Acceleration

scottishathletics

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Jared Deacon

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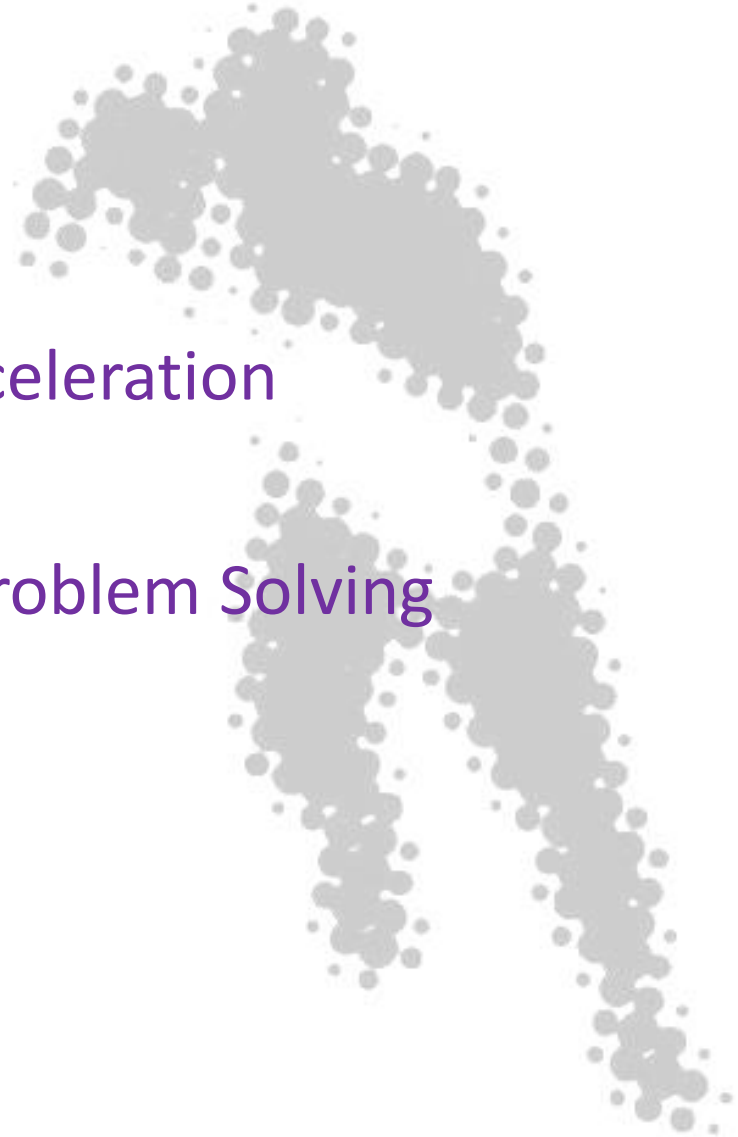
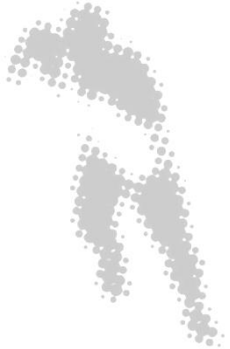
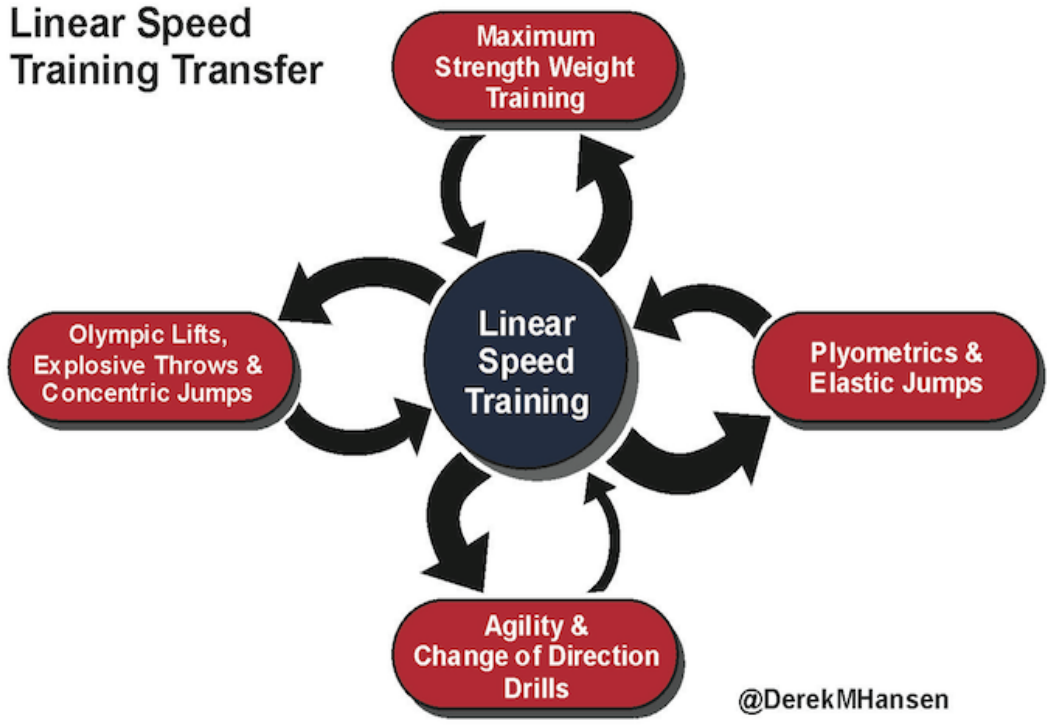
Acceleration

- Philosophy
- Technical Model – Acceleration
- Specific Skills
- Coaching Process & Problem Solving



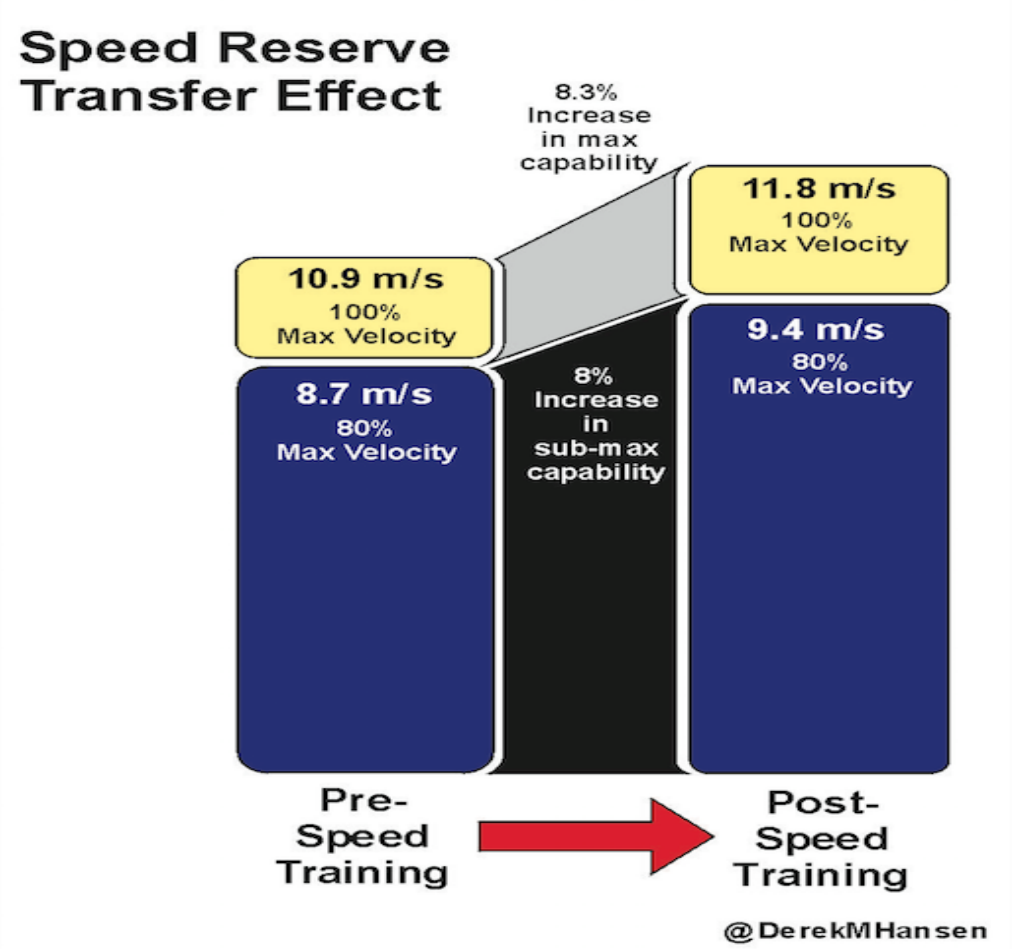


Philosophy - Transferability



The transfer of abilities developed through maximal speed training is a huge benefit as an enhancement to many other training modalities.

Philosophy - Efficiency

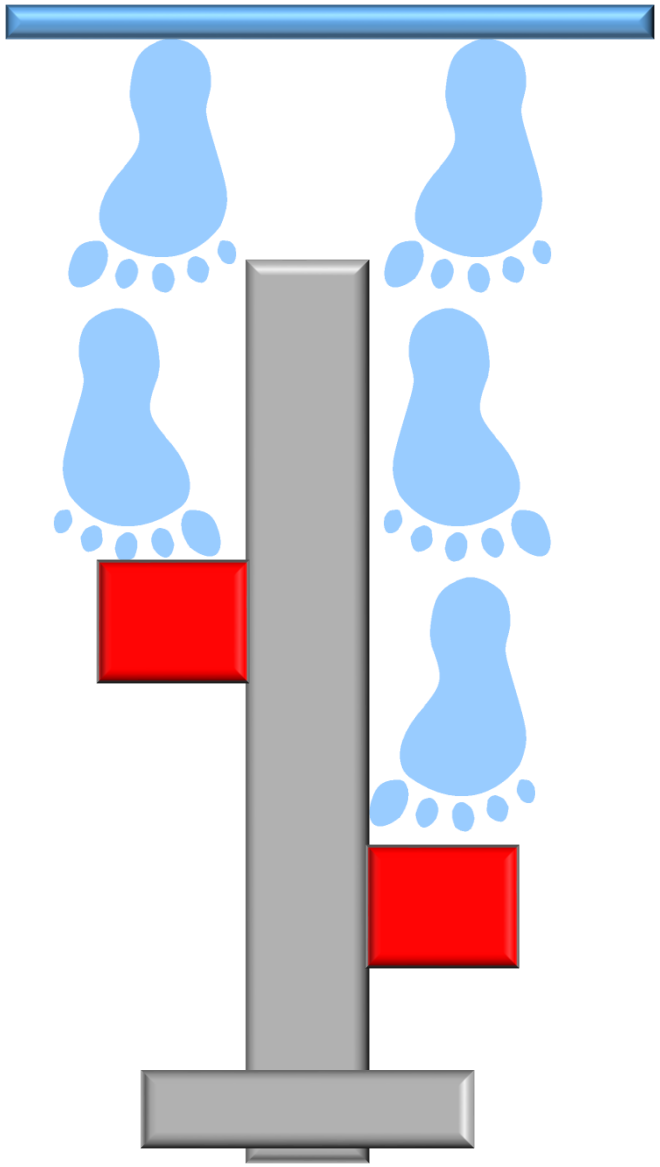


The development of a speed reserve is a huge factor in favour of the benefits of maximal speed training.

Increasing maximal speed will affect speed reserve in 2 ways:

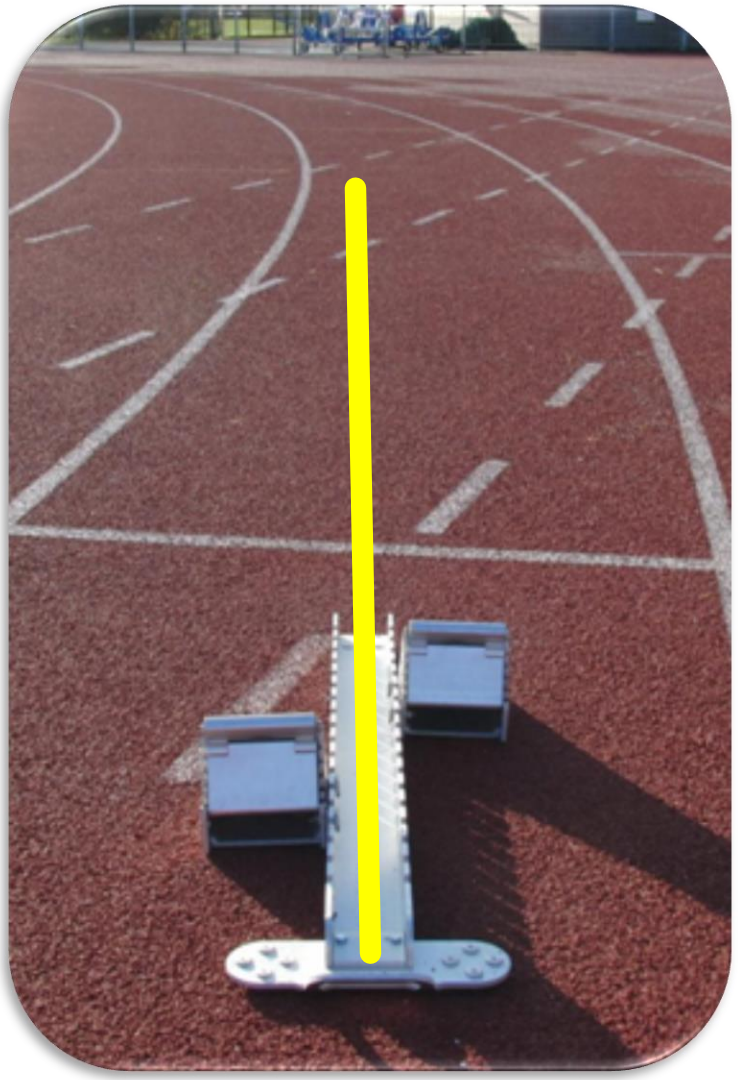
1. Ability to operate at a faster speed for same relative effort
2. Ability to operate at the same speed as previous which now becomes a lesser relative effort due to higher maximal capabilities

Block Starts – Set Up



- Align blocks with lane lines for straightway sprints
- Blocks placed in centre of the lane
- 2 feet to front block & 3 feet to back block
- Front block angle equal to or higher than back block

Block Starts - Bend Set Up



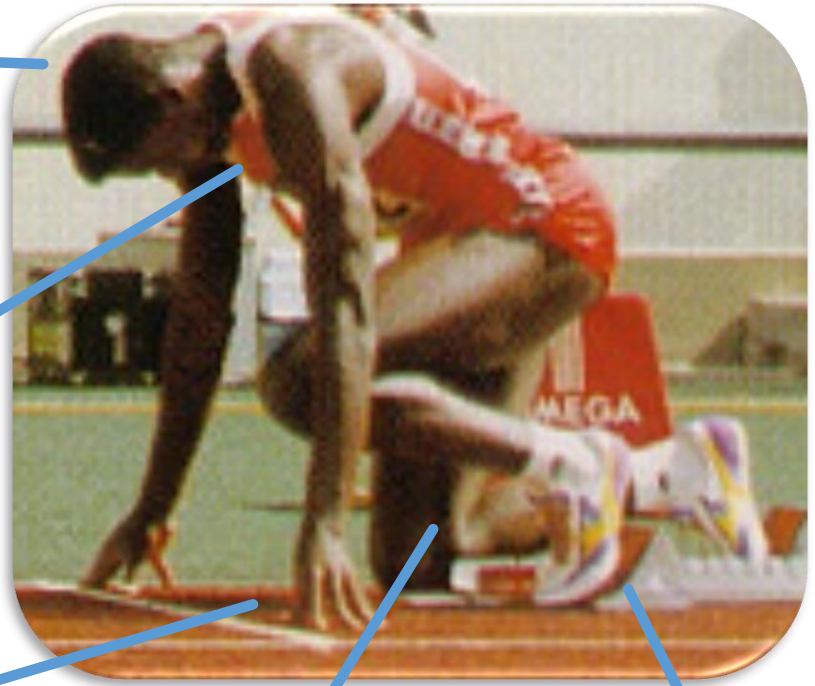
- Initial set up as for the straightway starts
- Line up the blocks so that the first few steps can be run in a straight line before going into the bend.
- They should be on a tangent with the track as it bends away

‘On Your Marks’ Position

Head looking down at the track in natural position

Shoulders are directly over hands with arms perpendicular to the floor

Hands shoulder width apart with arms straight



Back leg thigh should be perpendicular to the floor

Spike plate against block pads

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‘Set’ Position

Hips rise above shoulders in one smooth movement

Front knee angle at 90° with back knee at approx 120°

Hands and shoulder maintain all alignment

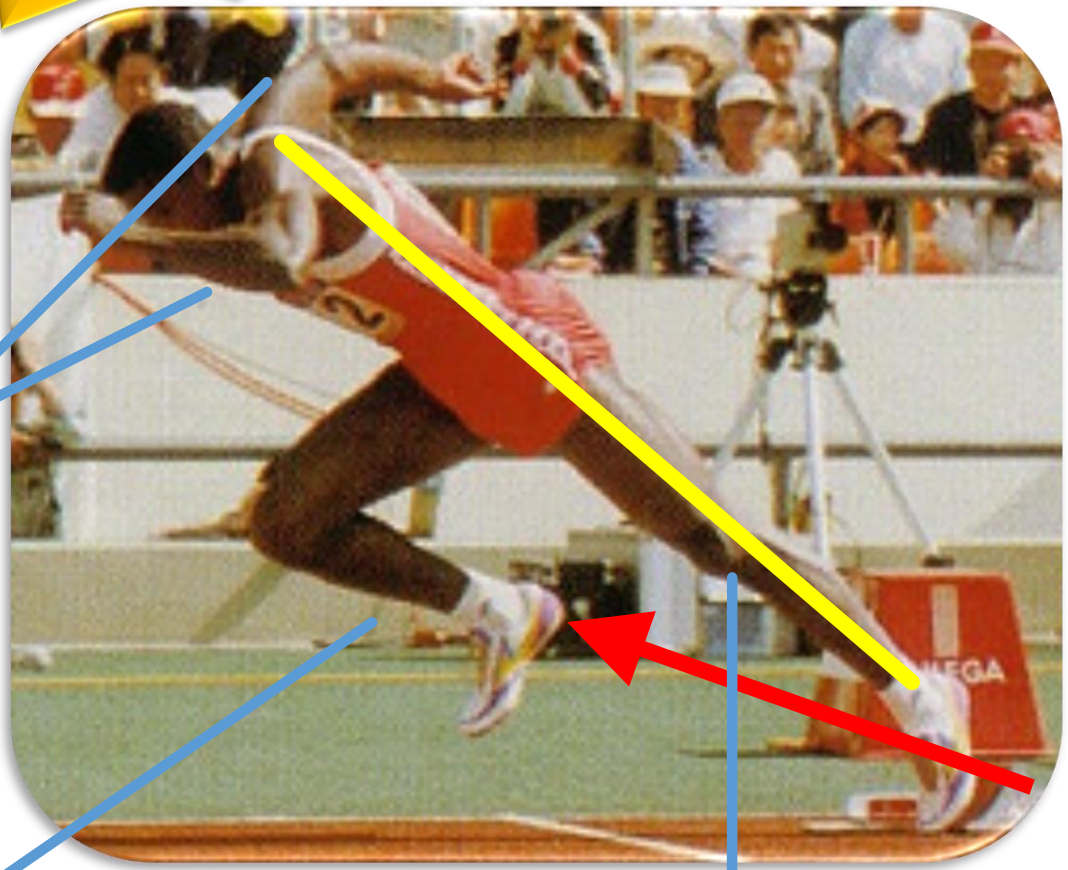
Feet pushing back into block pads

Bang

Contralateral arm and knee drive

Front arm is thrown forwards and upwards to above head height with elbow driven high

Back arm thrown backwards in a long/wide arc



Back leg pushes off blocks and drives forward with low heel carriage

Body drives out at a 45° angle

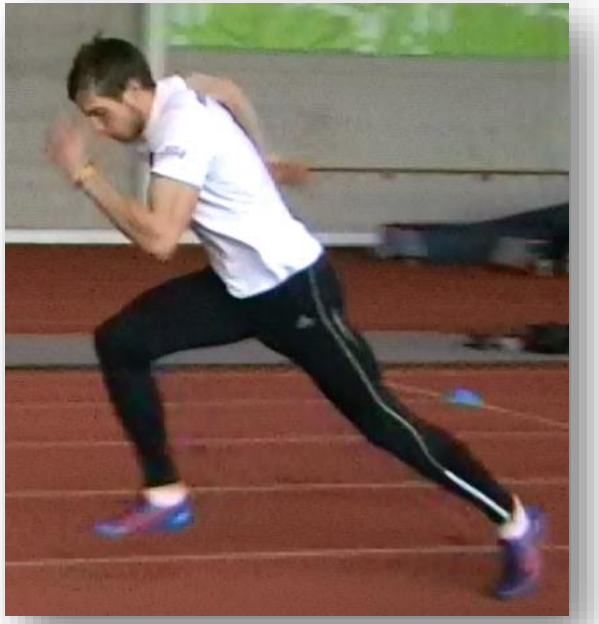
Extension through the whole body

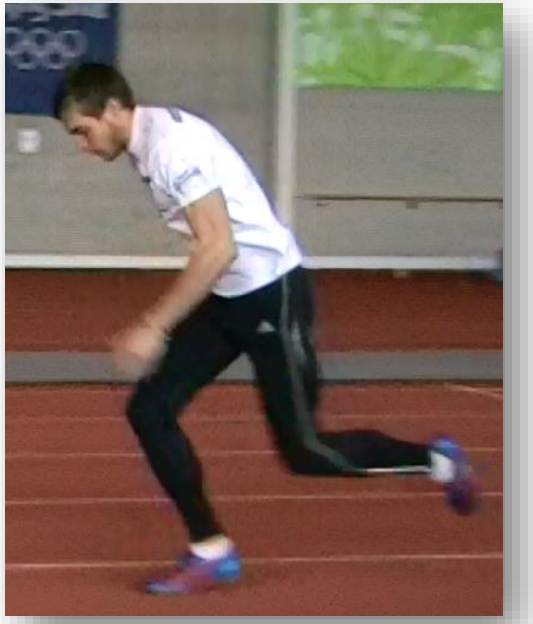
Technical Model - Acceleration

3 key positions:

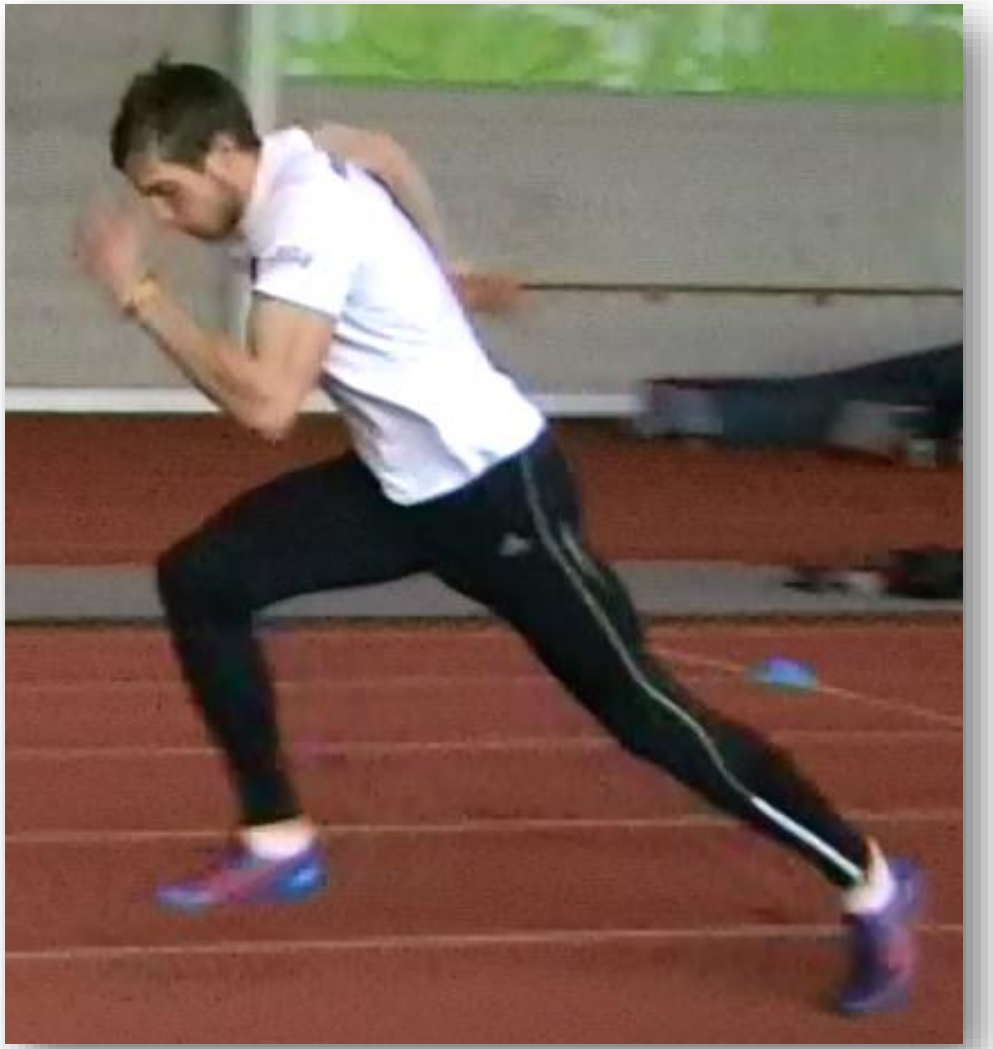
- Toe Off
- Ground Contact
- Ankle Cross

Running should display the attributes of positive running where there is a greater proportion of running action to the front of the midline of the body AKA front side mechanics





Acceleration – Toe Off



- Whole body angle
- Full triple extension – rear leg
- Positive shin angle – front leg
- Neutral/dorsiflexed foot – front leg
- Hip angle <90 – front leg

Acceleration – Ground Contact

- Contact made with ball of foot
- Contact below centre of mass
- Ball of foot contact
- Stiff ankle on contact
- Positive shin angle

Acceleration – Ankle Cross

- Ankle of recovery leg passes at or below knee of support leg
- Recovery ankle stays at or below height of recovery knee

Acceleration – Common Errors

- Short/choppy steps
- Lack of knee drive
- Not leaning forward
- Heels looping to the back
- Ground contact too far in front
- Falling and catching rather than positive driving

General Skills

- Underpinning basic movement skills will allow the development of the more specific skills to improve at a faster rate
- This implies that the development of running based motor skill requires a strong relationship and crossover with exercises and activities throughout the training programme and is not a stand alone entity
- A wide variety of general skills is useful; including activities that assist in developing coordination, balance, reactivity, mobility, postural control, spatial awareness

General Skills (cont.)

- The process of:
  - Learning the activities
  - Becoming competent at the activities
  - Adding variety of challenge to the activities

  should be the method of progressing through the skill continuum

  - This is the same for all skills and drills

Specific Skills

- The running cycle can be broken down into 3 key positions which can be worked on and developed as drills:
  - High Knees (HK)
  - High Heels (HH)
  - Foot Contact (FC)
- HK are most specific to acceleration
- HH & FC, along with HK, form the whole running cycle (RC)
- Once the individual components are mastered the RC drill sequence can be developed

Running Drills – High Knees

Key positions for all drills:

- Knee to hip height
- Free leg hip higher than stance leg hip
- Shin neutral to slightly positive
- Foot neutral/ dorsiflexed
- Tall posture

Sequence:

- Walking
- Skipping
- Running

SPEED DRILL OPTIONS

EXERCISE	SETS	DIST	VARIATIONS	CUES
HIGH KNEE WALK	2-3	10-15m	ARMS OH	Upper body upright with good tension, foot neutral (pull toes up). Land with heel and come onto ball of foot. Lift free hip when knee is at optimal height.
HIGH KNEE RUN	2-3	10-15m	DIRECTION OF TRAVEL/ ARMS OH/ONE ARM OH	Upper body upright with good tension, foot neutral (pull toes up). Land with active foot to rebound off the floor. Lift free hip hip when knee is at optimal height.
HIGH KNEE 3 STEP STOP	2-3	10-15m	ARMS OH ON STOP/OPP ARM OH ON STOP	Upper body upright with good tension, foot neutral (pull toes up). Land with active foot to rebound off the floor. Hold STOP position with good balance and control for 2-3sec. Lift free hip hip when knee is at optimal height.
HIGH KNEE BOUND	2-3	10-15m	VARY HEIGHT	Upper body upright with good tension, foot neutral (pull toes up). Land with heel and roll onto ball of foot. Lift free hip hip when knee is at optimal height. Take off and land on same leg then switch legs in step phase.
HIGH KNEE SKIPS	2-3	10-15m	NUMBER OF HOPS/ ARMS OH/ONE ARM OH	Upper body upright with good tension, foot neutral (pull toes up) Land with active foot to rebound off the floor. Lift free hip hip when knee is at optimal height. Take 2-5 little hops on one leg then switch legs in the air.
SINGLE LEG HIGH KNEE	2-3	5-10m	DIRECTION OF TRAVEL/ ONE ARM OH	Upper body upright with good tension, foot neutral (pull toes up) Land with active foot to rebound off the floor. Lift free hip hip when knee is at optimal height. Same foot continually rebounding off floor.
STRAIGHT LEG BOUND	2-3	20-30m	DOUBLE TAPS	Upper body upright with good tension, foot neutral (pull toes up). Land with active foot to rebound off the floor. Try to land under centre of mass.
HIGH HEEL LIFT	2-3	10-15m	VARY COUNT/RANDOM THROUGH HURDLES	Upper body upright with good tension, foot neutral (pull toes up). Fast and active lift up and put down. Land with active foot to rebound off the floor. Try to land under centre of mass.
RUNNING CYCLE	2-3	10-15m	OVER ANKLE/CALF/KNEE AND SWITCHING BETWEEN A/C/K	Upper body upright with good tension, foot neutral (pull toes up). Land with active foot to rebound off the floor. Try to land under centre of mass.

SKIPPING DRILLS & SKIPPING RUNNING - ANY OF THE ABOVE EXERCISES PLUS SKIPPING ROPE RUNNING

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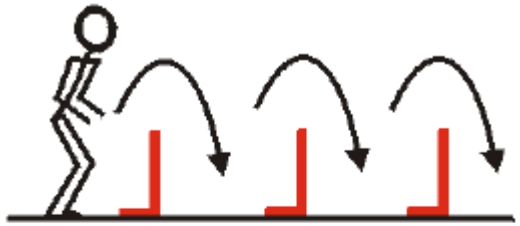
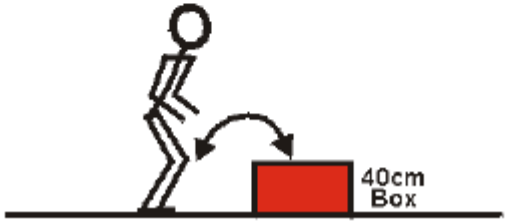
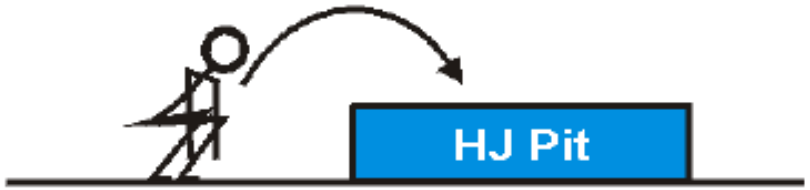
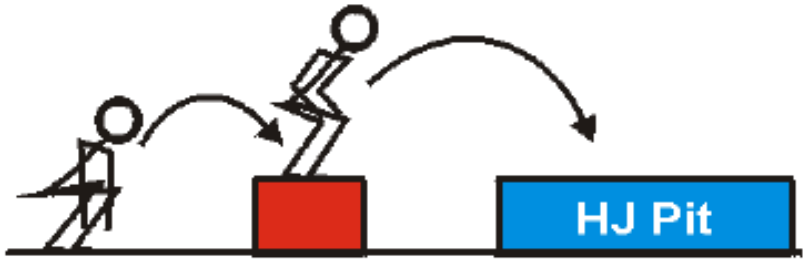
Assistance Exercises – Plyometrics Based

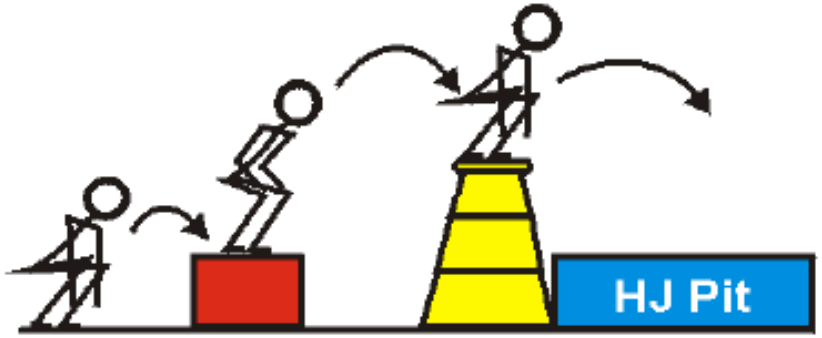
- High box jumps
- Reactive at various levels











Assistance Exercises – Gym Based

- Step Ups
- Cable Drives

Coaching Process & Problem Solving

- Know the desired technical model
- Know the technical model of the athlete – create a mental video library
- Observe the athlete in real time and with video feedback
- Compare the mental video library with the new footage
- Then ask these questions:
  - What is the biggest technical gap/technical issue?
  - What is the most important technical gap/technical issue?
  - What gap/issue will be addressed first?
  - What could be done to address the gap/issue?
- Then draw on coaching toolbox of drills, exercises, cues, tasks

Practical Session

- Upward jumps
- High Knee drills and variations
- Acceleration variations & technique