



U18 PHYSICAL TESTING

June, 2022

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INTRODUCTION

To assess physical characteristics and qualities of U18 judo athlete, Judo Canada established a set of tests focusing on developing the physical attributes necessary in Elite judo athlete. Those tests are set-up to compare athletes among themselves and measure their progress through time.

Classification charts, based on 3 different body weight (light, average and heavy), were also determined for each test to allow judo athlete to evaluate their level.

The different type of exercises required for U18 Physical Testing are listed in this document. They consist of strength endurance, maximal strength, lower body power, aerobic power, core strength and flexibility. For each of them, detailed explanation on how to perform the test are provided (equipment needed, technical aspect to consider, goal).

All those exercises and their associated classification were based on research and physical test used by various judo countries (Germany, England, EJU, ...). They were chosen because they are easily “feasible” and no specific equipment is needed. However, additional test can be performed if the specific equipment is available, the athlete is trained and he is familiar with it.

Before each test, it is important to respect the following steps:

- Explain the test procedures to the athlete. Do not hesitate to do a demonstration if needed.
- Perform screening of health risks and obtain informed consent.
- Prepare forms and record basic information such as age, height, body weight, gender, test conditions.
- Measure and mark out the result of the test.
- Ensure that the subjects are adequately warmed-up.

To help Judo Canada build a solid database and consolidate a national U18 classification for each test, we would appreciate if you could send us (hp@judocanada.org) the results of your tests (including basic information for each athlete).

Classification charts may evolve based on accumulated data.

1. CHIN-UP TEST – STRENGTH ENDURANCE

The Chin-up Test measures primarily the athlete upper body: arms, upper back, shoulder muscles, etc. It measures the pulling and gripping strength.

- Equipment:
 - Chin-up bar (or other appropriate bar).
- Technique:
 - The athlete positioned himself in a vertical suspension, with fully elbow extension, without ground contact, and hands in supination remained fixed.
 - From this position, the athlete must lift their body until complete elbow flexion so that their chin is above their handgrip, then returning to the initial position in a controlled pace.
 - When the athlete goes from position A to B to C, it counts as 1 chin-up.

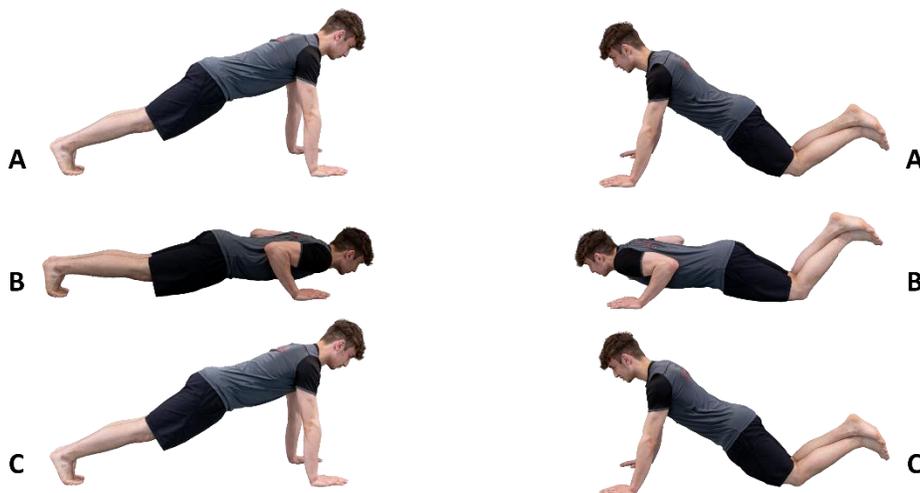


- Goal:
 - Complete as many chin-ups as possible at a steady rate without pausing.
 - Test finishes when the athlete can no longer make a chin-up or when the athlete is no longer able to complete the chin-up with correct technique.

2. PUSH-UP TEST – STRENGTH ENDURANCE

The Push-up Test measures the upper body strength and endurance.

- Equipment:
 - None
- Technique:
 - The athlete must start in the push-up position with their arms straight, body straight and with their hands on the ground at a distance of 10 to 20 cm from the shoulder line and toes facing forward. Elbows must stay in close contact with the ribcage at all times. Female athletes perform the push-up from the bent-knee position.
 - The athlete must bend their arms to approximately 90° degree position and then extend them again to return back to the starting position keeping at all time their body in a straight line.
 - When the athlete goes from position A to B to C, it counts as 1 push-up.



- Goal:
 - Complete as many push-ups as possible at a steady rate without pausing.
 - Test finishes when the athlete can no longer make a push-up or when the athlete is no longer able to complete the push-up with correct technique.

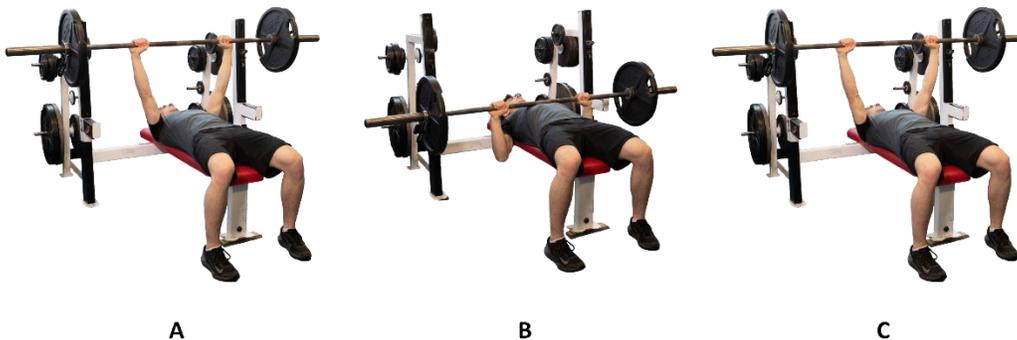
2.1 Additional: Bench-press Test

The Bench-press Test measures the maximum upper body strength. It also allows to establish and calculate the relative strength of the upper body.

The Bench-press test is not mandatory for “U18 Physical Testing” and is only intended for athletes who regularly practice this exercise.

This test should only be attempted under supervision, and with a spotter.

- Equipment:
 - Bench-press
- Technique:
 - Start with arms fully straightened.
 - The bar should touch the chest and arms should be straightened fully on each repetition.
 - When the athlete goes from position A to B to C, it counts as 1 bench-press.



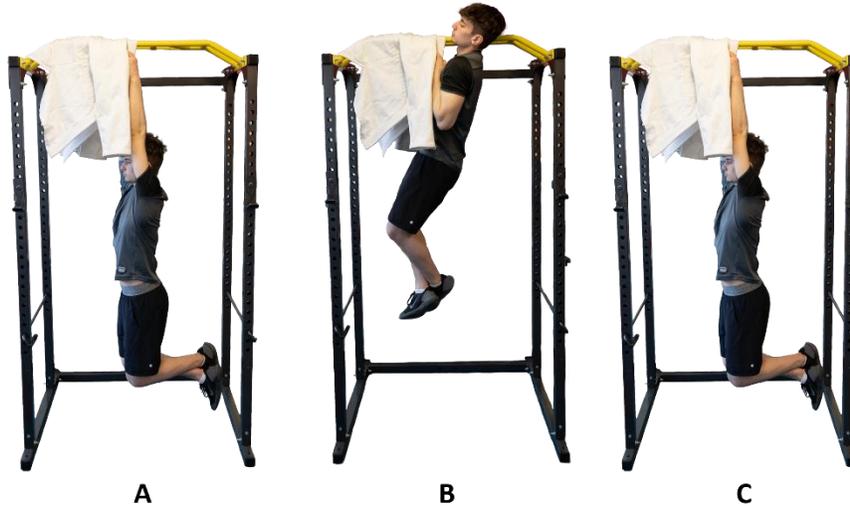
- Goal:
 - Achieve the maximum weight in 6 lifts. Have a 4 minute rest between each try.

3. HANDGRIP ENDURANCE TEST – STRENGTH ENDURANCE

The ability to keep the grip during a fight is of paramount importance for success. For this, the capacity to clench the hand and fingers and keep that contraction throughout the whole fight without marked strength loss plays an important part. The Handgrip Endurance Test allows to assess this capacity.

- Equipment:
 - Chin-up bar (or other appropriate bar).

- Technique:
 - Loop a judogi over the top of a chin-up bar (or other appropriate bar).
 - The athlete must take a grip on the lapel on each side of the bar.
 - From this position, the athlete must sustain their body mass holding the judogi in a fully flexed elbow position, with the chin above the hands.

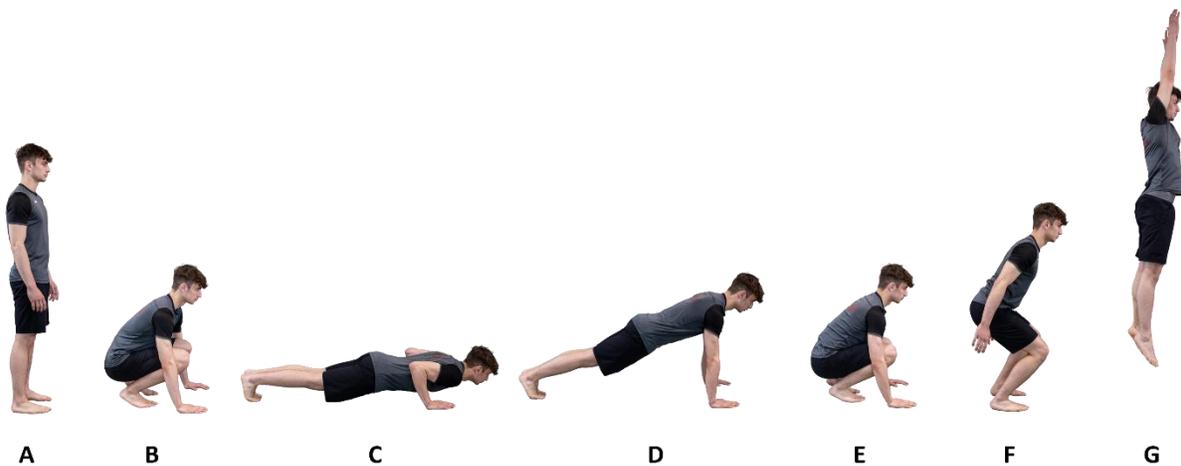


- Goal:
 - The athlete must maintain the suspension from a hanging judogi for the longest period possible.
 - The score is the time that an athlete maintains the correct initial isometric position.

4. BURPEES TEST – STRENGTH ENDURANCE

The Burpees Test is a test of agility, balance, coordination and strength endurance.

- Equipment:
 - Stopwatch
- Technique:
 - Start in standing position [A]
 - Bend your knees until in a full squatting position [B]
 - Place your hands on the ground, keeping your feet together at all times, kick both legs simultaneously back until in an upper push-up position [C]
 - Perform a full push-up. The push-up must be performed correctly (see “Section 2: Push-up Test” technique instruction) otherwise the burpee will not be accounted for [D]
 - Pull your legs simultaneously into the initial squatting position [E]
 - Jump up moving your arms up and clap your hands together at the peak point of the jump [F] & [G]
 - When the athlete goes from position A to G, it counts as 1 burpee.
 - When landing after the jump proceed into the second repetition.



- Goal:
 - Perform as many burpees as possible in 3 minutes. During this period maintain a steady rate without pausing.
 - Count how many correctly performed burpees are completed in the time limit.

5. STANDING LONG JUMP TEST – LOWER BODY POWER

The Standing Long Jump Test measures the explosivity of the athlete leg power. This test measures the horizontal distance you can jump in a maximal effort and is divided into 2 different steps.

- Equipment:
 - Decametre / Tape measure (at least 10m)
- Technique:
 - The athlete stands behind a line marked on the ground with feet slightly apart.
 - A two-foot take-off and landing is used, with swinging of the arms and bending of the knees to provide forward drive.
 - The athlete attempts to jump as far as possible, landing on both feet without falling backwards.
 - Three attempts are allowed.



- Goal:
 - Step 1:
 - This test measures the horizontal distance you can jump in a single maximal effort.
 - The measurement is taken from the take-off line to the first point of contact on the landing (back of the heels).
 - Record the longest distance jumped, the best of three attempts.
 - Step 2:
 - This test measures the horizontal distance you can jump in 3 consecutive maximal effort.
 - The measurement is taken from the take-off line to the third point of contact on the landing (back of the heels). If possible, also measure each jump. This will allow to make a comparison with the single maximal jump of Step 1.
 - Record the longest distance jumped, the best of three attempts.

5.1 Additional: Force Plate Test

The Force plate Test measures the vertical jump height. It allows a greater interpretation of leg strength and power.

- Equipment:
 - Force plate
- Technique:
 - The athlete stands on the force plate with both feet comfortably apart.
 - When ready, the athlete jumps as high as possible, landing back on the platform.



- Goal:
 - Record the highest jump, the best of three attempts.

5.2 Additional: Sargent Jump Test

The Sargent Jump Test measures the lower body power.

- Equipment:
 - Tape measure
 - Vertec vertical jump trainer
- Technique:

- Take the standing height of the athlete with both feet on the ground and one arm fully extended upward and touch the highest possible vane. It is possible to adjust the lowest vane to the point of the arm fully extended.
- Then have the athlete jump-up and touch the highest possible vane.
- The jump height is the difference between standing height and jumping height.



- Goal:
 - Record the highest jump, the best of three attempts.

6. PLANK TEST – CORE STRENGTH

The Plank Test measures the control and endurance of the back/core stabilizing muscles which are essentials to perform throws in judo.

- Equipment:
 - Stopwatch
- Technique:
 - Hold an elevated position for as long as possible.
 - Start with the upper body supported off the ground by the elbows and forearms, and the legs straight with the weight taken by the toes.
 - The hip is lifted off the floor creating a straight line from head to toe.
 - The head should be facing towards the ground and not looking forwards.
 - The test is over when the subject is unable to hold the back straight and the hip is lowered.



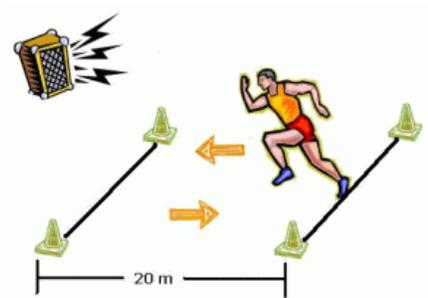
- Goal:
 - As soon as the athlete is in the correct position, the stopwatch is started.
 - Measure the time for which the athlete can maintain the plank position without losing posture (shoulders, back, hips).

- The time limit is 6 minutes. If an athlete reaches this limit, write 6 minutes as a result.

7. VO_2 MAX – AEROBIC POWER

Cardiovascular endurance, or aerobic fitness, is the ability to exercise continuously for extended periods without tiring. To assess this capacity, The “Multistage 20 meter shuttle run test for aerobic fitness” (Created by Luc Léger) will be used to provide an estimated VO_2 Max.

- Equipment:
 - Marking cones
 - Decametre
 - Beep test audio
 - Audio player
- Technique:
 - This test involves running between two lines/cones 20 meter apart in time to recorded beeps.
 - The athlete continues running between the two lines/cones, turning when signaled by the recorded beeps. If the line/cone is reached before the beep sounds, the athlete must wait until the beep sounds.
 - The time between recorded beeps decrease each minute (level). The initial running speed is 8.5 km/h, which increases by 0.5 km/h each minute.
 - If the line/cone is not reached in time for each beep, the athlete must run to the line/cone turn and try to catch up with the pace within 2 more ‘beeps’.
 - The test is stopped if the athlete fails to reach the line/cones (within 2 meters) for two consecutive ends.



- Goal:
 - The athlete is required to run as long as possible until they cannot cover the 20m distance in the required time.
 - The athlete's score is the level and number of shuttles (20m) reached before they were unable to keep up with the recording.
 - Record the last level completed (not necessarily the level stopped at).

8. FRONT SPLIT TEST – FLEXIBILITY

A Judoka requires a high level of agility and flexibility and stretching is important for injury prevention and improving strength. The Front Split Test measure the flexibility of the lower body, especially the hamstrings, of the athlete.

- Equipment:
 - Set square
 - Wall (or judo mat)
- Technique:
 - The athlete must lie on their back with the wall (or judo mat) on his side (the athlete can determine the side that suits best).
 - With both legs straighten, the athlete must spread their legs as much as possible and stay in contact with the wall (or judo mat).
 - Once the athlete can no longer spread his legs (throwing the leg is not allowed), the measure can be taken using a line that goes from the back of their heel to the ground.
 - If possible, draw/make a line on the wall (or judo mat) as a reference.
 - Measurement with a set square will be done from the center of the athlete pelvis. In the picture below, it is represented with the 90° degree line.



- Goal:
 - Using a set square, measure the angle formed by both legs of the athlete once he can no longer spread them.
 - Record the highest degree, the best of three attempts.

8.1 Additional: Sit & Reach test

The Sit & Reach Test measure the flexibility of the lower back and hamstring muscles.

- Equipment:
 - Sit & reach box
- Technique:
 - The athlete sits on the floor with their legs fully extended with the bottom of their bare feet against the box
 - The athlete places one hand on top of the other, slowly bends forward and reaches along the top of the ruler as far as possible holding the stretch for two seconds.
 - The distance reached by the athlete's finger tips is recorded.



- Goal:
 - Record the longest distance reached by the athlete's finger tips, the best of three attempts.

SOURCE

- EJU & Croatia Judo – Applicable research in judo
 - <https://www.eju.net/wp-content/uploads/2019/06/pnLfkSqnstYBfQ8Q6GdCPrXev1AlqApf.pdf>
- Deutscher Judo Bund (DJB) test for Cadet Judo Athletes:
 - <https://assets.judobund.de/public/uploads/rahmentrainingskonzeption-djb.pdf>
- British Judo – Physical Testing:
 - <https://www.britishjudo.org.uk/pdf/EnglandPhysicalTesting.pdf>
- Australian Judo – Fitness targets for Australian Cadet Judo athletes:
 - <https://www.ausjudo.com.au/athlete-development>
- L'Encyclopédie de la préparation physique – 4Trainer – 2020 Edition

APPENDIX A – U18 PHYSICAL TESTING FORM



– JUDO CANADA –
U18 PHYSICAL TESTING



GENERAL INFORMATION																						
Date: <input type="text"/>		Province: <input type="text"/>			Examiner: <input type="text"/>																	
ATHLETE INFORMATION								1.	2.	2.1	3.	4.	5.	5.	5.1	5.2	6.	7.	8.	8.1		
#	First name	Last name	Gender	Age	Grade	Height (cm)	Weight (kg)	Weight category	Chin-up	Push-up	Bench-press (kg)	Handgrip endurance (s)	Burpees	Standing long Jump x1 (cm)	Standing long Jump x3 (cm)	Force Plate (cm)	Sargent Jump (cm)	Plank (m)	VO2 Max	Front Split (degree)	Sit&Reach (cm)	
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→ Excel form will be available on the Judo Canada website

APPENDIX B – CLASSIFICATION CHART PER TEST

U18 – 1. Chin-up Test – Maximum repetition

LEVEL	FEMALE			MALE		
	Light	Average	Heavy	Light	Average	Heavy
4 Elite	>20	>15	>8	>30	>25	>15
3 Excellent	15–20	10–15	4–8	25–30	20–25	10–15
2 Average	5–14	3–9	1–3	15-24	10-19	5-9
1 Poor	<5	<3	<1	<15	<10	<5

U18 – 2. Push-up Test – Maximum repetition

LEVEL	FEMALE			MALE		
	Light	Average	Heavy	Light	Average	Heavy
4 Elite	>70	>60	>50	>90	>80	>70
3 Excellent	50-70	40-60	30-50	70-90	60-80	50-70
2 Average	40-49	30-39	20-29	60-69	50-59	40-49
1 Poor	<40	<30	<20	<60	<50	<40

U18 – 2.1 Bench-press Test (additional) – Maximum weight for 6 repetitions

LEVEL	FEMALE			MALE		
	Light	Average	Heavy	Light	Average	Heavy
4 Elite	1,0kg x Bodymass	0,9kg x Bodymass	0,8kg x Bodymass	1,2kg x Bodymass	1,2kg x Bodymass	1,0kg x Bodymass
3 Excellent	0,9kg x Bodymass	0,8kg x Bodymass	0,7kg x Bodymass	1,0kg x Bodymass	1,0kg x Bodymass	0,9kg x Bodymass
2 Average	0,8kg x Bodymass	0,7kg x Bodymass	0,6kg x Bodymass	0,9kg x Bodymass	0,9kg x Bodymass	0,8kg x Bodymass
1 Poor	<0,8kg x Bodymass	<0,7kg x Bodymass	<0,6kg x Bodymass	<0,9kg x Bodymass	<0,9kg x Bodymass	<0,8kg x Bodymass

U18 – 3. Handgrip Endurance Test – Maximum Time (in seconds)

LEVEL	FEMALE			MALE		
	Light	Average	Heavy	Light	Average	Heavy
4 Elite	>80	>75	>65	>105	>95	>80
3 Excellent	60-80	55-75	50-65	90-105	80-95	60-80
2 Average	35-59	40-54	30-49	60-89	55-79	40-59
1 Poor	<35	<40	<30	<60	<55	<40

U18 – 4. Burpees Test – Maximum repetition in 3 minutes

LEVEL	FEMALE			MALE		
	Light	Average	Heavy	Light	Average	Heavy
4 Elite	>50	>45	>30	>65	>60	>45
3 Excellent	40-50	35-45	25-30	55-65	50-60	35-45
2 Average	25-39	20-34	15-24	40-54	35-49	25-34
1 Poor	<25	<20	<15	<40	<35	<25

U18 – 5. Standing Long Jump Test – Maximum length in 1 jump (in cm)

LEVEL	FEMALE			MALE		
	Light	Average	Heavy	Light	Average	Heavy
4 Elite	>180	>185	>175	>220	>225	>210
3 Excellent	165-180	170-185	160-155	205-220	210-225	195-210
2 Average	145-164	150-169	140-159	185-204	190-209	175-194
1 Poor	<145	<150	<140	<185	<190	<175

U18 – 5. Standing Long Jump Test – Max. length in 3 consecutive jumps (in cm)

LEVEL	FEMALE			MALE		
	Light	Average	Heavy	Light	Average	Heavy
4 Elite	TBD	TBD	TBD	TBD	TBD	TBD
3 Excellent	TBD	TBD	TBD	TBD	TBD	TBD
2 Average	TBD	TBD	TBD	TBD	TBD	TBD
1 Poor	TBD	TBD	TBD	TBD	TBD	TBD

U18 – 5.1 Force plate (additional) – Highest jump (in cm)

LEVEL	FEMALE			MALE		
	Light	Average	Heavy	Light	Average	Heavy
4 Elite	>55	>55	>45	>65	>65	>55
3 Excellent	45-55	45-55	35-45	55-65	55-65	45-55
2 Average	30-44	30-44	20-34	40-54	40-54	25-44
1 Poor	<30	<30	<20	<40	<40	<25

U18 – 5.2 Sargent Jump (additional) – Highest jump (in cm)

LEVEL	FEMALE			MALE		
	Light	Average	Heavy	Light	Average	Heavy
4 Elite	>55	>55	>45	>65	>65	>55
3 Excellent	45-55	45-55	35-45	55-65	55-65	45-55
2 Average	30-44	30-44	20-34	40-54	40-54	25-44
1 Poor	<30	<30	<20	<40	<40	<25

U18 – 6. Plank Test – Maximum time (in minutes)

LEVEL	FEMALE			MALE		
	Light	Average	Heavy	Light	Average	Heavy
4 Elite	>6	>6	>5	>6	>6	>5
3 Excellent	4-6	4-6	3-5	4-6	4-6	3-5
2 Average	2-4	2-4	1-3	2-4	2-4	1-3
1 Poor	<2	<2	<1	<2	<2	<1

U18 – 7. Multi-stage fitness test (Stage - 20m shuttle run)

LEVEL	FEMALE			MALE		
	Light	Average	Heavy	Light	Average	Heavy
4 Elite	>12	>12	>11	>14	>14	>12
3 Excellent	11-12	11-12	9-10	13-14	13-14	10-12
2 Average	9-10	9-10	7-9	10-12	10-12	8-9
1 Poor	<9	<9	<7	<10	<10	<8

U18 – 8. Front Split Test – Maximum angle (in degrees)

LEVEL	FEMALE			MALE		
	Light	Average	Heavy	Light	Average	Heavy
4 Elite	>135	>135	>135	>135	>135	>135
3 Excellent	120-135	120-135	120-135	120-135	120-135	120-135
2 Average	90-119	90-119	90-119	90-119	90-119	90-119
1 Poor	<90	<90	<90	<90	<90	<90

U18 – 8.1 Site & Reach Test (additional) – Maximum length (in cm)

LEVEL	FEMALE			MALE		
	Light	Average	Heavy	Light	Average	Heavy
4 Elite	>50	>50	>50	>45	>45	>45
3 Excellent	45-50	45-50	45-50	40-45	40-45	40-45
2 Average	35-44	35-44	35-44	30-39	30-39	30-39
1 Poor	<35	<35	<35	<30	<30	<30