



PHYSICAL TRAINING GUIDE

FOR SKILLS ASSESSMENT & TRADES ORIENTATION

**Power Electrician, Mechanical Technician
& pre-placement training programs**



Available in accessible formats upon request.



DISCLAIMER AND WAIVER OF LIABILITY

The Skills Assessment and Trades Orientation (SATO) is a hands-on skills assessment that requires candidates to perform tasks that are similar to those performed on the job, such as working with hand tools and operating equipment. The Functional Abilities Evaluation component of SATO assesses candidates' physical capabilities to ensure they possess the required physical strength, dexterity, and endurance for the job. Participation in SATO and in any program to prepare for SATO is entirely voluntary.

Prior to embarking upon an exercise program, or any exercises, to prepare for the Functional Abilities Evaluation component of SATO, including the exercises suggested in the attached Guide, it is strongly recommended that you review the exercise program or exercises with your physician and get his/her approval to participate.

It must also be understood that, by participating in such an exercise program, or any exercises in preparation for the Functional Abilities Evaluation component of SATO, and by participating in SATO itself, **you are accepting all risks associated with them and will not holding Manitoba Hydro responsible for any injuries or illnesses or losses that may result from your preparations for SATO or your attendance at it.**

It must also be understood that completion of this exercise program does not guarantee success on the Functional Abilities Evaluation or at SATO due to individual variability in such things as your initial physical capacities and your responses to the training program.





WHAT IS THE SKILLS ASSESSMENT AND TRADES ORIENTATION (SATO)?

Manitoba Hydro, we strive to hire the best and brightest employees whose abilities match the requirements of the job. As part of our hiring process, we use selection methods that are designed to measure skills required for job and training success. One of the components of the selection process for the Power Electrician and Mechanical Technician Training Programs is called the Skills Assessment and Trades Orientation (SATO).

SATO is a hands-on skills assessment that requires candidates to perform tasks that are similar to those performed on the job, such as working with hand tools and operating equipment. During SATO, candidates are rated on their ability to

complete the tasks and their suitability for the job. This assessment also gives candidates a better idea of the type of work they would do on the job.

SATO also includes a Functional Abilities Evaluation. The Functional Abilities Evaluation assesses candidates' physical capabilities to ensure they possess the required physical strength, dexterity, and endurance for the job.

The Functional Abilities Evaluation is comprised of **six** individual tests that together evaluate muscular strength, endurance and aerobic capacity specific to electrical and mechanical technician positions. All tests are specific to task demands required on the job.



WHAT TASKS ARE INCLUDED IN THE FUNCTIONAL ABILITIES EVALUATION?

1. FLOOR TO WAIST LIFT

You will be required to lift and lower up to 50lbs between floor and waist level a total of 5 times with good technique.

2. WAIST TO CROWN LIFT

You will be required to lift a 50 lb. extension ladder down from 5.5 ft. high

wall hooks or off of a Hydro truck, and set it up against a vertical surface. You will then be required to replace the ladder onto the 5.5 ft. high hooks. You can take down/put up one side of the ladder at a time or lift it in one smooth motion placing it onto both hooks at the same time.

3. HOT STICK LIFT

You will be required to lift a ground chain from the floor to overhead with a hot stick, which is an insulated pole used by electric utility workers when working on energized high-voltage electric power lines. You will then attach the ground chain to a rail 10 feet above ground, 6 times in a row. The tip of the ground chain must be touched to the floor between lifts. It may not be rested against the wall or railing at any time during the lift. You may rest for up to a minute between lifts. A clockwise motion tightens the ground chain clamp. A hard hat and insulated rubber gloves (provided) must be worn. Please note that most participants have difficulty with this test. A strong back, legs, arms, and core are critical to perform this task safely and efficiently.

4. KNEELING/CROUCHING

You will be required to sustain a squat/kneel for 5 minutes. You may alternate between the two positions as needed during that time frame without standing up. While in the kneel/squat position, you will be required to tighten 4 large bolts using a 16" torque wrench and box wrench (to 112 ft. lbs of torque).

5. STAIR CLIMB WITH WEIGHT

You will be required to carry a 50lb tool bag in either the left or right hand, up and down two flights of stairs. You may alternate hands as desired and should use the railing for safety. Please note that most participants have difficulty with this test. Good cardiovascular endurance and a strong back, arms, legs and core are critical to perform this task safely and efficiently.

6. PULLEY LIFT

You will be required to stand on the ground and raise a 30lb tool pouch up to the 10-15 ft. height by pulling up on the rope in a hand over hand motion and then lowering it. This is repeated 5 times, gloves (provided) must be worn.



WHAT CAN I DO TO PREPARE FOR THE FUNCTIONAL ABILITIES EVALUATION?

The Manitoba Hydro Functional Abilities Evaluation requires individuals to possess muscular strength, muscular endurance, cardiovascular fitness and flexibility related to the bona fide occupational requirements. The following 12-week training program has been designed by the Wellness Institute to assist applicants in meeting the physical requirements of the Manitoba Hydro Functional Abilities Evaluation.



PHYSICAL TRAINING PROGRAM

THERE ARE THREE COMPONENTS TO FITNESS:

- 1 **Strength training**
(safe & progressive resistance)
- 2 **Cardio endurance**
- 3 **Flexibility**



STRENGTH TRAINING

(SAFE & PROGRESSIVE RESISTANCE)

Resistance training increases muscle mass, endurance, and strength; strengthens bones; and helps to burn stored energy or body fat. This training program includes a variety of strength training exercises that will condition you for the Manitoba Hydro Functional Abilities Evaluation. The muscle group being worked, the exercise name, and the Manitoba Hydro test that it relates to are listed on the exercise sheet.

It is recommended that you start your program with a lighter weight. Adjust from there to a weight that you can lift with good technique for 3 sets of 8-12 repetitions. Remember that the weight may feel light initially but muscle fatigue may happen sooner than you think and put you at risk for injury. You should “feel the burn” or work a little harder to complete the last 2-3 reps in each set.

Increase the amount of weight you lift after you are able to complete two repetitions over your target repetitions on the last exercise set on two successive days. For example, if you do 3 sets of 8-12 reps and on the final set you are able to complete 14 or more reps with good technique on two consecutive training days, you should increase the weight for your next training session. Remember, it is more important to perform exercises with proper technique than to lift a heavier weight.

It is important to rest the worked muscle groups for 48 hours (2 days) after a resistance workout. This allows for the body to repair the muscle tissue. Resistance training actually encourages micro-tears to

the muscle fibers, and this is why muscle soreness may occur one to two days after you workout. This is referred to as delayed onset muscle soreness, which is completely normal and should last no more than a week. This soreness will reduce as training continues. Given that you should allow worked muscles to rest for hours (2 days) after a resistance workout, you may choose to do your full-body resistance workout roughly every second day (e.g. Monday, Wednesday, Friday).

Core muscles are important for all activities and exercises as they provide stability to the trunk while the limbs are active. These muscles play an important role in maintaining good posture and improving balance. Strengthening core muscles will result in greater physical test performance and reduce the risk of injury. Strong core muscles are important for maintaining proper technique while lifting, carrying, pushing, and pulling. You can strengthen and engage core muscles with all exercises by standing with a tall posture and breathing out on the exertion of the lift.

STRENGTH TRAINING TERMS

- **Weight:** Amount of weight lifted
- **Repetitions (reps):** Number of times the weight is lifted (i.e. 8-12)
- **Sets:** Number of times a given number of reps are performed (2-3 sets of 8-12 reps)
- **Rest:** Break between sets (e.g., 30-60 second rest between sets)
- **Frequency:** Number of times per week that the sets are performed.

CARDIOVASCULAR ENDURANCE

Cardiovascular endurance is important for active everyday living.

Cardiovascular exercise helps to reduce the risk of cardiovascular disease, control high blood pressure and cholesterol, control body composition, increase bone strength and density, increase energy, reduce stress, improve sleep, and improve mood and self esteem.

Having good cardiovascular endurance is important for successful completion of the Functional Abilities Evaluation because your heart rate is monitored during each task to ensure it can handle the daily job demands without overexertion. To pass each assessment, your heart rate must not exceed 85% of your heart rate maximum.

WARM-UP:

It is important to prepare the body for exercise. Warming up involves 5-10 minutes of moderate cardiovascular or dynamic exercise; this should be enough to start perspiring. This raises the body's temperature making the muscles more pliable.

COOL DOWN:

Cooling down helps the heart rate and blood pressure to come down gradually, reducing blood pooling, and helps to reduce lactic acid in the working muscles.

To get the benefits from cardiovascular exercise (cardio) it must be performed most days of the week at a total of 30-60 minutes each day. The total amount of time can be broken up into shorter segments throughout the day (e.g., 10 minutes in the morning, 10 minutes in the afternoon, and 10 minutes in the evening). Or it can be split between a few activities (i.e. treadmill, stair climber, elliptical). As endurance improves, you should extend segment times until you are able to complete a minimum of 30 minutes at one time per day. To prepare for the Functional Abilities Evaluation, it is also recommended that you do cardio exercises that are similar to the demands of the job (e.g., running and stair climbing).

To calculate how hard you should be working, use the formula below:

Heart rate maximum (HR max): $220 - \text{Your age}$ — beats per minute (bpm)

YOU SHOULD TRAIN BETWEEN 70-85% OF YOUR HR MAX

Example: If you are 20 years old

HR max: $220 - 20 = 200$ bpm

Training range: $70\% \text{ of } 200 = 140$ bpm, $85\% \text{ of } 200 = 170$ bpm

Maintain the lower end of your training range throughout the duration of the cardiovascular exercise; gradually add short bursts of increased intensity to bring your heart rate up to the 85% heart rate level.

It is important to use your heart rate as a guide to how hard you are working.

Less physically active people should start off with 50-60% of their HR max. If you are already physically active 70-80%

of your HR max is an acceptable place to start. All should be able to maintain the 85% HR max by the end of the 12 week program. You should progress by 10% per week until you reach 85% HR max.

To take your heart rate, stop exercising and immediately place your index and forefinger over your wrist on the thumb side (radial pulse) for 15 seconds and multiply by four. For a more accurate reading, it is recommended that you use a heart rate monitor.

3

FLEXIBILITY



Stretching helps to reduce the risk of injury, improve posture, reduce muscle stress, maintain health of joints, increase range of motion, and reduce muscle soreness after activity.

The best time to stretch is when the muscles are warm and pliable. This helps to reduce the chance of injury. All stretches should be performed slowly and held for 15-20 seconds. You should feel a gentle stretch only; never push into pain.



STARTING YOUR TRAINING PROGRAM

THE FIRST WEEK OF EXERCISE COULD LOOK LIKE THIS:

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Cardio 30-60 mins	Cardio (optional)	Cardio 30-60 mins	Cardio (optional)	Cardio 30-60 mins	Cardio (optional)	Rest day
Strength training		Strength training		Strength training		

After the first week or once your body is ready, the resistance training workouts can be done every day by alternating muscle groups (i.e. upper body one day, lower body the next day). This also allows time for more exercises per muscle group.

WEEKS 2-12 COULD LOOK LIKE THIS:

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Cardio 30-60 mins	Cardio (optional)	Cardio 30-60 mins	Cardio (optional)	Cardio 30-60 mins	Cardio (optional)	Rest day
Lower body & core	Upper body	Lower body & core	Upper body	Lower body & core		

On the next page you will find an exercise chart with exercises

recommended to achieve the strength, flexibility and cardio endurance that you need to perform the tasks included in the Functional Abilities Evaluation.

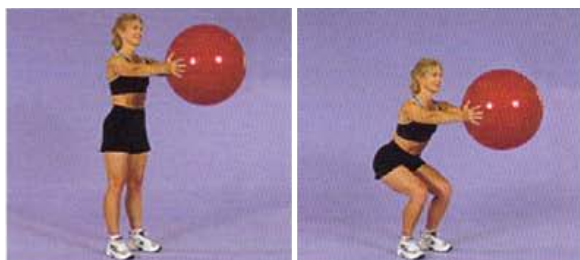
Pictures and descriptions of the exercises are also attached (with some options, depending on whether you are working out at home or in a gym).

Muscle group	Physical test	Gym exercises	Weight (lbs)	Set/Reps	Date	Date	Date	Date	Date
LEGS: Quadriceps Hamstrings Glutes Gastrocs	Floor to Waist lift Ladder Climb Stair Climb with Weight Dynamic Pulling	Squats or leg press Lunges Leg curls or bridge		3/8-12					
BACK: Latissimus Dorsi Trapezius	Floor to Waist lift Waist to Crown Dynamic Pulling Torque Wrench Pulley Lift	Front Pull Down Seated or Bent Over Row		3/8-12					
LOW BACK		Back Extensions or Supermans		3/8-12					
CHEST: Pectorals	Torque Wrench	Push up or Bench Press Chest Fly		3/8-12					
SHOULDERS: Anterior Deltoid Middle Deltoid Posterior Deltoid	Elevated work with Extended Reach Same as Back	Front Raise Shoulder Press Seated Row or Reverse Fly		3/8-12					
ARMS: Front: Biceps group Back: Triceps	Floor to Waist lift Waist to Crown Dynamic Pulling Torque Wrench Pulley Lift	Biceps Curl or preacher curl Tricep pull down or elbow Extension		3/8-12					
FOREARMS Wrist flexors Wrist extensors	Hand Grip Lift and Carry	Wrist curl Reverse Wrist Curl		3/8-12					
CORE:	*Important for all exercises*	'V'Hold, Abdominal Crunches, Plank, Sides Bridge		3/8-12					
CARDIO:		Stairs Elliptical Treadmill		3/8-12					

***ALWAYS BREATHE OUT ON EFFORT**

TARGET HEART RATE: bpm

Pick 2 exercises from legs and 1 exercise from all other muscle groups during week one. Be sure to choose different exercises for each day of exercise. During the second week split the program into upper body and lower/core body days.

**SQUATS**

Standing with feet slightly wider than shoulder width apart, sit down to a chair.

Return to the start position.

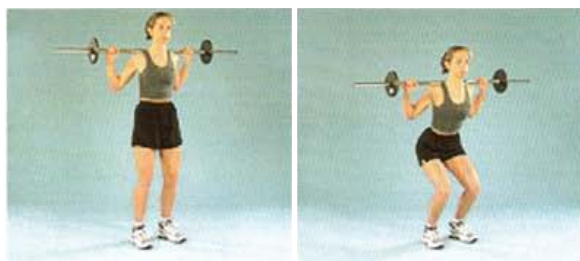
You do not need the ball, it just helps with balance.

Sit slowly to a chair.

SETS	3
REPS	8-12
WEIGHT	
HOLD	4-10 sec
REST	30-45 sec
2-3 x/week	

Note: An alternate for this exercise is the leg press machine.

OR

**SQUATS - BARBELL**

Standing in readiness position, feet shoulder width apart.

Bend the knees and lower body down into a squat position while maintaining the arch in the low back.

Do not allow knees to bend past 90°.

Squeeze the buttocks and keep body centered over the ankles to raise up to the starting position.

Repeat.

SETS	3
REPS	8-12
WEIGHT	
HOLD	
REST	30-45 sec
2-3 x/week	

**STATIC LUNGES - DUMBBELLS**

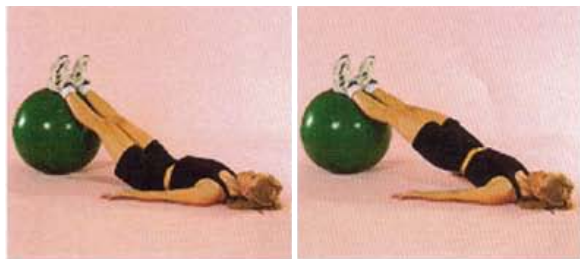
Step forward into a lunge position, longer than a normal stride.

From this position, lower body straight down until back knee almost touches floor.

Keep upper body tall and avoid leaning forward. Front knee should not bend past 90°.

Push up, returning to lunge stance, and repeat.

SETS	3
REPS	8-12
WEIGHT	
HOLD	
REST	30-45 sec
2-3 x/week	

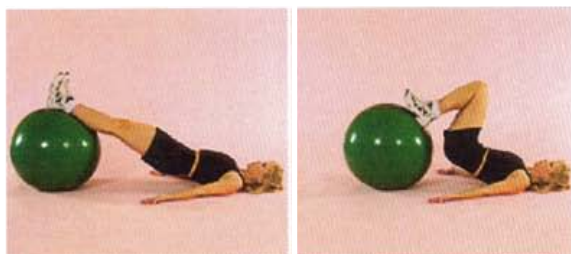
**SUPINE BRIDGE**

Lying on back with heels on ball and knees straight, Arms 45° at sides with palms up for stability.

Pull navel in. Press heels into ball and squeeze buttocks to raise pelvis and low back off floor (keep shoulder blades on floor). Keep ball stable.

Hold, then lower pelvis towards floor and repeat.

SETS	3
REPS	8-12
WEIGHT	
HOLD	
REST	30-45 sec
2-3 x/week	

**SUPINE BRIDGE LEG CURL**

Lying on back with heels on ball and knees straight.

Arms 45° at sides with palms up for stability. Press heels into ball to bridge pelvis and low back up off floor (keep shoulder blades on floor).

Maintaining bridge position, perform hamstring curls by pulling ball toward buttocks.

SETS	3
REPS	8-12
WEIGHT	
HOLD	4-10 sec
REST	30-45 sec
2-3 x/week	

Note: An alternate for this exercise is a leg curl machine.

**FRONT PULL DOWN - BAR**

Attach tubing to a bar (broomstick) and place overhead. Sit with chest up and shoulder blades down and back.

Hold bar in front of body at eye level with elbows slightly bent and palms facing forward.

Pull bar in towards the chest squeezing through the mid back, Avoid shrugging the shoulders.

SETS	3
REPS	8-12
WEIGHT	
HOLD	
REST	30-45 sec
2-3 x/week	

Note: An alternate for this exercise is a lat pull down machine.

**SEATED ROWS**

Sitting on floor with legs extended and tubing placed around bottom of feet. Hold tubing with palms up.

Pull tubing into chest keeping elbows tight to sides. Sit tall and avoid shrugging shoulders.

Slowly return to starting position.

Repeat.

SETS	3
REPS	8-12
WEIGHT	
HOLD	
REST	30-45 sec
2-3 x/week	

Note: An alternate for this exercise is the seated row machine.

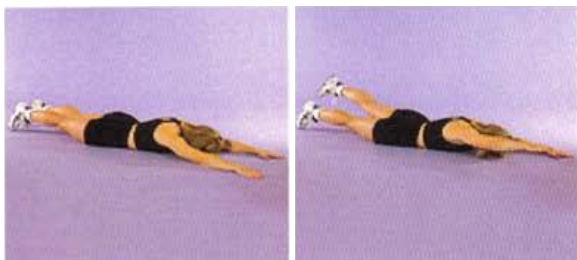
**BENT OVER ROWS - DUMBBELL/BENCH**

Bend at the hips and rest on knee and one hand up on a weight bench or table. Allow weight in opposite hand to hang down freely.

Pull weight up to side of rib cage squeezing through the mid back.

Do not allow upper back to twist during exercise.

SETS	3
REPS	8-12
WEIGHT	
HOLD	
REST	30-45 sec
2-3 x/week	

**LEG/ARM RAISE - PRONE**

Lie face down with a towel or pillow under pelvis.

Maintaining abdominal hollow, slowly raise one leg, and the opposite arm up off the floor and hold.

Lower arm and leg back to floor and alternate.

SETS	3
REPS	8-12 per side
WEIGHT	
HOLD	4-10 sec
REST	30-45 sec
2-3 x/week	

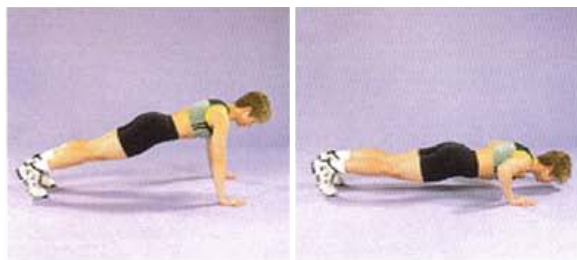
**SUPERMAN**

Lying on stomach with arms over head and thumbs pointing up to the ceiling.

Maintain a slight chin tuck position (avoid looking up with head) and raise chest slightly up off the floor.

Hold, lower and repeat.

SETS	3
REPS	8-12 per side
WEIGHT	
HOLD	4-10 sec
REST	30-45 sec
2-3 x/week	

**PUSH UPS**

From a push up position.

Lower whole body down to floor.

Press up to return to start position.

Maintain abdominal hollow and neutral spinal alignment throughout movement.

SETS	3
REPS	8-12
WEIGHT	
HOLD	4-10 sec
REST	30-45 sec
2-3 x/week	

Note: An alternate for this exercise is the chest press machine.

OR

**CHEST PRESS - BARBELL**

Lying on back on bench maintaining a neutral lumbar spine. Grasp barbell slightly wider than shoulder width.

Squeeze shoulder blades together and maintain the retraction throughout motion.

Lower barbell down toward chest until elbows are bent 90°. Push up to the starting position without locking elbows.

Repeat.

SETS	3
REPS	8-12
WEIGHT	
HOLD	
REST	30-45 sec
2-3 x/week	

**FLYS**

Lying on back holding weights up over chest with palms facing inward. Keep shoulder blades back and down, elbows slightly bent and maintain abdominal hollowing.

Lower weights out sideways in a circular motion until elbows are level with bench, Push weights back up to starting position.

Repeat.

SETS	3
REPS	8-12
WEIGHT	
HOLD	
REST	30-45sec
2-3 x/week	

**FRONT RAISE**

Standing in readiness position holding weights down at sides.

Raise one arm straight up in front toward shoulder level with palm facing down.

Lower weight and alternate.

SETS	3
REPS	8-12
WEIGHT	
HOLD	
REST	30-45sec
2-3 x/week	

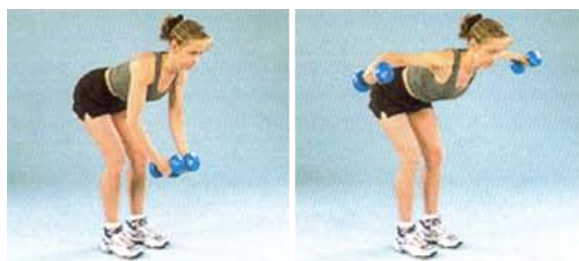
**SHOULDER PRESS - DUMBBELLS**

Sitting, maintaining readiness position. Hold weights at shoulder level with palms facing forward.

Sit tall and keep shoulder blades down and back while pushing weight straight up over head.

Repeat.

SETS	3
REPS	8-12
WEIGHT	
HOLD	
REST	30-45sec
2-3 x/week	

**REVERSE FLYS**

Standing in readiness position, 1/2 bent over at the waist. Hold weights down in front of chest with elbows slightly bent and palms facing each other.

Raise weights up away from body in a circular motion squeezing through the mid back.

Repeat.

SETS	3
REPS	8-12
WEIGHT	
HOLD	
REST	30-45sec
2-3 x/week	

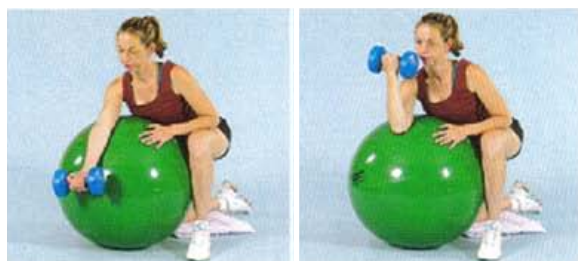
**BICEPS CURL**

Seated or standing in readiness position holding weights down at sides with palms facing in.

Raise one weight up, rotating palm to face up, keeping elbow tight against side.

Repeat.

SETS	3
REPS	8-12
WEIGHT	
HOLD	4-10 sec
REST	30-45sec
2-3 x/week	

**BICEPS/PREACHER CURLS - BALL**

Kneeling on one knee supporting upper body with the ball. Place one arm over ball holding weight with palm facing up.

Perform bicep curls by bending the elbow to bring weight up.

Hold, lower and repeat.

SETS	3
REPS	8-12
WEIGHT	
HOLD	
REST	30-45sec
2-3 x/week	

**TRICEPS PRESS/PULL DOWN**

Attach tubing above head level and hold one end in each hand. Standing with elbows tight to side and palms facing each other, straighten elbows to pull tubing straight down and back.

Return to starting position slowly and repeat.

SETS	3
REPS	8-12
WEIGHT	
HOLD	
REST	30-45sec
2-3 x/week	

Note: An alternate for this exercise is the cable pull down machine.

**TRICEPS/ELBOW EXTENSION**

Standing or sitting, 1/2 bent over, with elbow at side holding weight at waist level (can also put one knee up on a bench).

Push weight straight back in an arc without moving elbow from side of body.

Repeat.

SETS	3
REPS	8-12
WEIGHT	
HOLD	
REST	30-45sec
2-3 x/week	

**WRIST CURLS**

Seated in readiness position, bend over slightly, with forearms resting on knee. Let hand hang over knee, palm facing up and weight held loosely in the hand.

Curl fingers up into palm then curl weight up from the wrist.

Lower and repeat.

SETS	3
REPS	8-12
WEIGHT	
HOLD	
REST	30-45sec
2-3 x/week	

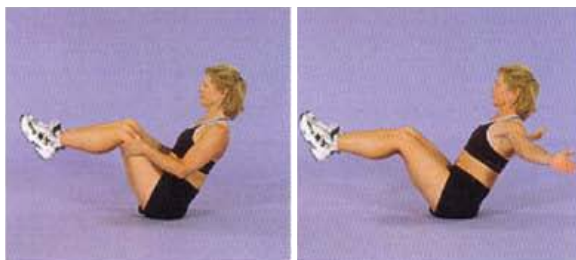
**REVERSE CURLS/WRIST**

Seated in readiness position, bent over slightly, with forearm resting on knee. Let hand hang over knee, palm facing down and hold weight loosely in the hand,

Raise weight up away from knee helping with your other hand. Then slowly let your hand down.

Repeat.

SETS	3
REPS	8-12
WEIGHT	
HOLD	
REST	30-45sec
2-3 x/week	

**V HOLD - UNSUPPORTED**

Sit up in a V pose with knees bent, hands supporting on thighs and chest held up strong.

Slowly lower upper body backward keeping spine in a neutral alignment and maintaining an abdominal hollow.

Only go as far as able, maintaining posture. If comfortable, bring arms out to the side.

Hold.

SETS	2-3
REPS	8-12
WEIGHT	
HOLD	10-30 sec
REST	30-45sec
5 x/week	

Note: Increase the difficulty of this exercise by clasping hands together in front of you and twisting to alternate sides, tap knuckles on floor beside seat. Perform 30 reps at 3 sets.

**ABDOMINAL CRUNCHES**

Lying on back with knees bent, feet flat on the floor and hands resting behind head.

Suck stomach in to curl body up until shoulder blades are off floor.

Keep stomach sucked in as you lower back down.

Keep chin in neutral, elbow back and do not pull on head.

SETS	3
REPS	15-20
WEIGHT	
HOLD	4-10 sec
REST	30-45sec
5 x/week	



PLANK - TOES TOGETHER

Support body in a plank position with forearms shoulder width apart and feet together.

Keep a straight line through the knee, hip and shoulder.

Maintain contraction of the transverse abdominal. (Suck abs in against gravity)

SETS	2-3
REPS	8-12
WEIGHT	
HOLD	10-30 sec
REST	30-45sec
5 x/week	



1/2 SIDE BRIDGE

Lying on one side with knees bent keeping knees, hip and shoulder in line.

Support upper body on forearm, placing elbow directly under shoulder.

Raise hip up off floor. Avoid rotating forward or backward.

SETS	2-3
REPS	8-12
WEIGHT	
HOLD	10-30 sec
REST	30-45sec
5 x/week	



SIDE BRIDGE - FOREARM

Lying on one side with legs out straight (feet staggered) keeping, hip and shoulder in line.

Support upper body on forearm, placing elbow directly under shoulder.

Raise hip up off floor. Avoid rotating forward or backward.

SETS	2-3
REPS	8-12
WEIGHT	
HOLD	10-30 sec
REST	30-45sec
5 x/week	

