



## CHAPTER 3

# Physical Development





**Y**oung children learn best by *doing*. Active physical play supports preschool children's brain development<sup>1</sup> and is a primary means for them to explore and discover their world.

Physical activities enhance all aspects of development, including cognitive, emotional, social, as well as physical. For example, cognitive growth occurs when children problem-solve how to negotiate an obstacle course or how to build a fort. Acquisition of physical skills supports



emotional development by increasing children's confidence and willingness to try new activities. Physical play creates optimal opportunities for social development. Since much of preschool children's peer play involves physical activities, proficient physical skills enable children to interact with others and to develop friendships. Active physical play also has clear benefits for children's health and fitness. Promoting children's **physical fitness** is critical given the increasing rates of lifestyle-related health issues (including **obesity** and diabetes) among children in California. All children, no matter their ability levels or backgrounds, benefit from engaging in physical activities.

The preschool years are a prime time for children's physical development. Preschool programs have a key role in maximizing children's developmental potential during this important time by providing well-designed, regular, and frequent opportunities for physical play. Although many of young children's physical activities are exploratory and self-

directed, children greatly benefit from adult encouragement and guidance when learning new physical skills. Teachers tap into children's intrinsic motivation for movement by designing meaningful, culturally appropriate, and accessible play activities in which all children feel challenged yet successful.



Teachers are important role models in the area of physical development. Children benefit immensely when teachers engage in physical activities alongside children and share in the fun of physical movement. Just as important, preschool programs collaborate with family and community members to promote children's physical development. Family support and participation foster children's active lifestyle habits. Promoting active lifestyles during the preschool years will benefit children throughout their lives.

---

## Guiding Principles

---

▶ **Developmentally appropriate movement programs accommodate a variety of individual differences among children.**

Children of the same chronological age may exhibit a wide range of **movement skills** because of differences in developmental level, previous experience,

### Research Highlight: Physical Activities Enhance Young Children's Brain Development

Children use multiple senses when they engage in physical activities. Multisensory experiences create and strengthen communication pathways in children's brains.<sup>2</sup> Young children's brains are highly malleable; thus, early experiences have a big impact on their brain development. Movement experiences that are personally meaningful and provide the "just right challenge" (i.e., challenging but doable) have the most impact on brain development.<sup>3</sup> Neuroscientists studying the brain confirm that "exercise provides an unparalleled stimulus, creating an environment in which the brain is ready, willing, and able to learn."<sup>4</sup>

opportunity for practice, fitness level, socioeconomic status, special needs, and cultural expectations. These differences need to be considered and accommodations made for them in order to create beneficial learning experiences for all children.

▶ **Children often learn best through maximum active participation.**

There should be a daily quest to minimize sitting, waiting, and watching so children enjoy meaningful participation in physical activities. Maximum purposeful participation at some level is a challenging but attainable goal. To achieve this goal, it is often best to first provide brief, simple explanations that enable children to begin moving as soon as possible. Additional instructions can be provided later as needed.

▶ **The physical safety of children's play environments should be of paramount importance at all times.**

Active play, by its very nature, involves an element of risk. It is risk that children enjoy as they test out their newly developing skills. Wise teachers permit children to take reasonable and measured risks but do so in a manner that does not compromise children's safety. A safe environment is one that maximizes learning opportunities and enjoyment while at the same time minimizing situations that compromise a child's physical, emotional, or social "safety net." Adults must continuously strive to provide a safe environment that is healthful in all ways.

▶ **Family members working as partners with teachers are key to enriching the physical development of children.**

Each child's unique interests and learning needs are best met through thoughtful and regular collaboration



between family members and teachers. Teachers play an important role in providing information to family members about child development, while family members provide valuable insights about their child's unique preferences, abilities, and life contexts (including their home, community, and culture). The partnership between families and teachers creates continuity in supporting children's physical skills development across home, community, and preschool environments.

▶ **Inclusion of children with special needs is beneficial to all and promotes greater understanding of and respect for diversity.**

Teachers can modify the environment, materials, or teaching methods during physical activities to facilitate participation and skill development for all children. When working with a child with disabilities or other special needs, they consult with the child's family members and special education specialists for adaptation strategies. All children in the preschool program benefit when provided with opportunities to play alongside peers with diverse abilities; they learn the important values of inclusion, empathy, respect, and acceptance.

▶ **Children are multisensory learners with unique learning styles.**

It is important to provide children with various ways to learn new physical skills: exploration and guided discovery, visual demonstration or pictures, verbal or gestural directions, hands-on assistance, or combinations of these strategies. Through intentional observations, teachers become aware of children's individual learning preferences. Teachers support children's learning of new movement skills by providing them with adequate time and opportunities

to observe and practice the skill demonstrated, close guidance, and teacher feedback.

▶ **To maximize teaching effectiveness, movement skill learning should first focus on *how* children are moving their bodies.**

By designing movement activities focused on the process or quality of the body movements, teachers place emphasis on improving the child's body coordination (e.g., arm/leg actions) and on increasing awareness of body movements. The product, or quantitative aspect of movements (e.g., how far they jumped, or how fast they ran), should not be the initial focus of learning. For children with disabilities and other special needs, the focus should be on the functional aspects of movement for that particular child. Referring to each child's IEP and consulting with special education specialists about movement goals are effective practices.

▶ **Children generally learn new movement skills more easily when they can focus on one specific aspect of the skill at a time.**

Providing cues to children for movement skill learning is important. However, it is recommended that teachers guide children on only one aspect of the skill at a time (e.g., stepping in opposition when throwing) while children are doing the overall movement.

▶ **Children benefit from ample opportunities to practice new physical skills.** When children initially acquire a new physical ability, they are often highly motivated to repeat the activity many times. Repetition should be encouraged because it strengthens the new communication pathways between the brain and the muscle being used.





Introducing slight variations or additional challenges further enhances motor development. For example, if a child has just learned to jump, it would be beneficial to challenge the child to try jumping on uneven surfaces, such as grass or sand, or to count while jumping.

► **Children benefit from integrated learning activities across the curriculum.**

Movement experiences provide an ideal context for children's development in not only the physical domain, but also in the cognitive, social-emotional, and language domains.

► **Frequency, intensity, type, and duration are the four key parameters to designing active physical play to enhance children's fitness and health.** The four parameters may be thought of as the FITT principles (Frequency, Intensity, Type, Time [duration]).<sup>5</sup> "Frequency" refers to the regularity of engaging in **physical activity**; frequent short periods of physical activity each day are preferred (children should not be sedentary for more than 60 minutes at a time except when sleeping<sup>6</sup>).<sup>\*</sup> "Intensity" refers to whether activities are **sedentary**, mild, moderate, or vigorous; moderate to vigorous activities are preferred. "Type" deals with the specific kind of physical activity engaged in; for young children, the types of activities usually take the form of active games, child-initiated play, as well as rhythms and dance. "Time" (duration) refers to the amount of time in which the child is engaged in physical activity; accumulating at least 60 minutes, and up to several hours,

<sup>\*</sup>Recommendation from *Active Start: A Statement of Physical Activity Guidelines for Children from Birth to Age 5* (Reston, VA: National Association for Sport and Physical Education, 2009).



of **moderate to vigorous physical activity** per day is recommended. Some children with special needs may not have the physical stamina to participate in the same ways in terms of frequency, intensity, type, and time. Teachers may modify activities to accommodate children's individual needs.

► **Physical skills are more easily learned when clear instructions and appropriate feedback are provided in children's home language using familiar communication methods.** Children who are English learners acquire new movement skills more easily when clear instructions are provided in their home language. Similarly, children who communicate using sign language, picture communication systems, or other augmentative communication systems benefit when teachers use appropriate communication methods to teach physical skills. Moreover, all children in the preschool program would benefit from exposure to different languages and communication methods in addition to physical demonstration, modeling, and material cues provided by teachers.



---

---

## Environmental Factors

---

---

- ▶ **Teachers promote optimal physical development when they provide children with positive encouragement and quality instruction (both indirect and direct).**

Teachers must be aware and take advantage of their critical role. They are the ones “setting the stage” and “creating the climate” for movement skill learning. Teachers who truly embrace the value of physical activities effectively communicate it to children, thus encouraging their participation. Often, quality instruction may require teachers to actively participate in physical play alongside children. At other times, children will benefit most when the teacher simply remains close by and shows genuine interest in the children’s physical activities.

- ▶ **The immediate physical environment is a powerful influence on children’s physical development.**

The physical environment, play materials, and play themes can all be skillfully designed to promote active play. Both indoor and outdoor play environments should encourage fun and enjoyable learning. Indoor and outdoor play environments are fundamentally different. Each offers distinct learning opportunities in terms of the amount and type of activity that takes place, the sensory properties of the play area, and the potential for using the natural materials unique to the local geography and culture. Multipurpose open space and sufficient outdoor time, weather permitting, are important environmental considerations. If weather or air quality does not permit outdoor play, indoor open space should be provided.

- ▶ **Indoor and outdoor play environments should include a variety of appropriately sized equipment that promotes both gross and fine motor development.**

Indoor movement areas can be as small as a corner of the room in which children can move with a scarf and streamers, throw at wall targets with a beanbag or foam-rubber ball, and play with other small materials. The outdoor play space should promote a variety of activities through the use of balls, low balance boards, hula hoops, tricycles, and other wheeled toys. Adaptations to the equipment encourage participation of children with special needs.

- ▶ **Learning is most meaningful when the environment and materials reflect and accommodate children’s individual interests, backgrounds, and present abilities.**

Children come to the learning environment with a wide range of needs, interests, and abilities. Children’s life context (i.e., culture, language, diversity, abilities) should be represented through movement activities that maximize opportunities for participation, active engagement, and success. Embrace the richness of diversity by learning about children’s culture, language, customs, music, physical activities, and focus on the unique gifts that each child brings to the learning environment.

- ▶ **Take time to build safety into both the indoor and outdoor play environments.**

A safe environment reduces the need for adults to say no. It is important to establish clear expectations. Limits should be set rather than rules (rules eliminate reasonable risk) in order to ensure personal safety. Be particularly



cognizant when working with children who have disabilities that impact their impulse control and judgment. Also, differences in cultural expectations for girls and those for boys, as well as language differences, may impact the critical need for building safety into children's regular play environments. Playground equipment, such as climbing, hanging, and sliding structures, should be checked regularly for safety hazards.

### Research Highlight: Must Young Children Sit Still in Order to Learn?

Researchers have stated that high activity levels, impulsivity, and short attention span for sedentary activities are characteristics of typically developing preschool-age children.<sup>7</sup> Children naturally need to move in order to learn.<sup>8</sup> Being physically active boosts children's attention span and capitalizes on multisensory learning so that children are more likely to retain academic concepts such as colors, shapes, and the alphabet.<sup>9</sup> The need for movement-based learning experiences may be particularly important for children with special needs. Research has shown that for children who have autism spectrum disorder and attention deficit hyperactivity disorder, being seated on a movable surface (e.g., a therapy ball) resulted in increased ability to stay on task and remain seated during classroom learning activities. However, children seated on a static surface such as a bench, chair, or floor were less able to remain on task.<sup>10,11</sup> Experts have suggested that adults' efforts to entice young children to sit still, pay attention, and be quiet during learning activities often run contrary to children's natural needs for physical movement.<sup>12</sup>

#### ► **Movement experiences should include exploration, discovery, and appreciation of the natural environment.**

Children learn by interacting with people, objects, and the natural environment. Nature provides rich, diverse sensory experiences—sounds, smells, textures, and sights—that are beneficial for young children's sensorimotor development. Outdoor play offers an array of opportunities for exploration, discovery, and learning in a natural environment.

#### ► **Thoughtfully designed movement experiences, guided by adults, support children's physical development.**

Most children need more than just free play to acquire movement skills. Children benefit from teacher-guided, **structured physical activities**, particularly when they are learning new movement skills. Structured but flexible play activities that emphasize active participation, exploration, and self-discovery are ideal for practicing new, challenging physical skills. Skills acquired from structured activities are important building blocks for expanding children's repertoire of skills for spontaneous, child-directed physical play.





---

---

## Summary of the Physical Development Foundations

---

The physical development domain is divided into three strands. The first strand is Fundamental Movement Skills. Most preschool children can acquire reasonable levels of competence in a wide range of movement activities, including balance, locomotor skills, and manipulative skills (both gross motor and fine motor), when given opportunities for instruction and practice in an enriched environment. The second strand is Perceptual-Motor Skills and Movement Concepts. This strand focuses on the development of body awareness, spatial awareness, and directional awareness. These skills are important for interacting with others and for exploring the environment. The third strand is Active Physical Play. Active physical play promotes children's health and physical fitness by increasing their levels of active participation, cardiovascular endurance, **muscular strength**, **muscular endurance**, and **flexibility**.

The remainder of this chapter is organized on the basis of the three strands. The introduction to each strand will highlight its importance to preschool children's overall development. Each strand is further divided into substrands, with specific strategies to support children's learning and development. Examples of strategies include both spontaneous interactions and planned activities that support children's physical development. Integration is a key concept in this framework, since the physical development activities also promote children's learning in all other

developmental domains. This framework will guide teachers in planning a physical development curriculum that is flexible, inclusive, and responsive to children's unique needs. Suggestions for working with children from diverse cultures, children with special needs, and children who are English learners are provided.

Teachers play a critical role in supporting children's physical development because physical skills need to be explicitly and deliberately taught. Physical play, both indoors and outdoors, is not merely "free time"; it requires thoughtful planning and intentional interactions.

---

---

## Summary of the Strands and Substrands

---

### Fundamental Movement Skills

- 1.0 Balance
- 2.0 Locomotor Skills
- 3.0 Manipulative Skills (gross motor and fine motor)

### Perceptual-Motor Skills and Movement Concepts

- 1.0 Body Awareness
- 2.0 Spatial Awareness
- 3.0 Directional Awareness

### Active Physical Play

- 1.0 Active Participation
- 2.0 Cardiovascular Endurance
- 3.0 Muscular Strength, Muscular Endurance, and Flexibility

Please refer to the map of the physical development foundations on page 211 for a visual explanation of the terminology used in the preschool learning foundations.





## Fundamental Movement Skills

**F**undamental movement skills are the foundations on which more complex movement skills are built. Early childhood is a crucial and unique time for developing coordination of the basic movement skills. During this period, daily movement experiences significantly influence children's patterns of movement and their future as happy, active movers. Children who develop these fundamental movement skills tend to become confident movers and have the building blocks for an active way of life.



Fundamental movement skills emerge following a developmental sequence from simple to more complex body actions. Initially, when children attempt a movement pattern, they move few body parts (e.g., when throwing, move only one arm while the rest of their body remains still). As their movement skills develop, children begin incorporating other body parts (e.g., throwing with one arm while stepping with one foot). Research-based developmental sequences represent common pathways of development and can guide instruction and learning. However, each child's development is unique and affected by many factors (e.g., genetics, culture, special needs, socioeconomic status, environment, and practice). Teachers should expect variations in individual development.

Fundamental movement skills develop through meaningful interactions with the environment, people, and objects; through both structured (e.g., teacher-guided) and unstructured (e.g., child-initiated play) practice of movement skills; through the integration of fundamental motor skills into the preschool curriculum; and

through the integration of fundamental movement skills into the daily home life of children. Children's movement activities should be designed with consideration of the multiple cultures and diversity of the participants. In addition, teachers need to be sensitive to children with disabilities and special needs and modify the tasks, context, or environment, including appropriate assistive devices and instructional strategies, to facilitate the development of fundamental skills for all children. The following strategies provide teachers, family members, and caregivers with guidance to foster the development of fundamental movement skills in preschool-age children.

Fundamental movement skills consist of three substrands:

- 1.0 Balance
- 2.0 Locomotor Skills
- 3.0 Manipulative Skills

These substrands of movement constitute the basis of movement throughout life. Teachers and caregivers have an important role in supporting the development and practice of foundational movement skills.



## 1.0 Balance

The ability to balance is fundamental to all body movements. All movement involves elements of balance, and each movement has different balance requirements. The center of gravity (i.e., how close the midsection of the body is to the floor) and the base of support (i.e., the amount of surface covered by the body parts holding the position) determine the difficulty of the task. If the center of gravity is closer to the floor, such as balancing on hands and knees, the balance task is easier than if it is far from the floor, such as balancing on tiptoes while standing on a stool. Likewise, if the base of support is larger (i.e., more area covered by the body parts holding the position), the movement will be easier. For example, standing with legs apart on a balance beam will be easier than standing on one foot on the same beam. Therefore some movements are more challenging than others for young children.

When most young children enter preschool, they have conquered the rudimentary ways of balancing. Most children

walk without falling and can go up and down stairs holding a rail. During the preschool years, children expand their balancing abilities in many different environments and in a variety of movements. Young children need to learn to restore their equilibrium when things alter their balance, such as uneven surfaces (e.g., walking across sand) or moving/changeable surfaces (e.g., taking an escalator). Children develop their balance skills by experiencing a variety of balancing challenges, such as holding still in postures; moving the arm, leg, or head while maintaining balance; continuously moving while balancing; and making big changes in body positions. All these movements will provide opportunities to learn how to control and compensate for small, continuous, or large changes in body positions. Balance movements involve postures such as standing on one foot, balancing while rotating or turning (such as rolling sideways), and balancing in locomotion (such as walking on a low balance beam).

### VIGNETTE

*During a group activity, Ms. King asks children to find a rope on the floor and stand next to it. She indicates, "When you find the rope you want to work with, stand next to it like this." Ms. King demonstrates the standing position with hands down at her sides. Ms. King gives children some time to find their ropes. All the children move and stand next to a rope. Three children stand briefly at the same rope. One child leaves and goes to another rope. Two children, Ying and Carla, stay standing there. Ms. King lets them try to solve the problem. Carla tells Ying that she got to the rope first. Ying seems a bit confused and stays in the middle of the rope that another child is claiming. Ms. King says, "Ying, can you find another rope? The teacher notices that Ying looks confused and does not move. Mrs. King then asks, "Can someone help Ying find a rope?" Sarah runs to him and points to an available rope. Ying runs and lands with knees next to the rope, smiling.*



*Ms. King suggests, “Okay, let’s see if we can hold our balance while using different body parts on the rope.” Some children use hands and one foot; others use two feet and one hand, two hands and two feet, head and two feet. Ms. King explains, “You have one, two, and three body parts. You have two hands and one foot, and you are holding your balance on four body parts.” They show different postures. Some are upside down, while others are right side up. Ms. King communicates, “Wow, you can hold your positions like statues using different body parts. Now please stand up.” Ms. King makes a friendly gesture with her hand, indicating up, while looking at Ying. Ying follows the sign and looks around, noticing that everybody is standing. Then, Ms. King asks, “Now, can you walk over the rope while maintaining your balance? Children begin walking, and Ms. King comments, “Sara, you are balancing on the rope. Carla, you are keeping your arms out and that really helps with balancing.” Ms. King sees Jose and says, “Jose, you take big steps while balancing on the rope. Wow, you have found many different ways to walk while maintaining your balance on the rope.” Ying keeps looking at the children and walks while balancing on his rope.*

**PLANNING  
LEARNING  
OPPORTUNITIES**

These balance activities allow children to challenge themselves and try different ways of balancing in static positions (i.e., stationary activities using different body parts) and dynamic ones (i.e., balancing while walking on the rope). Balance activities should be presented in developmentally appropriate ways by beginning with activities down at low levels, with the center of gravity closer to the floor. This can be followed by higher-level activities, with the center of gravity higher and using various body parts. Using more body parts at the beginning of the activity increases the base of support and the chance of success.

By asking questions and then describing children’s choices, teachers make children become more aware of their actions while other children gain ideas from listening and seeing others’ choices. Children tend to maintain a higher level of interest in the learning activity when they feel successful. In this way children build their balance repertory: from easy to more difficult tasks. Teachers’ facial expressions of assurance or use of sign language are also useful when there are children who are English learners or children with hearing impairments among the participants. Additional adaptations may be necessary for children with other special needs. These approaches are developmentally sound and allow children to challenge themselves at their individual ability level.



## Interactions and Strategies

**Design spaces and activities to develop balance following a developmental progression.** Provide low-level balance challenges and wide bases of support that encourage children to experience balancing with success (e.g., balancing on many body parts at a low level or tip-toe-walking on floor lines following different pathways). Progressively incorporate more difficult challenges, such as higher obstacles and narrower surfaces to stand or walk on (e.g., balancing on boxes or stones) and holding balance positions on fewer body parts. In general, most children enjoy the challenge of maintaining stability. Falling from low obstacles onto a safe surface will actually be fun and challenge them to keep trying. Young children learn to control their bodies better when they can progress from easier to more difficult balance positions or movements.



**Provide opportunities that include diverse cultural themes.** Traditional folk dances or dances that represent the culture of children and families can be really fun. Teachers can guide children to add extra balance demands. Changing body positions, dancing on one foot, and using different levels of movements can increase the balance challenges while children enjoy the rhythms of familiar songs. Activities such as tai-chi moves and hopscotch, where children move in different ways to accomplish a goal will, enhance balance in motion and stillness positions and can be fun ways to increase balance abilities. Other games using verbal and visual signals, such as Red Light—Green Light, help develop children’s awareness and also enhance stability.

**Incorporate balance activities into the children’s world.** Read stories and act them out incorporating balance challenges. Pretend to be in the zoo and act out different animals. Children may identify some animals, and the teacher may suggest some others, such as frogs jumping, bears walking on hands and feet, snakes moving close to the floor, or flamingos standing on one foot. Ask children to pretend to be things such as spinning tops that turn and stop or logs rolling down the hill. Do balancing acts such as balancing a turkey feather on their hand or plastic egg in a big spoon while standing, walking, or moving in a wheelchair. Ask children, “How does it feel? Which balances are harder?” These activities allow children to experience an array of balance challenges, and their bodies will increasingly improve stability and control.

**Provide opportunities for activities that include both active movements and still body positions.** Children need to experience the contrast between being in motion and being still. These activities will enhance the ability to control their





body movements and emotions. Games, such as Freeze where children dance and move to a song and then “freeze in different positions” when the music stops, are great for this purpose. Teachers can give a cue to visually or hearing-impaired children by clapping, making gestures, or showing pictures. Contrasting music may also be used; at times the music calls for fast movements, and other times the music slows down, calling for slow movements until total stillness is achieved. Children can use tambourines and bells or instruments that provide relaxing sounds.

**Challenge children’s balance abilities by asking questions.** Teachers can facilitate and guide children’s balance activities by providing thoughtful questions either before or after the activity. These questions challenge young children to explore and experience other ways of balancing. Teachers may ask, “Can you change from one balance position to another one while keeping your balance?” Questions can also focus on making children think about what their bodies are doing to maintain their balance, such as, “How did you move your body when changing positions and not fall down?” Teachers may also ask about what happened when children lost their balance, such as, “Why do you think you could not keep your balance this time?” These practices will develop body awareness that will translate into more confidence with balance abilities. Physical movements, along with a series of questions, will help children who are English learners bridge gaps in the understanding of the conversation. Teachers can also ask children who speak both the home language and English to help children who speak only the home language to understand the questions and the balance challenges. For more information about strategies to



support children who are English learners, see the *California Preschool Curriculum Framework, Volume 1*, chapter 5.

**Encourage persistence during challenging balance tasks.** Children will attempt to balance and will fail to hold the balance or fall down on the floor, or the object they are trying to balance may fall down. These are opportunities for teachers to encourage persistence and provide cues as to what they may do to better control their bodies or objects they are balancing. Effort is an important part of all learning, and children need to know that to control their bodies they need practice, practice, and more practice.

**Post pictures of balance positions and balance activities.** Provide visual examples of different balance positions or activities. Visual pictures can inspire children. These pictures can be of culturally representative athletes, dancers, art performers, known soccer players, gymnasts, people in yoga positions, as well as athletes with physical disabilities, such as wheelchair racers, or Special Olympians. When possible, find pictures or take digital photos of the children, children’s characters, animals in balance positions, and things that you would like children to imitate. In addition, these pictures will



provide another way of communication for children who prefer a visual idea or for children who are English learners.

**Design the environment so children combine balance skills with fundamental movement skills and movement concepts.** Provide opportunities for combinations of balances with locomotor, manipulative, perceptual-motor skills, and the development of movement concepts. Obstacle courses provide opportunities for a variety of movements, as well as flexibility for children's movement choices. Most children love giant obstacle courses. Indoor spaces may be limiting for big setups of equipment that encourage ongoing activities. However, small obstacle courses indoors (e.g., using chairs, tables, and small equipment such as discarded milk containers or potato chip cans) can be really fun and are an especially good option when it is rainy outside or there is a lack of other



available spaces. Outdoor spaces can have big setups with large equipment (e.g., wheel equipment, big boxes, playground equipment, big stones, trees, tunnels) where children can experience a variety of movement skills and balance challenges. Whether indoors or outdoors, obstacle courses should allow room to maneuver for children who use walkers or wheelchairs.

#### VIGNETTE

*Children in Ms. Lopez's class were very interested in fire stations. In a large circle activity the day before, they read a book about fire stations. Later a parent came and talked about the job of firefighters. The next day, Ms. Lopez designed a large obstacle course with fire station materials, such as fire hats and hoses, and placed equipment around the area to invite different movements and balancing challenges. A phone on one side and a round spot with scarves on the other side created a rectangular obstacle course. She added footprints in a curved path and boxes for children to crawl up and jump down from, a mat on the floor, hoops, and cones. When the children arrived, she commented, "I wonder if we can pretend to be firefighters and move like they do? How do you think the firefighters move?" Some children said they run and jump, and others said they go upstairs and put the fire out with their hoses. Ms. Lopez responded, "Exactly. Now you can play in this obstacle course while pretending you are firefighters." The children began moving around the course using the props and creating their own stories and ways of moving. Ms. Lopez was observing the multiple ways they chose to move and their different levels of development.*

*This activity revealed to Ms. Lopez the kinds of challenges her children were ready for and the activities that were their favorites. The children*



were very excited and continued going around and around the course. After observing that some children repeated the same balance challenges several times, Ms. Lopez suggested, "Can you find a different way of moving your body through the curved path next time?" Then, Ms. Lopez noticed that one child, Hoa, stopped in front of the climbing box and put her hands over her face. Ms. Lopez went to her and asked if she needed help, and Hoa said, "I cannot get up." Ms. Lopez replied, "Let's find another way to pass this box." Hoa said, "I cannot climb up." Then Ms. Lopez said, "How about sitting on it and sliding on your bottom all the way down?" Hoa sat and tried sliding, and when she came to the end of the box, Ms. Lopez said with a big smile, "Wonderful. Now see if you can find a different way to go over the box."

Another child, Andre, was crawling up and down the box each time he passed the boxes. The next time he was about to crawl down, Ms. Lopez questioned, "Do you want me to hold your hands to see if you can jump down from the box?" Andre responded no and continued the course. After a few more trials, Andre came over and requested, "Ms. Lopez, can you help me jump off the box?" Ms. Lopez replied, "Sure, let's see if you can jump off while holding my hands." Andre jumped down from the box, with assistance, and continued the course.

The children were engaged in acting out their stories. After everyone had participated in the activity, Ms. Lopez made a circle in the middle of the room and asked the children questions about their experiences during the activity: "What was fun? What ways did you move? Which activities were harder to do? How did you move your bodies when it was difficult? What other balancing or movement activities can you use the next time you go through an obstacle course?"

#### TEACHABLE MOMENT

This activity provides an opportunity to practice several kinds of balances in static positions and while moving and changing direction using locomotor skills and movement concepts. Because of the children's interest in fire stations, the teacher chose to create an obstacle course that provides opportunities to practice balance in a pretend, safe, and educationally fun way. Including children's interests in designing activities geared toward developing balancing skills motivates children to participate. During this activity, children were able to create their own stories and challenge themselves in ways that were appropriate for their individual abilities. The teacher attentively observes children's movements in order to assist and modify the task so those with special needs, low muscle tone, low levels of confidence, or lack of practice can participate successfully. Observation can also yield information to teachers for planning: guide children who need extra assistance, or challenge those who are ready to add more balancing skills to their repertoire.



**Provide a variety of sensory cues that facilitate multisensory learning.** Demonstrations, showing models or pictures, pinpointing a position or balance that a child is doing, or describing how some children resolve their balance challenges provide many opportunities for children to learn about their own balance skills. Teachers may need to provide hands-on assistance, such as hold a hand or a leg, or touch a body part to develop body awareness in different positions. These practices will enhance balance abilities and promote learning in different sensorial styles (e.g., visual, kinesthetic, listening, or a combination of senses). When working with children who are blind or have visual impairments, guide them to develop their awareness of how their body parts are positioned in space during balance activities. For example, if a child who is blind pretends to be a flamingo and attempts to stand on one foot, the teacher may say, “Can the flamingo stand better when she spreads her wings out? Or bends her knee?”

**Modify balance activities to increase participation by children with disabilities and special needs.** Teachers and caregivers need to be sensitive to all children’s needs. The task, or parts of the task, can always be modified for children with special needs or disabilities, depending on the disability. Sometimes children need a simple adjustment or modification to accomplish the task; at other times a more appropriate task needs to be incorporated where the child still works on balance but at his ability level and within

her body constraints. For instance, balancing on a low balance beam may be appropriate for one child, but another child who uses a wheelchair may need a different kind of balance, such as going through lines avoiding objects on the floor, balancing objects, or rolling sideways on a mat. These types of balances will stimulate their vestibular and visual systems for improved balance orientation. See the “Research Highlight: Beyond the Five Senses” on page 172 for more information about the vestibular system. For resources for working with children with disabilities or other special needs, see appendix D of the *California Preschool Curriculum Framework, Volume 1*.

**Use visual aids, foot and handprints, and objects on the floor to promote balancing skills.** Balancing activities rely heavily on the use of the visual and vestibular systems. Most children enjoy moving on patterns on a tile floor or on rugs. In addition, visual aids in front of the child, such as targets or pictures on the wall, can help children stabilize body positions. Footprints on the floor, such as dragon prints, bear prints, or human prints arranged in sequences, will encourage children to move over them. Teachers can vary the challenges by placing the targets closer or farther apart, placing hands and footprints on the floor, or adding other objects or pictures. For example, making a pathway (e.g., curved or straight), a hoop, a leaf, or a picture of a river will encourage movements that require balance skills.





## 2.0 Locomotor Skills

**L**ocomotor skills are the movement skills that children use to move effectively and efficiently through space. These skills allow children to travel, explore, and discover their environments. Preschool children use locomotor skills in their daily activities to move from one area to another. Locomotor skills include walking, running, jumping, galloping, sliding, leaping, skipping, and hopping. Teachers and caregivers can help children develop these skills by encouraging them to use different skills as they move and play in their environment. It is important to keep in mind that locomotor skills tend to develop in an orderly sequence in typically developing children.

The level of difficulty for locomotor skills varies from easy to more difficult according to the demands of the skill on the body. For instance, walking can be considered an easy skill for a typically developing preschool child who has had the opportunity to walk and master balance and stability since infancy. However, hopping may be considered a more difficult skill, because the requirements for balance and strength increase considerably.

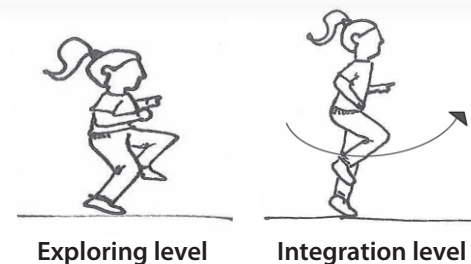
See figure 3.1, “Developmental Sequence of Hopping” and observe the body configuration of the early development of hopping. At the Exploring level, the child has one leg off the floor and in front of the body and has great difficulty getting the body off the floor on the other leg (little strength). The arms are to the side of the body, and they provide little help for pushing the body off the floor. At the Integration level, the child is able to hop several times on one leg while swinging the opposite leg back and forth like a pendulum. The arms move in opposition

to the swinging leg. At this level, the child has developed sufficient balance, strength, and coordination for the hopping skill.

Hopping requires the use of only one leg to lift the body and enough strength to catch the body when landing on the same leg. Between the Exploring level and the Integration level, children will explore and discover ways to move their body segments to facilitate the hopping action. In the transition from one level to the next, the leg that is off the floor will be placed down, behind, and inconsistently in different positions, and the arms will be used in different ways until the child finds the most efficient way of moving the body while hopping on one foot at the Integration level. It is important for teachers and caregivers to understand the increasing complexity of locomotor skills. This understanding permits them to provide a wide variety of developmentally appropriate activities for skill development.

The immediate environment can also be manipulated to increase or decrease the difficulty of locomotor skills. Teachers and caregivers can modify it the most by using different surfaces and objects,

**Figure 3.1 Developmental Sequence of Hopping**



Designed by Clersida Garcia and illustrated by Xuyen Garcia, 2010.



such as beanbags; cones; rhythm sticks; footprints; visual aids; low-, middle-, and high-level obstacles; and music. Interesting, inviting activities can motivate children to practice a variety of locomotor skills. Modifications, adaptations, and preparation of the environment based on observations of children's ability levels and special needs can provide more appropriate challenges. Environmental modifications and adaptations assist



children's development and may enhance children's sense of accomplishment of these skills.

The previous experiences, health status, cultural background, cognitive abilities, motor challenges, and personality traits of individual children will also influence the development of locomotor skills. Individual and cultural differences should be considered and activities adjusted accordingly so all children can develop efficient and effective locomotor skills.

### Research Highlight: Locomotor Skills

Research indicates that movements develop from the interaction of the individual, the environment in which the movement occurs, and the task to be undertaken. Changing any of these factors will change the resulting movement. These three factors are in continuous interaction when children are growing and moving in different environments. To enhance and develop movement, teachers and caregivers need to consider the relationship between the characteristics of the individual child, her surroundings, and the purpose or reason for moving. To enhance motor skill development, these three aspects deserve clear consideration.<sup>13</sup>

#### VIGNETTE

*During outdoor time the teacher invited children to play a game called "Pretend to walk on..." and the children excitedly agreed. The teacher asked them to spread out and listen. Then the teacher said, "We are walking on ice, and it is cold." He wrapped his arms around his body and started walking very slowly and carefully. Some children began walking as though on ice immediately while others started getting the idea by the teacher's demonstrations. The teacher said, "Okay, okay, now we are walking on hot sand. How do you move your body when the sand is hot?" While the children followed excitedly he continued to change the activity place, such as walking on a tightrope, walking on glue, walking on car oil, and so on. Then the teacher asked, "Who*



*would like a turn to decide where we are walking?” One child raised his hand and said, “We are walking on mud.” All the children began walking and falling in funny ways. Another raised his hand insistently and, when given the turn, he said, “We are walking on rocks” and laughed. The children continued pretending and participating in the game, laughing and falling as if they were walking on rocks. Then another child said, “We are walking on water, and we splash it.” The game continued until it was time to go back inside. Later, at circle time, the teacher reflected about the different ways they walked for each floor surface.*

---

**PLANNING  
LEARNING  
OPPORTUNITIES**

▶ These activities provide opportunities to experience a variety of pretend surfaces in which children’s movement patterns adjust to the demands of the environment. The vignette also exemplifies that the environment has an impact on how people choose to move. The pretend world of children allows a variety of environments. For example, teachers can change the game to accommodate different weather conditions, places, or jobs. Music is an excellent resource to facilitate locomotor skills. It provides rhythm and can evoke emotion when a locomotor skill is demonstrated. This activity may be modified for children with movement difficulties by having the teacher add to the discussion about the various ways that children move (e.g., using adaptive equipment such as a walker or wheelchair).

Walking is the easiest way for children to travel. They have an opportunity to learn about safety because walking is a slower motion and gives children time to see other children moving and time to respond to the changing environment. Children may respond to an approaching child by changing direction or by stopping and waiting for someone to pass. By observing children walking, the teacher or caregiver can determine new challenges that can be incorporated in daily routines and ways to enhance safety while moving faster.

---

**TEACHABLE  
MOMENT**

▶ The walking pattern may change depending on the conditions of the environment or the special needs of some children. Some children may walk primarily on their toes, without putting much weight on their heels, while others may not have experienced conditions such as snow; consequently, they do not know how to walk on it. However, teacher engagement, demonstration, and modification of the task according to special needs of children can enhance participation. For example, a child in a wheelchair could demonstrate and then talk about how the wheelchair would move on different surfaces.



## Interactions and Strategies

**Observe and analyze children’s locomotor skills to facilitate planning for learning opportunities.** While children play and move using locomotor skills, teachers and caregivers can observe what kind of locomotor skills children are using, which ones they use more often and which they do not use or rarely try (see the illustrations in “Selected Developmental Sequences of Locomotor Skills” at the end of this chapter). Teachers can determine children’s developmental progression for a particular skill (see the “Research Highlight: Locomotor Skills” on page 148). Observations can guide the focus and purpose of the activities in the creation of plans to facilitate skill development and to provide opportunities for variation of those skills.

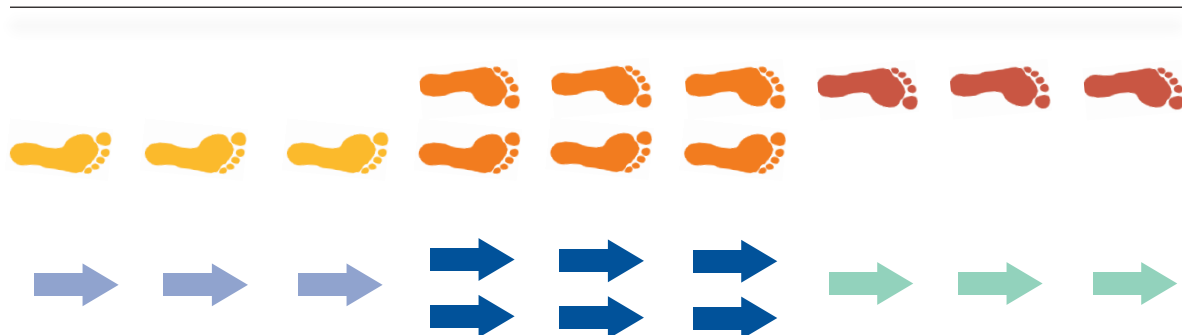
For instance, the teacher observed that children walk and run but rarely use any other locomotor skills in the playground. This observation can guide the teacher’s planning to increase variation in the locomotor skills used. The teacher can guide the variation of locomotor skills by designing the outdoor environment or spacious indoor environment to include objects that call for other locomotor movements. Adding some hoops, spots,

and footprints in patterns on the ground or floor (e.g., a line of three single footprints followed by three pairs of footprints and then followed by another line of single footprints may encourage hopping and jumping). See figure 3.2. Additionally asking children to find different ways to move in and out of the hoops and patterns of footprints can create new forms of locomotion. Some children may jump, others may hop, others may leap, and some may tiptoe through the area.

As children explore new ways of moving, the teacher and caregiver should continue observing carefully to acknowledge those ways, help children who may need assistance, describe ways that other children are moving, and identify the children’s levels of development. Focusing on the way the arms and legs move while observing can help the teacher clearly identify children’s levels of development and therefore inform the planning of new and appropriate challenges for future activities.

**Promote progressive development of leg strength.** It is important to understand that locomotor skills require different levels of leg strength; however, teachers cannot sit and wait until children get stronger, because it is through using their legs and arms that children will gain

Figure 3.2 Locomotor Movement Patterns







more strength. Therefore, if the locomotor skill calls for strength, such as jumping, provide ways to develop strength in young children. Design the indoor and outdoor environments in ways that invite the use of locomotor skills, such as running, galloping, jumping, crawling, and climbing. Children can pretend to be springs and crunch down before jumping up; that will help build strength. Place different obstacles on the floor according to children's ability levels and the special needs; initially place them close to the ground and then increase the height as children's strength increases. Boxes of different sizes allow them to jump to the ground using the force of gravity. Taking off is more difficult than landing, and landing can be on hands and feet. Provide hands to assist the take-off if some children need this assistance. Safety in landing can be enhanced by providing cushioned surfaces, such as sand, grass, water, or mats. Coordinate with specialists and check the IEP goals for children with motor development challenges.

**Promote progressive development of balance.\*** All locomotor skills require balance. Some locomotor skills have a greater demand for balance than others. If the children have a lower level of

\*See the Balance substrand on page 140 for additional strategies.

balance skills, then the teacher needs to provide ways to facilitate balancing skills. In this case, guide children to experiment with their arms in different positions to find greater stability. Usually, open arms along the side of the body enhance stability. Vision also plays a role in balance, so enhance visual cues. For children who have visual impairments, a vision specialist or an orientation and mobility specialist may suggest supportive ways to promote the child's progressive development of balance. Create activities that stimulate the use of the vestibular system to increase balance (see the "Research Highlight: Beyond the Five Senses" on page 172 for more information about the vestibular system). Encourage children to help each other. This also develops cooperation skills.

**Promote and be aware of the progressive development of coordination of locomotor skills.** Coordination is the most efficient organization of the body systems to perform movements. Advanced arm-leg coordination will demonstrate a contra-lateral opposition of arm and legs (see figure 3.1, "Developmental Sequence of Hopping.") Coordination increases with repetition of the movement actions and with guided practice. Children move progressively to a higher level of coordination as their bodies get stronger, they gain balance, and they experience new ways of moving their bodies. For coordination, observe the ways children move their arms as they run, gallop, leap, jump, or hop. Arm-leg coordination may be developed by challenging children to use their arms in different ways and to find out which way feels easiest. Holding scarves, maracas, or ribbons is a way to practice arm movements. In addition to the demands of the skill itself, locomotor skills can be combined in different patterns of two to three



locomotor skills (e.g., run and jump, run and leap, hop-hop-hop and jump), or sequences of skills to music. There are other ways teachers can vary the challenges and increase the coordination of locomotor skills. Consult with specialists and refer to IEP goals for children with motor development challenges. For resources for working with children with disabilities or other special needs, see the *California Preschool Curriculum Framework, Volume 1*, appendix D.

**Encourage practice of locomotor movements in both indoor and outdoor environments.**

Children love to move in different ways. When they learn new locomotor skills, they want to use them over and over again. This is a natural drive for mastering locomotor skills. Teachers and family members should celebrate these accomplishments and encourage the use of emerging skills because it is through repetition that children establish the coordination pattern in their nervous system. Locomotor skills can be used in the daily routines of the preschool program, such as when moving from area



to area, going out to the playground, or going into the classroom while setting up or cleaning up, in large-group activities, or after large-group activities. For instance, the teacher can say (verbally or using sign language), “Today, when I call your name, go to an interest area by galloping,” or “Choose your favorite way to move to an area for play.” The teacher can take into account the varying ability levels when giving the commands, providing locomotor practice that is inclusive of all children. The more ways teachers provide opportunities and encourage practice, the greater the opportunity for children to develop efficient patterns of locomotor skills. It is important to provide opportunities for both indoor and outdoor locomotor activities, as these two environments call for different levels of intensity, speed, and range of motions. Outdoor open spaces are excellent places for children to learn to control their efforts when moving in these spaces. The indoor environment offers a limited and more constrained space, while outdoor playgrounds provide for different types of terrain, natural obstacles, and availability of natural resources and people. It is essential that children practice and learn to move in these different spaces. Children will learn the range, speed, and intensity to apply to their locomotor skills when they are inside their homes or in more open areas such as playgrounds or parks.

**Use vivid visual information and visual aids that communicate to children in simple ways how to move.**

Use props to promote locomotor skills. Pictures of animals, visual pointers such as arrows for directions, or pathways can guide children in performing locomotor skills. Visual information is also valuable for children who are English learners and children with auditory disabilities. Pat-



terns of footprints and handprints from different animals or monsters are exciting for children to follow. Low, slanted hurdles allow children to jump or leap at their ability level. Bubble-wrap material secured to the floor produces great sounds when children jump on it. Sturdy boxes of different sizes provide different heights for jumping on and from. Stones of different sizes, containers, and pictures secured to the floor facilitate and also promote locomotor skills.

**Use music, songs, rhymes, and stories to provide rhythmic patterns.** All locomotor skills have a rhythmic pattern, and most children benefit from listening to the beat as they move their bodies. Rhythmic patterns are evident in songs such as “Skip to My Lou” or “Listen and Move.” Or use different rhythm instruments such as rhythm sticks, drums, paper plates, metal cans that are property sealed, or maracas. When using instruments or music, be aware that some children have a low threshold for noise tolerance. Adapt by providing soft earplugs or earmuffs. Many early childhood music CDs, including music in many languages, promote the development of locomotor skills. The words of the songs are also an excellent source for increased vocabulary and understanding of their meaning as well as bridging children’s vocabulary in their home language and English. The Explorer Adventure Game allows teachers to create stories around children’s interests. For example, going on an adventure to find “magic” leaf shapes, stones of different colors, stick sizes, or hidden objects is an activity that most children like to do again and again. Variety may also be introduced in games such as Simon Says or Red Light, Green Light by using different locomotor movements. Teachers can ask parents for cultural music or songs involving movement and play from their

childhood and incorporate the music or songs into the locomotor activities. These actions provide opportunities to validate children’s culture and family values.

**Plan meaningful, purposeful, and connected locomotor activities and games.** The activities should be meaningful to children, have a clear purpose, and be connected to their culture and the realities of their lives. To be meaningful, the activities should represent children’s interests. Children love to move to accomplish something: to feed a pretend animal, to carry pieces of a puzzle from one side of the room to another, to take a letter from one container and place it into another, to match objects, to order numbers, to build a house, to show their costumes, and so on. All these activities can be combined with locomotor movements. One of the factors that can influence the development of locomotor skills and motor skills in general is the purpose or reasons for moving. Teachers need to design activities that center on children’s interests. For instance, many children have a genuine interest in animals and love to care for them. This interest can be combined with locomotor skills by setting up plates at one end of the room and containers of food at the other end. In this way children move with the purpose of feeding the animals. Children will be asked to feed the animals the food on the other side. Each time they go to pick a food, ask them to use a different locomotor skill. Remember to discuss the purpose of the movement, such as in this activity, which was to feed the animals. Ask questions: “Did you bring something yellow to your animals? How about something green? What about something red?” “Did they eat their food?” Or, if the children know the food names and groups, add that information to the questions.



**Create picture cards representing different ways to move related to children’s cultural background.** Teachers can add feelings to the locomotor movements, such as happy (skipping), calm (tip-toe), funny (jumping), silly (walking), angry (hopping), and dance walking. Ask the child to pick a card and then move that way. At the end of the activity, ask questions to reinforce concepts and to increase children’s awareness of how they moved. For example, ask, “Did anyone move on one foot? Did you move quickly or slowly? Did you express a feeling when you moved? Which one was your favorite way of moving?”

**Create culturally diverse scenarios for practicing locomotor skills.** Providing movement experiences that reflect the diversity of a group of children is another way to motivate participation and to validate children’s cultures. Dances representing different cultures are excellent ways to practice locomotor skills. Another way to incorporate cultural scenarios is through pretend activities using props. For example, children can pretend to be rangers, wear hats, and use Styrofoam noodles as “horses.” The teacher can play western-style galloping music to which children can gallop around a “range area.” When the teacher plays a different sound (or signal) for the horses to stop, children may act out a jump or make horse noises. The teacher can play the song (or signal) again, and the children can continue galloping to the music.

Teachers and caregivers can incorporate cultural customs and traditions into the locomotor activities. For instance, some Latino children celebrate their birthdays with a cake and a piñata. Traditionally, the piñata is filled with candies and toys. Children take turns hitting it with a stick until it breaks and the prizes fall out. Then they collect items and take

them home. Teachers may evoke piñata fun times by having children paint and decorate small piñatas or by making pretend piñatas using cardboard or square paper plates and then gluing decorations to the outside. The cardboard or paper plates should have a small hole at one end so a plastic string or a light rope can be attached. Then pair up the children: one with the piñata and one with a short noodle wand in her hand. Have children chase the piñata outside and hit it with their wands. This activity calls for locomotor movements such as running, galloping, leaping, and changing directions while hitting the piñata. This is a fun activity that should be done outside in open areas that allow space for running, chasing, and changing directions. Teachers can also design a rectangular or circular track area by using traffic cones for children to run around. More than one child can follow the piñata on the ground. This is an excellent locomotor, eye-hand-coordination, and endurance activity. If one member of the pair has motor challenges, the partner can carry out the actions based on verbal or gestural cues.

**Encourage persistence during challenging locomotor skills.** Some locomotor skills are more challenging and difficult than others. For instance, hopping is difficult because it requires a lot of strength, balance, and coordination. As children experience difficulties, provide **affordances** (i.e., facilitators) such as objects to hold onto while hopping on one foot. Value children’s efforts by making them aware of the importance of trying. Ask children to try hopping just one or two steps before trying to hop continuously. Another way to develop hopping skills is by increasing balancing skills on one foot and leg strength. Climbing can also assist children in strength development.





**Provide appropriate challenges for children with special needs.** Children with disabilities and special needs may need accommodations based on their differing abilities. Teachers need to be open and responsive to individual unique differences. If a child receives services from a specialist such as a physical therapist, occupational therapist, adaptive physical education teacher, or special education teacher, be sure to consult with the specialist about ways to appropriately encourage and challenge physical development. Recognize the strengths of children with special needs and enhance the sensory information that they increasingly rely on. Some children benefit from kinesthetic assistance while others get



overstimulated when touched. Know your children well and modify the tasks accordingly. For instance, enhancing auditory and **tactile** stimulation is helpful for children with visual impairments and blindness. In the piñata game mentioned previously, an easy modification would be to place bells on the disc and on the cords. Provide longer cords and see if the child can participate more easily and accomplish the task. You may want to provide a partner for this child to ensure success at the beginning of the game, but as the child gains confidence let her try on her own and see how she feels. Pairing up different children as partners also fosters socialization and acceptance. For resources for working with children with disabilities or other special needs, see appendix D in the *California Preschool Curriculum Framework, Volume 1*.

**Express enthusiasm for locomotor skills.** Teachers can enhance children's participation by demonstrating enthusiasm for locomotor movement actions and by encouraging children to try new ways of moving. Teachers can show genuine appreciation for movement by describing children's locomotor actions, by taking pictures of children moving around and sending the pictures home (or posting them on a wall or board), by asking them about their feelings while they are moving, and, most importantly, by acting as good role models. Furthermore, describing children's efforts and giving cues or pointers will make them aware of their body actions and ability to replicate successful attempts. These strategies expand exploration, self-discovery, and self-confidence.



### 3.0 Manipulative Skills

**M**anipulative skills allow children to use their arms, hands, legs, and feet to project an object away from the body (e.g., throwing a beanbag) or to receive and absorb the force of an object coming to the body (e.g., catching a balloon). Fundamental motor skills that involve large muscle groups are called **gross motor skills** (e.g., kicking) and the ones that involve small muscle groups are called **fine motor skills** (e.g., cutting). Fine motor manipulative skills are usually those in which children manipulate objects with their hands. Gross motor manipulative skills include tossing, rolling, throwing, catching, striking, kicking, bouncing, and punting with objects. Fine motor manipulative skills include cutting, painting, and buttoning.

Most children are naturally eager to play with objects and discover manipulative skills. Exploring and manipulating objects is a natural or engaging way for preschoolers to understand their physical body and their impact on objects and people in the environment. From a young age, children begin exploring objects with their mouth and then with the hands and feet. Soon they drop objects intention-



ally while observing the reaction of the object as it falls, as well as the people observing and the changes in the environment. They are naturally thrilled by these actions and the reactions of others. To facilitate development, teachers need to observe what children like and dislike playing freely (e.g., some children avoid touching objects or people) and incorporate some of these aspects into their activities.

The acquisition of fundamental manipulative skills follows a predictable developmental sequence, but children often progress through these sequences at different rates (see illustrations of “Selected Developmental Sequences of Fundamental Manipulative Skills,” at the end of this chapter). The different rates depend largely on opportunities for practice, encouragement, and instruction (i.e., development is age-related but not age-dependent). Teachers need to understand and expect variability of ability levels among children of the same chronological age as well as among children with special needs.

Environments also affect the quality of skill development. For instance, poverty may affect the availability of resources and opportunities for movement and may limit skill development and movement experiences. Therefore, low levels of skill development and low confidence in movement may be present in children facing these conditions.

A child living in a small urban apartment often tends to be more sedentary, less confident, and may show more delays in movement skill acquisition than a child who lives in a single-family home. The child living in the apartment faces obstacles: hazards outside, lack of play



time with parents because parent work schedules, and limited space and toys. The child living in a house tends to have adequate space to play, toys to play with, and parents who have time to encourage and physically play with him. Likewise, cultural values and beliefs about physical activity can affect the development of motor skills. In general, most cultures tend to support and encourage boys to play with balls and be physically active while girls may get the message that physical activity and gross manipulative skills (e.g., playing with balls) are not important for them.<sup>14,15</sup> These beliefs and subtle messages may lead to girls becoming less interested in gross motor activities. On the other hand, boys may get less encouragement and opportunities for locomotor skills and fine motor manipulative skills. These cultural values, which are stronger in some cultures than others, negatively affect both boys and girls in the development of their movement repertoire. Fundamental movement skills are the foundation of movement for life, and both boys and girls need to develop proficiency in all locomotor, manipulative, and balance skills. To move with confidence and to develop healthy habits

of physical activity, children need to have plenty of opportunities and encouragement that can ensure a physically active lifestyle in the future. Teachers and caregivers need to be aware of these cultural values and expectations so they can encourage, guide, and assist children and families in understanding the issues.

Enriched and developmentally appropriate environments invite movement experiences and may enhance children's skill development, physical activity experiences, and confidence in moving. However, certain aspects of the environment may affect progress in the development of manipulative skills. The conditions of the learning environment, the requirements of the movement task, and the uniqueness of the individual play important roles in the learning of manipulative skills. Strategies for teaching manipulative skills should be flexible and sensitive to individual and cultural differences in a variety of environments. Teachers should also facilitate the adjustment of the manipulative task to create appropriate challenges for all participating children (see the "Research Highlight: Locomotor Skills" on page 148).

---

## Manipulative Skills: Gross Motor

---

### VIGNETTE

*Children were playing around a big plastic wading pool, and a few "swam" in a pretend lake (the pretend lake was defined by a large circle drawn on the floor). Children were tossing "food" toward plastic fish in the pretend lake. Some children indicated whom they were trying to feed, while others just tossed food for any of the fish or ducks. The food was in a plastic bucket and consisted of yarn balls, small beanbags, sticky balls, balls with bells inside, and small plastic sensory balls. Mrs. Williams observed the children and described how happy the animals were to get the food: "Oh, those fish are so happy they do not have to look for food today. You sure are having fun tossing food to the fish today. You may want to toss a little harder to reach the ones that are far away." Some children answered, "Yeah. I am*



*going to toss really hard,” and tossed and stepped forward with the force needed. Mrs. Williams observed, “I noticed that you stepped this time, and that helps when you want to toss hard.” Then the child repeated and stepped again and again. Mrs. Williams walked around the circle and asked, “Can you step when you toss the food? Try stepping and see how far you can throw.”*

*Some children stepped with the same-side foot as the arm in action; others changed back and forth. Mrs. Williams indicated to these children, “You’re stepping a long way!” By now they were out of food, and the teacher remarked, “Okay, let’s walk on your tiptoes and pick up the food and bring it back to the buckets. Look around so you don’t bump into anyone.” The children stepped into the lake and did so. Mrs. Williams reflected, “Now let’s see if we can step over the line before you toss, like this,” and she showed them the movement. The children began tossing again. A few stepped, but many others did not.*

---

**PLANNING  
LEARNING  
OPPORTUNITIES**

▶ This activity is engaging to children because it has a purpose that matches their interest. After observing the children’s body movements when tossing, the teacher was aware that some children were more advanced than others. A few of the children stepped contra-laterally (i.e., using the leg opposite to the tossing arm), some stepped homo-laterally (i.e., using the same leg as the tossing arm), and many others did not step. This activity provides important information for the teacher when planning the next tossing activity. She can add some visual aids such as footprints (e.g., circle, small mat) and ask children questions to scaffold the stepping action such as, “Can you step in the footprint before tossing the food?” The teacher is aware that her goal for the next time in developing this skill is to encourage stepping. This stepping action can be with either foot so children begin to move their center of gravity. Teachers can ask, “Show me how you can step on the footprint before you toss.” Teachers can model and show children the movement by indicating, “I step and toss. Did you see how I stepped?” Some children may benefit from the additional instructional strategy of having the teacher physically guide their bodies through the stepping motion so that children can learn how it feels to step when tossing.

---

**TEACHABLE  
MOMENT**

▶ Encouraging comments, such as “It seems like you are having fun tossing to the fish today,” help build internal motivation and enjoyment among children. Teachers can encourage children to step by affirming them based on what the teacher sees (e.g., “That time you took a step. How does





it feel?"). Or, when a child steps, the teacher may say, "That's great! You remembered to take a step before tossing." These comments will make children aware of their foot actions. When a child steps and tosses, the teacher can comment, "Way to step" or, "Now, you're stepping every time." In this way teachers reinforce and encourage the stepping action. If the teacher wants to remind a child of the stepping action, he might say, "Did you step this time?" Furthermore, modeling, mirroring, and physically guiding when the need arises will assist young children in becoming aware of their foot actions. In this vignette, the teacher also helped a child who was more advanced become aware that if his goal was tossing far away, stepping helped. Positive, instructive comments will empower the child and provide him with information on how to control his body to reach his goal.

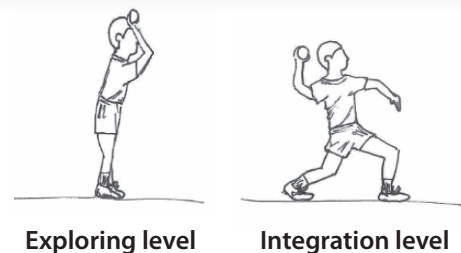
## Interactions and Strategies

**Observe developmental sequences of fundamental manipulative skills.** Most children progress in fundamental manipulative skills according to developmental sequences. These movements are usually of increasing complexity as the body moves from simple to greater body coordination. Teachers need to be aware of the sequences and able to observe where children are in their development in order to best facilitate the development of these skills in young children (see figure 3.3, "Developmental Sequence of Throwing").

**Vary the focus of the manipulative skills.** Usually young and inexperienced children will not move their feet when manipulating an object through gross motor movement (see figure 3.3 "Developmental Sequence of Throwing"). At the exploring level the child throws without moving her feet. Only the throwing arm moves; therefore, teachers and caregivers may want to encourage stepping

by giving a cue and scaffolding the feet. As children begin stepping with their manipulative actions, their stepping will be done first using a homolateral pattern (i.e., stepping with the same side foot as the arm being used.). Developmentally, it is expected and a natural sequence that most children go through. As children become more comfortable stepping this way, teachers may begin encouraging a more proficient way of stepping. Stepping contra-laterally means with the foot opposed to the arm action. Progressively

**Figure 3.3 Developmental Sequence of Throwing**



Designed by Clersida Garcia and illustrated by Xuyen Garcia, 2010.



children will begin the transition to step in opposition (i.e., contra-laterally), the more coordinated way of moving the legs in most manipulative skills (see the integration level illustrated in figure 3.3). Most children with disabilities or special needs move through the same levels of developmental sequences, but their progress is often at a different or delayed pace. Children with physical disabilities will accommodate their movement actions to their special capabilities. For instance, a child in a wheelchair will not step but can use a similar arm action as the one observed at the integration level. For propulsion skills, such as throwing, teachers and caregivers may want to encourage children to extend their arm back or swing the leg back before contact to increase the propulsive force that will be applied to the object (e.g., arms for throwing, legs for kicking). For receptive skills, such as catching, teachers may want to encourage children to focus on arms reaching up and moving smoothly down to absorb the force of the object. As children improve their skills, teachers may later encourage and focus on trunk rotation and so on. Teachers need to consider all these aspects when designing activities addressing the gross motor manipulative skills.

**Provide a variety of equipment to accommodate individual differences in body size, skill level, and the development of children's physical and sensory systems.** For example, for gross motor manipulative skill development, it is helpful to provide balls of different sizes, shapes, textures, and weight. Beanbags, sponge balls, or even wadded-up newspaper are good. If children will throw at a target, it should be colorful, large, and interactive. The activity should be enjoyable and interesting. A target with sounds or effects (e.g., objects

appear and disappear) provides children with motivation and directionality in projection skills. When targets are used, the emphasis should not be on how accurately children hit the targets. Rather, the teacher's focus should be on observing children's movement patterns. Do they use the right hand or left hand consistently? Do they make an attempt at the movement? Do they step? How do they step? Do they step in opposition?

**Create meaningful scenarios that provide the opportunity for the integration of fundamental movement skills with other curriculum concepts.**

Children learn and recall both motor skills and curriculum concepts better when they are related in meaningful ways. As stated earlier in this framework, motor, cognitive, social, and emotional development are all interrelated. Teachers can create opportunities for incorporating all domains of learning and concepts such as numbers, shapes, colors, matching activities, sequencing activities, creative activities, and special cultural themes with both gross and fine motor manipulative skills. This kind of experience will create countless opportunities for teachable moments (see "Bringing It All Together" on page 171 for an example).

**Use both unstructured and structured strategies, as well as multisensory experiences, in your teaching.** Unstructured time encourages children to explore and discover multiple possibilities and ranges of body motion. Structured activities provide efficient models for children to replicate skills. Young children typically benefit from exposure to a balance of unstructured and structured strategies. Children sometimes need a demonstration by the teacher or direct guidance on how to move ("Step with this foot,



Mary” while touching her foot); and other times they need a challenge: “How many ways can we move our feet to toss this beanbag to the circle?” “Show me two ways to kick!” “How can we throw from a sitting position?” In addition to these strategies, adding a variety of sensory stimulation (e.g., visual, hearing, tactile) can address children’s multiple ways of learning.

**Create developmental activities that provide a sense of success.** Modifying activities for individual skill levels is a constant aspect of teaching. For instance, the way a teacher enhances a child’s developing visual and perceptual systems and ability to track objects in space can facilitate success. The teacher can enhance and facilitate success by setting up the environment with appropriate challenges and by observing individual children and assisting them accordingly. For instance, using materials that are colorful, light, and falls slowly, such as scarves, feathers, balloons, or bubbles, can increase the child’s ability to visually follow (i.e., track) the object. The slow fall of the object provides time for the child to respond and catch successfully even though the child may have delayed arm action. (*Note:* This is a typical characteristic of a young child’s developing



perceptual system.) Providing slower-falling objects may be particularly appropriate for children with disabilities and other special needs who benefit from having more time to respond physically or cognitively. Another accommodation can be made in the way the balls or objects are presented to children with special needs. For instance, it is easier for a child with a visual impairment to catch an object that makes sounds and rolls on the floor or a low table than a silent object that is tossed.

**Provide opportunities for repeated practice in a safe environment.** Children need plenty of opportunities to practice their manipulative motor skills in a variety of settings and with a variety of materials and equipment. Manipulative activities can be practiced indoors and outdoors, in interest areas, and during small- or large-group activities. Young children need to practice the same manipulative skills in many different settings. Sometimes a familiar activity in a different setting seems like a completely new experience. To provide safety during manipulative activities, check the space where the activity will be done and remove obstacles. Such things as water on the floor, slippery surfaces, or objects that can impede safe play need to be rectified before any activity begins. Making sure that the manipulative play equipment is soft and light is another important safety consideration. Also, be certain to provide clear directions and a recognized signal for starting and stopping all activities.

**Understand gender-based expectations of the children’s culture when teaching manipulative skills.** Culture influences young children’s exposure and opportunities to engage in manipulative activities. In some cultures, playing



with balls and using the large muscles is expected of boys. Likewise the clothing used by children represents these culturally based expectations. Boys are more likely to be dressed in clothing that allows for physical activity, rough-and-tumble play, and wear and tear. Girls are sometimes expected to be less active and may be dressed in clothes that limit their active play. In addition, girls may show little interest for gross motor manipulative skills because their culture perceives active play to be of low value.

The gender-based expectations of children's culture, as well as their level of skill development, may influence the motivation of children to participate in gross motor manipulative activities. Boys, in general, tend to be more interested in gross motor manipulative skills, while girls tend to avoid gross motor manipulative skills due to a lack of exposure and the cultural, gender-based perception that these types of skills are not for



them.<sup>16</sup> Teachers should understand that these differences may be initially observed but do not need to persist. Open communication with parents and family members about the importance of gross motor manipulative skills for girls as well as boys, and asking for collaboration, can help girls and their families understand the benefits of becoming competent in manipulative skills. In addition, parents and children need to understand the importance of appropriate clothing for movement activities. Teachers, parents, and family members need to learn and understand the benefits of manipulative and large muscle skills for girls. Girls may need more encouragement, guided assistance, reassurance, and role modeling to develop manipulative skills. To learn more about expectations for children in specific cultures, observe carefully, communicate thoughtfully with children and family members, and seek community resources as needed.

**Provide plenty of encouragement.** Most of the time, young children value adults' opinions about their efforts. Adults need to recognize the value of trying. Trying is key to the process that led to the acquisition of the skill. Skills development is a slow process and each tiny improvement helps that process advance. Children want adults to notice them in action and to acknowledge their efforts. Adults encourage children to participate and enhance children's sense of accomplishment of a task. Positive verbal and nonverbal communication is effective. For example, take time to express verbal acknowledgment of their movement actions, take digital pictures of their movement skills, show reassurance, and use hand signals such as "a high-five" or thumbs-up gesture. Adults' demonstrations of enjoyment and genuine enthusiasm for children's skill development are





a powerful motivation for young children. (See the *California Preschool Curriculum Framework, Volume 1*, chapter 3, for more information).

**Create manipulative activities that provide automatic feedback and a sense of accomplishment.** Teachers can create activities in which children’s movement actions cause a reaction in the environment. For instance, providing targets with sound lets children know immediately that they hit the target. This activity can provide a sense of accomplishment

independent of skill level. If they do not hit the target, they may make an adjustment to do so. They will develop their ability to judge and adjust their movement actions. Another motivational effect is having children knock down objects that produce a sound or making something appear or disappear after the child’s action. For example, hitting a beach ball with a short Styrofoam “noodle” will create a sound that children enjoy. The sound itself may motivate them to do the task over and over again.

---

## Manipulative Skills: Fine Motor

---

### VIGNETTE

*Ms. Lupe overhears Trang, a new child in the preschool program, talk enthusiastically about going on nature hikes with her family. Ms. Lupe designs a nature-hike activity in which children pretend to be scientists and collect specimens from the outside play area. The teacher provides several specimen containers, including twist-top food jars, zippered pouches, and flip-top dental floss dispensers. Trang finds an acorn to put into a twist-top jar, and Todd places a leaf into a zippered pouch. Todd and Trang return to the “lab” area indoors, where there are “lab coats” consisting of button-down shirts and a tray of “lab tools.” The tools include a magnifying glass, tweezers, and a paintbrush. Both children put on lab coats, and Trang buttons one button.*

*Trang asks Todd, “Want to see the nut I found?” “Yeah!” exclaims Todd as Ms. Lupe joins the children. Trang untwists the lid of her container and pours the acorn onto the tray. Ms. Lupe says, “Scientist Trang, you found a nut called an acorn.” Trang takes the tweezers and tries to pick up the acorn, which slips out. Trang sighs in frustration but keeps trying, while Ms. Lupe nods and smiles encouragingly at Trang. On her third attempt, Trang picks up the acorn. Ms. Lupe exclaims, “Trang, you picked up your acorn! How did you hold the tweezers?” Trang shrugs and says, “I don’t know.” Ms. Lupe suggests, “Hmm . . . it looks like you squeezed the tweezers just tightly enough, but not too much. What do you think?” Trang pauses for a moment, and then nods, “The nut falls when I squeeze too hard. I have to squeeze just right.” Ms. Lupe replies, “Yes, you squeezed the tweezers just right to pick up your acorn. And you kept trying even when it was hard. Now, tell me about this acorn.”*



### PLANNING LEARNING OPPORTUNITIES

Teachers can design meaningful learning experiences by incorporating children's interests. By being a careful observer, Ms. Lupe learns about Trang's interest in nature walks. The teacher designs the general theme and purpose of the activity (i.e., find an object from outside) but provides choices for carrying out the activity, such as which containers to use and what to collect. Having choices may motivate children's participation and accommodate different skill levels and interests. This activity provides multiple ways for children to develop fine motor manipulative skills. Because natural materials from outside are used, children can explore and manipulate objects of various sizes, shapes, weight, and textures. Incorporating different tools, containers, and clothing fasteners creates additional fine motor challenges. The nature-hike activity also provides learning opportunities in other domains; it involves science concepts, vocabulary, emotional regulation (e.g., persisting with a challenging task and managing frustration), social interaction, and pretend play.

### TEACHABLE MOMENT

The teacher observes that Trang is frustrated by the challenge of manipulating tweezers and uses nonverbal communication (i.e., facial expressions and gestures) to encourage the child's effort. If Trang had become very frustrated or had been unable to pick up the acorn after numerous attempts, Ms. Lupe may have provided verbal suggestions, demonstrations, or hands-on assistance as needed. Ms. Lupe expresses genuine enthusiasm when Trang picks up the acorn. The teacher's description of what the child did validated her accomplishment. The teacher helps the child to reflect on *how* she effectively manipulated the tool; this reflection process promotes self-awareness of the motor strategies used and solidifies learning.

### VIGNETTE

*Luz, an English language learner, reaches for scissors during a craft activity. Mr. Aponte hands her a pair of scissors, saying, "These are scissors." Luz repeats "scissors." A few days later, also during a craft activity, Mr. Aponte asks Luz, "Show me what you do with scissors." Luz opens and closes her index and middle fingers, pretending to be cutting something using scissors. A few weeks later, during another craft activity, Luz says to a peer, "Please give me the scissors."*



### TEACHABLE MOMENT

In this vignette, the teacher uses a craft activity as an opportunity to teach and reinforce the learning of the word “scissors.” Mr. Aponte first uses the natural context of handing over a pair of scissors to expose Luz to a vocabulary word. Then, after exposing Luz to the word perhaps multiple times, Mr. Aponte checks Luz’s comprehension of the word by asking her to use gestures to demonstrate its meaning. Finally, Luz has mastered the word and uses it to facilitate her participation in craft activities. Fine motor manipulative activities can provide meaningful contexts for learning English. This vignette also illustrates a realistic learning process that could span over weeks or even months.

## Interactions and Strategies

**Learn about children’s cultural context for fine motor activities.** Culture influences young children’s opportunities to engage in fine motor activities. Fine motor skills may be highly valued and encouraged in some cultures but viewed as less important in others. Thus, children whose cultures value fine motor skills may demonstrate more well-developed skills due to increased practice opportunities. Gender-based cultural expectations may also exist; some cultures expect girls to engage more in fine motor activities and boys to be more proficient in gross motor activities. Cultures also



differ in the types of tools introduced to children and the appropriate time to introduce those tools. For example, young children may be expected to manipulate chopsticks, use a fork, or eat with their hands, depending on their cultural norm. To learn more about certain cultures, observe carefully, communicate thoughtfully with children and family members, and access community resources as needed. Remain respectful of children’s cultural contexts while communicating openly with family members about the importance and benefits of fine motor skills for all children.

**Learn about families’ values related to fine motor activities.** Be sensitive to each family’s personal values. Some family members may have safety concerns about introducing scissors to young children. Others may be uncomfortable about allowing children to get messy with paints or markers. Educate families about the benefits and safety of fine motor participation for children while remaining sensitive to family values. For example, teachers may suggest that children use only blunt-tip scissors and only in the presence of an adult. Teachers may also use washable paint and suggest that children



wear aprons to keep clothing free from stains. Partner with families to identify appropriate home activities to promote children's fine motor development.

**Learn about children's prior experiences and personal interests related to fine motor activities.** Depending on cultural traditions, socioeconomic status, family values, and special needs, children enter preschool with a wide range of prior exposure and access to fine motor activities. Children also have personal preferences with respect to play. Children who prefer fine motor play may demonstrate a relative strength in fine motor development. By gaining a broad understanding of each child's personal contexts and interests, teachers can design more effective and more meaningful learning opportunities to support fine motor development.

**Focus on the quality of movement rather than the end product.** When children are acquiring new fine motor skills, focus on the developmental progression of hand and arm movements (see figure 3.4, "Developmental Sequence of Cutting"). For example, when children are learning to cut, provide instruction and feedback on the quality and mechanics of movement (e.g., proper positioning of the scissors in the hand) rather than about the end product (i.e., whether the child cuts on the line).

**Provide clear, specific feedback to facilitate children's problem-solving process.** Motor skills are learned best when children are allowed to encounter motor challenges, problem-solve, and develop their own solutions.<sup>17</sup> During challenging activities, encourage children's efforts with acknowledgment such

Figure 3.4 Developmental Sequence of Cutting



#### Early Cutting

When children are first learning to cut, they often hold the scissors with the thumb facing down. The elbow may elevate as they cut. They tend to cut across their bodies (toward the opposite hand). Young children usually need to position the paper on a support surface.

Photographs by Robyn Wu



#### More Mature Cutting

As children's cutting skills mature, the thumb is positioned facing up. They also keep their elbows down at their side when cutting. Children tend to cut away from their bodies. Older children can hold the paper in the opposite hand as they cut.





as, “You are working hard to make this necklace. The beads are smaller than what you used before.” Teachers can also assist children by narrating and framing the motor problem: “Hmm, the bead slips out of your fingers when you try to push the lace through. I wonder how you can get the bead to stay in your fingers?” When children are able to solve the motor problems, provide prompts to increase self-awareness about how they solved the problem. The teacher may say, “You held onto the bead this time. What did you do differently?” The teacher can also offer a more directive prompt, such as, “The bead stayed in your hand when you held on to the very middle of the bead. Does it feel different when you hold it like that?”

**Provide a variety of tools and media to promote participation.** Accommodate individual differences in interests and abilities by providing options. For example, if children create greeting cards, provide various materials to decorate the cards, including crayons (of different diameters and lengths), markers, stickers, stamps, or finger paint. Crayons or markers may motivate those children who prefer to draw freehanded, and the different types and sizes of drawing tools will accommodate differences in grasping abilities and hand strength. Children who enjoy sensory exploration with their hands may choose finger painting. The novelty of stickers and stamps may appeal to others.

**Design meaningful fine motor activities by incorporating children’s diverse backgrounds.** Children from diverse ethnic or cultural backgrounds may be familiar with different types of tools and materials for fine motor manipulation. Create meaningful learning experiences for children by incorporating elements from their cultures. For example, cook-

ing activities can incorporate fine motor activities from multiple cultures, such as making tortillas with rolling pins, crushing dough with a Roti press, or picking up sticky rice with chopsticks. Include clothing and accessories from various cultures for children to explore during dress-up play. Exposure to diverse tools, materials, and activities yields not only fine motor benefits, but also enhances cognitive and social development for children from all cultural backgrounds.

**Provide adaptations to support participation of children with disabilities or other special needs.** Adapt fine motor activities and materials to enable children with differing abilities to participate. Some children with physical disabilities may benefit from additional postural support during fine motor activities. Common positioning strategies for postural support including providing a tabletop or tray to support the elbows, firm blankets or pillows to prevent loss of balance sideways, or hip straps to keep the pelvis in place. If a child has use of only one hand, teachers can stabilize fine motor materials by using nonslip mats, binder clips, or clamps. Consult with the children’s family or special education specialists to obtain specific suggestions to meet children’s unique needs. See the strategy, “Assist children with proper fit and positioning of scissors” on page 169 for including a variety of types of scissors. For resources for working with children with disabilities or other special needs, see appendix D of the *California Preschool Curriculum Framework, Volume 1*.

**Promote children’s ability to manipulate objects by feel.** To use the hands with skill and efficiency, children need to learn to manipulate objects “by feel” (i.e., using the sense of touch) rather than relying only on vision.<sup>18</sup> As children’s



touch sense develops, they can determine an object's size, weight, shape, texture, and other physical features by feeling with their hands, without needing to look at the object. Finding small treasures hidden in a treasure box of water, sand, or other materials develops the sense of touch. Challenge children to refine their touch and movement senses by asking them to build, with their eyes closed, a block tower as high as possible. Teachers can also introduce small-group games, such as having children pass around and identify a mystery object while keeping their eyes closed. The development of touch perception may be particularly important for children who have visual impairments. Some children have an aversion to touching certain objects or textures. Consult with the family and an early childhood special education specialist for adaptations.

**Provide opportunities for children to engage in fine motor activities in a variety of positions.** Fine motor activities can be performed in many different positions, including standing, lying on the stomach, seated on the floor, or seated in a chair. Preschool children benefit from the opportunity to practice manipulative skills from different body positions.



**Provide optimal postural support during challenging fine motor activities.**

When a child appears challenged by a fine motor activity, consider asking the child to sit in a chair at a tabletop surface for more postural support. Postural support allows children to focus more on hand movements and less on postural control. Optimal support is achieved when the child sits on a stable chair with ankles, knees, and hips bent at 90 degrees, feet flat on the floor, and forearms resting on the table. The tabletop should be approximately two inches above the child's elbow when she is seated. Simple adaptations to accommodate different body sizes include footrests of telephone books or shoeboxes and seat cushions made from rolled towels or blankets.

**Position materials vertically.** Provide opportunities to explore art and writing media at vertical surfaces such as an easel, writing board, or paper taped on the wall. Pegboards and lacing boards can also be placed vertically. Manipulating objects on a vertical surface develops strength and endurance in children's shoulder and trunk muscles. Strong shoulder and trunk muscles are necessary for maintaining the body in a stable, upright position during fine motor activities. The vertical position also promotes development of the wrist and thumb muscles for grasping tools. Cutting materials can also be positioned vertically. For example, teachers can tape a long strip of paper vertically to the wall or top of a cabinet and have children cut on a "road" from the bottom to the top. Cutting in a vertical, upward direction encourages proper positioning of the forearm (i.e., thumb up and elbow down) for using scissors.



**Engage children in “heavy work” activities to develop trunk and shoulder muscles.** Examples of “heavy work” for preschool children include pushing a chair across the floor, carrying a tray of snacks across the room, carrying a watering can to the garden, or wiping off a table. Many children are motivated by the helper role when completing heavy work. Heavy work strengthens the trunk and shoulder muscles necessary for maintaining the child’s body in proper alignment (i.e., upright rather than slumped over) during fine motor activities.

**Provide resistive activities to develop hand strength.** Hand strength is required to complete many tasks, such as removing the cap from a marker, opening food containers, or fastening snaps on clothing. Resistive play activities include rolling clay to make snakes, using clothespins to pin up flags for a castle, or carrying buckets of water to the sandbox. Encourage children to use resistive tools—a rolling pin to roll out play dough

for pizza, a single-hole punch to punch holes for lacing, or a shovel to dig a moat in the sandbox. Tearing, scrunching, and folding paper for art projects also develop hand muscles.

**Provide activities to develop hand precision.** Children need precision when manipulating small objects, such as when buttoning or threading a zipper. Focus on developing refined control of the thumb, index finger, and middle finger. Provide play activities that require precise placement of small objects, such as lacing small beads or playing with puzzles. Provide fun, purposeful activities involving tools, such as squeezing spray bottles to water plants, using chopsticks to sort objects (can be adapted by using rubber bands to help hold the two sticks together) or manipulating eye droppers filled with colored water to make pictures.

**Assist children with proper fit and positioning of scissors.** To accommodate the range of hand sizes in a preschool program, consider obtaining a few different sizes and designs of blunt-tip children’s scissors. If the child has not used scissors before, show her how to hold the scissors with the thumb and middle finger through the loops and the index finger placed on the underside of the scissors, outside of the loops. Scissors designed for children with special needs include “loop” scissors (more like using tongs), spring-loaded scissors (which help the child reopen the scissors after each cut), and “trainer” scissors (with added loops for adults to cut with the child). These alternative scissors may benefit all children.

**Provide a variety of media for cutting with scissors.** If children are new to cutting, they can practice snipping straws, rolls of play dough, or strips of paper,



where one cutting movement results in a successful cut. A fun activity that incorporates many fine motor skills is snipping plastic straws into short segments and then threading the straw segments to make a necklace. Once children acquire the basic movement patterns for cutting, they benefit from opportunities to cut different textures of paper (e.g., cardstock, tissue, construction paper) or cloth. Practicing with a variety of media promotes further development of cutting skills.

**Be aware of children’s handedness when providing assistance with fine motor activities.** Many preschool children may not consistently demonstrate whether they are right- or left-handed (see the “Research Highlight: Development of Handedness in Children” for more information). Teachers have excellent opportunities to observe children’s hand-preference development when children are drawing with crayons, pounding with toy hammers, or eating with a spoon. To promote the child’s natural **handedness**, offer tools at the middle



level of the child’s body, letting the child choose which hand to use. For children with established handedness, model and provide assistance that is compatible with the child’s handedness. For example, it may be easier for a left-handed child to learn to hold scissors when the teacher demonstrates with the left hand.

### Research Highlight: Development of Handedness in Children

*Handedness* means that one hand is consistently used for most tasks requiring skilled manipulation (e.g., drawing, cutting). Handedness is genetically determined, and scientists have observed a preferred hand for thumb sucking as early as in the womb. However, there is a wide age range at which handedness is consistently demonstrated in children. A majority of children begin to show a hand preference by age three. Most children exhibit consistent hand preference between ages five and six. However, a small percentage of typically developing children do not show consistent hand preference until as late as age eight. Approximately 90 percent of the typically developing population is right-handed. Children with special needs may demonstrate handedness later and are more likely to exhibit inconsistent hand preference. Among children with learning disabilities and autism, the incidence of left-handedness is higher, ranging from 15 to 30 percent.<sup>19, 20, 21, 22, 23</sup>





## Bringing It All Together

The only way to develop efficient patterns of fundamental movement skills is through the practice of these skills. Teachers play a critical role in engaging children and supporting their practice by modifying the environment and allowing individualization and meaningful interactions that reflect children's interests and cultural experiences. When planning to guide and expose children to opportunities for developing more proficient patterns of fundamental movement skills, teachers and caregivers need to consider the value of integration in learning.

Children learn new skills, including movement skills, most effectively when the learning occurs in an integrated, personally meaningful way. Fundamental movement skills provide another way for children to learn, develop, and to gain knowledge and experiences about the physical world. In this sense, meaningful connections with all areas of development and the reality of the children involved, including their cultural and linguistic experiences, are essential for healthy development.

*Children constructed birds and balls out of paper while playing indoors. They colored the papers using markers of different colors. Children also decorated their creations with colorful feathers and cut out shapes from magazines. They attached these decorations to their birds and balls with glue. When the decorations were dry, the teacher invited them to play with their birds and balls outside. The teacher, Ms. Gupta, previously had designed the outdoor play area by placing some colorful plastic hoops, cones, and shapes on the floor with pictures of the community*

*buildings attached to them. She also drew a line two steps away from the pretend buildings.*

*Outside, she said to the children, "Let's make the birds fly toward those buildings and see where they land." The children became excited and began using the throwing action to fly their birds. Some children were much closer to the line, and others stood farther away. While throwing, they began adjusting their proximity to the line. Ms. Gupta said, "How can you move your bodies to make your bird fly up in the sky?" Jamila said, "I know, throw like this [moving her arm up and down]." Lesley said, "We need to step and send the bird up." Ms. Gupta paused and observed them throwing for a while. One child's bird was going down fast, and she said, "Xuyen, do you want your bird to go up?" Xuyen replied, "Yes." Ms. Gupta asked, "How can we do that?" Xuyen shrugged her shoulders as though to say, "I do not know." Ms. Gupta then suggested, "How about if you throw it toward the sky?" Xuyen moved her arm up over her head in the throwing action, and her bird flew a little longer. She noticed and smiled, then ran to get it and tried again. Ms. Gupta smiled and said, "You moved your arm up this time. That is the way to make your bird go up: keep moving your arm up each time." Another child was picking up his bird, and Ms. Gupta said, "Yeng, on what building did your bird land?" Yeng said, "The store." and kept running back to try again. Ms. Gupta said to another child, "Mary, did your bird land in the hospital?" Mary replied, "No, that is the park." Mary was right. Ms. Gupta continued asking different children about the buildings.*



After some time, Ms. Gupta changed the challenge by asking the children if they wanted to try throwing the paper balls. After observing their movement pattern of throwing the balls, she said, “It may help if you step before you throw,” as she demonstrated the movement. Some children tried the movement, and others continued doing it their way. She noticed that some began incorporating their locomotor skills. Then she said, “What other movements can you add before you throw?” and paused. Then she said, “How fast can you go to get your paper balls?” Then she said, “Let’s pretend that you are walk-

ing in mud when you go to pick up your balls.” (Ms. Gupta already knew that the children enjoy pretending to walk in mud.) Then she asked, “What other ways can you go to get your paper ball?” She knew the children would come up with different ideas because they had played the game “Pretend You Are Walking on . . .” before. One child who was having a difficult time throwing said to Ms. Gupta, “I know how a bird flies!” Ms. Gupta said, “Show me, Alejandro.” Alejandro went on and began running around the whole playground area, moving his arms like a bird. Ms. Gupta said, when Alejandro came back,

### Research Highlight: Beyond the Five Senses

Most people are familiar with the five senses: hearing, vision, touch, smell, and taste. However, there are two additional body senses, **vestibular** (i.e., head position and head movement) and **proprioceptive** (i.e., body position and body movement), and they are extremely important for physical development in young children.

The vestibular receptors, located in the inner ear, provide information about head position in space. Thus, we can perceive whether we are upside down or right-side up while riding a roller coaster. Vestibular receptors also tell us the direction in which our head is moving through space, and how fast it is moving—such as when we are riding an elevator or jumping on a trampoline. Intact vestibular processing contributes to many fundamental physical functions, including keeping our balance, sustaining muscle tone to stay upright against gravity, maintaining alertness, coordinating head and eye movements (e.g., when turning our head to look at a sign while riding in a car), and coordinating the two sides of the body.

The proprioceptive sense provides information about the position and movement of body

parts. Proprioceptive receptors in muscles and joints enable people to know whether their fingers are bent or straight when they have their hands inside pockets. This internal sense of how body joints are positioned is important for planning how to move the body and for adjusting movements to maneuver around obstacles. Proprioceptive awareness also enables people to gauge how much pressure to use when manipulating toys or touching other people.

The preschool years are a critical developmental period for the vestibular and proprioceptive senses. Both senses are activated when children engage in movement activities such as running, jumping, rolling across the floor, or twirling around when dancing. Preschool children need plenty of movement experiences throughout the day to support the development of these two important senses.<sup>24</sup>

Often, children with special needs have difficulty in processing vestibular or proprioceptive sensations, which affects their ability to explore their environments, to interact with others, and to learn.<sup>25</sup>



*“You really know how they fly. Have you seen them before?” Alejandro said, “Yes, I saw many around my house.”*

In this movement activity, the teacher integrates learning with other areas of the preschool curriculum and learning that includes fundamental movement skills. The line on the floor that she draws will separate the throwing area from the landing area. That line also gives children a point of reference to adjust their throwing. Most children will automatically adjust their position (i.e., closer to the line or farther from the line) according to their ability levels. The teacher makes the activity developmentally appropriate by allowing children to make adjustments. Children will fly their birds and throw their paper balls and they have some connection to the birds and balls because they created them. This is another way to create connections and meaning for the activities. Finding out where the birds and balls land gives children a chance to integrate knowledge about their community with fundamental movement skills. In this activity, the teacher can also integrate knowledge from the areas of visual and performing arts with the realities of their community. The ways they move to collect their birds and balls provide them with opportunities to practice locomotor skills and movement concepts. Children can also learn which of the two objects flies better and how to control their bodies to make the objects fly higher or farther. They use their locomotor skills and perceptual skills to go get their airplanes without bumping into each other. They can pretend to be birds and explore movement concepts.

Alejandro, the child who wanted to show the teacher how birds fly, may have difficulty throwing but clearly understands the action even though he cannot demonstrate it with his paper bird. Some

children understand the concepts but cannot produce the desired movements, and they benefit from opportunities to express themselves. The teacher also integrated the children’s past pleasant experiences into the activity when she asked them to walk on mud. The ideas for connection become countless when teachers begin to consider the possibilities for integration.

In relation to manipulative skills, children here were working on throwing and fine motor skills prior to the activity. This activity may move them into stepping naturally, after their throw, or may help loosen their bodies for the step-and-throw action to evolve. They will have used their fine motor skills in the preparation and construction of birds and paper balls. The teacher could incorporate more unique places in the community, geometric shapes, animals, numbers, or letters as landing targets and have other pretend landing scenarios that incorporate other academic areas into this activity.

## Engaging Families

Teachers need to develop some patterns for continuous communication with parents and caregivers. Families are an important force in children’s lives and in the physical activities children engage in. Some people believe that fundamental movement skills are only used outdoors. Although the outdoor environment offers a series of appealing possibilities, such as open space and the chance to use all-out force, indoor spaces also offer an array of opportunities for continued practice of the fundamental movement skills.

- ✓ Create a newsletter to be given to parents and family members periodically. Photos of their children, pictures, and documents in the family’s home language about what their children are learning about fundamental



movement skills can be included. This may require translation; however, the connection with the families is worth the effort. Provide some stories and pictures of children in action.

- ✓ Provide suggestions for activities that will support children's continuous fundamental motor skill development. Be specific about how. For instance, suggest to parents and family members that when they go to the park, they can ask their child to show a balance position or a balance movement they learned at preschool, demonstrate a favorite way to move fast or slow, or show how he or she plays with balls.
- ✓ Ask parents and family members about the kind of balance, locomotor, and manipulative activities they did when they were young children. They can write them down or verbally communicate with the teachers and their children. This information can be incorporated into future activities and open a door of communication to discuss physical development in the past and in the present. Talk about the importance of physical development for both boys and girls and how gender issues may affect children. Girls already receive encouragement for manipulative skills, as do boys for locomotor skills. These reflections and conversations can bring opportunities to close this gap and explain to parents the importance of physical activity in today's society.
- ✓ Encourage parents and family members to ask their children about the movement skills the children are learning at their preschool.
- ✓ Inform parents about the importance of having their children wear comfortable clothes and shoes so they can

move easily and freely during physical development activities.

- ✓ Ask children to show their parents and family members the movements they are learning at their preschool.
- ✓ Have a parents' "Show and Tell Day" where children show and tell parents their favorite fundamental movement skills.
- ✓ Ask children to identify the movement skills of the athletes in sport games family members are watching and then demonstrate those skills. This is a way to engage family members' interest in their child's fundamental movement skills development.
- ✓ Suggest ways for children to help around the home and at the same time practice their fundamental movement skills. Examples include matching and rolling their socks and tossing them from a short distance into the laundry basket or drawer. Helping to unpack groceries and placing them on shelves provides children with an activity to develop manipulative skills and strengthen their hands. Parents and children can create a safe obstacle course in their home where children can move under and over furniture by using locomotor skills.
- ✓ Encourage parents and family members to provide time for children to perform independent daily living activities, such as brushing teeth or getting dressed. Children need time to manipulate objects such as toothpaste caps, zippers on their clothing, and lids of food containers.
- ✓ Encourage parents and family members to take their children outside to safe, open spaces and play areas where they can use fundamental movement skills.





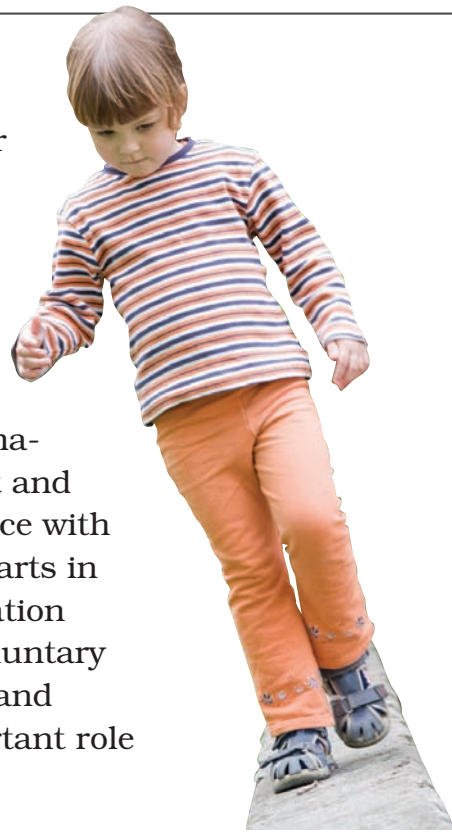
### ***Questions for Reflection***

1. In what areas of your program can you incorporate fundamental movement skills? How can you integrate and make meaningful connections with other domains of learning, such as language and literacy, social–emotional development, and mathematics?
2. What aspects of the indoor and outdoor environments can you modify to help children advance in the development of fundamental movement skills?
3. What tasks can you modify to facilitate the development of more efficient fundamental movement skills? How can you modify these tasks?
4. How can fundamental movement activities be modified to include children with disabilities and special needs?
5. How can family culture, language, and diversity be incorporated into fundamental movement activities? How can ideas and materials from children’s different cultures be included in fine motor activities and games?
6. In what ways can you encourage the practice of fundamental movement skills at home?



## Perceptual-Motor Skills and Movement Concepts

Perceptual-motor skills and movement concepts are essential to all facets of young children's lives. Perceptual-motor coordination is the process of receiving, interpreting, and using information from all of the body's senses. Perceptual-motor development requires children to integrate both sensory and motor abilities to carry out physical activities. For example, to walk across a balance beam, children take in sensory information from multiple senses. They see the height and dimensions of the balance beam, feel its surface with their feet, and feel the position of their body parts in space. Children then use this sensory information to plan how they will step on the beam. All voluntary movement involves an element of perception, and perceptual-motor coordination plays an important role in children's development of movement skills.



Movement concepts are the cognitive component of movement. Preschool children gain important knowledge about how the body can move in an almost endless variety of ways. For example, they learn to move at different speeds and with different degrees of force, in various pathways, around different types of obstacles, and in relation to other people. They are also acquiring new vocabulary (e.g., *zigzag*, *under*, or *behind*) that describe their movement experiences. Movement concepts enable children to

problem-solve how the body should move during certain activities and situations. For example, walking across ice requires children to take slow, light steps, while walking in sand requires heavier steps. Movement concepts provide critical foundations for learning how to move in novel situations (e.g., when playing new sport). To become proficient movers, children need to acquire both the movement skills and the movement concepts underlying those skills.



Children enter preschool with various experiences and abilities in perceptual-motor coordination and understanding of movement concepts. Children's growth in perceptual-motor skills and movement concepts leads to increased success and confidence when exploring, performing personal care, and playing cooperatively with others. Perceptual-motor skills and movement concepts are also key building blocks for future learning in areas such as reading, writing, and mathematics. Preschool programs promote children's development of perceptual-motor skills and movement concepts by engaging children in a variety of movement experiences and by increasing their cognitive understanding of movement. When teachers and family members become aware of the importance of perceptual-motor skills and intentionally teach these skills, they lay important foundations for children to successfully learn and participate in all of life's activities.



In this section, strategies are provided to promote development in each of the following substrands:

- 1.0 Body Awareness
- 2.0 Spatial Awareness
- 3.0 Directional Awareness



## 1.0 Body Awareness

During the preschool years, children's knowledge of their bodies becomes more accurate and specific. They develop a clear understanding of how body parts interrelate (e.g., the shoulder connects to the arm, which connects to the hand). Children are also learning to identify, describe, and differentiate an increasing number of body parts. Furthermore, they can demonstrate different ways to move

specific body parts (e.g., the shoulder can move up and down, out to the side, or in a circular motion). Body awareness is necessary for coordinating physical movements when new skills are being learned, such as hopping or throwing. Accurate knowledge about body parts also enhances children's ability to care for their own bodies, such as during toileting, bathing, and dressing.

### VIGNETTE

*Ms. Elena approaches the dramatic play area, where Deepa and Jorge are playing together. Both children greet their teacher with a hug and then resume playing. Jorge, a child who is a very new English learner, picks up a shiny bracelet and shows Deepa. "Put that here!" Deepa says enthusiastically as she points to her wrist. Jorge puts the bracelet on Deepa, and both children smile while admiring the bracelet. Ms. Elena exclaims, "What a sparkly bracelet Deepa has on her wrist!" as Ms. Elena lightly touches Deepa's wrist. Ms. Elena smiles at Jorge and says, "Pulsera en su muñeca (Bracelet on her wrist)." She touches the bracelet as she says "pulsera" and lightly taps Jorge's wrist when she says "muñeca."*

### TEACHABLE MOMENT

▶ Ms. Elena took the opportunity to introduce body-parts vocabulary within the meaningful context of a child-initiated play activity. She utilized a **multisensory** teaching approach by providing verbal modeling, visual prompts, and touch feedback to both children. In this scenario, the teacher had determined that both children would be comfortable with having her touch their wrists; it is important to consider each child's comfort level with receiving physical touch from teachers. Ms. Elena modeled vocabulary in each child's home language. For more information about strategies to support children who are English learners, see the *California Preschool Curriculum Framework, Volume 1*, chapter 5.





## Interactions and Strategies

**Use multisensory teaching strategies to reinforce children’s learning.** Whenever possible, incorporate multiple senses to teach a concept. For example, if teaching children about the elbow, the following strategies may be used: (1) visual, by the teacher holding up or pointing to his own elbows or asking children to find elbows in pictures; (2) auditory, by modeling and prompting children to say the word *elbow* during both planned and unplanned activities; and (3) touch and movement, such as by having children wiggle their elbows, rub their elbows, touch a friend’s elbow, or put a sticker on one of their elbows.

**Use body-parts vocabulary in the child’s home language.** When working with children who are English learners, obtain written words and auditory recordings of vocabulary in children’s home languages from family members or interpreters. Incorporate children’s home languages when teaching body parts. Teachers can also use the home language of children who are English learners during songs. For example, if there are Spanish speakers, teachers can teach the “Head, Shoulders, Knees, and Toes” song with Spanish translations of the key words (i.e., *cabeza, hombros, rodillas, y dedos*). Children who are English learners may learn more easily when instruction is available in their home languages, and *all children* benefit from exposure to additional languages.

**Use alternative communication methods, as appropriate, to teach body-parts vocabulary.** Some children with special needs may communicate by using sign language, picture communication systems, or other augmentative

communication methods. Incorporate the child’s familiar communication method when introducing body parts vocabulary. All children in the preschool program may benefit from the additional visual cues provided by sign language or pictures.

**Use body-parts vocabulary in the natural context of daily living activities and child-initiated play.** For example, during handwashing, the teacher can demonstrate by rubbing his hands together and say, “Rub your *palms* together like this.” If a child is exploring art media, the teacher may say, “Wow, you put the elephant stamp on your *forearm*.”

**Introduce body-parts vocabulary during structured group games.** Games such as Simon Says can teach body awareness. When playing Simon Says, give all children the chance to play for the entire duration of the game. Assist children to correct their movements or postures rather than taking them out of the game if they make errors. Dice games can also be used to teach body parts. Teachers can make “body-parts dice” by placing pictures of different body parts on each side of a small cardboard box. Children take turns rolling the die and leading the group in a body movement. For example, if a child rolls the “ankle” picture, she may choose to have everyone make circles with their ankles.

**Engage children in singing and movement activities to teach body parts.** Singing group songs provides multisensory learning opportunities with music, body movements, and visual modeling. For example, when singing the “Spider on the Floor” song, teachers can lead children in touching and pointing to the body parts from the lyrics. “The Mulberry Bush” song can be adapted into a body-awareness activity by asking children



to take turns choosing body parts and movements to sing about. For example, the lyrics can be “This is the way we wiggle our hips” or “This is the way we shrug our shoulders.” When singing “If You’re Happy and You Know It,” teachers can also introduce body-parts vocabulary with corresponding movements—for example, “If you’re happy and you know it, tap your chin.”

**Encourage children to identify and describe body parts in books or in pictures of themselves and family members.** Match the difficulty level of the prompting questions to the child’s abilities. For example, a teacher can say, “Where is daddy’s nose?” and allow the child to respond by pointing. With a different child, the teacher can give a more open-ended prompt such as, “Tell me about Daddy’s face.”

**Provide opportunities for dress-up play.** Children learn body awareness through the process of exploring clothing items and accessories, looking at themselves and each other during dress-up, and talking about what they are wearing. Teachers can also narrate children’s play



using body-parts vocabulary, such as by saying: “You have a necklace around your *neck*.” Some children may also enjoy dressing up dolls, action figures, or stuffed animals. In addition to promoting body awareness, dress-up play also provides the opportunity to develop pretend play, social interaction, language, and fine motor manipulation skills.

**Provide opportunities for children to see external representations of their bodies.** Seeing external images of their bodies through playing in front of mirrors, making body shadows, or tracing body parts (e.g., hands or feet) onto paper enhances development of children’s “visual maps” of their body parts.

**Provide constructional play for children to build or put together body parts.** Children can use play dough or clay to make people or animals. Preschool children may also enjoy making collages by cutting out pictures of different body parts from magazines. Provide puzzles, felt boards, or self-sticking hook-and-eye surfaces for children to assemble faces and bodies.

**Ask children to describe their drawings of people.** Between the ages of four and five, many children begin to make rudimentary drawings of people. Please refer to the visual and performing arts foundations in the *California Preschool Learning Foundations, Volume 2*, for more information about children’s drawing skills. Children are often motivated to draw pictures of themselves or a significant person such as a family member. Encourage the child to talk about the drawing and model the usage of body-parts vocabulary when commenting on the child’s drawing.



## 2.0 Spatial Awareness

**S**patial awareness enables children to understand their location and the location of objects and people around them. Preschool children are learning to judge how much space their bodies and other objects take up and whether something is “close” or “far.” They are also developing vocabulary for describing the position of two objects relative to one another, such as whether a ball is “in front of” or “behind” them. Children gain awareness of their body dimensions and body position by physically exploring their world and by maneuvering around different obstacles (both people and objects) during play.

Activities that require children to push, pull, squeeze or do other “heavy work” against resistance provide amplified sensory feedback to children’s bodies and are effective for developing spatial awareness. Moreover, the type of touch sensation experienced during “heavy work” activities is generally well tolerated by most children, including those who have difficulty tolerating other types of touch sensations (e.g., light touch, wet or messy textures). Spatial awareness is an important skill that will support children’s development in multiple domains, including Physical Development, Math (see the *California Preschool Curriculum Framework, Volume 1*, chapter 6, “Mathematics,” Geometry strand), and

Visual and Performing Arts (see chapter 2, “Visual and Performing Arts,” Dance strand).

### Developmental Sequence of Spatial Awareness

- Around three years of age, a child bumps into others who are close by during all types of activities.
- Around four years of age, a child participates in seated activities without bumping into others.
- Around five years of age, a child participates in standing activities (primarily staying in place) without bumping into others.
- Around five and a half years of age, during a locomotor activity in which children move in the same direction (e.g., pretending to walk like a row of ducklings or marching in a parade), a child, with prompting, maintains space around self without bumping into others.
- Around six years of age, during a locomotor or movement activity in which children move in different directions (e.g., chasing games or dancing), a child maintains space around self without bumping into others.<sup>26</sup>

#### VIGNETTE

*During outside play, Mr. Clay brings several phone books, recycled bubble-wrap material, and a large cardboard box with cutouts. Ming (a child who uses a wheelchair), Lana, and Spencer go over to see what their teacher is doing. Mr. Clay indicates, “I am setting up an obstacle course. Would you all like to help?” The children all agree excitedly.*

*Ming points to the box and asks, “Is this a tunnel?”*



---

**PLANNING  
LEARNING  
OPPORTUNITIES**

*Mr. Clay replies, “Ming, I think this would make a great tunnel. What do the rest of you think?” The teacher facilitates the children’s discussion as they decide this will be a tunnel in the mountains. “Where is a good place for the tunnel?” asks Mr. Clay. The children look around, and Lana says, “Over there,” while pointing. Mr. Clay replies, “Great idea, Lana. There is a space over there, between the sandbox and the grass area.” The three children work together to push the box over.*

Teachers can promote the development of spatial awareness by providing fun movement activities that require children to figure out how to maneuver their bodies over, under, or around various obstacles. By designing the obstacle course as a small-group activity, teachers give children the opportunity to use spatial awareness to maintain an appropriate distance from other children. Materials used in the obstacle course are simple yet versatile for providing variations in movement experiences. For example, children can jump on, step over, or zigzag around the pieces of bubble wrap. Asking children to help with setup or cleanup requires them to coordinate their own body spaces and positions with each other and the objects. Teachers can also introduce vocabulary for spatial concepts when giving verbal instructions (e.g., using the word “between”).

**VIGNETTE**

*Jamar brings a ladybug in a container to show his friends at preschool. He arrives at preschool with his grandfather, Elijah, who says, “Jamar, put the ladybug on the table behind you.” When Jamar looks at his grandfather with a slightly puzzled look, Elijah repeats, “Behind you, Jamar,” while simultaneously pointing to the table. Jamar then walks to the table using his walker, takes the ladybug container out of his walker pouch, and places the container on the table. Ms. Julia, who has been observing, says to Jamar, “Wow, I like your ladybug! We sometimes have to turn our bodies around to get to things ‘behind’ us, right?” Jamar nods and then goes to find his friends. Ms. Julia takes this opportunity to talk to Jamar’s grandfather. She says, “Jamar is learning many new words. By using the word ‘behind’ and also pointing in that direction, you helped Jamar learn what ‘behind’ means.”*

---

**TEACHABLE  
MOMENT**

Jamar’s grandfather spontaneously used an effective multi-sensory strategy (i.e., using both words and gestures) to teach Jamar the spatial concept “behind.” Ms. Julia took the opportunity to reinforce Jamar’s understanding of the





concept. She also provided feedback to Jamar's grandfather to increase his awareness about the learning process that just occurred and to encourage the family member to continue these types of interactions with the child. Adults can help children develop a sense of position by modeling and teaching positional vocabulary in natural contexts.<sup>27</sup>

## Interactions and Strategies

**Set up obstacles courses** that encourage children to go over, under, and through objects. General household objects and recyclable items (e.g., cardboard boxes, phone books, or ropes) can be easily adapted for outdoor or indoor use.

**Provide opportunities for children to experience moving at different levels of body positioning, ranging from high to low.** Guide children to practice high-level movements by asking them to be as “tall” as possible while pretending to be storybook characters (e.g., Clifford the giant dog) or tall animals (e.g., a giraffe). Encourage children to move at lower levels by asking them to pretend to be animals, such as a snake sliding across the sand or a bunny hopping across the field. Teachers can also provide physical obstacles for children to negotiate, such as using a long Styrofoam noodle for Limbo (where children have to pass underneath the target without using hands) or creating a tunnel with cardboard boxes for crawling.

**Provide games for children to explore changing the size of their bodies.** Ask children to make their bodies as “small” or “big” as possible when pretending to be different animals or characters. For example, when acting out “Goldilocks and the Three Bears,” encourage children

to make their bodies small for Baby Bear and big for Papa Bear.

**Play games that allow children to move around with objects balanced on different parts of their body.** For example, ask children to crawl or move with a beanbag on their shoulder or on top of their head.

**Provide pushing and pulling games with peers.** Two to three children can work together to push or pull each other across the room or playground while seated in a cardboard box, storage bin, or wagon. For an additional challenge, children can transport blocks or beanbags in addition to the “passenger.” Children may be motivated to participate when provided with pretend-play themes—for example, pretending to be the school bus, an airplane, or race car.

**Play games that require two to three children to work together to transport a large, lightweight object.** Children will experience many spatial-awareness challenges when coordinating their own body positions with others to carry large items (such as a sheet or blanket, a large poster board or cardboard, or a long pole) in the context of play.

**Use dancing and musical games to promote the development of spatial awareness and body control.** Group games, such as musical hoops or musical statues, provide fun opportunities for



children to practice starting and stopping their movements while navigating around furniture and other people. When playing musical hoops, keep enough hoops and allow children to share their hoops so that all children can participate and learn about sharing. To play musical statues, children dance whenever the music is playing and “freeze” like statues whenever the music stops. Recognize that children can engage in large or small movements to participate in this activity.

**Use positional-concepts vocabulary within the natural context of daily routines.** For example, during toileting, the teacher may say, “Did you pull your pants up all the way in the *back*?” When assisting a child to pack up to go home, the teacher may say, “Let’s put your things *inside* your backpack.”

**Have children participate in cleanup routines by putting away toys.** Cleanup activities require children to use spatial skills to place play objects back into containers. Children also apply positional concepts when putting away containers, such as understanding that the bin of play dough goes on the *top* shelf and the car and truck bin goes on the *bottom* shelf.

**Engage children in helper roles by performing “heavy work” activities.** Heavy work activities include pushing, pulling, squeezing, or carrying objects. While engaging in heavy work, children develop body awareness and spatial awareness as their muscles and joints receive amplified sensory information. Heavy work may have a calming and organizing effect for children who have attention or sensory processing challenges.<sup>28, 29</sup> Teachers can reinforce positional concepts when giving instructions during heavy work, such as by saying, “Please stack the chairs *on top*

*of the table*” or “Please put the apples *next to* the milk at the snack table.”

**Narrate or ask questions about children’s play using positional-concepts vocabulary in English and the child’s home language.** When children are playing “car wash,” a teacher may comment or sign to the child, “I wonder if you will wash the *front* or the *back* of the car first?” or “Wow, the *side* of this truck looks much cleaner now.” During constructional play, a teacher may ask, “Are you going to build your house *close to* the train station?”

**Engage children in songs and rhymes with body movements or spatial concepts.** For example, when singing the “Hokey Pokey,” emphasize the words “in” and “out” and demonstrate the actions for children to follow. The “Ring Around the Rosie” song provides opportunities for children to learn the concepts of up and down. Teachers can also engage children in a spatial-concepts activity by adapting the lyrics of “Where Is Thumbkin?” Provide a stationary object (e.g., a large beach ball) and ask a child to pick a way to position himself relative to the object. For example, if Dylan chooses to position himself behind the ball, the group would sing, “Where is Dylan? Where is Dylan? There he is. There he is. He’s behind the ball. He’s behind the ball. Wave to Dylan! Wave to Dylan!”

**Reinforce spatial concepts when reading or looking at books.** Reading books together not only promotes language and literacy development, but also can teach movement concepts. Encourage children to describe locations of characters or objects in pictures. Reading and acting out books with spatial-concept themes (e.g., “Going on a Bear Hunt” or “Three Little Monkeys Jumping on the Bed”) help to reinforce children’s emerging spatial vocabulary.



**Use props or play objects to guide children in positioning their bodies.**

For example, provide individual carpet squares for children to sit on during circle time and explain that each carpet square is his or her space. Place hula hoops or draw circles on the ground and ask small groups of children to sit within the boundaries when playing games that requires children to be “close” to each other.

**Use the child’s home language to introduce spatial-concepts vocabulary.**

When working with children who are English learners, provide written words and an auditory recording of key vocabulary for distance (e.g., close, far) and position in space (e.g., under, over, in front of, behind, next to) in children’s home languages. Teachers can obtain translations from other teaching and support staff, bilingual assistants, and family or community members. Incorporate vocabulary in the child’s home language when giving instructions (e.g., “Stand *behind* the rope”) or when describing the child’s play (e.g., “You are *next to* your fort”). For more information about strategies to support children who are English learners, see the *California Preschool Curriculum Framework, Volume 1*, chapter 5.

**Provide alternative ways for children with physical disabilities or other special needs to learn spatial concepts.**

Children who lack the mobility to participate in active physical play may not have the same opportunities for physical exploration. Teachers can provide alternative learning activities for children, such as manipulating dolls and actions figures during pretend play or identifying positions of characters and objects in books. When possible, it is helpful for the child to have the physical experience of moving through different positions. Children who are blind or have visual impairments may need extra assistance to explore their physical environments. Talk with the specialists working with the child to discover how to best support this learning. For resources for working with children with disabilities or other special needs, see appendix D of the *California Preschool Curriculum Framework, Volume 1*.

**Provide additional cues and assistance as needed to ensure safety for children who have spatial-awareness challenges.** Some children with special needs, such as those with hearing or visual impairments, may need extra help to avoid bumping into other people or environmental obstacles during play and daily routines. Sometimes children do not have an accurate awareness of their body dimensions or position in space. Other times they may not be able to plan or sequence movements (i.e., motor plan) in order to negotiate obstacles or climb onto/off playground equipment. Teachers can help by providing extra verbal prompts, visual aids, or physical guidance as appropriate. Always consult with family members and specialists working with the child.



### 3.0 Directional Awareness

When provided with opportunities to move their bodies through space in different directions, preschool children are learning what it means and how it feels to move up, down, forward, and backward. They later learn the concept of moving sideways. Most preschool children begin to understand that their bodies have two sides but cannot yet identify the left or right side of their body. Children are also learning to identify the top, bottom, front, or back of objects, but they do not clearly understand that objects have a left or right side. Preschool children also enjoy following pathways on the floor or creating their own movement pathways, such as straight, curved, or zigzag. Teachers can promote



the development of preschool children's directional awareness by providing both planned games and child-initiated play to encourage children to move their bodies in different ways.

#### Developmental Sequence of Directional Awareness

- As children mature, they develop their "sense of direction" in a predictable sequence.
- Between ages two and three, children can identify front/back and top/bottom on their own bodies.
- Around age four, children are aware that their bodies have two distinct sides and are learning to determine which side is left and which is right.
- By age six or seven, children can accurately identify the left and right sides on their own body parts.
- Around age eight, children become aware that objects also have a left and right side.
- Older children (age ten or older) can give directions to another person, such as "Go down the hall and turn left to get to the school office." They can accurately identify the left and right sides on another person, even if the person is facing a different direction.<sup>30, 31, 32</sup>

#### VIGNETTE

*During outdoor play, Ms. Jodi notices several children playing the "Mirror, Mirror" game, which they learned yesterday during a teacher-guided group activity. Harpreet, one of the more outgoing children, is the leader. She makes gestures with her arms and gets into different postures (e.g., standing on tiptoes or on one foot), and the others imitate her. After a few minutes, Ms. Jodi comments, "I see how all of you are paying attention to the leader and doing the same thing as Harpreet. Would it be fun to try to copy her if she moves in different directions?" The children are excited about this new way to play the*





game, but Kai asks, “Like what?” Ms. Jodi explains, “For example, if I were the leader, I could move forward [she simultaneously demonstrating each movement] . . . backward . . . sideways . . . or even turn my body all the way around in a circle.” The children have fun exploring this new variation of the game. After several minutes, Ms. Jodi suggests that Miya, who is usually reserved and quiet, take a turn being the leader. Miya smiles and agrees.

### TEACHABLE MOMENT

Ms. Jodi creates an opportunity for the children to explore directional concepts by suggesting a variation to a movement game they already know and enjoy. The teacher provides verbal instructions and visual modeling of the movements. If needed, the teacher can also provide hands-on assistance to help children with their movements. If children seem to be catching on as the game continues, Ms. Jodi can suggest additional challenges, such as moving at a faster pace or holding hands with a partner while moving. The teacher adjusts the pace of the game so that children experience a sense of success yet remain engaged and challenged by the variety in the movement experiences. Ms. Jodi also encourages a quiet child to take a turn at being the leader. Children benefit from the opportunity to both follow and lead movements.

## Interactions and Strategies

**Provide opportunities for child-initiated play in areas with open space.** The outside environment is ideal for allowing children to explore moving their bodies while running, chasing, jumping, or moving alongside other children. Indoor spaces can also be adapted to create open spaces for children to run, chase, and move about freely.

**Provide safe environments in which children can climb up and down.** Climbing experiences can occur in a variety of environments, such as outside on play equipment; in a designated inside area, where children can climb onto the top of a mountain of cushions; or out in the community, where children can climb steps.

**Encourage children to move in different directions and in different types of pathways (e.g., straight, curved, or zigzag) during group movement games.** During games such as Follow the Leader, provide opportunities for children to move in different directions, including forward, backward, and sideways. To encourage children to move in curved or zigzag pathways, use visual guides for obstacle courses or treasure hunts in which children have to follow a path drawn on the ground with sidewalk chalk or taped on the floor with masking tape.

**Design activities for children to practice moving alongside or in a line with other people.** For example, moving alongside or behind another child while marching in a parade or dancing in a conga line provides a wonderful challenge for both directional awareness



and spatial awareness. Or have children practice staying in a line while pretending to march like ants or swim like ducklings. Games such as Red Light–Green Light provide an additional challenge by requiring children to control starting and stopping body movements frequently while moving alongside others. Suggest more challenging variations to Red Light–Green Light by asking children to move backwards or sideways.

**Play games that require children to coordinate moving with others to manage a physical object or prop.** For example, the teacher can suggest children to either move in a line or move around in a circle while everyone holds onto a section of a long rope. Children can work together to transport a large box across the room. During parachute play, teachers can ask all children to move around in a circle with the parachute. Children can also move forward toward the middle of the parachute to make the parachute “small” and then move backwards away from the middle to make the parachute “big.” A large sheet can serve as a parachute.



**Provide opportunities for children to move and use their bodies with force.** Some young children may receive more sensory feedback about their body movements when they use a large amount of force. Thus, children may benefit from

a safe environment to crash their bodies into a pile of pillows or cushions, stomp hard on a sheet of bubble-wrap material taped on the ground, or push heavy boxes up a slope. In particular, some children who have disabilities or other special needs may seek and benefit from opportunities to move their bodies with force. Give all children clear safety guidelines for the activities and set up the environment to ensure safety.

**Provide opportunities for children to move and use their bodies lightly.** Children learn how much force to use by practicing both forceful and light movements. Provide games for children to move their bodies while handling light objects, such as transporting a feather or plastic egg on a mixing spoon across the room. Soft, slow music also encourages light movements. Be aware of different children’s responses to light touch, which may be perceived as uncomfortable by some children.

**Engage children in two-handed play activities.** Provide percussion instruments for children to bang together or shake with both hands during movement activities, such as dancing or marching. Examples of homemade percussion toys include paper tubes filled with small rocks or beads, pots and pans (including lids), and metal cups, plates, and utensils. Many fine motor activities (e.g., opening containers, lacing, stringing beads) also incorporate use of both hands. Using two hands together during play increases children’s awareness of the two sides of their body.

**Position drawing activities vertically.** When children draw at a vertical surface, they are able to apply directional concepts to their drawings more easily because the paper is oriented the same way, (i.e., vertically) as their body. For



example, if children understand *up* and *down* movements with their own body, they can use their own body orientation as a guide when learning to draw *up* and *down* lines on a piece of paper.

**Provide pretend-play activities to reinforce directional concepts.** During pretend play, children can “drive” vehicles or move action figures in different directions. Teachers can comment or ask about the children’s play, such as by saying, “I wonder if the fire engine is going to *back up* to get *closer* to the building?” or “I wonder if the firefighter is going to climb *up* the tree to find the cat?”



**Use the child’s home language for introducing directional-concepts vocabulary.**

When working with children who are English learners, provide written words and auditory recordings of key vocabulary for directional concepts (e.g., forward, backward, sideways). Incorporate vocabulary in the child’s home language when giving instructions (e.g., “Let’s walk backwards”) or when describing the child’s play (e.g., “You are jumping sideways”). For more information about strategies to support children who are English learners, see the *California Preschool Curriculum Framework, Volume 1*, chapter 5.

**Adapt movement experiences as needed for children with physical disabilities.** Some children with physical disabilities may not be able to move their body in different directions through space. However, they still benefit from the experience of moving forward, backwards, or sideways in a wagon or wheelchair.



## Bringing It All Together

Several children in Mr. Clay's class are interested in trains, and during circle time they read a book about trains. Later that day, a group of children go through the obstacle course outdoors. Spencer asks, "I wonder if a train could go through our tunnel." Ming responds, "Yeah, the train in the book went through mountain tunnels." Mr. Clay suggests, "Well, maybe this obstacle course is a railroad today?" The children all agree excitedly.

Children begin to go through the obstacle pretending to be trains and saying "choo-choo" along the way. After awhile, Mr. Clay asks, "Do any of you trains want to carry freight?" "I do!" volunteers Mei enthusiastically. Mr. Clay retrieves a bucket of beanbags, which will be the trains' freight. The teacher asks Mei, "Mei the Train, where will you carry your freight?" Mei replies, "here" while pointing to her shoulder. "On your shoulder? Great idea!" responds Mr. Clay. As children continue with the activity, Mr. Clay assists them in coming up with other variations, such as having everyone line up in a row and stay close together as one long train. When Ming gets to the cardboard tunnel, the teacher lifts up the cardboard box to provide clearance for Ming and his wheelchair to fit through the tunnel. Later, the teacher asks, "I wonder if it would be fun for the trains to go in reverse?" "What's reverse?" Spencer asks. Ming responds, "I know! Watch this," and demonstrates wheeling his wheelchair backwards.

In this vignette, the teacher thoughtfully incorporates perceptual-motor skills and movement concepts into a child-initiated movement activity. Mr.

Clay reinforces body awareness by asking Mei to decide how she would be carrying her freight and thoughtfully used the word "shoulder" in a meaningful context. Spatial awareness is required for negotiating the obstacle course while maintaining appropriate physical positioning with peers. The teacher introduces directional concepts by suggesting "reverse" movements. The children are motivated by the pretend-play theme, and the teacher uses the train theme to create variations and challenges to the activity. Mr. Clay provides an integrated learning experience by using the physical play activity to reinforce "train" vocabulary and concepts from an earlier circle-time activity. This vignette also illustrates how a child who uses a wheelchair for mobility is able to participate fully alongside his peers when given a simple accommodation (i.e., the teacher lifting up the cardboard box momentarily).

### Engaging Families

The following suggestions to family members may promote their children's development in the area of perceptual-motor skills and movement concepts.

- ✓ Encourage children to use words or signs to identify or describe their body parts when they are completing personal-care activities such as getting dressed or bathing.
- ✓ Provide opportunities for children to interact with adults and help around the home with activities such as putting away their toys, putting away groceries, sorting laundry, or bringing dirty dishes to the kitchen.





- ✓ When out in the community, such as at the park or grocery store, communicate with children about objects in the environment. Encourage them to describe where trees, buildings, cars, and other objects are located in relation to one another.
- ✓ When looking at books or pictures together, talk about how the characters are positioned and how they are moving their bodies.
- ✓ When children are playing, ask them to describe what they are doing with their bodies.

### *Questions for Reflection*

1. What is your current level of knowledge, experience, and comfort with promoting the development of perceptual-motor skills and movement concepts in young children? What specific topics do you want to learn more about? What resources can you access for more information?
2. How would you recognize if children in your program were experiencing challenges with perceptual-motor skills and movement concepts? How might it look when a child is having difficulty with body awareness, spatial awareness, or directional awareness?
3. How can you use pretend-play themes and children's interests to provide variety and challenges to the movement activities in order to promote development of body awareness, spatial awareness, and directional awareness?
4. How can you enlist children as helpers for group activities? Which activities would be beneficial for their perceptual development?
5. How can you thoughtfully use vocabulary for body parts, positional concepts, and directional concepts more often throughout the school day?
6. What types of activities, environmental supports, and teaching strategies may promote the development of perceptual-motor skills and movement concepts for children who are English learners?
7. What types of activities, environmental supports, and teaching strategies may promote the development of perceptual-motor skills and movement concepts for children with special needs?



## Active Physical Play

**A**ctive play is essential to the optimal physical development and overall health of young children. Physical activity embedded throughout the preschool day promotes children's ability to attend to, learn, and regulate their emotional responses. Active physical play not only enhances the body's physiological functions (i.e., physical fitness), it promotes optimal brain chemistry for self-regulation and enhances learning readiness.<sup>33,34</sup> As such, it should be fully integrated into the regular preschool day.



Active physical play contributes markedly to enhancing children's fundamental movement skills in three principal areas: balance, locomotion, and both gross and fine motor manipulation. Both typically developing children<sup>35,36</sup> and those with special needs benefit.<sup>37,38</sup> Furthermore, the perceptual-motor components also discussed earlier are promoted through active physical play. Activities that promote body awareness, spatial awareness, and directional awareness engage the senses as children move through space.<sup>39</sup>

To derive the maximum health-related benefits, children should engage in active play on most days of the week, in an environment that promotes enjoyment, safety, and success. These benefits include increases in **muscular strength, muscular endurance**, and joint **flexibility** as well as improved **aerobic endurance** and **body composition**. Proper nutrition and adequate hydration also play important roles in young children's active physical play. Both of these topics are covered in greater detail in the *California Preschool*

*Learning Foundations, Volume 2* and in chapter 4, "Health."

Young children can be easily engaged in movement and benefit immensely from an active way of life. The habits of physical activity that children learn in the early years greatly increase the chance that children will continue being physically active throughout childhood and beyond. Most importantly, children must see active play as fun. Your regular participation with children will do much to model the joy of moving. You can take almost any indoor or outdoor physical activity, give it a name, and make it a game. Children are active learners. For most, physical activity is fun. Your enthusiastic participation with children will go a long way to motivate them for continued active play. The three sub-strands of Active Physical Play are:

- 1.0 Active Participation
- 2.0 Cardiovascular Endurance
- 3.0 Muscular Strength, Muscular Endurance, and Flexibility



## 1.0 Active Participation

When the large muscles of the body are fully engaged, young children learn more effectively and also derive important health and physical fitness benefits. Active physical play contributes measurably to all aspects of physical fitness. Physical fitness is defined as a set of physical attributes related to a person's ability to perform activities that require cardiovascular endurance, muscular strength, muscular endurance, and joint flexibility. Although genetic inheritance does play a role, physical fitness is largely determined by regular participation in moderate to vigorous physical activity.

Moderate physical activities use large muscle groups and include walking,

water play under a garden sprinkler, and dancing for short periods of time. Vigorous physical activities elevate the heart rate significantly and sustain an elevated rate. Activities such as running for several minutes at a time, tricycle riding up an incline, dancing to music that helps maintain an elevated heart rate, and repeatedly jumping over a rope for a sustained period are vigorous physical activities. Young children need to be involved in moderate to vigorous physical activity almost daily, at home and at school. Moderate to vigorous activity that is enjoyable, developmentally appropriate, and adapted to the needs of each child increases children's physical fitness levels.

### VIGNETTE

*Anna and Bethany, two preschool-age girls, live in urban, high-rise apartment buildings that limit the opportunity for physical activity. At home they watch television, play computer games, and engage in a variety of sedentary activities. Their outdoor play is restricted because of their parents' concern for safety. Fortunately, they are enrolled in preschool programs where there are well-informed teachers who are just as concerned with and knowledgeable about children's physical development as they are with their social-emotional and cognitive development.*

*At Anna's preschool, Ms. Jennifer has created both indoor and outdoor spaces that encourage increased physical activity. Indoors, Ms. Jennifer has taken a corner of the room and outfitted it with beanbags, soft balls, beach balls, and scarves for manipulative activities; floor markings, rubber spots, and sturdy boxes of varying heights to encourage jumping; and a tunnel made from discarded packing boxes to encourage crawling and imagery activities. Outdoors, Ms. Jennifer has provided tricycles, hand carts, wagons, musical instruments and music CDs that encourage active movement for sustained periods, and a variety of climbing, hanging, and swinging equipment to promote vigorous physical activity.*

*Bethany's teacher, Ms. Ellie, has less access to play equipment and space but still engages the children in many physical activities. Indoors, she provides frequent learning activities in which she leads the children through a story play, nursery rhyme, or song that involves*



*the use of the major muscle groups of the body. Outdoors, Ms. Ellie relies on the natural terrain of the small outdoor play area and actively engages children by offering movement challenges, problem-solving activities, and imagery that encourages increased physical activity.*

*Anna and Bethany love preschool for many reasons. Chief among them is the opportunity to engage in a variety of indoor and outdoor play activities that are fun and not possible at home. Their parents are also pleased with the programs not only because they are “fun,” as Anna and Bethany insist, but also because the activities give their children regular opportunities for sustained gross motor play that improves their fundamental movement skills, perceptual-motor abilities, and active participation in moderate to vigorous physical activities.*

---

**TEACHABLE  
MOMENT**

▶ At the beginning of the school year, the teacher observes that Anna is reluctant to engage in large muscle activities and much prefers sedentary activities. Approaching Anna, Ms. Jennifer says, “Let’s go to the movement area and play with the beach balls.” Ms. Jennifer has created an indoor movement area by using a small space in a corner of the room where children play with materials such as streamers, scarves, beanbags, and hoops to promote increased physical activity. Working with Anna and others who spontaneously gravitate to the movement center, Ms. Jennifer poses a set of progressive movement challenges in the form of questions such as: “Can you bat the beach ball on the floor?” “Can you hit it real hard/real soft/on one side/on the other side?” “High/down low?” “Can you hit the beach ball to make it roll on the floor from this side of the room to the other side? Can you keep running after your beach ball while rolling it on the ground?” “Can you move about the room while keeping the beach ball rolling on the floor?” “Can you make funny faces while keeping the beach ball on the ground?” “Can you find new ways to hit your beach ball to keep it rolling on the ground?” Ms. Jennifer provides plenty of verbal reinforcement to Anna and the other children, acknowledging their attempts and offering new and progressively more challenging movement problems. Finally, she encourages small groups of two or three children to roll the ball back and forth on the ground. She retreats from the space, leaving Anna and the other children to discover new ways of playing with the beach balls.

---

**PLANNING  
LEARNING  
OPPORTUNITIES**

▶ By carefully observing children and their activity preferences, teachers and parents can provide support to children in exploring and experimenting with new objects and active play.





Children who have not had an opportunity to ride a tricycle, play on a climbing apparatus, or express themselves to music, as well as children with other special needs, might need extra support and encouragement. Teachers can guide children to try new activities by breaking the activity down into its simplest components and building skill upon skill. For example, for a child who has never been on a climbing dome, the teacher may first encourage him to climb to only the lowest rung and to then try to move all the way around the dome on just the lowest rung. Later the teacher may encourage him to climb higher and eventually to the top. Care should be taken to go at the child's pace in building skills and to let the child take the initiative to explore, experiment, and discover at her own pace.

#### VIGNETTE

*The class goes to the playground. It is the first time for Elisa. While other children are climbing, swinging, and sliding, Elisa looks intimidated. Ms. Martinez wants to her go up the steps to the top of the slide. Elisa refuses to go up and starts to shake. Ms. Martinez stays close to Elisa while paying close attention to other children. The next time they come to the playground, Ms. Martinez brings a ball with her so that Elisa can play on the ground. A few times later, Ms. Martinez notices that Elisa ventures to the stairs of the slide, cautiously making baby steps. "You can do it!" Ms. Martinez encourages her. After Elisa has made a few steps, Ms. Martinez says, "You did it! You made one more step than last time!" Two months later, Elisa climbs up the stairs and slides down on her own: "I did it!" she says. Ms. Martinez gives her a big hug, and the whole class cheers for Elisa.*

#### TEACHABLE MOMENT

Many children from low-income families are not exposed to parks before they enter preschool. In some low-income neighborhoods, there are not enough clean and safe parks suitable for young children. Some parents are not aware of the importance of bringing children to parks or do not have time to do so. Children's initial responses to parks may be very different. Some children may cry and may not want to leave the park after playing there for the first time. They may be intimidated by these new activities. This vignette captures the process through which a teacher helps a child who has had limited play experiences on the playground overcome her fear and strategically get to master one type of popular play equipment.



## Interactions and Strategies

### **Provide ample opportunities for children to engage daily in active play.**

Play is the “learning laboratory” of children. It is a primary means by which they make contact with and make meaning of their rapidly expanding world. Children should participate in both self-directed play and guided play each day. Because young children tend to have low levels of endurance and short attention spans, their physical activity patterns are intermittent. The “Active Start” guidelines recommend at least 60 minutes of daily physical activity that can be broken into two or three bouts of 20 or 30 minutes. Actual instructional time for physical activity should be daily but for no more than 30 minutes at a time.<sup>40</sup> Additional time should be allotted daily for children to engage in self-directed play both indoors and outdoors. It is widely recommended that children accumulate at least 60 minutes and up to several hours of **unstructured physical activity** on each day of the week.<sup>41, 42, 43, 44</sup>

**Create inviting activity environments in which children can be physically active.** Fun is the primary motive for young children to engage in active play.



Without teacher interaction, children may not understand (or know) that the results of their physical activity or inactivity affect their physical fitness and overall health. Teachers therefore should “plant seeds” for understanding and model enthusiasm for being active movers. For example, the teacher may say, “Put your hand on your heart before and after running around the playground. Do you feel a difference? Is your heart beating faster or slower? Why?” Making an activity fun is the key to getting children moving and to sustaining active play that results in a fitness benefit.

**Help children identify appropriate places for different types of physical activity.** It is important for young children to know and respect what is appropriate for various indoor and outdoor play spaces. This is important for their own safety and enjoyment and that of others. See the “Research Highlight: Does Increasing Children’s Physical Activity really make a difference?” See page 198 for more information about the importance of physical activity for preschool children.

**Create an activity environment that is nurturing and supportive and allows likely success.** Children respond positively to encouragement and the process of building skill upon skill. Breaking an activity down into smaller steps promotes success. Participation attempts that have positive results tend to encourage further participation, which leads to improved body coordination. Preschool-age children do not fully master physical skills. However, they can attain increased competence in a wide range of activities. For example, when a child climbs on an apparatus, the teacher might first say, “See if you can climb as high as my head. I’ll be behind you and help if you



need it.” Later the teacher may say, “You climbed so high yesterday on the climbing gym. Let’s see if you can do it again and maybe even climb higher.” Finally the teacher may say, “You are so strong. See if you can climb to the top while I stand beneath you here at the bottom.”

**Encourage children to continue participation by providing opportunities for short but frequent rest periods during vigorous activity.** Low levels of strength and endurance make it necessary to take a short break for up to one minute during extended bouts of vigorous activity. Experienced teachers use this “down” time to encourage children, to check for understanding, and to monitor interest levels. If interest wanes, activity levels will decrease. So it may be time to transition to another activity or game or self-directed play. Oftentimes, giving a routine activity a name and making it a game will spark continued vigorous activity. For

example, rather than having the children just run or tricycle around the play area, call it the “Playground Super Challenge.” Have children pretend to be race cars and count laps out loud, or even better, try it yourself. Children often love to imitate adults. If they see you having fun, they will join in the fun too.

**Ensure that physical activity is sustained by providing personally meaningful and purposeful opportunities for children.** The primary reasons given by children for engaging in physical activities are to have fun and to make new friends. Teachers need to keep these two reasons in the forefront of their planning to facilitate success and enjoyment in a social context. Today’s children live in a world in which physical activity that results in improved fitness levels and positive health benefits has become an option rather than a necessity. The problem is well known and the culprits are many (e.g., TV, computer games, lack of space, city planning, personal safety).

**Recognize and take into account any environmental constraints.** Take time to observe and be responsible for the play environment. Are there barriers to participation such as insufficient or worn-out equipment, lack of materials, or limited play spaces? If so, these barriers need to be addressed to the best of your ability. When working with children with disabilities, it is especially important to assess potential barriers in the play space, accommodate for them (e.g., create ramps to eliminate stair barriers), and create environments that are educational, safe, and accessible. Proper clothing for the outdoor environment (e.g., shorts or slacks and an adequate shirt and head covering for sun protection) as well as adequate footwear (e.g., sneakers or sturdy shoes) are also important



considerations. Long dresses, baggy pants, flip-flops, and jelly shoes restrict movement and may result in injury. It will be helpful for adults to participate with the children by also wearing appropriate clothing for active play, both indoors and outdoors.

**Encourage physical exploration through play equipment and materials.**

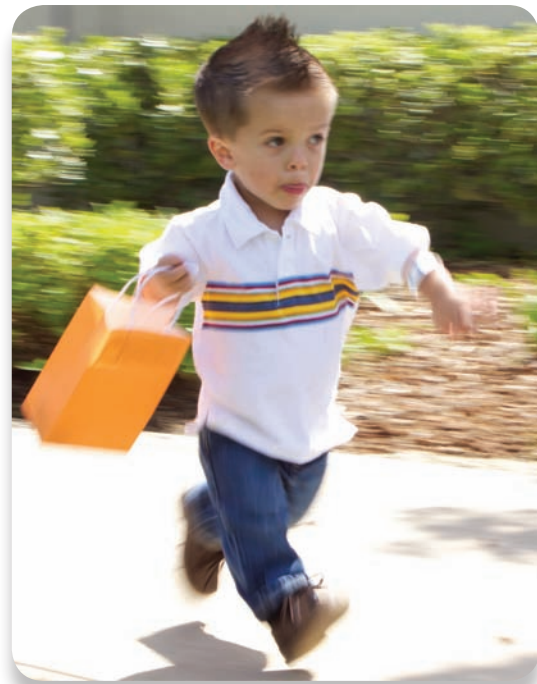
Equipment that is simple and versatile (e.g., hula hoops, ropes, balls, streamers, and recycled materials such as cardboard boxes, bubble-wrap material, PVC pipe, and hosiery) promotes physical development and learning. Ample opportunities to explore, experiment, and discover new ways of moving that capitalize on children's emerging sense of discovery, wonder, and risk taking are important.

**Research Highlight:  
Does Increasing Children's  
Physical Activity Really Make  
a Difference?**

A decisive "yes" was the answer to this important question which was cited in a review of 850 research articles and published in the *Journal of Pediatrics*.<sup>45,46</sup> The evidence strongly supported that children of school age who engage in relatively high levels of physical activity are less overweight than inactive children, have better cardiovascular endurance, and higher levels of muscular strength, endurance, and higher self-concepts. The authors conclude that "Increasing the level of habitual moderate- to vigorous-intensity physical activity in youth is a health promotion and disease-prevention strategy. Sedentary youngsters should progress toward the recommended level of physical activity gradually."

Providing adaptive toys and equipment is important to ensure that all children can participate in physical exploration.

**Respect differences in children's temperament and find creative ways to engage all children in active physical play.** Some children enjoy being ballerinas, while others prefer to be superheroes in their fantasy play. Some enjoy endless chasing and fleeing activities; others prefer kicking, bouncing, or throwing a ball as they pretend to be soccer, basketball, or baseball players. Still others enjoy rough-and-tumble activities in the outdoor play space. Others prefer nesting in a shady area or playing in the sandbox. It is important to recognize and respect these differences in temperament, but it is also important to find new and creative ways to get children moving in ways that elevate their heart rates; challenge their balance; locomotor, and manipulative skills; and promote increased levels of fitness.







## 2.0 Cardiovascular Endurance

The general assumption is that children are naturally active and that they get plenty of vigorous physical activity as a normal part of their day. The research, however, is not as supportive of this notion. Some children are sufficiently physically active to promote improved levels of cardiovascular endurance, but many are not. The rapidly increasing rate of obesity among young children in the United States attests to the need for children to be more active. Moderate to

vigorous levels of physical activity for sustained periods on all or most days of the week, coupled with proper nutrition, will do much to reverse this unfortunate trend that has impacted all cultural groups in American society. Building cardiovascular endurance involves exposing the body to an increased workload that raises the heart rate beyond its normal range of beats per minute and sustains that elevated rate for several minutes.

### VIGNETTE

*Paulo loves to run and to ride his tricycle. He enjoys running games and is eager to learn to ride a bicycle. He is fortunate because at preschool and at home there are plenty of opportunities to learn to ride safely with adult assistance. Running games are also encouraged on the large grassy areas at both home and preschool. Simply because of the way his environment is structured and the aid of helpful parents and teachers, Paulo is well on his way to enjoying a lifetime of vigorous physical activities that promote cardiovascular health.*

*Paulo's friend and next-door neighbor, Ian, is not as fortunate. Although he would also love to run and ride a tricycle, he has little opportunity or encouragement to do so. His home environment is one that focuses on regular participation in things other than physical activities. His parents are reluctant to encourage vigorous play activities because of time constraints and safety concerns. As a result, his preschool is the only place where Ian has both the opportunities and encouragement to be physically active.*

### TEACHABLE MOMENT

Ian's teachers recognize the need for children to increase their level of physical activity and the importance of vigorous activities such as running, jumping, and tricycle riding. They regularly send information sheets home that provide ideas for parents to play with their children. The teachers also invite family members and their preschool children to a family fun night once or twice each year. At these sessions they provide hands-on ideas for families to help them learn how to play with their children and engage them in physical activities that are healthful and fun even, when families have limited outdoor space.



## PLANNING LEARNING OPPORTUNITIES

Teachers can gain tremendous momentum on behalf of children's physical activity needs by partnering with family members and representatives from the local community, as well as with their own program leaders. Adults can work together to provide young children with designated play areas, open spaces, and the necessary equipment to promote vigorous physical activity. The health benefits of regular physical activity are too great to be ignored.

## Interactions and Strategies

**Design the physical setting of the play environment to encourage moderate or vigorous physical activity.** Provide an inviting environment for sustaining elevated heart rates by offering large open spaces; climbing, hanging, and swinging apparatus; as well as natural places to climb, crawl, and slide. Locating and making regular use of open play spaces can be challenging in some communities, but the effort will be worth it in terms of promoting increased cardiovascular endurance.

**Engage children of all ability levels in activities that promote increased cardiovascular endurance.** The dramatic trend toward sedentary activity and less physical activity among all segments of American children may be attributed to many factors. Television, computer games, neighborhood design, family customs and dietary habits, and lack of adequate spaces for young children to play safely are among the most frequently cited. Reversing this trend takes conscious and sustained effort on the part of both parents and teachers. Take time to consider the activity levels of your children and look for ways to engage them in moderate to vigorous physical activities

that are viewed as purposeful, meaningful, and fun. Children with disabilities that result in low muscle tone (hypotonia) may benefit from extra encouragement to initiate physical activities; initiation of physical activities may be particularly effortful for children with low muscle tone.

**Promote increased cardiovascular endurance through chasing and fleeing activities.** Children love to chase and be chased. A simple game of tag or games that raise the heart rate promote improved cardiovascular endurance.

**Promote cardiovascular endurance through the use of riding toys that require sustained pedaling or cranking.** Mobility toys are excellent ways to promote cardiovascular endurance through active participation. Tricycles, "hot wheel" carts, and hand-cranked tricycles provide children the thrill of fast movement, sheer enjoyment, and the potential for sustaining an elevated heart rate for several minutes at a time.

**Use imagery as an effective tool in promoting moderate to vigorous physical activity.** Permitting children to be superheroes complete with cape (an old bath towel will do) on the playground or outdoor play space is a simple way to encourage them to be aerobically active.



The use of props, such as cardboard boxes or a bed sheet draped over a table, creates an environment that promotes active fantasy play.

**Provide positive encouragement for participation.** Positive encouragement is both the teachers' and parents' primary avenue for sustaining active physical play. Recognizing effort, and not just results, is important because children are attuned to what we say and how we say it. The use of rich, descriptive language that recognizes effort encourages children's continued participation. Starting with a positive comment, following with a helpful instructional hint, and finishing with an encouraging statement is a simple technique that works, even with young children. Breaking down an



activity into small steps and building skill upon skill promotes feelings of success. It is important to check for understanding (e.g., "What was it that I asked you to try when you threw the ball?"). Getting immediate feedback from the child (e.g., "You jumped down from the top of the climber. How did it make you feel?") promotes skill building and continued participation.

**Promote increased physical activity through story plays.** Story plays that act out familiar children's stories and nursery rhymes can be an effective group activity for promoting increased physical activity. Taking an imaginary trip to the jungle to photograph the animals can be fun and can elevate young heart rates for several minutes. Pretending to be firefighters on the way to a fire, reeling out the hoses, fighting the fire, and returning to the fire station can result in heart-pounding fun.

**Promote cardiovascular endurance through dance and rhythmic activities.** Children often love to move to music. They shake and wiggle and move about in an attempt to keep time with the music. Including music that children know from home serves to encourage them to practice familiar dance steps as well as create a natural bridge between home and school communities. Props such as scarves, ribbons, and homemade musical instruments further encourage actively moving to the music and assist children in sustaining this increased physical activity.



### 3.0 Muscular Strength, Muscular Endurance, and Flexibility

Children who are active naturally increase their muscular strength, muscular endurance, and joint flexibility. By definition, muscular strength is the ability to perform one maximum effort, such as lifting a heavy weight overhead, or picking up a heavy object off the ground. Muscular endurance is the ability to perform work repeatedly. It is not recommended that children prior to puberty engage in maximum strength efforts through high-resistance activities. Instead, it is recommended that children engage in low-resistance activities with multiple repetitions.<sup>47</sup> Keep this important concept in mind when planning activities for children. Low-resistance activities that are continually repetitive—such as swimming, riding a tricycle, or pushing one’s wheelchair up a gradual incline or around the playground, walking distances, running, and jumping—will promote both muscular endurance and cardiovascular

endurance. They also contribute to strengthening the muscles used.

Active young children are generally quite flexible. Flexibility is the ability of a joint to move through its full, intended range of motion. With disuse, joints become less flexible. Older children entering the prepubescent growth spurt often experience a dramatic decrease in joint flexibility. During this period, growth is frequently so rapid that muscles and tendons have yet to catch up to increased body proportions. Preserving joint flexibility throughout life requires maintaining an active way of life and engaging in activities that promote stretching. Failure to do so will result in the gradual lessening of flexibility and a tightening of the muscles and tendons around the joints. Some children with physical disabilities are more vulnerable to loss of flexibility; thus, play activities that incorporate stretching are particularly beneficial.

#### VIGNETTE

*During outdoor play activities, several boys and girls love running around the playground pretending to be superheroes, who can perform amazing feats of strength and daring. Their teacher picks up on their spontaneous play and decides to encourage it as a means of promoting the children’s muscular strength and endurance and flexibility. Using donated bath towels and pillowcases, Mr. Lee fashions colorful capes for his class of superheroes. Pretending to be a superhero himself, the teacher leads the class several times each week on a “mission” that involves bending, stretching, reaching, lifting, pushing, pulling, and other activities that make them “strong” superheroes who always succeed in their mission to help others in need. Mr. Lee’s clever use of imagery makes the “heavy work” of superheroes fun and has the net effect of promoting increased strength, endurance, and flexibility.*

#### TEACHABLE MOMENT

During the play activity, Adam and Alec and their friends, Julie and Mai, ask Mr. Lee to show his “muscles” and to make his “arm big.” Mr. Lee cheerfully obliges and flexes his biceps. The





**PLANNING  
LEARNING  
OPPORTUNITIES**

children are fascinated and want to flex their biceps also. When they try, however, they see little change in the muscle. Disappointed, they ask Mr. Lee why they do not see much of a difference.

Now is an excellent time for Mr. Lee to remind children that being strong is not all about having big muscles. Being strong is about being able to do more work than one could do before. To be able to play longer, climb higher, and run faster than before are the important signs of being strong. Mr. Lee emphasizes that real “superheroes” do not need big, bulging muscles to be strong. But they do need to work their muscles every day in active play to get stronger and to be able to do more than they could before.

Children who are reluctant to engage in new movement activities are inhibited for many reasons. Some are afraid of failing and lack the confidence to try new activities. Others may be self-conscious and afraid of looking “silly” in front of others. Still others may not be used to the spontaneous nature of active play. Or they may feel uncomfortable due to limited ease in communicating with peers who speak a different language. Whatever the reason, reluctant movers can be encouraged by incorporating a few simple guidelines. Invite the child to take part. Do not insist on participation. First try, “Would you like to go to the movement center?” If the child hesitates, take the next step by offering to go to the movement center together and playing together.

Children often love it when you take time to play with them. When you are at the movement center, make the experience positive and fun-filled. You can do this by asking a series of movement questions that progressively challenge the child to try new ways of moving. These movement challenges provide open-ended opportunities for experimentation, exploration, and discovery of new and fun ways of moving. For example, moving on a chalk line can be made into a circus high-wire act in which you and the other children, who are sure to join in, perform a series of “daring” moves as you all move from one end of the wire to the other. Questions to foster progressive movement might be as follows: “Can you move on the high wire from one end to the other?” “How can you use your arms to help you balance?” “Can you find three new ways to get from one end of the high wire to the other without falling off?” “Can you make a half turn/full turn while keeping your feet on the wire?”



## Interactions and Strategies

**Encourage the development of muscular strength and endurance through building activities that involve performing “work” repeatedly.** The “work” of children is active play. Providing ample opportunities for self-directed play, encouraging physical activity, and serving as a role model for physical activity will do much to spur children to increase their activity level. Teachers standing with their arms folded and enjoying a “break” during outdoor play time do little

### Research Highlight: Strength Training for Young Children: Is It Okay?

**Strength training** for prepubescent children can be beneficial if properly supervised at all times. Boys and girls, including preschoolers, can increase their strength by engaging in low-resistance, high-repetition activities. Maximum efforts, however, are not safe and have no place in strength training for children. These are the conclusions arrived at by the American Academy of Pediatrics and published in a 2001 position statement entitled *Strength Training by Children and Adolescents*.<sup>48</sup>

With proper supervision, strength-training activities can benefit children by promoting gains in strength and endurance, injury reduction, and improved performance. It must be stressed that strength training is much different from weight lifting. Strength training involves the use of progressive resistance and several repetitions. Weight lifting is a sport in which one attempts to make a single maximal lift, as in the bench press or overhead press. Weight lifting is strongly discouraged for all prepubescent children.

in the way of modeling to encourage children to be active. However, teachers who are actively engaged with children from time to time and who encourage children (verbally or by using sign language) promote increased physical activity.

**Promote cardiovascular endurance through repeated muscular endurance activities.** Children engaged in rough-and-tumble play, tricycle riding, and a game of tag are simultaneously improving both their muscular endurance and cardiovascular endurance.

**Promote muscular endurance and strength in the muscles of the upper body through the use of playground equipment that encourages climbing, hanging, and swinging.** Children enjoy the thrill of climbing to the top of the jungle gym or climbing on a rope ladder to the top of an apparatus. In doing so, they test their newly developing climbing skills and increase their muscular strength and endurance. Care should be taken to ensure the safety of participants on any climbing apparatus. Instruction should be provided on the **safety grip** (see figure 3.5): the thumb curls under the fingers when grasping an object.

Figure 3.5

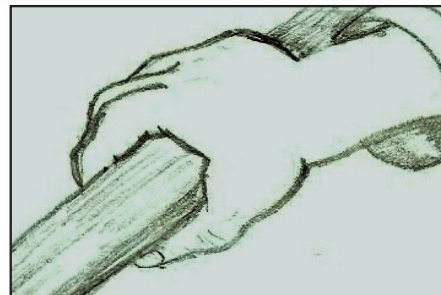


Illustration by Laura Bridges

**Allow for supervised risk taking.** Risk taking, when properly supervised, is a natural and desirable response by children as they test their developing



strength, endurance, and flexibility. Testing the ability to climb higher, jump from a greater height, swing higher and higher, or twirl until losing balance are natural challenges for young children. Proper supervision is, of course, essential. But so too is an environment that permits and celebrates reasonable risk taking. Some children and adults are reluctant to try new and challenging physical activities. They may be afraid of injury or being in an unsettling situation. The three keys to proper supervision are to:

- build skill upon skill (e.g., “Try sliding down or climb up the low slide before the high one”);
- be close by to encourage verbally (e.g., “You can do it”);
- be close enough to assist physically (but only as needed).

Some children with special needs engage in extreme risk-taking behavior. Careful monitoring of the environment and each child’s actions is needed.

**Engage children in the setup of the play space and the return of materials to their original space.** This practice not only promotes group cooperation and responsibility, it also promotes

increases in muscular endurance and strength. Children are generally eager to be of assistance. Helping with setting up and taking down play equipment for an obstacle course can be used as a means to enhance muscular endurance. The obstacle course will be another way to get physically involved in repetitive movements. Workloads that are greater than normal, such as the pushing and pulling of an object, help build strong muscles and increase endurance. Make sure that obstacle courses involve some pulling and pushing, or change the equipment from one location to another.

**Promote increased joint flexibility through animal walks, nursery rhymes, and story plays.** Animal walks such as walking like a bear, giraffe, puppy dog, or frog, promote joint flexibility as do movement songs such as “Head, Shoulders, Knees, and Toes” and “Itsy Bitsy Spider.” Engaging children in a story play that involves reaching high, stretching low, and twisting and turning from side to side—as in acting out “A Day at the Laundry” or “Picking Apples off the Tree”—promotes increased joint flexibility.

**Encourage practice in fundamental movement skills and perceptual-motor activities that contribute to children’s physical fitness.** Although the teacher’s attention may be focused on one aspect of motor, cognitive, or social-emotional development, the reality is that any given activity has the potential to contribute to development in multiple ways. For example, the game Crossing the Brook involves two lines that are drawn increasingly far apart, and the children jump across the “brook,” which provides them with practice in jumping repeatedly over greater distances. This game also helps children negotiate aspects of body and spatial awareness and promotes increased leg muscle endurance and joint flexibility.



---

---

## Bringing It All Together

---

*When the weather permits, Ms. Jennifer takes her class outdoors to play in the designated play space. She is intrigued by the many types of activities in which her children choose to engage. She is quick to notice that several are in almost perpetual motion, running to and fro with seemingly endless energy and little purpose to their activity. Others tend to gravitate to the sandbox and other fine motor activities. Still others are hesitant to explore and reluctant to participate in any self-initiated free-play activities. Knowing the importance of active physical play, Ms. Jennifer develops strategies intended to maximize meaningful participation in a variety of activities that promote active participation by all, cardiovascular endurance, muscular strength, muscular endurance, and joint flexibility. These strategies take into account children's personal preferences, likes and dislikes, and sense of success and accomplishment. Over several months of engaging in active play with children and encouraging them to try new things, she notices a decided change in behavior. The children are now more fully engaged in play activities that are purposeful, meaningful, safe, and fun.*

---

Being outdoors and observing the children as they spontaneously engage in a variety of activities can be an illuminating experience. Children have a tendency to gravitate to areas in which they experience success and enjoy learning. Some will be engaged in fine motor activities in the sandbox or with small objects. Others will be running about, wheeling their wheelchairs, or pedaling tricycles almost constantly. Some will be engaged with balls or other **manipulative**

**equipment**, and still others will be enjoying climbing, hanging, and swinging activities.

Such child-initiated play and individual differences in temperament should be recognized, respected, and encouraged. By creating a physical environment where all can find success and learning enjoyment, teachers do much to promote active participation by all children. Creativity in taking advantage of the natural environment, both indoors and outdoors, is needed for an endless variety of activities that promote fundamental movement and perceptual-motor skills and engage children in active physical play.

However, as teachers look around, they will notice that some children are hesitant to explore, experiment, and discover the joy of movement. For a wide variety of reasons including temperament and fears, both real and imagined, some young children hesitate to get involved in playground activities. Instead they seem to prefer sitting, waiting, and watching others as they play. This is an area where sensitive and caring adults can be influential. Teachers can help a hesitant child enter into a small group so the child can feel comfortable with the social and physical aspects of play. Furthermore, pairing children who speak the same home language often helps children who are English learners feel more comfortable and confident during play. By providing positive encouragement, offering to play with the child, adapting the play environment or materials to be more accessible, or providing simple instructional cues, teachers can do much to engage children in active play. Increased participation, cardiovascular endurance, muscular strength, muscular endurance, and flexibility will result.





Teachers can take time to observe children at play and reflect on how they might encourage active and more diverse physical play. Child-initiated play is encouraged and respected, but teacher-guided play can be a powerful motivator, especially for children who are reluctant to participate.

## Engaging Families

- ✓ **Create an “Activity Recall Chart” to be used in the classroom first, then at home.** To begin, teachers can use photocopied pages from a date book or daily planner, and colorful letters creatively drawn as an **S**, **M**, and **V** by the children in class as they learn about the differences in the levels of physical activity in which they can participate: **Sedentary**, **Moderate**, and **Vigorous**. It will be helpful to first try this activity in the classroom and then introduce it later at a family night for possible use at home. First, as a classroom activity help children chart their physical activities over the course of a school day. Young children will need help to recall their activities and how long they lasted. Classify each activity as **S** (*sedentary physical activities*, such as story or nap time); **M** (*moderate physical activities*, such as playing in the sandbox or doing other fine motor activities); or **V** (*vigorous physical activities*: such as climbing stairs, riding a tricycle, running, or engaging in rough-and-tumble play). Later, as a family activity, use the same letters drawn in school; colored stickers (e.g., red for sedentary, white for moderate, blue for vigorous) or animal stickers (hibernating animals such as bears for sedentary, cuddly animals such as koalas for moderate, speedy ani-
- mals such as jaguars for vigorous). At the end of the 24-hour period, family members total up the number of each letter (**S**, **M**, **V**) color (*red, white, blue*) or animal (*bears, koalas, jaguars*) representing sedentary, moderate, or vigorous physical activities. Be sure to take time to discuss what you can do as a family to put more moderate to vigorous activity into your day and why it is important.
- ✓ **Have a “Family Dance Party.”** Most children love to move to music. They enjoy wiggling, shaking, and moving in new and creative ways to the catchy beats of their favorite music. Take advantage of this natural urge to move by dancing with your children. Practice dances familiar to your culture and make up new ones for fun, enjoyment, and increased physical activity. Be sure to take time to discuss how dancing increases the heart rate and why it is fun and healthy to be physically active.
- ✓ **Model healthy behavior.** Modeling healthy behavior is a powerful way to effect change. Children are expert observers, and they observe the activity habits that adults engage in. Taking a walk as a family, playing a game of tag, or engaging in a family activity familiar to one’s cultural heritage can be a powerful means of promoting increased levels of physical activity.
- ✓ **Take an adventure walk to school.** Children in a neighborhood preschool program can become part of an adult-led Walk to School Day. Although it is not recommended that young children walk to school unaccompanied by a responsible adult, they can take part in an adult-led adventure walk. With an adult in the lead and one in the back, turn



your walk to school into a journey by “train.” The adults are the engine and caboose, and the children are the freight cars in between. Take time to stress safety by obeying traffic signs, crossing only at designated areas, and looking both ways before crossing streets.

- ✓ **Develop a list of “can do” family rules for active physical play.** Active family fun works best when there are ground rules for participation that respect the rights of other family members and promote a safe and healthful play environment for all. For example, children often love to jump and bounce, but doing so unsupervised on a sofa or bed could be dangerous. A family rule of where and under what circumstances jumping is permissible will go a long way to preventing injuries and saving your furniture. Be sure that your family rules form a short “can do” list rather than a long list of what is not allowed. It is much more affirming to say “Jumping on the bed is okay when mom or dad is present,” rather than “No jumping on the sofa or the bed.”
- ✓ **Take part in family rough-and-tumble play that respects the rights and wishes of all.** Children often enjoy the rough-and-tumble activities of playing horsey on top of a parent or wrestling on the living-room floor. These activities are worthwhile and promote active physical play by all, but they must be kept in perspective. It is of paramount importance to set rules of play in which the rights, responsibilities, and wishes of all are clearly understood and followed. For example, Family Trap is a rough-and-tumble game in which an adult ensnares a child in an arm or leg grasp and then,

after the child has made efforts to escape, releases the child. The adult may permit the child to determine if it is to be an “easy trap,” “medium trap,” or “hard trap.” It is fun to give each of the traps a name, such as the “mouse-trap,” “butterfly trap,” “alligator trap,” or even the much-anticipated “double dog trap.” There is, of course, no place for family play of this sort in which the child experiences pain or distress of *any* kind. If this does occur, immediately change the activity to something appropriate that the child finds to be fun.

- ✓ **Proper clothing for indoor and outdoor family activities is a must.** Proper clothing for active physical play need not be expensive or elaborate. It must, however, be appropriate to the activity and the playing conditions. Sturdy gym shoes, shorts (even under a dress) and an appropriate T-shirt or blouse will work well for most indoor activities. Special care, however, should be taken for sunny or cold outdoor conditions. Sun protection, in the form of a cap and sunscreen, is important, as are proper layering, mittens, a jacket, and scarf in the cold. Below-freezing temperatures are not a sufficient reason for remaining inside. Children, when properly clothed, enjoy the refreshing vigor of playing in cold weather.
- ✓ **Make a FITT activity chart.** At a family meeting, discuss the different types of activities that each family member likes; emphasize activities that get the heart pumping and muscles working. Try to follow the FITT principles: **F** stands for *Frequency* (how many times the activity is performed each week); **I** stands for *Intensity* (how hard one plays). **T** stands for *Type* (of activity).



And the second **T** stands for *Time* or *duration* (length of time of the activity). Make a weekly chart with the names of each family member and the physical play activities each one wants to engage in (e.g., walking, running, playing an active game, tricycling). Put a check mark or a star by each activity in which the family member participates during the week. At the

end of the week, discuss what everyone did and whether the four FITT principles were followed. Continue to build children's interest in participation by emphasizing fun and enjoyment and by joining in when possible. Adults who model of active physical play do much to encourage children to be active also.

### ***Questions for Reflection***

1. How can you increase young children's participation in moderate to vigorous physical activities on a sustained basis in your program?
2. What is your level of participation in moderate to vigorous physical activity? Do you need to increase your personal participation in active physical play in ways that demonstrate to children that you "love to move"?
3. What community, social, cultural, linguistic, or other environmental considerations might limit some children's participation in active physical play? How might these limitations be addressed in ways that are sensitive and respectful?
4. How can you increase children's level of active participation in ways that they find purposeful, meaningful, and fun?
5. Obesity rates among children and adults have risen dramatically over the past 20 years. How can preschool teachers, caregivers, and family members prevent or reverse this trend?
6. How can you adapt the program environment, materials, or activities to ensure that children with disabilities can participate alongside their peers in active physical play?
7. What are your views on physical risk taking by young children? Why might it be important to reevaluate your position? How might you negotiate with children to permit them to engage in reasonable and supervised risk-taking activities?



## Concluding Thoughts



Until recently, the physical development of young children was often taken for granted. Family members and caregivers had a tendency to assume that children, by virtue of being children, got plenty of physical activity as a normal part of their daily routine. The results of over a decade of research comparing the present, more sedentary generation of children to previous generations clearly reveals an alarming trend toward increased obesity, diabetes, asthma, and other health-impairing conditions.<sup>49</sup> Fortunately, a resurgence of interest in the vital importance of young children's physical development is taking place throughout California and the nation. Those working with young children have recognized that developing fundamental movement skills; learning perceptual-motor skills and movement concepts, and engaging in active physical play are essential to the total balanced development of children.<sup>50</sup>

The development of fundamental movement skills provides a basis for an active way of life. Attaining proficiency in a myriad of fundamental balance, locomotor, and manipulative skills equips children for active participation in physical activities for a lifetime. Perceptual-motor skills and basic movement concepts are important to the many time and space concepts

that children acquire as they get ready for more formal types of instruction and learning. Body-awareness, spatial-awareness, and directional-awareness concepts can be taught and learned through both teacher-directed and self-directed play. However, children need encouragement, instruction, and sufficient opportunities for practice in supportive environments to learn fundamental movement skills, perceptual-motor skills, and movement concepts. Preschool programs and families play a critical role in maximizing children's development in these areas.

Active physical play in preschool is a means by which children (and adults) can engage in the physical activities that promote healthy lifestyles and a genuine zest for life. Through active participation in self-directed and adult-facilitated play, children acquire increased cardiovascular endurance, muscular endurance, muscular strength, and flexibility. Young children have not only movement skills and perceptual abilities; they also have the joy of movement. Learning to move and moving to learn are too important to be left to chance. Parents and teachers have a precious opportunity to help set the stage for young children to enjoy physical activity for a lifetime.





## Map of the Foundations



**Substrand** → **1.0 Balance**

	At around 48 months of age	At around 60 months of age
<b>Foundation</b> →	<b>1.1</b> Maintain balance while holding still; sometimes may need assistance.	<b>1.1</b> Show increasing balance and control when holding still.
<b>Examples</b> →	<ul style="list-style-type: none"> <li>• Pretends to be a flamingo by standing balanced on one foot, with or without assistance, for several seconds using arms to balance.</li> <li>• Stands still with eyes open; arms may swing side to side to maintain balance.</li> <li>• Able to "freeze" after running; arms may swing side to side to maintain balance.</li> <li>• Able to stand still while holding onto a shopping cart or walker.*</li> </ul>	<ul style="list-style-type: none"> <li>• Pretends to be a flamingo by standing on one foot, unassisted, for five or more seconds without touching a nearby object, such as a wall or a table, for support.</li> <li>• Balances on three body parts (for example, two hands and one foot).</li> <li>• Stands still while holding arms at side when the song says, "Freeze!"</li> <li>• Balances a beanbag on top of head for several seconds.</li> </ul>

**Age** ←

**Includes notes for children with disabilities** →

*Note:* Many examples in this section describe movement skills that may look different in children with physical disabilities. When possible, early educators should check with family and specialists regarding the child's movement skill development.

\*Walker: When used in examples, it indicates a therapeutic walker specifically prescribed for a child in need of support when walking.



## Selected Developmental Sequences

### Locomotor Skills

#### Sample Developmental Sequence of Running



##### Exploring level

Child runs with feet flat  
Arms are at the waist and move side to side  
Small steps, little bend of knees and little reach with legs



Child runs alternating flat feet with heel to toe action  
Bigger strides  
Arms are down to the side  
Knees bend less than 90 degrees  
Inconsistency



##### Integration level

Child runs showing opposition of arms and legs and heel to toe action  
Knees bend more than 90 degrees in recovery  
Increased speed, body leans forward  
Consistency



#### Sample Developmental Sequence of Jumping



##### Exploring level

Child brings arms back on takeoff  
Legs do not completely extend  
Body bends  
Small vertical jump



Child brings arms sideways on the takeoff  
Arms do a complete circle at takeoff  
Body leans forward and jumps forward  
Body and legs flexed during flight phase  
Lands on hands and feet  
Inconsistency



##### Integration level

Child swings arms forward over head  
Body gets extended during the flight phase, jump is diagonal  
Lands on feet  
Consistency



Designed by Clersida Garcia and illustrated by Xuyen Garcia, 2010.



### Sample Developmental Sequence of Hopping



**Exploring level**

Child holds hopping leg up with leg parallel to the floor. Body erect. Difficult to maintain leg up and hop.



Hopping leg flexed and moves up and down

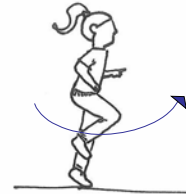
Forceful hops; arms pull up

Body leans forward too much

Leg hangs behind the body

Arms uncoordinated

Inconsistency



**Integration level**

Child swings leg as in a pendulum action. Shows opposition of arm and leg. Smooth, rhythmical hopping. Body leans forward.

Consistency



### Sample Developmental Sequence of Skipping



**Exploring level**

Child has difficulty alternating feet. May hop, step, or run while trying.

Arms bilateral and uncoordinated.



Deliberated skip

High skips

Arms used to pull body up

Slow rhythm

Arm used bilaterally

Uneasy skips

Inconsistency



**Integration level**

Child shows smooth alternative skip. Smooth and rhythmical pattern. Arms used contra-laterally in opposition to legs.

Consistency



Designed by Clersida Garcia and illustrated by Xuyen Garcia, 2010.



## Fundamental Manipulative Skills

### Sample Developmental Sequence of Catching



#### Exploring level

Child is stationary and usually misses the ball



Child begins to use hands, arms, and chest to successfully catch the ball

May step toward the ball

Begins to catch with hands only

Inconsistency



#### Integration level

Child usually moves feet to catch successfully, using hands only

Consistency catching



### Sample Developmental Sequence of Throwing



#### Exploring level

Child is stationary and usually brings arm up, flexed or extended, and throws down with arm action only



Child begins to homo-laterally step

Arm windup upward and moves down during the throw

Arm moves upward during windup and sideways during the throw, sometimes body rotates (block rotation of body)

Homo-laterally steps and may maintain straddle position for several throws

Homo-lateral and contra-lateral steps (inconsistency). Throws facing target.

Big step is contra-lateral most of the time; side faces target.



#### Integration level

Arm windup down; back below waist.

Throw showing arm lag, lower body rotates first, then upper body (sequential rotation)

Consistency

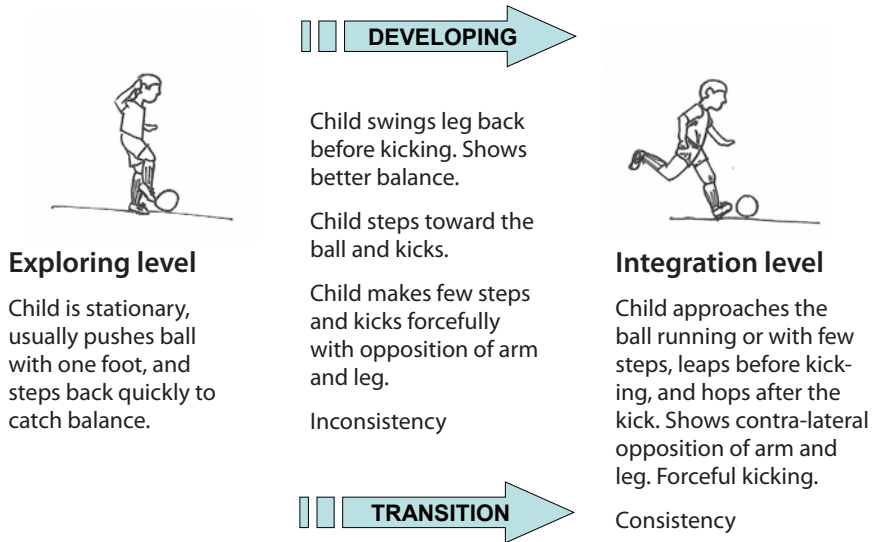


Designed by Clersida Garcia and illustrated by Xuyen Garcia, 2010.

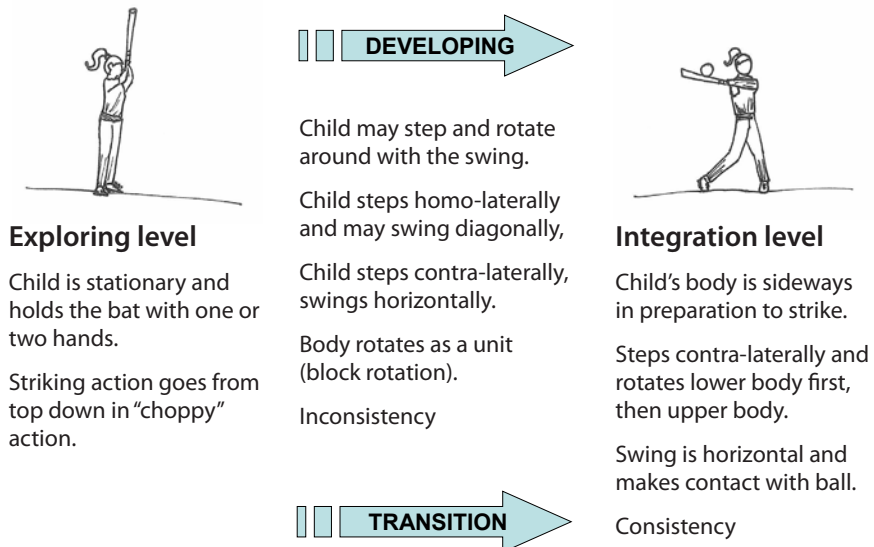




### Sample Developmental Sequence of Kicking



### Sample Developmental Sequence of Striking



Designed by Clersida Garcia and illustrated by Xuyen Garcia, 2010.



---

---

## Teacher Resources

---

**Alliance for Technology Access (ATA).**

<http://www.ataccess.org/pdf/WeCanPlay.pdf>  
(p. 14). *Playgrounds for Everyone*.

Suggestions and resources for creating universally accessible outdoor play areas for children.

Bissell, J., and others. 1998. *Sensory Motor Handbook* (Second edition). San Antonio, TX: Therapy Skill Builders.

This book provides fun and easy activities to implement at home or at a center. Activities are designed to develop gross motor, fine motor, and oral motor skills.

Blaydes Madigan, J. 2004. *Thinking on Your Feet* (Second edition). Murphy, TX: Action Based Learning.

This book provides ideas, games and activities on how movement enhances learning in all academic subject matters. Can be used from prekindergarten to sixth grade.

Brack, J. C. 2004. *Learn to Move, Move to Learn! Sensorimotor Early Childhood Activity Themes*. Shawnee Mission, KS: Autism Asperger Publishing Company.

This book, written by a pediatric occupational therapist, provides lesson plans for multisensory learning activities. It includes explanations about how each sensory system (e.g., vestibular, proprioceptive, touch, auditory, and visual) is addressed by the recommended activities.

Clement, R. 1995. *My Neighborhood Movement Challenges: Narratives, Games and Stunts for Ages Three Through Eight*. Reston, VA: National Association for Sport and Physical Education (NASPE).

Provides narratives taken from storybooks, tales, fables, rhymes, mimetic activities, challenges and games. Designed to reinforce the child's understanding of the body's movement capabilities.

Clements, R. L., and S. L. Schneider. 2006. *Movement-Based Learning: Academic Concepts and Physical Activity for Ages Three Through*

*Eight*. Reston, VA: National Association for Sport and Physical Education (NASPE).

This book provides a wealth of simple lesson plans using the NASPE National Standards for Quality Physical Education as a guide for fun, creative, and educationally sound activities.

**Council on Physical Education for Children.**

2000. *Appropriate Practices in Movement Programs for Young Children Ages 3–5. A Position Statement of the National Association for Sport and Physical Education*. Reston, VA: National Association for Sport and Physical Education (NASPE).

This publication provides clear descriptions of appropriate and inappropriate practices in movement programs for children ages three to five helps teachers and caregivers make sound curricular decisions.

Craft, D. H., and C. L. Smith. 2008. *Active Play: Fun Activities for Young Children*. Cortland, NY: Active Play Books.

This book comes with a DVD of toddlers and preschoolers moving and learning.

Davis, K., and S. Dixon. 2010. *When Actions Speak Louder than Words: Understanding the Challenging Behaviors of Young Children and Students with Disabilities*. Bloomington, IN: Solution Tree Press.

This excellent resource supports all children whose primary way to communicate is through challenging behaviors. It addresses the behaviors children use to communicate, the messages they may be sending, and how adults can ask six critical questions to better understand and meet children's needs.

**Erhardt Developmental Products.** <http://www.erhardtproducts.com/>

The company provides videos and publications about fine motor development in young children. Teachers can access helpful resources for working with children with disabilities.

**Fit Source: A Web Directory for Providers.**

<http://www.nccic.org/fitsource>. The Child Care Bureau, Administration for Children



and Families, U.S. Department of Health and Human Services.

The directory contains resources for incorporating physical activity into child care programs. It includes activity/game ideas, curricula plans, and information for parents.

Gallahue, D. L., and F. Cleland-Donnelly. 2003. *Developmental Physical Education for All Children* (Fourth edition). Champaign, IL: Human Kinetics.

This practical, easy-to-use resource for teachers incorporates the NASPE national standards for quality physical education for young children in age-appropriate, developmentally appropriate, and fun ways. Fundamental movement skill acquisition, perceptual-motor learning, and increased physical activity for young children are emphasized.

Gallahue, D. L., J. C. Ozmun, and J. D. Goodway. In press. *Understanding Motor Development: Infants, Children, Adolescents, and Adults* (Seventh Edition). Boston, MA: McGraw Hill.

Up-to-date theory and research on motor development throughout a lifespan with emphasis on growth development of children and youth.

**Handwriting Without Tears.** 2009. *The Pre-K Get Set for School*. <http://www.hwtears.com>.

A program developed for preschool children by a pediatric occupational therapist. This preschool workbook of activities includes music, movement, building, coloring, and sensory play for developing gross motor and fine motor control.

Haywood, K. M., and N. Getchell. 2009. *Life Span Motor Development* (Fifth edition). Champaign, IL: Human Kinetics.

The book presents research and theory on motor development throughout a lifespan using a constraints approach.

Jensen, E. 2005. *Teaching with Brain in Mind* (Second edition). Alexandria, VA: Association for Supervision and Curriculum Development. This book addresses brain anatomy, cooperation and competition in the brain, brain changes over time, and how the brain learns.

**National Association for Sport and Physical Education (NASPE).** 2004. *Moving Into the*

*Future: National Standards for Physical Education* (Second edition). Reston, VA: NASPE.

This excellent resource aligns curricula content with NASPE's voluntary national standards for excellence in physical education from kindergarten through grade twelve.

———. 2005. *Inicio Activo: Informa de Lineamientos de Actividad Fisica para Ninos desde el Nacimiento hasta los Cinco Anos de Edad*. Reston, VA: NASPE.

Spanish translation of the NASPE *Physical Activity Guidelines for Children Ages 3-5*.

———. 2009. *Active Start: A Statement of Physical Activity Guidelines for Children Birth to Age 5* (Second edition). Reston, VA: NASPE.

This excellent resource for parents and caregivers describes how to implement NASPE's Physical Activity Guidelines for infants, toddlers, and preschool children.

———. 2009. *Appropriate Practices in Movement Programs for Young Children Ages 3-5* (Third edition). Reston, VA: NASPE.

This guidebook of appropriate practices for children ages three through five is suitable for use by preschool teachers, daycare providers, caregivers, parents, and administrators.

**North Dakota State University of Agriculture and Applied Science,** NDSU Extension Service, 2003. <http://www.ext.nodak.edu/food/kidsnutrition/edu-2.htm#Resources>.

The Web site features children's books about physical activity.

Pica, R. 2003. *Teachable Transitions: 190 Activities to Move from Morning Circle to the End of the Day*. Silver Spring, MD: Gryphon House, Inc.

This book focuses on transitions during the preschool day and provides movement activities, songs, and finger plays to move smoothly from one activity to the next while holding the attention of waiting children.

———. 2006. *A Running Start: How Play, Physical Activity, and Free Time Create a Successful Child*. Emeryville, CA: Marlowe and Company.

This book addresses the importance of a balance between free play and structured activity and how physical activity contributes to brain



and intellectual development. It provides great practical ideas for parents to bring fun and play back into their homes and yards.

———. 2007. *Moving and Learning Across the Curriculum: More than 300 Activities and Games to Make Learning Fun* (Second edition). Florence, KY: Wadsworth.

This excellent resource for preschool teachers and parents provides fun movement activities related to all academic disciplines of the preschool curriculum.

———. 2008. *Physical Education for Young Children: Movement ABCs for the Little Ones*. Champaign, IL: Human Kinetics.

This book provides great ideas and activities for teaching basic movement to young children.

Ratey, J. J. 2008. *The Revolutionary New Science of Exercise and the Brain*. New York: Little, Brown and Company.

This book provides a fascinating journey through the mind-body connection, presenting startling new research to prove that exercise is the best defense against everything from mood disorders to attention deficit hyperactivity disorder to Alzheimer's and provides incontrovertible evidence that aerobic exercise physically transforms the brain for peak performance.

Staisiuna-Hurley, D. 2001. *Sensory Motor Activities for the Young Child*. Bisbee, AZ: Imaginart Press.

This book, written by a pediatric physical therapist, provides suggestions for simple movement activities. Each activity page includes what the activity works on, materials or setup needed, step-by-step instructions, and how to modify the activity. It is appropriate for both typically developing children and children with disabilities, ages three to seven years old.





## Endnotes

1. National Scientific Council on the Developing Child, *Rich Experiences, Physical Activity Create Healthy Brains*. Cambridge, MA: Center on the Developing Child, Harvard University, 2006. <http://www.developingchild.net> (accessed September 3, 2009).
2. National Association for Sport and Physical Education (NASPE), *Active Start: A Statement of Physical Activity Guidelines for Children Birth to Age 5*. Reston, VA: NASPE, 2009.
3. G. L. McCormack and others, "How Occupational Therapy Influences Neuroplasticity," *OT Practice* 14, no. 17 (2009): 1–8.
4. J. J. Ratey, *Spark: The Revolutionary New Science of Exercise and the Brain*. New York: Little, Brown and Company, Hachette Book Group, 2008, 10.
5. D. L. Gallahue and F. Cleland Donnelly, *Developmental Physical Education for All Children*, 4th ed. (Champaign, IL: Human Kinetics, 2003).
6. National Association for Sport and Physical Education (NASPE), *Active Start: A Statement of Physical Activity Guidelines for Children Birth to Age 5*. Reston, VA: 2009.
7. J. A. Blackman, "Attention-Deficit/Hyperactivity Disorder in Preschoolers. Does It Exist and Should We Treat It?" *Pediatric Clinics of North America* 46, no. 5 (1999): 1011–25.
8. T. Hunter, "Some Thoughts About Sitting Still," *Young Children* 55, no. 3 (2000): 50.
9. T. Schilling, and others, "Promoting Language Development Through Movement," *Teaching Elementary Physical Education* 17, no. 6 (2006): 39–42.
10. D. L. Schilling and I. S. Schwartz, "Alternative Seating for Young Children with Autism Spectrum Disorder: Effects on Classroom Behavior," *Journal of Autism and Developmental Disorders* 43, no. 4 (2004): 423–32.
11. D. L. Schilling and others, "Classroom Seating for Children with Attention Deficit Hyperactivity Disorder: Therapy Ball Versus Chairs," *American Journal of Occupational Therapy* 57, no. 5 (2003): 534–41.
12. T. Hunter, "Some Thoughts About Sitting Still," *Young Children* 55, no. 3 (2000): 50.

### Fundamental Movement Skills

13. K. M. Newell, "Constraints on the Development of Coordination," in *Motor Development in Children: Aspects of Coordination and Control*, ed. M. G. Wade and H. T. A. Whiting. Dordrecht (The Netherlands: Martinus Nijhoff, 1986): 341–61.
14. C. Garcia, "Gender Differences in Young Children's Interactions When Learning Fundamental Motor Skills," *Research Quarterly for Exercise and Sport* 65, no. 3 (1994): 213–25.
15. C. Garcia and L. Garcia, "Examining Developmental Changes in Throwing: A Close Up Look," *Motor Development Research and Reviews* 2 (2002): 62–95.
16. C. Garcia, "Gender Differences in Young Children's Interactions When Learning Fundamental Motor Skills," *Research Quarterly for Exercise and Sport* 65, no. 3 (1994): 213–25.
17. J. O. O'Brien and J. E. Lewin, "Translating Motor Control and Motor Learning Theory Into Occupational Therapy Practice for Children and Youth," *Occupational Therapy Practice* 13 (2008): CE1-8.
18. J. Case-Smith and N. Weintraub, "Hand Function and Developmental Coordination Disorder," in *Developmental Coordination Disorder*, ed. S. A. Cermak and D. Larkin (Albany, NY: Delmar, 2002).
19. S. Mori, M. Iteya, and C. Gabbard, "Hand Preference Consistency and Eye-Hand Coordination in Young Children During a Motor Task," *Perceptual and Motor Skills* 102, no. 1 (2006): 29–34.
20. R. P. Erhardt, *The Erhardt Hand Preference Assessment* (Maplewood, MN: Erhardt Developmental Products, 2006).



21. M. Annett, "Hand Preference Observed in Large Healthy Samples: Classification, Norms and Interpretations of Increased Non-Right-Handedness by the Right Shift Theory," *British Journal of Psychology* 95 (2004): 339–53.
22. Z. Goetz and N. Zeinik, "Handedness in Patients with Developmental Coordination Disorder," *Journal of Child Neurology* 23, no. 2 (2008): 151–54.
23. P. G. Hepper, S. Shahhidullah, and R. White, "Handedness in the Human Fetus," *Neuropsychologia* 29, no. 11 (1991): 1107–11.
24. S. J. Lane, "Structure and Function of the Sensory Systems," in *Sensory Integration: Theory and Practice*, 2nd ed. Edited by A. C. Bundy, S. J. Lane, and E. A. Murray (Philadelphia, PA: F. A. Davis Company, 2002), 35–70.
25. C. S. Kranowitz, *The Out-of-Sync Child: Recognizing and Coping with Sensory Processing Disorder* (New York: Penguin, 2005).

### Perceptual-Motor Skills and Movement Concepts

26. J. O'Brien and H. Williams, "Application of Motor Control/ Motor Learning to Practice," in *Occupational Therapy for Children*, 6th ed. Edited by J. Case-Smith and J. O'Brien (Maryland Heights, MO: Elsevier, 2010), 245–74.
27. C. Poole, "Development: Ages and Stages—Spatial Awareness," *Early Childhood Today* 20, no. 6 (2006): 25–30.
28. D. Fertel-Daly, G. Bedell, and J. Hinojosa, "Effects of a Weighted Vest on Attention to Task and Self-Stimulatory Behaviors in Preschoolers with Pervasive Developmental Disorders," *American Journal of Occupational Therapy* 55, no. 6 (2001): 629–40.
29. N. L. VandenBerg, "The Use of a Weighted Vest to Increase On-Task Behavior in Children with Attention Difficulties," *American Journal of Occupational Therapy* 55, no. 6 (2001): 621–28.
30. C. M. Schneck, "Visual Perception," in *Occupational Therapy for Children*, 5th ed. Edited by J. Case-Smith (St. Louis, MO: Elsevier Mosby, 2005).
31. M. N. Roncesvalles, and others, "From Egocentric to Exocentric Spatial Orientation: The Development of Postural Control in Bi-Manual and Trunk Inclination Tasks," *Journal of Motor Behavior* 37 (2005): 404–16.
32. S. Mori, M. Iteya, and C. Gabbard, "Hand Preference Consistency and Simple Rhythmic Bimanual Coordination in Preschool Children," *Perceptual and Motor Skills* 104 (2007): 792–98.

### Active Physical Play

33. Q. Ma, "Beneficial Effects of Moderate Voluntary Physical Exercise and Its Biological Mechanisms on Brain Health," *Neuroscience Bulletin* 24, no. 4 (2008) 265–70.
34. R. Meeusen, "Exercise and the Brain: Insight in New Therapeutic Modalities," *Annals of Transplantation* 10, no. 4 (2005) 49–51.
35. J. Miller, "Primary School-Aged Children and Fundamental Motor Skills: What is All the Fuss About?" Refereed paper for publication and presented at the Australian Association for Research in Education (AARE), Adelaide, Australia, November 2006, 1-13.
36. A. Fisher, and others, "Fundamental Movement Skills and Habitual Physical Activity in Young Children," *Medicine and Science in Sport and Exercise* 37, no. 4 (2005) 684–88.
37. J. Goodway and C. Branta, "Influence of a Motor Skill Intervention Program on Fundamental Motor Skill Development of Disadvantaged Preschool Children," *Research Quarterly for Exercise and Sport* 74, no. 1 (2003): 36–46.
38. G. T. Baranek, "Efficacy of Sensory and Motor Interventions for Children with Autism," *Journal of Autism and Developmental Disorders* 32 (2002): 397–422.
39. L. Biel and N. Peske, *Raising a Sensory Smart Child* (New York: Penguin Group, 2005).
40. National Association for Sport and Physical Education (NASPE), *Active Start: A Statement of Physical Activity Guidelines for Children from Birth to Age 5*, 2nd ed. (Reston, VA: NASPE, 2002).



41. Centers for Disease Control and Prevention (CDC), "Increasing Physical Activity: A Report on Recommendations of the Task Force on Community Prevention Services," *Morbidity and Mortality Weekly Report* 50 (RR-18, 2001): 1–16.
42. National Association for Sport and Physical Education, *Appropriate Practices in Movement Programs for Children Ages 3-5*, 3rd ed. (Reston, VA: NASPE, 2009).
43. U.S. Department of Health and Human Services, Center for Disease Control and Prevention, *Physical Activity and Health: A Report of the Surgeon General Executive Summary*, 2004. <http://www.cdc.gov/nccdphp/sgr/pdf/execsumm.pdf> (accessed March 29, 2010).
44. National Association for Sport and Physical Education, *Active Start: A Statement of Physical Activity Guidelines for Children Birth to Age 5*, 2nd ed. (Reston, VA: NASPE, 2009).
45. W. B. Strong and others, "Evidence Based Physical Activity for School-Age Youth," *The Journal of Pediatrics* 146, no. 6 (2005): 732–37.
46. A. Ignico, C. Richart, and V. Wayda, "The Effects of a Physical Activity Program on Children's Activity Level, Health-Related Fitness, and Health," *Early Childhood Development* 154 (1999): 31–39.
47. American Academy of Pediatrics, "Policy Statement: Strength Training by Children and Adolescents," *Pediatrics* 107, no. 6 (2001): 1470–72.
48. Ibid.
49. National Association for Sport and Physical Education, *Comprehensive School Physical Activity Programs: A Position Statement* (Reston, VA: NASPE, 2008).
50. H. G. Williams and others, "Motor Skill Performance and Physical Activity in Preschool Children," *Obesity* 16 (2008): 1421–26.



---

---

## Bibliography

---

- American Academy of Pediatrics. Policy statement: Strength training by children and adolescents. *Pediatrics* 107, no. 6 (2001): 1470–72.
- Annett, M. Hand preference observed in large healthy samples: Classification, norms and interpretations of increased non-right-handedness by the right shift theory. *British Journal of Psychology* 95 (2004): 339–53.
- Baranek, G. T. Efficacy of sensory and motor interventions for children with autism. *Journal of Autism and Developmental Disorders* 32, no. 5 (2002): 397–422.
- Bertenthal, B., and C. Von Hofsten. Eye, head, and trunk control: The foundation for manual development. *Neuroscience and Biobehavioral Reviews* 22, no. 4 (1998): 515–20.
- Biel, L., and N. Peske. *Raising a sensory smart child*. New York: Penguin Books, 2005.
- Bundy, A. C., S. J. Lane, and E. A. Murray. *Sensory integration: Theory and practice* (Second edition). Philadelphia, PA: F. A. Davis Company, 2002.
- Case-Smith, J., and N. Weintraub. Hand function and developmental coordination disorder. In *Developmental Coordination Disorder*. Edited by S. A. Cermak and D. Larkin. Albany, NY: Delmar, 2002.
- Centers for Disease Control and Prevention (CDC). Increasing physical activity: A report on recommendations of the task force on community prevention services. *Morbidity and Mortality Weekly Report* 50, RR-18 (2001): 1–16.
- . 2004. *Physical activity and health: A report of the surgeon general executive summary*. [www.cdc.gov/nccdphp/sgr/summ.htm](http://www.cdc.gov/nccdphp/sgr/summ.htm) (accessed April 29, 2010).
- Erhardt, R. P. *The Erhardt hand preference assessment (EDPA)*. Maplewood, MN: Erhardt Developmental Products, 2006.
- Fertel-Daly, D., G. Bedel, and J. Hinojosa. Effects of a weighted vest on attention to task and self-stimulatory behaviors in preschoolers with pervasive developmental disorders. *American Journal of Occupational Therapy* 55, no. 6 (2001): 629–40.
- Fisher, A., and others. Fundamental movement skills and habitual physical activity in young children. *Medicine and Science in Sport and Exercise* 37, no. 4 (2005): 684–88.
- Gallahue, D. L., and F. Cleland Donnelly. *Developmental physical education for all children*. 4th ed. Champaign, IL: Human Kinetics, 2003.
- Garcia, C. Gender differences in young children's interactions when learning fundamental motor skills. *Research Quarterly for Exercise and Sport* 65, no. 3 (1994): 213–25.
- Garcia, C., and L. Garcia. Examining developmental changes in throwing: A close up look. *Motor Development Research and Reviews* 2 (2002).
- Goez, Z., and N. Zelnik. Handedness in patients with developmental coordination disorder." *Journal of Child Neurology* 23, no. 2 (2008): 151–54.
- Goodway, J., and C. Branta. Influence of a motor skill intervention program on fundamental motor skill development of disadvantaged preschool children. *Research Quarterly for Exercise and Sport* 74, no. 1 (2003): 36–46.
- Henderson, A. Self-care and hand skill. In *Hand Function in the Child*. Edited by A. Henderson and C. Pehoski. St. Louis, MO: Mosby, 2005.
- Hepper, P. G., S. Shahhidullah, and R. White. Handedness in the human fetus. *Neuropsychologia* 29, no. 11 (1991): 1107–11.
- Ignico, A., C. Richart, and V. Wayda. The effects of a physical activity program on children's activity level, health-related fitness, and health. *Early Childhood Development* 154 (1999): 31–39.
- Kranowitz, C. S. *The out-of-sync child: Recognizing and coping with sensory processing disorder*. New York: Penguin Group, 2005.
- Lane, S. J. Structure and function of the sensory systems. In *Sensory Integration: Theory and Practice*. 2nd ed. Edited by A. C. Bundy, S. J. Lane, and E. A. Murray. Philadelphia, PA: F.A. Davis Company, 2002.





- Ma, Q. Beneficial effects of moderate voluntary physical exercise and its biological mechanisms on brain health, *Neuroscience Bulletin* 24, no. 4 (2008): 265–70.
- McCormack, G. L., and others. How occupational therapy influences neuroplasticity, *Occupational Therapy Practice* 14, no. 17 (2009).
- Meeusen, R. Exercise and the brain: Insight in new therapeutic modalities, *Annals of Transplantation* 10, no. 4 (2005): 49–51.
- Miller, J. Primary school-aged children and fundamental motor skills: What is all the fuss about? Refereed paper for publication and presented at the Australian Association for Research in Education (AARE), Adelaide, Australia, November, 2006, 1–13.
- Mori, S., M. Iteya, and C. Gabbard. Hand preference consistency and simple rhythmic bimanual coordination in preschool children, *Perceptual and Motor Skills* 104, no. 3 (2007): 792–98.
- Myer, C. A. Therapeutic fine motor activities for preschoolers, In *Development of hand skills in the child*. Edited by J. Case-Smith and C. Pehoski. Rockville, MD: American Occupational Therapy Association, 1992.
- National Association for Sport and Physical Education (NASPE). *Active start: A statement of physical activity guidelines for children from birth to age 5*. Reston, VA: NASPE, 2002.
- . *Active start: A statement of physical activity guidelines for children birth to age 5*. 2nd ed. Reston, VA: NASPE, 2009.
- . *Appropriate practices in movement programs for children ages 3–5*. 3rd ed. Reston, VA: NASPE, 2009.
- . *Moving into the future: National standards for physical education*. 2nd ed. Reston, VA: NASPE, 2004.
- . *Position statement: Comprehensive school physical activity programs*. Reston, VA: NASPE, 2008.
- Newell, K. M. Constraints on the development of coordination. In *Motor development in children: Aspects of coordination and control*. Edited by M. G. Wade and H. T. A. Whiting. Dordrecht, the Netherlands: Martinus Nijhoff, 1986.
- O'Brien, J. O., and J. E. Lewin. Translating motor control and motor learning theory into occupational therapy practice for children and youth, *Occupational Therapy Practice* 13 (2008): CE1–8.
- O'Brien, J., and H. Williams. Application of motor control/ motor learning to practice. In *Occupational Therapy for Children*. 6th ed. Edited by J. Case-Smith and J. O'Brien. Maryland Heights, MO: Elsevier, 2010.
- Poole, C. Development: Ages and stages—Spatial awareness, *Early Childhood Today* 20, no. 6 (2006): 25–30.
- Ratey, J. J. *Spark: The revolutionary new science of exercise and the brain*. New York: Little, Brown and Company, Hachette Book Group, 2008.
- Ray, M. *Rich experiences, physical activity create healthy brains: An interview with developmental psychologist William Greenough*. Cambridge, MA: National Scientific Council on the Developing Child, Center on the Developing Child, Harvard University, 2006. <http://www.developingchild.harvard.edu> (accessed September 3, 2009).
- Roncesvalles, M. N., and others. 2005. From egocentric to exocentric spatial orientation: The development of postural control in bimanual and trunk inclination tasks, *Journal of Motor Behavior* 37, no. 5: 404–16.
- Schneck, C. M. 2005. Visual perception. In *Occupational therapy for children*. 5th ed., 412–48. Edited by J. Case-Smith. St. Louis, MO: Elsevier.
- Shumway-Cook, A. and M. Woollacott. 2007. *Motor control: Theory and practical applications*. 3rd ed. Philadelphia, PA: Lippincott Williams and Wilkins.
- Smith-Zuzovsky, N., and C. E. Exner. The effect of seated positioning quality on typical 6- and 7-year old children's object manipulation skills, *American Journal of Occupational Therapy* 58 (2004): 380–88.
- Strong, W. B., and others. Evidence based physical activity for school-age youth, *Journal of Pediatrics* 146, no. 6 (2005): 732–37.
- Sullivan, K., S. Kantuk, and P. Burtner. Motor learning in children: Feedback effects on skill acquisition, *Physical Therapy* 88 (2008): 720–32.



VandenBerg, N. L. The use of a weighted vest to increase on-task behavior in children with attention difficulties, *American Journal of Occupational Therapy* 55, no. 6 (2001): 621–28.

Williams, H. G., and others. Motor skill performance and physical activity in pre-school children, *Obesity* 16, no. 6 (2008): 1421–26.