

BC Archery Association

Fitness Programming for Developing Archery Athletes

Three years of programming to improve performance and prepare for National Team selection

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Thank-you to Matt Fisher for editing the strength and stability exercise programs.

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Physical Fitness Programming for the BC Archery Association

Introduction

This 3-year program is for Train to Compete archers, who have been in the sport for 4-10 years, and are tracking towards the Shoot to Excel level. This program will help athletes prepare for the Archery Canada fitness testing protocol for Sport Canada funding. It will also help athletes have more holistic fitness than would be obtained by training for the fitness tests alone; it will incorporate posture, stability, mobility, strength, muscle endurance and aerobic endurance components. It will be estimated that athletes in this stage of shooting are approximately aged 15-20 years old, although it is understood that substantial variance of these ages is possible in the sport of archery. This program is not designed for pre-pubescent athletes, although it may be modified by coaches for younger athletes.

This program is a tool. It can greatly assist coaches and athletes, but it can also cause harm if not executed properly. Athletes require supervision by knowledgeable strength coaches to ensure that exercises in this program are being executed properly, the appropriate loads are being used, and that athletes progress to more complex movements only when ready. Excellent posture and form is essential for safe and effective progressions through this program. Poor posture and form will likely limit progress and increase risks of injury.

Importantly, this program does not include a crucial element: movement assessments. One example of a movement screening is a Functional Movement Screen. Certified members can be found at www.functionalmovement.com. PacificSport also offers Sport Readiness Assessments and offers education for coaches who wish to learn how to perform these assessments on their athletes themselves. It is important to monitor the flexibility and movement abilities of athletes to understand which exercises are safe for them, and which exercises may need to be modified.

How to use this program

This program can be aligned to each coach's sport specific yearly training plan. As shown in Table 1, it has been divided into the five phases of a traditional yearly training program: General Preparation, Specific Preparation, Pre-Competition, Competition and Transition. Two programs are provided for each General Preparation phase per year, since this tends to be the longest phase. From a strength and stability standpoint, this is arguably the most important phase because it forms a base of strength, stability and movement competency that can be built upon in future programs. This plan is best suited for a double periodized plan as shown below. It can be modified for single periodized plans by lengthening the number of weeks spent using each strength and stability program, although very long usages will lead to plateaus in physiological adaptations. Please note that recovery weeks are not specified in this plan, but it is recommended that coaches schedule recovery into the plans for their athletes; for example, the 1st and 3rd week of each program could be reduced to 85% of the intensity of other weeks.

Table 1. A sample of a double periodization plan for archery, and how to align it with strength & stability programming. Sport specific plan contributed by coach Linda Price.

Sport Specific Yearly Training Plan for Train to Compete			Strength & Stability Yearly Training Plan for Train to Compete	
Training Phase	Time of Year	Duration	Program Title	Duration
General Prep	October - December	12 weeks	General Preparation A	6 weeks
			General Preparation B	6 weeks
Specific Prep	January	4 weeks	Specific Preparation	4 weeks
Pre Comp	Feb *VEGAS	4 weeks	Pre-Competition	4 weeks
Competition - Indoor	March to Easter	6 weeks	Competition	6 weeks
Transition	Easter to end of April	2 weeks	No program during transition	2 weeks
Specific Prep	Early May	3 weeks	Specific Preparation	5 weeks
Pre Comp	Late May	2 weeks		
Competition- Outdoor	June to September	17 weeks	Pre-Competition	6 weeks
			Competition	11 weeks
Transition	Late September or Early October	2 weeks	No program during transition	2 weeks

Each year of the program has slight variations in the frequency and duration of training sessions based on the Long Term Athlete Development plan for Archery, as shown in Table 2.

Table 2. Suggested number of sessions per week and hours of weekly training depending on year of program and phase of yearly training plan:

	Year 1		Year 2		Year 3	
	Stability & Strength	Aerobic Capacity	Stability & Strength	Aerobic Capacity	Stability & Strength	Aerobic Capacity
General Preparation	3 sessions each 60 minutes	3 sessions each 30 minutes	3 sessions each 90 minutes	3 sessions, each 30-45 minutes +	3 sessions each 90 minutes	3 sessions, each 30-45 minutes +
Specific Preparation	2-3 sessions each 60 minutes	3 sessions each 30 minutes	2-3 sessions each 90 minutes	3 sessions, each 30-45 minutes +	3 sessions each 90 minutes	3 sessions, each 30-45 minutes +
Pre-Competition	2 sessions each 60 minutes	2 sessions each 30 minutes	2 sessions each 90 minutes	2 sessions each 30-45 minutes	2 sessions each 90 minutes	2 sessions each 30-45 minutes
Competition	3 combined sessions each 60 minutes plus stability/mobility work built into archery practices		3 combined sessions each 60 minutes plus stability/mobility work built into archery practices		3 combined sessions each 60 minutes plus stability/mobility work built into archery practices	
Transition	Stay physically active in ways not part of regular structured training. Take time to recover from any overuse issues.		Stay physically active in ways not part of regular structured training. Take time to recover from any overuse issues.		Stay physically active in ways not part of regular structured training. Take time to recover from any overuse issues.	

Please note that each fitness session should begin with a proper warm-up including a myofascial release routine, a cardiovascular warm-up, and dynamic stretching. Flexibility programs three times per week are also recommended.

Please refer to the video link within the references section of this document to view the proper way to perform these exercises. Thank you to BCAA athletes Mariessa Pinto and Elissa Foley for their role in developing this library of exercises.

Three Years of Strength and Stability Programming

First Year: Strength and Stability Program

First Year Focuses:

- Ensure excellent posture for both static and dynamic postures
- Develop stability of joints
- Establish a base of strength and mobility while learning foundational movements using low-moderate loads and moderate-high repetitions
- Establish safe and effective habits for strength and stability workouts (warm up, safe movements, knowing limitations, consistency of training)
- Begin to develop base of aerobic fitness

Year 1: General Preparation A

Focus	Exercise	Sets and Repetitions	Notes
Posture	Pelvic Tilt Against Wall	2 sets of 12-15	Stand against wall with feet hip width apart and about 5 cm from wall. Keep shoulder blades, head and hips against wall. Start with 1 hand width between lower back and wall, then tilt pelvis so bottom of pelvis comes forward and top moves towards wall, eliminating the space between the lower back and wall. Repeat.
Posture	Scapular retraction and depression	2 sets of 12-15	Stand with feet hip width apart, knees slightly bent and pelvis/spine neutral. Gently pull your shoulder blades back and a bit closer together while pulling them slightly downwards. Keep spine and ribs still. Relax and repeat.
Lower body strength	Goblet Squat	2 sets of 12-15	Stand with feet wider than hip width and toes pointed slightly outward. Hold weight with palms up and wrists facing each other (dumbbell between wrists and held up by palms). Keep your heels on the ground, and keep your spine and pelvis neutral. While squatting, push your hips back (like sitting on a low stool). Your knees will naturally come forward – try to keep them tracking in line with the middle toes. Your torso will lean forward slightly, but do not let it become more horizontal than the shins.

Chest strength	Assisted Push Ups	2 sets of 12-15	Attach a superband to a squat rack at knee height and put it against the mid-chest for assistance or perform the push up with hands elevated on a bench. Less ideally, use assistance by going on knees rather than feet. Keep spine and pelvis neutral, and bend elbows 45 degrees from torso. Keep shoulder blades secure against ribs (not winging upward).
Middle back strength	Seated Row	2 sets of 12-15	Keep the spine neutral, and keep the shoulders gently down away from ears. Activate deep core before pulling, and pull towards the upper abdomen/lower chest area, keeping elbows tucked in and forearms/wrists fairly horizontal.
Shoulder strength	Lateral Raises	2 sets of 12-15	Lay on a high bench with arms hanging downward. Ideally, have help obtaining the barbell. Beginning with arms straight and shoulders stabilized, pull the barbell toward the bench slightly wider than shoulder width, and with elbows moving up/back so upper arms are 45 degrees from torso. Keep forearms vertical. Do Supine row if you do not have the appropriate set-up. It is the reverse of a push up holding racked back at approximately thigh level or higher. For supine row, raise hand level or keep knees bent to make easier. Rings or suspension devices work well.
Abdominal strength	Dead bug with ball	2 sets of 12-15	Lie on back and keep lower back against ground in an upside down 'hands and knees' position. Extend the opposite arm and leg towards the ground, then bring them back to the start position. Repeat on other sides.
Lower back strength	Superman	2 sets of 12-15	Lie on front. Activate glutes and deep core, then raise alternate arm & leg 5 cm from ground, then switch sides.
Abdominal strength endurance	Boat Pose	2 sets of 20 seconds	Sit on floor with torso leaned back 30-45 degrees, thighs at 45 degrees and feet off of the ground with shins horizontal. If needed, gently hold thighs for support. Stop if you're not able to keep your back in a neutral posture. (Stop if your back rounds or arches)
Shoulder stability	YTA on ground	2 sets of 12-15	Lie on front. Make a Y position with arms above head. Raise them 5 cm from the ground. Relax then move into a T position. Raise 5 cm from ground and repeat in the A position (arms by hips at 45 degrees).
Hip stability	Side step with band	2 sets of 12-15	Put a light looped band around the ankles and side step without rocking the torso or allowing the band to go slack.

Year 1: General Preparation B

Focus	Exercise	Sets and Repetitions	Notes
Posture	Pelvic Tilt on ground	2 sets of 12-15	Lie on back with feet hip width apart, feet on ground. Keep shoulder blades, head and hips against wall. Start with 1 hand width between lower back and wall, then tilt pelvis so bottom of pelvis comes forward and top moves towards wall, eliminating the space between the lower back and wall. Repeat.
Posture	Chin retractions	2 sets of 12-15	Stand against wall with feet hip width apart and about 5 cm from wall. Keep shoulder blades, head and hips against wall. Keep the spine neutral, with 1 hand-width between wall and lower back. Then, poke your head away from the wall, and bring it back into position against the wall. Make sure your head remains level – avoid letting your chin poke upwards
Lower body strength	Split squat	2 sets of 8-10 per side	Get into a lunge position, with legs astride front to back, both feet facing forward and the back heel off the ground. Keep weight even on both feet while lowering and raising the body. Both knees bend to about 90 degrees. Keep the spine neutral and imagine a dowel touching the glutes, upper back and head at all times to avoid leaning forward. Keep knee movements linear and avoid allowing knees to come inward.
Chest strength	Dumbbell chest press	2 sets of 10-12	Hold the dumbbells close to your chest while lying on the bench. Keep lower back gently pressed against bench. To start, raise the dumbbells above your mid-chest at shoulder width. Then, lower the dumbbells by bending elbows, bringing them down so upper arms are 45 degrees from torso. Keep forearms vertical.
Middle back strength	Single arm seated row	2 sets of 10-12	Keep the spine neutral, and keep the shoulders gently down away from ears. Activate deep core before pulling, and pull towards the upper abdomen/lower chest area, keeping elbows tucked in and forearm/wrist fairly horizontal. This requires more stability than the double arm seated row.
Shoulder/back strength	Seated reverse fly	2 sets of 10-12	Sit on a bench. Keeping the spine neutral, lean forward to 45 degrees and be sure to activate the deep core muscles to protect the lower back. Start with the dumbbells at your sides and raise them laterally directly against gravity, to shoulder height, keeping arms slightly bent at all times.
Abdominal strength (obliques)	Side plank	2 sets of 45 seconds	Lie on side with elbow and forearm on ground, and list hips so the body is in a sturdy line from ears to ankles. Rest briefly as often as needed if you cannot keep good form, then resume.

Core strength	Plank	2 sets of 60 seconds	Lie on front with forearms on ground and lift hips off of the ground to create a sturdy aligned body from heels to back of head. Rest briefly as often as needed if you cannot keep good form, then resume.
Shoulder stability	Band diagonal, T, diagonal	2 sets of 12-15	Using a light band, keep arms nearly straight while pulling alternating hands back and up/down, then in a T position, then the opposite orientation of down/up. Use the small muscles in your back for these moves.
Hip stability	clam	2 sets of 12-15	Lie on your side with your hips on the ground. To start, knees and feet are stacked with knees bent at 45 degrees and feet below hips. Keep bottom leg relaxed while top leg opens like a clamshell (hip abduction)

Year 1: Specific Preparation

Focus	Exercise	Sets and Repetitions	Notes
Posture	Wall Angel	2 sets of 12-15	Sit on floor with back against wall, keeping neutral spine (1 hand width behind low back). Put the backs of your arms against the wall, starting with arms at 90 degrees bent. Straighten arms so hands are above head, shoulder width apart. Aim to keep forearms and wrists as close to the wall as possible.
Lower body strength	Walking lunges	2 sets of 8-10 per side	Maintain great posture with neutral spine, pelvis and shoulders. Hold dumbbells at sides with arms straight. Walk forward, and with each step descent, so the front thigh/hip and both knees bend at 90 degrees. The rear heel comes off of the ground during each step.
Chest strength	Single arm Dumbbell Chest Press	2 sets of 8-10 per side	Hold the dumbbell close to your chest while lying on the bench. Keep lower back gently pressed against bench. To start, raise the dumbbell above your mid-chest at shoulder width. Then, lower the dumbbell by bending elbow so the upper arm is 45 degrees from torso. Keep forearm vertical. This requires more stability than the double arm press.
Middle back strength	Dumbbell Bench Pull (or supine row)	2 sets of 8-10	Lay on a high bench with arms hanging downward. Ideally, have help obtaining the dumbbells. Beginning with arms straight and shoulders stabilized, pull the dumbbells towards the bench slightly wider than shoulder width, and with elbows moving up/back so upper arms are 45 degrees from torso. Keep forearms vertical. Do Supine row if you do not have the appropriate set-up. It is the reverse of a push up holding racked back at approximately thigh level or higher. For supine row, raise hand level or keep knees bent to make easier. Rings or suspension devices work well.

Shoulder strength	Front raises	2 sets of 10-12	Stand with legs slightly bent and spine, pelvis and shoulders neutral. Activate the deep core musculature, then raise one arm up to shoulder level in front of the body, with thumbs up and slightly wider than shoulder width. Alternate arms. It's harder to maintain correct posture if both arms are raised at once.
Middle back & shoulder strength, athletic stance	Reverse flies using pulley	2 sets of 10-12	Stand facing a double pulley machine, with pulleys set at shoulder height. Cross the cables, so the handle from the left side is in your right hand and vice versa. Activate your deep core muscles, and use your upper back to extend your arms to the side, remaining at shoulder height or slightly lower. Keep arms slightly bent.
Core strength & stability	Plank with hip dips	2 sets of 10-12	Lie on front with forearms on ground and lift hips off of the ground to create a sturdy aligned body from heels to back of head. Dip one hip at a time towards the floor. Avoid letting lower back overextend. Rest briefly as often as needed if you cannot keep good form, then resume.
Core strength & stability	Side Plank hip dip	2 sets of 10-12 per side	Lie on side with elbow and forearm on ground, and list hips so the body is in a sturdy line from ears to ankles. Dip the hips toward the ground and come back to neutral position. Rest briefly as often as needed if you cannot keep good form, then resume.
Hip stability	Fire hydrant	2 sets of 12-15 per side	On hands and knees, raise one leg up to the side, keeping knees and hip bent. Aim to keep hips and spine neutral.
Shoulder stability	W's on ball with dumbbells	2 sets of 12-15	Put feet against wall to stabilize, and put hips/abdomen on big ball, so body is tilted. If using dumbbells, start very, very light. Begin with upper arms at shoulder height, elbows bent at 90 degrees. Keep elbows bent at 90 while rotating upper arms until forearms are parallel with ground, then relax so arms are perpendicular to ground.

Year 1: Pre-Competition

Main Focus	Exercise	Sets and Repetitions	Notes
Chest strength	Chest Flies	2 sets of 8-10	Hold the dumbbell close to your chest while lying on the bench. Keep lower back gently pressed against bench. To start, raise the dumbbell above your mid-chest at shoulder width. Then, extend your arms out to the sides keeping elbows softly bent. Hands remain at shoulder level, but elbows may be more in line with chest. Do not lower elbows lower than the bench.
Middle back strength	One-arm Row with dumbbell	2 sets of 8-10 per side	Put one knee on the bench, and one foot on the floor keeping body weight symmetrically distributed. Put one hand on the bench (same side as knee on bench). Keep spine, pelvis

			and scapula neutral. Lift dumbbell so elbow moves slightly past torso, keeping forearm fairly vertical and wrists flat.
Lower body strength	Step Ups with dumbbells	2 sets of 8-10 per leg	Choose a bench/box at knee-level or lower to avoid tilting hips when stepping. Start with dumbbells at sides (straight arms) and both feet on ground, with neutral spine, pelvis and shoulders. Step up so one foot is completely on box/bench, then bring the other foot up too. Put the foot that most recently ascended back on the ground, then put the leg that first ascended back on the ground. Do all reps on one leg, then do all reps on the other leg.
Middle back and shoulder	Seated Rear flies dumbbells	2 sets of 8	Sitting, hinge the torso forward keeping excellent posture with the spine. Maintain excellent posture for the whole exercise. Hold a light dumbbell in each hand, beginning with arms beside thighs. Activate your deep core muscles, and use your upper back to extend your arms to the side (up and back), remaining at shoulder height or slightly lower. Keep arms slightly bent. Hold each for 5 seconds. Stop if core stability is lost and your lower back arches.
Core strength	Ball Roll out	2 sets of 12 OR 2x6 reps	Kneel on a doubled mat with your feet supported by a wall. Really focus on maintaining a plank position from the knees to head for the entire movement. Put hands on the close top side of a big ball, palms together (pinkies on the ball). Keeping the plank, increase the angle between your arms and torso while the ball rolls forward. Stop before your plank position is compromised, and resume from starting position. Range depends on core strength.
Serratus Anterior	Plank Up	2 sets of 10-12	Begin in a high plank position (on hands rather than forearms) and intentionally slide your shoulder blades outwards against your ribs so your torso rises. Return to neutral and repeat. Arms stay nearly straight for the entire exercise.
Core strength	Back extension	2 sets of 12 OR 2x6 reps	With the front of your thighs on a big ball, and your feet against the wall for support, flex/curve the spine so your head and chest move downwards then come up to neutral position. Avoid hyperextending back when completing the movement. If you have a back extension machine, feel free to use it instead.
Core strength	Front Plank with leg extensions	2 sets of (2x30 seconds)	Lie on front with forearms on ground and lift hips off of the ground to create a sturdy aligned body from heels to back of head. Take one foot at a time 2 cm off of the ground while both hips at the same level. Avoid letting lower back overextend. Rest briefly as often as needed if you cannot keep good form, then resume.
Hip stability and core strength	Side plank with leg raises	2 sets of (2x20 seconds) per side	Lie on side with elbow and forearm on ground, and list hips so the body is in a sturdy line from ears to ankles. Have the legs/feet stacked, the top on directly over the bottom one.

			Lift the top leg to the height of your top hip, then lower and repeat. Rest briefly as often as needed if you cannot keep good form, then resume.
Shoulder stability	Supine pull overhead with band	2 sets of 12 per side	Lie with back on floor/mat. Hold a band or tubing in both hands, one on the navel with the thumb upward, and the other about 30 cm above the navel with the thumb facing inward (best to have a band with a handle). Raise the top hand over the head toward the floor, slightly wider than shoulder width. Return to start position and repeat.

Year 1: Competition. This is a circuit incorporating muscle endurance, stability and aerobic components. Do 45 seconds per exercise, with 15 seconds transition between exercises and 3-5 minute rests between circuits. Athletes should feel challenged and be breathing hard. They should not be able to converse. Do 2-3 sets of the first circuit, followed by 2-3 sets of the core circuit.

Exercise	Duration	Notes
Squats	45 seconds quickly and with full control	Unweighted, or light goblet squats
Assisted push ups	45 seconds quickly and with full control	Use greater assistance than in previous programs to maintain perfect form
Step Ups	45 seconds quickly and with full control	unweighted
Bench Pull or assisted supine row	45 seconds quickly and with full control	Doable but challenging weight for 45 sec
Mountain Climber	45 seconds quickly and with full control	Hands on floor in high plank position, raise knee to chest, alternating.
Scapular squeezes with band	45 seconds quickly and with full control	Elbows at shoulder height and hands in front of chest. Keep band taught. Widen hands and activate upper back each rep..
Alternating Forward Lunge	45 seconds quickly and with full control	Step forward into lunge, then return to standing. Alternate sides.
Dumbbell Drag	45 seconds quickly and with full control	Place a dumbbell on the floor; in a position resembling high plank, drag it under the body to the hips. Crawl back, and drag it in the same fashion with the other arm.
Alternating Reverse Lunge	45 seconds quickly and with full control	Step backward into lunge, then return to standing. Alternate sides.

Do 2-3 sets of the circuit above before moving on to this core and stability circuit, and do it 2 times:

Ab crunch on ball or bosu	15 repetitions per circuit	Hold weight against chest if needed. With ball on upper hips and lower back, think of lifting chest up rather than curling forward when raising the chest/dumbbell.
Side extensions on ball (right)	15 repetitions per circuit	Hold weight against chest if needed. Top leg forward, feet against wall and side of hip on ball. Extend the spine sideways so head and torso go closer to the ground, then return to a neutral position.
Side extensions on Ball (left)	15 repetitions per circuit	Hold weight against chest if needed. Top leg forward, feet against wall and side of hip on ball. Extend the spine sideways so head and torso go closer to the ground, then return to a neutral position.
Back extensions on ball	15 repetitions per circuit	Hold weight against chest if needed.

Second Year: Strength and Stability Program

Second year focuses:

- Maintain excellent posture
- Develop stability while resisting external forces (anti-rotation, for example)
- Continue building base of strength and mobility, moving to moderate loads and repetitions
- Introduce more complex movements
- Maintain safe and effective habits for high performance strength and stability training
- Further develop aerobic base and begin aerobic power training
- Once base of strength and movement are solid, begin training for muscle endurance

Year 2: General Preparation A. 4 weeks is adequate for this program, but it can be up to 8 weeks.

Focus	Exercise	Sets and Repetitions	Notes
Posture	Pelvic Tilt Against Wall	1 set of 12-15	Stand against wall with feet hip width apart and about 5 cm from wall. Keep shoulder blades, head and hips against wall. Start with 1 hand width between lower back and wall, then tilt pelvis so bottom of pelvis comes forward and top moves towards wall, eliminating the space between the lower back and wall. Repeat.
Posture	Scapular retraction and depression	1 set of 12-15	Stand with feet hip width apart, knees slightly bent and pelvis/spine neutral. Gently pull your shoulder blades back and a bit closer together while pulling them slightly downwards. Keep spine and ribs still. Relax and repeat.

Lower body strength	Goblet Squat	2 sets of 12-15	Stand with feet wider than hip width and toes pointed slightly outward. Hold weight with palms up and wrists facing each other (dumbbell between wrists and held up by palms). Keep your heels on the ground, and keep your spine and pelvis neutral. While squatting, push your hips back (like sitting on a low stool). Your knees will naturally come forward – try to keep them tracking in line with the middle toes. Your torso will lean forward slightly, but do not let it become more horizontal than the shins.
Lower body strength	Supine Ball Pull-in	2 sets of 12-15	Start in a high plank position (on hands) and the ball under shins. Pull knees toward chest and roll ball forward. Return to start position and repeat.
Chest strength	Assisted Push Ups	2 sets of 12-15	Attach a superband to a squat rack at knee height and put it against the mid-chest for assistance or perform the push up with hands elevated on a bench. Less ideally, use assistance by going on knees rather than feet. Keep spine and pelvis neutral, and bend elbows 45 degrees from torso. Keep shoulder blades secure against ribs (not winging upward).
Middle back strength	Bench pull or supine row	2 sets of 12-15	Lay on a high bench with arms hanging downward. Ideally, have help obtaining the barbell. Beginning with arms straight and shoulders stabilized, pull the barbell toward the bench slightly wider than shoulder width, and with elbows moving up/back so upper arms are 45 degrees from torso. Keep forearms vertical. Do Supine row if you do not have the appropriate set-up. It is the reverse of a push up holding racked back at approximately thigh level or higher. For supine row, raise hand level or keep knees bent to make easier. Rings or suspension devices work well.
Shoulder strength	Lateral Raises	2 sets of 12-15	Stand with legs slightly bent and spine, pelvis and shoulders neutral. Activate the deep core musculature, then raise one arm up to shoulder level beside the body (but slightly forward to ease stress on shoulders), with thumbs up and slightly wider than shoulder width. Alternate arms. It's harder to maintain correct posture if both arms are raised at once.
Middle back/shoulders	Reverse Fly with pulleys	2 sets of 12-15	Stand facing a double pulley machine, with pulleys set at shoulder height. Cross the cables, so the handle from the left side is in your right hand and vice versa. Activate your deep core muscles, and use your upper back to extend your arms to the side, remaining at shoulder height or slightly lower. Keep arms slightly bent.
Abdominal strength	Dead bug with ball	2 sets of 12-15	Lie on back and keep lower back against ground in an upside down 'hands and knees' position. Extend the opposite arm and leg towards the ground, then bring them back to the start position. Repeat on other sides.

Lower back and glute strength	Flying Squirrel	2 sets of 12-15	Lie on front with arms bent on floor above head, and feet touching but knees apart. Use the Glutes and back to raise the knees off of the ground. Once that's mastered, add in raising the chest at the same time.
Core strength & whole body stability	Pallof Press	2 sets of 8-10 per side	Stand in an athletic stance a few steps away from a partner, both facing the same direction and both holding the same heavy resistance band in your hands with arms extended in front of the chest and straight. Take turns bringing your hands to your own chest. When your partner does this movement, resist the rotational pull and keep excellent and symmetrical posture.
Shoulder stability	YTA with cables	2 sets of 12-15	Set the pulleys in a low or medium position, cross the cables so the left handle is in the right hand and vice versa. Keeping excellent posture (avoid extending back and tilting top of pelvis forward!), make a Y position with arms above head, using the upper back to retract scapulae. Relax upper back a bit, then move into a T position, retracting scapulae again. Repeat in the A position (arms by hips at 45 degrees).
Hip stability	Side step with band	2 sets of 12-15	Put a light looped band around the ankles and side step without rocking the torso or allowing the band to go slack.
Abdominal Muscle Endurance	Boat Pose	2 sets of 40 seconds	Sit on floor with torso leaned back 30-45 degrees, thighs at 45 degrees and feet off of the ground with shins horizontal. If needed, gently hold thighs for support. Stop if you're not able to keep your back in a neutral posture. (Stop if your back rounds or arches)

Year 2: General Preparation B

Focus	Exercise	Sets and Repetitions	Notes
Posture	Wall Angel	1 sets of 12-15	Sit on floor with back against wall, keeping neutral spine (1 hand width behind low back). Put the backs of your arms against the wall, starting with arms at 90 degrees bent. Straighten arms so hands are above head, shoulder width apart. Aim to keep forearms and wrists as close to the wall as possible.
Posture	Chin retractions	1 sets of 12-15	Stand against wall with feet hip width apart and about 5 cm from wall. Keep shoulder blades, head and hips against wall. Keep the spine neutral, with 1 hand-width between wall and lower back. Then, poke your head away from the wall, and bring it back into position against the wall. Make sure your head remains level – avoid letting your chin poke upwards

Lower body strength	Assisted Pistol Squat	2 sets of 8-10 per leg	Holding the handles of a suspension system or rings for assistance (or the post of a squat rack) balance on one foot with the other leg ready to extend in front, then do a low squat with one leg only. Make sure knees don't go inward, and if there is knee pain, limit the depth of the squat. Another option is to sit and rise from a bench using only 1 leg, with a lower bench being more challenging.
Lower body strength	Glute Bridge	2 sets of 10-12	Lie on back with heels on floor about 30 cm from Glutes. Activate the Glutes and raise the hips, creating a plank position from head to knees. Lower hips and repeat. If it's too easy, add padded weight to the hips, if it can be done comfortably. Or try single leg raises, if hips can move together symmetrically.
Chest strength	Dumbbell chest press	2 sets of 10-12	Hold the dumbbells close to your chest while lying on the bench. Keep lower back gently pressed against bench. To start, raise the dumbbells above your mid-chest at shoulder width. Then, lower the dumbbells by bending elbows, bringing them down so upper arms are 45 degrees from torso. Keep forearms vertical.
Middle back strength	One Arm Row with Dumbbell	2 sets of 10-12	Put one knee on the bench, and one foot on the floor keeping body weight symmetrically distributed. Put one hand on the bench (same side as knee on bench). Keep spine, pelvis and scapula neutral. Lift dumbbell so elbow moves slightly past torso, keeping forearm fairly vertical and wrists flat.
Shoulder strength and core stability	Seated military press	2 sets of 10-12	Keep weights fairly light. Focus on maintaining neutral positioning for ribcage, spine and pelvis. Begin with elbows at shoulder height, bent at 90 degrees with forearms vertical. Raise weights above head a bit wider than shoulder width and return to start position.
Middle back/shoulder	Seated one-arm reverse fly	2 sets of 10-12 per side	Keep weights fairly light. Sit on a bench. Keeping the spine neutral, lean forward to 45 degrees and be sure to activate the deep core muscles to protect the lower back. Start with the dumbbell at your side and raise it laterally directly against gravity (up and back), to shoulder height, keeping arm slightly bent at all times. Repeat on other side.
Obliques	Torso rotation from side	2 sets of 8-10 per side	Adjust pulley to chest height and hold handle with both hands. Stand perpendicularly to the cable, slightly behind it. Pivot your feet to face the cable machine (starting position). Pivot your feet and rotate the hips and torso away from the machine. Discontinue if there is knee discomfort.

Abdominal strength (obliques)	Side plank top leg flexion/extension	2 sets of 60 seconds per side	Lie on side with elbow and forearm on ground, and list hips so the body is in a sturdy line from ears to ankles. Have the legs/feet stacked, the top on directly over the bottom one. Lift the top leg to the height of your top hip, then move it 3-5 cm forward from the other leg, then 3-5 cm back from the other leg. Rest briefly as often as needed if you cannot keep good form, then resume. Stop if form begins to fail.
Lower back strength	Plank with alternating leg abduction/adduction	2 sets of 75 seconds	Lie on front with forearms on ground and lift hips off of the ground to create a sturdy aligned body from heels to back of head. Take one foot at a time 2 cm off of the ground while both hips at the same level; while the foot is raised move it out to the side as far as possible while maintaining plank. Avoid letting lower back overextend. Rest briefly as often as needed if you cannot keep good form, then resume.
Hip, spine and shoulder stability	½ kneeling Pallof Press	2 sets of 8-10 per side	Kneel on outside knee. Increase difficulty by putting foot of front leg in line with knee of back leg. Be few steps away from a partner, both facing the same direction and both holding the same heavy resistance band in your hands with arms extended in front of the chest and straight. Take turns bringing your hands to your own chest. When your partner does this movement, resist the rotational pull and keep excellent and symmetrical posture.
Shoulder stability	Band diagonal, T, diagonal	2 sets of 12-15	Using a light band, keep arms nearly straight while pulling alternating hands back and up/down, then in a T position, then the opposite orientation of down/up. Use the small muscles in your back for these moves.
Hip stability	clam	2 sets of 12-15	Lie on your side with your hips on the ground. To start, knees and feet are stacked with knees bent at 45 degrees and feet below hips. Keep bottom leg relaxed while top leg opens like a clamshell (hip abduction)

Year 2: Specific Preparation

Main Focus	Exercise	Sets and Repetitions	Notes
Lower body strength	Bulgarian split squats	2 sets of 8-10 per side	Get into a lunge position, with the back foot on a bench Use the front leg to lift the body; the back leg is used for balance. Allow the front knee to bend to about 90 degrees. The back knee will be under or slightly behind the hips, depending on flexibility – keep hips level. Keep the spine neutral and imagine a dowel touching the glutes, upper back and head at all times to avoid

			leaning forward. Avoid allowing knees to come inward. Do split squat instead if unable to find comfortable positioning.
Chest strength	Chest Flies	2 sets of 8-10	Hold the dumbbell close to your chest while lying on the bench. Keep lower back gently pressed against bench. To start, raise the dumbbell above your mid-chest at shoulder width. Then, extend your arms out to the sides keeping elbows softly bent. Hands remain at shoulder level, but elbows may be more in line with chest. Do not lower elbows lower than the bench.
Middle back strength	Single arm seated row	2 sets of 8-10 per side	Keep the spine neutral, and keep the shoulders gently down away from ears. Activate deep core before pulling, and pull towards the upper abdomen/lower chest area, keeping elbows tucked in and forearm/wrist fairly horizontal. This requires more stability than the double arm seated row.
Shoulder strength	Front raises	2 sets of 8-10	Stand with legs slightly bent and spine, pelvis and shoulders neutral. Activate the deep core musculature, then raise one arm up to shoulder level in front of the body, with thumbs up and slightly wider than shoulder width. Alternate arms. It's harder to maintain correct posture if both arms are raised at once.
Middle back and shoulder strength	Reverse flies using pulley	2 sets of 10-12	Stand facing a double pulley machine, with pulleys set at shoulder height. Cross the cables, so the handle from the left side is in your right hand and vice versa. Activate your deep core muscles, and use your upper back to extend your arms to the side, remaining at shoulder height or slightly lower. Keep arms slightly bent.
Core strength & stability	Dead Bug with Ball	2 sets of 10-12	Lie on back and keep lower back against ground in an upside down 'hands and knees' position. Extend the opposite arm and leg towards the ground, then bring them back to the start position. Repeat on other sides.
Core strength & stability	Plank with small reaches	2 sets of 10-12 total	Lie on front with forearms on ground and lift hips off of the ground to create a sturdy aligned body from heels to back of head. Reach forward with alternating arms. Stop if form begins to fail.
Core strength & stability	Side Plank reach under	2 sets of 10-12 per side	Lie on side with elbow and forearm on ground, and lift hips so the body is in a sturdy line from ears to ankles. Rotate the torso and use the top arm to reach under the body/torso. Stop if form begins to fail.
Core strength and whole body stability	Torso rotation from front	2 sets of 8-10 per side	Adjust pulley to chest height and hold handle with both hands. Stand facing the machine. Pivot your feet to face the cable machine (starting position). Activate your core, then rotate torso to the left then right. Discontinue if there is knee discomfort.

Hip stability	Fire hydrant	2 sets of 10-12 per side	On hands and knees, raise one leg up to the side, keeping knees and hip bent. Aim to keep hips and spine neutral.
Shoulder stability	W's on ball with dumbbells	2 sets of 12-15	Put feet against wall to stabilize, and put hips/abdomen on big ball, so body is tilted. If using dumbbells, start very, very light. Begin with upper arms at shoulder height, elbows bent at 90 degrees. Keep elbows bent at 90 while rotating upper arms until forearms are parallel with ground, then relax so arms are perpendicular to ground.
Spine & Shoulder stability	Ball Taps	2 sets of 12-15	In a half-kneeling position, hold a large ball in front of the chest and activate core. Get a partner to hit the ball in different places, hard enough to challenge your stability, but not hard enough to knock the ball into you or out of your hands.
Middle Back muscle endurance	Bench Pull or Assisted Supine Row	2 sets of 1 minute steady. Rest if needed then resume until time is up.	Use ½ to ¾ of the weight used in General Preparation A program. Lay on a high bench with arms hanging downward. Ideally, have help obtaining the barbell. Beginning with arms straight and shoulders stabilized, pull the barbell toward the bench slightly wider than shoulder width, and with elbows moving up/back so upper arms are 45 degrees from torso. Keep forearms vertical. Do Supine row if you do not have the appropriate set-up. It is the reverse of a push up holding racked back at approximately thigh level or higher. For supine row, raise hand level or keep knees bent to make easier. Rings or suspension devices work well.

Year 2: Pre-Competition

Main Focus	Exercise	Sets and Repetitions	Notes
Lower body strength	Step Ups with dumbbells	2 sets of 8-10 per side	Choose a bench/box at knee-level or lower to avoid tilting hips when stepping. Start with dumbbells at sides (straight arms) and both feet on ground, with neutral spine, pelvis and shoulders. Step up so one foot is completely on box/bench, then bring the other foot up too. Put the foot that most recently ascended back on the ground, then put the leg that first ascended back on the ground. Do all reps on one leg, then do all reps on the other leg.
Chest strength	Assisted Push Ups	2 sets of 10-12	Attach a superband to a squat rack at knee height and put it against the mid-chest for assistance or perform the push up with hands elevated on a bench. Less ideally, use assistance by going on knees rather than feet. Keep spine and pelvis neutral, and bend elbows 45 degrees from torso. Keep shoulder blades secure against ribs (not winging upward).

Middle back strength	One-arm Row with dumbbell	2 sets of 8-10 per side	Put one knee on the bench, and one foot on the floor keeping body weight symmetrically distributed. Put one hand on the bench (same side as knee on bench). Keep spine, pelvis and scapula neutral. Lift dumbbell so elbow moves slightly past torso, keeping forearm fairly vertical and wrists flat.
Serratus Anterior	Plank Up	2 sets of 12-15	Begin in a high plank position (on hands rather than forearms) and intentionally slide your shoulder blades outwards against your ribs so your torso rises. Return to neutral and repeat. Arms stay nearly straight for the entire exercise.
Core strength	Supine Windshield wipers	2 sets of 12-15 per side	Lie on back on mat with knees and hips at 90 degree angles. Put arms on the ground 45 degrees from torso for stability. Keep upper back and head on mat. Rotate lower torso so knees/feet nearly touch the floor to the side, then repeat on other side. Legs can be straightened if this becomes too easy.
Core strength	Stir the Pot	2 sets of 6-8 per side (or for up to 60 seconds!)	Plank with forearms on a big ball. Move forearms circularly, beginning with small circles. Gradually, circles can become larger and stability develop. Keep spine neutral – avoid sagging lower back.
Core strength and hip stability	Side plank with leg raises	2 sets of 60 seconds	Lie on side with elbow and forearm on ground, and list hips so the body is in a sturdy line from ears to ankles. Have the legs/feet stacked, the top on directly over the bottom one. Lift the top leg to the height of your top hip, then lower and repeat. Break up the 60 seconds into shorter durations if needed. Stop if form begins to fail.
Shoulder stability	Supine pull overhead with band	2 sets of 12 per arm	Lie on bench, starting with one dumbbell held with both hands lengthwise with arms extended above chest. Keep arms slightly bent. Keep lower back on bench as moving dumbbell above head and behind bench. Keep the weight fairly light, and do not do this exercise if there is any shoulder discomfort.
Posture, strength and stability	Farmer's walk (both arms)	2 sets of 20 steps (total)	Carefully pick up 2 dumbbells using a squat technique. Walk with the dumbbells held at the side, arms straight. Keep perfect posture of spine, ribs, pelvis and shoulders. Walk linearly, not letting knees come inward.
Metabolic Training	Single Arm Dumbbell Bench Pull or Row	1 set of 1 minute steady per arm. Rest if needed then resume until time is up.	Use $\frac{1}{2}$ to $\frac{3}{4}$ of the weight used for this exercise in the previous program. Keep shoulder blades and spine stabilized.
Metabolic training	Scapular squeezes with band	2 sets of 45 seconds	Elbows at shoulder height and hands in front of chest. Keep band taught. Widen hands and activate upper back each rep.

Year 2: Competition. This is a circuit incorporating muscle endurance, stability and aerobic components. Do 45 seconds per exercise, with 15 seconds transition between exercises and 3-5 minute rests between circuits. Athletes should feel challenged and be breathing hard. They should not be able to converse. Do 2-3 sets of the first circuit, followed by 2-3 sets of the core circuit.

Exercise	Duration	Notes
Split Squats (one side only)	45 seconds quickly and with full control	Keep torso upright.
Split Squats (other side)	45 seconds quickly and with full control	Keep torso upright.
Push Ups	45 seconds quickly and with full control	Maintain excellent posture.
Step Ups	45 seconds quickly and with full control	unweighted
Bench Pull or assisted supine row	45 seconds quickly and with full control	Choose a doable but challenging weight for 45 sec
Bear crawl	45 seconds quickly and with full control	Begin on hands and knees then raise knees 2 cm from the ground. Crawl keeping back and hips parallel to ground, and knees 2 cm from ground.
Scapular squeezes with band	45 seconds quickly and with full control	Elbows at shoulder height and hands in front of chest. Keep band taught. Widen hands and activate upper back each rep.
Band side step	45 seconds quickly and with full control	Keep torso stable.
Dumbbell Drag	45 seconds quickly and with full control	Doable but challenging weight for 45 sec
YTA on mat	45 seconds quickly and with full control	Use very light weights if unweighted is too easy

Do 2-3 sets of the circuit above before moving on to this core and stability circuit, and do it 2-3 times:

Plank with punches	15 repetitions per side	Maintain alignment from ears to ankles. Keep hips still while punching or reaching forward with one arm at a time.
Windshield wipers	15 repetitions per side	Keep head and neck relaxed, and gently press arms to the ground for support.
V-sit	60 seconds (take breaks if needed)	Maintain excellent posture in back. No slouching!
Superman	15-20 repetitions per circuit	Lay prone on floor, and raise all limbs at once, using Glutes and lower back.

Third Year: Strength and Stability Program

Third year focus:

- Maintain excellent posture and ability to keep all joints stable while resisting external forces
- Maintain base of strength and mobility. Vary movements to optimize fitness adaptations.
- Maintain safe and effective training habits
- Further develop aerobic capacity and power
- Further develop muscle endurance

Year 3: General Preparation A

Main Focus	Exercise	Sets and Repetitions	Notes
Posture	Wall Angel	1 set of 12-15	Sit on floor with back against wall, keeping neutral spine (1 hand width behind low back). Put the backs of your arms against the wall, starting with arms at 90 degrees bent. Straighten arms so hands are above head, shoulder width apart. Aim to keep forearms and wrists as close to the wall as possible.
Lower body strength	Goblet Squat (or Back Squat)	2 sets of 12-15	Stand with feet wider than hip width and toes pointed slightly outward. Hold weight with palms up and wrists facing each other (dumbbell between wrists and held up by palms). Keep your heels on the ground, and keep your spine and pelvis neutral. While squatting, push your hips back (like sitting on a low stool). Your knees will naturally come forward – try to keep them tracking in line with the middle toes. Your torso will lean forward slightly, but do not let it become more horizontal than the shins. For back squat, set up a rack with bar at armpit height, and squat with the bar on the upper back. Be sure to have safety bars in place. This should be taught in-person by a strength coach, if possible.
Lower Body Strength	Soft Knee Deadlift (Hip Hinge) or Supine Ball Pull-in	2 sets of 12-15	Holding dumbbells or a barbell, with straight arms in front of thighs, shoulder width apart, push hips back until hamstrings feel stretched. Keep shins vertical and keep neutral spine/shoulders. Do ball pull-in if not feeling confident about technique – lie on back with ball under calves, and arms on ground 45 degrees from torso; lift hips creating a plank then pull heels and ball towards Glutes.
Chest strength	Assisted Push Ups (or Bench Press)	2 sets of 12-15	Attach a superband to a squat rack at knee height and put it against the mid-chest for assistance or perform the push up with hands elevated on a bench. Less ideally, use assistance by going on knees rather than feet. Keep spine and pelvis

			neutral, and bend elbows 45 degrees from torso. Keep shoulder blades secure against ribs (not winging upward). For bench press, do the same motion as dumbbell chest press, but with a barbell instead. Be sure to have a competent spotter and excellent communication.
Middle back strength	Bench pull or supine row	2 sets of 12-15	Lay on a high bench with arms hanging downward. Ideally, have help obtaining the barbell. Beginning with arms straight and shoulders stabilized, pull the barbell toward the bench slightly wider than shoulder width, and with elbows moving up/back so upper arms are 45 degrees from torso. Keep forearms vertical. Do Supine row if you do not have the appropriate set-up. It is the reverse of a push up holding racked back at approximately thigh level or higher. For supine row, raise hand level or keep knees bent to make easier. Rings or suspension devices work well.
Middle back Strength	Lat Pulls or Assisted Pull Ups	2 sets of 12-15	Using pulley: reach up and hold the bar about 1 hand-width wider than shoulder width on each side. Stabilize the shoulders, and have arms straight, then lean torso back 20 degrees keeping back neutral (start position). Pull the bar down to clavicles, keeping forearms at the same angle for the movement. For assisted pull ups, wrap a superband around a pull-up bar, grip the bar palms out, and put the band around the knees for assistance – be sure the straighten the arms at the bottom and put the chin higher than the bar at the top!
Shoulder strength	Lateral Raises	2 sets of 12-15	Lay on a high bench with arms hanging downward. Ideally, have help obtaining the barbell. Beginning with arms straight and shoulders stabilized, pull the barbell toward the bench slightly wider than shoulder width, and with elbows moving up/back so upper arms are 45 degrees from torso. Keep forearms vertical. Do Supine row if you do not have the appropriate set-up. It is the reverse of a push up holding racked back at approximately thigh level or higher. For supine row, raise hand level or keep knees bent to make easier. Rings or suspension devices work well.
Middle back/shoulders	Reverse Fly with dumbbells	2 sets of 12-15	Standing with feet at hip width and knees slightly bent, push hips back (as in the hip hinge exercise), keeping the spine neutral, lean forward to 45 degrees or more and be sure to activate the deep core muscles to protect the lower back. Start with the dumbbells at your sides and raise them laterally directly against gravity, to shoulder height, keeping arms slightly bent at all times.

Abdominal strength	Ab Crunch on Ball (push weight to ceiling)	2 sets of 12-15	Hold weight against chest if needed. With ball on upper hips and lower back, think of lifting chest up rather than curling forward when raising the chest/dumbbell.
Lower back and glutes strength	Flying Squirrel	2 sets of 12-15	Lie on front with arms bent on floor above head, and feet touching but knees apart. Use the Glutes and back to raise the knees off of the ground. Once that's mastered, add in raising the chest at the same time.
Whole body stability and core strength endurance	Palof Press (standing)	2 sets of 8-10 per side	Stand in an athletic stance a few steps away from a partner, both facing the same direction and both holding the same heavy resistance band in your hands with arms extended in front of the chest and straight. Take turns bringing your hands to your own chest. When your partner does this movement, resist the rotational pull and keep excellent and symmetrical posture.
Abdominal Strength Endurance	Boat Pose (V-sit)	2 sets of 45 seconds	Sit on floor with torso leaned back 30-45 degrees, thighs at 45 degrees and feet off of the ground with shins horizontal. If needed, gently hold thighs for support. Stop if you're not able to keep your back in a neutral posture. (Stop if your back rounds or arches)
Shoulder stability	YTA with cables	2 sets of 12-15	Set the pulleys in a low or medium position, cross the cables so the left handle is in the right hand and vice versa. Keeping excellent posture (avoid extending back and tilting top of pelvis forward!), make a Y position with arms above head, using the upper back to retract scapulae. Relax upper back a bit, then move into a T position, retracting scapulae again. Repeat in the A position (arms by hips at 45 degrees).
Hip stability	Side step with band	2 sets of 12-15	Put a light looped band around the ankles and side step without rocking the torso or allowing the band to go slack.

Year 3: General Preparation B

Main Focus	Exercise	Sets and Repetitions	Notes
Lower body strength	Assisted Pistol Squat	2 sets of 8-10 per leg	Holding the handles of a suspension system or rings for assistance (or the post of a squat rack) balance on one foot with the other leg ready to extend in front, then do a low squat with one leg only. Make sure knees don't go inward, and if there is knee pain, limit the depth of the squat. Another option is to sit and rise from a bench using only 1 leg, with a lower bench being more challenging.

Lower Body Strength	Single leg soft knee deadlift	2 sets of 8-10 per leg	Stand on one leg and push hips back until hamstring of the standing leg feel stretched. Push the other heel straight back in the air at hip height, keeping hips level. Keep shin of standing leg vertical and keep neutral spine/shoulders. Hold a dumbbell or bar once the movement becomes easy to perform.
Chest strength	Dumbbell chest press	2 sets of 10-12	Hold the dumbbells close to your chest while lying on the bench. Keep lower back gently pressed against bench. To start, raise the dumbbells above your mid-chest at shoulder width. Then, lower the dumbbells by bending elbows, bringing them down so upper arms are 45 degrees from torso. Keep forearms vertical.
Middle back strength	One Arm Row with Dumbbell	2 sets of 8-10 per side	Put one knee on the bench, and one foot on the floor keeping body weight symmetrically distributed. Put one hand on the bench (same side as knee on bench). Keep spine, pelvis and scapula neutral. Lift dumbbell so elbow moves slightly past torso, keeping forearm fairly vertical and wrists flat.
Middle back strength	Face Pulls	2 sets of 10-12	Set a Pulley machine at face height. Use a rope attachment, and hold the rope on either side with palms down and thumbs inward. In an athletic stance (knees slightly bent, stabilized) pull the attachment towards your face by using the upper back, with elbows moving back and slightly downwards.
Middle back/shoulder	Standing one-arm reverse fly	2 sets of 8-10 per side	Standing with feet at hip width and knees slightly bent, push hips back (as in the hip hinge exercise), keeping the spine neutral, lean forward to 45 degrees or more and be sure to activate the deep core muscles to protect the lower back. Start with the dumbbell at your side and raise it laterally directly against gravity, to shoulder height, keeping arms slightly bent at all times.
Obliques	Woodchop	2 sets of 8-10 per side	Adjust pulley to a high position and hold handle with both hands. Stand perpendicularly to the cable, slightly behind it. Pivot your feet to face the cable machine, arms extended towards machine (starting position). Pivot your feet and rotate the hips and torso away from the machine, pulling the cable downwards and ending the movement with hands on the outside of the outer knee. Discontinue if there is knee discomfort.
Abdominal strength (obliques)	Side plank with leg raises	2 sets of 60 seconds per side	Lie on side with elbow and forearm on ground, and list hips so the body is in a sturdy line from ears to ankles. Have the legs/feet stacked, the top on directly over the bottom one. Lift the top leg to the height of your top hip, then lower and repeat. Rest briefly as often as needed if you cannot keep good form, then resume.
Lower back strength	Plank with leg extensions	2 sets of 75 seconds	Lie on front with forearms on ground and lift hips off of the ground to create a sturdy aligned body from heels to back of head. Take one foot at a time 2 cm off of the

			ground while both hips at the same level. Avoid letting lower back overextend. Rest briefly as often as needed if you cannot keep good form, then resume.
Hip, spine and shoulder stability	½ kneeling Pallof Press	2 sets of 8-10 per side	Kneel on outside knee. Increase difficulty by putting foot of front leg in line with knee of back leg. Be few steps away from a partner, both facing the same direction and both holding the same heavy resistance band in your hands with arms extended in front of the chest and straight. Take turns bringing your hands to your own chest. When your partner does this movement, resist the rotational pull and keep excellent and symmetrical posture.
Shoulder stability	Band diagonal, T, diagonal	2 sets of 12-15	Using a light band, keep arms nearly straight while pulling alternating hands back and up/down, then in a T position, then the opposite orientation of down/up. Use the small muscles in your back for these moves.
Hip stability	clam	2 sets of 12-15	Lie on your side with your hips on the ground. To start, knees and feet are stacked with knees bent at 45 degrees and feet below hips. Keep bottom leg relaxed while top leg opens like a clamshell (hip abduction)

Year 3: Specific Preparation

Exercise	Exercise	Sets and Repetitions	Notes
Lower body strength	Walking lunges	2 sets of 8-10 steps per side	Maintain great posture with neutral spine, pelvis and shoulders. Hold dumbbells at sides with arms straight. Walk forward, and with each step descent, so the front thigh/ hip and both knees bend at 90 degrees. The rear heel comes off of the ground during each step.
Lower body strength	Goblet Squat	2 sets of 8-10	Stand with feet wider than hip width and toes pointed slightly outward. Hold weight with palms up and wrists facing each other (dumbbell between wrists and held up by palms). Keep your heels on the ground, and keep your spine and pelvis neutral. While squatting, push your hips back (like sitting on a low stool). Your knees will naturally come forward – try to keep them tracking in line with the middle toes. Your torso will lean forward slightly, but do not let it become more horizontal than the shins.
Chest strength	Single arm Dumbbell Chest Press	2 sets of 8-10 per arm	Hold the dumbbell close to your chest while lying on the bench. Keep lower back gently pressed against bench. To start, raise the dumbbell above your mid-chest at shoulder width. Then, lower the dumbbell by bending elbow so the upper arm is 45 degrees from torso. Keep forearm vertical. This requires more stability than the double arm press.

Middle back strength	Lat Pulls or assisted Pull ups	2 sets of 8-10	Using pulley: reach up and hold the bar about 1 hand-width wider than shoulder width on each side. Stabilize the shoulders, and have arms straight, then lean torso back 20 degrees keeping back neutral (start position). Pull the bar down to clavicles, keeping forearms at the same angle for the movement. For assisted pull ups, wrap a superband around a pull-up bar, grip the bar palms out, and put the band around the knees for assistance – be sure the straighten the arms at the bottom and put the chin higher than the bar at the top!
Core strength & stability	Thread the needle	2 sets of 10-12	Front plank with hands on ground and one shin on big ball. Rotate the hips and put the foot under the hips to the other side of the ball then bring it back beside the leg on the ball.
Core strength & stability	Side Plank hip dip	2 sets of 60 seconds per side	Lie on side with elbow and forearm on ground, and list hips so the body is in a sturdy line from ears to ankles. Dip the hips toward the ground and come back to neutral position. Rest briefly as often as needed if you cannot keep good form, then resume.
Hip stability	Fire hydrant	2 sets of 12-15	On hands and knees, raise one leg up to the side, keeping knees and hip bent. Aim to keep hips and spine neutral.
Shoulder stability	Prone W and press on ball with dumbbells	2 sets of 10-12 per side	Put feet against wall to stabilize, and put hips/abdomen on big ball, so body is tilted. If using dumbbells, start very, very light. Begin with upper arms at shoulder height, elbows bent at 90 degrees. Keep elbows bent at 90 while rotating upper arms until forearms are parallel with ground, then extend arms overhead, ending a bit wider than shoulder height. Reverse the motion and repeat.
Middle back strength endurance	Bench Pull or Assisted Supine Row	2 sets of 1 minute steady. Rest if needed then resume until time is up.	Use ½ to ¾ of weight in earlier program, or increase hand level if doing supine row.
Shoulder Muscular Endurance	Horizon Trace with light dumbbells	2 sets of 1 minute steady. Rest if needed then resume until time is up.	Keeping excellent posture, begin with arms extended in front of chest, palms facing inward. Slowly move your hands apart until they are fully extended at sides, still at shoulder level. Repeat. Stop if your posture is compromised.

Year 3: Pre-Competition

Main Focus	Exercise	Sets and Repetitions	Notes
Lower body strength	Step Ups with dumbbells (or barbell)	2 sets of 8-10 per side	Choose a bench/box at knee-level or lower to avoid tilting hips when stepping. Start with dumbbells at sides (straight arms) and both feet on ground, with neutral spine, pelvis and shoulders. Step up so one foot is completely on box/bench, then bring the other foot up too. Put the foot that most recently ascended back on the ground, then put the leg that first ascended back on the ground. Do all reps on one leg, then do all reps on the other leg.
Chest strength	Chest Flies	2 sets of 8-10	Hold the dumbbell close to your chest while lying on the bench. Keep lower back gently pressed against bench. To start, raise the dumbbell above your mid-chest at shoulder width. Then, extend your arms out to the sides keeping elbows softly bent. Hands remain at shoulder level, but elbows may be more in line with chest. Do not lower elbows lower than the bench.
Middle back strength	One-arm Row with dumbbell	2 sets of 8-10 per side	Put one knee on the bench, and one foot on the floor keeping body weight symmetrically distributed. Put one hand on the bench (same side as knee on bench). Keep spine, pelvis and scapula neutral. Lift dumbbell so elbow moves slightly past torso, keeping forearm fairly vertical and wrists flat.
Serratus Anterior	Plank Up	2 sets of 12-15	Begin in a high plank position (on hands rather than forearms) and intentionally slide your shoulder blades outwards against your ribs so your torso rises. Return to neutral and repeat. Arms stay nearly straight for the entire exercise.
Middle back and shoulder	Pull from side using pulley	2 sets of 12-15	Stand perpendicular to pulley, with it adjusted to shoulder height. Hold handle with hand farthest from machine, starting with hand in front of chest and elbow raised at shoulder level. Pull the elbow back so the hand is in front of the shoulder (similar to archery motion).
Core, chest, shoulder, legs	Rock Star	2 sets of 10-12 per side	Hold a bar in one hand with the other end secured on the ground in a corner. Start by holding the bar with your hand in front of the opposite thigh. Then pivot the body to the side holding the bar, and keeping the elbow bent, rotate the upper arm so the forearm is parallel with the ground. Reverse the movement and repeat.
Core strength	Ball Roll out	2 sets of 10-12	Kneel on a doubled mat with your feet supported by a wall. Really focus on maintaining a plank position from the knees to head for the entire movement. Put hands on the close top side of a big ball, palms together (pinkies on the ball). Keeping the plank, increase the angle between your arms and torso while

			the ball rolls forward. Stop before your plank position is compromised, and resume from starting position. Range depends on core strength.
Core strength	Back extension	2 sets of 10-12	With the front of your thighs on a big ball, and your feet against the wall for support, flex/curve the spine so your head and chest move downwards then come up to neutral position. Avoid hyperextending back when completing the movement. If you have a back extension machine, feel free to use it instead.
Hip stability and core strength	Side plank with leg raises	2 sets of 60 seconds per side	Lie on side with elbow and forearm on ground, and list hips so the body is in a sturdy line from ears to ankles. Have the legs/feet stacked, the top on directly over the bottom one. Lift the top leg to the height of your top hip, then lower and repeat. Break up the 60 seconds into shorter durations if needed. Stop if form begins to fail.
	Palof Press standing on outside leg only	2 sets of 8-10 per side	Stand in an athletic stance on outside leg only, a few steps away from a partner, both facing the same direction and both holding the same heavy resistance band in your hands with arms extended in front of the chest and straight. Take turns bringing your hands to your own chest. When your partner does this movement, resist the rotational pull and keep excellent and symmetrical posture.
Shoulder stability	Scapular squeezes with band and elbow taps	2 sets of 10-12	Elbows at shoulder height and hands in front of chest. Keep band taught. Widen hands and activate upper back each rep. Have a partner tap your elbows to increase your need to stabilize your body.
Posture, strength and stability	Farmer's walk (one side)	2 sets of 8-10 per side	Carefully pick up 1 dumbbell using a squat technique. Walk with the dumbbell held at one side, arm straight. Keep perfect posture of spine, ribs, pelvis and shoulders. Walk linearly, not letting knees come inward.
Abdominal strength endurance	Boat Pose (V-sit)	2 sets of 45-60 seconds	Sit on floor with torso leaned back 30-45 degrees, thighs at 45 degrees and feet off of the ground with shins horizontal. If needed, gently hold thighs for support. Stop if you're not able to keep your back in a neutral posture. (Stop if your back rounds or arches)
Metabolic Training	Single Arm Dumbbell Bench Pull or Row	1 set of 1 minute steady per arm. Rest if needed then resume until time is up.	Use ½ to ¾ of the weight used in earlier program.

Year 3: Competition. This is a circuit incorporating muscle endurance, stability and aerobic components. Do 45 seconds per exercise, with 15 seconds transition between exercises and 3-5 minute rests between circuits. Athletes should feel challenged and be breathing hard. They should not be able to converse. Do 2-3 sets of the first circuit, followed by 2-3 sets of the core circuit.

Exercise	Duration	Notes
Squats or jump squats	45 seconds quickly and with full control	Unweighted
Assisted push ups	45 seconds quickly and with full control	Maintain perfect form
Split squats (add a jump if desired)	45 seconds quickly and with full control	Unweighted
Split Squats (other side)		Unweighted
Bench Pull or assisted supine row	45 seconds quickly and with full control	Doable but challenging weight for 45 sec
Mountain Climber	45 seconds quickly and with full control	Hands on Medicine ball if too easy
Scapular squeezes with band	45 seconds quickly and with full control	Elbows at shoulder height and hands in front of chest
Bear Crawl	45 seconds quickly and with full control	Keep knees close to ground but not touching, and keep hips moving linearly (not side-to-side)
Dumbbell Drag	45 seconds quickly and with full control	Doable but challenging weight for 45 sec

Do 2-3 sets of the circuit above before moving on to this core and stability circuit, and do it 2 times:

Plank with Pull	15 repetitions	Use a band or pulley. Keep aligned from ears to ankles.
Plank with Pull (other side)	15 repetitions	Use a band or pulley. Keep aligned from ears to ankles.
Thread the needle or windshield wipers	15 repetitions	Rest if needed to maintain proper form.
Thread the needle or windshield wipers (other side)	15 repetitions	Rest if needed to maintain proper form.

Back extensions hold on machine	90 seconds	With the front of your thighs on a big ball, or machine, extend so your back is not supported by the ball or machine and hold with good posture. Take rests if/when needed to maintain perfect form.
V-sit	90 seconds	Take rests if/when needed to maintain perfect form.

Three Years of Aerobic Fitness Programming

This structured program for developing aerobic fitness will help athletes increase cardiac output and thereby reduce their resting heart rates. It can be used for running, cycling, swimming or cardio machines in the gym, such as elliptical trainers or stair climbers. This program has limited variability; athletes and coaches are encouraged to diversify training by substituting other aerobic activities such as fitness classes, skiing, skating, hiking and so on. Archery athletes may also enjoy participating in an additional sport that has greater aerobic demands as a fun way to improve aerobic fitness.

For the aerobic workouts, intensities will be set using a Rating of Perceived Exertion (RPE) scale of 1-10:

RPE	Description
1	Resting
2-3	Very light activity – can go for hours
4-6	Moderate activity – noticeable increase in breathing rate
7-8	Vigorous – cannot speak more than 1 sentence without becoming breathless
9	Difficult to maintain – can speak occasional words but not a whole sentence
10	Maximal – cannot talk and can only maintain effort for a very short time

Please begin each workout with an 8-10 minute warm up at an RPE of 4-6.

First Year: Aerobic Program

General Preparation A: Three 30 minute workouts per week

	Focus	Workout
Workout 1	Aerobic Capacity	Two sets of 6 of 90 seconds at RPE 6-7 with 30 second active rests at RPE 3-4. Take a 5 minute active rest at RPE 2-3 between sets.
Workout 2	Aerobic Capacity	Eight 3 minute pieces at RPE 6-7 with 30 second active rests at RPE 3-4
Workout 3	Aerobic Capacity	Three 8 minute pieces at RPE 6-7 separated by 2 minute active rests at RPE 3-4

General Preparation B: Three 30 minute workouts per week

	Focus	Workout
Workout 1	Aerobic Capacity	4 sets of 5 minutes at RPE 6-7, with 1 minute active rests at RPE 3-4
Workout 2	Aerobic Capacity	Two 10 minutes pieces at RPE 6-7 separated by a 2 minute active rest at RPE 3-4
Workout 3	Aerobic Capacity	25 minutes at RPE 6-7

Specific Preparation: Three 30 minute workouts per week

	Focus	Workout
Workout 1	Aerobic Capacity	Pyramid of 3-6-9-6-3 minute pieces at RPE 6-7, with 30 second active rests between pieces at RPE 3-4
Workout 2	Aerobic Capacity	Three pieces: 4, 8 and 12 minutes at RPE 6-7 with 30 second active rests between pieces at RPE 3-4
Workout 3	Aerobic Capacity	25 minutes at RPE 6-7

Pre-Competition: Two 30 minute sessions per week

	Focus	Workout
Workout 1	Aerobic Capacity	Three 8 minute pieces at RPE 6-7, with 30 second active rests between pieces at RPE 3-4
Workout 2	Aerobic Power	3 minutes at RPE 8-9, with 1 minute rest (off or RPE 2-3)

Competition: The circuit used for fitness maintenance addresses aerobic fitness as well as strength and stability.

Second Year: Aerobic Program

General Preparation A: Three 30-45 minute workouts per week

	Focus	Workout
Workout 1	Aerobic Capacity	Three 10 minute pieces at RPE 7-8, and 1 minute active rests at RPE 3-4
Workout 2	Aerobic Capacity	Two 15 minute pieces at RPE 7-8 and a 1 minute active rest at RPE 3-4
Workout 3	Aerobic Capacity	2 sets of 4 of 5 minutes at RPE 7-8 and 30 seconds active rests at RPE 3-4

General Preparation B: Three 30-45 minute workouts per week

	Focus	Workout
Workout 1	Aerobic Capacity	15-10-5 minute pieces at RPE 7-8 and 30 second active rests at RPE 3-4
Workout 2	Aerobic Capacity	Pyramid: 2-4-8-10-8-4-2 minute pieces at RPE 7-8 with 30 second rests at RPE 3-4
Workout 3	Aerobic Capacity	12 times 3 minutes at RPE 7-8 with 15 second active rests at RPE 3-4

Specific Preparation: Three 30-45 minute workouts per week

	Focus	Workout
Workout 1	Aerobic Capacity	2 sets of 4 of 5 minutes at RPE 7-8 with 15 second active rests at RPE 3-4. Take a 2-5 minute rest between sets.
Workout 2	Aerobic Power	2 sets of 10: 1 minute at RPE 8-9 with 1 minute active rests at RPE 2-3. Between sets take a 2-5 minute rest.
Workout 3	Aerobic Capacity	30 minutes at RPE 7-8

Pre-Competition: Two 30-45 minute workouts per week

	Focus	Workout
Workout 1	Aerobic Capacity	Pyramid: 5-7-9-7-5 minutes at RPE 7-8 with 15 second active rests at RPE 3-4.
Workout 2	Aerobic Power	4 sets of 6: 30 seconds at RPE 9+ with 15 seconds active rest at RPE 2-3

Competition: The circuit used for fitness maintenance addresses aerobic fitness as well as strength and stability.

Third Year: Aerobic Program

General Preparation A: Three 30-45 minute workouts per week

	Focus	Workout
Workout 1	Aerobic Capacity	Pyramid: 2-3-4-5-6-5-4-3-2 minutes at RPE 7-8 with 30 second active rests at RPE 3-4

Workout 2	Aerobic Capacity	Descending: 12-10-8-6-4 minutes at RPE 7-8 with 30 second active rests at RPE 3-4
Workout 3	Aerobic Capacity	20 minutes at 7-8 RPE, 1 minute active rest at RPE 3-4, then 15 minutes at 7-8 RPE

General Preparation B: Three 30-45 minute workouts per week

	Focus	Workout
Workout 1	Aerobic Capacity	Ascending: 4-6-8-10-12 minutes at RPE 7-8 with 30 second active rests at RPE 3-4
Workout 2	Aerobic Capacity	Seven 5 minute pieces at RPE 7-8 with 15 second active rests at RPE 3-4
Workout 3	Aerobic Capacity	35 minutes at 7-8 RPE

Specific Preparation: Three 30-45 minute workouts per week

	Focus	Workout
Workout 1	Aerobic Capacity	3 sets of 4: 3 minutes at RPE 7-8 with 15 second active rests at RPE 3-4, with 1-2 minutes rest between sets
Workout 2	Aerobic Power	3 sets of 8 minutes at 7-8+ RPE with a 2 minute active rest of RPE 2-3 followed by high intensity intervals: 8 times 45 seconds at RPE 9 with 15 seconds active rest at RPE 2-3
Workout 3	Aerobic Capacity	3 sets of 12 minutes at 7-8 RPE with 15 second rests

Pre-Competition: Two 30-45 minute workouts per week

	Focus	Workout
Workout 1	Aerobic Capacity	3 times: 6-4-2 minutes at RPE 7-8 with 15 second active rests at RPE 3-4, with 1-2 minutes rest between sets
Workout 2	Aerobic Power	Two 10 minute pieces at 7-8+ RPE with a 2 minute active rest of RPE 2-3 followed by high intensity intervals: 3 sets of 8 of 20 seconds at RPE 9+ and 10 seconds rest at RPE 2-3, with 2 minute rests between sets

Competition: The circuit used for fitness maintenance addresses aerobic fitness as well as strength and stability.

References

Recurve Archers – Men and Women: Carding Policy & Process for 2017 Carding, Able-Bodied Archers –English. Archery Canada. June 10, 2016.

video links to exercises <https://www.youtube.com/playlist?list=PLA73oM53M4jXuGN6JWiqARkApzhLXOF1>