's neck?

Does the neck look like your neck? Why?

What does the chicken use it's neck for?

Look at the chicken's head.

Where are the chicken's eyes? Where are your eyes?

Where are the chicken's ears? Where are your ears?

How are the chicken's ears different from your ears?

I wonder why the eyes are on the side of the chicken's head?

Look carefully at the eyelids. The eyelids cover the eyes from bottom to top.

Look at the chicken's mouth.

How is the chicken's mouth different from your mouth?

What is the chicken's mouth called?

Why is the chicken's mouth different?

Using a large wipe off board, you and the children draw a big chicken. You begin by drawing a large oval shape, next encourage children to come up and add "chicken parts." Release.

<u>Lesson 3:</u>

Today introduce the incubator and then lead into the hatching of baby chicks. Look at the incubator and determine the physical features:

Shape

Color

Wires

Material it is made of

Present the name "incubator," and say it several times throughout the lesson. Discover how we heat the incubator. Review electricity and tie it into the heating of the incubator. Discuss why we keep the incubator warm. The incubator will provide a warm home or nest for the eggs while the baby chicks develop inside their shells. discuss the growth of the chicken inside the egg. Discuss how the chicken grows a little bit each day, using the wipe off board to draw pictures to help with understanding. Discuss what will happen if: the eggs are dropped? The eggs get too cold or too hot? The eggs are not turned? Using your calendar, discuss the length of time (21 days) it will take for the chicken to hatch. After the chickens hatch, what will we need to keep the chickens comfortable and alive? Show the children the eggs you will be responsible for. Place a dot and a room number on one side, and a room number only on the other side. (This will help you to keep track of your classroom's eggs and to know which eggs have been turned.)

Lesson 4:

Review eggs, the chicken, and the incubator. Today we will discover the bird's world. Leading questions to consider:

Have you ever watched birds?

Where do birds live?

How do the birds get up to the top of tress?

How do they get down?

Why do birds come down to the ground?

Do birds have an incubator to put their eggs in?

Where do they hatch their eggs?

What are bird's nests made of?

Let's look at these nests. Bring out different nests and encourage children to come up and look at nests.

What are the nests made of?

What do you see that the mother and father birds used to build their nests?

Is there an electrical cord that will heat the nest and keep the eggs warm? We talked about how important it is to keep the eggs warm so the baby inside the egg shell would not get too cold and die, so how are the eggs going to stay warm? Discuss the fact that the mother bird sits upon the eggs and her body keeps the eggs warm. After most baby birds hatch, they do not have feathers to keep them warm.

How will the mother bird keep her baby birds warm?

How will she feed her baby birds?

Together look at a picture of the mother bird feeding her babies.

Look at the baby bird's mouths. What do you think they need?

Soon the birds will be bigger and will have feathers.

Then what will they do?

Do you think it will be hard for them to fly? They will need to practice many times.

How do birds talk to each other?

How would the baby bird tell its mother that he is hungry? Thank children for being such good thinkers, and release.

Special Activities:

Eggnog:

4 eggs

1-quart cold milk

1-teaspoon vanilla

Pinch of salt

Hatching Eggs:

Put 2-dozen fertile eggs in an incubator. Keep temperature at 102-103 degrees.

Turn eggs twice daily at 12-hour intervals for the first 15 days. Keep pan of water in incubator. Its surface should be about as large as the space the eggs would take if they were laid side by side, close together. Do not turn the eggs after the 18th day and do not open the incubator, unless it is too warm. It should not be opened until the eggs hatch.

Check the eggs each day. Late on the 19th day, some chicks will "pip" or break the shell. By the 20th day, many chicks will have hatched. Chicks will be dried and fluffed by 21 days.

After 21st day, if some eggs are not hatched, place some boiling water in water pan to steam up incubator. If after 2-3 days, still nothing, try to help by carefully picking away shell.

Rearing chicks:

Chicks should be fed as soon as they rare hatched. Give them a chick "starter mash" obtainable at a feed, farm supply, or pet stores.

Eggs,Eggs,Eggs: scrambled, hard boiled, egg salad

Eatable Bird Nests:

Heat chocolate chips and peanut butter in an electric skillet. When melted, add crushed shredded wheat cereal. Mix all together and spoon onto a cookie sheet. Make a small indentation in the center of the "nest," using a spoon. Add jelly bellies, place in refrigerator for cooling.

Egg salad:

You and your children chop up eggs, lettuce, celery pieces etc.,to make your own egg salad. If the children make it, the children eat it!

Bird Extravaganza! Encourage children who have birds at home to bring their birds in cages to share with the class. Children will be seeing birds of all different sizes and colors!

Art Ideas:

The Big Egg Paint: Encourage children to bring eggshells to school. Lay eggshells and watercolors on your art table and paint, paint, paint.

Egg Collage: Encourage children to cut out an oval pattern and collage all those egg shells you painted and crushed.

Stuffed Birds: Encourage children to cut out 2 bird patterns that have been taped together. Next help the children to staple all around the bird shape, leaving a small opening. Stuff the bird with newspaper, staple shut, and collage with colored feathers.

Nature Walk Bird Nest: Take your children on a walk around the center and go "a gathering" for twigs, bark, leaves, string, anything they think a bird may use to build a nest. At work time, lay all the treasures on the art table. Encourage children to collage their findings on a paper plate using brown colored glue. Or, children can cut out a nest pattern and collage their findings on that.

Tissue Paper Birds: Encourage children to cut out a bird pattern and collage twisted tissue paper all around.

Egg White Painting: Mix tempra paint with egg white and encourage children to paint. When dry, their picture will be shiny.

Paper Bag Bird Nests: Using a brown lunch bag, encourage children to "roll" the bag down. Collage "spring" grass, crushed eggshells, yarn etc, inside. Add a pom pom baby bird in the nest.

Bird Feeders: Using a hole punch, punch two holes in a toilet paper roll. Spread peanut butter all around the toilet paper roll. Next roll this in birdseed. Hang from a tree in your center- the birds really come!!

Literacy Ideas:

An Extraordinary Egg

By: Leo Lionni

Are You My Mother

By: P. D. Eastman

Baby Bird's First Nest

By: Frank Asch

Birds' Nest

By: Eileen Curran

Chicken and Egg

By: Christine Back/Jens Olesen

Chicken Little

By: Steven Kellogg

Chickens Aren't the Only Ones

By: Ruth Heller

Come Along Daisy

By: Jane Simmons

Daisy and the Egg

By: Jane Simmons

Daisy and the Monster

By: Jane Simmons

Edward the Emu

By: Sheena Knowles

Edwina the Emu

By: Shenna Knowles

Feathers for Lunch

By: Lois Ehlert

Have You Seen Birds?

By: Joanne Oppenheim

Have You Seen My Ducklings?

By: Nancy Tafuri

Little Green

By: Keith Baker

Make Way For Ducklings

By: Robert McCloskey

My Goose Betsy

By: Trudi Braun

Owl Babies

By: Martin Waddell

Rooster's Off to See the World

By: Eric Carle

The Best Nest

By: P. D. Eastman

The Little Red Hen

By: Paul Galdone

The Most Wonderful Egg in the World

By: Helme Heine

The Rooster, the Mouse, and the Little Red Hen

By: Deborah Apy

The Runaway Chick

By: Robin Ravilious

What's Inside

By: May Garelick

What Kind of Bird is That?

By: Mirra Ginsburg

What Makes a Bird a Bird?

By: May Garelick

Theme 12: "Seeds and Plants"

Discussion Ideas:

What is a seed? A seed is a baby plant with a covering of food and skin or membrane on the outside. Each seed comes from its mother plant and when it is planted and grows to its maturity it will be the same as its mother plant.

Seeds are different sizes. Some seeds, like the coconut are as big as a ball, while other seeds are so tiny that they are hard to pick up or to see without a magnifying glass.

Springtime, with its warm days, is the "come to life" time for seeds that have been sleeping in the earth all through the winter.

In some parts of the country, the melting snow has sunk deep into the earth. The spring rains come with gentle drops of water to help moisten the earth and dampen the seeds' tough skin until it becomes soft. The food inside the seed swells up with water and bursts the tough protective skin. Then the seed bursts open and the baby plant begins to grow. A tiny root pushes down into the ground to search for food and water. The roots help to anchor the little plant firmly in the earth. Soon the tiny stem pushes up through the earth looking for the sunshine.

As the plant grows, it uses up it's warehouse of stored food and it begins to make it's own food out of sunshine, air, water, and minerals.

Lesson 1:

Materials: dried seeds: peas, corn, acorns, and nuts.

Compare these seeds with fresh seeds; string beans- open them up to see the seeds (beans) inside.

Soak lima beans in water.

Introduce dries seeds to children by asking leading questions to identify seeds: Are they hard or soft? Why? Can we eat these seeds? Which seeds can we eat? Do you think seeds are food? What other animals eat seeds? How are they different from the seeds in this bean?

What would we need to do to make these seeds edible? (Shell them, soak them, and cook them.)

Show lima bean. Here is a lima bean that has been soaking in water. How is it different from the dried lima beans? Let's see how many things have changed about the bean. You and the children compare the dried lima bean to the bean that has been soaking.

I wonder what it is like inside the seed? Open the lima bean seed carefully so they can see the little plant inside. Using the magnifying glasses encourage children to talk about what they see, you may want to chart the differences you see.

Explain that the lima bean is the seed of the lima bean plant. The two halves of the seed supply food for the baby plant until it becomes strong in growth.

Let's plant the lima bean and water it to see how it grows. We will have to care for the plant in our room. What do you think we will need?

Experiments:

Grow birdseed on a sponge.

Place a wet paper towel in a glass so it presses against the side and plant lima beans between the glass and paper towel. Keep moist.

Plant a sweet potato in water.

Plant an avocado seed in water.

Plant a pineapple top in water.

Plant a carrot basket.

How to Make a Carrot Basket

Choose a large carrot, cut off all the leaves. Cut off the tip of the carrot leaving approximately 3 inches of the large end where the leaves grew. Carefully hollow out the inside, but do not cut through the shell or outside of the carrot. Punch 3 small holes in the cut end of the carrot so that you can string through it to make a hanging basket out of the carrot. Gently place a wad of cotton in the bottom of the hollowed out area, and fill with water. Hang the carrot in a place receiving good light and keep it well watered. Soon fern-like leaves will start to grow and eventually will cover the carrot basket. Note: The same process can be done with turnips, beets, and parsnips.

Place a celery stalk in colored water and note how the water goes up the stalk.

Baggie Green Houses: Place two pieces of cotton in water until pretty soaked. Next place a lima bean between the two cotton balls. Place the cotton balls with lima bean in sandwich size baggie. Zip shut and tape baggies to the window and watch the growth process from root to stem and leaves! Later these can be planted either in pots or in the yard.

Lesson 2:

Have on display:

Root vegetable- carrot, potato

Stalk vegetable- celery

Leaf vegetable- lettuce

Seed vegetable- green beans

Flower vegetable- cauliflower

Fruit vegetable- tomato

Encourage children to identify each vegetable and discuss how you eat it (cooked or raw). Discuss their likes and dislikes. Name other vegetables, which are not on display.

Leading questions: Where do you think we got these vegetables? Where did the storekeeper get them? How did the farmer or gardener get them? Where does the farmer make his garden? How do you make a garden? What would you dig with? Why do we need to put the dirt over the seeds? (The dirt serves as a blanket to help keep the seeds warm as well as to protect the seeds from the birds etc. The dirt also has food in it for the plants.) Do you remember our lima beans that we opened? What was inside? What will happen to that baby plant if we water it and it is kept warm by the sunshine?

Draw a Picture on the Wipe Off Board: Using leading questions begin to draw the growth of a plant. What do you think the baby plant needs in order to grow? Draw soil (dirt), water, sunshine, seed, roots growing down, stem and leaves growing up. What are some of the things that will harm the plant or seed? (Birds, rabbits, other animals may eat them, weeds, and insects). What do you think we could do to frighten the birds and rabbits away? Discuss plans for making a garden and a scarecrow.

Cooked Bean Project: Discuss beans and how hard they are. Suggest they should be washed. Encourage children to help with this process. Talk to children about cooking the beans. Recall the story stone soup.

Place washed beans in a crock-pot, add onion, salt and pepper and simmer all day on low.

Lesson 3:

Review seeds and different vegetables and plants. Do you remember the many vegetables we talked about? We talked about the parts of the plant that we eat; some of these parts were roots, stems, leaves, flowers, and seeds. Using a large picture, point out and discuss with the children the different vegetables that we eat.

Now we are ready to plant our garden. What part of the vegetable will we plant? (Seed) All go out, look at your garden "spot" and prepare to plant. You will need to weed and water your soil to make it soft enough for planting. Children enjoy this. Have small shovels etc. to aid in the process.

Art Ideas:

Planter Decorating: Paint on clay pots using puffy paint- or color on styra foam cups with permanent markers.

Tissue Paper Flowers: Have available colorful large color patterns for children to cut out. Children then twist large squares of tissue paper and glue on flower cut out.

Coffee Filter Flowers: Using markers, encourage children to color all over a coffee filter. Next, fill a spray bottle with water and allow children to spray water all over their filter. The colors will bleed and make a beautiful painting! These can then be made into flowers by twisted a pipe cleaner over the end of the filter.

Seed/Bean Collage

Muffin Cup Flowers: On your art table place; colored muffin cups, large seeds, pieces of brown paper, spring grass, green pieces of paper, and markers. Watch the children create their own flower scene.

Newspaper Flowers: Roll up newspaper and paint green. (Save) collage tissue paper (flowers) up and down stem.

Special Projects:

Fresh carrots for snack: Encourage each child to "pull" a carrot with tops out of a bin of dirt, wash the carrot, and eat it!

Flower eating: Encourage children to help you wash the flowers; cauliflower and broccoli, add ranch dip and eat!

Classroom Salad Bar: Using plastic knives, encourage children to help you cut up all different kinds of vegetables. Place vegetables in small bowls and set on snack tables. Children walk up just as if they were at a real salad bar, pick up their bowl and serve themselves- watch them eat it up!!!

Literacy Ideas:

Apron Annie

By: Joellyn Thrall Cicciarelli

Cecil's Garden

By: Holly Keller

Grandpa's Too-Good Garden

By: James Stevenson

Grow Flower Grow!

By: Lisa Bruce

Growing Vegetable Soup

By: Lois Ehlert

In My Garden

By: Ermanno Cristini/Luigi Puricelli

Planting a Rainbow

By: Lois Ehlert

Something is Coming

By: Bernice Chardiet

The Carrot Seed

By: Ruth Krauss

The Flower Alphabet Book

By: Jerry Pallotta

The Garden in Our Yard

By: Greg Henry Quinn

The Reason For a Flower

By: Ruth Heller

The Rose in My Garden

By: Arnold Lobel

The Seed Story

By: Judy Saksie

The Story of a Garden

By: George Levenson

The Surprise Garden

By: Zoe Hall

The Tiny Seed

By: Eric Carle

Tops and Bottoms

By: Janet Stevens

Seeds! Seeds! Seeds!

By: Nancy Elizabeth Wallace

Theme 13: "Wild Animals"

Discussion Ideas:

Each day I encourage you to choose a wild animal and using props or large pictures compare that wild animal's body to the childrens' bodies. Point out similarities as well as differences. Give simple factual information regarding each wild animal.

Lion: 4 legs

2 eyes

1 nose

1 mouth

2 ears on top of the head

Hair all over its body

Tail

Sharp teeth

Baby lion is called a cub

Male lion has a mane, female lion does not

Elephant: 4 legs

2 eyes

1 nose called a trunk

1 mouth

2 big ears

Hair all over its body tail

Baby elephant called a calf

Monkey: 2 arms

2 legs

Long tail

2 eyes

1 nose

1 mouth

2 ears

Giraffe: 2 eyes

1 nose

1 mouth

2 ears on top of the head

Very long neck

2 very long legs

Tiger: 2 eyes

1 nose

1 mouth

2 ears on top of head

Strips all over its body

1 tail

Special Activities:

Circus Day: Encourage children to make little tickets by cutting strips of paper and coloring them, putting stickers on them or whatever you choose. Place animal crackers in lunch bags. Set up boundaries for "wild animals" either in the classroom or outside on the playground. Allow your class to choose which animal mask (that they made) they would like to wear, encourage the children to put on their mask and set them in their cage. Invite another class to come and "purchase" a ticket to the circus, give them a bag of animal crackers, and invite them in to "feed" the wild animals.

Art Ideas:

Lion Masks: Using a paper plate, encourage children to tear yellow, brown, and black paper construction paper and glue it around the paper plate, giving the look of the lion's mane. Cut eyes, nose, and mouth out of paper plate. Add yarn for tying around the neck and you've got your lion mask for circus day.

Elephant Masks: Encourage children to cut 2 huge ears out of gray construction paper. Next give each child a 2-3 inch wide piece of gray construction paper. Encourage the children to fold this "accordion" style. Using a glue gun, glue this strip at the bottom of a paper plate. Let each child choose a peanut (still in the shell) and glue gun this peanut at the tip of the gray strip. Cut out eyes, nose, and mouth. Add a piece of yarn for tying around the child's neck and you now have an elephant mask for circus day.

Caged Animals: Encourage children to draw a picture of a wild animal, (this is done AFTER much conversation and picture showing of many wild animals). You and the children rip pieces of paper and place these strips on your bulletin board, to give the look of animal cages. Place the animal portraits inside the cages on your bulletin board.

Literacy Ideas:

Animals Should Definitely Not Wear Clothing

By: Judi Barrett

Caps For Sale

By: Esphyr Slobodkina

Chimps Don't Wear Glasses

By: Laura Numeroff

Crocodile Beat

By: Gail Jorgensen and Patricia Mullins

Dandelion

By: Don Freeman

Does a Kangaroo Have a Mother ,Too?

By: Eric Carle

Going to the Zoo

By: Tom Paxton

Good Night, Gorilla

By: Peggy Rathmann

I Love You as Much...

By: Laura Krauss Melmed

In the Forest

By: Marie Hall Ets

May I Bring a Friend?

By: Beatrice Schenk De Regniers

The Right Number of Elephants

By: Jeff Sheppard

What Am I? An Animal Guessing Game

By: Iza Trapani

Theme 14: "Dinosuars"

Discussion Ideas:

Children love this theme; I would venture to say it is their favorite! The purpose of this theme is to establish the fact that dinosaurs lived a long, long, long, long, long time ago. Talk to the children about the museum and the fact that if we want to see dinosaur bones we need to go to a museum.

Using your books and large pictures of dinosaurs, compare the dinosaurs' body to ours; how many legs, any arms, eyes, nose, mouth etc. There are two kinds of dinosaurs; meat eaters and plant eaters. The meat eaters have very sharp teeth, whereas, the plant eaters do not. The meat eaters ate "dinosaur" meat; the plant eaters ate plants.
The children love to learn the names of the dinosaurs as they learn about the meat eaters and plant eaters.

Suggested names:

Apatasaurus (plant eater)

Stegosaurus (plant eater)

Allosaurus (meat eater)

Triceratops (plant eater)

Bird Robber (meat eater)

Anklyosaurus (plant eater)

Tyranosaurus rex (meat eater)

If we weren't alive when the dinosaurs were alive, how do we know what they looked like? Discuss with the children the fact that people called "scientists" dug up the dinosaurs' bones, and then they put these bones together to form a skeleton. This can also be a review of the children's' skeletons.

Discuss with the children the size of the dinosaurs. Use language that they will be able to understand; This dinosaur was as big as a house, or as big as 10 elephants! Talk about the loud noise the dinosaurs would make when they walked.

This is a two-week unit, so ENJOY!!

Special Activities:

Dinosaur Claws: Melt chocolate chips and peanut butter in an electric skillet, add Chinese noodles. Place on cookie sheet by BIG spoonfuls and place in the refrigerator to cool.

Stegosaurus Salad Bar: You and the children cut up lettuce, tomatoes, and cucumber etc. Place vegetables in bowls, add your favorite dressing and enjoy your dinosaur plant eating!

Dinosaur fossils: 1 cup used coffee grounds

½ cup cold coffee

½ cup salt

1-cup flour

Stir coffee ground mixture together. Make impressions in the dough and let dry. (Takes at least 24 hours to dry). Put your fossils in a bucket full of sand and let the children become paleontologists for the day. The children can use paintbrushes to remove the sand from the fossils they find.

Art Ideas:

Dinosaur Prints: Cover your bulletin board with newspaper. Paint each child's feet with white paint and place their feet on a piece of white construction paper. The heading of your bulletin board could read; "Special Notice: Dinosaur Prints Found at the Children's Center." When placing the child's name on the painting add "osaurus at the end, exp; Codyosaurus.

Plant collage: Go on a nature walk and collect leaves, twigs, bark etc. Encourage children to cut out a stegosaurus pattern and collage their plant findings all over his body.

Sand Painted Tryrannosaurus: Cut out a T Rex pattern, add dry tempra to sand, paint with glue on your T Rex and sprinkle colored sand on top.

Stuffed Dinosaurs: Cut out two of the same dinosaur shape. Staple all but 4 inches. Stuff the dinosaur with newspaper and staple completely shut. Let your children decide how they would like to decorate their dinosaur.

Stegosaurus Hats: Encourage children to bingo marker as many paper plates as they wish. When dry, fold paper plates in half and staple one into the next. This gives the appearance of the spikes on the Stegosaurus' back. Put yarn on the first paper plate, this will tie around the child's neck; you are ready for your dinosaur parade.

Dinosaur Chant for Parade

Here he comes, from afar

That enormous dinosaur

Earth shakes

Earth quakes

Hear the dreadful sound he makes

Dinosaur Dough: Use up that old play dough. Give each child some play dough and allow them to make their own dinosaur. When dry, let them paint their dinosaur with puffy paint.

Literacy Ideas:

Danny and the Dinosaur

By: Syd Hoff

Dinosaur Bob and His Adventures With the Family Lazardo

By: William Joyce

Dinosaur Bones

By: Bob Barner

Dinosaurs, Dinosaurs

By: Byron Barton

Dinosaur Roar!

By: Paul & Henrietta Stickland

Dinosaur Story

By: Joanna Cole

How Do Dinosaurs Say Goodnight?

By: Jane Yolen & Mark Teague

Sammy and the Dinosaurs

By: Ian Whybrow

Saturday Night at the Dinosaur Stomp

By: Carol Diggory Shields

The Dinosaur Alphabet Book

By: Jerry Pallotta

The Magic School Bus in the Time of the Dinosaurs

By: Joanna Cole & Bruce Degen

Tyrone the Double Dirty Rotten Cheater

By: Hans Wilhelm

Theme 15: "Sea Life"

Discussion Ideas:

Lesson 1:

Vocabulary: white cap salty water

waves ocean

Using a picture of the beach as the focal point of discussion, encourage children to recall or to wonder about the beach, the water, and it's inhabitants. Ask if they have visited the beach. Listen to their experiences.

Help them to verbalize by asking: What is the ocean made of? Can we drink the water? Why not? Do you think the ocean is deep? How does it look to you when you look at it? Point to the picture on the bulletin board and ask what the high parts (on the waves) are called. The white tops of the waves have a name. Can you tell me what that name is? What kind of a sound does the moving water make?

Let's name everything we can think of that lives in the ocean. Do people live in the ocean? What do people do there? (Play, sunbathe, swim, fish, collect shells, ride boats, and surf board etc.)

What is the beach made of? Why do people like to play at the beach? Why do they like to get a suntan? How does it feel when you're getting a suntan? Sunburn?

Using a flannel board and sea flannel pieces extend your conversation. Release.

Lesson 2:

Teacher Information:

Fish have a bony skeleton with gills as respiratory organs. The fish takes water into the mouth and pushes it out through the gills. Their limbs are in the form of fins. The body of the fish is divided into 3 parts: 1) head 2) trunk 3) tail. Scales cover the fish' body. The fish' eyes have no eyelids. Fins serve as oars when the fish is swimming slowly. Fins also help the fish to steer and balance when the fish is resting. The caudal fin is the propeller as the fish swims, lashing its tail back and forth.

Vocabulary:	fish	tail	rudder
	gills	fins	

Today we are going to talk about an animal that lives in the ocean. Have you looked at the aquarium? How many fish do you see in the aquarium? Are fish alive? How do you know? How do the fish breathe in the water? Could you live in the water like a fish? How do the fish move? Do fish have hands? Feet? Nose? Eyes? Mouth? Let's look at the pictures of fish on the bulletin board and see the parts of the fish. (Point to each part of the fish and give simple factual information. compare the fish' body to the children's' bodies.

Today we are going to look at a real fish. Take fish out of the cooler and lay on a piece of butcher paper. Using magnifying glasses encourage children to "study" the fish, again comparing this fish's body to the childrens' bodies.

Lesson 3:

Vocabulary: snail shell fish

slime sand dollar

Last week we talked about the beach and looked at a real fish. Tell me some of the things you remember about the fish? Today we are going to talk about shellfish animals. These are small animals that build a shell around their bodies to help protect them. Do you remember the turtle? His shell was his home.

Bring several land snails and empty shells to the classroom. Let the snail crawl on black paper to see the slippery slime trail he uses as a roadway. Ask children if they have seen these strange animals in their gardens. By using a clear piece of glass watch the snail walk on his "slime" foot. Look at the empty snail shells.

If you go to the beach you may find empty shells that have washed ashore. The little animals that lived in the shells usually have died and the waves move the shell towards the beach. Sometimes the little animals that lived in the shells grew too big and they had to find a bigger shell for their home. Let's look at these shells. Discuss with the children how the sea animals lived in these shells just like the land snails.

Here's a little sea animal we call a sand dollar. Point to the small hole on the underside of the shell, this is the sand dollar's mouth. On top of the sand dollar is a pattern that looks like a flower. Let's count the petals. The little holes make this pattern. The sand dollar breathes through these holes.

Encourage children to come up and to "study" the sand dollars and "gently" pick them up.

Special Projects:

Let's Go Fishing: Attach a magnet to a colored piece of string yarn; next attach this yarn to a small pole. Cut out a large wavy circle out of blue construction paper and laminate. Cut out a small fish out of colored construction paper and laminate. Attach large paper clips to these fish. Lay the blue "water" down on the rug and go fishing.

Sardines or Tuna Fish for Snack

Eatable Crabs: Melt chocolate chips and peanut butter in an electric skillet, add Chinese noodles. Take out by large spoonfuls and place on plastic wrap and set in refrigerator to cool.

Gone Fishin' Snack: Make blue jello, add gummy fish.

Art Ideas:

Paper Bag Blow Fish: Encourage children to stuff a lunch size paper bag with newspaper, secure with a colored piece of yarn. You may set out paint, or collage materials etc., to decorate the fish.

Sea Collage: Collage ripped paper seaweed, small pebbles, paper fish on a large paper plate. Cover entire plate with blue siran wrap. You've now made your own fish bowl collage.

Jelly Fish: Grate crayons and then iron these crayons between two pieces of wax paper. Encourage children to cut "strips" from wax paper and you now have your very own jellyfish.

Big Blow Fish: Encourage children to cut out 2 large fish shapes that have been taped together. Dip straws in colored paint and blow the paint all over the fish. When dry, stuff fish with just a little bit of paper. Next step is to laminate these fish. Hang from the classroom ceiling using fishing line; add crepe paper streamers to the ceiling- you are now have an "underwater" classroom.

Sand Collage: You and your class go out to the playground and get a bucket of dry sand. Place sand in individual bowls. Add 2 teaspoons of different colors of dry tempra paint to sand and stir. Encourage children to make a design with glue on a piece of cardboard and sprinkle colored sand on top.

Whipped Soap Painting: Whip up soap flakes, add blue food coloring. Place on tabletop and encourage children to finger-paint. The same can be done using shaving cream with food coloring.

Star Fish Reinforcement: Children love this one! Encourage children to cut out a large starfish shape. Give the children another piece of paper. Using paper reinforcers, encourage children to attach their starfish to the second piece of paper using the rein forcers.

Wally the Whale: The teacher cuts out a very large whale out of butcher paper. Encourage children to collage gray strips of crepe paper on the whale using starch. When completed add large moveable eyes, blue tissue paper for a spout and you're ready to place Wally on your bulletin board. Give Wally an open mouth and add little black construction paper fish on the bulletin board swimming away from Wally's mouth!

Literacy Ideas:

A House For Hermit Crab

By: Eric Carle

Beach Day

By: Karen Roosa

Big Al

By: Andrew Clements Yoshi

Commotion in the Ocean

By: Giles Andreae & David Wojtowycz

Fish is Fish

By: Leo Lionni

Over in the Ocean In a Coral Reef

By: Marianne Berkes

Swimmy

By: Leo Lionni

The Fish Who Could Wish

By: John Bush & Korky Paul

THE Ocean Alphabet Book

By: Jerry Pallotta

The Rainbow Fish

By: Marcus Fisher

Objective:

To guide early childhood educators in sciencing strategies by providing opportunities to stimulate teachers to find their own means of discovery, to make intelligent guesses, and to speculate.

Participants will gain tools needed to:

- ✓ Increase their awareness of the skills and learning concepts children gain through discussion and activities with science.
- ✓ Identify strategies to expand how children use science.
- ✓ Increase their abilities to evaluate sciencing experiences and the environment.
- ✓ Improve the planning and arrangement of the environment.
- ✓ Develop activities to help children develop literacy, numeracy, communication, and problem solving skills.

The Sciencing Manual includes:

- ✓ Background and theoretical information on the value of utilizing science in the early childhood classroom.
- ✓ Ideas for organizing and preparing sciencing activities in your classroom.
- ✓ Strategies for hands-on practical applications of sciencing in the classroom.
- ✓ Sample discussion ideas to be used with young children.

- ✓ Additional science activities for children to extend the sciencing concepts.
- ✓ List of resources for teacher.

Appendix A1

The Framework of Sciencing Training

Introduction to the Playful Sciencing Curriculum Themes (Appendix A1)

The Sciencing Curriculum (Appendix A1) is divided into two modules: Natural Science and Physical Science. The Natural Science module consists of five themes. The Physical Science module consists of ten themes. Each module lasts approximately 5 months.

The Natural Science module consists of:

- Domestic Animals, Insects/Spiders, Trees, Leaves, Nuts, and Fruits, and The Five Senses.

The Physical Science module consists of:

- Weather, Weights and Measures, Magnets, Space, Physiology, Birds/Eggs/Nests, Seeds, Flowers and Plants, Wild Animals, Prehistoric Animals, Sea Life.

APPENDIX B

TRAINING MANUAL

List Of Appendixes and Transparencies

Curriculum Training Framework (Appendix B1)

There are nine components of this training framework:

(1) Curriculum Goal

(2) Theme Selection

(3) Special Activities

(4) Material Selection

(5) Setting Up Environment

(6) Discussion Ideas

(7) Curriculum Demonstration

(8) Lesson Planning

(9) Group Evaluation

Event Calendar (Appendix B2)

SUN	MON	TUE	WED	THU	FRI	SAT
				6 Author-Director Training (Ants)	7 Director-Teacher Training (Ants)	8
9	10 Ants	11 Ladybugs	12 Caterpillars	13 Butterflies	14 Grass Hoppers	15
16	17 Bees	18 Spiders	19 Spiders	20 Author-Director Training (Birds)	21 Author-Director Training (Birds)	22
23	24 Eggs	25 Eggs	26 Birds	27 Birds	28 Nests	29
30	31 Nests Group Evaluation					

Special Activities Chart (Appendix B3)

	Authored-Selected Themes	
	Insects/Spiders	**Birds/Eggs/Nests**
Special Activities	Sprinkle sugar on an ant hill	Live birds Hatching Eggs Rearing chicken Bird Extravaganza Bird Feeder
Cooking	Eatable Insects Ants on a Log	Eggnog Eatable Bird's Nests Egg! Egg! Egg! Egg salad
Dramatic Play (also include books)	Insect Head Bands Insect Potholders	Bird Nets Stuffed Birds Bird Hats Cloth Bird in a Bird cage
Art Ideas	String Painting Yarn collage Spider Web Finger Painting, Print lift, and Cut-out Ants Collage on Huge Anthill Make Ladybug Make Caterpillar Splatter Painting Make Shinny Butterfly Make Silly Insects from Ropewalk Treasure	The Big Egg Paint Egg Collage Nature Walk Bird Nest Tissue Paper Birds Egg White Painting Paper Bag Bird Nests Bird Feeders
Literacy	The Butterfly Hunt Effie Ladybug, Ladybug The Very Busy Spider The Very Hungry Caterpillar Old Black Fly Be nice to Spiders Demi's Secret Garden Eensey Weensey Spider	What Makes a Bird a Bird? Chickens Aren't The Only Ones Edward the Emu Edwina the Emu Owl Babies An Extraoridinary Egg Are You My Mother Baby Bird's First Nest Bird's Nest Chicken And Egg

Discussion Chart (Appendix B4)

Discussions	Authored-selected Themes	
	Insects/Spiders	**Birds/Eggs/Nests**
Explores/ Questions-Engages in open-ended explorations/ discussions	Display of different insects/ spiders for discussion	Large, colorful pictures of birds for discussion
Begins to Investigate- Engages in simple investigations	Live tarantula- Investigation	Live bird - Investigation
Collects Data- Engages in gathering data	Compare the spider's body to that of the child's	Compare the bird's body to the child's body
Records and represents experience- Describes and records experiences	Paint the experience- add language	Feather gluing birds- add language
Synthesizes and analyzes data from experiences- Makes predictions, explanations based on experiences	Compare painting of self and spider- Who's bigger/ Smaller? Who has more legs/less?	Talk about "feathered" creation- More feathers? Less feathers? How many legs?
Use language to communicate findings- Communicates observations and ideas	Group share out of findings	Group share out of findings
Collaborates- Collaborates in joint investigations	Aquarium with tarantula and magnifying glasses for exploration with peers at worktime	Bird in cage and magnifying glasses for exploration with peers at worktime

The Playful Sciencing Lesson Plan (Appendix B5)

The Exciting World of Insects and Spiders (Appendix B6)

Theme 3: **"The Exciting World Of Insects/Spiders"**

Discussion Ideas

Science Information: Of all crawling creatures, only insects have wings, but not all insects have wings.

E. An insect has 6 legs

F. An insect has 3 body parts

1. Head- with antennae or feelers
2. Chest or thorax- with all wings and legs
3. Tail or abdomen

G. Insects' skeletons are on the outside

H. Spiders have 8 legs- spiders are not insects.

When you have greeted each child ask the group, "do you know what you are? Are you a horse? Are you a dog?" Children will enjoy this and will soon enter into this game—by and by one child will say that they are a person. "Yes, you are a person. Are you alive? Do you walk? Do you run? Do you eat?" Continue involving the children, smiling and enjoying the game. "How many eyes do you have? How many heads? How many legs? Etc."

Now draw attention to the bulletin board, where pictures of different insects have been placed. Ask anyone if they know what this is? Listen very carefully; as sometimes children speak very quietly, until they have gained confidence, you may overlook the child's answer. If someone mentions insect or bug immediately affirm this answer.

"Can anyone find another insect on the board?" Let children go up to the board and point to different insects, encouraging them to name the insect - if this is too difficult you supply the name. Allow for each child's turn but move on when you notice disinterest. This lesson needs to be repeated the second day.

Day two add a felt insect with 3 body parts, 2 antennae, and 6 legs. "Can someone point to the insect's legs? Do you have legs? How many legs do you have? How many legs does the insect have? Who has more? Who has less? Continue this conversation, comparing the insects' body to the children's body.

Now we want to check for understanding. As children are seated on the rug, place the felt insect's body pieces on the felt board, incorrectly. Children love this game, teacher is so silly!

The following days will find you talking about different insects. Remember, review yesterday's information before introducing new information. Introduce one new insect each day.

Insect Facts:

Ants: 6 legs

2 antennae
3 body parts
Live in ant hill
Worker ants
Queen ant
Red and black ants

Ladybugs: 6 legs

2 antennae

3 body parts
Wings tucked under shell (skeleton)
Round shape

<u>Caterpillars:</u> 6 legs (the rest are suction cups)

2 antennae
3 body parts
Furry bodies
Form cocoon around body = butterfly

<u>Butterflies:</u> 6 legs

2 antennae
3 body parts
Review cycle (caterpillar-butterfly)

<u>Grasshopper:</u> 6 legs

2 antennae
3 body parts
Hind (back) legs for hopping
Wings

<u>Bees:</u> 6 legs

2 antennae
3 body parts
Gather nectar (sweet juices) from flower
Carry nectar on back legs in sacs
Queen bee
Worker bees
Beehive
Different colors
Wings

Praying Mantis: 6 legs

2 antennae
3 body parts
Green color for "camouflage"
Front legs are hooks to catch
Bugs

Spider: not an insect

8 legs
2 body parts
Many eyes- 2-12

Spiders with poor eyes need to spin webs to catch their food. Spider stays in the center of his web. Web is sticky on the outside; spider "feels" web shaking and catches his food. Spiders with good eyes don't spin webs. They hunt their food on the ground.

Special Activities

1. Sprinkle sugar on an anthill. Carry ant away from ant hill- see if he can find his way back.
2. Eatable insects: apples, pretzels, marshmallows, and raisins.
3. Ants on a log: celery, peanut butter, and raisins.

Art Ideas

1. String painting making spider webs- add plastic spider

2. Yarn collage spider web - add plastic spider

3. Fingerpaint with red paint, take a print lift using newspaper.

Let a your parents cut ants from painting.

4. Children rip brown paper and collage on huge anthill made out of butcher paper. Place your red ants all around anthill.

5. Children trace a circle on red paper. Now add dots either using thumb prints or cut out black dots (ladybug).

6. Collage tissue paper on 3-hole egg carton (caterpillar).

7. Splatter painting using screens, toothbrushes, food coloring, and glue on butterfly shape.

8. Straw blowing on $\frac{1}{2}$ of butterfly shape using glue and tempra paint. Fold and open = very shiny butterfly.

9. Go on a ropewalk, collecting twigs, grass, and bark etc. Make a silly insect by sticking your ropewalk treasures in play dough.

Literacy

1. Be Nice to Spiders
    1. By: Margaret Bloy Graham
2. Demi's Secret Garden
    1. By: Demi
3. Eensey Weensey Spider
    1. By: Joanne Oppenheim & S.D. Schindler
4. Effie
    1. By: Beverly Allinson & Barbara Reid
5. Have You Seen Bugs?
    1. By: Joanne Oppenheim & Ron Broda
6. "I Can't Said" The Ant
    1. By: Polly Cameron
7. I Know an Old Lady Who Swallowed a Fly
    1. By: Nadine Bernard Westcott
8. I Know an Old Lady Who Swallowed a Fly
    1. By: Stephen Oulbis
9. I Love Spiders
    1. By: John Parker & Rita Parkinson
10. I Love to Eat Bugs
    1. By: John Strejan
11. In the Tall, Tall Grass
    1. By: Denise Fleming
12. Ladybug

1. By: Barrie Watts

13. Ladybug, Ladybug

    1. By: Ruth Brown

14. Miss Spider's Tea Party

    1. By: David Kirk

15. More Bugs in a Box

    1. By: David A. Carter

16. Old Black Fly

    1. By: Jim Aylesworth & Stephen Gammell

17. Quick as a Cricket

    1. By: Audrey & Don Wood

18. The Big Honey Hunt

    1. By: Stanley and Janice Berenstain

19. The Butterfly Hunt

    1. By: Toshi

20. The Butterfly Kiss

    1. By: Marcial Boo & Tim Vyner

21. The Flea's Sneeze

    1. By: Lynn Downey & Karla Firehammer

22. The Grouchy Ladybug

    1. By: Eric Carle

23. The Honey Bee and the Robber

    1. By: Eric Carle

24. The Icky Bug Alphabet Book

1. By: Jerry Pallotta & Ralph Masiello

25. The Itsy Bitsy Spider

1. By: Iza Trapani

26. The Very Busy Spider

1. By: Eric Carle

27. The Very Clumsy Click Beetle

1. By: Eric Carle

28. The Very Hungry Caterpillar

1. By: Eric Carle

29. The Very Lonely Firefly

1. By: Eric Carle

30. The Very Quiet Cricket

1. By: Eric Carle

31. There was an Old Lady who Swallowed a Fly

1. By: Simms Taback

32. We Like Bugs

1. By: Gladys Conklin & Arthur Marokvia

33. When the Fly Flew In

1. By: Lisa Westberg & Brad Sneed

Birds, Eggs, and Nests (Appendix B7)

Theme 11: "Birds/Eggs/Nests"

Discussion Ideas

Lesson 1:

Display different sizes and colors of eggs on a tray. Talk with the children about the different eggs. Ask children about the egg as their food. Ask about the inside of the egg. What do you think is inside the egg?

Open the egg in a pan and pass it around to look at and touch if they like. (Reminder; if they touch the egg, they need to go wash their hands). Talk about the shell, yolk, and egg white.

Where do you think we got this egg? Use leading questions until someone mentions a bird. The egg is developed inside the bird's body. The bird lays the egg in a nest through a special opening in her body

Name different creatures that develop from an egg:
Chicken, Duck, Goose, Peacock, (All birds), Insects, Spiders,
Reptiles, Fish, Dinosaurs.

Establish what will grow inside each egg by leading questions; What will hatch from a turkey egg? What will hatch from a snake egg? (Etc.) Establish where different eggs come from.

Lesson 2:

Have a chicken in a cage next to you at circle time.

Leading questions to consider:

What is this animal called?
Is it alive?
How do you know it is alive?
Would it hurt the chicken to hit or squeeze it?
Let's look at the chicken.

Leading questions to consider:

How many legs and feet does the chicken have? How many do you have?
How are the chickens legs and feet different form your lags and feet?
Why do chickens need different feet?
How many arms and hands does the chicken have?
How does the chicken pick up things?
How does the chicken eat without hands?

Spread the wings out so the children can see them. Talk about the feathers. (Teacher information: birds are the only creatures that have feathers)

Leading questions to consider:

There is one thing that a bird has that no other creature has. Can you guess what this is? Encourage all answers. If no one mentions feathers, give the children BIG hints until someone mentions feathers.

Why do you think the bird has feathers?
Where is the chicken's body?
What shape is the chicken's body?
What covers the chicken's body?
What covers your body?
Why do we have skin?

Point out the neck of the chicken.

What shape is the chicken's neck?
Does the neck look like your neck? Why?
What does the chicken use it's neck for?

Look at the chicken's head.

Where are the chicken's eyes? Where are your eyes?
Where are the chicken's ears? Where are your ears?
How are the chicken's ears different from your ears?

I wonder why the eyes are on the side of the chicken's head?

Look carefully at the eyelids. The eyelids cover the eyes from bottom to top.

Look at the chicken's mouth.

How is the chicken's mouth different from your mouth?
What is the chicken's mouth called?
Why is the chicken's mouth different?

Using a large wipe off board, you and the children draw a big chicken. You begin by drawing a large oval shape, next encourage children to come up and add "chicken parts." Release.

Lesson 3:

Today introduce the incubator and then lead into the hatching of baby chicks. Look at the incubator and determine the physical features:

Shape
Color
Wires
Material it is made of

Present the name "incubator," and say it several times throughout the lesson. Discover how we heat the incubator. Review electricity and tie it into the heating of the incubator. Discuss why we keep the incubator warm. The incubator will provide a warm home or nest for the eggs while the baby chicks develop inside their shells. discuss the growth of the chicken inside the egg. Discuss how the chicken grows a little bit each day, using the wipe off board to draw pictures to help with understanding. Discuss what will happen if: the eggs are dropped? The eggs get too cold or too hot? The eggs are not turned? Using your calendar, discuss the length of time (21 days) it will take for the chicken to hatch. After the chickens hatch, what will we need to keep the chickens comfortable and alive? Show the children the eggs you will be responsible for. Place a dot and a room number on one side, and a room number only on the other side. (This will help you to keep track of your classroom's eggs and to know which eggs have been turned.)

Lesson 4:

Review eggs, the chicken, and the incubator. Today we will discover the bird's world. Leading questions to consider:
Have you ever watched birds?
Where do birds live?
How do the birds get up to the top of tress?
How do they get down?
Why do birds come down to the ground?
Do birds have an incubator to put their eggs in?
Where do they hatch their eggs?
What are bird's nests made of?

Let's look at these nests. Bring out different nests and encourage children to come up and look at nests.

What are the nests made of?
What do you see that the mother and father birds used to build their nests?

Is there an electrical cord that will heat the nest and keep the eggs warm?We talked about how important it is to keep the eggs warm so the baby inside the egg shell would not get too cold and die, so how are the eggs going to stay warm? Discuss the fact that the mother bird sits upon the eggs and her body keeps the eggs warm. After most baby birds hatch, they do not have feathers to keep them warm.
How will the mother bird keep her baby birds warm?
How will she feed her baby birds?

Together look at a picture of the mother bird feeding her babies.
Look at the baby bird's mouths. What do you think they need?
Soon the birds will be bigger and will have feathers.

Then what will they do?
Do you think it will be hard for them to fly? They will need to practice many times.
How do birds talk to each other?
How would the baby bird tell its mother that he is hungry? Thank children for being such good thinkers, and release.

Special Activities

1. <u>Eggnog</u>:
    - i. 4 eggs
    - ii. 1-quart cold milk
    - iii. 1-teaspoon vanilla
    - iv. Pinch of salt

2. <u>Hatching Eggs</u>:
    - i. Put 2-dozen fertile eggs in an incubator. Keep temperature at 102-103 degrees.
    - ii. Turn eggs twice daily at 12-hour intervals for the first 15 days.
    - iii. Keep pan of water in incubator. Its surface should be about as large as the space the eggs would take if they were laid side by side, close together. Do not turn the eggs after the 18th day and do not open the incubator, unless it is too warm. It should not be opened until the eggs hatch.
    - iv. Check the eggs each day. Late on the 19th day, some chicks will "pip" or break the shell. By the 20th day, many chicks will have hatched. Chicks will be dried and fluffed by 21 days.
    - v. After 21st day, if some eggs are not hatched, place some boiling water in water pan to steam up incubator. If after 2-3 days, still nothing, try to help by carefully picking away shell.

3. <u>Rearing chicks:</u>
    - i. Chicks should be fed as soon as they rare hatched. Give them a chick "starter mash" obtainable at a feed, farm supply, or pet stores.

4. <u>Eggs,Eggs,Eggs</u>: scrambled, hard boiled, egg salad

5. <u>Eatable Bird Nests</u>:
    - i. Heat chocolate chips and peanut butter in an electric skillet. When melted, add crushed shredded wheat cereal. Mix all together and spoon onto a cookie sheet. Make a small

indentation in the center of the "nest," using a spoon. Add jelly bellies, place in refrigerator for cooling.

6. Egg salad:
   i. You and your children chop up eggs, lettuce, celery pieces etc.,to make your own egg salad. If the children make it, the children eat it!

7. Bird Extravaganza! Encourage children who have birds at home to bring their birds in cages to share with the class. Children will be seeing birds of all different sizes and colors!

Art Ideas

2. The Big Egg Paint: Encourage children to bring eggshells to school. Lay eggshells and watercolors on your art table and paint, paint, paint.

3. Egg Collage: Encourage children to cut out an oval pattern and collage all those egg shells you painted and crushed.

4. Stuffed Birds: Encourage children to cut out 2 bird patterns that have been taped together. Next help the children to staple all around the bird shape, leaving a small opening. Stuff the bird with newspaper, staple shut, and collage with colored feathers.

5. Nature Walk Bird Nest: Take your children on a walk around the center and go "a gathering" for twigs, bark, leaves, string, anything they think a bird may use to build a nest. At work time, lay all the treasures on the art table. Encourage children to collage their findings on a paper plate using brown colored glue. Or, children can cut out a nest pattern and collage their findings on that.

6. Tissue Paper Birds: Encourage children to cut out a bird pattern and collage twisted tissue paper all around.

7. Egg White Painting: Mix tempra paint with egg white and encourage children to paint. When dry, their picture will be shiny.

8. Paper Bag Bird Nests: Using a brown lunch bag, encourage children to "roll" the bag down. Collage "spring" grass, crushed eggshells, yarn etc, inside. Add a pom pom baby bird in the nest.

9. Bird Feeders: Using a hole punch, punch two holes in a toilet paper roll. Spread peanut butter all around the toilet paper roll. Next roll this in birdseed. Hang from a tree in your center- the birds really come!!

Literacy Ideas

1. An Extraordinary Egg
    i. By: Leo Lionni
2. Are You My Mother
    i. By: P. D. Eastman
3. Baby Bird's First Nest
    i. By: Frank Asch
4. Birds' Nest
    i. By: Eileen Curran
5. Chicken and Egg
    i. By: Christine Back/Jens Olesen
6. Chicken Little
    i. By: Steven Kellogg
7. Chickens Aren't the Only Ones
    i. By: Ruth Heller
8. Come Along Daisy
    i. By: Jane Simmons
9. Daisy and the Egg
    i. By: Jane Simmons
10. Daisy and the Monster
    i. By: Jane Simmons
11. Edward the Emu
    i. By: Sheena Knowles
12. Edwina the Emu
    i. By: Shenna Knowles
13. Feathers for Lunch
    i. By: Lois Ehlert
14. Have You Seen Birds?
    i. By: Joanne Oppenheim
15. Have You Seen My Ducklings?
    i. By: Nancy Tafuri
16. Little Green
    i. By: Keith Baker
17. Make Way For Ducklings
    i. By: Robert McCloskey

18. <u>My Goose Betsy</u>

i. By: Trudi Braun

Transparency 1

Science

- Science Tables
- One table with science tools (magnifying glasses)
- One table with Plants/fish Tank
- One table with the above and theme-related activities
- This is a simply one piece of the "Sciencing pie"

Transparency 2

Holistic Sciencing Approach

- This approach is the whole "sciencing" pie
- Entire classroom is engulfed in the "sciencng" approach
- Science can be seen in all centers of the classroom:

  Art

  Literacy

  Dramatic play

  Blocks

  Manipulatives

Transparency 3

Piaget

- The interaction between assimilation and accommodation is the source of development and learning.
- Assimilation is the process of taking in information and using this information with no adaptations.
- Accommodation is the process through which new schemas (organize new thinking) are created, or existing thought patterns are changed in order to incorporate new information.

Transparency 3

Piaget Cont'd

- Children construct knowledge on their own (independent explorations of the world).
- Cognitive structures need to be in place before children can master learning.
- The purpose of play was to assimilate activities, incorporate mental structures, practice newly formed representational ideas and construct meaning from their experience (Berk & Winsler, 1995; Kagan, 1990).

Transparency 4

Vygotsky

- Children "co-construct" knowledge with their partners.
- Social and cultural interactions promote cognitive growth.
- Play is the process through which the cognitive development of the child is advanced.

Transparency 4

Vygotsky Cont'd

- Play as a scaffold for the child.
- Scaffolding: supporting the child to take steps they may not be able to take without adult intervention.
- Scaffolding is best conducted in the Zone of Proximal Development.
- The Zone of Proximal Development is the distance between the child's actual developmental level and the level of potential development.
- Cognitive structures need not be in place before children can master learning.

Transparency 4

Scaffolding

- Supporting children to take steps they might not be able to take without adult intervention.
- Scaffolding techniques consistently predict increased learning and positive outcomes in children.

Transparency 5

Guided Discovery

- Vygotsky and Piaget believed in the constructivist approach to learning for young children.
- Piaget held that children actively construct their own knowledge by means of hands-on exploration, whereas, Vygotsky believed that learning was accomplished in a social context.

Transparency 5

Guided Discovery Research

A review article written by Richard Mayer (2003) compared two views of learning:

- Pure discovery where students have maximal freedom to explore
- Guided Discovery where the teacher provides systematic guidance.

Results showed that children seem to learn better when they are active and when a teacher helps guide their activity.

Transparency 5

Guided Discovery Research Cont'd

Research also showed that children in the Guided Discovery group with the use of giving hints

- Learned
- Remembered
- Transferred to new problems

more efficiently than the Pure Discovery group. Although children in the Guided Discovery group required the most learning time, it resulted in the best performance on solving transfer problems.

Transparency 6

Playful Sciencing Curriculum

- Play is derived from Scaffolding based on Vygotsky.
- Hands-on exploration based on Piaget.
- Guided Discovery is the culmination of the two theorists.
- This curriculum is designed to promote a play-based environment.

APPENDIX C

SCIENCING WITH TEACHERS AND CHILDREN

QUESTIONNAIRE

Sciencing with Teachers and Children Questionnaire

Use the scale below to answer the questions 1-7. Write a number between 1-5 next to each item that best applies.

Almost Never Or Never True	Not Often True	Sometimes True	Often True	Always True
1	2	3	4	5

___ 1. Was the mentoring portion of the curriculum helpful? ____________________

____

____

____

___ Curriculum Goal
___ Theme Selection
___ Special Activities
___ Material Selection
___ Setting Up Environment
___ Discussion Ideas
___ Curriculum Demonstration
___ Lesson Planning
___ Group Evaluation

___ 2. Was the theme workable? Why? Why not?______

____

____

____

Almost Never Or Never True 1	Not Often True 2	Sometimes True 3	Often True 4	Always True 5

____ 3. Were the children engaged in the discussion? In what way? ______________________________

____

____

____ 4. Were the children engaged in the activities? In what way? ______________________________

____

____

____ 5. Did the previous discussion continue in the following weeks? ______________________________

____

____

____ 6. Did the curriculum help you to enhance the environment? ______________________________

____

____

____

____ 7. Will you continue to use this curriculum? Why? Why not? ______________________________

____

____

APPENDIX D

DEMOGRAPHIC INFORMATION FORM

Demographic Information Form

1. Your age ___

2. Your gender ___Male ___Female

3. Your current marital status:

   ___Married ___Single ___Separated

   ___Divorced ___Widowed

   ___Other (specify_____________________)

4. Children ___yes ___no

   ___How many ages__________________

5. Experience working in preschool________

   ___Years ___Months

6. General education units______

7. Special Training___________________________________

8. What was the highest level of education your father completed? _________________________________

9. What was the highest level of education your mother completed? _________________________________

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