

Weight Training

How do we get stronger?

A muscle will only strengthen when forced to operate beyond its customary intensity (overload). Overload can be progressed by increasing the:

- resistance e.g. adding 10kg to the barbell
- number of repetitions with a particular weight
- number of sets of the exercise

How Much?

The amount of weight to be used should be based on a percentage of the maximum amount of weight that can be lifted one time, generally referred to as one repetition maximum (1RM). The maximum number of repetitions performed before fatigue prohibits the completion of an additional repetition is a function of the weight used, referred to as repetition maximum (RM), and reflects the intensity of the exercise. A weight load that produces fatigue on the third repetition is termed a three repetition maximum (3RM) and corresponds to approximately 95% of the weight that could be lifted for 1RM.

For maximum results athletes should train according to their genetic predisposition. An athlete with a greater proportion of slow twitch muscles would adapt better to endurance training and a muscular endurance program using more repetitions of a lighter weight. An athlete with a greater proportion of fast twitch muscles would benefit from sprint training and a muscular strength program using fewer repetitions of a heavier weight.

- 1RM to 3RM - neuromuscular strength
- 4RM to 6RM - maximum strength by stimulating muscle hypertrophy
- 6RM to 12RM - muscle size (hypertrophy) with moderate gains in strength (Fleck & Kraemer, 1996)
- **12RM to 20RM - muscle size and endurance (target for most people looking to improve general fitness)—all MDH students will train at this number of repetitions.**

Rest Interval between sets

The aim of the recovery period between sets is to replenish the stores of ATP (Energy) and Creatine Phosphate (CP) in the muscles. An inadequate recovery means more reliance on the Lactic Acid (LA) energy pathway in the next set. It is the build up of this Lactic Acid that causes cramps and muscle soreness. Several factors influence the recovery period, including:

- Type of strength you are developing
- The load used in the exercise
- Number of muscle groups used in the exercise
- Your condition
- Your weight

A recovery of three to five minutes or longer will allow almost the complete restoration of ATP/CP.

Due to the load/intensity that you will be working with most of your workouts will require 1-2 min. of rest between sets. If in doubt more rest is better.

Rest Interval between sessions

You should always allow your body to recover from the previous session. Therefore aim to follow a training session with a rest day. The rest day should not be totally free from exercise – active rest is better. On rest days keep active – go for a walk, swim or gentle cycle. This will result in less muscle soreness and aid the recovery process.

What sort of weight lifting equipment?

There are variable resistance machines and free weights. Variable resistance machines are effective tools for building strength and muscle tone and are designed to work the target muscle in isolation, without the assistance of the surrounding muscles. Free weights (barbells, dumbbells and machines that provide the same equal resistance to a muscle) allow you not only to target a particular muscle group but also to engage other muscles that assist in the work. Once they are conditioned, these assisting muscles help you to increase the weight you use in training the target muscles in order to stimulate the most growth in muscle fibres. The assisting muscles help stabilize the body, support limbs and maintain posture during a lift. Lifting free weights improves your coordination by improving the neuromuscular pathways that connect your muscles to the central nervous system.

Training Systems

Simple Sets: e.g. 3 x 15 with 70% - meaning three sets of fifteen repetitions with a weight of 70% of maximum for one repetition. This is the system that all novice lifters should work on, because the high number of repetitions enables the lifter to learn correct technique, and thereby reduce the risk of injury.

Pyramid System: Here the load is increased and the repetitions are reduced (e.g. 100kg x 10, 120kg x 5, 130kg x 4, 140kg x 3, 150kg x 2, 160kg x 1). Pyramid lifting is only for experienced lifters who have an established good technique.

Super Setting This consists of performing two or three exercises continuously, without rest in between sets, until all exercises have been performed. The normal 'between sets' rest is taken before the next circuit of exercises is commenced. This is also for experienced lifters only.

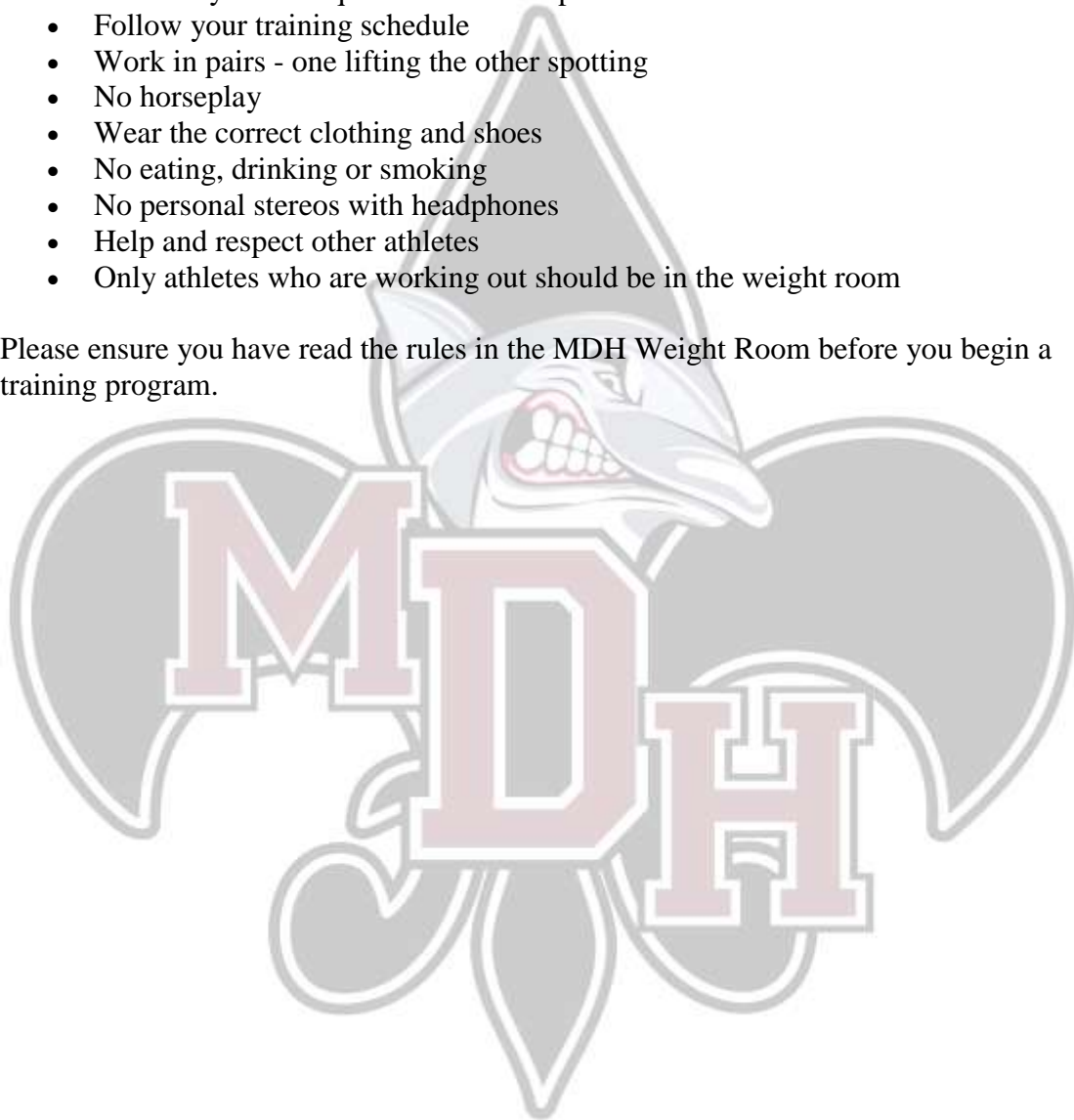
Circuit Training: Performing 1 set of each exercise in succession. Resting, and then repeating the same exercises.

Safety in the Weight Room

Strength training is safe when properly supervised and controlled. Every weight room should have a set of rules and regulations pertaining to safety and they should be on public display. Rules may vary from one weight room to another but some very basic rules apply to them all:

- Train only when a qualified coach is present
- Follow your training schedule
- Work in pairs - one lifting the other spotting
- No horseplay
- Wear the correct clothing and shoes
- No eating, drinking or smoking
- No personal stereos with headphones
- Help and respect other athletes
- Only athletes who are working out should be in the weight room

Please ensure you have read the rules in the MDH Weight Room before you begin a training program.



Total fitness in 3 hours per week

For a tiny percentage of your available time, even the busiest person can reach a high level of fitness with the following plan.

Busy, busy, busy?

Symptomatic of our current society, almost everyone these days is busy, busy, busy. Finding time for fitness whilst juggling work, school, sports, domestic and family commitments becomes an increasingly difficult task as demands on your time come from every angle. Furthermore, the current guidelines for recommended levels of weekly physical activity compound the problem, making it seem impossible to fit in all the exercise necessary for optimum all-round fitness. For example:

Recommended exercise levels for a healthy adult

Cardiovascular (CV) exercise, (training the heart and lungs): three to five, 20-40 minute sessions per week.

Resistance training: Two to five sessions per week, exercising all the main muscle groups of the body.

Flexibility exercises: Stretching all the main muscle groups is essential to reduce risk of injury, maintain postural alignment and full muscle function. This should be done from four to seven days a week.

Core training: Integral component in any balanced fitness programme. This involves working the abdominal muscles. This should be the focus of every workout.

Add to this travelling to gyms, changing and showering etc, it's no surprise that many people struggle to commit to a regular fitness routine and feel that it is impossible to make sufficient time to keep fit. However the MDH Weight Room is available at lunch, before and after school. It can be utilised to save time and get fit.

The hectic schedule fitness solution

With careful planning, it is actually possible to reach and maintain a high level of all-round fitness with just 3 one-hour training sessions per week. The key is to combine cardiovascular and resistance training with the other disciplines so that you maximise your time and gains each session. A typical training week can be seen below.

Day	Training	Notes
Mon	Gym training session (1 hour total)	<i>Quality combination of strength and conditioning, CV, core and flexibility session</i>
Tues	Rest day	<i>Active Recovery from Tuesday's session</i>
Wed	Gym training session (1 hour total)	<i>Quality combination of strength and conditioning, CV, core and flexibility session</i>
Thurs	Rest day	<i>Active Recovery from Wednesday's session</i>
Fri	Gym training session (1 hour total)	<i>Quality combination of strength and conditioning, CV, core and flexibility session</i>
Sat	Rest day	<i>Recovery from Friday's session</i>
Sun	Any aerobic activity to increase the heart rate 20-60min.	<i>Dedicated CV session away from the gym</i>

Rest days

The most important part of any fitness program is when you are not training, i.e.: rest days. Rest days are essential in allowing your body to rebuild following the demands that you have placed on it during training. Missing rest days can lead to:

- Fatigue build-up
- Overtraining
- Illness
- Injury
- Loss of motivation
- reduced fitness gains and reduced progression

Sample training programme

- 5 mins warm up – any CV machine followed by stretches
- 20 mins CV work.
- 30 min.- 4 weight resistance exercise (eg. 2 upper body, 2 lower body) 3 x 15 reps
- 5 mins cool down followed by stretches.

This entire session will take no more than one hour, including set-up time between exercises. For added variety, substitute different exercises each time you train and different CV training (running, rowing, X-trainer etc), throughout the session.

CV training session

- Carry out a light warm-up for a minimum of five minutes, ideally carrying out the same activity as your main session. You can either use a combination of exercises such as jogging and walking, or rowing and cross-training, or one continuous exercise such as cycling or swimming. Either way, you need to gradually build up your endurance until you can train continuously for 45 minutes.
- Cool down with some lower-intensity CV, ideally the same discipline. For example, if you have been jogging, walk for five minutes. Or, if you have been swimming front crawl, relax with a few minutes of breaststroke.
- Finish your session by stretching the main muscle groups employed

This programme takes less than 2% of your week, yet is completely balanced to exercise your entire body. Therefore there is no excuse for not exercising and visiting the gym.