

Mini Review

Motor Development Activities for Inclusive Early Childhood Education

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Abstract

This study presents motor development activities that can be duplicated in any school or center. At a regional service center in Texas, sixteen preschool children with motor delays or disabilities, aged 3 to 5 years, experienced improved gross and fine motor development while enjoying fun outdoor activities. Developmental timeline results indicated that all children improved in motor skill milestones and core developmental motor norms. Also, the Peabody Developmental Motor Scales indicated that seven children progressed in performing motor tasks and gained as much as three to nine months of growth in motor skills. Directions for duplicating the low-cost playground and activities are included.

Discussion

Review of Literature

The National Center for Education Statistics (2021) reported that, in the 2018–2019 school year, 39,000 students with orthopedic impairments received special education services under IDEA [1]. Although medical diagnosis indicates the initial identification of physical disabilities, assessments are carefully performed to detect students' potential for delayed motor skills. The student's mobility includes the current and potential range and mode of mobility. Using the CDC's developmental milestones, behavioral and physical benchmarks are standards that 75% or more of children are expected to reach by a specific age [2]. Historically, Raver [3] suggested that assessment for developmental motor delays consists of a systematic activity involving parents while using appropriate assessments that reflect the child's authentic behaviors. The Peabody Developmental Motor Scales (PDMS-2/PDMS-3) evaluate both gross (large muscle) and fine (small muscle) motor skills in children from birth to age 5. They incorporate six subtests, including reflexes, locomotion, and grasping. The PDMS-2 was developed to: (1) estimate a child's motor competence; (2) compare gross and fine motor performance; (3) provide qualitative and quantitative information about individual motor skills; (4) monitor a child's progress; and (5) serve as a research tool. The scale enables tracking of motor progress over time, both qualitatively and quantitatively. Its normative nature allows diagnosticians to determine whether a child's development is within the expected range for their age using none, partial, or full performance [4].

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Methodology

The early learning center focused mostly on gross motor development, although some fine motor development was included. It was thought that the best way to encourage children to develop motor skills was to build a DIY playground that contained the activities children needed to develop according to their test results. The children spent mornings and afternoons playing in sessions lasting 45 minutes, five days a week. Children were guided to play in all motor development areas described below. Once they mastered a play area, they were appointed as helpers and helped other children achieve motor goals.

Directions for Playground and Activities

There was very little cost involved, and no commercial equipment was used. No special tools were needed, just a saw, hammer, nuts and bolts, chain, and eye hooks. Discarded materials such as tires and tubes and an old mattress were also used. Each area was designed for the purpose of training perceptual and motor growth and development. The activities can be duplicated for children with or without disabilities with little effort, cooperation, materials, and parent volunteers. The playground consisted of the following purpose areas and activities, while illustrations follow [5-7].

Cargo Climbing Net

A cargo net, obtained through army or navy surplus, is mounted between two 8-foot 4×4 posts. The posts are set in concrete exactly 8 feet apart. The cargo net measures 8 feet. The purpose of this activity is to strengthen children's muscles and develop climbing skills while they enjoy playing on the net.

Walking Trough

The walking trough is an excellent means of teaching balance and coordination. The trough is 8 feet long and is shaped like a "V." Set in a 2-foot $\times$ 4-foot framework, it stands 30 inches high. Pieces of wood, 1 inch by 6 inches, form the sides. The floorboards are 8 inches above the ground. The children walk on the sides of the V while having fun and achieving a difficult task.

Swing and Bounce

This innovative aspect of the priceless playground uses a cargo net as a stabilizing base for a double mattress that is suspended within a 7-foot frame. The framework is

constructed of railroad ties measuring 5×8 inches. It is 8 feet high. The cargo net is divided into 6-inch squares and measures 8 feet in total. It is fun for swinging, bouncing, and jumping.

Free Form Sand Pile

Three yards of red dirt were dumped in a corner of our play yard. The children brought their pails and shovels, dug their own holes, and rolled down the hill. This sand pile is far more creative than the restricting boundaries of a regular sandbox. Playtime in this area is limited only by children's imagination and motor development.

The Ladder

A simple ladder was constructed with scrap 2×4 boards. It is 12 feet long, with rungs placed every 12 inches. The rungs measure 2×2 inches. The children purposefully develop coordination skills by walking between the rungs of the ladder and along the 2×4 frame. A similar activity is one in which railroad ties are placed at angles so that children can learn laterality through this exercise. The railroad ties are covered with scraps of indoor/outdoor carpeting for comfortable walking.

Walking Beam

The Walking Beam is a crooked walkway that teaches children laterality and balance. It is constructed of 2×4 boards, each 6 feet long, and set at 45° angles. It is 12 inches above the ground and held up by 4×4 blocks. The design is flexible so that additional links may be added.

Balance Beam

Balance boards are constructed of two-by-fours in 8-foot links. The base mounts are 2×6 and 30 inches wide. Two slots are cut in the base mount to fit the 2×4 . One slot is 2 inches wide, and the other is 4 inches wide. This permits placement of the balance board in either a horizontal or vertical position. As children become adept at walking on the 4-inch horizontal board, it may be placed vertically for greater challenge and effort. Children walk forward, backward, and sideways on the board. This activity is sometimes performed by the children individually or under the direction of the teacher or aide.

Water Play Table

A water play table was constructed from spare air-conditioning and sheet metal materials. It is made with galvanized steel, with a removable water tray and a drain

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plug for easy drainage. The dimensions are 4 feet $\times$ 8 feet, with an overall height of 30 inches. This is a favorite place for developing fine motor skills through sailing boats and racing bottle tops.

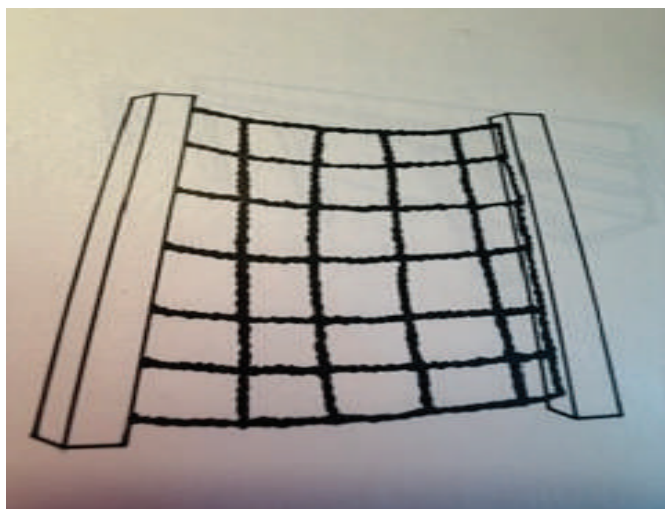
Riding Area

The riding area is designed for use with wheeled toys. The area is laid out to form a pattern with right and left turns and stops. There is more demand on the child than riding on a sidewalk; yet, it is safe in a yard or playground area. Laterality, directions, and language are learned through this play. This is put together using one-foot by 12-foot redwood boards joined to form a 3-foot riding path that measures 24 feet in width and 36 feet in length at the maximum points. Signs were painted on fiberboards and mounted on one-inch by two-inch sticks and then cemented in 3-pound coffee cans for stability. Children learned to *stop*, *go*, *use caution*, *slow*, and *yield*.

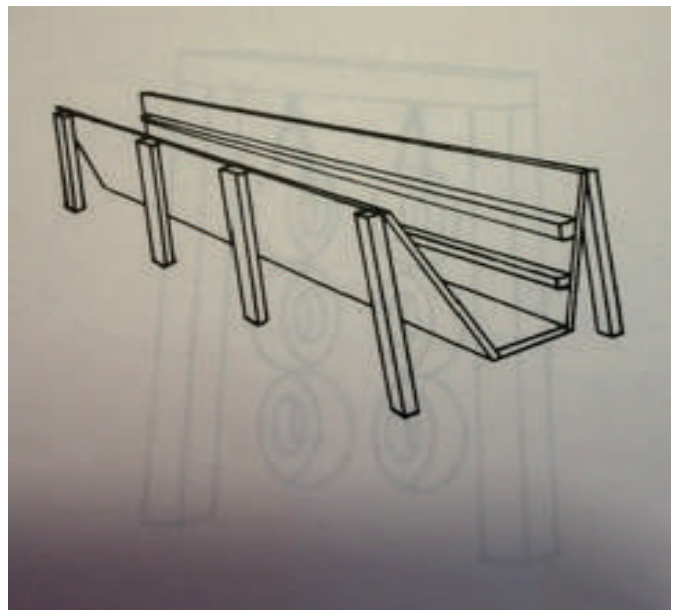
Four-in-One Fort

The four-in-one fort is very versatile. The unit incorporates a series of three ramps, a galvanized sheet metal slide, a playhouse, and a ladder/stairway area. Children climb, run up or down the carpeted ramps, or slide down the gentle metal incline. The platform housing the playhouse measures 4 $\times$ 6 feet with a pitched roof. The overall height of the playhouse is 8 feet, with 4 $\times$ 4 posts forming the framework. All ramps are 4 $\times$ 8 sheets of three-quarter-inch plywood. The stairway is 3 feet $\times$ 6 feet, and the ladder is 3 feet $\times$ 5 feet. This is a favorite area for children developing motor skills.

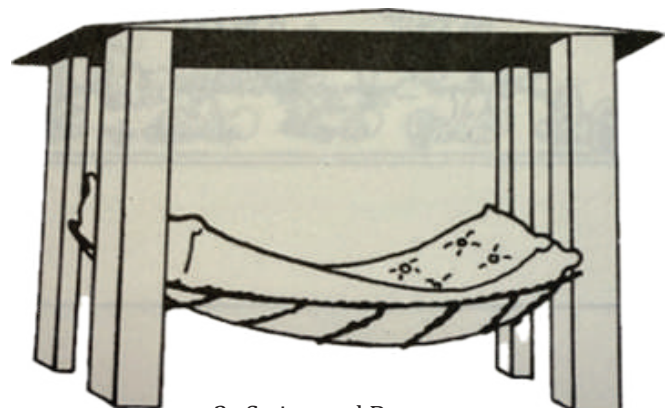
Illustrations



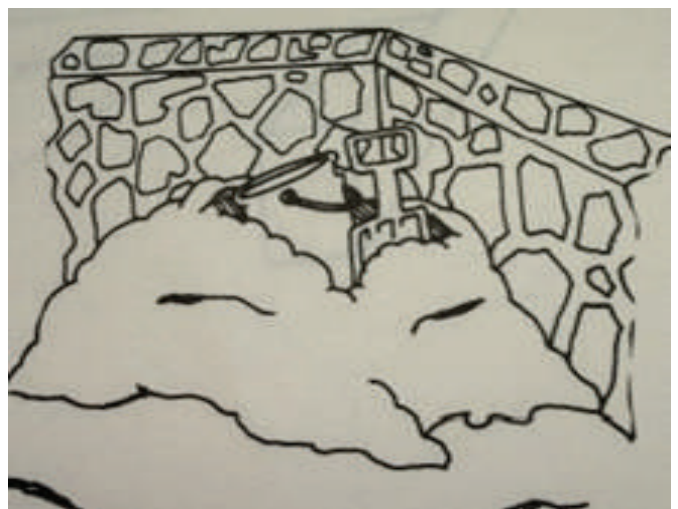
1. Cargo Climbing Net



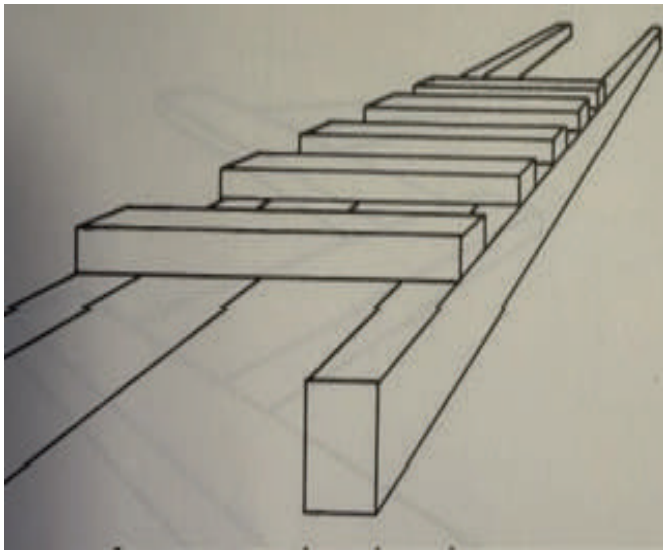
2. Walking Trough



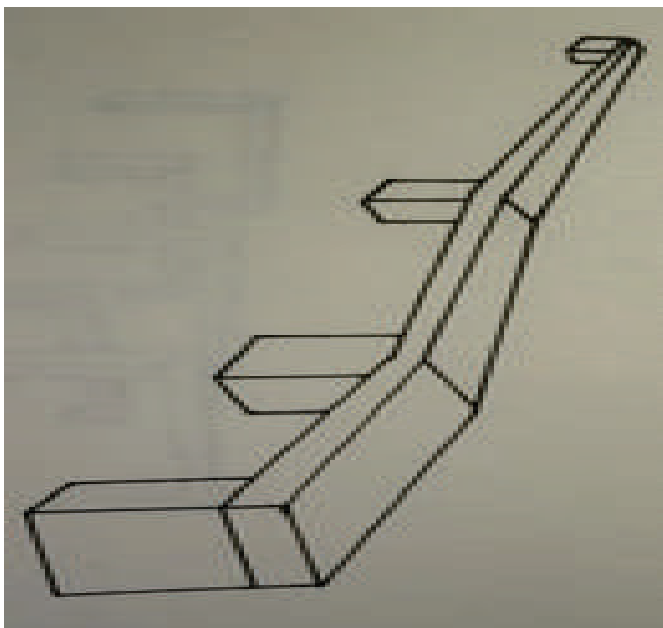
3. Swing and Bounce



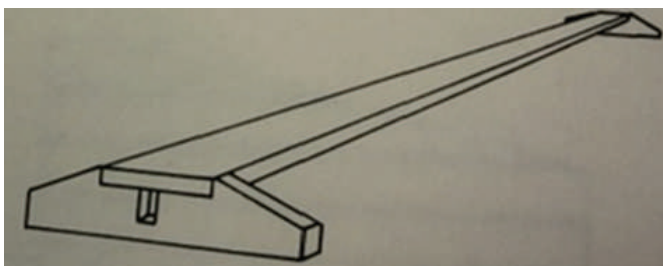
4. Free Form Sand Pile



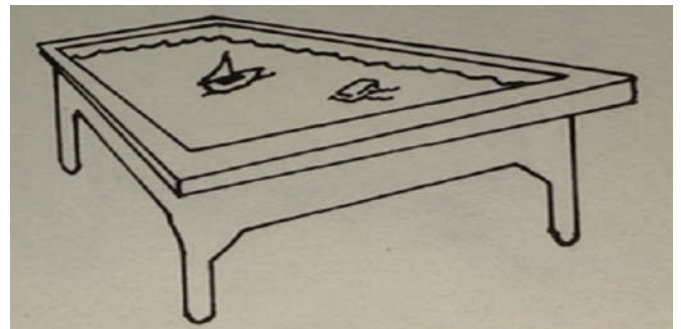
5. The Ladder



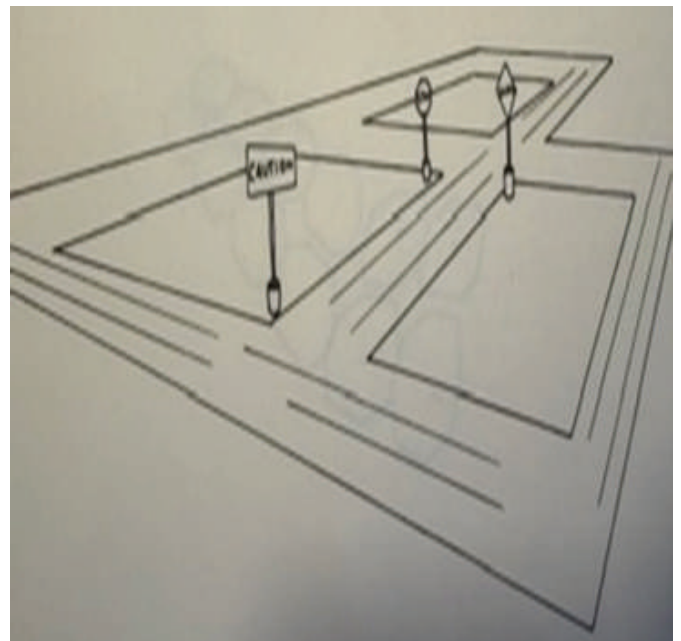
6. Walking Beam



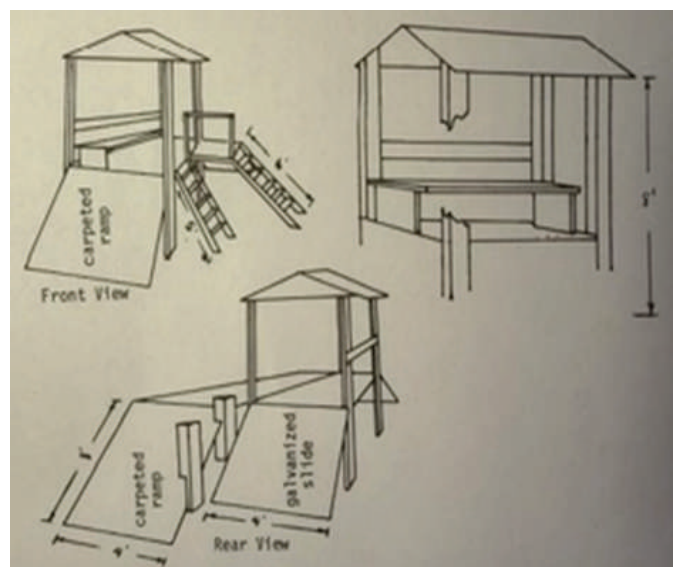
7. Balance Beam



8. Water Play Table



9. Riding Area



10. Four-in-One Fort

Results

Previously, the children were reported to avoid motor play because they were not able to perform like their peers. However, after 6 months of guided motor play using the activities described above, all 16 children improved and advanced in motor coordination skills. Seven children progressed in performing motor tasks by as much as three to nine months, as recorded on the Peabody Developmental Motor Scales. Other developmental norms, or the ages when children typically reach specific physical, mental, and social milestones, also improved. Although milestones and norms are general guidelines rather than strict rules, the confidence, skills, self-awareness, and "I can do this!" attitudes that the children developed were welcome by-products of the motor development play. The economical playground brought progress and fun to the children in the program.

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