Fundamental Object-Control Skills
Interesting Facts

Studies indicate that boys move across the stages at a faster rate than girls which means there are large gender differences in throwing development.

Overarm throw is usually studied by measuring the distance, accuracy, and velocity of one’s throw.

In all of the above measures boys are better than girls even with more and more girls being afforded the opportunity to partake in skilled motor practice.

Of all the motor skills throwing performance was found to have the greatest gender difference.
Accounting for Gender Differences

Heredity or Sociocultural Factors were to determine to be the causes.
Heredity

Nelson and colleagues (1986) measuring boy’s and girl’s joint diameters, shoulder/hip ratio, forearm length, and arm and leg muscle mass, determined that girls improvement in throwing was only 69% of that of boys.

Nelson et al (1991) indicated that arm muscle mass was a major player in throwing distance. Girls who weighted more and had greater arm and leg muscles than smaller and weaker girls threw farther but still lagged behind boys.
Sociocultural Factor

Carlton (1989) concluded that the best predictor for throwing development in girls was their participation in sport and movement programs and the presence of an older brother in the household. The best predictor for throwing development in boys was father’s sport involvement and father-son play.
Factors that Affect Throwing

Halverson and associates (1977 & 1979) studied the effects of instruction on overarm throwing:

- Instruction did not improve kindergarten children's ball-throwing velocities.
- Instruction did improve kindergarten throwing techniques.
Instruction & Overarm Throwing Development

Giving instruction about throwing components of stride length, arm retraction, side facing, trunk rotation, arm patterns, and stride opposition.

- Stride length was the only component that improved (Luedke, 1980).

Walkwitz (1989) indicated that throwing pattern development does not correspond to greater throwing distance in girls.
Factors that Affect Throwing

Three critical learning cues have been identified to develop overarm throwing:

- Take a long step toward the target with the opposite foot of your throwing arm.
- Take your arm straight down, then stretch it way back to make an “L” with the arm.
- Watch the target and release the ball when you see your fingers (Fronske & colleagues, 1997)
Stride Length in Throwing
Factors that Affect Throwing

Ball Size

- Ball size and hand size width has an important relationship to throwing
- Researchers have found that as ball diameter increases and as hand size decreases throwing becomes less mature.
Factors that Affect Throwing

Angle of release
- Angle of release is related to throwing distance
- Mature angle of releases can be facilitated by manipulating ball weight and size (Burton and Colleagues, 1993)
Factors that Affect Throwing

Does improvement in one’s technique affect throwing velocity?

Longitudinal data over a 7 year period by Roberton and Konczak (2001) found that developmental sequence of the overhand throw accounted for 65 to 85% of ball-throwing velocity.

Increasing one’s stride length accounted for the greatest increase in ball-throwing velocity.
Overarm Throw

• Preparatory Phase
• Execution Phase
• Follow-through Phase
Wild’s (1938) Developmental Overarm Throwing Stages

• Stage 1: Lack of any preparatory backswing of the throwing arm.

• Stage 2: The ball is brought up beside the head by upward humerus flexion and exaggerated elbow flexion.

• Stage 3: Simple vertical lift of throwing arm.

• Stage 4: Circular arm action in which the arm moves down and back
Throwing

Teachable Points
- Eyes are focused on the target
- Ball is held at the base of the fingers
- Weight transference by stepping forward with foot opposite the throwing arm
- Arm extension is evident
- Wrist is cocked at the at the back of the wind-up
- Throw starts with hip rotating toward the target and then the shoulders follow.

Teachable Points
- Arm moves forward, it bends approximately 90 degrees.
- Ball is released in front of the body
- Wrist snaps downward
- Follow-through toward target, then down, and past leg.
Catching

Action of bringing an airborne object under control by using the hands and arms.

There has been little research into developmental stages of catching.
Catching

Preparation: Arm Component
Reception: Arm Component
Hand Component
Body component
Interesting Fact about Catching

Developmental characteristics of catching relates to the development of the visuoperceptual system ability to predict the object’s flight characteristics. The ability to predict the object’s flight characteristics is usually not developed until around the age of 15 with extensive practice.

The first attempt to catch occurred when as a infant we blocked a rolled object.

Fear of the projectile is a conditioned response from earlier failures at the task.

Catching with one’s hands is the most advanced level of catching development.
Interesting Facts About Catching

At the present time, studies have not found conclusively if boys develop faster than girls or girls develop faster than boys.

Location of the tossed ball is an important factor in one and two handed catching.
Factors that Influence Catching Performance

Ball size
- A smaller ball elicits a more mature hand catch than an arm/chest trap.
- As ball size increased, the maturity level of catching regressed.

Ball color and background color
- Preferred ball color influence catching
- Blue and yellow balls were caught significantly better than white ball.
- Background is an important factor (contrast sensitivity)
Factor Affecting Catching

Instruction
- To date only one studies has been conducted about instruction and catching.
- Williams (1992) trained 8 year old boy on 7 successive days for 30 minutes.
- Significant changes were observed in number of successful catches.
Factors that influence Catching Performance

Ball speed
  Catching performances decline as speed of the ball increases. Is there a threshold?

Trajectory angle
  Project the ball or implement higher for all around better catching.

Viewing time
  As viewing time decreases, one ability to retain the projectile decreases.
Catching

Balls projected directly toward the person is easier to catch than moving to a new location to catch the ball (Keegan, 1989)

Avoid pairing up an inexperienced thrower with a inexperienced catcher.

Using a glove improves catching success.

Using a new glove or one that is too large hinders catching.
Teachable Points
- Ready position is where elbows are slightly bent and fingers curved and spread.
- Eyes are focused on the ball
- Hand move to meet the ball
- Hands are adjusted for the size of the ball
- Fingers face upward for a high ball; downward for a low ball.
- Ball is cushioned on impact
- Ball is caught with the hands not trapped against the body.
Striking

Fundamental movement in which a designated body part or some implement is used to project an object.
Forms of Striking

One-handed striking
Two-handed striking
Bouncing
Kicking
Punting
Sidearm Striking

Inexperienced
• NO step but if a step is present it is with the homolateral leg.
• Up-down striking motion
• Little backswing with striking arm or implement
• Trunk and hips do not rotate
• There is no blocking of the hip action.
• Arms are rigid with little wrist snap when swing

Experienced
• Forward step with foot opposite the striking arm or striking side.
• Striker uses a full backswing
• Striker swings the striking implement horizontally
• Hip then trunk rotation (differentiated)
• Arms are relaxed and noticeable wrist snap when swinging the bat or implement
Bouncing

Bouncing a ball by using the hand to push the ball repeatedly downward (dribbling).
Bouncing

Early forms of bouncing resembles a spanking or slapping motion.

Underlying ability of bouncing is eye-hand coordination.
Bouncing

Faults:
- Arm does not extend downward but stays rigid.
- Arm does not give slightly upward as the ball contacts the hand.
- Elbow does not bend.
- Hand and fingers pat or slap the ball.
- Hand closes too slowly or at the wrong time (timing).
- Eyes are not focused on the ball.

Teachable points:
- balanced position
- eyes are focused on the ball
- ball is pushed down with the hand by the extending arm
- fingers are curved and spread
- ball is bounced in front of and to the side of the body.
Facts about Bouncing

Inexperienced bouncers have difficulty in controlling the direction in which the ball is hit.

Key sign of development from inexperienced to experienced performance is gradual extension of elbow and delay in retracting the forearm.

Boys and girls usually perform a developmental level of bouncing by the age of 4.
Kicking

Use the foot to give impetus to a ball.

Most common form of kicking is place kicking (the ball is placed on either the ground or on a kicking tee).
Kicking

Teachable points
- Step is forward with the non-kicking foot placed close to the ball.
- Balance is maintained throughout kicking action.
- Adequate bending of the kicking leg’s knee is backswing is evident.
- Ball is contacted on the instep of the kicking foot (soccer style) or on the front of the foot (American’ style).
- Arm opposite the kicking leg moves forward during the kick.
- Kicking foot is extended, follow through is in the direction of the target.
Punting

Involves striking an airborne ball with the foot.

Punting is more complex than place kicking.
Teachable points

- eyes are focused on the ball
- step is forward onto non-kicking foot.
- ball is held correctly in front of body at hip height with both hands.
- Kicking leg is bent with a back swing of 90 degrees.
- Ball is guided down with hand on the same side as kicking leg (not dropped)
- Ball is contacted on the instep of the kicking foot (soccer style) or top of the foot (American style).
- Arm opposite the kicking leg moves forward during the kick.
- High follow-through occurs in the direction of the target.
Facts about Kicking

In placing kicking the last step before contact involves a leap step on plant or supporting foot. In a immature kicker there is usually no leap step on plant or supporting foot. Placing kicking performed at a fundamental level in boys and girls is about 3-4 years of age. Research is lacking in all forms of kicking especially punting.