

FITNESS AND RECRUITMENT



Guidance Pack

Physically Preparing for the
Recruitment and Selection Process



central and south of scotland joint
firefighter recruitment
board



General Exercise Guidance

The advice outlined in this pack constitutes generic fitness advice. Fitness training and the adaptations occurring in response to training are highly specific to the individual. However, the information outlined here provides an overview of the type of preparation necessary to meet the demands encountered during the fitness and practical selection tests.

The role of a Firefighter is physically demanding. Firefighting tasks place demands on cardiovascular fitness (CV), muscular strength, muscular endurance, speed, power and agility to name a few. It is evident that good all-round fitness will ensure that physical work can be carried out efficiently, minimising risk of injury and the onset of fatigue.

It is essential that physical preparation is carried out prior to your involvement in the selection process.

If you are in any doubt regarding your health or physical ability to exercise, consult your doctor before you commence physical activity. This is especially important if you are pregnant (or think you may be), have not exercised for the last 6 months or had a recent illness or injury. It is important to warm up before commencing any exercise. It is also important to wear appropriate clothing and footwear. Do not train if you are injured or unwell.

Preparing for Exercise

Warm Up

Before commencing any training session, you should begin with a warm up. This will prepare the muscles you are about to use during your session. You should allocate around 10 minutes for the warm up activity – below are some general steps to consider:

Be specific: Make sure your warm up activity is relevant to the activity you are about to perform. For example, if you are about to undertake a running session, you should commence with a jog. If you are about to undertake a weight training session, you should focus on the joints and muscles involved in the resistance exercise.

Build up your warm up progressively: At the start of your session your muscles may be relatively cold. When you undertake your warm up you should start slowly and build the intensity progressively. This will increase muscle temperature progressively and help prevent injury occurring.

Stretch/mobility: For many years it was thought that performing static stretches prior to exercise would prevent injury. However, more recent research suggests that this may not prevent muscle or tendon injury. It is now suggested that any form of mobility or stretching activity should be performed following a warm up period or an exercise session.

Improving Your Fitness

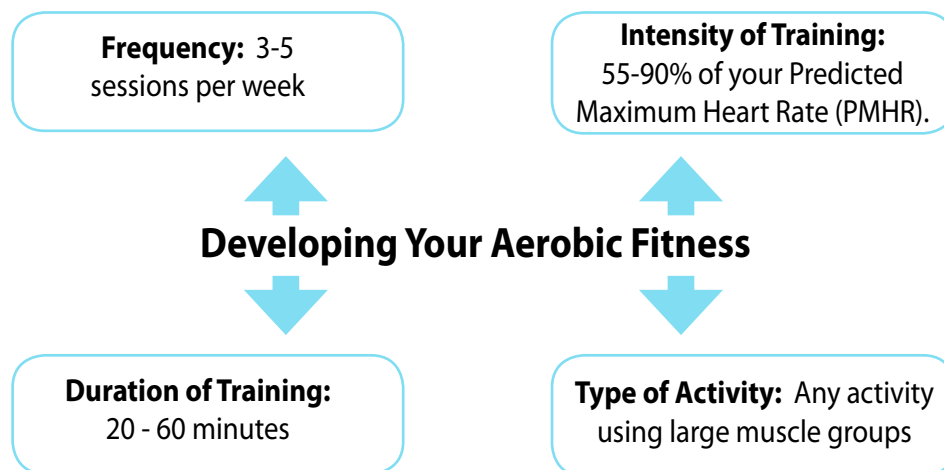
Engaging in a fitness programme will require self discipline and a commitment to manage your time effectively so that adequate time can be set aside for training. Exercise sessions have to be completed on a regular basis and performed in a structured way. Later in this guide you will find an example of an 12 week training programme.

In order to improve your fitness over time it is essential to alter the frequency, intensity and duration of your exercise. Your training should be gradual and progressive. The intensity of your training should build over time. Altering the intensity of your exercise at regular stages within your training programme is essential as this will produce the fitness gains as a result of the increasing demands being placed on your body.

The following training programme will provide guidance on improving all round fitness. This will include aerobic, resistance and flexibility development. Each type of training will be discussed in more detail below.

Aerobic Training

The amount of improvement achieved will be dependant on your current aerobic fitness standard. The following guidelines should improve your aerobic fitness.



Frequency: 3-5 sessions per week

Intensity: 55-90% of your Predicted Maximum Heart Rate (PMHR).

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$220 - \text{your age} = \text{your Predicted Maximum Heart Rate (PMHR)}$

$\text{PMHR} \times 0.5 = 50\% \text{ PMHR}$

$\text{PMHR} \times 0.6 = 60\% \text{ PMHR}$

$\text{PMHR} \times 0.7 = 70\% \text{ PMHR}$

$\text{PMHR} \times 0.8 = 80\% \text{ PMHR}$

$\text{PMHR} \times 0.9 = 90\% \text{ PMHR}$

Aerobic Training

If you don't have access to a heart rate monitor you can use another method of monitoring your exercise intensity. This is known as your Rate of Perceived Effort (RPE) scale, adapted from the work of Borg (1998). To use this method you have to self evaluate your exercise intensity using the following scale:

Level	'How should the exercise feel?'	Estimated Heart Rate (Beats/Min)	% Maximum Heart Rate
6	rest	< 100	< 50
7	very, very light		
8			
9	very light	100 - 120	50 - 60
10			
11	fairly light		
12		120 - 150	60 - 75
13	moderate		
14			
15	hard	150 - 170	75 - 85
16			
17	very hard	170 - 199	85 - 99
18			
19	very, very hard		
20	exhaustion	200	100

Duration: 20 – 60 minutes of continuous or intermittent aerobic activity. The duration is dependant on the intensity of the activity. If you are exercising at a higher intensity you should train for at least 20 minutes. If you are exercising at a lower intensity you should train for at least 30 minutes.

Type of activity: Any activity that uses larger muscle groups which are continuous and rhythmical in nature, e.g. running-jogging, cycling, rowing, swimming, stair climbing, aerobic dance/group exercise, cross-country skiing, skipping etc.

However, in order to maximise the efficiency of your training you should focus on exercises that are similar to those in the entry tests. These include running/jogging, stepping/stair climbing and other weight bearing activities.

Resistance Training

Resistance training is designed to improve your strength and/or muscular endurance. The resistance can be your own body weight or you can use specific items of equipment such as dumbbells, barbells, or resistance machines.

Selecting the correct exercise intensity for muscular strength and endurance training is usually achieved by counting the number of repetitions that you are able to perform of a particular exercise. For example, if you can bench press a 30kg bar, 12 times using good technique and without fatigue, then this weight would be known as your 12-repetition maximum (12-RM). Most muscular strength and resistance training sessions use this technique to set the correct exercise intensity. Remember that each exercise will have a specific load particular to that exercise. This is initially determined by trial and error, but it is recommended that you always start with a light load, and gradually increase the weight until you find your particular RM for each exercise. It is a good idea to keep a note of your RM's for each exercise as they will increase as you become stronger.

The following group of exercises follow a whole body approach, whereby all major muscles are targeted. A suggested outline describing the frequency of sessions and the ratio of sets and repetitions are detailed in the 12 week programme.

Safety

It is essential that you consider your own safety whilst undertaking free weights resistance training. If you are a beginner it is advised that you use fixed resistance machines only/and exercises where your own body weight provides the resistance. If you are competent in the use of free weights it is advised that you work with a partner and 'spot' on all relevant exercises.

Bench Press



Start Position: Lie flat on the bench and lift the bar or handles so that your arms are straight and in line with your chest. You should keep your feet flat on the floor unless you have lower back problems.

Action: Breathing in and keeping your elbows below your hands, slowly lower the weight to the chest. Breathe out as you push the bar in a controlled motion back to the start position.

Seated Row



Start Position: Sit with your back straight, chest out, holding the pulley, with your legs slightly bent and feet against the brace.

Action: Maintaining this position, take a deep breath then as you breathe out pull the bar into your stomach keeping your elbows in. Breathe in as you slowly return to the start position.

Shoulder Press



Start Position: You can sit or stand, which ever you find most comfortable. Hold the barbell or dumbbells with an over hand grip and start with them at shoulder height.

Action: Keeping your back straight and your chest up breathe in then breathe out as you push the weight up until your arms are straight but not locked out. Breathe in as you slowly return to the starting position.

Lateral Pull Down



Start Position: Facing the machine take hold of the bar with a wide grip. Sit on the seat provided (or available box or kneel) keep your back straight and your chest up.

Action: Take a deep breath then breathing out pull the bar down in front of your face to the top of your chest. Then slowly return to the start position. Your body should not move or swing as you pull the weight.

Squat



Start Position: Using a squat rack if possible choose the required weight. Step under the bar and place the bar over your shoulders making sure it is on the soft muscle and not the bone. Your feet should be facing forwards and just over shoulder width apart.

Action: Take a deep breath in and slowly bend your knees and squat down. You should keep your back straight (not upright) by keeping your head and chest up. By maintaining a flat back you will avoid back injury. Squat down until you legs are parallel to the floor, making sure your knees are still over your feet. If your knees are passed your toes this puts extra strain on the knee. Then push back to the starting position quickly as you breathe out.

Lunge



Start Position: This can be done with dumbbells, a bar or without weight. Start in a standing position.

Action: Take a breath in and then take a large step forward bending the leading leg. You should keep your back straight and your leading knee over the ankle. Bend your knee until your trailing knee touches or almost touches the ground. Then as you breathe out, push off the leading leg back to the start position. Repeat for the opposite leg.

Abdominal Crunch



Start Position: Lie face up on a soft surface, bend knees and bring feet close to the buttocks. Fold your arms across your chest, or place the hand lightly behind the head.

Action: Draw your belly button towards your spine by contracting your lower abdominal muscles. Whilst holding this contraction with normal breathing, slowly raise your shoulders towards your thighs while keeping the lower back on the floor.

Back Extension



Start Position: Lie on your stomach on a soft surface. Place your arms at your sides so that your hands are by your hips.

Action: Raise your head and shoulders off the floor as high as comfortably possible. Hold for 1-2 seconds. Lower the head and shoulders.

Flexibility

A selection of the following stretches can be used as part of your warm up and cool down routines or they can be performed as part of a separate flexibility session. This type of training is designed to maintain or improve your range of motion. It should be noted that any stretches should only be performed following a warm up consisting of at least 4 minutes aerobic activity.

It is very important that you avoid stretching to the point of pain. You should ease gently into each stretch and hold it for 10 – 30 seconds, repeating each stretch twice. You should hold each stretch statically, i.e. do not bounce. This can greatly reduce the effectiveness of the stretch.

Lateral Head Tilt Stretch (Side and back of neck)



Stand with feet shoulder width apart and knees slightly bent

With arms by your sides, slowly move your right ear towards your right shoulder whilst gently moving your left shoulder away from your left ear

Hold this position once you feel mild tension in the left side of your neck and shoulder

Return to starting position and repeat on other side

Arm Pull Back (Shoulders and Chest)



Stand with feet shoulder width apart and knees slightly bent

Expand your chest and pull shoulders back by squeezing shoulder blades together

Hold your hands behind your back and slowly straighten arms as you lift your hands upwards

Hold this position once you feel mild tension in the shoulder/chest area and then slowly release

Overhead Tricep/Shoulder Stretch (Back of Shoulder and Tricep)



Stand with feet shoulder width apart and knees slightly bent

Lift one arm overhead, bend elbow and reach hand towards the opposite shoulder blade

Hold flexed elbow with your opposite arm to assist stretch by gently pulling on the bent elbow

Hold this position once you feel mild tension in the back of the shoulder and tricep then slowly release and repeat with opposite arm

Arm Across Shoulder Stretch (Back of Shoulder, Tricep and Upper Back)



Stand with feet shoulder width apart and knees slightly bent

Bring one arm parallel with the ground across your chest

Gently pull the elbow further across with your other arm

Hold this position once you feel mild tension in the shoulder, triceps and upper back then slowly release and repeat with opposite arm

Quad/Hip Flexor stretch (Quadriceps and Hip Flexors)



Stand close to a wall or solid object and assist your balance with one hand

With your inner thighs close together bend one knee and gently pull your heel towards your buttocks

Hold this position when you feel mild tension in the quadriceps then slowly release and repeat with opposite leg

To emphasise the hip flexor, repeat as above but gently push the hip slightly further forward by tightening the buttocks until you feel mild tension in front of the hip

Standing Hip Flexor Stretch (Hip Flexors and Quadriceps)



Kneel on the ground with one leg forward and one leg back and hands on hips

Ensure that your head, shoulders and hips are aligned over one another and keep your chest lifted by gently pulling your shoulder blades together

Push your hips forward without changing foot position

Hold this position when you feel mild tension in front of the hip then slowly release and repeat with opposite leg

Standing Hamstring Stretch (Hamstrings)



Extend one leg out in front ensuring that the bottom of your foot remains on the ground

Bend your back knee and place your hands on the front of the thigh

Lean forward slightly (ensure that you hinge from your hip and keep your back straight rather than rounding your spine)

Hold this position when you feel mild tension in the hamstring then slowly release and repeat with opposite leg

Seated Hamstring Stretch (Hamstrings)



Extend one leg out in front whilst placing opposite foot flat against the inner thigh

Lean forward slightly and slide both hands down the front of your extended leg whilst keeping your arms straight (ensure that you hinge from your hip and keep your back straight rather than rounding your spine)

Hold this position when you feel mild tension in the hamstring then slowly release and repeat with opposite leg

Standing Calf Stretch (Calves)



Stand with one leg in front of the other and place hands at shoulder height against a wall

Bring your back leg further away from the wall ensuring that you keep it straight

Ensure your heel is on the floor and foot is pointing straight ahead then gently push your hips forward

Hold this position when you feel mild tension in the calf muscle then slowly release and repeat with the opposite leg

Standing Achilles Tendon Stretch (Achilles Tendon)



Stand with feet hip width apart

Position one foot slightly ahead of the other ensuring that both feet are pointing straight ahead and both heels remain on the ground

Lower your weight on to your back foot by bending your knee and leaning forward from your ankle

Hold this position when you feel mild tension in the Achilles tendon area then slowly release and repeat with the opposite leg

Inner Thigh Stretch (Inner Thighs)



Stand with feet wide apart and with your toes pointing forward

Slowly bend one knee whilst keeping your body facing forward and your other leg straight and support your hands on the bent leg

Hold this position when you feel the stretch in the inner thigh of straight leg and then move back to the starting position

Repeat on the opposite leg

Seated Gluteal Stretch (Buttocks)



Sit with one leg extended and the other leg bent and crossed over thigh

Place your arms around the knee and gently pull it towards the opposite shoulder

Hold this position when you feel the mild tension in the buttock area then slowly release and repeat on the opposite side

Back Curl Stretch (Abdominals)



Kneel on all fours with your hands below your shoulders and knees below hips

Keep your neck straight and gently pull your shoulder blades together

Tighten your lower back muscles and arch your lower back (think about pushing your belly button towards the floor)

Hold this position and then return to the starting position

Back Arch Stretch (Lumbar Region)



Kneel on all fours with your hands below your shoulders and knees below hips

Gently pull your shoulder blades together whilst tightening your abdominals and rolling your hips under you

Hold this position and then return to the starting position

12 Week Fitness Programme

The following 12 week training programme is an example of how you could plan your training schedule. As you will notice you are required to complete 3 running sessions, 2 resistance sessions and 2 flexibility sessions each week. The programme incorporates the principles of frequency, duration and intensity; this means the sessions become progressively harder. It is recommended that you do not perform the same type of session on consecutive days. You could use the following layout as a guide;

Day 1 steady run & flexibility

Day 2 resistance

Day 3 fartlek

Day 4 rest

Day 5 steady run & flexibility

Day 6 resistance

Day 7 rest

Below is an explanation of the sessions included in the 12 week programme:

Steady Pace Running

This session should be performed at a comfortable pace. You can increase the pace as you work your way through the programme, however you should maintain a steady pace during any given session. This type of exercise is designed to develop you aerobic fitness. This is included 2 times per week

Fartlek Running

This term is derived from the word 'speedplay'. This type of running involves changing the pace throughout the session. Basically you should include periods of faster running throughout the session. You could include a mixture of steady jogging, faster jogging, sprinting, walking, up hill running etc. The objective of the session is to work continuously for around 20 minutes using the various types of running suggested above. It is important that you do not go straight into any form of faster pace running in the first 5 minutes. This session is designed to develop you aerobic and anaerobic fitness.

As you can see both of the above sessions are based around the activity of running as this will best prepare you for the fitness test used in the selection process, i.e. The Multistage Shuttle Run Test. This accounts for the training principle of specificity. However, other forms of aerobic exercise will still be beneficial.

Resistance Training

These sessions will target all the major muscle groups and will help improve you muscular strength and endurance.

Flexibility Training

This type of session is designed to maintain or improve your range of motion. These exercises may also reduce the likelihood of injury, reduce muscle soreness following exercise and may enhance muscular performance.

It is important you have read and understood the programme before commencing your training.

12 Week Programme

The following is a suggested programme and can be altered or changed to accommodate different needs and time availability.

Week	Sessions	Duration	Intensity	Times/week
Week 1	Steady pace run	20 Mins	RPE 12-16 or 60-85% HR max	2
	Resistance Training	1 Set	15-20 RM	1
	Fartlek			0
	Flexibility	10-30 sec/stretch	Stretch to point of discomfort	2
Week 2	Steady pace run	20 Mins	RPE 12-16 or 60-85% HR max	2
	Resistance Training	1 Set	15-20 RM	1
	Fartlek			0
	Flexibility	10-30 sec/stretch	Stretch to point of discomfort	2
Week 3	Steady pace run	20 Mins	RPE 12-16 or 60-85% HR max	2
	Resistance Training	1 Set	15-20 RM	1
	Fartlek			0
	Flexibility	10-30 sec/stretch	Stretch to point of discomfort	2
Week 4	Steady pace run	20 Mins	RPE 12-16 or 60-85% HR max	2
	Resistance Training	1 Set	15-20 RM	1
	Fartlek			0
	Flexibility	10-30 sec/stretch	Stretch to point of discomfort	2
Week 5	Steady pace run	20-25 Mins	RPE 12-16 or 60-85% HR max	2
	Resistance Training	1 Set	6-12 RM	2
	Fartlek	20 Mins	RPE 14-16 or 75-85% HRmax	1
	Flexibility	10-30 sec/stretch	Stretch to point of discomfort	2
Week 6	Steady pace run	20-25 Mins	RPE 12-16 or 60-85% HR max	2
	Resistance Training	2 Sets	6-12 RM	2
	Fartlek	20 Mins	RPE 14-16 or 75-85% HRmax	1
	Flexibility	10-30 sec/stretch	Stretch to point of discomfort	2
Week 7	Steady pace run	25 Mins	RPE 14-18 or 70-90% HR max	2
	Resistance Training	2 Sets	6-12 RM	2
	Fartlek	25 Mins	RPE 16-18 or 70-90% HRmax	1
	Flexibility	10-30 sec/stretch	Stretch to point of discomfort	2
Week 8	Steady pace run	25 Mins	RPE 14-18 or 70-90% HR max	2
	Resistance Training	2 Sets	6-12 RM	2
	Fartlek	25 Mins	RPE 16-18 or 70-90% HRmax	1
	Flexibility	10-30 sec/stretch	Stretch to point of discomfort	2
Week 9	Steady pace run	25 Mins	RPE 14-18 or 70-90% HR max	2
	Resistance Training	2 Sets	12-15 RM	2
	Fartlek	25 Mins	RPE 16-18 or 70-90% HRmax	1
	Flexibility	10-30 sec/stretch	Stretch to point of discomfort	2
Week 10	Steady pace run	25 Mins	RPE 14-18 or 70-90% HR max	2
	Resistance Training	2 sets	6-12 RM	2
	Fartlek	25-30 Mins	RPE 16-18 or 70-90% HRmax	1
	Flexibility	10-30 sec/stretch	Stretch to point of discomfort	2
Week 11	Steady pace run	25-30 Mins	RPE 14-18 or 70-90% HR max	2
	Resistance Training	2 Sets	12-15 RM	2
	Fartlek	25-30 Mins	RPE 16-18 or 70-90% HRmax	1
	Flexibility	10-30 sec/stretch	Stretch to point of discomfort	2
Week 12	Steady pace run	25-30 Mins	RPE 14-18 or 70-90% HR max	2
	Resistance Training	2 Sets	6-12 RM	2
	Fartlek	25-30 Mins	RPE 16-18 or 70-90% HRmax	1