

Inquiry: Science in the Early Childhood Classroom

2006 Conference for Early Childhood Educators
Once Upon a Time and the Scientific Mind

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What Am I?

- **Weird fact:** I cannot see in red light, but I can see in green light very well.

2

EYE

- I have "compound eyes" which allows me to see simultaneously in almost all directions around my body. Each eye is made up of 2,000 individual lenses. In contrast, human eyes have only one lens.

3

LEG

- Hairs on my legs provide me with an extra sense of touch.

4

MOUTH

- My mouth can smell as well as taste. (Imagine eating with your nose!)
- It moves from side to side, not up and down the way human mouths do.

5

REPRODUCTION

- To attract mates, the female produces an odor (a pheromone) that excites males. Males produce a package of sperm that may keep females pregnant for most of their lives.
- Depending on the species, females can produce egg cases with anywhere from 16 to 64 embryos.

6

SKELETON

- My skeleton is on the outside of my body. I can shed my skeleton when I outgrow it.

7

FAT BODY

- Like fat in humans, it stores energy. It also breaks down nutrients to provide energy, and helps treat or detoxify poison that may be sprayed on me.

8

BRAIN

- My brain is spread throughout my body. The head holds a bit of a nervous system, while the rest of the brain is scattered along the ventral (belly-side) part of its body.
- So, now you understand that if you cut off my head, I will still live for as long as one week; eventually dying from starvation or thirst.

9

Run for Your Lives!

- My cousin (who lives in South America) is six inches long with a one-foot wingspan.

10

Giant Cockroach *Blaberus giganteus*



- Individuals can measure over three inches (88 mm) in length and one and one-half inches (38 mm) in width. In spite of their extended dimensions, *Blaberus giganteus* are lightly-built, sprightly roaches, with bodies that are much broader than deep. This flattened body allows them to squeeze between cracks to hide from predators. *Blaberus giganteus* is found in parts of the West Indies, in Panama, and southward into northern South America.
- Source: http://www.key-net.net/users/swb/pet_arthropod/RCH.htm

11

Why Science for Young Children?

- What is appropriate content for 3 – 5 yr olds?
- How do teachers engage children in science inquiry?

12

Why Science for Young Children?

- Curious
- Exploration
- Hypothesis/Explanation Building
- Classroom science →extend natural curiosity

13

Testing for gravity...

14

What goes up...

15

Must come down! (at a rate of
 9.8 m/s^2)

16

Misconceptions of the Natural World

- Children's explanations are built on limited experiences (may be reasonable but incomplete)!
- (ex. Trees cause wind.)
- Teachers can provide children with more focused experiences to challenge their ideas and to help them develop new/complex explanations.

17

Science in the Early Childhood Classroom

- Provides children with direct experiences with materials, events, and ideas that are critical to later learning.

18

Exploration of Nature

- Exploration of the outdoors and close observation of indoor organisms provide a foundation for deeper understanding of life science.

19

Science Inquiry

- When children **engage** in science **exploration** they are doing what we call **science inquiry**.

20

What Does Inquiry Look Like?

- Exploration of the materials or event.
- Asking questions.
- Investigation.
- Record and represent their work.
- Reflect on what they have done and what it means.
- Create new ideas/explanations about how the world works.

21

Is There Time for Science? Most Certainly!

- Doing ***inquiry-based science*** by its very nature, requires the use of language, mathematics, and social skills.
- A science program will provide the meaningful context in which these skills can be learned best.

22

A Sound Early Childhood Science Program

- The *NSES* states that “All students regardless of age, sex, culture or ethnic background, disabilities, aspirations or interest and motivation in science should have the opportunity to attain high levels of scientific literacy” (National Research Council 1996, 20).

23

The Early Childhood Science Program

- Builds on children’s prior experiences, backgrounds, and early ideas/explanations.
- Draws on children’s innate curiosity and encourages children to pursue their own questions and develop their own ideas.

24

The Early Childhood Science Program



- Engages children in in-depth exploration of a topic over time in a carefully prepared environment.
- Encourages reflection and documentation of experiences.
- Embedded in children's daily work and play and is integrated with other content areas/domains.
- Provides access to science experiences for all children.

25

Teachers: *Choose a focus for inquiry*

- Is the topic interesting/engaging to my children?
- Does the topic draw from and connect to their experience?
- What are the basic science concepts for children to think about?
- Are the concepts ones my age group can handle?

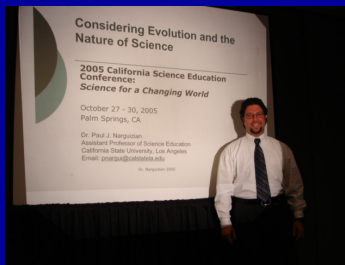


At the Charter College of Education, our education and training programs reflect our commitment to diversity and learning within the urban environment.

26

Teachers: *Prepare themselves to teach the topic*

- Books/Library.
- Exploring the World-Wide-Web/Internet.
- Science Educators (Hint! Hint!)→→→→
- Working directly with the materials the children will use.
- Playing, inquiring, and experimenting.



27

Teachers: *Create a physical environment that supports inquiry*

- Area large enough?
- What materials will focus on children's attention on science ideas?
- What materials need to be added/removed?
- Books/pictures→ encourage science exploration?



We give personalized attention to our students.

28

Teachers: *Observe and assess individual children and the group*

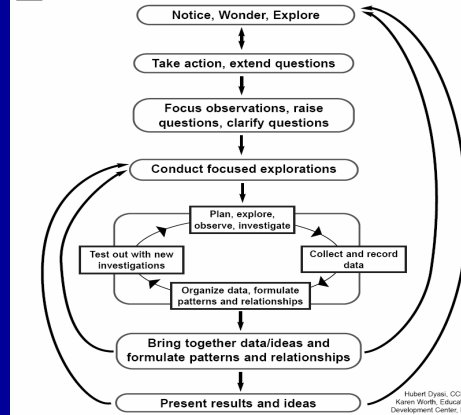
- Clear set of goals and expectations for science?
- Assessment plan/varied assessments?
- Type(s) of record keeping of children's experiences and what they are thinking and learning?



At the Charter College of Education, we support a variety of community outreach programs throughout the Los Angeles basin.

29

Inquiry



Hubert Dwyer, DCNY,
Karen Worth, Education
Development Center, Inc.

30



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Resources

- **Understanding Evolution** <http://evolution.berkeley.edu> developed in 2004 by the University of California Museum of Paleontology, evolution concepts for grades K – 2.
- A Place of Our Own (KCET) KCET's *A Place of Our Own* (and *Los Niños en Su Casa* in Spanish) is a daily television series, a website, and an extensive outreach program devoted to the unique needs of people who care for children. <http://www.aplaceofourown.org/index.php>
- ERIC Clearinghouse on Elementary and **Early Childhood Education** http://www.ccc.commnet.edu/webpicks/weblist/educ_list.htm

36

National Research Council
1996, 23

- *Science inquiry refers to the diverse ways in which scientists study the natural world and propose explanations based on the **evidence** derived from their work. Inquiry also refers to the activities of students in which they develop knowledge and understanding of scientific ideas, as well as an understanding of how scientists study the natural world.*

37