Assessment and Exercise Program Design

Level 2

PERFORMANCE
REDEFINED

PHYSICAL LITERACY SCREEN

MAKING EXERCISE MATTER!

THE CASE FOR PHYSICAL LITERACY

The motivation, confidence, physical competence, knowledge and understanding to move across a wide range of physical activities and settings characterized by varying physical demands – Physical Literacy

There are many personal, task and environmental factors that influence *how* each of us moves while working, playing or navigating life's daily activities. In other words, our movement patterns reflect our motivation, confidence, physical fitness, knowledge, social influences, etc. And when performed repeatedly, these patterns can become *learned behaviours* that influence all areas of our lives – the way we lift our child out of bed, our decision to use the stairs instead of the escalator, or our ability to sustain a long career in a physically demanding occupation such as firefighting.

Described as the collective influence of these factors on how we move, our *Physical Literacy* reflects the extent to which our movement behaviours shape our health, wellness and quality of life. It also underscores the importance of being physically fit, while highlighting the fact that possessing the fitness (e.g. aerobic capacity) to perform a particular activity may mean very little without also having the awareness, confidence or requisite mobility to move safely and effectively. For example, adopting an undesirable movement pattern to lift your child (perhaps because the behaviour was engrained by repeatedly lifting heavy boxes while at work) can be detrimental to your health, wellness and quality of life in the short and long term.

For these reasons, when assessing a client's physical needs their movement patterns must be assessed within the context of any relevant task demands. Knowing whether the client is able to control motion of their knees, back and shoulders, for example, across a range of activities requiring varying degrees of physical fitness will shed light on their physical literacy and help to personalize any exercise, education or coaching recommendations.

ASSESSING PHYSICAL LITERACY

Before discussing the many options to assess physical literacy, a distinction must be made between *key features*, *movement patterns* and *fitness demands*.

Key features are specific attributes of a skill or movement pattern the will influence the execution or outcome the activity (e.g. risk factors or mechanisms of injury). Key features may also be common to a range of patterns and task demands.

Movement patterns are descriptors of motion that can be used to subcategorize skills (e.g. throwing a ball), tasks (e.g. lifting a box from the floor) and activities (e.g. game of basketball). A performer's ability to control the '7 Key Features' may differ across movement patterns.

The fitness demands associated with a particular activity reflect the frequency, intensity, and duration, and will influence the level of effort required by a performer. A performer's ability to control the '7 Key Features' may be influenced by the fitness demands.

Assessing someone's movement patterns (using select key features) across a range of tasks characterized by varying fitness demands will help to establish their literacy needs. If fitness and movement are assessed separately the interpretation of any findings should be limited.

What can be said if only use FITNESS Testing	What can be said if only use MOVEMENT Testing
• 'Passing' a fitness test provides limited insight into a performer's physical literacy. Can only say that fitness was sufficient to meet test demands. • 'Failing' a fitness test provides insight into a performer's fitness. Can say that fitness will limit physical literacy.	• 'Passing' a movement test provides insight into a performer's fitness and physical literacy. Can say that fitness does not limit the way they move in test. • 'Failing' a movement test provides limited insight into a performer's fitness. Can only say that fitness may be limited.

PHYSICALLY LITERATE *(Performer A)*

10 Reps < 15s

PHYSICALLY FIT *(Performer B)*

10 Reps < 15s

NOT PHYSICALLY FIT *(Performer C)*

10 Reps > 15s

CATEGORIZING LITERACY NEEDS

Identify FITNESS and LITERACY needs to inform exercise recommendations

INFORMING EXERCISE RECOMMENDATIONS

Knowing how someone controls their body in space while performing a range activities with varying physical demands can provide invaluable information that will help to inform personalized exercise recommendations (fitness, physical literacy or otherwise). In general, performers can be categorized as being physically literate, physically fit, or not sufficiently fit to perform the screening tasks.

PERFORMER A (PHYSICALLY LITERATE)

Those who possess the ability to actively CONTROL motion of their knees, back, and shoulders while squatting, lunging, hinging, pushing and pulling with varying demands. Displaying control implies that, at a minimum, the requisite FITNESS is present.

Implications for Exercise: Activities characterized by single patterns or limited demands may not afford an opportunity to further improve physical literacy. Suggest using activities that involve complex patterns and varied (elevated) demands.

PERFORMER B (PHYSICALLY FIT ONLY)

Those who do not possess the ability to actively CONTROL motion of their knees, back, or shoulders while squatting, lunging, hinging, pushing and pulling with varying demands, but do have the requisite FITNESS to meet the task objectives (e.g. work continuously for 30s).

Implications for Exercise: Activities that challenge fitness may not provide an opportunity to focus on actively controlling motion of the knees, back or shoulders. Suggest using activities that involve limited complexity and/or range of motion and varied demands (fitness can be maintained). Improving control must be prioritized (i.e. learn how to use available fitness).

PERFORMER C (Not PHYSICALLY FIT)

Those who do not possess the ability to actively CONTROL motion of their knees, back, or shoulders while squatting, lunging, hinging, pushing and pulling with varying demands, because they do have the requisite FITNESS to meet the task objectives (e.g. work continuously for 30s).

Implications for Exercise: Activities that emphasize fitness should be prioritized. In the absence of fitness, the task demands will need to be modified. Suggest combining activities that will help to both improve fitness and active control of the knees, back and shoulders.

PHYSICAL LITERACY SCREEN™

The Physical Literacy Screen™ comprises a series of 15 tasks that can be used separately or collectively to better understand *how* an individual moves while performing a series of general movement patterns. The 15 tasks are also separated into 3 categories each differing in the physical demands imposed.

REPETITION tasks impose a LOAD challenge (i.e. 15 repetitions per limb)

WORK tasks impose a TIME challenge (i.e. 30 seconds continuously)

TEMPO tasks impose a SPEED challenge (i.e. 10 repetitions in 15 seconds)

The Screen does not need to be completed in any specific order, and there is no requisite rest period between tasks. Fitness, as defined by the screening criteria, reflects the ability to perform each task in isolation. Movement, as defined by the screening criteria, must be graded within the context of the task being performed – a performer can only be described as 'moving well' if able to meet the fitness criteria.

The Physical Literacy Screen can be used to categorize performers as being: A) physically literate (fitness and movement), B) physically fit (fitness only), and C) not physically fit (no fitness or movement).

	Performer A	Performer B	Performer C
FITNESS CRITERIA	✔	✘	✘
MOVEMENT CRITERIA	✔	✔	✘
	Physically Literate	Physically Fit	Not Physically Fit

THE SCREENING TASKS

The 15 tasks outlined below can be used separately or collectively to better understand an individual's physical literacy (i.e. their ability to control key movement features while performing general movement patterns within a range of fitness domains). If the FITNESS and MOVEMENT criteria are met, it can be stated that the individual has the physically literacy to perform. If one or more of the criteria are not met, it can be stated that the fitness, pattern or feature can or should be emphasized with exercise.

REPETITION-BASED CHALLENGES

Use to screen squat, lunge, hinge, push and pull patterns with LOAD demand (15 Reps / Limb)

1. Squat: ONE LEG SQUAT

2. Lunge: FRONT LUNGE

3. Hinge: ONE LEG ROMANIAN DEADLIFT

4. Push: ONE ARM PLANK

5. Pull: ONE ARM ROW

WORK-BASED CHALLENGES

Use to screen squat, lunge, hinge, push and pull patterns with TIME demand (30s Continuous)

1. Squat: JUMP SQUAT

2. Lunge: LATERAL LUNGE

3. Hinge: ONE LEG HIP BRIDGE

4. Push: HANDSTAND

5. Pull: PULL-UP HANG

TEMPO-BASED CHALLENGES

Use to screen squat, lunge, hinge, push and pull patterns with SPEED demand (10 Reps / 15s)

1. Squat: AIR SQUAT

2. Lunge: BACK LUNGE

3. Hinge: GOOD MORNING

4. Push: PUSH-UP

5. Pull: INVERTED ROW

PHYSICAL LITERACY SCREEN
Knee, Low Back and Shoulder Control

15 REPETITIONS / SIDE

1 LEG SQUAT KN / BK
Instructions
1. Stance heel must remain on the floor.
2. Squat to knee angle of 90°.
3. Alternate legs. Provide feedback.

FRONT LUNGE KN / BK
Instructions
1. Each lunge must be continuous motion.
2. Lunge forwards to knee angle of 90°.
3. Alternate legs. Provide feedback.

1 LEG RDL KN / BK
Instructions
1. Stance heel must remain on the floor.
2. Hinge to hip angle of 90°.
3. Alternate legs. Provide feedback.

1 ARM PLANK BK / SH
Instructions
1. Hands shoulder width, feet > shoulders.
2. Touch hand to opposite shoulder.
3. Alternate arms. Provide feedback.

1 ARM ROW BK / SH
Instructions
1. Hands shoulder width, feet > shoulders.
2. Touch hand to opposite shoulder.
3. Alternate arms. Provide feedback.

30 SECONDS CONTINUOUS

JUMP SQUAT KN / BK
Instructions
1. Each jump must be continuous motion.
2. Jump, land, squat to knee angle of 90°.
3. Provide feedback.

LAT LUNGE KN / BK
Instructions
1. Each lunge must be continuous motion.
2. Lunge sideways to knee angle of 90°.
3. Alternate legs. Provide feedback.

HIP BRIDGE KN / BK
Instructions
1. Leg motion must be continuous.
2. Raise hips, flex one hip to 90°.
3. Alternate legs. Provide feedback.

HAND STAND BK / SH
Instructions
1. Hands shoulder width, 1-1.5 ft from wall.
2. Legs straight, feet supported.
3. Provide feedback.

PULL-UP HANG BK / SH
Instructions
1. Hands shoulder width, prone/neutral grip.
2. Legs straight, feet uncrossed.
3. Provide feedback.

10 REPS / 15 SECONDS

AIR SQUAT KN / BK
Instructions
1. Heels must remain on the floor.
2. Squat to knee angle of 90°.
3. Provide feedback.

BACK LUNGE KN / BK
Instructions
1. Each lunge must be continuous motion.
2. Lunge back to front knee angle of 90°.
3. Alternate legs. Provide feedback.

GOOD MORN KN / BK
Instructions
1. Hands on head, slight bend in knees.
2. Hinge to a hip angle of 90°.
3. Provide feedback.

PUSH-UP BK / SH
Instructions
1. Hands and feet shoulder width.
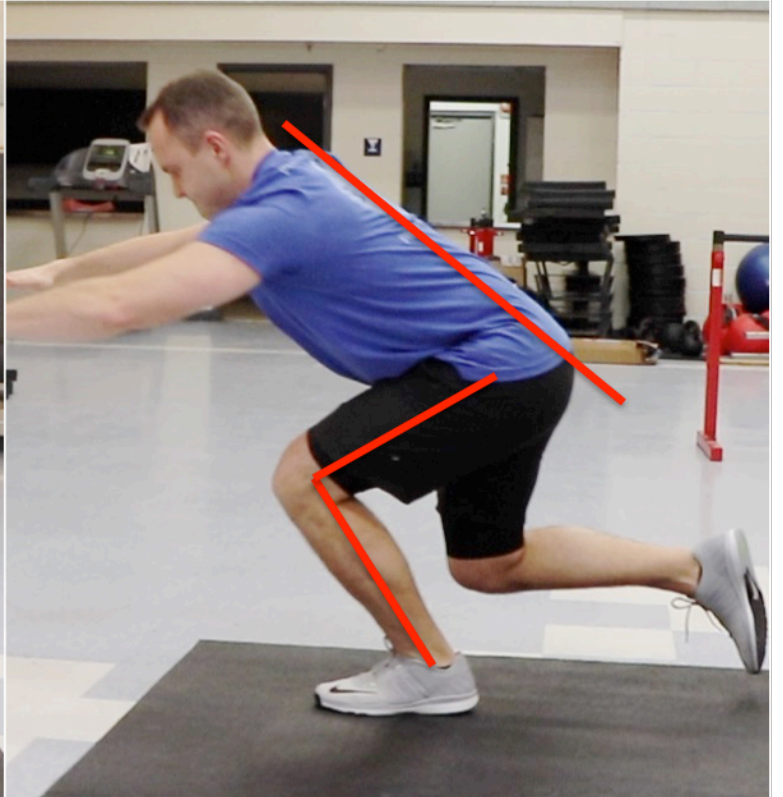2. Touch chest to floor, extend arms.
3. Provide feedback.

INV ROW BK / SH
Instructions
1. Hands and feet shoulder width, knees 90°.
2. Touch chest to bar, extend arms.
3. Provide feedback.

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ONE LEG SQUAT

Screen **literacy** to perform a unilateral **SQUAT** pattern with a **LOAD** demand

INSTRUCTIONS

- With the shoes on, stand on one leg and place the arms in front or beside the body (not on hips). Keep the heel in contact with the floor at all times.

- Squat to a knee flexion angle of 90° and return to standing with the hip fully extended.

- Attempt to keep the stance knee in line with the stance hip and foot, and the back in a neutral position (same as standing) throughout the motion.

- Perform 15 repetitions on each leg in an alternating manner and provide as much feedback as necessary to help the performer achieve the desired fitness and movement standards.

- The test can be terminated if the desired depth cannot be achieved on 3 consecutive repetitions (on same leg).

STANDARDS

- ✓ Heel on the floor
- ✓ Hands off hips
- ✓ 90° knee angle
- ✓ Hip extended
- ✓ Alternate legs
- ✓ 15 reps per leg

SCREENING CRITERIA

FITNESS
(Both criteria must be met to meet the fitness standard)

ROM: Squats to a knee angle of 90° while keeping the heel on the floor
REPETITIONS: Performs 15 repetitions with each leg in an alternating fashion

KNEE MOTION
(Fitness standards must be met to comment on knee control, otherwise unknown)

CONTROL: Stance knee is aligned with the stance hip and foot throughout the motion
Note position of knee with respect to line drawn between the stance hip and foot

BACK MOTION
(Fitness standards must be met to comment on back control, otherwise unknown)

CONTROL: A neutral low back curvature is maintained (reference standing curvature).
Note change in relationship between lines drawn through the upper back and hips

GRADING THE PHYSICAL LITERACY SCREEN™

Use the 15 screening tasks to identify relevant opportunities for exercise, related specifically to an area of FITNESS, movement PATTERN or KEY FEATURE, by noting the presence or absence of specific criteria. For each task, both the FITNESS and MOVEMENT criteria must be noted.
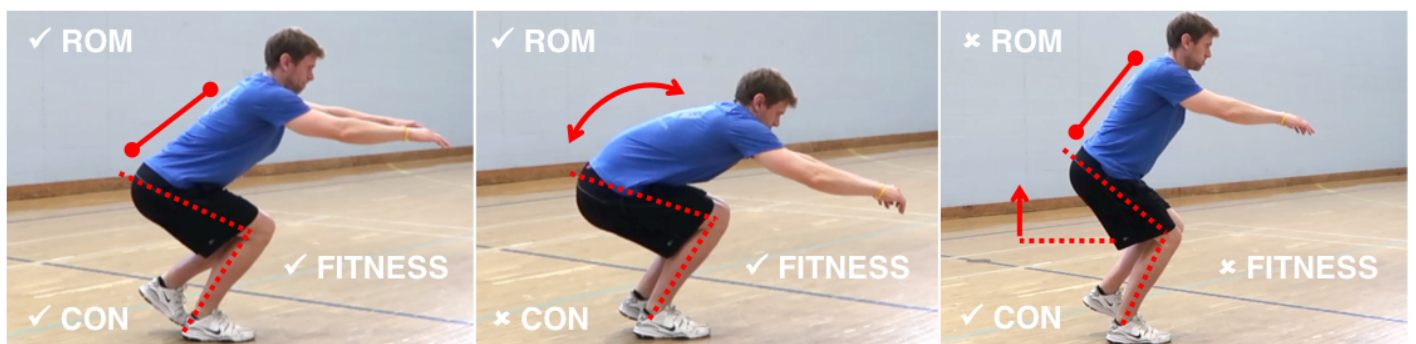
FITNESS STANDARDS

ALL TASKS
(The specific criteria for each task will vary slightly)

ROM: The requisite RoM must be achieved while maintaining hand/foot position. Failing to achieve the requisite RoM on 3 consecutive reps should be documented as an '✖'.

REPETITIONS: For all REPS tasks, 15 reps must be performed with the requisite RoM.

WORK TIME: All WORK tasks must be performed continuously for 30s with the requisite RoM.

TEMPO: For all TEMPO tasks, 10 reps must be performed with the requisite RoM within 15s.

MOVEMENT STANDARDS

(Both the RoM and FITNESS criteria must be met to comment on the presence of joint CONTROL)

KNEE MOTION

CONTROL: Knees are aligned with the hips and feet (reference line from hip to toes). Failure to control the knees on 3 consecutive reps (same side of body) should be documented as an '✗'. If an '✗' is noted on the left or right side, the task score will be an '✗'.

BACK MOTION

CONTROL: A neutral low back curvature is maintained (reference standing curvature). Failure to control the back (flexion, extension, lateral bend or twist) on 3 consecutive reps should be documented as an '✗'.
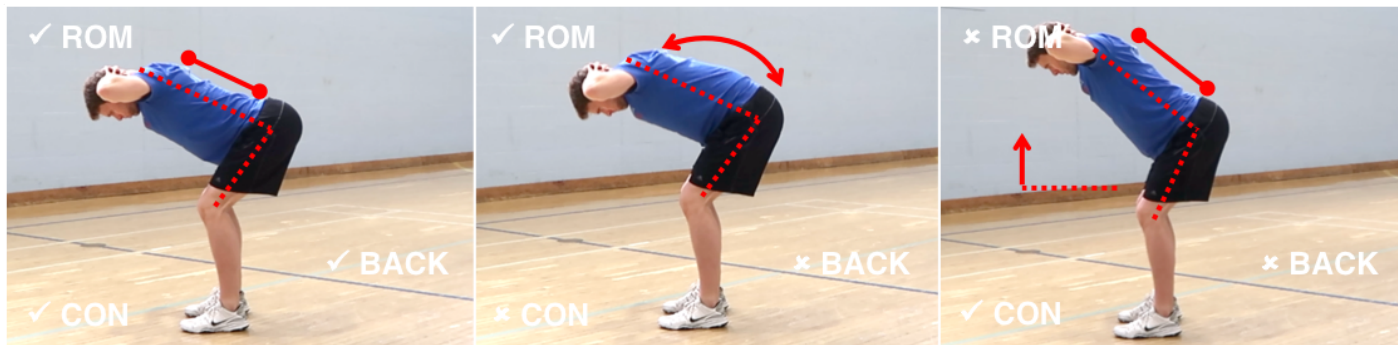
SHOULDER MOTION

CONTROL: The shoulders are back and down (reference distance from ears). Failure to control the shoulders on 3 consecutive reps (same side of body) should be documented as an '✗'. If an '✗' is noted on the left or right side, the task score will be an '✗'.

PRESENTING THE FINDINGS

Three options to present the results of the Physical Literacy Screen™

LETTER GRADE

(Reviewing in consultation with the findings from the Mobility Screen™ is recommended)

Performer A: The Fitness and Movement Standards are met (✔) for at least 11 of the 15 tasks, which implies a sufficient level of PHYSICAL LITERACY.

Performer B: The Fitness Standards are met (✔) for at least 11 of the 15 tasks, but the Movement Standards are not (10 or fewer ✔ noted). Further CONTROL should be emphasized.

Performer C: The Fitness and Movement Standards are not met (✘) for 5 or more of the 15 tasks, which implies that FITNESS should be emphasized.
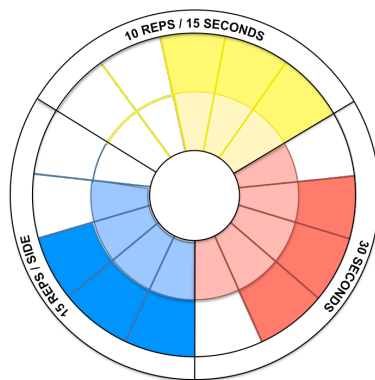
VISUAL

(Rep tasks are shaded BLUE (left side), Tempo are shaded YELLOW (top), Work are shaded RED)

Inner Circle: Colour if the fitness standard is met (✔) and the requisite RoM is achieved. The movement standard may or may not be met.

Outer Circle: Colour if the two movement criteria are met (✔). If the fitness standard is not met, the movement standard cannot be documented and an '✘' must be noted. In this case the outer circle should not be coloured.
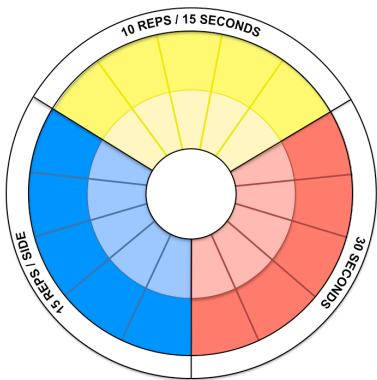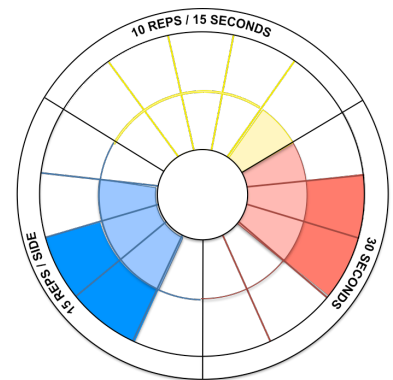
Has FITNESS and CONTROL of Knees, Back and Shoulders	Has FITNESS, Limited CONTROL of Knees, Back and Shoulders	Has Limited FITNESS, CONTROL of Knees, Back and Shoulders
FITNESS: 15	FITNESS: 12	FITNESS: 7
MOVEMENT: 15	MOVEMENT: 9	MOVEMENT: 4
SQUAT: 3	SQUAT: 1	SQUAT: 0
LUNGE: 3	LUNGE: 2	LUNGE: 2
HINGE: 3	HINGE: 3	HINGE: 2
PUSH: 3	PUSH: 2	PUSH: 0
PULL: 3	PULL: 1	PULL: 0

POINTS

(The scores outlined below can be used to establish general recommendations, but should be used in combination with the results of the Mobility Screen™ and the interests/lifestyle habits of the performer)

Assessment Score: Composed of two scores – FITNESS ONLY and LITERACY.

The FITNESS ONLY score is computed by counting the number of times the Fitness Standard was met (✔). The LITERACY score is computed by counting the number of times the Fitness and Movement Standards were met (✔).

FITNESS ONLY Target: > 10   LITERACY Target: > 10

Fitness Score: Composed of three scores – REPS, WORK, and TEMPO.

The REPS score is computed by counting the number of times the Fitness (i.e. 15 reps/side) and Movement Standards were met (✔) for each of the 5 corresponding tasks. The WORK and TEMPO scores are computed by counting the number of times the standards are met (✔) for the 5 corresponding tasks.

Fitness Score (REPS, WORK and TEMPO) Target: > 2

Pattern Score: Composed of five scores – SQUAT, LUNGE, HINGE, PUSH and PULL.

The SQUAT score is computed by counting the number of times the Fitness and Movement Standards were met (✔) for each of the 3 corresponding tasks (i.e. One Leg Squat, Jump Squat and Air Squat). The LUNGE, HINGE, PUSH and PULL scores are computed by counting the number of times the standards are met (✔) for the 3 corresponding tasks.

Pattern Score (SQUAT, LUNGE, HINGE, PUSH and PULL) Target: > 1

Key Feature Score: Composed of three scores – KNEE, BACK and SHOULDER.

The KNEE score is computed by counting the number of times the Knee Criteria were met (✔) for each of the 9 corresponding tasks. The BACK score is computed by counting the number of times the Back Criteria were met (✔) for each of the 15 corresponding tasks. The SHOULDER score is computed by counting the number of times the Shoulder Criteria were met (✔) for each of the 6 corresponding tasks

KNEE Target: > 6   BACK Target: > 10   SHOULDER Target: > 4

FITNESS (/15)	LITERACY (/15)
11	7

Emphasize
CONTROL

REPS (/5)	WORK (/5)	TEMPO (/5)
2	2	3

Target
REPS and *WORK*

SQUAT (/3)	LUNGE (/3)	HINGE (/3)	PUSH (/3)	PULL (/3)
1	2	1	2	1

Target
SQUAT, *HINGE* and *PULL* Patterns

KNEE (/9)	BACK (/15)	SHLD (/6)
7	7	5

Target
BACK Control

PHYSICAL LITERACY

Literacy is defined as "Being knowledgeable and capable within a particular subject area." Although commonly viewed within the context of reading and writing, *Physical Literacy* is becoming increasingly relevant to promote health and physical activity across the lifespan. Dedicating a little time every day to our *Physical Literacy* will help to ensure that we have the motivation, confidence, knowledge and physical competence to maintain health, prevent disease, and redefine performance with work, life and play!

While there are in infinite number of ways to emphasize Physical Literacy within a Daily Movement Practice, in general, the emphasis should be placed on addressing or accommodating our specific needs. For example, with regards to the needs identified with the Physical Literacy Screen™, an activity could be structured to CREATE a fitness foundation, CHALLENGE the ability to control motion with the available fitness, or CHANGE the demands to facilitate the transfer of any learned movement behaviours to relevant activities that involve the 7 key features and 5 general patterns.

Knowing which of the 5 general patterns challenge each of the 7 key features can also help to identify relevant opportunities for A, B and C performers.

KEY FEATURE	PATTERNS	SAMPLE LITERACY OPPORTUNITIES
IN-LINE / MID-FOOT	Squat, Lunge, Hinge	C (0/15 Fitness) – CREATE fitness foundation
FLEX/EXT	Squat, Lunge, Hinge, Push, Pull	B (4/15 Back) – CHALLENGE back control
LAT BEND	Asymmetrical Push, Asymmetrical Pull	A (14/15 Literacy) – CHANGE work duration
TWIST	Asymmetrical Push, Asymmetrical Pull	B (13/15 Back) – CHANGE hand positions
DOWN / BACK	Push, Pull	C (3/6 Shoulders) – CREATE strength foundation

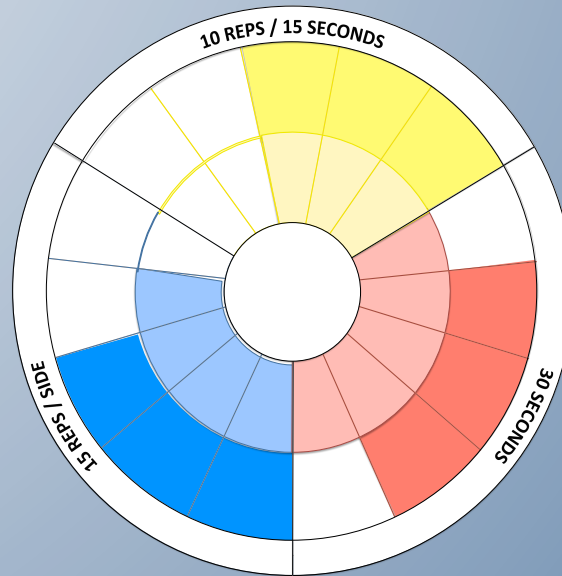# PHYSICAL LITERACY SCREEN (Level 2)

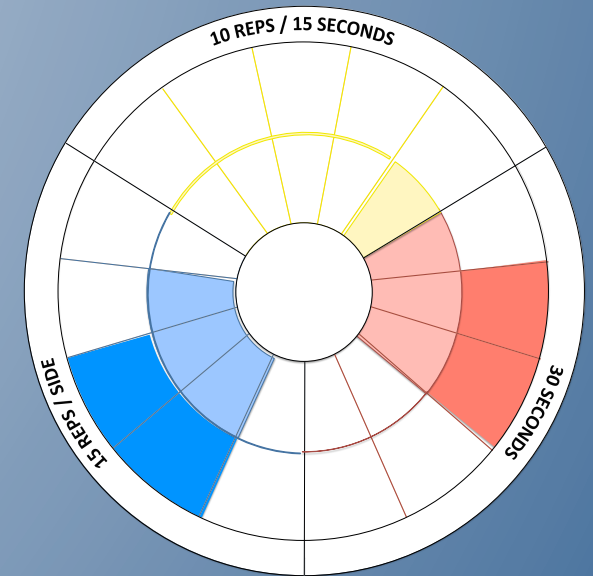Knee, Low Back, Shoulder Control
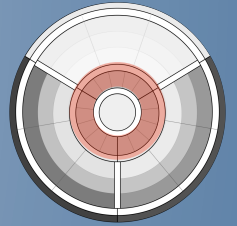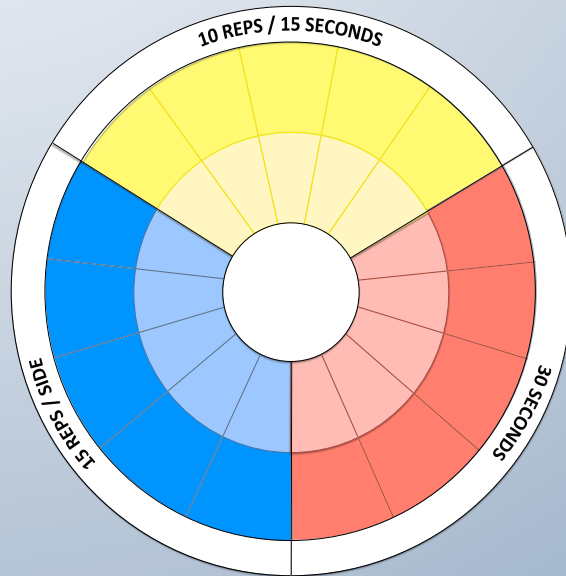
PERFORMER A   PERFORMER B   PERFORMER C

WHAT SHOULD I DO FOR EXERCISE?

CHANGE **LITERACY** DEMANDS   CHALLENGE **CONTROL** OF FEATURES   CREATE **FITNESS** FOUNDATION

CHANGE **LITERACY** DEMANDS   CHALLENGE **CONTROL** OF FEATURES

CHANGE **LITERACY** DEMANDS

PERFORMANCE **REDEFINED.**

DEVELOPING PHYSICAL LITERACY

Physical literacy sessions can be brief and simple to perform, but should be relevant to the needs of a specific performer. Simply because two people share similar demands (i.e. both are firefighters or soccer players), does not imply they have identical needs. Physical literacy sessions can also serve as a warm-up, recovery workout, or stand-alone activity to encourage '*play*'. In other words, they can take on many forms despite the overarching aim of promoting health, wellness and performance. Sample guidelines with respect to the design of these sessions include:

CREATE A FITNESS FOUNDATION

Performers who have been identified as having fitness needs should seek to create a broader fitness foundation. If physically unable to handle the imposed demands of the Physical Literacy Screen because they lack the fitness to perform, their experience, awareness, motivation, mobility, etc. may provide limited benefit.

CHALLENGE CONTROL OF KEY FEATURES

Performers who have been identified as having control needs should learn how to better express the fitness that is currently available. If unable to control specific movement patterns because they lack the awareness, coordination, etc. their fitness may simply reflect the potential to perform safely and effectively in work, life or play.

CHANGE THE LITERACY DEMANDS

Performers who have been identified as having physical literacy should vary the task demands (fitness and control) to further promote the transfer of any learned behaviours. Having the awareness, motivation and ability (i.e. physical literacy) to move within a range of contexts will improve the odds of being healthy and active for life.

INCORPORATE OPPORTUNITIES TO 'PLAY'

Less structured activities in which an individual is able to explore and express their creativity with others can be central to their physical, psychological and social well-being, and can help with the development of a movement vocabulary. Providing opportunities for 'play' can also promote an intrinsic enthusiasm for physical activity.