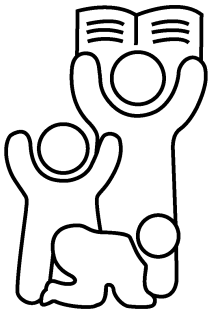

Educating Young Children: Active Learning Practices for Preschool and Child Care Programs

excerpt from Educating Young Children *(pages 13-41), a curriculum guide from High/Scope Educational Research Foundation, Ypsilanti, Michigan, USA*

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Snack
Monday

Part 1

The Active Learning Approach

Secure in the knowledge that an adult is available to help if needed, this child solves the problem of how to make a tower taller and develops an "I can do it" feeling about herself.

1

Active Learning: The Way Children Construct Knowledge

Human Development as a Framework for Education

The cornerstone of the High/Scope approach to early childhood education is the belief that *active learning* is fundamental to the full development of human potential and that active learning occurs most effectively in settings that provide *developmentally appropriate learning opportunities*. Therefore, the overarching goal of our early childhood work is to establish a flexible, "open framework," operational model that supports developmentally appropriate education in diverse settings. In doing so, we have made the following basic assumptions about human growth and development:

• Human beings develop capacities in predictable sequences throughout their lives. As people mature, new capabilities emerge.

• Despite the general predictability of human development, each person displays unique characteristics from birth, which through everyday interactions progressively differentiate into a unique personality. Learning always occurs in the context of each person's unique characteristics, abilities, and opportunities.

• There are times during the life cycle when certain kinds of things are learned best or most efficiently, and there are teaching methods that are more appropriate at certain times in the developmental sequence than at others.

Given that developmental change is a basic fact of human existence but that each person is also developmentally unique, and that there are optimal times for particular kinds of learning, developmentally appropriate education can be defined by three criteria. An educational experience, procedure, or method—whether adult- or child-initiated—is developmentally appropriate if it . . .

1. Exercises and challenges the learner's capacities as they emerge at a given developmental level

2. Encourages and helps the learner to develop a unique pattern of interests, talents, and goals

3. Presents learning experiences when learners are best able to master, generalize, and retain what they learn and can relate it to previous experiences and future expectations

Knowledge arises neither from objects nor the child, but from interactions between the child and those objects.

— Jean Piaget

"Only knowledge of the order and connection of the stages in the development of the psychical functions can . . . insure the full meaning and free, yet orderly or law-abiding, exercise of the psychical powers. In a word, education itself is precisely the work of supplying the conditions which will enable the psychical functions, as they successively arise, to mature and pass into higher functions in the freest and fullest manner."

— John Dewey and James A. McLellan, (1964, p. 207)

Furthermore, in the High/Scope approach, learning is viewed as a *social experience* involving meaningful interactions among children and adults. Since children learn at different rates and have unique interests and experiences, they are more likely to reach their full potential for growth when they are encouraged to interact and communicate freely with peers and adults. These social experiences occur in the context of real-life activities that children have planned and initiated themselves, or within adult-initiated experiences that afford ample opportunity for children's choice, leadership, and individual expression.

Learning as *Developmental Change*

The High/Scope Curriculum draws extensively on the cognitive-developmental work of Jean Piaget (1969, 1970) and his colleagues, as well as the progressive educational philosophy of John Dewey (1963/1938, 1933). Both of these theorists believed that human development occurs gradually through a series of ordered, sequential stages. The High/Scope preschool approach is geared to children who are functioning in what Piaget calls the "preoperational" stage of development. The preoperational period falls between the "sensory-motor" period (infants and toddlers) and the "concrete-operational" period (elementary level) in Piaget's developmental continuum. Moreover, both the progressives and the cognitive-developmentalists view learning as *developmental change*. The *progressive* view of learning can be expressed as "an active change in patterns of thinking brought about by experiential problem-solving" (Kohlberg and Mayer 1972, p. 455). Progressives believe that the aim of education should be to support children's natural interactions with people and the environment, because this process of interaction stimulates development "through the presentation of resolvable but genuine problems or conflicts" (Kohlberg and Mayer 1972, p. 454).

Similarly, the *cognitive-developmentalists* describe learning as a process in which the child acts on and interacts with the immediate world to construct an increasingly elaborate concept of reality. Through experience, the child forms incomplete ideas that may lead to contradictory conclusions; the *process* of resolving these contradictions leads to increasingly more complex thinking and learning. For example, Karla, a child who has noticed that most of the balls in her experience are round and bounce, observes to herself: "My Play-Doh ball is round. It will bounce." Through further experience, Karla becomes aware of a contradiction—the Play-Doh ball is round, but sticks to the floor when bounced—and recognizes the need to construct a new way of thinking that coordinates her past conclusions with her new observations: "*That* ball outside bounces, but *this* Play-Doh ball doesn't bounce." Note that even though Karla has adjusted her concept of reality to accommodate new information, the new explanation she gives is still incomplete, because developmental change occurs slowly, in small increments. It usually takes many experiences for a child to acquire a new concept. According to developmental psychologist John Flavel (1963), children "can incorporate only those components of reality which [their mental] structures can assimilate without drastic change" (p. 50).

Active Learning—A Complex Physical and Mental Process

The learning process, then, is seen as an *interaction* between the goal-oriented actions of the learner and the environmental realities that affect those actions. Children construct their own models of reality, which develop over time in response to new experiences and exposure to other viewpoints.

Children as Active Learners

Active learning—the direct and immediate experiencing of objects, people, ideas, and events—is a necessary condition for cognitive restructuring and hence for development. Put simply, young children learn concepts, form ideas, and create their own symbols or abstractions through self-initiated activity—moving, listening, searching, feeling, manipulating. Such activity, carried on within a social context in which an alert and sensitive adult is a *participant-observer*, makes it possible for the child to be involved in intrinsically interesting experiences that may produce contradictory conclusions and a consequent reorganization of the child's understanding of his or her world.

In High/Scope centers and classrooms, children are active agents who construct their own knowledge of the world as they transform their ideas and interactions into logical and intuitive sequences of thought and action, work with diverse materials to create personally meaningful experiences and outcomes, and talk about their experiences in their own words.

In embracing the view of learning as a process of developmental change, High/Scope adopted the term "**active learning**" to describe the central process of the High/Scope Curriculum. **Active learning is defined as learning in which the child, by acting on objects and interacting with people, ideas, and events, constructs new understanding.** No one else can have experiences for the child or construct knowledge for the child. Children must do this for themselves.

In this book, "active learning" stands for four critical elements: (1) direct action on objects, (2) reflection on actions, (3) intrinsic motivation, invention, and generativity, and (4) problem solving. Next, we discuss each of these elements as reflected in the activities of preschool children.

► Direct actions on objects

Active learning depends on the use of *materials*—natural and found materials, household objects, toys, equipment, and tools. Active learning begins as young children manipulate objects, using their bodies and all their senses to find out about the objects. Acting on objects gives children something "real" to think about and discuss with others. Through these types of "concrete" experiences with materials and people, children gradually begin to form abstract concepts. As Flavel (1963) puts it, "Children perform real actions on materials which form the learning base, actions as concrete and direct as the materials can be made to allow" (p. 367).

► Reflection on actions

Action alone is not sufficient for learning. To understand their immediate world, children must interact *thoughtfully* with it. Children's understanding of the world develops as they carry out actions arising from the need to test ideas or find answers to questions. A young child who reaches for a ball, for example, is pursuing an internal question, such as "Hmm . . . wonder what this thing does?" By acting (grasping, tasting, chewing, dropping, pushing, and rolling) and then reflecting on these actions, the child begins to answer the question and to construct a personal understanding of what balls do. Put another way, the child's actions, and reflections on those actions, result in the development of thought and understanding. Thus, active learning involves both the *physical activity* of interacting with objects to produce effects and the *mental activity* of interpreting these effects and fitting the interpretations into a more complete understanding of the world.

► Intrinsic motivation, invention, and generativity

In this perspective, the impetus to learn clearly arises from within the child. The child's personal interests, questions, and intentions lead to exploration, experimentation, and the construction of new knowledge and understanding. Active learners are questioners and inventors. They generate hypotheses—"I wonder how I can get this block that I want to be my scuba diving air tank to stay on my back?"—and test them out by using and combining materials in a way that makes sense to *them*. As inventors, children create unique solutions and products: "I tried tying the block on with string, and it kept falling off, but the tape made it work."

Active learning starts as children manipulate objects—for example, maneuvering a mirror to just the right spot for their pretend play.

The Importance of Independent Problem Solving

Experiences in which the preschool child produces some effect on the world (in contrast with, say, watching television) are crucial to the development of thought processes, because the child's logic develops from the effort to interpret the information gained through such experiences; interpretation of new information modifies the interpretative structures themselves as the child strives for a more logical internal model of reality. Therefore, if we want children to become intelligent problem solvers, it seems clear that the best way to do so in preschool or child care programs is to give children many opportunities to work on problems of interest to them—that is, problems that arise from their own attempts to comprehend the world.

While children's creations may sometimes be messy, unstable, or unrecognizable to adults, the *process* by which children think about and produce these creations is the way they come to understand their world. It is also important to recognize that the errors children make ("The string won't hold the block on") are as important as their successes in providing them with essential information about their original hypotheses. Thus, active learning is an ongoing, inventive process in which children combine materials, experiences, and ideas to produce effects that are new to them. Although adults may take for granted the laws of nature and logic, each child discovers them as if for the first time.

► Problem solving

Experiences in which children produce an effect they may or may not anticipate are crucial to the development of their ability to think and reason. When children encounter real-life problems—unexpected outcomes or barriers to fulfilling their intentions—the process of reconciling the unexpected with what they already know about the world stimulates learning and development. For example, Roberto, a child pretending to cook soup, tries to cover the pot of "soup" (water) with a lid. He expects the lid to cover the pan, but instead it falls into the soup and water splashes on his hand. Roberto knows from experience that the lid is supposed to stay on top of the pan, so he decides to place several other lids on the pot until he finds one that fits properly and does not fall into the soup. Through repeated experiences like this, he will learn to consider the size of any cover in relation to the size of an opening.

Young Children and Adults Think Differently

Learning to understand the world is a slow and gradual process in which children try to fit new observations to what they already know or think they understand about reality. As a result, they often come to unique conclusions, conclusions that, from the standpoint of adult thinking, may be viewed as errors. Adults interacting with children should recognize that this type of thinking is part of the active learning process and should accept children's nonadult reasoning—in time, children's thinking will become more like adult thinking. Below are some of the ways preschool children think differently from adults:

It's alive! "It's running after me!" 4-year-old Erin exclaims as she runs away from a trickle of water. Erin is not being silly or cute. She is trying to understand her direct experience. The distinction between living and nonliving things is not very clear to young children. They often equate movement with life ("The butter's running! It's alive!") and wonder when dead pets or relatives will be alive again.

Concrete definitions. "I'm beside myself with excitement!" exclaims Mrs. Cantu.

"How you do that?" James asks, looking at her curiously.

"Do what?" Mrs. Cantu asks.

"You . . . be . . . be . . . beside you. How you do it?"

Young children base the meanings of words on their own experiences. To James, "beside" means "next to." He is trying to figure out how Mrs. Cantu can be next to herself.

Blending intuitive and scientific thought. "Look, my magnet catches nails," Wanda says to her friend, Topher.

"We catch nails 'cause our magnets have strong powers."

"But we can't catch these sticks. They don't have powers."

Wanda and Topher have constructed their ideas from careful observation (the magnets pick up nails but not sticks) and intuition or fantasy (the magnet "catches" some things because of special "powers").

One thing at a time. Because they generally focus on one thing at a time, young children usually don't make "both . . . and" statements. For example, when Corey asks his friend Vanessa if she has any pets, she says she doesn't. This doesn't stop Corey from asking her whether she has any cats (even though cats are included in the larger class of pets). When Vanessa says she doesn't have a cat, Corey asks her if she has a dog. Vanessa replies that she does have a dog, and Corey confides that he has a dog, too. Neither child is aware that Vanessa's dog is both a dog *and* a pet.

Judging by appearances. Young children tend to make judgments about "how much" and "how many" based on appearances. For example, young children reason that a nickel is more than a dime because it is bigger. They might also think that a cup (8 ounces) of juice in a small glass is more than a cup of juice in a bigger glass simply because the smaller glass is fuller.

"If I hold my hands out like this, will I go faster?"—As they play, active learners pose questions and seek answers.

Active learning involves both interacting with objects (using a food mill) and interpreting the effects of one's actions (thinking about how the apples changed to applesauce).

Children do most of the "work" of active learning while the teacher is a conscious participant-observer. Here, as she gets a "haircut," the teacher jots down an observation to discuss later with her teammate.

Adults as Supporters of Active Learners

Given that children learn through their own experiences and discoveries, what is the role of adults in the active learning environment? In the broadest sense, adults are **supporters of development,** and as such their primary goal is to encourage active learning on the part of the child. Adults do not *tell* children what to learn or how to learn it—instead, they *empower* children to take control of their own learning. In carrying out this role, adults are not only active and participatory but also observational and reflective; *they are conscious participant-observers*.

While children interact with materials, people, ideas, and events to construct their own understanding of reality, **adults observe and interact with children to discover how each child thinks and reasons.** Adults strive to recognize each child's particular interests and abilities, and to offer the child appropriate support and challenges. This adult role is complex and develops gradually as the adult becomes more adept at recognizing and meeting each child's developmental needs. Basically, adults in High/Scope settings support children by . . .

- **Organizing environments and routines for active learning**
- **Establishing a climate for positive social interactions**
- **Encouraging children's intentional actions, problem solving, and verbal reflection**
- **Observing and interpreting the actions of each child in terms of the developmental principles embodied in the High/Scope *key experiences***
- **Planning experiences that build on the child's actions and interests**

It is the major purpose of this book to describe in detail these aspects of the adult's role; therefore, specific examples of how adults support children appear throughout the text.

The Adult Role

Adults support active learning by

• Organizing environments

Play areas are clearly defined and stocked with interesting, age-appropriate materials.

• Organizing routines

The sequence of the day's events is carefully planned. Here, the teacher uses a handmade picture book to help children learn what part of the routine comes next.

• ***Establishing a supportive social climate***

Relationships among adults and children are relaxed and positive.

• ***Encouraging children's intentional actions, problem solving, and verbal reflections***

The adult focuses on the children's *actions and goals.*

• ***Interpreting children's actions in terms of the High/Scope key experiences***

Teams meet daily to discuss and interpret observations.

• ***Planning experiences***

The adults planned this recall-time activity to build on children's interests.

High/Scope Preschool Key Experiences

Creative Representation

- Recognizing objects by sight, sound, touch, taste, and smell
- Imitating actions and sounds
- Relating models, pictures, and photographs to real places and things
- Pretending and role playing
- Making models out of clay, blocks, and other materials
- Drawing and painting

Language and Literacy

- Talking with others about personally meaningful experiences
- Describing objects, events, and relations
- Having fun with language: listening to stories and poems, making up stories and rhymes
- Writing in various ways: drawing, scribbling, letterlike forms, invented spelling, conventional forms
- Reading in various ways: reading storybooks, signs and symbols, one's own writing
- Dictating stories

Initiative and Social Relations

- Making and expressing choices, plans, and decisions
- Solving problems encountered in play
- Taking care of one's own needs
- Expressing feelings in words
- Participating in group routines
- Being sensitive to the feelings, interests, and needs of others
- Building relationships with children and adults
- Creating and experiencing collaborative play
- Dealing with social conflict

Movement

- Moving in nonlocomotor ways (anchored movement: bending, twisting, rocking, swinging one's arms)
- Moving in locomotor ways (nonanchored movement: running, jumping, hopping, skipping, marching, climbing)
- Moving with objects
- Expressing creativity in movement
- Describing movement
- Acting upon movement directions
- Feeling and expressing steady beat
- Moving in sequences to a common beat

Music

- Moving to music
- Exploring and identifying sounds
- Exploring the singing voice
- Developing melody
- Singing songs
- Playing simple musical instruments

Classification

- Exploring and describing similarities, differences, and the attributes of things
- Distinguishing and describing shapes
- Sorting and matching
- Using and describing something in several ways
- Holding more than one attribute in mind at a time
- Distinguishing between "some" and "all"
- Describing characteristics something does not possess or what class it does not belong to

Seriation

- Comparing attributes (longer/shorter, bigger/smaller)
- Arranging several things one after another in a series or pattern and describing the relationships (big/bigger/biggest, red/blue/red/blue)
- Fitting one ordered set of objects to another through trial and error (small cup–small saucer/medium cup–medium saucer/big cup–big saucer)

Number

- Comparing the number of things in two sets to determine "more," "fewer," "same number"
- Arranging two sets of objects in one-to-one correspondence
- Counting objects

Space

- Filling and emptying
- Fitting things together and taking them apart
- Changing the shape and arrangement of objects (wrapping, twisting, stretching, stacking, enclosing)
- Observing people, places, and things from different spatial viewpoints
- Experiencing and describing positions, directions, and distances in the play space, building, and neighborhood
- Interpreting spatial relations in drawings, pictures, and photographs

Time

- Starting and stopping an action on signal
- Experiencing and describing rates of movement
- Experiencing and comparing time intervals
- Anticipating, remembering, and describing sequences of events

The High/Scope Key Experiences—A Framework for Understanding Active Learning

If a set of beliefs about how children learn and how adults support learning form the *process* of the High/Scope approach, then the *content* is provided by the **High/Scope key experiences. The preschool key experiences are a series of statements describing the social, cognitive, and physical development of children from the ages of $2\frac{1}{2}$–5 years.** Each statement highlights an active learning experience that is essential for the development of the fundamental abilities that emerge during early childhood. These experiences are not a set of specific topics and learning objectives; instead, they are experiences that young children encounter repeatedly in the natural course of their daily lives. Together, the key experiences define the kinds of knowledge young children are acquiring as they interact with materials, people, ideas, and events.

Since young children readily engage in the High/Scope key experiences, the role of adults is to create an environment in which these developmentally important experiences can occur and then to recognize, support, and build on them when they do. *The creation of an environment rich with key experiences, and the delivery of appropriate adult support, are critical elements in educating young children.* The key experiences are organized around these topics: **creative representation; language and literacy; initiative and social relations; movement; music; classification; seriation; number; space; and time.** They are discussed in detail in Part 3 of this book.

Piaget and Dewey on the Adult's Role

Jean Piaget:

"In our view, the role of the teacher remains essential but very difficult to gauge: it consists essentially in arousing the child's curiosity and in stimulating the child's research. It accomplishes this by encouraging the child to set his or her own problems, and not by thrusting problems upon the child or dictating solutions. Above all, the adult must continually find fresh ways to stimulate the child's activity and be prepared to vary his or her approach as the child raises new questions or imagines new solutions. In particular, when these solutions are false or incomplete, the role of the teacher will consist primarily in devising counter examples or control experiments so that the child will be able to correct his or her own errors and find fresh solutions through direct actions."

—Jean Piaget, quoted in Banet (1976, p. 7)

John Dewey:

"[The educator's] problem is to protect the spirit of inquiry, to keep it from becoming blasé from overexcitement, wooden from routine, fossilized through dogmatic instruction, or dissipated by random exercise upon trivial things."

—John Dewey (1933, p. 34)

"The educator is responsible for a knowledge of individuals and for a knowledge of subject-matter that will enable activities to be selected which lend themselves to social organization in which all individuals have an opportunity to contribute something, and in which the activities in which all participate are the chief carrier of control . . .

"When education is based upon experience and educative experience is seen to be a social process . . . the teacher loses the position of external boss or dictator but takes on that of leader of group activities."

—John Dewey (1933, pp. 56, 59, 71)

Adults use the High/Scope key experiences for child development as a window for understanding children's behavior. The key experience arranging several things one after another in a series or pattern *helps adults interpret this child's actions.*

What Happens in an Active Learning Setting

So far in this chapter we have outlined the perspective on learning that underlies the High/Scope Curriculum. We have introduced the concept of "active learning" and have briefly described the adult's role in terms of supporting the active learning process. The next section illustrates how an active learning approach such as High/Scope's is implemented in classrooms, centers, or homes. We describe what children typically do in active learning settings, what adults do, how adults and children interact, and some of the short- and long-range benefits—for both adults and children—of participating in an active learning program.

Active learners are focused on their own actions and thoughts.

What Children Do in the Active Learning Setting

► **Children initiate activities that grow from personal interests and intentions.**

How can we tell when children are truly engaged in active learning? One of the defining characteristics of active learners is that they are focused on their own actions and thoughts. At the art table, Jeff goes over to the easel to get the green paint; Vanessa stands up to press her elbows into her Play-Doh; Craig places his picture on the floor to have more room to work on it. These actions evoke discussion:

Craig: *Hey, Jeff. You didn't clean up.*

Jeff: *I'm still paintin'. I need some green.*

Craig: *I'm still paintin', too, and I need all the colors.*

Vanessa: *Look! Look! Holes! I did it!*

Active learners find plenty of things to do and often talk about what they intend to do. At first glance, adults who are expecting to see quiet groups of children doing the same thing at the same time may view an active learning setting as disorganized. But adults who understand the importance of supporting active learners realize that a child's *internal motivation* creates an effective organizing force both within the child and in the classroom or center. For example, if a child needs green paint, a smock,

another block, or a friend to help, he or she can generally meet the need independently because an active learning environment supports this type of decision making. Because children in active learning settings make choices based on their own interests and questions, and then have time to follow through on their plans, they are intensely involved with people and materials and freely share their ideas, findings, and observations. With appropriate adult support they thus become active agents of their own learning rather than passive recipients of adult-directed learning.

► Children choose materials and decide what to do with them.

One of the hallmarks of programs based on active learning is the many opportunities they provide for children to make choices. Young children are quite able and eager to choose materials and decide how to use them. Many materials are new to young children, so they often do not use the materials according to their intended function. Instead, children are inventive—manipulating the materials according to their own interests and abilities. One child might use tape, for example, to fasten pieces of paper together, while another might take the tape outside and use it for fastening acorns, flower petals, sticks, and stones together. Consider a group of children working with similar materials—paper, glue, yarn, and paper-towel tubes—at an art table. It is likely that each child will choose to do something different with the materials:

• Della cuts a piece of paper into little bits, which she puts inside a paper-towel tube. "Still need more," she says, getting up to peer down into the tube to see how full it is.

• Dan wraps yarn around his paper-towel tube and then puts glue on top of the yarn "to make the string stick."

When children are free to make their own choices, they often use materials in unexpected, creative ways—like painting with four brushes at once!

• Katie, spreading glue on her paper, watches Dan. "No, no," she tells Dan when he tries to roll his tube and string on her gluey paper.

• "I'm gonna make a long spying thing," announces Joey, as he cuts holes in two paper-towel tubes and ties them together.

• Kim Wan cuts a tube into rings and glues the rings in a row on his paper.

The freedom to make choices like these is essential to active learning because it is by making choices that children learn more about what interests them, what questions to answer, what contradictions to resolve, and what explanations to accept. Because adults in active learning settings understand the important role that children's choices play in learning, they strive to incorporate an element of choice in all of children's activities, even those—such as washing one's hands or zipping one's coat—that many adults might see as incidental to the "real program." Children, after all, do not make distinctions between the regular program and incidental events. They approach most situations with a desire for active involvement. By making choices available in all parts of a program, not just during "free play" or at "free-choice" times, adults increase children's active involvement and thus broaden their opportunities to learn.

► Children explore materials actively with all their senses.

The active learning process involves all the senses. A young child learns what an object is by experimenting with it—holding, squeezing, climbing on, crawling under, dropping, poking, smelling, and tasting it; viewing it from many angles; and listening to the sounds it makes.

When children explore an object and discover its attributes, they begin to understand how the different parts function and fit together, how the object "works," and what the object is really like rather than how it appears. When children discover that the outside part of a pineapple is hard and prickly while the inside part is sweet and juicy, they are beginning to understand that an object that looks forbidding may taste good. Even if they are told this, they still do not *learn* it unless they make their own observations and discoveries.

Through exploration, children answer their own questions and satisfy their curiosity. In active learning settings, adults respect children's

Choices for children are a part of all active learning experiences. Here, a child shares his idea for the next verse of a song in a music activity.

This parent understands that active learning means exploring with all the senses: looking at an icicle up close, touching it, even tasting it.

desire to explore, recognizing that exploration is one of the most important ways young children learn.

► **Children discover relationships through direct experience with objects.**

As children become familiar with the objects around them and continue to experiment with them, they become interested in putting them together. In this way, children discover for themselves what objects are like in relation to other objects and how objects work together. Children learn about relationships between things by finding out the answers to their own questions, such as, "What happens when you put a long necklace on the teddy bear?" "Add a wooden block to the cardboard block tower?" "Pour sand from the milk jug into the strainer?" Two-year-old Barnie, for example, is not yet able to look at two cardboard boxes and tell which one is bigger, wider, deeper, or taller. To gain a sense of their relative proportions, he has to work with the boxes, fitting them together, stacking them, getting into them, standing them next to each other.

Adults in active learning settings give children like Barnie the time and space they need

Discovering How Objects Relate to Each Other

As they explore objects, children learn about relationships—that one box fits inside another, that juice can overflow a cup, that one block can be placed on top of another, that a truck fits inside a hollow block, that one tower is taller than another, that one truck goes faster than another. Simple discoveries such as these are the foundations for children's understanding of number, logic, space, and time concepts. Adults need to stand back and let children discover such relationships for themselves. This takes patience and an understanding of children's developmental needs:

Bonnie is fitting together large Lego blocks. One of the pieces is upside-down, so it will not fit on the one below it. As Mr. Bloom reaches over to help her, Bonnie pushes his hand away. "I do it. I do it," she insists. After considerable trial and error, she manages to fit the Lego block on top of the one below and then reaches for another block.

to discover relationships on their own. They resist the temptation to help children do something "right" or to show children what to do, knowing that this can deprive children of valuable opportunities for learning and discovery. Children need time to work at their own pace with materials in order to discover for themselves the relationships between things.

► Children transform and combine materials.

Changing the consistency, shape, or color of a material is another way children work with materials in the active learning setting. Consider Ahmed, who is playing in the sandbox. As he presses down on the sand to make a level panful, the sand becomes compacted and will no longer pour. When Ahmed adds some water to his pan of sand, he notices that the hard, dry, compacted sand has turned into a soupy liquid. As Ahmed molds the wet sand, the smooth, flat surface becomes a series of mounds and craters.

Sand play is just one of countless activities in which young children manipulate, transform, and combine materials. As children engage in this type of activity, they are learning about the less obvious, but essential, properties of materials. A child learns, for example, that the quantity of clay remains the same, whether it is clumped together in a ball or flattened out in a thin layer. Children are also learning about cause-and-effect relationships. For example, a child who ties a knot at the end of a string (cause) learns that this action keeps the beads on the string (effect). By providing materials that can take many forms and by valuing children's efforts to transform and combine the materials, adults in active learning settings are encouraging these kinds of important discoveries.

► Children use age-appropriate tools and equipment.

Opportunities to use tools and equipment designed for specific purposes are abundant in the active learning setting. By age 3, children can coordinate two or more actions and thus are capable of using a wide range of tools and equipment. These include both equipment designed for children—wheeled toys, climbers, swings—and such adult items as cameras, eggbeaters, food grinders, and staplers. As children use such simple machines, they are developing a range of movement and coordination skills. Consider the actions involved in riding a tricycle: the child must simultaneously grasp the handlebars, turn them to steer, and pedal. Similarly, when hammering, the child must grasp the hammer, steady the nail, aim, and pound. As they work with tools and equipment, children are developing skills and dispositions that will enable them to do more things on their own and to solve more complex problems.

Clearly, opportunities for problem solving are plentiful when children work with tools: one child searches for a nail that is long enough to connect two pieces of wood; another tries to find a piece of wood that is the right size to form one side of a birdhouse. Children also experience cause-and-effect relationships when using tools—sawing fast makes lots of sawdust and takes more effort; turning the handle of the eggbeater faster makes more bubbles.

Initially, just *using* a tool may be more important to the child than its intended function. For example, turning a vacuum cleaner on and off, pushing and pulling it, steering it, managing the cord, and fitting the machine under a table may be more important to a youthful vacuumer than actually cleaning the carpet.

► Children use their large muscles.

Active learning for a preschooler means learning with the whole body. Children are eager to stretch their physical strengths and capacities. They love to climb on top of blocks; move chairs and tables; lift up their friends; roll across the floor; mash clay with their elbows; turn around until they are dizzy; run, hop, jump, push, crawl, shout, whisper, sing, wiggle, throw, pound, kick, climb, twist. Such motions are an undeniable part of their youthful nature. Expecting young children not to move is like expecting them not to breathe. Therefore, in the active learning environment adults provide space and time for children to engage in activities that exercise the large

Preschoolers' Typical Transformations

Mixing paints
Adding food coloring to water
Blowing bubbles
Wringing out a wet sponge
Making a paper chain
Folding a doll blanket
Cracking open nuts
Sawing wood
Drilling holes
Shaking a tambourine
Fitting oneself into a doll cradle
Printing a mask created at the computer
Rolling a Play-Doh ball into a long coil
Putting on a wig
Twisting wire around a stick

The Essentials of Discovery

For the young child, *access* to materials, *freedom* to manipulate, transform, and combine them in his or her own way, and *time* to do so are the essentials of the process of discovery. Adults can provide these essentials.

muscles and also provide lots of things for children to push, throw, lift, kick, and carry.

Exploring materials, discovering relationships, transforming and combining materials, acquiring skills with tools and equipment, and using the large muscles are vital manipulative processes. Through such daily opportunities children gain a basic knowledge of the physical world—what it is made of, how it works, and the effect their actions have upon it.

Working with snow at the water table helps children see how a common material can be molded, reshaped, and transformed.

► Children talk about their experiences.

In active learning settings, children talk about what they are doing (or have just done) throughout the day. Children are encouraged to set the agenda in conversations with adults, and as a result, what the child says often takes the adult by surprise. Listen to Jerry talking to Mrs. Gibbs about their field trip to a farm: "I left my lunch on the bus an' I had to share some of Toni's. His sandwich was flat. This flat! He sat on it 'cause his dad was late. Boy, was his dad mad, so Toni didn't tell him. It was in the bag, so it was okay."

Clearly, Mrs. Gibbs did not plan a trip to the farm so Jerry could have an experience with a flat sandwich. She thought he might talk about the goat he milked or the chicken feathers he collected, and she was mildly surprised that Jerry was so captivated by Toni's flat sandwich. Paula, on the other hand, describes the egg she found in the hayloft: "It was way down in there. It didn't break. The other one did." Whether children talk about sandwiches or eggs, however, the process of putting actions into words is the same. *But*—conscientious adults might ask—who learned more, Jerry or Paula? Each child was particularly interested in a different aspect of the trip. Perhaps Paula learned more about eggs and hay while

Jerry learned more about what happens when one sits on a sandwich. What we can say with assurance is that both children were involved in memorable experiences that caused them some surprise, both had the opportunity to consciously reflect on their findings, and both were free to describe these reflections in their own words.

When children are free to converse about personally meaningful experiences, they use language to deal with ideas and problems that are real and important to them. As the children communicate their thoughts through language and listen to one another's comments, they learn that their personal way of speaking is effective and respected. In the active learning setting, where children's language reflects their personal perceptions, thoughts, and concerns, each child's voice is heard.

► Children talk about what they are doing in their own words.

What children say in the active learning setting reflects their own experiences and understanding and is often characterized by a logic that differs from adult thinking:

• "I didn't put any animals in my barn," Melissa says about a farm she made with blocks. "Just horses and cows."

• "That car can't go," Max giggles, pointing to a side-view picture of a car in a storybook. "It's got only two wheels!" "The other two wheels are on the other side," his dad points out. "No they're not!" Max exclaims, as he turns the page to look.

Why should an adult encourage children to say things in their own words when what they say is often incorrect? Because young children like Melissa and Max are using the best reasoning powers at their disposal. No matter how many times an adult tells Melissa that horses and cows are animals, until she develops the capacity to understand class inclusion, to her "a horse is a horse is a horse." Period. Max sees a car with two wheels. Since he is not yet able to imagine another spatial perspective, he thinks his father is joking when he explains to Max that the other two wheels are on the other side of the car. When Max looks on the "other side," he finds another picture, not the other side of the car. According to Melissa's and Max's best reasoning, their views and perceptions are correct. *They need the opportunity to share their observations, so talking about what they think and see becomes a natural part of their lives.* As they mature and experience new contradictions, their thinking will develop along with their self-confidence, and their observations will become increasingly more logical and realistic. In the meantime, they are developing the habit of talking about what they understand and what is important to them.

Using the large muscles is a key component of active learning.

What Adults Do in the Active Learning Setting

► Adults provide a variety of materials for children to work with.

Observers new to active learning settings may be surprised by the wide range of materials that are available to children. Adults provide such a variety of materials to assure that there are plentiful opportunities for children to make choices and manipulate materials—key aspects of the active learning process. Materials may include any familiar or unfamiliar objects of interest to young children, except for things that are clearly dangerous (metal cans with sharp edges) or too difficult for this age group (a *Monopoly* game). In

Chapter 5 we describe specific materials and the play and learning they support, but following are some general types of materials that are typically offered to stimulate young children's active learning:

• **Practical everyday objects useful to adults.** Children enjoy using the same things that the important people in their lives use—a lunch box like dad's, hair curlers like big sister's, earrings like mom's, shaving cream like grandpa's.

• **Natural and found materials.** Natural materials like shells, acorns, and pinecones and found materials like cardboard boxes and toilet-paper tubes appeal to children because they can be used in many different ways for many different purposes. And they appeal to adults because they are easily accessible, plentiful, and often free.

• **Tools.** Tools are important to children for the same reason they are important to adults—they help "get the job done." Therefore, provide real tools—scissors, hole punches, construction tools like hammers and screwdrivers. (It is important that tools be in good condition and that safety procedures be followed consistently by both children and adults.)

• **Messy, sticky, gooey, drippy, squishy materials.** Touchable materials like sand, water, paste, paint, and Play-Doh appeal strongly to many children because of the interesting sensory experiences they provide.

• **Heavy, large materials.** Children use their whole bodies, exercise their muscles, and gain a sense of their physical capacities when using large wooden blocks, shovels, wheeled toys, and other sturdy, heavy materials.

• **Easy-to-handle materials.** Materials that fit in their hands—buttons, toy figures, Lego blocks, and so forth—give children a sense of control because they can use such small objects successfully without adult assistance.

Some Materials for Active Learning

It is important to stock your classroom, center, or home with a wide variety of materials of interest to young children. The materials listed here are just a few examples of the kinds of materials that will support active learning experiences. Please refer to Chapter 5 for more details on selecting materials for an active learning environment.

Practical Everyday Objects
Pots and pans, eggbeaters, food grinders, mail, hammers, nails, staplers, pieces of wood, sheets, tires, boxes, books, paper

Natural and Found Materials
Stones, shells, leaves, sand, carpet scraps, paper-towel tubes, envelopes

Tools
Brooms, dustpans, mops, buckets, sponges; hammers, saws, hand drills, vices, nails, screws; staplers, hole punches, scissors, paper clips; car jacks, bicycle pumps; shovels, hoes, trowels, wheelbarrows, hoses, watering cans

Messy Materials
Water, soap bubbles, paste, dough, glue, paint

Heavy, Large Materials
Boxes, tree stumps, wagons, shovels, piles of dirt, wooden planks, climbing structures, large blocks

Easy-to-Handle Materials
Blocks, beads, buttons, dry beans or pasta, toy cars, stuffed animals

Common Materials in Active Learning Settings

• *Practical everyday objects useful to adults*

• *Natural and found materials*

• *Tools*

• *Messy, sticky, gooey, dripping, squishy materials*

• *Heavy, large materials*

• *Easy-to-handle materials*

Encouraging Independence

Helping children learn to help themselves is one of the most important ways adults can be of service to young children.

► **Adults provide space and time for children to use materials.**

To take full advantage of the materials in the active learning setting, children need an organized environment. Two key aspects of the adult's role in the active learning setting, therefore, are to *arrange and equip play areas* and to *plan a daily routine*. The specifics of planning the environment and routine are covered in detail in later chapters, but a few key elements of the environment and routine are introduced here.

First, adults divide the environment into distinct spaces organized around specific kinds of experiences, for example, house, art, block, toy, and sand and water areas. Each space is stocked with abundant materials related to that type of play.

Second, adults plan a consistent daily routine so children have opportunities for many different kinds of interactions with people and materials. **Plan-work-recall time** is a lengthy segment of the day allotted for children to work throughout the classroom or center with materials of their own choosing. **Small-group time** is the segment of the day in which children work in groups of six to eight in one location with similar sets of materials. (Even though the adult chooses a group of materials for children to use at small-group time, children are free to make choices among the materials provided, to add materials, and to use the materials in individual ways.) **Large-group time** is a segment of the day in which the whole group comes together for songs, movement activities, and other group experiences. **Outside time** is usually the segment of the day allotted for children to play outside with swings, wheeled toys, outdoor art materials, materials from nature, and so forth.

By choosing materials, planning the arrangement of space, and offering a consistent daily routine, adults are able to set the stage for children's active learning. Once the stage is set, adults continue to be active and involved—observing children and supporting their initiatives throughout the day.

► **Adults seek out children's intentions.**

In active learning settings, adults believe that understanding children's intentions and encouraging children to follow through on them is essential to the learning process. By seeking out children's intentions, adults strengthen children's sense of initiative and control.

Adults are careful to *acknowledge children's choices and actions*. This lets children know that what they are doing is valued. Adults often let themselves be guided by the child's example, thereby demonstrating the importance they place on children's intentions. For example, Stony is crawling, so Mrs. Lewis crawls beside him. When Stony stops, Mrs. Lewis stops. When he crawls fast, she crawls fast to keep up with him. Stony laughs with delight at the game he has created, and Mrs. Lewis laughs right along with him.

Similarly, it is common for adults in active learning settings to *use materials in the same ways children are using them*—stacking blocks, flattening Play-Doh, packing sand. In this way they are nonverbally communicating to children that their activities are important, as well as offering opportunities for children to make thought-provoking comparisons.

To ascertain the intentions behind children's actions, adults *watch what children do with materials without preconceptions,* because children often use materials in unexpected ways. In the detailed example that ends this chapter, 3-year-old Callie is deeply involved in labeling envelopes with people's initials and then sealing them. Rather than assume Callie will use envelopes in the conventional way—enclosing something in them before sealing them—the adult observes Callie closely to discern her intention, then encourages her to use the envelopes *her* way.

In addition to seeking out children's intentions through observation, adults also *ask children about their intentions*. This gives children the opportunity to put their intentions into words and reflect on them. For example, an adult sees Scott sitting on the floor and sanding wood scraps, but she cannot tell whether Scott is sanding for its own sake or for some other purpose unless she talks with him. She sits down next to Scott and picks up several wood scraps he has sanded. Then she makes this observation:

Adult: *You've been doing a lot of work, Scott.*

Scott: *Yep . . . sanding. . . it's my job.*

Adult: *Oh, sanding is your job.*

Scott: (Continues sanding) *I sand these* (tosses sanded piece in a bucket). *Then I put 'em here, in the bucket. Billy's the wrapper. He's not here right now.*

Adult: *Oh, you sand and Billy wraps.*

Scott: *But he's getting more tape.*

For more information on conversing with children about their intentions and plans, see the discussion of planning with children in Chapter 6.

► **Adults listen for and encourage children's thinking.**

Children's **reflections** on their actions are a fundamental part of the learning process. Listening for and encouraging each child's particular way of thinking strengthens the child's emerging thinking and reasoning abilities. Adults *listen to children as they work and play* so they can understand from their spontaneous comments how they are thinking about what they are doing. Markie, for example, chants, "One for you . . . one for you . . . one for you" as he puts a block on each opening of his tower. His chant indicates that he is thinking out loud about matching blocks and openings in one-to-one correspondence.

Another way adults encourage children to reflect is to *converse with children about what they are doing and thinking*. In programs based on the High/Scope Curriculum, relaxed conversation between adults and children occurs throughout the day. As they converse with children, adults *focus on the child's actions* rather than introduce unrelated topics. Instead of lecturing children or asking a lot of questions, adults make frequent comments that repeat, amplify, and build on what the child says. In the course of these conversations, adults pause frequently to give children ample time to think and gather their thoughts into words. Note, for example, how Mrs. Foster encourages Kurt's thinking in this conversational exchange:

Kurt: *I like that music. It's real fast.*

Mrs. Foster: *I think it's helping us put these blocks away real fast.*

Kurt: *I'm gonna put them on this truck and go really fast.*

Markie is thinking out loud as he puts a block in each opening of his tower in one-to-one correspondence. "One for you . . . One for you," he chants.

Mrs. Foster: *All the way to the block shelf?*

Kurt: *Yep. Here I go, just like my daddy.* (Drives off to block shelf, unloads blocks, returns for more.)

Mrs. Foster: *I saw your daddy's truck when he brought you this morning.*

Kurt: (Laughs) *But my daddy's truck is . . . big . . . too big for this room . . . . It wouldn't even fit in the door!*

Mrs. Foster: *No, it wouldn't fit in the door.*

Kurt: *The doors are big enough for . . . for . . . this one!* (Drives truck loaded with blocks to the door and then to the block shelf.)

Strategies for conversing with children are presented throughout this book. In particular, see the section in Chapter 7 on conversing with children at work time.

As noted earlier, adults in active learning settings understand that encouraging children's thinking means accepting children's answers and explanations—even when they are "wrong." Because children's thinking and reasoning skills are still developing, the conclusions children reach are often faulty by adult standards. However, if adults continually correct children, they encourage children to keep their thoughts to themselves. On the other hand, by accepting children's conclusions, adults encourage children to test their ideas. For example, consider Karla again, the child who made a Play-Doh ball and expected it to bounce. Karla finally concluded that the ball would not bounce because it was not round enough. The teacher accepted this conclusion, and Karla made another "very round" ball to test her idea. Many very round Play-Doh balls later, Karla finally observed, "This Play-Doh is too squishy to bounce." Again, the adult accepted Karla's idea. By accepting each new hypothesis Karla offered, the adult encouraged Karla's further reflection and testing:

Teacher: *It **is** squishy. Can you think of some way to change that?*

Karla: *Well . . . If I leaved it. Leaved it out . . . 'til tomorrow!*

Adults encourage children to talk about their thinking by listening to and accepting what they say rather than by correcting children or asking many questions.

Teacher: *If you left the ball out of the can?*

Karla: *Yeah! It would get hard!*

Teacher: *Would it bounce if it were hard?*

Karla: *Yeah! Then it would bounce. Leave it right here 'til tomorrow. Okay?*

► **Adults encourage children to do things for themselves.**

Adults in active learning settings are guided by a belief that encouraging children to solve the problems they encounter offers them more learning opportunities than doing things for them or attempting to provide a problem-free environment. Therefore, they stand by patiently and wait while children take care of things independently—zipping a jacket, fastening a buckle, stirring juice, wiping up spills, moving the waste can, fitting the tricycle through the door, or finding a board that spans the space between two blocks. Adults can do most such things far more easily and efficiently than children can, but by waiting for children to do these things for themselves, adults allow children to think of and practice ways of solving the everyday problems they encounter.

In an active learning environment, where children are constantly involved with materials and are encouraged to do things for themselves, spills and messes are inevitable and are actually important opportunities for learning. Dallas, for example, finds out what happens when he keeps pouring juice past the top of his cup. Juice gets on the table, the chair, the floor. To clean it up he has to get enough towels to soak up all the liquid. He also has to figure out a way to get the juice-soaked towels to the sink. In the active learning setting, *adults show understanding of such mishaps* because they view them as opportunities for children to gain the satisfaction of solving their own problems.

Give Children Time to Solve Problems Themselves

Mr. Mulla saw that Chad and Anil were having trouble cutting the long pieces of masking tape they needed for a box structure, because the tape kept getting stuck to itself. Although he could have come to their aid, Mr. Mulla waited while the boys came up with a number of ideas on their own. When one did not work, they simply tried something else. Finally, Chad taped one end of the tape to the table edge and held it there while Anil pulled the tape out as long as they needed it. Anil then cut the tape, and each boy held on to an end until they could attach it to their box structure in the place they wanted it. While it took quite a while for the boys to solve this problem, their solution worked, and in the process of solving the problem, they discovered something about the properties of tape. The boys felt good about their idea, especially when other children began to notice and copy it.

The adult watches patiently as this child tears the paper off the pad without any help, knowing this will bolster the child's confidence in her ability to solve problems.

Another way adults encourage children to solve their own problems is to *refer children to one another for ideas, assistance, and conversation* so children come to rely on one another, rather than always turning to adults for assistance. For example, when Tess cannot remember how to print out the mask she just made on her computer screen, Mr. Wills suggests that she ask Mia (another child who had just printed out a mask) to show her how to do it.

Adults in active learning settings also *encourage children to ask and answer their own questions*. Generally, if a child knows enough to ask a particular question, he or she knows enough to have some idea of an answer. For example, following the incident with Tess and Mia, above, Tess came to Mr. Wills the next day with the same problem. Here is how Mr. Wills handled it:

Mr. Wills: *What did you do yesterday when Mia helped you?*

Tess: *Pushed this* (points to the print key).

Mr. Wills: *That's exactly what you did. What happened when you pushed that button?*

Tess: *It came out!* (She pushes the print key and watches the printer print out her mask.)

Providing a variety of materials, planning the play space and routine, seeking out children's intentions, listening for and encouraging children's thinking, and encouraging children to do things for themselves are key elements of the adult's role in active learning programs. More of these types of strategies are provided throughout this book.

How Adults and Children Interact in the Active Learning Setting

► **Children and adults are active and interactive.**

In an active learning environment, both children and adults act, think, and solve problems throughout the day. Children are active in choosing materials, activities, and playmates. Adults are active in supporting and participating in the learning experiences initiated by children as well as in planning group experiences and setting them in motion. Both children and adults take initiative and respond to one another's initiatives, building on one another's ideas, suggestions, and actions. These reciprocal give-and-take relationships are what drive both teaching and learning.

► **Adults and children form partnerships.**

In active learning settings, adults and children form partnerships. Whether joining in a child's play, working with a child to solve a problem, or conversing with a child about his or her experiences, the adult relates to the child as a *partner,* seeking out the child's intentions and helping the child carry out and expand upon his or her intended activity. Sita, for example, is rolling tennis balls under a chair. Mr. Bloom stretches out on his stomach on the other side of the chair, holding a tennis ball. "Wait," Sita instructs. "They have to go here," she says, indicating a path under the chair, "not out there." "Oh, in here," responds Mr. Bloom, rolling his ball along the path indicated by Sita.

The reciprocal give-and-take of a partnership relationship is more supportive of children's development than its alternatives—in which the adult assumes either a dominant or a passive role by directing, lecturing, diverting, or simply watching or ignoring the child's work and play. To form partnerships with children, adults in active learning settings *position themselves at the children's physical level*, *follow children's ideas and interests*, and *converse with children in a give-and-take style*.

Being a partner in children's play means following the child's lead.

By using these strategies to form a partnership with Sita, Mr. Bloom is letting her know that what she is doing is valued and accepted, and that he will be there to provide support as she expands on her explorations.

► **Children and adults invent and discover.**

Active learning is a process that *unfolds*, not a set of prescribed directives to be followed. In the active learning setting, children and adults invent, explore, and make unexpected discoveries. Although adults have set up the environment to support children's interests and activities, they cannot predict with accuracy what children will do or say or how they themselves will respond. Mr. Garcia, for example, is very pleased that he has finally been able to add a color printer to the computer system his preschoolers are using. He expects the children to print out the masks they are making on the computer screen in many different colors. Instead, they use the computer and printer exactly as they often use the easel—filling the whole piece of paper (computer screen) with one color. "Of course," Mr. Garcia realizes upon seeing the children excitedly clutching their pieces of paper filled with one color, "why didn't I think of that!" In the active learning setting, children and adults share the surprises and pleasures of teaching and learning.

The Effects of Active Learning

► **Choices for children provide an alternative to adult-child conflict.**

When children are free to make choices and decisions, potential adult-child conflicts are often avoided and are replaced with cooperative learning experiences. When adults understand children's need to be active, they become involved in supporting and extending children's self-initiated activities rather than trying to control children's behavior. For example, when adults expect children to talk about their choices and decisions, children who speak freely and express their intentions are not viewed as "disruptive." When children are free to decide how to use materials, adults are as willing to support the child who uses a material in an exploratory way (smearing paste on paper and arms, touching it, and smelling it) as they are to support the child who uses the materials in the expected way (using paste to fasten pieces of paper together in the course of making something). When adults eliminate long periods of waiting and listening in favor of active learning experiences, children direct their energies toward working with the materials they have selected rather than engaging in disruptive behavior.

By accepting children's exploratory behaviors as normal and desirable, rather than attempting to dispute or eliminate them, adults

A "Constructive" Learning Process

Active learning is the process through which children construct an understanding of things that interest them. For example, while most 4-year-olds are not yet able to construct an understanding of calculus because it involves abstract mathematical thinking beyond their capabilities, they are able to count objects, compare amounts, and construct 1-to-1 relationships—abilities from which their understanding of higher math will eventually evolve. And while most preschoolers are not yet able to read and write, they are enthusiastic about books, stories, their own names, and the process of invented writing.

make their own lives and children's lives more enjoyable, less contentious, and more conducive to learning.

► **Children and adults develop confidence.**

In an active learning setting, children are free to pursue their own interests. Adults stock the environment with developmentally appropriate materials and interact with children to support them in pursuing their intentions. Children are free to make errors as they gain an understanding of their world; adults do not correct children's errors, but when appropriate, they challenge children's thinking about what they are doing so children can begin to construct a more complete picture of reality. In this atmosphere, young children develop feelings of competence because they receive encouragement and support for their actions, choices, exploratory behaviors, and emerging thoughts and explanations. Adults feel more competent, too, because they find themselves supporting, rather than disputing, more of children's actions, and because each day they learn something new about the children in their group. As one adult put it, "I'm not yelling at the children anymore. I'm paying attention to *their* interests instead of trying to get them to sit still and pay attention to *me*."

► **Children draw on early active learning experiences in later school settings.**

Some adults worry that an "active learning" early childhood setting will put children at a disadvantage when they enter elementary school. What happens to active learners when they must remain seated at desks, follow detailed instructions, speak only when permitted to do so, and concentrate on paper-and-pencil tasks?

Active learners tend to adjust well to elementary school because they identify themselves as "can-do" people who take care of their own needs and solve problems. In the best of circumstances, the elementary school setting will also encourage active learning. However, in settings that do not, children tend to use their problem-solving skills to adapt to the new style of teaching and learning, and continue to function as active learners outside of school. Since active learners have developed into self-confident decision makers, they often carry these attributes into whatever school settings they encounter.

Regardless of the setting or form of instruction in elementary schools, children continue to learn best by doing, thinking, speaking, and solving problems independently. Therefore, it is imperative that early childhood settings support active learning practices. Through their experiences in such active learning settings, children develop a strong sense of their own ability to affect and understand their world, a capacity which will serve them well throughout their lives.

The Practical Ingredients of Active Learning

To provide a practical frame of reference for adults interested in implementing programs based on an active learning philosophy, we have developed five **ingredients of active learning.** These ingredients capture the essence of the active learning process in summary form. They are easily understood and can be used by adults in any early childhood setting to evaluate whether an activity for children is truly a developmentally appropriate, active experience and to plan for activities that meet these criteria. As we explore

Denver Project Follows High/Scope Children Into Non–High/Scope Settings

The Clayton Foundation in Denver, Colorado, operates a High/Scope kindergarten program (Clayton Kids) and a High/Scope after-school program (Clayton Thinkers) for its kindergarten graduates in grades 1–3 in public schools across the city. In response to the question, "How well do Clayton Kids fare once they are in the public school system?" Clayton staff asked each elementary school for progress reports that included teacher comments on the 41 children who had graduated from the Clayton Kids kindergarten program and were currently enrolled in the Clayton Thinkers after-school program. Clayton staff were able to collect school progress reports and teacher comments on 34 of their 41 enrollees (Dalton 1991). They found that the elementary school teachers rated 88 percent of the Clayton after-school group as average or above in standard school subject areas (reading, writing, math, cooperation, and so forth); 38 percent were rated as average; 29 percent, as above average; and 21 percent, as well-above-average. The teachers also commented favorably on the children's social and intellectual abilities. For example, consider these excerpts taken from teacher reports on children's progress:

"D. is always willing to help on any project."
"I appreciate M.'s enthusiasm and creativity."
"J. is a real hard worker."
"T. is one of the best readers in the class."
"W. often sees unique solutions to problems."
"N. has many good ideas."
"E. has made great strides in her skills as a reader, writer, and leader this year."
"I'm enjoying watching A. grow and become more responsible and independent."
"C. is a pleasure to have in class."
"R. is a good group member and a hard worker."
"S. puts a lot into her assignments."
"V. is spontaneous, enthusiastic, straightforward in her thoughts, and lets everyone know what she is thinking. She enjoys learning and asking questions."

It is apparent from these findings that Clayton's active learners continue to do well in traditional elementary school settings. (For an account of a prekindergarten program based on the High/Scope Curriculum whose children's success in kindergarten and third grade has been researched and documented, see Hauser-Cram et al. 1991.)

the details of the High/Scope educational approach throughout the rest of this book, we will return again and again to the following active learning ingredients:

• **Materials—**There are abundant, age-appropriate materials that the child can use in a variety of ways. Learning grows out of the child's direct actions on the materials.

• **Manipulation—**The child has opportunities to explore, manipulate, combine, and transform the materials chosen.

• **Choice—**The child chooses what to do. Since learning results from the child's attempts to pursue personal interests and goals, the opportunity to choose activities and materials is essential.

• **Language from the child—**The child describes what he or she is doing. Through language, the child reflects on his or her actions, integrates new experiences into an existing knowledge base, and seeks the cooperation of others in his or her activities.

• **Adult support—**Adults recognize and encourage the child's reasoning, problem solving, and creativity.

Using the Ingredients of Active Learning

Anyone caring for young children—parents, adults involved in home visits, adult teams in classrooms and child care centers, home child care providers, grandparents, babysitters—can use the active learning ingredients to provide developmentally appropriate experiences for young children. The active learning ingredients apply to experiences and activities involving one child or two children as well as activities for small groups and large groups of children. Active learning opportunities are present throughout a formally structured day as well as in other daily events, such as trips in a car or visits to a park. **In the High/Scope Curriculum, the ingredients of active learning guide every experience and activity adults and children engage in during their time together.**

Adults implementing the High/Scope Curriculum use the ingredients of active learning as a guide to observing children, planning for children's experiences, and interacting with children in any curriculum area. In the following example, we show how this framework is applied

When the ingredients of active learning—materials, manipulation, choice, language from children, and adult support—are present, children are busy and focused.

Why Children Need to Make Choices

"The intrinsic motivation argument leads to perhaps the most common-sense rationale for allowing children to select learning experiences. A child will, like anyone else, learn best what he is interested in learning. If you allow him to choose, he will select what interests him. If he is interested in something, he will be an active agent in developing his understanding rather than a passive consumer of knowledge. Piaget's 50 years of research on children's thinking has led him to postulate that a child's active involvement in learning is at the heart of the developmental process. 'The child,' Piaget says, 'is the chief architect of his own mental model of the world.'"

—Thomas Likona (1973)

in the context of a writing activity undertaken by 3-year-old Callie. We describe how each active learning ingredient shapes the general decisions adults make in preparing for children's writing experiences as well as their specific decisions about how to interact with and support Callie. The teachers' observations of Callie are presented in italic type.

An Active Learning Experience: Observing and Supporting Callie

Materials. The adults in Callie's classroom have provided a wide range of materials to encourage and support young children's developing writing abilities. The materials available include writing tools and materials (crayons, markers, pencils, paints, brushes, stickers, many kinds of paper, envelopes), three-dimensional materials for letter play and letter-making (letter sets, sand, Play-Doh, clay), and a variety of print materials (favorite storybooks, children's dictated stories, word labels accompanying pictorial labels on classroom signs and storage containers, old magazines and catalogs). The availability of a wide range of writing materials seems to have the stimulating effect intended by the adults, as Callie and several other children have chosen to work with some of the writing materials:

Callie got out some envelopes and markers.

Manipulation. The adults expect Callie and her classmates to manipulate the reading and writing materials in a variety of ways. For example, children might turn pages, point to and circle letters, draw, paint, print, and so on, as they explore for themselves the shape and feel of letters, or they might transform a variety of materials into letters. In addition, since most of the children have observed that writing is used for important purposes in the world around them—for making shopping lists, taking restaurant orders, letter-writing, and so forth—the adults expect that some children will want to use (or pretend to use) writing for some of these same functions. Callie's use of the writing materials has the active, physical quality that we associate with young children's manipulations; it also shows her growing understanding of some of the functions of writing:

Callie seemed to be repeating a sequence of actions:

Put an envelope in front of herself on the table.

Picked up the envelope in both hands.

Licked it thoroughly three or four times.

Pounded the envelope shut with her fist.

Turned it over and drew on the front.

Gave it to someone.

Choice. In this classroom the children are free to use any of the writing materials they want to during the plan-work-recall segment of the daily routine:

None of the other children at the art table were working with envelopes and markers. (One was drawing, two were working with stickers; one was playing with wooden letters.) Working with the envelopes was obviously Callie's choice.

Language from the child. As children work with writing materials, the teachers observe them and listen attentively, waiting for the child to initiate conversation about what he or she is doing and taking care not to use language to dominate or control the child's experience:

Callie was very quiet as she worked, but when she completed each envelope she would give it to someone, saying, "This is for you." I sat for a while at Callie's table, and soon she gave one to me, saying, "Here, Ann, I made this for you."

Adult support. The adults recognize that preschoolers are beginning to make a connection between spoken and written language and to realize that they can write things down for themselves. They understand that children's writing starts out as scribbles and drawings, and gradually, through trial and error, emerges as recognizable script. The adults in Callie's classroom, therefore, encourage children's early, creative interest in the writing process by supporting—without correction—all children's attempts at writing, whether or not they use conventional forms:

I sat down at the art table to see what the children were doing. When Callie gave me an envelope, I was very surprised to see that what she had drawn on the front were letters. I had no idea she was interested in letters or could even make any! She had marked mine with lots of A's, and I wanted to recognize her accomplishment so I said, "Callie, you made A's on my envelope!"

"That's your name!" she told me.

"That is *my name. A's for Ann," I replied.*

When Callie gave Linda an envelope, Linda threw it down on the floor saying "That's not how you write my name. It's L-I-N-D-A."

Linda is 5 and has been writing her name and other words for some time. I wanted to acknowledge both Linda's skill and Callie's, so I said, "That is the way you spell your name, Linda. Callie spells it a different way."

I also found when I started to open my envelope that Callie stopped me, saying, "No, I already did that!" Since I wanted to respect her intentions, I pressed down the part of the flap I had lifted and turned the envelope over so I could see the front again.

"Is this what you wanted me to have?" I asked, looking at the front of the envelope.

"Yep. That's what I made for you," Callie replied, before turning to another envelope and beginning the process again. Clearly what was important to Callie was sealing the envelope and writing on the outside. She had no intention of putting anything inside the envelope.

Active Learning: The Foundation of the High/Scope Curriculum

In the chapters that follow, the concept of active learning will continue to guide our discussions. In particular, the concept of active learning comes into play throughout discussions of how adults can create a supportive social climate (Chapter 2), work with families (Chapter 3), work as teams to make the active learning process effective in their particular setting with their particular group of children (Chapter 4), select and arrange materials for children to choose and manipulate (Chapter 5), develop the daily routine so children have many opportunities to initiate, plan, carry out, and discuss their actions and ideas (Chapters 6, 7, and 8), and use the High/Scope key experiences as a framework for interacting with children (Chapters 9–19).

Essential Ingredients of Active Learning: A Summary

Choice: The child chooses what to do.

___ Children initiate activities that grow from personal interests and intentions.
___ Children choose materials.
___ Children decide what to do with materials.

Materials: There are abundant materials that children can use in many ways.

___ Children use a variety of materials.
  ___ Practical everyday objects
  ___ Natural and found materials
  ___ Tools
  ___ Messy, sticky, gooey, drippy, squishy materials
  ___ Heavy, large materials
  ___ Easy-to-handle materials
___ Children have space to use materials.
___ Children have time to use materials.

Manipulation: Adults encourage children to manipulate objects freely.

___ Children explore actively with all their senses.
___ Children discover relationships through direct experience.
___ Children transform and combine materials.
___ Children use age-appropriate tools and equipment.
___ Children use their large muscles.

Language from the child: The child describes what he or she is doing.

___ Children talk about their experiences.
___ Children talk about what they are doing in their own words.

Adult support: Adults recognize and encourage children's intentions, reflections, problem solving, and creativity.

___ Adults form partnerships with children.
  ___ Put themselves on children's physical level.
  ___ Follow children's ideas and interests.
  ___ Converse in a give-and-take style.
___ Adults seek out children's intentions.
  ___ Acknowledge children's choices and actions.
  ___ Use materials in the same way children are using them.
  ___ Watch what children do with materials.
  ___ Ask children about their intentions.
___ Adults listen for and encourage children's thinking.
  ___ Listen to children as they work and play.
  ___ Converse with children about what they are doing and thinking.
  ___ Focus on children's actions.
  ___ Make comments that repeat, amplify, and build on what the child says.
  ___ Pause frequently to give children time to think and gather their thoughts into words.
  ___ Accept children's answers and explanations even when they are "wrong".
___ Adults encourage children to do things for themselves.
  ___ Stand by patiently and wait while children take care of things independently.
  ___ Show understanding of children's mishaps.
  ___ Refer children to one another for ideas, assistance, and conversation.
  ___ Encourage children to ask and answer their own questions.

References

Banet, Bernard. 1976. "Toward a Developmentally Valid Preschool Curriculum." In *The High/Scope Report, 1975–1976,* C. Silverman, ed., 7–12. Ypsilanti, MI: High/Scope Press.

Dalton, Joanne. 1991. *State of Affairs Report of Clayton Thinkers*. Denver: The Clayton Foundation.

Dewey, John. 1938. *Education and Experience*. Reprint. New York: Macmillan, 1963.

Dewey, John. 1933. *How We Think: A Restatement of the Relation of Reflective Thinking to the Educative Process*. Boston: Heath.

Dewey, John, and James McLellan. 1964. "What Psychology Can Do for the Teacher." In *John Dewey on Education: Selected Writings*, Reginald D. Archambault, ed., 195–211. New York: Random House.

Flavel, John H. 1963. *The Developmental Psychology of Jean Piaget*. Princeton: D. Van Nostrand Company.

Hauser-Cram, Penny, Donald E. Pierson, Deborah Klein Walker, and Terrence Tivnan. 1991. *Early Education in the Public Schools: Lessons From a Comprehensive Birth-to-Kindergarten Program*. San Francisco: Jossey-Bass.

Kohlberg, Lawrence, and Rochelle Mayer. 1972. "Development as the Aim of Education." *Harvard Educational Review* 42, no. 4 (November): 449–96.

Likona, Thomas. 1973. "The Psychology of Choice Learning." In *Open Education: Increasing Alternatives for Teachers and Children,* Thomas Likona, Ruth Nickse, David Young, and Jessie Adams, eds. Courtland: Open Education Foundation, State University of New York.

Piaget, Jean. 1970. "Piaget's Theory." In *Carmichael's Manual of Child Psychology,* 3rd ed., Vol. 1, Paul H. Mussen, ed., 703–32. New York: John Wiley & Sons.

Piaget, Jean, and Bärbel Inhelder. 1969. *The Psychology of the Child*. New York: Basic Books. (Originally published in French as *La Psychologie de L'Enfant*. Paris: Presses Universitaires de France, 1966.)

Related Reading

Ayers, William. 1986. "Thinking About Teachers and the Curriculum." *Harvard Educational Review* 56, no. 1 (February): 49–51.

Brickman, Nancy A., and Lynn S. Taylor, eds. 1991. "Supporting Active Learning." Chap. 1 in *Supporting Young Learners,* 3–60. Ypsilanti: High/Scope Press.

DeVries, Rheta, and Lawrence Kohlberg. 1987. *Programs of Early Education*. New York: Longman.

Evans, Judith, and Ellen Ilfeld. 1982. *Good Beginnings: Parenting in the Early Years*. Ypsilanti: High/Scope Press.

Fabricius, William. 1979. "Piaget's Theory of Knowledge—Its Philosophical Context." In *The High/Scope Report, 1979,* C. Silverman, ed., 4–13. Ypsilanti: High/Scope Press.

Forman, George. 1992. "The Constructivist Perspective." In *Approaches to Early Childhood Education,* 2nd ed., Jaipaul L. Roopnarine and James E. Johnson, eds., 137–55. Columbus, OH: Merrill.

Forman, George E., and Catherine Twomey Fosnot. 1982. "The Use of Piaget's Constructivism in Early Childhood Education Programs." In *Handbook of Research in Early Childhood Education,* Bernard Spodek, ed., 185–211. New York: Macmillan.

Forman, George, and David Kuschner. 1983. *The Child's Construction of Knowledge*. Washington, DC: NAEYC.

Gelman, Rochel. 1978. "Cognitive Development." *Annual Review of Psychology* 29: 297–332.

Ginsburg, Herbert, and Sylvia Opper. 1979. *Piaget's Theory of Intellectual Development*. Englewood, NJ: Prentice-Hall, Inc.

Hohmann, Charles, and Warren Buckleitner. 1991. *Introduction to the High/Scope K–3 Curriculum*. Draft ed. Ypsilanti: High/Scope Press.

Hohmann, Charles, Barbara Carmody, and Chica McCabe-Branz. 1995. *High/Scope Buyer's Guide to Children's Software*. Ypsilanti: High/Scope Press.

Hohmann, Mary. 1983. *A Study Guide to Young Children in Action*. Ypsilanti: High/Scope Press.

Hohmann, Mary, Bernard Banet, and David P. Weikart. 1979. "Active Learning." Chap. 5 in *Young Children in Action,* 129–46. Ypsilanti: High/Scope Press.

Kolb, D. A. 1984. *Experiential Learning: Experience as a Source of Development*. Englewood: Prentice-Hall, Inc.

Matz, Robert D. 1976. "Operativity and the Cognitive Unconscious: A Piagetian Perspective on Thinking and Learning." In *The High/Scope Report, 1975–1976,* C. Silverman, ed., 32–38. Ypsilanti: High/Scope Press.

Tompkins, Mark. 1991. "Active Learning: Making It Happen in Your Program." In *Supporting Young Learners,* Nancy A. Brickman and Lynn S. Taylor, eds., 5–13. Ypsilanti: High/Scope Press.

Weikart, David P., Charles Hohmann, and Ray Rhine. 1981. "High/Scope Cognitively Oriented Curriculum Model." In *Making Schools More Effective,* Ray Rhine, ed., 201–19. New York: Academic Press.

Wood, David, Linnet McMahon, and Yvonne Cranstoun. 1980. *Working With Under Fives*. Ypsilanti: High/Scope Press.

Related Media

The following materials are available from the High/Scope Press, 600 N. River St., Ypsilanti, MI, 48198-2898: for more information, call 1 800-40-PRESS.

High/Scope K–3 Curriculum Series: Active Learning. 1991. Color videotape, 17 min.

Supporting Children's Active Learning. 1989. Color videotape, 13 min.

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