

# Starting Them Early: Science Learning in Pre-K & Early Elementary

Workshop Presenter:

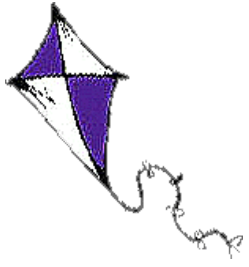
Mia Jackson

David Heil & Associates, Inc.

Foundation for Family Science

[www.familyscience.org](http://www.familyscience.org)





Exploration Place

"The new research shows that babies and young children know and learn more about the world than we could ever have imagined. They think, draw conclusions, make predictions, look for explanations, and even do experiments."

*The Scientist in the Crib, Gropnik, Meltzoff and Kuhl, 2000*



"With carefully selected materials and thoughtful guidance, children's explorations will encourage them to observe more closely, develop new ideas about the world, and build a foundation of experiences and ideas on which to construct later understanding."

*Chalufour and Worth  
The Young Scientist Series, 2003*

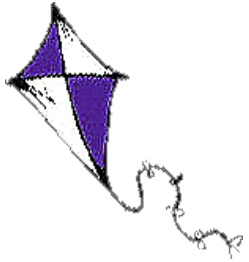
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Garden State Discovery Museum

"I do not accept an America where elementary school kids are only getting an average of twenty-five minutes of science each day when we know that over 80% of the fastest-growing jobs require a knowledge base in math and science."

*Senator Barack Obama, November 2007*



"Lifelong scientific literacy begins with attitudes and values established in the earliest years."

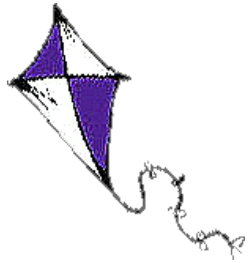
*National Science Education Standards, 1996*

"Studies have found that children in Kindergarten are already forming negative views about science that could cast a shadow across their entire educational careers."

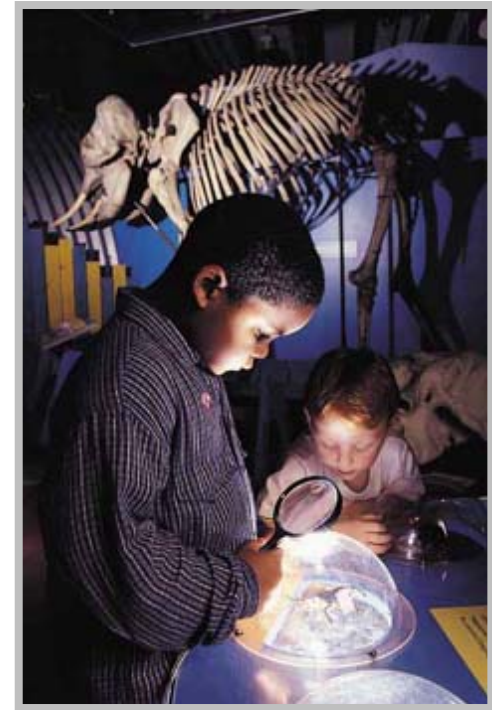
*Scientific American*  
*February 18, 2010*

*Foundation for Family Science*





"We know that by the time students enter seventh grade, more than half say they are not interested in science. Our challenge is to teach science in a way that students can't lose interest."



*Dr. Gerald Wheeler  
NSTA Executive Director, 1997*



# Early Childhood Development Core Concepts for Science Learning

1. Human development is shaped by a dynamic and continuous interaction between biology and experience.
2. The growth of self regulation is a cornerstone of early childhood development
3. Children are active participants in their own development, reflecting the intrinsic human drive to explore and master one's environment.
4. Human relationships are the building blocks of healthy development.
5. The course of development can be altered in early childhood by effective interventions.

*Adapted from: Neurons to Neighborhoods:  
The Science of Early Childhood Development  
National Research Council, 2000*

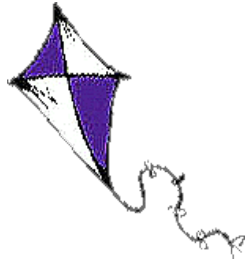


# The Idea

By intervening at an early age, it would be possible to encourage exploratory behaviors and cognitive development in the very young child that could lead to increased readiness for learning science in elementary school and beyond.

- Increased questioning skills
- Increased confidence in exploring/investigating
- More first hand experiences with science





# Important Assumptions About Early Childhood Science Learning

- All children are naturally curious and can successfully engage in developmentally appropriate scientific inquiry.
- The best science content draws from a child's own experiences, interests, and questions about the world they live in.
- The richer and more varied a learner's environment is, the richer and more varied the child's learning experience will be.
- Care givers and teachers can use particular strategies, materials, and environmental resources to encourage and support early childhood science learning. They don't have to be science "experts" to do this!
- Children learn from each other, and discussion, expression, reflection and illustration help build their language of science exploration.
- Parents also play a critical role in their young child's science learning by modeling exploration, encouraging inquiry and building the child's confidence as a learner.



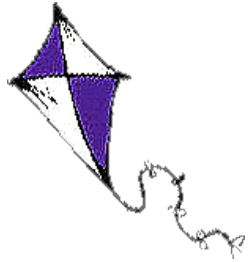
# Science in the Early Years

## Foster Natural Curiosity

- Children are natural explorers
- All territory is new and uncharted to them
- Ask questions about their surroundings and phenomena
- Allow experimentation
- Alert children to using many senses



Virginia Discovery Museum



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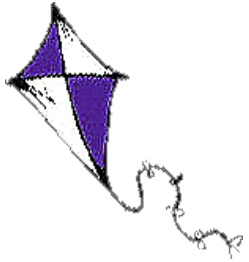
# Science in the Early Years

## Make it Meaningful and Relevant

- Start from where they are
- Create new experiences
- Integrate science with literature, music, math, even lunch time



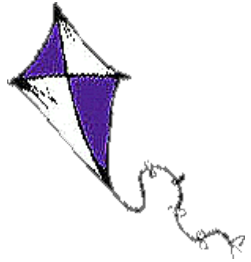
Santa Fe Children's Museum



"Using inquiry-based science, by its very nature, requires the use of language, mathematics, and social skills. A science program will not detract from learning of these basic skills. Rather, a science program will provide the meaningful context in which these skills can be learned best."

*Worth and Grollman  
Worms, Shadows and Whirlpools:  
Science in the Early Childhood Classroom, 2003*

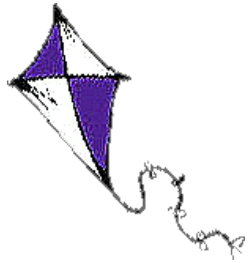
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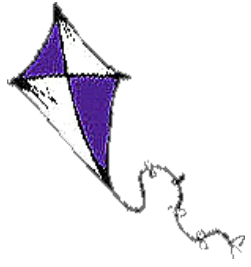


# Science in the Early Years

## Set the Stage

- Materials
  - Observation tools: magnifiers, monoculars, bug boxes, etc.
  - Exploration tools: critter containers, insect nets, touch socks, etc.
  - Common, approachable tools/objects





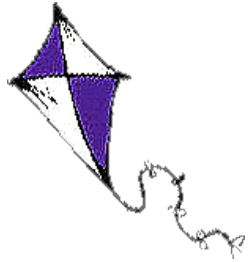
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## Set the Stage

- **Books & Literature**
  - High-quality children's literature with science themes
  - High-quality children's field guides/picture books with engaging pictures
  
- Allowing time for exploratory play and experimentation

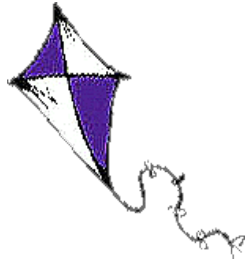


Betty Brinn Children's Museum



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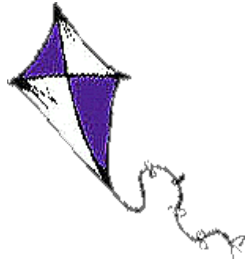
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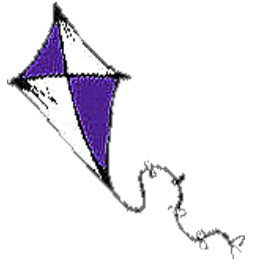
## Guiding Science Learning

- Young children readily engage in science inquiry
- Get basic training in inquiry methods
- Introduce science explorations through both teacher-initiated and child-initiated activity
- Make science available - prepare the environment
- Don't be afraid to say "I don't know" - join your students in "finding out"



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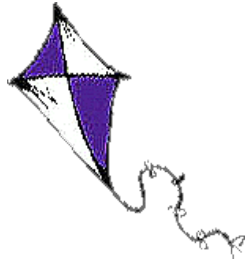
# Science in the Early Years

## Use a Variety of Methods

- Large group activities
- Individual exploration and discovery
- Collaboration and teamwork with peers
- Opportunities to share new knowledge
- Opportunities to use new knowledge

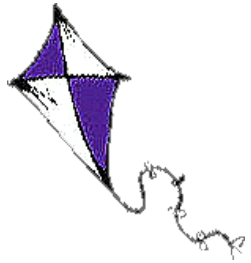






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# Science in the Early Years

## Involve the Family

- Inform parents about what science is happening at school
- Send home ideas for family connections
- Give children activities they can only do at home



The Children's Museum of Houston

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Full Slide Set Available at:  
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