Developing Acceleration: Application for All Events

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Acceleration is fundamental to track and field. Every event except the circle throws accelerate in running form.

- Sprints, hurdles and relays all require acceleration, the shorter the event the more crucial
- All jumps including pole vault are preceded by acceleration
- Distance races have a short but still important acceleration at the start
- Javelin throws are preceded by acceleration
- Circle throws often include acceleration in training for power development

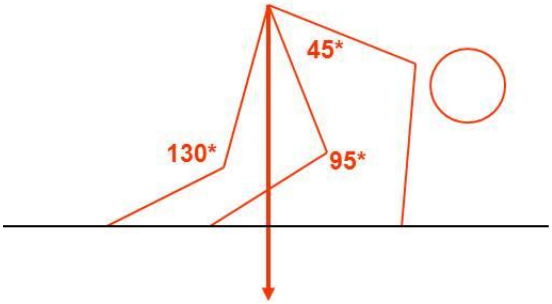
Acceleration is a learned skill.

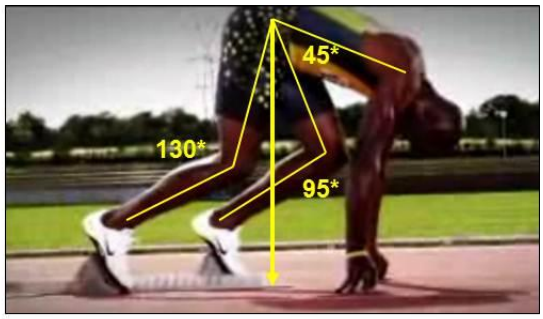
- Acceleration requires correct technical execution and like any technical skill requires practice
- Correct acceleration technique can then be modified for event specificity

Overview of Basic Mechanics

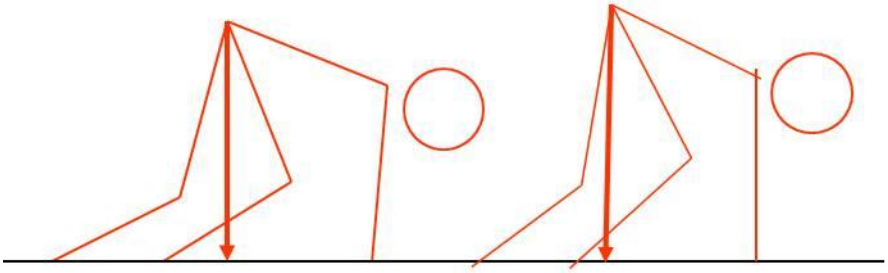
Basic Setup- Ideal Angles

- Ideally the strong leg should be the forward though hurdles or athlete preference may necessitate a switch
- Ideal angles: 130* rear knee, 95* front knee, 45* back
- Center of gravity must be forward of front foot





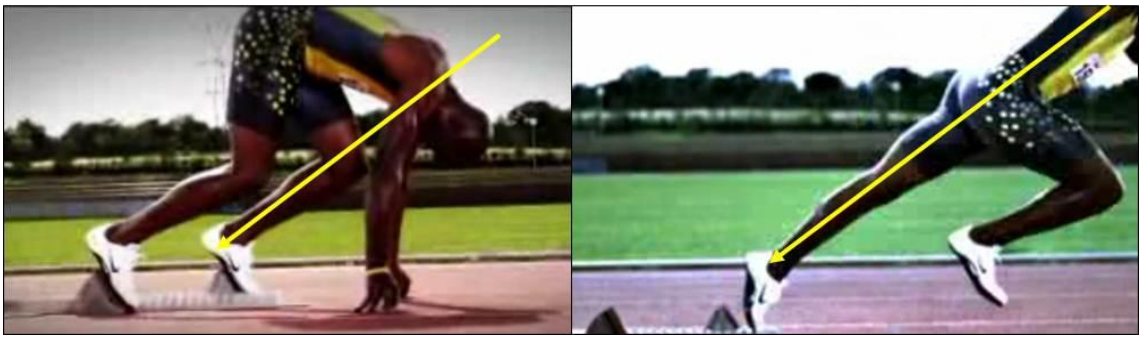
- Angles will vary slightly based on the athlete's body size, proportions and strength



- Stronger athletes can use a lower hip height and lesser shin angle while weaker athletes need higher hip placement. Note both still maintain a center of gravity forward of the front foot.

Launch Angle

- Determined by front shin angle
- Hips, knees and ankle joints all extend (triple extension)

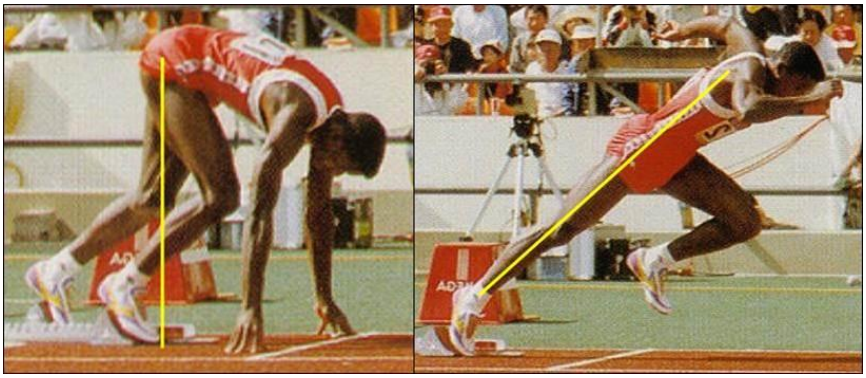


Angle of Body Lean During Acceleration

- Determined by rate of acceleration!
- Most high school athletes hit top speed at 30-40 meters
- Younger and slower athletes may reach top speed at 15 meters, don't force them to stay down
- Naturally let angles occur, it should be a smooth rise like an airplane taking off

Force Application

- Acceleration is all about pushing
- Location of athlete's center of gravity vital for proper push mechanics



- "Stepping out" results from lack of push
- Inexperienced and weaker athletes especially need to be taught pushing
- Push with both feet, the applied force should be down and back

Arm action

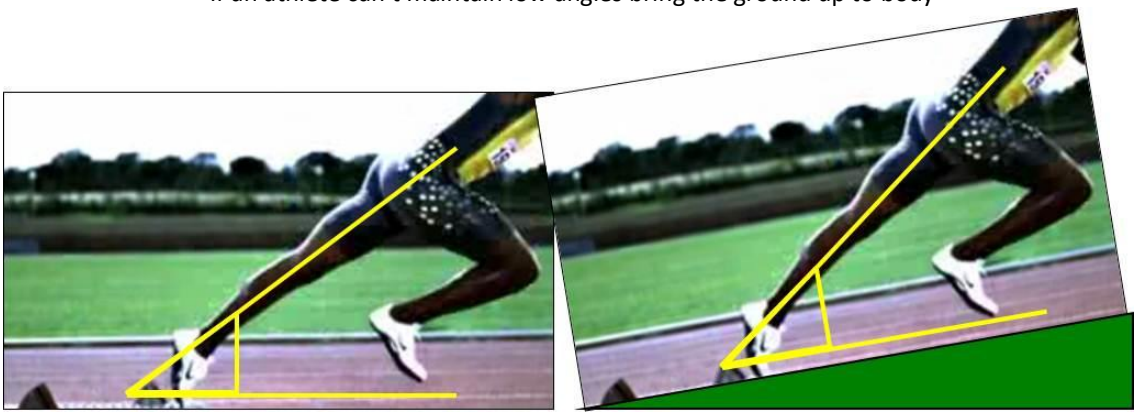
- The hands slightly precede the legs
- Cues include sweep the track or flick the wrist
- Don't overdrive the arms
- Goal is unconscious leg action so it becomes mostly about "quick hands" or arms

Long Term Acceleration Development

- Best way to improve acceleration is to practice accelerating!
- Two simple ways to help teach correct acceleration mechanics and improve power include hill running and explosive medicine balls throws

Hill Running

- If an athlete can't maintain low angles bring the ground up to body

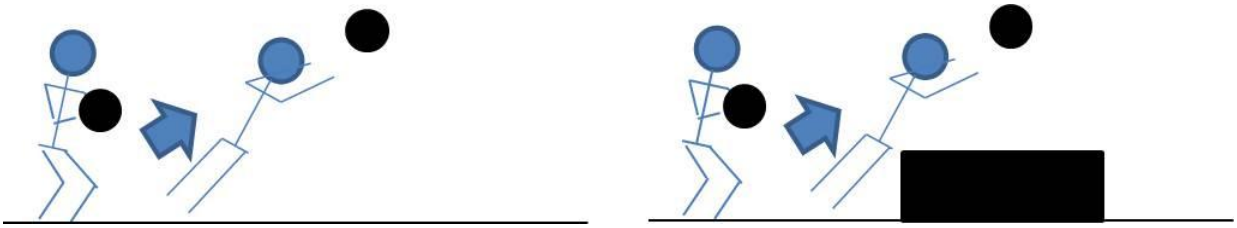


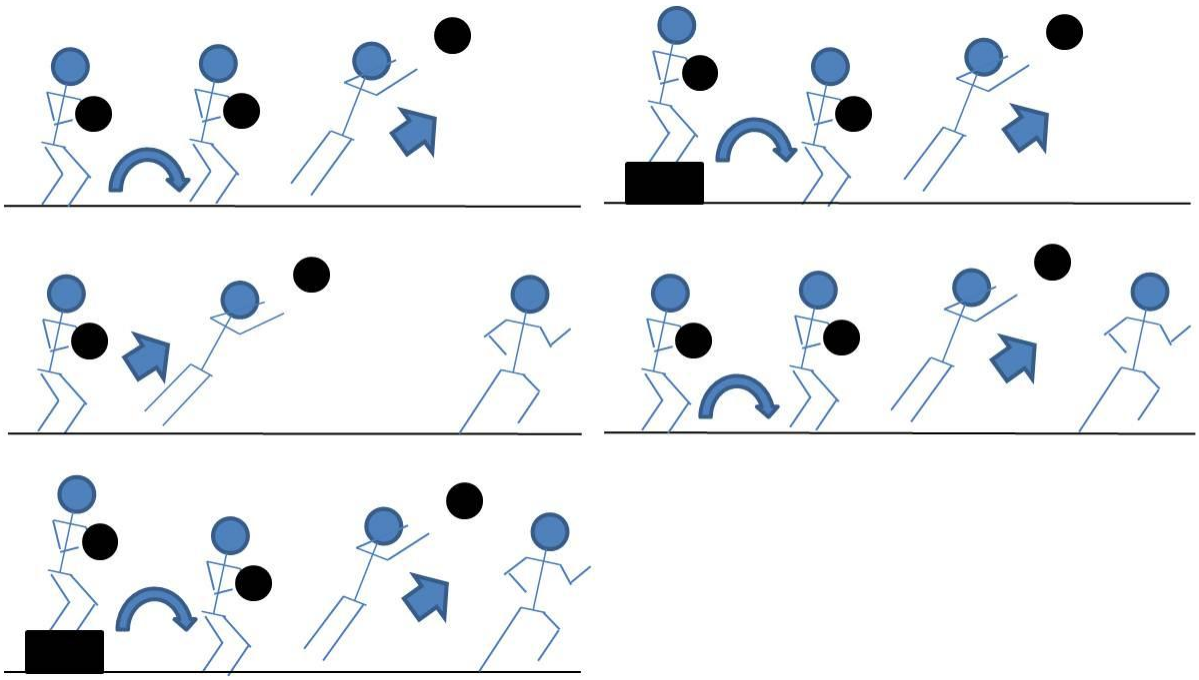
- Look for hills around campus (local parks, pavement if need be)

Medicine Ball Throws

- Simple way to develop explosiveness, triple extension, how to use hip power
- Alternatives to medicine balls: shot puts, old dumbbells and weight plates, smooth rocks or bricks, old soccer balls filled with sand and rags (8-12 lbs.)
- Basic throws progression for acceleration development:

Medicine ball toss*
Medicine ball toss and jump onto mat*
1 hop medicine ball toss
2 hops medicine ball toss
Box drop medicine ball toss
Medicine ball toss into acceleration*
1 hop medicine ball toss into acceleration
2 hops medicine ball toss into acceleration
Box drop medicine ball toss into acceleration





Applying Acceleration Principles to Each Event

Sprints, Relays and Hurdles (accelerating from a crouch)

Jumps (accelerating from standing position)

- Same principles but from a standing position
- Carl Lewis had both sprint start and long jump start
- Athletes must transition quicker into upright posture
- Appropriate number of acceleration strides (4, 6, 7)

Distance Races (accelerating from a standing position)

- Important for creating separation at start
- May need to learn hip projection and may not intuitively push

Throwing Events

- Train javelin throwers like sprinters
- 40 yard dash training for shot and discus guys or anyone else who plays football
    - COG relative to front foot and shin angle is crucial (see poor example below)
    - Goal is as close to line as possible while maintaining proper angles