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# PHYSICAL PREPARATION

WELSH ATHLETICS COACHING RESOURCE



Youth Physical  
Development Centre  
•••  
Canolfan Ddatblygu  
Corfforol Ieuenctid

*sportwales*  
*chwaraeon cymru*



Cardiff  
School of Sport  
Ysgol Chwaraeon  
Caerdydd



WELSH ATHLETICS  
ATHLETAU CYMRU



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# FOREWORD

Coaching athletics in the 21st century requires a multidisciplinary approach to training prescription and competition preparation at all levels. A great deal of our time is spent studying and programming the event specific components of training, often with a particular emphasis on performing the event itself. However, potential limiting factors to performance can be attributed to a lack of general athleticism or physical preparation throughout the various stages of an athlete's career.

A significant coaching related KPI (key performance indicator) for success is navigating athletes through the youth and junior age groups into the senior ranks, the success of this process is largely a coaches responsibility. Our aim is to produce senior champions capable of representing Wales at the Commonwealth Games and ultimately to win medals. This process starts in the youth and junior age groups by laying appropriate performance foundations.

All events in track and field require the athlete to possess some unique physical capabilities, however all sport specific movements are advanced derivatives of fundamental motor skills and movement patterns. At Welsh Athletics we believe in the mastery of fundamentals from an early age and that maintaining these through an athletes developmental years will minimise the risk of injury and provide a platform or foundation from which event specific demands can be tolerated.

Our guiding principle is to prescribe training that is both appropriate and progressive relative to the individual athlete's age and stage of development. To produce high level performances in our sport, it is essential that an athlete is physically competent to cope with event specific demands by producing force, in the correct direction within a given timeframe.

The coaching challenge is to become highly effective movement coaches and great generalists with an event or event group specialism. All coaches are required to teach movement, develop skill and provide well planned and appropriate training for athletes. This is a challenge we urge coaches to accept and one that Welsh Athletics is proud to support.

We are pleased to have teamed up with Sport Wales and Cardiff Metropolitan University to produce physical preparation coaching resources and workshops to help coaches successfully nurture the current and future generations of Welsh athletes.

*Welsh Athletics Coaching and Performance team*



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# ABOUT THE CONTRIBUTORS



**Rhodri S. Lloyd, PhD, ASCC, CSCS\*D** is currently a Senior Lecturer in strength and conditioning and Chair of the Youth Physical Development Centre at Cardiff Metropolitan University. His research interests surround the impact of growth and maturation on long-term athletic development and the neuromuscular mechanisms underpinning resistance training adaptations in youth populations.



**Jon L. Oliver, PhD** is currently a Reader in applied paediatric exercise science at Cardiff Metropolitan University and an Adjunct Professor at the Sport Performance Research Institute New Zealand (SPRINZ) at Auckland University of Technology. His research interests surround the natural development of physical fitness and how growth and maturation interact to influence the responsiveness to training in youth populations.



**Jason Pedley, MSc, ASCC** is currently a Lecturer in strength and conditioning at Cardiff Metropolitan University. His research interests surround injury screening and effective training and coaching interventions to reduce the likelihood of musculoskeletal injury in young athletes.



**John M. Radnor, MSc, ASCC** is currently an Associate Lecturer in Strength and Conditioning at Cardiff Metropolitan University. He is undertaking a PhD in applied paediatric exercise science alongside his coaching responsibilities with Welsh Rowing. His research interests include speed, agility and plyometric development in children and adolescents and the trainability of youth athletes.



**Sylvia Moeskops, MSc** is currently a Technician Demonstrator and Associate Gymnastics Lecturer at Cardiff Metropolitan University. She is undertaking a PhD in strength and power development in young female artistic gymnasts, alongside delivering strength and conditioning support to these athletes through the Youth Physical Development Centre.

# LONG-TERM ATHLETIC DEVELOPMENT

The notion of adopting a long-term approach to the development of athleticism in youth is supported by leading authorities around the world (Lloyd et al., 2016; Bergeron et al., 2015). Whether an individual enters a long-term athletic development pathway from an early age during childhood or transitions into a pathway later in life (i.e. during adolescence), it is imperative that coaches provide the foundations of physical fitness to support their safe participation in sports and physical activity.

Central to the philosophy of long-term athletic development is the early mastery of fundamental motor skills and the development of base levels of muscular strength. The rationale for this emphasis is that, irrespective of the sport or event an individual participates in, they will be required to both produce force and absorb force. To do this safely and effectively, the individual requires a strong and robust system (muscle strength) which moves in a technically correct and fluent manner (fundamental motor skills) when faced with any physical challenge. Strong and technically competent athletes will be better placed to express power, speed and agility, while also being more economical when utilising various forms of endurance.

Coaches working with young or novice athletes should never seek short-term improvements in performance at the expense of the health and well-being of the individual, but instead aim for logical, sequential and progressive advances in a range of physical qualities. Additionally, despite sports and/or events having unique characteristics, it is important that coaches attempt to develop athleticism in a well-rounded, holistic and athlete-centered manner.

(Lloyd et al., 2014a)



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# CHILDREN ARE NOT 'MINIATURE ADULTS'

Throughout childhood and adolescence, all systems within the body (e.g. nervous, muscular, skeletal, endocrine) will develop at different rates and in a non-linear manner. Biological maturation is the process of progressing toward a mature state, and varies in magnitude (extent of change), timing (onset of change) and tempo (rate of change) between different systems in the body and between individuals (Lloyd et al., 2014b).

Dependent on these variables, youth can be classified as biologically "ahead of" (early maturer), "on time" with (average maturer), or "behind" (late maturer) their chronological age. This inter-individual difference in biological maturation is often clear when comparing a squad of young athletes of the same chronological age who may differ markedly in terms of maturation. Within sports, including athletics, it is often the case that early maturing athletes (especially boys) are selected ahead of late maturing peers simply as a consequence of the absolute physical advantage that early maturation provides (e.g. greater levels of strength and power).

While exercise prescription will almost always be driven by technical competency of the individual, coaches should be aware of the influence that growth and maturation will potentially have on the training responsiveness, relative risk of injury and resiliency of athletes.

# YOUTH PHYSICAL DEVELOPMENT MODEL

The Youth Physical Development model (Lloyd and Oliver, 2012) was designed to provide a contemporary view of the trainability of youth of different stages of maturation for both males (left) and females (right). The model shows that all components of fitness are trainable at all stages of development; however, within the model, the larger the font size, the more important and responsive to training the fitness quality will be during the developmental stage. During early childhood, FMS and muscle strength are prioritised as these qualities will aid the development of well-controlled movement skills, which also underpin other fitness qualities.

Youth Physical Development (YPD) Model for **Males**

CHRONOLOGICAL AGE (YEARS)	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21+
AGE PERIODS	EARLY CHILDHOOD			MIDDLE CHILDHOOD						ADOLESCENCE						ADULTHOOD				
GROWTH RATE	RAPID GROWTH			STEADY GROWTH						ADOLESCENT SPURT			DECLINE IN GROWTH RATE							
MATURATIONAL STATUS	YEARS PRE-PHV						PHV			YEARS POST-PHV										
TRAINING ADAPTATION	COMBINATION OF NEURAL AND HORMONAL (MATURITY-RELATED)											PREDOMINANTLY NEURAL (AGE-RELATED)								
PHYSICAL QUALITIES	FMS			FMS			FMS			FMS										
	SSS			SSS			SSS			SSS										
	MOBILITY			MOBILITY						MOBILITY										
	AGILITY			AGILITY			AGILITY			AGILITY										
	SPEED			SPEED			SPEED			SPEED										
	POWER			POWER			POWER			POWER										
	STRENGTH			STRENGTH			STRENGTH			STRENGTH										
	HYPERTROPHY						HYPER TROPHY	HYPERTROPHY						HYPER TROPHY						
	ENDURANCE & MC		ENDURANCE & MC				ENDURANCE & MC				ENDURANCE & MC									
TRAINING STRUCTURE	UNSTRUCTURED			LOW STRUCTURE			MODERATE STRUCTURE		HIGH STRUCTURE			VERY HIGH STRUCTURE								

FMS = fundamental motor skills; SSS = sport-specific skills; MC = metabolic conditioning

Youth Physical Development (YPD) Model for **Females**

CHRONOLOGICAL AGE (YEARS)	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21+
AGE PERIODS	EARLY CHILDHOOD			MIDDLE CHILDHOOD						ADOLESCENCE						ADULTHOOD				
GROWTH RATE	RAPID GROWTH			STEADY GROWTH						ADOLESCENT SPURT			DECLINE IN GROWTH RATE							
MATURATIONAL STATUS	YEARS PRE-PHV						PHV			YEARS POST-PHV										
TRAINING ADAPTATION	PREDOMINANTLY NEURAL (AGE-RELATED)											COMBINATION OF NEURAL AND HORMONAL (MATURITY-RELATED)								
PHYSICAL QUALITIES	FMS			FMS			FMS			FMS										
	SSS			SSS			SSS			SSS										
	MOBILITY			MOBILITY						MOBILITY										
	AGILITY			AGILITY			AGILITY			AGILITY										
	SPEED			SPEED			SPEED			SPEED										
	POWER			POWER			POWER			POWER										
	STRENGTH			STRENGTH			STRENGTH			STRENGTH										
	HYPERTROPHY						HYPER TROPHY	HYPERTROPHY						HYPER TROPHY						
	ENDURANCE & MC		ENDURANCE & MC				ENDURANCE & MC				ENDURANCE & MC									
TRAINING STRUCTURE	UNSTRUCTURED			LOW STRUCTURE			MODERATE STRUCTURE		HIGH STRUCTURE			VERY HIGH STRUCTURE								

FMS = fundamental motor skills; SSS = sport-specific skills; MC = metabolic conditioning

# TECHNICAL COMPETENCY

While coaches should be aware of the physical and psychosocial maturity of their athlete(s), when coaching young or novice athletes, it is ultimately technical competency that is the key priority

The technical competency model (right) provides a stepwise approach for coaches to determine the technical competency of the athlete(s) they have in front of them.

Should an athlete not be able to demonstrate technical competency at any stage of the process, then the coach should attempt to correct movement with developmentally-appropriate cueing (external cues tend to be more effective).

If cueing does not help correct the movement, then coaches should regress the drill or use a corrective exercise.

Where technical competency is repeatedly displayed in dynamic tasks, then the exercise should be progressed in a sensible manner.

## What does movement competency look like?



A.D., Lloyd, R.S., and Oliver, J.L. (in press)

# WARM-UP ANIMAL SHAPES

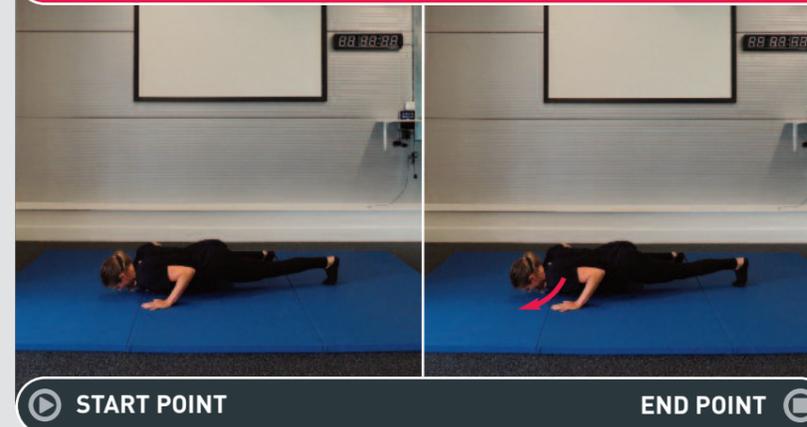
The purpose of the warm-up is to suitably prepare the body for exercise by increasing heart rate, blood flow, body temperature and mental alertness. However, the warm-up also provides an excellent opportunity to develop athleticism by exposing athletes to opportunities to develop fundamental motor skills and muscle strength. While the coach should always reinforce good technique, the warm-up should be fun, engaging and dynamic.

Wherever possible, coaches should adopt the RAMP principle for a warm-up; whereby:

- R** Raise (temperature, heart rate, respiration rate, blood flow)
- A** Activate (key muscle groups)
- M** Mobilise (key joints)
- P** Potentiate (excite the neuromuscular system)

The following pages provide an example of some animal shapes, which can be used in a variety of ways (including individual performance, large scale groups, relay races, tag and other interactive games) to help develop fundamental motor skills (i.e. locomotion, stabilisation and manipulation)

## ALLIGATOR



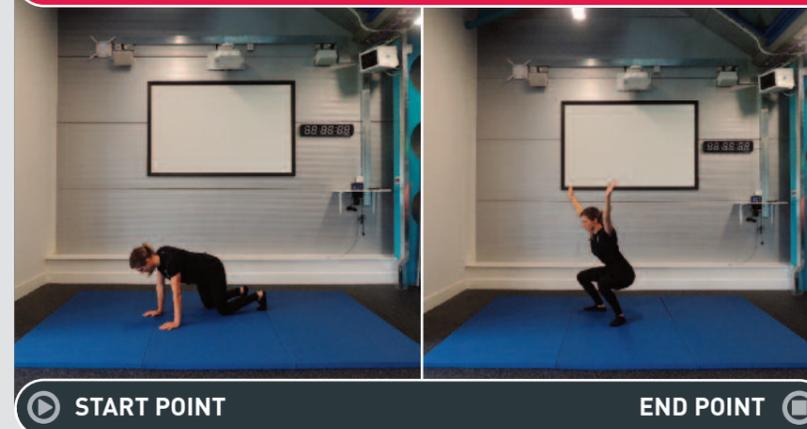
### Technical Points

- ✓ Move close to the ground
- ✓ Keep belly off the floor
- ✓ Drive knee to elbow

### Common errors

- ✗ Body too far from the floor
- ✗ Arching at lower back
- ✗ Unsynchronized movement

## BEAR



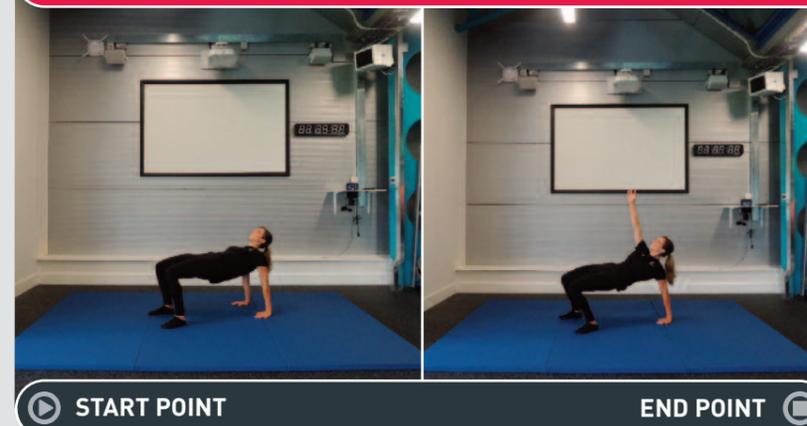
### Technical Points

- ✓ Arms straight and knees off floor
- ✓ Flat back with pelvis straight
- ✓ Chest up when squatting

### Common errors

- ✗ Rounded back
- ✗ Pelvis moving side to side
- ✗ Forward lean when squatting

## CRAB



### Coaching points

- ✓ Hips up to ceiling
- ✓ Hands facing feet
- ✓ Feet flat, hip width apart

### Common errors

- ✗ Hips dropping
- ✗ Arms not straight
- ✗ Feet too wide



# BODYWEIGHT TRAINING

The ability of the young or novice athlete to manage their own bodyweight in a variety of positions and on a range of different surfaces is important for general athleticism.

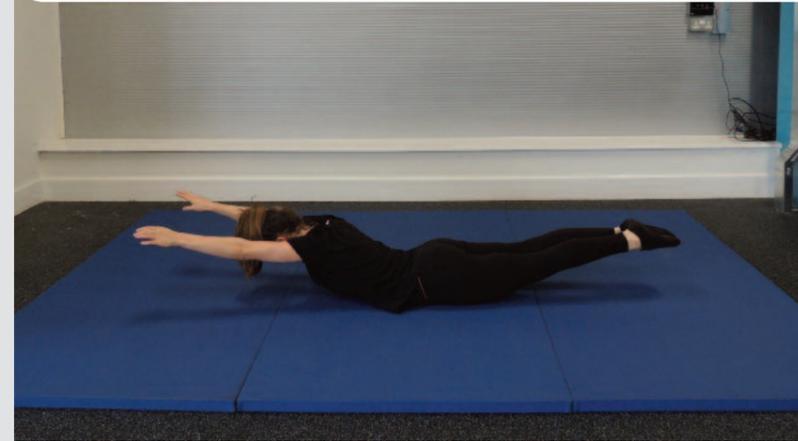
The use of the body as a form of resistance also provides a suitable training stimulus for the simultaneous development of fundamental motor skills and muscle strength.

The subsequent sections provide an example of ① key shapes, and ② positions, which children should be competent at performing, as competency in these exercises will later serve as the foundation of more advanced athletic motor skills. The final section, ③ sports acrobatics, are exercises that challenge the individual to perform the shapes and positions in combination with partners, to provide a fun and engaging physical challenge.

These are only examples, and coaches should attempt to develop their own library of exercises and ensure they are supported with developmentally appropriate cues wherever possible.

While young or novice athletes should be challenged, technical competency and general health and safety should be reinforced at all times.

## ARCH



### Technical Points

- ✓ Bend at the lower back
- ✓ Lift chest and arms off the floor
- ✓ Lift knees and feet off the floor

### Common errors

- ✗ Legs not straight
- ✗ Arms not straight
- ✗ Head up

## DISH



### Technical Points

- ✓ Brace core
- ✓ Lift arms, shoulders, and head off the floor
- ✓ Lift legs off the floor

### Common errors

- ✗ Arch at lower back
- ✗ Shoulders on the floor
- ✗ Legs not straight

## TUCK



### Technical Points

- ✓ Flat back
- ✓ Bring legs to chest
- ✓ Heels off the floor

### Common errors

- ✗ Rounded back
- ✗ Legs too straight
- ✗ Heels on the floor

**PIKE**



**Technical Points**

- ✓ Flat back
- ✓ Arms straight overhead
- ✓ Legs straight and together

**Common errors**

- ✗ Rounded back
- ✗ Legs not straight
- ✗ Arms not straight

**STRAIGHT**



**Technical Points**

- ✓ Flat back
- ✓ Arms straight
- ✓ Legs straight and together

**Common errors**

- ✗ Arching at lower back
- ✗ Legs not straight
- ✗ Arms not straight

**PUCK**



**Technical Points**

- ✓ Flat back
- ✓ Bending at hips and knees
- ✓ Weight on heels

**Common errors**

- ✗ Rounded back
- ✗ Knees too far over toes
- ✗ Weight towards front of foot

**STRADDLE**



**Technical Points**

- ✓ Flat back
- ✓ Legs straight
- ✓ Legs apart

**Common errors**

- ✗ Bending at lower back
- ✗ Rounded back
- ✗ Legs not wide enough apart

**FORWARD STRADDLE**



**Technical Points**

- ✓ Flat back
- ✓ Arms and legs straight
- ✓ Bend at hip with one leg to point to ceiling

**Common errors**

- ✗ Arching at lower back
- ✗ Legs not straight
- ✗ Leg not raised to appropriate height

**STAR**



**Technical Points**

- ✓ Flat back
- ✓ Arms and legs straight
- ✓ Legs apart

**Common errors**

- ✗ Arching at lower back
- ✗ Arms not straight
- ✗ Legs not wide enough apart

## SQUAT



### Technical Points

- ✓ Flat back
- ✓ Bending at hips and knees
- ✓ Weight on heels

### Common errors

- ✗ Rounded back
- ✗ Knees too far over toes
- ✗ Weight towards front of foot

## LUNGE



### Technical Points

- ✓ Flat back
- ✓ Legs at 90 degrees
- ✓ Front shin vertical

### Common errors

- ✗ Rounded back
- ✗ Knee too far over front toes
- ✗ Shin not vertical

## LATERAL LUNGE



### Technical Points

- ✓ Flat back
- ✓ Hips pushed back and down
- ✓ Trail leg straight

### Common errors

- ✗ Rounded upper back
- ✗ Knee not in line with toes
- ✗ Trail leg not straight

## FRONT SUPPORT



### Technical Points

- ✓ Straight line from shoulders to toes
- ✓ Arms straight
- ✓ Shoulders above hands

### Common errors

- ✗ Rounded back
- ✗ Arching at lower back
- ✗ Shoulders not above hands

## SIDE SUPPORT



### Technical Points

- ✓ Straight line from shoulders to toes
- ✓ Arms straight
- ✓ Shoulders above hands

### Common errors

- ✗ Hips dropping
- ✗ Arching at lower back
- ✗ Shoulders not above hands

## BACK SUPPORT



### Technical Points

- ✓ Straight line from shoulders to toes
- ✓ Hands facing feet
- ✓ Shoulders above hands

### Common errors

- ✗ Hips dropping
- ✗ Arching at lower back
- ✗ Hands facing backwards

## SHOULDER STAND



### Technical Points

- ✓ Straight line from shoulders to feet
- ✓ Arms straight, palms facing the floor
- ✓ Feet pointing to the ceiling

### Common errors

- ✗ Hips dropping to the floor
- ✗ Legs not straight
- ✗ Legs not together

## SUPERMAN



### Technical Points

- ✓ Flat back
- ✓ Legs straight and arms straight
- ✓ Pelvis level

### Common errors

- ✗ Arching at lower back
- ✗ Pelvis moving side to side
- ✗ Unsynchronized movement

## BRIDGE



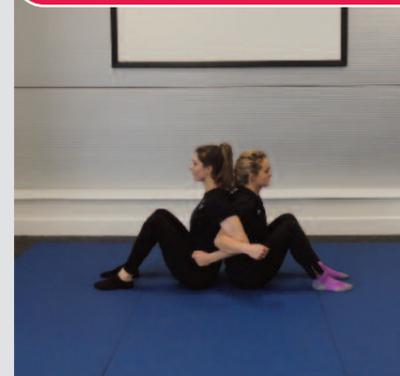
### Technical Points

- ✓ Shoulders above hands
- ✓ Hips to the ceiling
- ✓ Straight arms

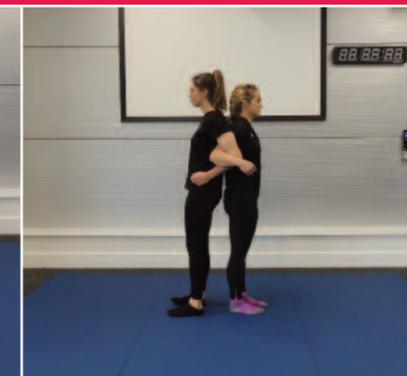
### Common errors

- ✗ Hands not facing feet
- ✗ Arms not straight
- ✗ Hips dropping to the floor

## BACK-TO-BACK SQUAT



START POINT



END POINT

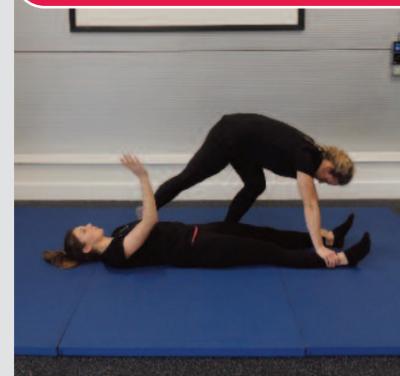
### Technical Points

- ✓ Legs bent with weight on heels
- ✓ Flat back
- ✓ Push against partner to stand

### Common errors

- ✗ Rounded back
- ✗ Feet not flat on floor
- ✗ Unsynchronized movement

## BED BUNKS



START POINT



END POINT

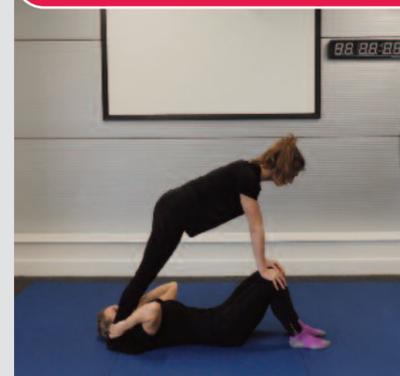
### Technical Points

- ✓ Arms straight
- ✓ Straight line from shoulders to feet
- ✓ Hands and shoulders in line

### Common errors

- ✗ Arching at lower back
- ✗ Arms bent
- ✗ Shoulders and hands not inline

## PARTNER BOXES



START POINT



END POINT

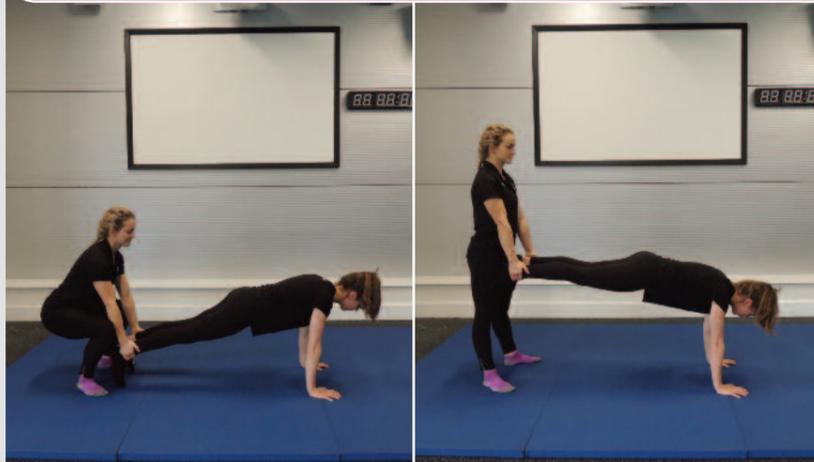
### Technical Points

- ✓ Arms straight, supporting shin of top partner
- ✓ Straight line from shoulders to feet
- ✓ Hands and shoulders in line

### Common errors

- ✗ Arching at lower back
- ✗ Arms bent
- ✗ Shoulders and hands not inline

## FRONT SUPPORT TRAVEL



## Technical Points

- ✓ Supporting partner maintain flat back
- ✓ Straight line from shoulders to feet
- ✓ Shoulders above hands

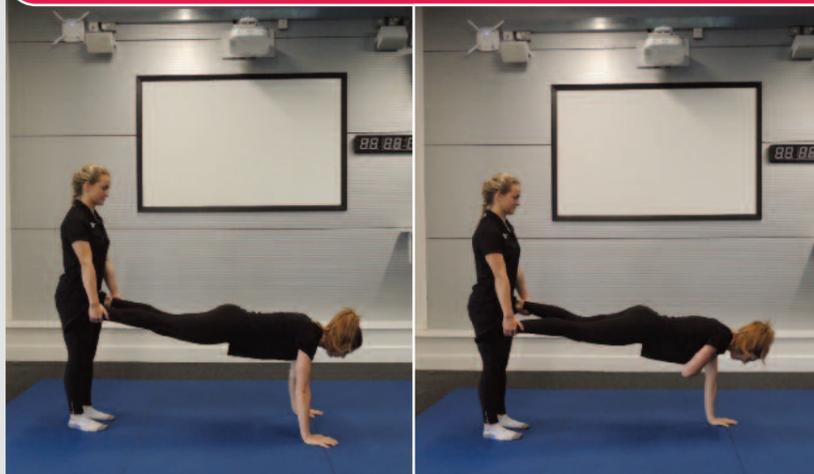
## Common errors

- ✗ Supporting partner rounding back
- ✗ Arching at lower back
- ✗ Shoulders not above hands

START POINT

END POINT

## FRONT SUPPORT GORILLA SLAPS



## Technical Points

- ✓ Supporting partner maintain flat back
- ✓ Straight line from shoulders to feet
- ✓ Keep pelvis straight

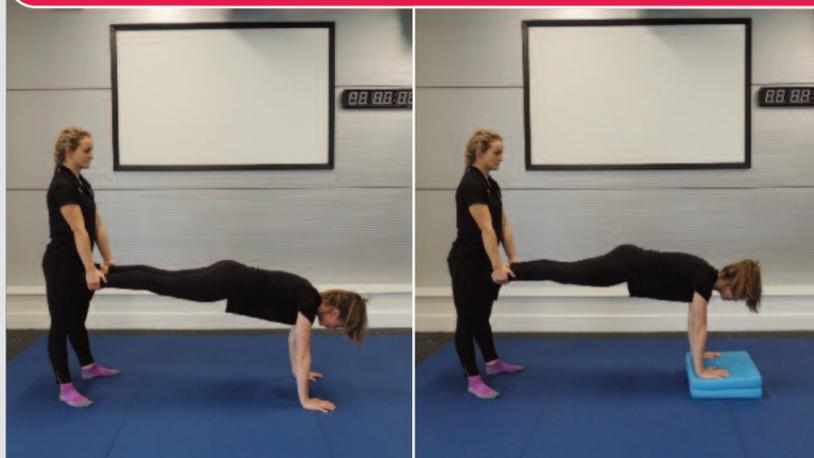
## Common errors

- ✗ Supporting partner rounding back
- ✗ Arching at lower back
- ✗ Pelvis moving side to side

START POINT

END POINT

## FRONT SUPPORT STEP-UP



## Technical Points

- ✓ Supporting partner maintain flat back
- ✓ Straight line from shoulders to feet
- ✓ Keep pelvis straight

## Common errors

- ✗ Supporting partner rounding back
- ✗ Arching at lower back
- ✗ Pelvis moving side to side

START POINT

END POINT

## PARTNER SQUAT



## Technical Points

- ✓ Grip partners wrist
- ✓ Bend at hips and knees simultaneously
- ✓ Weight on heels at bottom

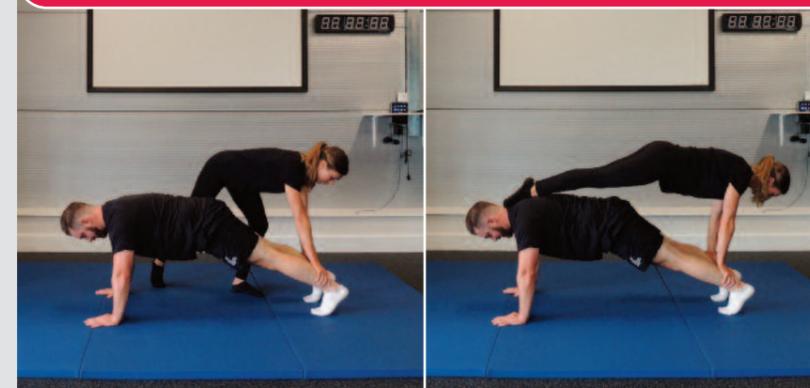
## Common errors

- ✗ Rounded back
- ✗ Knees too far over toes
- ✗ Weight towards front of foot

START POINT

END POINT

## PARTNER PLANK



## Technical Points

- ✓ Top partner grip above ankles
- ✓ Straight line from shoulders to feet
- ✓ Shoulders above hands

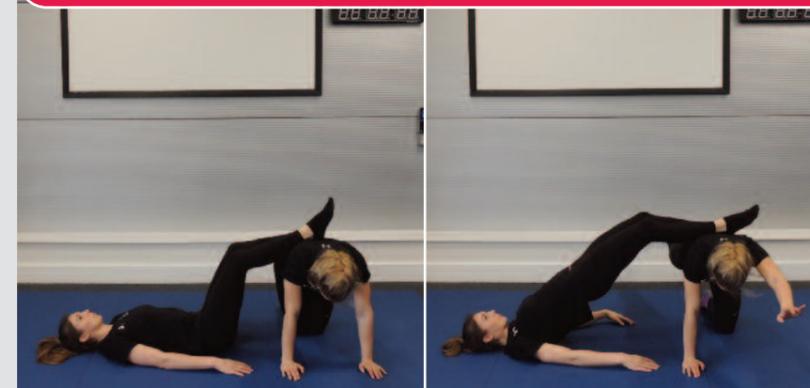
## Common errors

- ✗ Rounded back
- ✗ Arching at lower back
- ✗ Shoulders not above hands

START POINT

END POINT

## GLUTE BRIDGE AND SUPERMAN



## Technical Points

- ✓ Flat back for both partners
- ✓ Pelvis level
- ✓ Hips up to ceiling (glute bridge), arms and legs straight (Superman)

## Common errors

- ✗ Hips dropping
- ✗ Arching at lower back
- ✗ Pelvis not level

START POINT

END POINT



# ATHLETIC MOTOR SKILL COMPETENCIES

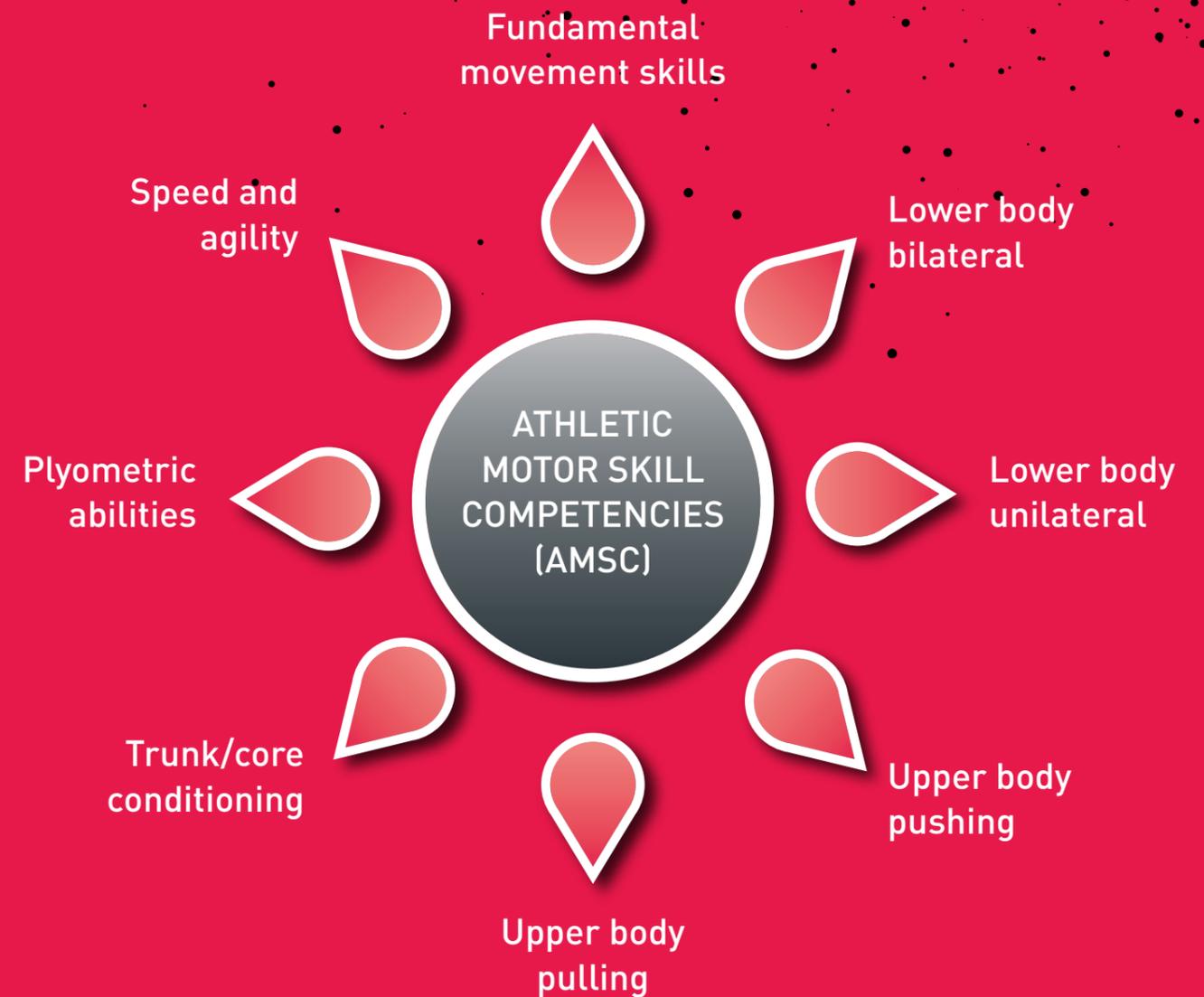
**Athletic motor skill competencies (AMSC) are movement skills that form the basis of global movements, such as running, jumping and throwing, and also allow for progression to more advanced athletic training.**

It is very likely that low levels of muscle strength and movement control and coordination will limit the development of AMSC.

Coaches should ensure that all athletes are competent in all AMSC and are able to produce and absorb forces with correct technique.

The following exercises are only examples, and coaches should attempt to develop their own library.

However, whether using the following example exercises, or using their own, coaches should seek to develop competency across all AMSC. Exposure to the different AMSC may take place in the same session or across multiple sessions depending on the level of athlete.



A.D., Lloyd, R.S., and Oliver, J.L. (2014)

## FOAM ROLLER



### Technical Points

- ✓ Wrap arms around chest
- ✓ Flat back
- ✓ Breathe out while rolling

### Common errors

- ✗ Holding breath
- ✗ Arching lower back
- ✗ Not rolling all of the back

## WINDMILLS



### Technical Points

- ✓ Knee stays in contact with roller
- ✓ Hips fixed in place
- ✓ Only upper body moves

### Common errors

- ✗ Rotating hips to aid range
- ✗ Only moving arm and not torso
- ✗ Rushing the movement

## SPIDERMAN



### Technical Points

- ✓ Flat back
- ✓ Foot flat on the floor
- ✓ Straight line from head to heel

### Common errors

- ✗ Heel off the floor
- ✗ Rounded back
- ✗ Knee collapsing towards elbow

## GLUTE BRIDGE



### Technical Points

- ✓ Squeeze abdominals and glutes
- ✓ Push through heels
- ✓ Knees pushed out

### Common errors

- ✗ Knees collapsing together
- ✗ Arching lower back
- ✗ Not fully extending hip

## MINI BAND WALKS



### Technical Points

- ✓ Weight on mid-foot
- ✓ Lead with knee
- ✓ Stay low

### Common errors

- ✗ Rising and falling
- ✗ Leading with foot
- ✗ Knees dropping forwards

## OVERHEAD BAND SQUAT



### Technical Points

- ✓ Band above the crown of the head
- ✓ Weight through heels
- ✓ Chest up

### Common errors

- ✗ Band in front or behind head
- ✗ Elbows not locked out
- ✗ Flexing spine

## JUMP TO BOX



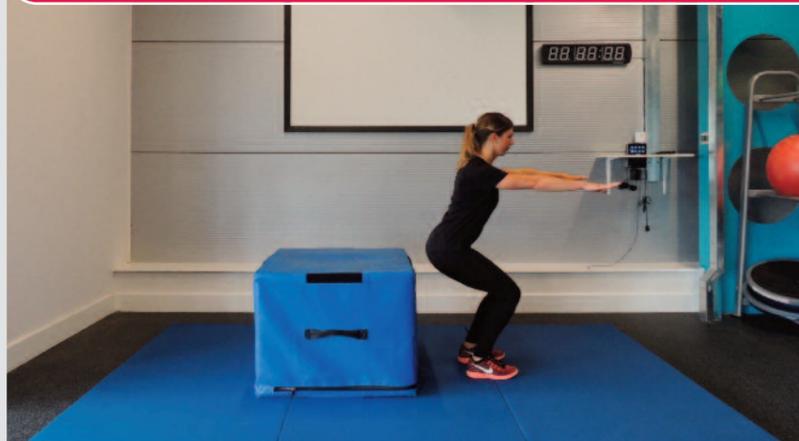
### Technical Points

- ✓ Soft landing
- ✓ Full foot contact
- ✓ Assume back squat position upon landing

### Common errors

- ✗ Heavy/loud landing
- ✗ Knees collapsing together
- ✗ Hips sinking towards floor

## JUMP FROM BOX



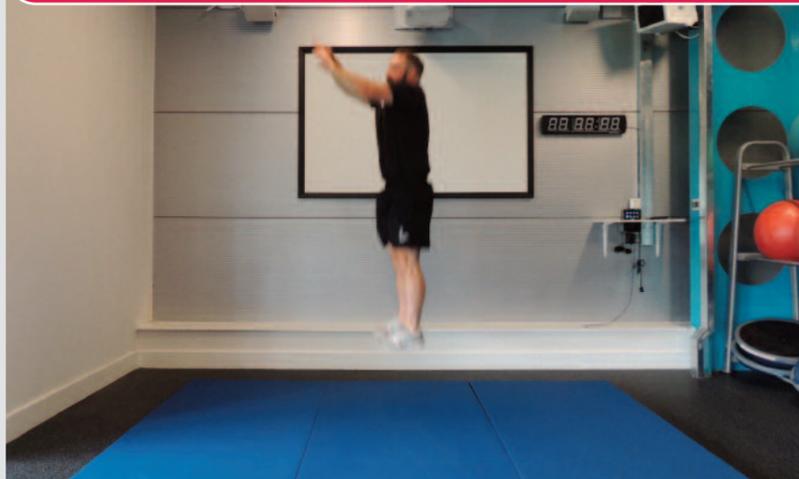
### Technical Points

- ✓ Soft landing
- ✓ Full foot contact
- ✓ Assume back squat position upon landing

### Common errors

- ✗ Heavy/loud landing
- ✗ Knees collapsing together
- ✗ Hips sinking towards floor

## JUMP IN PLACE



### Technical Points

- ✓ Soft landing
- ✓ Full foot contact
- ✓ Assume back squat position upon landing

### Common errors

- ✗ Heavy/loud landing
- ✗ Knees collapsing together
- ✗ Hips sinking towards floor towards elbow

## JUMP WITH PERTURBATION



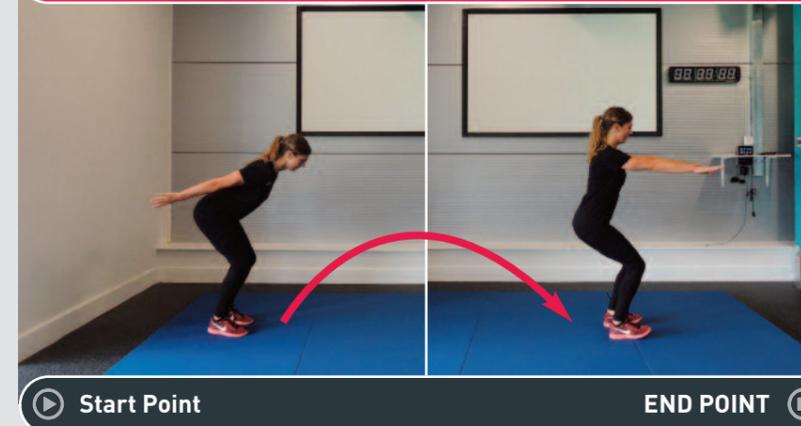
### Technical Points

- ✓ Soft landing
- ✓ Full foot contact
- ✓ Assume back squat position upon landing
- ✓ Weight equally distributed between both feet

### Common errors

- ✗ Heavy/loud landing
- ✗ Knees collapsing together

## HORIZONTAL JUMP



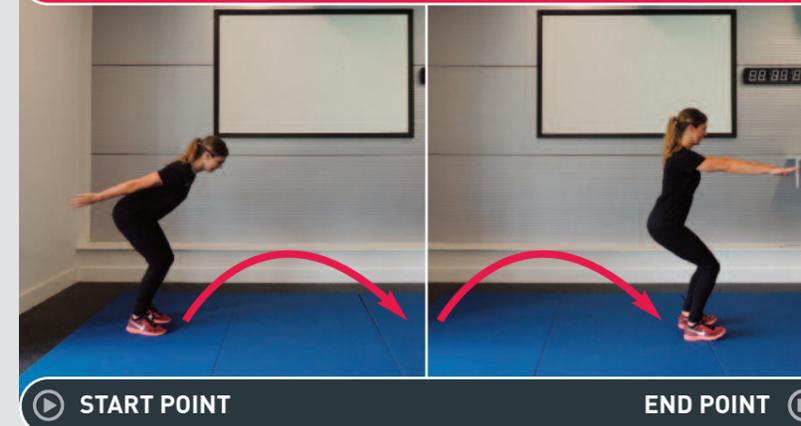
### Technical Points

- ✓ Soft landing
- ✓ Full foot contact
- ✓ Assume back squat position upon landing

### Common errors

- ✗ Heavy/loud landing
- ✗ Knees collapsing together
- ✗ Hips sinking towards floor

## MULTIPLE JUMPS



### Technical Points

- ✓ Quick transition into next jump
- ✓ Full foot contact
- ✓ Assume back squat position upon landing

### Common errors

- ✗ Heavy/loud landing
- ✗ Knees collapsing together
- ✗ Hips sinking towards floor

## BACK SQUAT

### BILATERAL

#### Technical Points

- ✓ Weight towards heels in bottom position
- ✓ Knees in line with toes
- ✓ Keep torso upright

#### Common errors

- ✗ Flexing knees first
- ✗ Knees collapsing together
- ✗ Flexing of spine



START POINT

END POINT

## OVERHEAD SQUAT

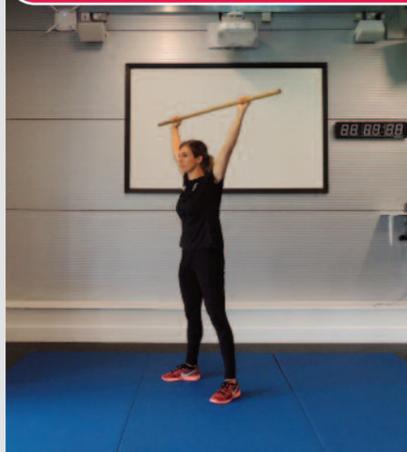
### BILATERAL

#### Technical Points

- ✓ Keep bar over the crown of the head
- ✓ Body weight through heels
- ✓ Flat back

#### Common errors

- ✗ Bar travelling forwards or backwards
- ✗ Back flexing
- ✗ Knees collapsing together



START POINT

END POINT

## SPLIT SQUAT

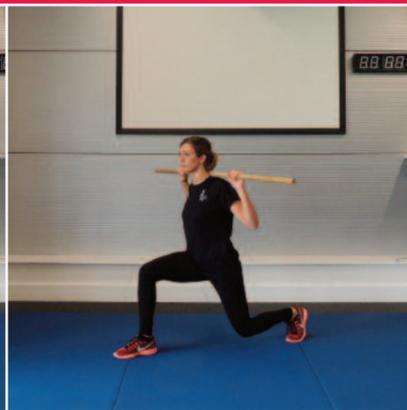
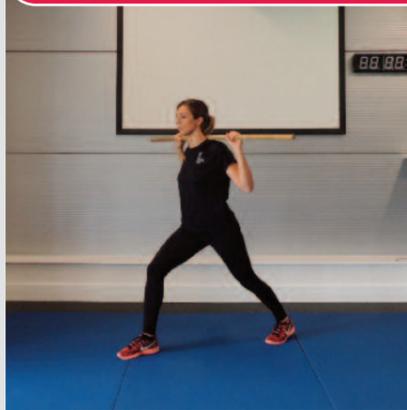
### UNILATERAL

#### Technical Points

- ✓ Push through front heel
- ✓ Torso upright, hips travel straight down
- ✓ 90 degrees at ankle, knee and hip

#### Common errors

- ✗ Front knee traveling beyond the toes
- ✗ Torso leaning forwards



START POINT

END POINT

## SINGLE LEG SQUAT

### UNILATERAL

#### Technical Points

- ✓ Sit backwards
- ✓ Push through heel
- ✓ Knee in line with toes

#### Common errors

- ✗ Knee collapsing inwards
- ✗ Heel lifting off the floor
- ✗ Pelvic tilt (left/right)



START POINT

END POINT

## BAND HIP THRUST

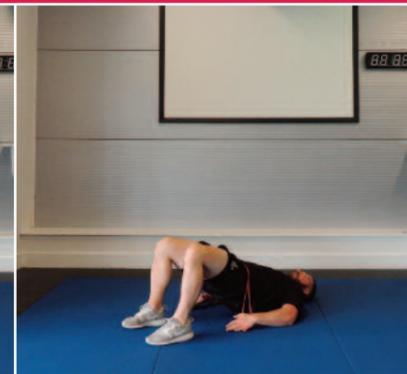
### HINGING

#### Technical Points

- ✓ Push through heels
- ✓ Squeeze abdominals and glutes

#### Common errors

- ✗ Pelvic tilt (left/right or forward/backwards)
- ✗ Arching of lower back
- ✗ Not hitting full hip extension



START POINT

END POINT

## ROMANIAN DEADLIFT

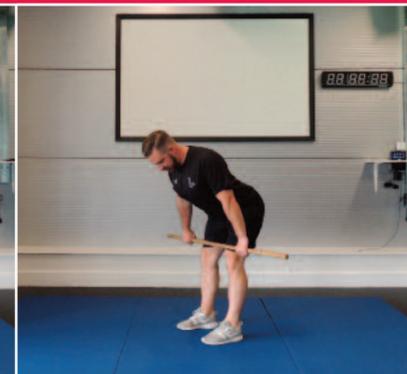
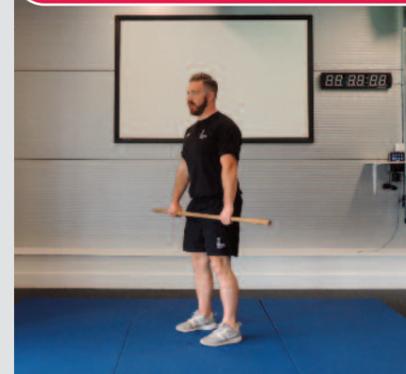
### HINGING

#### Technical Points

- ✓ Flat back
- ✓ Weight through heels
- ✓ Hips pushed backwards

#### Common errors

- ✗ Flexing of lower back
- ✗ Weight on front of foot
- ✗ Excessive bending of knees



START POINT

END POINT









# GLOSSARY

**Athletic motor skill competencies (AMSC)** - movement skills that form the basis of global movements, such as running, jumping and throwing, and also allow for progression to more advanced athletic training.

**Athleticism** is the ability to repeatedly perform a range of movements with precision and confidence in a variety of environments, which require competent levels of; motor skills, strength, power, speed, agility, balance, coordination, and endurance.

**Bilateral** exercises are performed using both sides of the body or both limbs at the same time. An example of this would be a double leg squat.

**Bodyweight training** - a form of training that requires children to manage body weight through movements that stress fundamental motor skills

**Chronological age** is the time from date birth, whereas **biological maturation** is the process of progressing toward a mature state.

**Exercise progression** is the process of increasing the demands of a movement task, such as making a task more complex.

**Exercise regression** reflects the simplification of the demands of a movement task, such as making a task less complex.

**Fundamental motor skills (FMS)** are basic motor skills that are typically classified as locomotion, manipulation and stabilisation skills.

**Sport-specific skills (SSS)** are more advanced motor skills that are far more specific to actual sporting activities.

**Technical competency** is the ability of an individual to execute a skill with control and proficiency.

**Metabolic conditioning** - exercise that aims to improve the ability of the muscle to use aerobic and/or anaerobic energy and resist fatigue.

**R.A.M.P. Warm-up** is the systematic approach to a warm-up, consisting of raising, activation and mobilisation, and potentiation.

**Unilateral** exercises are performed using one side of the body or a single limb. An example of this would be a single leg squat.

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