Office of Head Start

Early Childhood Science

National Webcast Series

Discovering Science

Webcast #2: Look What I Know. See What I Can Do!

Slide1: Discovering Science

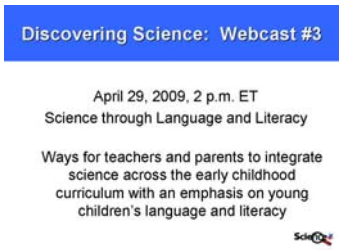
AMANDA BRYANS: Welcome to Discovering Science, the Office of Head Start's four-part series on building the foundation for science in the early years.

UP CG:

Amanda Bryans

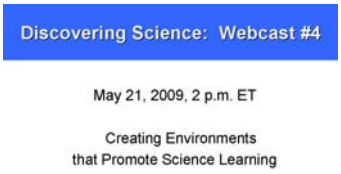
Director, Educational Development and Partnerships Division, OHS

My name is Amanda Bryans. I'm the Director of the Educational Development and Partnerships Division at the Office of Head Start. Thank you for joining us today. During the first Webcast we explored what science is, and what science looks like from birth to five.



Slide 2:

Our next Webcast, on April 29th, will reveal various ways for teachers and parents to integrate science across early childhood learning experiences with an emphasis on young children's language and literacy.



Slide 3:

And the final Webcast, on May 21st, will focus on creating environments that promote science learning. But today we will discuss scientific understanding and thinking in the early years and how adults can facilitate it.

From a very early age children interact with their environments, ask questions, and seek ways to answer those questions. Their understanding is significantly enhanced when their ideas are anchored in experiences.

It is through inquiry that children can develop knowledge and understanding of how science works and how scientists think. Inquiry also provides an excellent means to develop children's "habits of mind," including their higher-order thinking skills, reasoning abilities, problem-solving abilities, communication skills, and decision making. Meaningful teacher practices and interactions such as responding to the child's lead and encouraging questions are essential for supporting children through the learning process.

Amanda Story Ad Lib

Our host for this Webcast series is Dr. Shari Ellis. Dr. Ellis is a Senior Early Childhood Science Advisor for the Office of Head Start and Project Director of the Center for Informal Science Education at the Florida Museum of Natural History. Here to share a teacher's perspective is Barbara Dowling, a Head Start teacher in South Dakota and a 2008-2009 National Head Start Fellow in the Office of Head Start.

Shari…

UP CG:

Shari Ellis

Senior Advisor, Early Childhood Science, Office of Head Start

SHARI ELLIS: Thank you, Amanda. It's great to be back with you. I hope you will find today's program useful and informative.

Today's Webcast will feature video clips from classrooms and from various experts around the country. Later in the Webcast, we will take some of your questions.

Throughout the Webcast you can simply type your question in the "Ask a Question" form on your browser, and we strongly encourage you to do so.

You can also download a copy of the Learner's Guide for this Webcast by clicking "Learner's Guide" located at the lower portion of your screen. After each Webcast, we will provide a list of resources for further study. We will also e-mail a feedback form, inviting your comments on this series and your suggestions for improving future Webcasts.

POST:

ECLKC: www.eclkc.ohs.acf.hhs.gov

If you want to watch these Webcasts again, or you want to refer a friend or colleague, this series is also available on the web through the Early Childhood Learning and Knowledge Center, also known as the E-C-L-K-C.

Barbara…

UP CG:

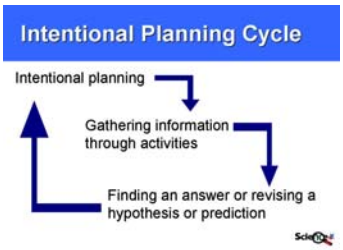
Barbara Dowling

2008-2009 National Head Start Fellow, Office of Head Start

BARBARA DOWLING: Thank you, Shari. Let me start by thanking all of you for the thoughtful questions and comments you shared about the first Webcast.

Some viewers wrote in to request that we provide sample activities and so I want to take a moment to respond to this request. In this Webcast series, activities are viewed as tools to help children find answers to their questions or hypotheses. Instead of focusing on particular activities, we will continue to focus on questions children and teachers ask.

Once a question is raised, a teacher develops or selects activities and materials that will give children experiences to help them find answers.



Slide 4:

As you see illustrated here, teachers need to engage in a continuous cycle of intentional planning and implementation of learning experiences by incorporating a series of specific, related activities with appropriate materials. These materials and activities should provide information to help the child answer the question or develop a new hypothesis. These steps continue on as children arrive at answers or generate questions.

Slide 5:

To illustrate this point, you can view activities as a toolbox where each tool helps to accomplish a specific task, and each activity helps answer a specific question. You need to know the task before you can choose the appropriate tool just like you need to have a question defined before you can choose or develop an appropriate activity.

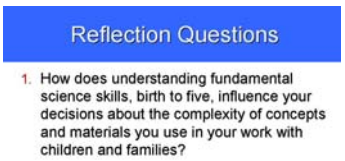
This approach allows children and teachers to engage in rich, meaningful encounters of observing, exploring, discovering, and problem solving. During the remaining Webcasts,

scientific experiences or explorations will be shown and discussed in the context of tools used to gain information about a particular question.

Slide 6:

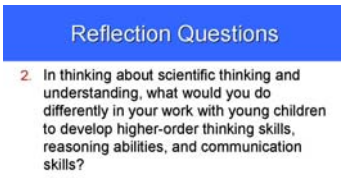
In this Webcast, we are going to focus on how science thinking develops from birth to five. Our goal is to help you discover that science is happening in and around you already. We will suggest ways for you to build on those opportunities, and at the same time boost children's interest and understanding in their use of science process skills and their engagement in the pursuit of scientific knowledge.

As you watch this Webcast, I want to give you two questions to consider:



Slide 7

1. How does understanding fundamental science skills from birth on influence your decisions about the complexity of concepts and materials you use in your work with children and families?



Slide 8

2. In thinking about this information on scientific thinking and understanding, what would you do differently in your work with young children to develop their higher-order thinking skills, reasoning abilities, and communication skills?

Shari…

UP CG:

Shari Ellis

Senior Advisor, Early Childhood Science, Office of Head Start

SHARI ELLIS: Let's review a few key points from our first Webcast. We explored the questions, what is science and what does science look like? Science is about understanding the world and how it works. Science includes knowledge, concepts, and theories as well as skills such as making observations, asking questions, drawing conclusions, and giving explanations.

Slide 9

We also described many opportunities that exist in children's lives to learn about and practice science. We found that children can explore science nearly everywhere—in the bathtub, during meals, and outside.

Keep in mind, children learn science best when we intentionally design and take advantage of those opportunities. It is so rewarding to explore alongside children as they learn about the world. It's exciting to observe children as they make new discoveries. It allows us and the children to experience "aha" moments and the challenges and joys of learning together.

Dr. William Ritz is the Director of the Head Start on Science Project at California State University Long Beach. Let's listen as he talks about nurturing a child's sense of wonder.

ROLL TAPE!!

VTR Dr. Ritz's

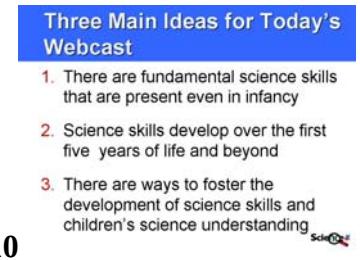
TRT: 1:41

UP CG:

Barbara Dowling

2008-2009 National Head Start Fellow Office of Head Start

BARBARA DOWLING: Today's discussion of science from birth to five is framed by three main ideas.



Slide 10

First, there are fundamental science skills that are present beginning in infancy. Second, these skills develop over the first five years of life and beyond. And finally, there are ways that we can foster the development of these skills, and consequently, children's science understanding.

During this Webcast, we are going to provide examples from several areas of science knowledge. Our goal with these examples is to increase your awareness of science opportunities that may exist in particular learning environments … whether it is an infant-toddler or preschool classroom, a home, or the outdoors. We are also going to describe strategies you can use to help foster the development of science skills.

Slides 11 and 12

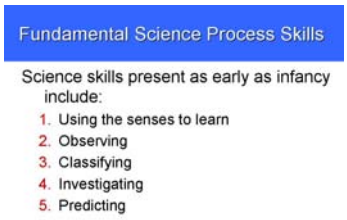
You may be wondering why we include early science with infants in our presentation. One reason is that infants work to understand the world right from the start.

Another reason is that later skills and understanding are built on earlier ones.

Having a sense of the progression is necessary in the context of promoting discovery and learning. This is especially important in early childhood where there is a wide range of individual differences in children's prior experiences, knowledge, and skills.

Slides 13 and 14

Another reason to focus some attention on what infants can do is to better acknowledge and appreciate their competence. By highlighting some of the things very young children can do and understand, we hope to raise expectations for all children from birth to five.



Slide 15

Some of the fundamental science process skills present as early as infancy include using the senses to learn, observing, classifying, investigating, and predicting. Each of these science skills are reflected in the Head Start Child Outcomes Framework.

UP CG:

Shari Ellis, Ph.D.

Senior Advisor, Early Childhood Science, Office of Head Start

SHARI ELLIS: The first science process skill we are going to talk about today is learning through the senses.

Slide 16

Let's briefly review the development of the five basic senses which are touch, smell, taste, hearing, vision/ sight.

Touch, smell, and taste are well developed at birth.

Now what about sight? Although newborns can see, they do not see as clearly as adults until about 12 months of age.

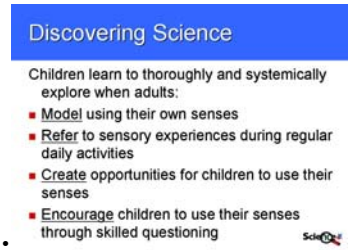
At birth, infants are less sensitive to sound than adults, but by the end of the first year of life they hear as well as we do. And interestingly, infants are initially able to discriminate the speech sounds in all human languages, but they lose this ability by the time they are 11 months old.

These findings help illustrate the importance of sensory experiences during the first years of life. Despite the fact that infants are born with an impressive array of sensory capabilities, experience is critical for the further development and refinement of sensory skills.

So, what kinds of experiences can support the development of these skills during infancy and early childhood? When infants are given opportunities to explore their world using all their senses and they have the support and guidance of caring adults these skills flourish. In some respects, this seems so simple. Infants typically do not need a specially designed environment to develop their vision, hearing, and other sensory skills. Yet, in our modern world, babies may not always be in an environment that adequately supports use or development of those skills.

We know that infants' sensory capabilities are about on par with that of adults by around age 1. Does this mean this fundamental science process skill is fully developed? Of course not. While young children naturally use their senses to learn about the world, they continue to need

guidance and practice. However, we are often surprised by very young children's ability to notice things that we miss ourselves.



Slide 17:

In general, young children grow more skilled at using their senses to learn when they receive consistent support and encouragement. Children learn to thoroughly and systematically explore when adults model using their own senses, refer to sensory experiences during regular daily activities, create opportunities for children to use their senses in meaningful ways, and encourage children to use their senses through skilled questioning.

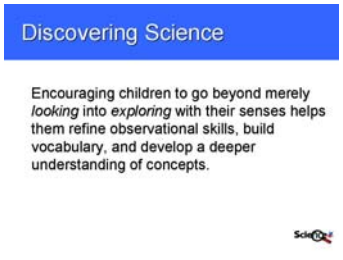
Barbara, can you explain why multisensory learning is important in preschool?

UP CG:

Barbara Dowling

2008-2009 National Head Start Fellow, Office of Head Start

BARBARA DOWLING: It is important for teachers, caregivers, and parents to remember the value of using all of the senses to learn.



Slide 18:

Encouraging children to go beyond merely *looking* into *exploring* with their senses helps them refine observational skills, build vocabulary, and develop a deeper understanding of concepts. The more children can explore an object or event, the more information their brains have to process to help them understand. This information allows the children to connect the object, event, or concept with other information they have from previous experiences and adds complexity to the children's thinking.

UP CG:

Shari Ellis

Senior Advisor, Early Childhood Science, Office of Head Start

SHARI ELLIS: There are important differences between the ways young children and adults use their senses to learn. As adults, we can readily talk about what we learn through the use of each of our senses. We know that peaches are sweet because we taste it, and that bath water is warm because we feel it. However, for young children the connections between what they know and how they come to know it must be learned.

Let's illustrate with an example that many of you have probably experienced… having a child explore an object inside a box or feely bag.

Shari AD LIB and DEMONSTRATION

In order to engage in scientific discussions, children need to be able to answer questions like "How do you know that?" They need to be able to link what they know with how they came to know it. The difficulty that young children have explaining how they know what they know has

been the focus of much research. This research shows significant growth in children's abilities in this area between the ages of 3 and 5. I'd like to briefly describe one relevant study with my friend, Mr. Potato Head.

In this study, Drs. Daniela O'Neill and Selena Chong asked 3- and 4-year-old children to engage in several tasks that involved using their senses. For example, in one task children were asked to tell adults whether the water in a miniature swimming pool was warm or cold.

In contrast, about 60 percent of the 4-year-olds could explain how they came to know the water was cold. And, more than 80 percent could show the experimenter how they knew the answer—either on their own or by using Mr. Potato Head. Some of the most interesting responses the children offered involved senses other than the one that they actually used. For example, one child said the water was cold, "because I peeked in it."

The difficulty young children have in explaining how they come to know what they know is intriguing. They are able to make observations such as "I can hear the siren but I can't see it" which suggests they can distinguish among their senses as events happen.

It isn't the case that young children have terrible memories—they actually have pretty impressive memory skills—especially those related to events they themselves have participated in. Many 3-year-olds are capable of describing in great detail a meaningful event be it an injury, birthday party, or animal encounter days or even weeks or months later.

Why then is it so difficult for children to recall an experience that happened only moments earlier? We have yet to fully answer this question.

One possibility is young children are more about just exploring and learning about the world than in knowing how they know. In other words, they get so caught up in the experience that they do not encode it in memory in a way that allows them to later connect what they know to how they came to know it.

In addition, answering "How do you know that?" involves reasoning about cause and effect—that sensory experience leads to sensory knowledge. And, it requires that children isolate the different senses and not think about how the information might usually come to them.

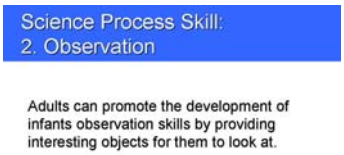
What can teachers and parents learn from these findings? Hopefully this gives you pause the next time you are frustrated by a child who doesn't quite seem to get the point of your questions—such as the child who places his hand in a feely bag and describes the color of the object!

More importantly, the findings suggest that we should not dismiss these kinds of questions and interactions as meaningless because young children initially do not do very well. Learning to use the senses and talking about what they have learned lay the foundation for shared inquiry.

UP CG:

Barbara Dowling

2008-2009 National Head Start Fellow, Office of Head Start



Slide 19

BARBARA DOWLING: Let's move now to our second fundamental science process skill—observation. During early infancy, we can promote the development of children's observation skills by providing interesting objects for them to look at. We are all familiar with mobiles that can be displayed over changing tables and cribs, but we can also hang two-dimensional items such as quilts, drawings, and photos at the infants' eye level.

During interactions with infants, we can draw attention to various objects to see what interests the child. We can observe that infants want "a change of scenery" when they stop looking at something or look away more often than they focus.

During the toddler years, it becomes increasingly possible to actively nurture observation skills. Shari recently spoke with Dr. Sharon Schaffer at the Smithsonian Early Enrichment Center about "learning to look."

ROLL TAPE!!

Sharon Schaffer
TRT: 5:54

SHARI ELLIS: As Dr. Shaffer points out, we can encourage the development of children's observation skills by using photographs and illustrations as well as objects. How and when we use materials matter. I'd like to illustrate this with a technique we use called a "Peep Hole"

book. You may recognize these books as similar to published books by an author named Tana Hoban.

Shari Demonstration: Peep Hole

We create "Peep Hole" books by finding very interesting photographs in calendars and magazines. We laminate them and create an overlay with a peep hole that highlights a particularly interesting or revealing part of the object or animal shown. We then use these books to help children practice careful observation and to elicit descriptive words.

The point is not to use such strategies to allow children to guess or to memorize the pictures in the book. Rather, the point is that children must draw upon prior experiences and existing knowledge to help identify what is new. New pictures can be added into the book throughout the year to allow continued practice. I know one teacher who inserted photographs of the children in her "Peep Hole" book!

Photos Slides 20-22

The natural world also affords endless opportunities to practice careful observation and to begin to use observation in sorting, classifying, or categorizing new knowledge. In one of my recent classroom visits, I observed two 4-year-olds intently searching in the sand. This went on and on

and on. I finally asked them what they were looking for. It turns out they were looking for very small orange stones!

Of course, this behavior is not unusual. Depending on the environment, we can find children searching with similar intensity for acorns… insects… small toads… or even colorful leaves to observe, collect, and investigate! Let's learn how that can happen.

UP CG:

Barbara Dowling

2008-2009 National Head Start Fellow, Office of Head Start

Photo slides 23-24

BARBARA DOWLING: Leaves are an element in nature that are always interesting to some children. They can easily be collected and there are multiple facets of leaves that can be explored and observed. Collecting leaves can be done as a group activity, as a family activity, and as an extended activity using the Internet to connect to other Head Start programs in your city or state to engage in a leaf exchange to expand the local collections.

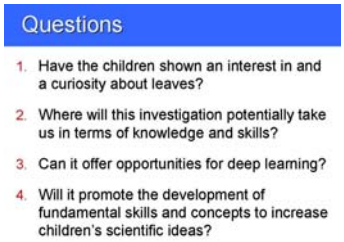
Slide 25:

With so many different colors, textures, sizes, and shapes, leaves offer many opportunities for children to practice their observation skills. Some have smooth edges, some have points. Some are found in groups, some are found alone.

Slides 26:

Can collecting and observing leaves grow into a project? Sure. If you can answer yes to a few questions:

Slide 27:



- "Have the children shown an interest in and a curiosity about leaves?"
- "Where will this investigation potentially take us in terms of knowledge and skills?"
- "Can it offer opportunities for deep learning?"
- "Will it promote the development of fundamental skills and concepts to increase children's scientific ideas?"

If you have answered these questions and you want to move forward, begin by noting what questions the children have asked and what observations they have already made about leaves while collecting them… “Do leaves make noise? When and why?” “As a tree grows taller do the leaves get bigger?” “Are leaves and needles the same thing?” “Why do some leaves fall off the trees?” “Look! These leaves have smooth edges and these are pointy. Why is that?”

Slide 28:

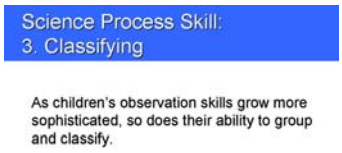
From these questions you can design focused, intentional, explorations. Now you are more ready to begin your leaf project with the children.

Shari…

UP CG:

Shari Ellis

Senior Advisor, Early Childhood Science, Office of Head Start



Slide 29

SHARI ELLIS: As children’s observation skills grow more sophisticated, so does their ability to group and classify objects, materials, and events. Classification is another fundamental science process skill.

Much of the work that scientists do involves classification. Scientists have been classifying the world since ancient times and much of this effort has been devoted to classifying living things. The reason classification is important is that it allows us to make predictions.

It is amazing how early in life children begin to classify or build categories. Recently, Dr. Jean Simpson, spoke with Laura Annunziata, a Training Specialist at the Early Head Start National Resource Center at Zero to Three. Let's hear what she had to say about the emergence of early classification skills.

ROLL TAPE!

Laura Annunziata VTR

TRT: 1:49

UP CG:

Barbara Dowling

2008-2009 National Head Start Fellow, Office of Head Start

BARBARA DOWLING: Look what I know. See what I can do! Children communicate this to us every day. How do we really come to understand what children know? One way is through careful observation. Careful observation is so important when trying to understand what young children are thinking and doing as they learn to classify.

Once, I observed a young child with Down syndrome during clean-up time. The block area was Sammy's favorite area because he enjoyed playing with the people figures, vehicles, and small blocks. During clean-up time, I showed him how to return objects to the appropriate containers which had picture labels. He happily picked up some objects and placed them in the appropriate container, but he tossed other objects to the side. Again, I demonstrated and explained what to do with the objects. Again he placed some in the correct container and tossed aside others. I watched this scenario for a few days. Then I observed with great care as Sammy picked up an object, looked at it and either placed it in the container or tossed it to the side.

I looked at the objects in the container and the objects he had put aside and saw in fact that he was sorting the objects but was focused only on the people figurines that belonged in the container closest to him. The others did not belong in the people group and he discarded them. He was categorizing! He could not verbally explain it to me, but he did understand which objects belonged in the category of "people" and which ones did not. He was demonstrating… look what I know! See what I can do! Now through careful observation I knew what my next steps in helping him learn to classify would be.

Shari….

UP CG:

Shari Ellis

Senior Advisor, Early Childhood Science, Office of Head Start

SHARI ELLIS: I have another example of helping children learn to classify. In our work at the Florida Museum of Natural History, we have encouraged teachers to recycle. Teachers and

children collect recyclable items used in the classrooms, found on “litter hunts,” and brought in from home. Once the items are cleaned and sharp edges smoothed, children can sort—or classify—them into plastic, metal, and paper. With supportive conversations children can move beyond labeling the containers as “juice” or “milk” to what the object is composed of—“plastic” or “paper.”

Barbara…

UP CG:

Barbara Dowling

2008-2009 National Head Start Fellow, Office of Head Start

Photo slides 30-32

BARBARA DOWLING: Children love collecting and they love treasures. When children bring in objects to share we treat them with great respect. It is the children’s love of collecting found treasures that led me to a wonderful book called *Beautiful Stuff: Learning with Found Objects* by Cathy Topal and Lella Gandini. This book inspired me to have the children collect treasures to use throughout the year. Eagerly the children brought in bags of treasures: keys, feathers, marker lids, buttons, nuts and bolts, ribbons, and yarn. The treasures were talked about, shared, grouped, regrouped, and classified. This also allowed the children to provide free materials that were used in a variety of ways and for a variety of learning purposes. The children were able to

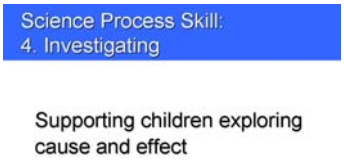
learn multiple attributes of the treasures and multiple ways they could be classified. For example… instead of button, yarn, and key, the children started to say a red square button, a long fat piece of blue yarn, a tiny silver key.

Shari…

UP CG:

Shari Ellis

Senior Advisor, Early Childhood Science, Office of Head Start



Slide 33

SHARI ELLIS: The examples of classification we have shared today involved objects—actually man-made objects or artifacts—such as blocks, toys, beads, cans, and other containers. There are many ways to sort or classify these materials. We can sort them by color, size, shape, or function... or just as easily, things we like and things we don't like.

However, as Laura Annunziata reminds us, it is important to note that young children are always forming categories or classifying their worlds and these "sorts" are not so arbitrary.

As we mentioned earlier, one reason the human mind tends to classify or categorize new instances is that it allows us to make predictions about properties or characteristic tendencies.

For example, it would be terribly time consuming if every time we encounter a new animal we have to figure out: How does it move? Where does it live? What does it eat? How does it reproduce?

Categories in science are, in a sense, short cuts. Once we know that an animal is, in fact, a bird, we can make lots or pretty accurate predictions. We expect the bird will lay eggs, have wings, feathers, and a beak, produce distinctive sounds, and probably fly.

Even children as young as two are prepared to learn about and use these kinds of categories to make sense of the world. Knowing that children are naturally categorizing or classifying the world does have implications for how we introduce or talk about science... for example, many young children are fascinated by what animals eat—especially when animals eat other animals. This makes it very easy for them to identify—at a very young age—carnivores, herbivores, and omnivores!

What this suggests is that teachers should not limit opportunities for classification or "sorting" to observable characteristics such as color, shape, or size.

Using our senses, observing, and classifying are all important science process skills. The fourth science process skill we are going to explore today is investigating. When do children begin engaging in investigations?

Dr. Jean Simpson also recently spoke with Amanda Perez who is an Infant Toddler Training Specialist, about children's earliest explorations. Let's listen to what she had to say.

ROLL TAPE!
Amanda Perez VTR
TRT: 2:55

What can we do to support young children's experiences with cause and effect? Sometimes, demonstrating or showing children the actions needed to cause an effect is appropriate.

ROLL TAPE!
Teacher, Boy, Drum
TRT: 25secs

Carefully observing children's explorations, interpreting them accurately, and deciding how and when to intervene are at the heart of skilled teaching. It can be challenging to decide how much support and the kind of support we provide children as they explore the world.

We sometimes wait too long and opt not to help… and the learning moment disappears. Or we jump in too early and take over for the child. So, when and how much should we intervene?

A general principle when providing support is to offer just enough help to allow a child to accomplish something they could not accomplish on their own and without doing the task or solving the problem for them. This gap between what children can do on their own and what they can do with help is known as the "zone of proximal development." Research shows that sensitive help that is aimed at the gap—at the zone—if you will, is the most effective.

Determining how much help to provide—or whether to offer any help at all—can be a challenge. Amanda Perez again provides some guidance on how to respond when a child seems to need help with exploration.

ROLL TAPE!

Amanda Perez VTR

NEW INCUE: "We're working in programs…"

Using language to describe what children are doing not only introduces vocabulary, but helps them make the link between their actions and the results of those actions. Asking questions is another effective means of fostering an understanding of cause and effect. By encouraging children to put their thoughts into words, we help them build their understanding.

The following video of a ramp exploration with 2-year-olds illustrates effective questioning. Then teachers reflect on the experience and doing science with toddlers.

ROLL TAPE!

Teacher Interview and Ramps VTR

TRT: 3:46

This example illustrates several of the points we have made already. One is that young children have ideas based on their experiences. These children had experienced slides or ramps using their own bodies and had begun to experiment with putting objects on the slides. The activity the teachers designed gave the children the opportunity to investigate this question.

Barbara, could you speak more about how investigations begin in your classroom?

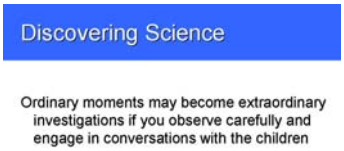
UP CG:

Barbara Dowling

2008-2009 National Head Start Fellow, Office of Head Start

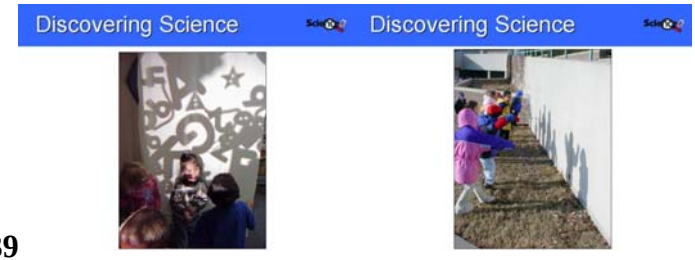
Photo slides 34-36

BARBARA DOWLING: Investigations begin by observing the children, listening to them, and asking yourself, "What are they curious about?" The home, the classroom, the park, the sidewalk, the grocery store, ants on the playground, new objects in the environment, a comment a child makes that a flower looks like a hot air balloon—these all can be starting points for an investigation.



Slide 37

Ordinary moments may become extraordinary investigations if you observe carefully and engage in conversations with the children.

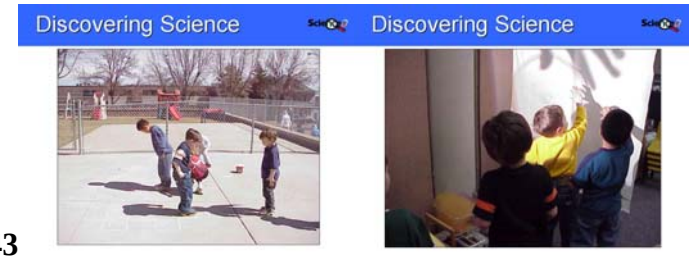


Slides 38 and 39

One phenomenon that often intrigues young children is shadows. They notice them and wonder what they are and where they come from. They formulate theories about shadows and engage in activities and experiences to test those theories.

Slides 40 and 41

Children ask lots of questions such as, "How can we make our shadows bigger or smaller? What makes a shadow disappear? What makes shadows at night? Do shadows talk? Where are my shadow's eyes?"



Slides 42 and 43

They'll say, "Our shadows were in front of us when we left, but they are behind us now. What happened? How can we get our shadows in front of us again? Where do shadows go when the sun goes behind a cloud?"

Slides 44

These questions also reflect the theories children have about shadows and these theories will determine what experiences and activities to offer the children. It is extremely important that the content and experiences presented to the children match their cognitive abilities. How children view shadows or any other subject is determined by their experiences and their perspectives.

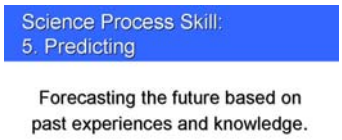
Slide 45

Their responses are not always correct and there may be some misconceptions, but it is the process of the investigation that is important and that will expand the children's thinking. By investigating, the children are developing a scientific approach to studying phenomena in their environment.

UP CG:

Shari Ellis

Senior Advisor, Early Childhood Science, Office of Head Start



Slide 46

SHARI ELLIS: Let's move on to the fifth, and final, science process skill we are going to discuss today—making predictions. You may wonder at what age children begin to make predictions. Actually, we begin to make informal predictions very early in life—as soon as we begin to have expectations of people and objects around us. Let's hear some examples.

ROLL TAPE!

Laura and Amanda Predictions VTR

TRT: 1:49

It is useful to begin with a topic or phenomenon that children have experience with—or one that can be explored directly—when you begin making formal predictions. Predicting seems a lot like guessing, but as I mentioned earlier, scientific guessing is based on reasoning from previous learning, not on just a gut feeling or random guessing.

Let's observe a group of 4-year-olds making predictions about the number, size, and color of seeds in a collection of fruits. I would like to point out that the teacher in the following video reviewed with the children what "predict" means, but it was not captured in the video. While

you watch, you may want to make note of any of the other 4 science process skills used here. Do you see children using their senses? Observing carefully? Classifying?

ROLL TAPE!

Seeds VTR

TRT: 3:45

This video helps illustrate that children base their predictions on either past experience or logic or reasoning. Also striking is that the children do not all make the same prediction. Some children were familiar with even the exotic papaya. One child thinks the pepper seeds would be the color of the pepper—a reasonable expectation. Most expect seeds in new fruits to be the same color as the seeds in the fruit they had already seen. Their ability to use that information depended, however, on careful observation.

The teacher helped draw attention to the seeds by first showing the children photographs of seeds so that they would know what to look at. Throughout the experience, she focused their attention on the seeds by asking them to describe the color, size, and number. By planning effectively and facilitating this experience, the children were able to make predictions rather than random guesses.

UP CG:

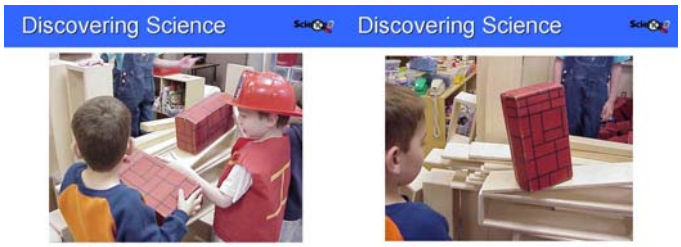
Barbara Dowling

2008-2009 National Head Start Fellow, Office of Head Start

BARBARA DOWLING: Engaging young children in the practice of making predictions is how they learn to do so. And, when making predictions becomes a natural part of their day and not confined to structured experiences, children will have an easier time grasping the concept.

Slides 47-48

There are plenty of opportunities to make predictions on a nature walk—"Hear that noise? I hear leaves rustling in that tree. What do you think might be in there making noise?" Or, on the playground—"Listen! Do you hear that sound? What do you think it is?" It is also possible to embed predictions into mealtimes—"Hmmm…what do you think that smells like?"



Slides 50 and 51

It is helpful for adults to model making a prediction, such as, "I think this block will slide all the way down the ramp and not fall like this one." By interchanging the phrases "I think" and "I predict" we can help children understand what the word "predict" means… and soon they'll

come to love using the term! If teachers explain their own thinking and ask children to justify their predictions, older preschoolers will begin to explain their predictions.

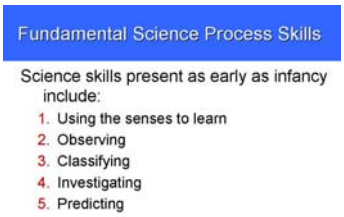
Formalizing predictions by sharing them with others, writing them on a chart, or asking children to describe them in their drawings or journals facilitates the development of prediction-making. We will address these strategies in more detail in our third Webcast.

The seed experience you saw a few minutes ago grew out of children's experience with apples. At this Center, the children are provided sliced apples with the seeds still attached… and, the children often complain about these seeds! The teacher used this everyday experience as an opportunity to focus on seeds as part of a conversation.

Slide 54

Which parts of these plants do we eat? Which parts don't we eat? Do we ever eat seeds?

As I explained at the beginning of today's program, we view activities as tools to help children find answers to their questions or hypotheses. So, this same seed activity could be used as a tool to answer a number of other questions such as "Where do plants come from? How do they start?" "What is the difference between a fruit and a vegetable?" It could even be used in a project exploring "insides and outsides."



Slide 55

Our discussions today have been centered on the fact there are 5 fundamental science skills—using the senses to learn, observing, classifying, investigating, predicting—that are present in infancy and that develop over the first five years of life and beyond. And, as we have illustrated today, there are many ways adults can support and facilitate the development and use of these skills.

In our final video clip today, Dr. Victoria Fu echoes the importance of today's ideas as she talks about the value of scientific inquiry in the early years.

ROLL TAPE!

DR. FU VTR

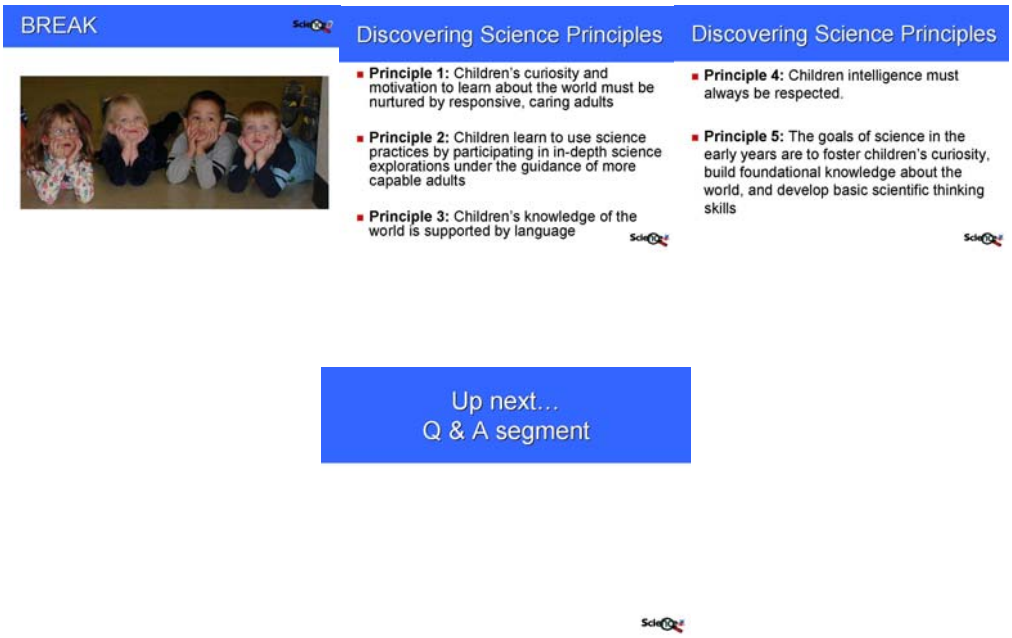
TRT: 3:56

Now we're going to take a short break. When we come back we'll begin our live Q&A session.

We'll see you in 3 minutes…

*****3-MINUTE BREAK*****

ROLL Reviewer Recruitment Clip



SHARI ELLIS: Welcome back! Now it's time to answer some questions. Here to help Barbara and me is Amanda Bryans and Dr. Jean Simpson from the Office of Head Start.

UP CG:

Jean Simpson, Ph.D.

Education Specialist, Office of Head Start

JEAN SIMPSON: Thank you, Shari and Barbara. It's not too late to send in your questions. Remember you can type your question into the "Ask a Question" form on your browser.

Our first question is from….

Live Q & A Segment (20 minutes)

And our final question is from…

JEAN SIMPSON (ON CUE): Thank you Shari, Barbara, and Amanda, and thanks to all of you. This concludes our second Science Webcast. In our next Webcast we will discuss various ways teachers and parents can plan to integrate science across early childhood experiences with an emphasis on language and literacy.

In the meantime, please visit the E-C-L-K-C for additional information concerning science, and please feel free to send suggestions you have about these Webcasts to the e-mail address at the bottom of your screen.

UP CG:
ScienceWebcasts@esi-dc.com

Once again, thank you for taking the time to be with us today; and for the time you spend in making a difference in the lives of the children and families we serve in Head Start and Early Head Start daily.

We'll be with you soon—on April 29th for our third Science Webcast.

-End-