

CHAPTER 12

Development of Fundamental Movement: Locomotor Skills

©Gallahue, D.L., Ozmun, J.C., Goodway, J.D. (2012). *Understanding Motor Development*. Boston: McGraw-Hill.

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KEY CONCEPT 12.1

Locomotor skills allow individuals to navigate through space or move their body from one point to another and constitute foundational skills for engagement in sports, games & lifetime activities.

12-2

LOCOMOTOR SKILLS

Locomotor skills are considered to be more phylogenetic (common to the species) in nature & develop more “naturally” with less need for formal instruction & feedback.

- Running
- Galloping
- Skipping
- Jumping
- Hopping

12-3

Proficient Runners

- ▣ **Force Production:**
 - Body leans forward
 - Base leg extends 180 degrees at take-off
 - Opposite (or swing) leg drives forward with knee bent
 - Arms flexed 90 degrees & pump in opposition to legs
- ▣ **Swing Phase:**
 - Flight phase
 - After push-off swing leg bends & heel comes close to buttocks to shorten lever & speed time to foot contact
- ▣ **Support Phase:**
 - Heel-to-toe or ball of foot landing

12-4

Running Development

- ▣ **Total Body**
 - 1- Run high guard - Flat footed , wide base of support, arms in high guard
 - 2 - Run middle guard - Flat footed, arms in middle guard & swing across mid line
 - 3 - Heel-toe (or toe) contact, arms swing in opposition to legs, arms extended
 - 4 - Heel-toe (toe) contact, arms bent to 90 degrees & swing in opposition to legs. High heel recovery.

12-5

Running Constraints

Individual	Task	Environmental
Gender	Distance of run	
Age		

Developmental stage of running is predictive of product measures (speed) of running – perhaps due to increasing biomechanical efficiencies. As children develop competence in running they should practice a wide range of running speeds & directions.

12-6

CONCEPT 12.2

Concept 12.2 – Process measures of a fundamental motor skill describe the pattern of movement whereas product measures examine the outcome of the movement; although related, each tells something different about the movement of the child.

12-7

Proficient Gallopers

- Smooth, fluid rhythmical action
- Lead leg stays in front
- Hips, front facing
- Trail leg lands beside or slightly behind lead leg
- Feet remain close to surface
- Knees are flexed slightly while in flight
- Ability to lead with both right & left legs in front

12-8

Galloping Development

- ▣ **Total Body**
 - 1 – A blend of a gallop & run, struggle to keep lead leg in front
 - 2 – Lead leg emerges, trail leg is stiff (freezes the degrees of freedom)
 - 3 – Rhythmical, fluid pattern, stays low to the ground, lead front stays in front

12-9

Proficient Skippers

- Rhythmical weight transfer & ability to maintain step-hop pattern easily
- Stays close to surface
- Limited vertical component
- Limited use of arms as force producers
- Landing & taking off from toe

12-10

Skipping Development

- ▣ Total Body
 - 1- *Broken skip* - cannot maintain a rhythmical step-hop pattern, often slow & deliberate or a broken pattern
 - 2 - *High arms & legs* - maintains a rhythmical step-hop pattern but with a high vertical component
 - 3 - *Rhythmical skip* - rhythmical step-hop pattern, arms swing in opposition to legs, stays low to surface

12-11

Proficient Jumpers

▣ Preparatory Action ➤ Knees bent & body leans forward at hip ➤ Arms swing forward & back to generate momentum ▣ Force Production ➤ Arms & legs extend forcefully upward & forward ➤ Full extension of body (toes-trunk & arms) on take-off ➤ Shoulder angle 180 degrees, arms extended ➤ At take-off body leans to 45 degree angle	▣ Flight Phase ➤ As body in air arms move down & back ➤ Legs move forward & up with knees bent ▣ Landing & Follow Through ➤ Heels reach forward to touch surface ➤ Thighs parallel to the surface ➤ Arms extend forward to pull body forward ➤ Hips travel in an arc
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12-12

Horizontal Jumping Development

▣ Total Body

- 1- *Braking arms* - arms swing backward against body. Short jump.
- 2 - *Winging arms* - arms swing forward & sideward (winging). Short jump.
- 3 - *Arms swing to head* - with elbows forward at take-off. Take-off angle greater 45 degrees. Legs extend.
- 4 - *Full body extension* - complete arm & body extension at take-off, body leans 45 degrees. Long jump.

12-13

Jumping Constraints - Product

Individual	Task	Environmental
Age		
Gender - from age 12		

Jumping is a complex skills requiring coordination, strength & balance. Jumping takes a long time to develop & weight (strength-to-weight ratio) can play a factor in it' s development.

12-14

Proficient Hoppers

- Balance effectively on support foot
- Support leg fully extends at take-off & flexes at landing
- Thigh of non-support leg pumps back & forth with the hop
- Arms pump in opposition to the swing leg' s pendular motion
- Forward lean of body

12-15

Hopping Development

▣ Total Body

- 1- *Foot in front* - free foot in front of base leg. Arms in high guard. Labored hop.
- 2 - *Foot by support leg* - free foot alongside base leg with knee in front. Slight body lean & bi-lateral arms.
- 3 - *Foot behind support leg* - free foot behind base leg. Body leans forward & hop.
- 4 - *Pendular free leg* - free leg pumps in pendular action. Forward body lean & opposition of arms with hop.

12-16

ASSESSMENT OF FMS

➤ FMS Assessments Need:

- **Reliability** – tests that provide consistent scores from one testing period to another.
- **Validity** – tests that measure what it claims to measure.
- **Objectivity** – tests that will give similar results when it is administered by different testers.

➤ **Concept 12.5** – Assessments can be categorized as norm-referenced, criterion-references, product-oriented and/or process-oriented.

12-17

ASSESSMENT OF FMS

- **Product-oriented tests** –outcome of a skill.
 - 3 of 10 catches, threw 20 feet
- **Process-oriented tests** – pattern of the performance.
 - Developmental sequences
- **Norm-referenced tests** – compare child' s skills to similar age, & gender.
 - At 20th percentile
- **Criterion-referenced tests** – examine quality of movement to pre-determined criteria of performance.
 - Hand catch - Yes or No?

12-18

CONCLUDING CONCEPT

Concept 12.4 - There is a relationship between process & product measures in some locomotor skills (running & jumping). As performers move from initial, to emerging to proficient patterns of performance (process), they are able to apply these biomechanical efficiencies into greater outcomes (product) such as speed of run & distance jumped.

12-19
