



PAF30-PAF40

PERSONAL FITNESS

## **WEIGHT ROOM RULES**

- Do not use equipment without supervision
- No food or drink permitted in this area
- No jewelry
- Proper athletic attire required
- Collars must be used with all free weights
- Weights must be placed on racks after use

## **WEIGHT ROOM RULES**

- No horseplay
- No jewelry
- No food, drink or gum
- No loitering
- No personal electronics
- Proper athletic attire required
- Always use a spotter
- Do not put weights or bar on benches
- Rack your weights before leaving

# SAFETY CONSIDERATIONS



## PROCEDURES

- PAR-Q should first be filled out by each participant.
- Policies and procedures should be clearly understood by ALL students.
- Appropriate clothing and footwear should be worn during workouts. T-shirts, shorts, tights and athletic shoes.
- NO running or misbehaviour in the weight room.
- Proper procedures should be followed for all exercises and equipment.
- “SPOTTING” should be taught and practiced by all students, especially when using free weights.
- If you are unsure of a piece of equipment or exercise ask the teacher for proper instruction.

# SAFETY CONSIDERATIONS



## EXERCISE TECHNIQUE

- Perform a proper warm-up before, and a cool-down after each workout.
- Make sure to keep your back flat on the bench for all supine (lying down) exercises.
- When performing exercises in a standing position, always keep a strong base of support and keep your knees slightly bent.
- Breathe regularly - exhale as you lift or push the weight, inhale when you lower the weight.
- Concentrate on what you are doing: “ALWAYS” lift in a controlled fashion.
- Work from larger muscle groups to smaller ones throughout your workout.
- Never forcefully “LOCK” out a joint (ie. during leg extensions)
- Use a full range of motion with each exercise.
- Stretch before and after each workout.
- Don’t lift more weight that you can control.

# SAFETY CONSIDERATIONS



## GUIDELINES AND PRECAUTIONS

- Use slow, smooth, controlled, **NON-BOUNCY** movements; control the momentum of all your movements so that you can prevent injury.
- Use a **FULL RANGE OF MOTION** to help develop the strength of the muscle throughout its contraction range and to maintain normal flexibility (don't "cheat" in your exercise movements).
- Breathe **RHYTHMICALLY** during weight lifting, exhaling when lifting or pushing and inhaling on the lowering phase.
- **CONCENTRATE** during all exercises, focussing on doing the movement correctly.
- Keep your knees slightly bent for **ALL** standing exercises.
- Make sure you maintain a **NEUTRAL BACK POSITION** during the lifts (erect posture with normal slight curvature in the lower back).
- Lift weights to build strength, not demonstrate it!!!

# SAFETY CONSIDERATIONS



## SPOTTING TIPS

- The spotter should establish a solid base of support with proper posture.
- When spotting overhead or back-racked exercises, stand behind the lifter and assist in bar stability throughout the movement.
- When spotting over-the-face barbell exercises, the spotter should use an alternate grip to pick up the bar, but supinated grip to spot the bar.
- For dumbbell exercises, spot as close to the dumbbells as possible or actually spot the dumbbell itself.
- Always make sure that you help the lifter secure the weight back to the starting position.

# SAFETY CONSIDERATIONS



## COMMUNICATION

- THE LIFTER SHOULD ALWAYS TELL THE SPOTTER HOW THE BAR WILL BE HANDLED, AND HOW MANY REPETITIONS THEY ARE AIMING FOR.
- ALWAYS TELL THE SPOTTER WHEN YOU ARE STARTING AND WHEN YOU ARE HAVING TROUBLE WITH THE LIFT.

# SAFETY CONSIDERATIONS

[GUIDELINES](#) | [PROCEDURES](#) | [TECHNIQUES](#) | [PRECAUTIONS](#) | [SPOTTING](#)

## PROCEDURES

- PAR-Q should first be filled out by each participant.
- Policies and procedures should be clearly understood by ALL students.
- Appropriate clothing and footwear should be worn during workouts. T-shirts, shorts, tights and athletic shoes.
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- Proper procedures should be followed for all exercises and equipment.
- "SPOTTING" should be taught and practiced by all students, especially when using free weights.
- If you are unsure of a piece of equipment or exercise ask the teacher for proper instruction.

## EXERCISE TECHNIQUE

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- Concentrate on what you are doing: "ALWAYS" lift in a controlled fashion.
- Work from larger muscle groups to smaller ones throughout your workout.
- Never forcefully "LOCK" out a joint (ie. during leg extensions)
- Use a full range of motion with each exercise.
- Stretch before and after each workout.
- Don't lift more weight that you can control.

### WEIGHT ROOM RULES

1. DO NOT USE EQUIPMENT WITHOUT ADULT SUPERVISION.
2. NO FOOD/DRINK PERMITTED IN THIS AREA.
3. COLLARS MUST BE USED WITH ALL FREE WEIGHTS.
4. ALL WEIGHTS SHOULD BE NEATLY STACKED AFTER USE.

## STRENGTH TRAINING GUIDELINES and PRECAUTIONS

- Use slow, smooth, controlled, NON-BOUNCY movements; control the momentum of all your movements so that you can prevent injury.
- Use a FULL RANGE OF MOTION to help develop the strength of the muscle throughout its contraction range and to maintain normal flexibility (don't "cheat" in your exercise movements).
- Breathe RHYTHMICALLY during weight lifting, exhaling when lifting or pushing and inhaling on the lowering phase.
- CONCENTRATE during all exercises, focussing on doing the movement correctly.
- Keep your knees slightly bent for ALL standing exercises.
- Make sure you maintain a NEUTRAL BACK POSITION during the lifts (erect posture with normal slight curvature in the lower back).
- Lift weights to build strength, not demonstrate it!!!

## SPOTTING

A spotter is someone who assists the lifter in the execution of an exercise and helps ensure their safety.

### Spotting Tips

- The spotter should establish a solid base of support with proper posture.
- When spotting overhead or back-racked exercises, stand behind the lifter and assist in bar stability throughout the movement.
- When spotting over-the-face barbell exercises, the spotter should use an alternate grip to pick up the bar, but supinated grip to spot the bar.
- For dumbbell exercises, spot as close to the dumbbells as possible or actually spot the dumbbell itself.
- Always make sure that you help the lifter secure the weight back to the starting position.

### Communication

- The lifter should always tell the spotter how the bar will be handled, and how many repetitions they are aiming for.
- Always tell the spotter when you are starting and when you are having trouble with the lift.





# FITNESS TESTING AND BODY COMPOSITION ANALYSIS

## Why do we fitness test and measure body composition?

- Identify strengths and weaknesses
- Identify areas for improvement
- To monitor progress
- Give you a starting point for setting goals
- Talent identification/program placement
- Evaluate a Training Program
- To aid motivation



# STRENGTH TESTING

STRENGTH TESTING

STRENGTH TESTING SHEET:

Body Weight \_\_\_\_\_ lbs

TEST	WEIGHT	TEST 1 REPS	TEST 2 REPS	TEST 3 REPS
<b>BENCH PRESS</b> (75% of body weight)				
<b>LEG PRESS</b> (1.75% of body weight)				
<b>PULL-UPS</b> (full body weight)				
<b>DIPS</b> (full body weight)				

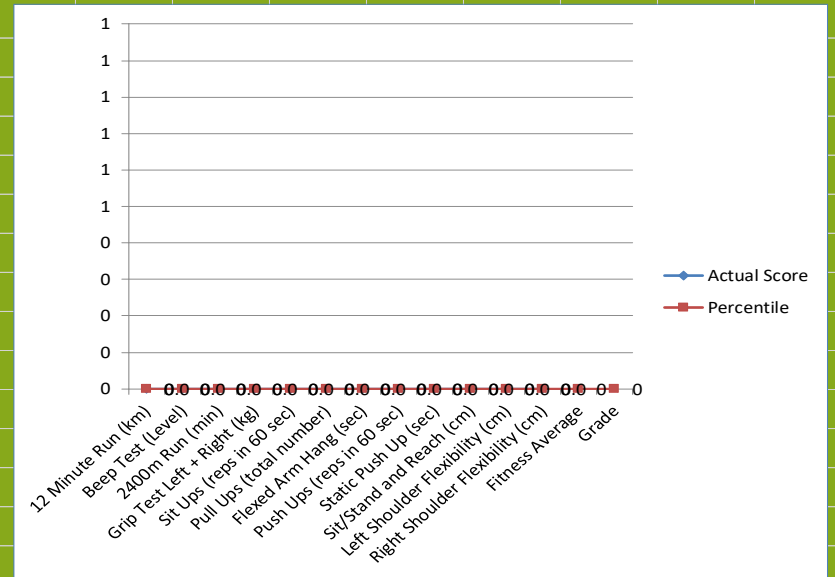
1. Calculate the amount of weight that you have to lift using the appropriate percentage of your body weight.
2. Write this number down so that you can use it for all your tests.
3. Try to lift as many reps as you can using proper form.
4. You can choose to do 3 additional tests that are not included on the sheet.



# FITNESS TESTING

RMC MALE FITNESS CALCULATOR		
Fitness Tests	Actual	Percentile
Name		
12 Minute Run (km)	0.00	N/A
Beep Test (Level)	0.00	N/A
2400m Run (min)	0.00	N/A
Grip Test Left + Right (kg)	0.00	N/A
Sit Ups (reps in 60 sec)	0.00	N/A
Pull Ups (total number)	0.00	N/A
Flexed Arm Hang (sec)	0.00	N/A
Push Ups (reps in 60 sec)	0.00	N/A
Static Push Up (sec)	0.00	N/A
Sit/Stand and Reach (cm)	0.00	N/A
Left Shoulder Flexibility (cm)	0.00	N/A
Right Shoulder Flexibility (cm)	0.00	N/A
Fitness Average		#DIV/0!
Grade		#DIV/0!

VIEW  
LOG  
CLEAR



# EXERCISE MYTHS

- “Weight training reduces body fat.”

There is only a moderate reduction in body fat solely due to weight training. Aerobic activities are more effective at reducing body fat.

- “Weight training can ..... take fat off specific body parts.”

Spot reduction is impossible. Fat stored near working muscles is not actually used; rather, fatty acids in the blood and fat droplets in muscles are utilized.

- “Aerobic fitness improves with weight training.”

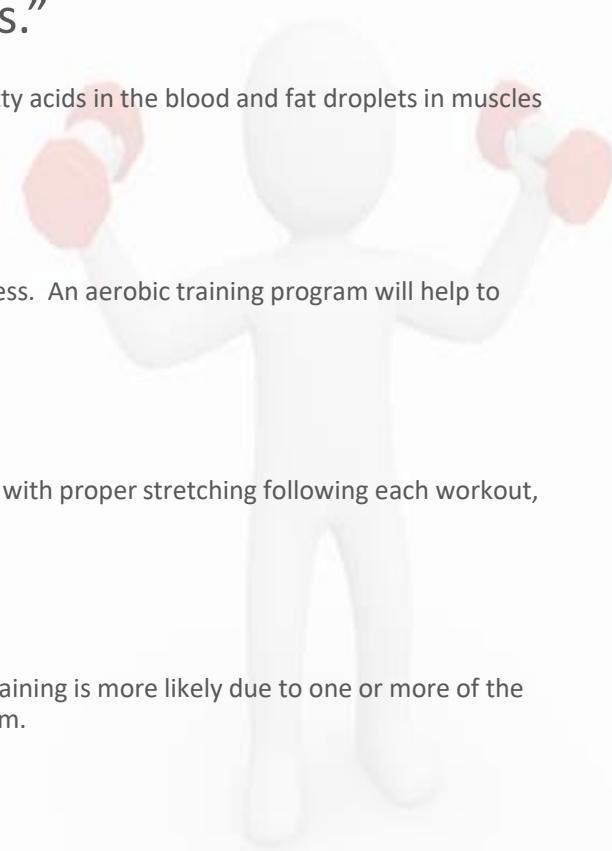
There is actually a low correlation between weight training and improvements in aerobic fitness. An aerobic training program will help to achieve this goal.

- “Weight training makes you muscle-bound.”

A weight training program that combines exercise done through a full range of motion, along with proper stretching following each workout, will in fact improve flexibility.

- “Muscle turns to fat if you stop training.”

One type of tissue cannot turn into another type of tissue; an increase in fat after a stop in training is more likely due to one or more of the following reasons: poorer eating habits, decrease in caloric expenditure, or slower metabolism.



## HOW DO MUSCLES GROW

MUSCLE  
HYPERTROPHY





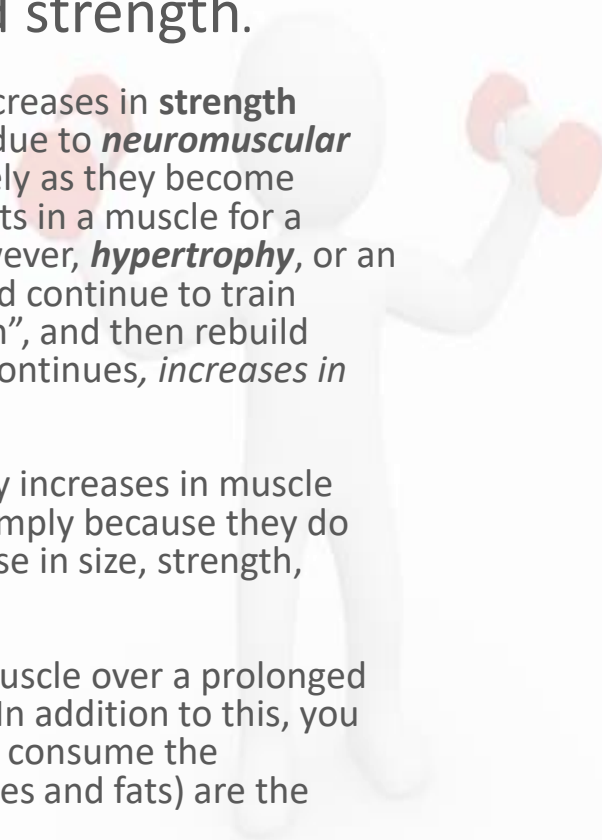
# EXERCISE TRUTHS

- “Progressive Overload Training”, which has you steadily increasing the **LOAD** (weight, frequency, intensity, recovery) you are using over a period of time, is the most effective way to increase fitness levels and strength.

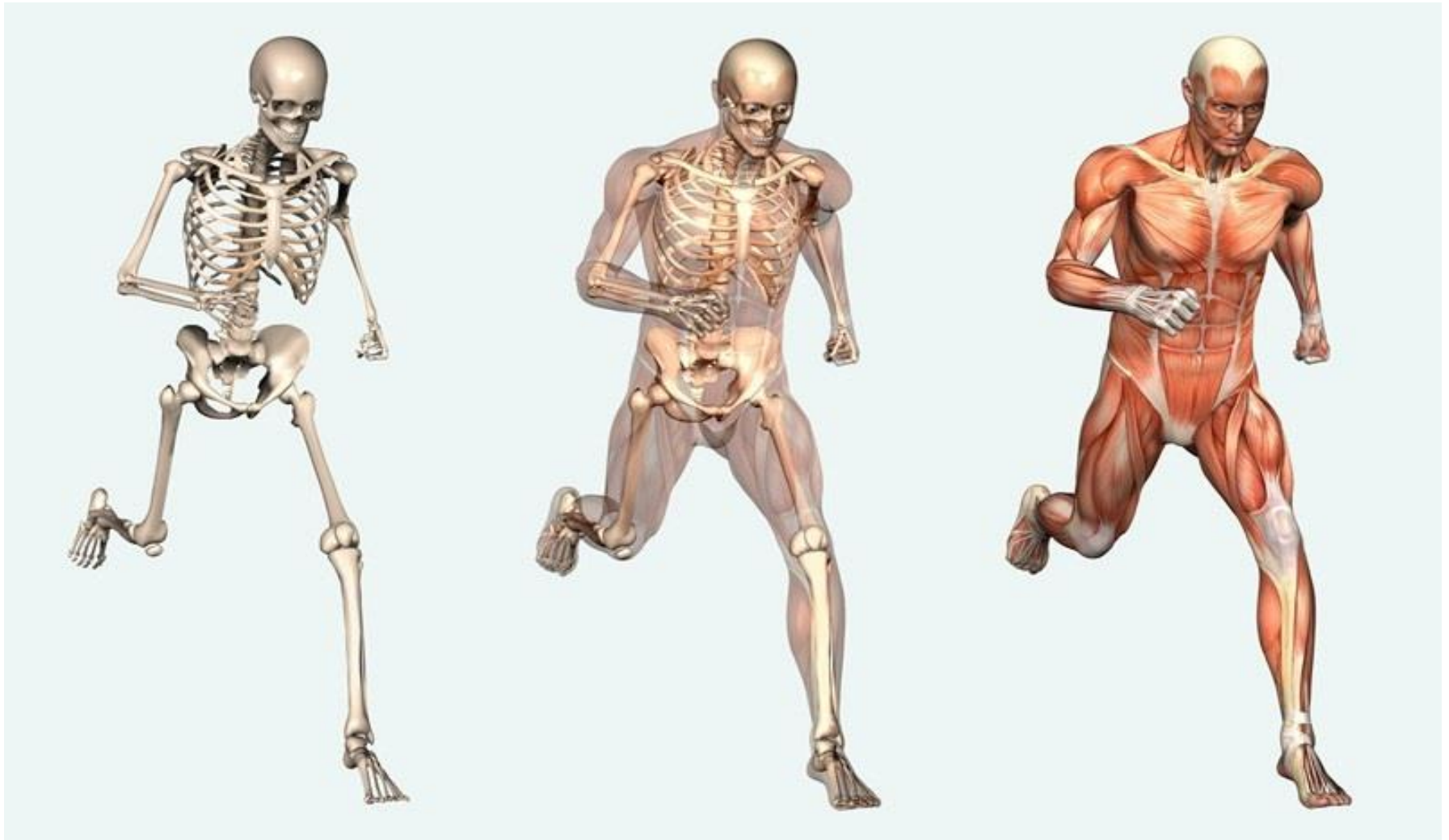
During the first several weeks of a training program, initial increases in **strength** (accompanied by the ability to lift progressively heavier weights) are due to **neuromuscular adaptations**. The brain, nerves and muscle coordinate more effectively as they become familiar with the movements; this enables you to use more motor units in a muscle for a particular movement, and you thus become more effective at it. However, **hypertrophy**, or an increase in muscle **size**, occurs after this adaptation, so be patient, and continue to train properly. During training, muscle tissues microscopically “break down”, and then rebuild themselves if appropriate nutrition and recovery is ensured. As this continues, *increases in muscle size will occur, typically with 4-6 weeks.*

A lot of regular, intense resistance training is required to obtain steady increases in muscle mass. Most people will not get as big as professional body builders simply because they do not have the genetics. You can realistically expect to see some increase in size, strength, muscle definition and flexibility as a result of training.

To reach your potential you need to apply a continuous load on the muscle over a prolonged period of time, that produces microscopic damage to the myofibrils. In addition to this, you need to provide 48-72 hrs for repair and recovery of the muscles, and consume the appropriate amount of nutrients. The nutrients (protein, carbohydrates and fats) are the building blocks for muscle growth.



# BODY COMPOSITION





# BODY COMPOSITION

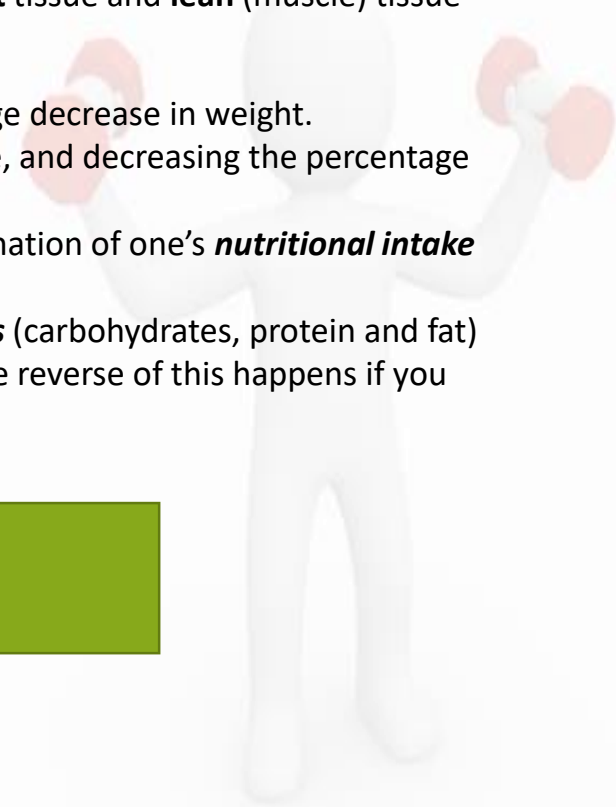
## Body Composition – defined:

Body Composition refers to the comparison between the body's amount of **fat** tissue and **lean** (muscle) tissue

- Improved body composition can make you appear trimmer without a huge decrease in weight.
- The focus should be on increasing the body's percentage of muscle tissue, and decreasing the percentage of fat tissue.
- While genetics play some role, body composition is a result of the combination of one's ***nutritional intake*** and ***daily routine of physical activity***.
- If you exercise regularly and consume a balanced diet of **Macro Nutrients** (carbohydrates, protein and fat) you should have a higher percentage of muscle tissue than fat tissue. The reverse of this happens if you maintain a sedentary lifestyle and do not eat a balanced diet.

Remember:

You cannot out train a poor diet.



# GENETICS

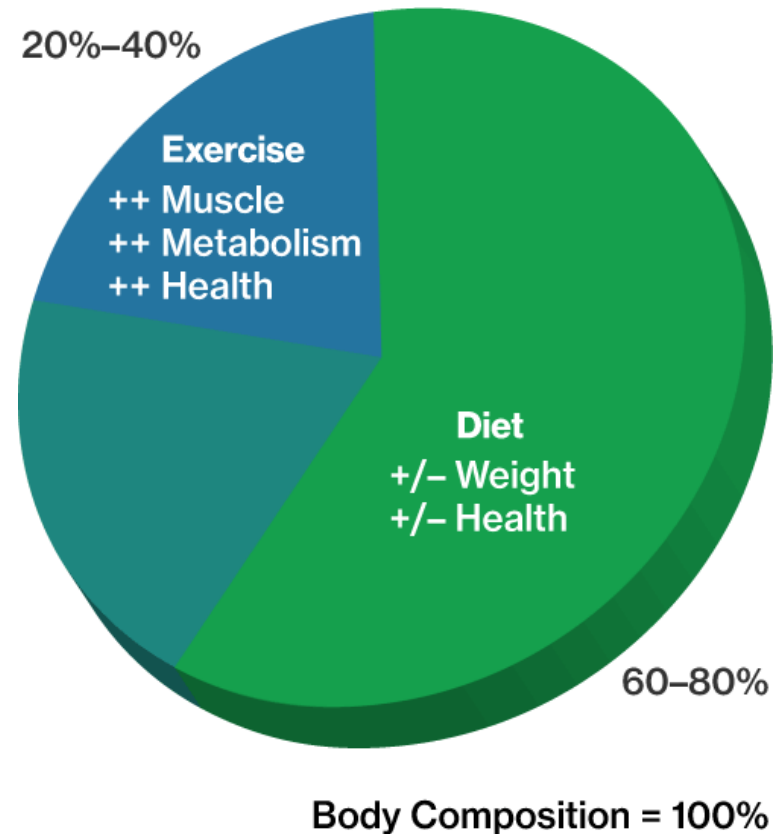
Our height, structure, predisposition to store fat, and muscularity are genetically determined when we reach puberty.

These attributes determine our base shape and appearance, and cannot be changed without surgery or drugs.

We can, however, increase or decrease body fat and muscle to sculpt a new shape. Keep in mind, we have a [natural limit](#) for muscular potential

# 80/20 RULE FOR BODY COMPOSITION

While not a hard rule for illustration purposes, the majority of your body composition (lean mass + fat) is the result from diet. [Diet](#) enables you to change your weight. Exercise is a tool to manipulate further change by necessitating the growth of muscle or to accelerate fat loss.



# BODY COMPOSITION

SKIN FOLD TEST | BODY MASS INDEX | GIRTH MEASUREMENTS | BIOELECTRIC IMPEDANCE

## BODY COMPOSITION TESTS

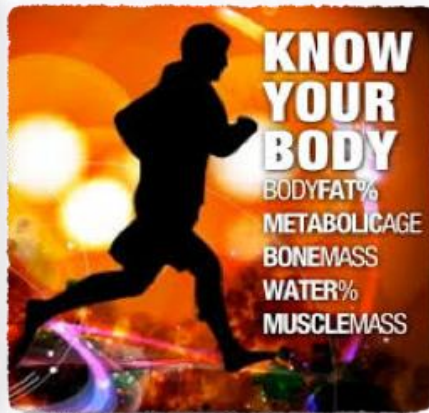
TEST	RESULT	TEST 1	TEST 2	TEST 3
SKINFOLD - Jackson/Pollock 4 sites	% BODY FAT			
BMI (body mass index)				
BMR (Basal Metabolic Rate)	Calories/day			
GIRTH (waist to hip ratio)				
BIOELECTRIC IMPEDANCE	% BODY FAT			
WATER	% WATER			
LEAN BODY MASS	LBS			

We are going to use a website to do our calculations for the Skinfold, BMI, and BMR.

WebSite: **LINEAR ONLINE**

Skinfold Sites:

- Abdominal
- Thigh
- Tricep
- Suprailiac



# BODY MEASUREMENTS

SKIN FOLD TEST | BODY MASS INDEX | GIRTH MEASUREMENTS | BIOELECTRIC IMPEDANCE

## BODY MEASUREMENTS

One of the many benefits of exercise is the way your body changes as you build up your fitness (due to gaining muscle or losing fat). It is important to track the changes in your body throughout the semester.

Initial Body Composition Assessment (Men)				Page 1 of 1
Skinfolds		Girths		
Site	Measurements (mm)	Site	Measurements (cm)	
Abdominal skinfold (mm)	1:	Neck girth (cm)	1:	
	2:		2:	
	3:		3:	
	Mean:		Mean:	
Triceps skinfold (mm)	1:	Shoulder girth (cm)	1:	
	2:		2:	
	3:		3:	
	Mean:		Mean:	
Chest skinfold (mm)	1:	Chest girth (cm)	1:	
	2:		2:	
	3:		3:	
	Mean:		Mean:	
Midaxillary skinfold (mm)	1:	Upper-arm girth (cm)	1:	
	2:		2:	
	3:		3:	
	Mean:		Mean:	
Subscapular skinfold (mm)	1:	Waist girth (cm)	1:	
	2:		2:	
	3:		3:	
	Mean:		Mean:	
Suprailiac skinfold (mm)	1:	Hip girth (cm)	1:	
	2:		2:	
	3:		3:	
	Mean:		Mean:	
Thigh skinfold (mm)	1:	Thigh girth (cm)	1:	
	2:		2:	
	3:		3:	
	Mean:		Mean:	
Sum of mean skinfolds (mm) -		Calf girth (cm)	1:	
Body fat % (See appendix A for calculations) -			2:	
			3:	
			Mean:	

# BODY COMPOSTION



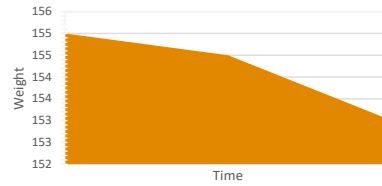
## ABOUT ME:

Gender: Male  
 Age: 16  
 Weight: 170  
 Height: 71  
 Unit: Imperial  
 BMI: 23.71

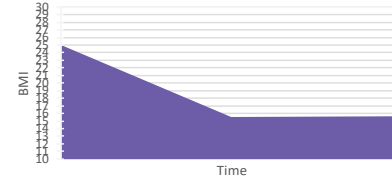
## STARTING STATS/GOAL/FINAL STATS

Type	Current	Goal	Final
Weight	170	150	155
Height:	71	62	62
BMI:	23.71	25	23.71
BF%	18	15	16
Lean BM	135	140	141

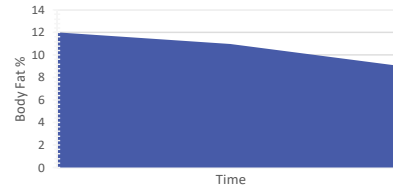
### WEIGHT



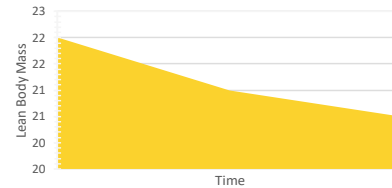
### BMI



### BODY FAT %



### LEAN BM



### WEIGHT TRACKER

Date	Time	Weight
2016-01-31	8:00 AM	155.0
2016-02-01	2:00 PM	154.5
2016-02-02	8:15 AM	153.0

### HEIGHT: TRACKER

Date	Time	Size
2016-01-31	8:00 AM	35.0
2016-02-01	2:00 PM	35.0
2016-02-02	8:15 AM	38.0

### BMI: TRACKER

Date	Time	Size
2016-01-31	8:00 AM	25.0
2016-02-01	2:00 PM	15.5
2016-02-02	8:15 AM	15.6

### BF% TRACKER

Date	Time	Size
2016-01-31	8:00 AM	12.0
2016-02-01	2:00 PM	11.0
2016-02-02	10:00 AM	9.0

### LEAN BM TRACKER

Date	Time	Size
2016-01-31	8:00 AM	22.0
2016-02-01	2:00 PM	21.0
2016-02-02	8:15 AM	20.5

Male

# Body Fat Chart

Female

20-39

40-59

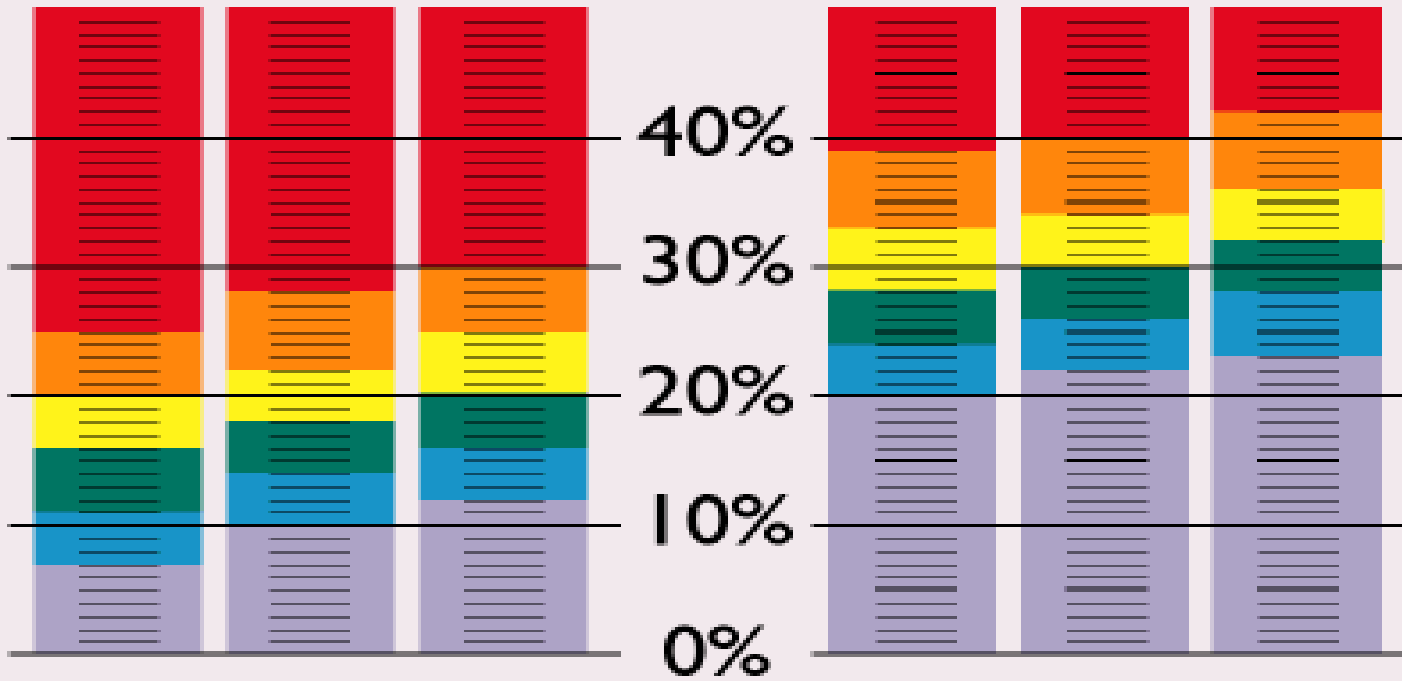
60-79

AGE

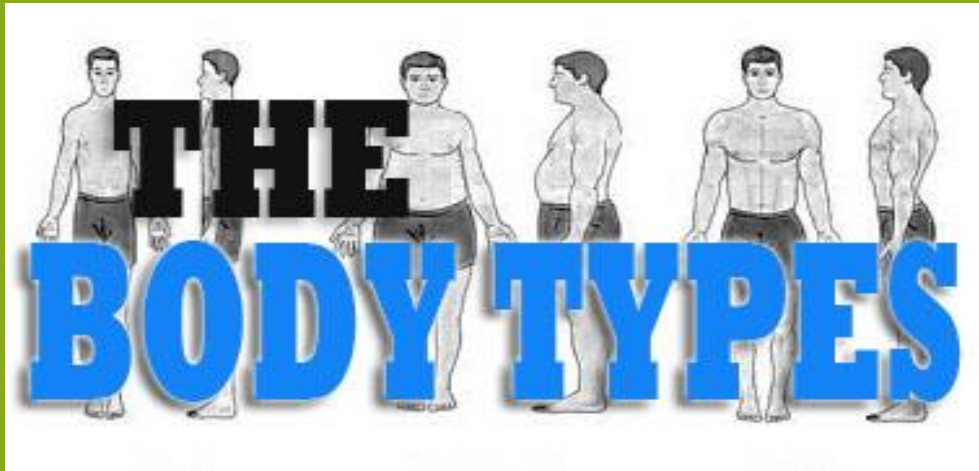
20-39

40-59

60-79



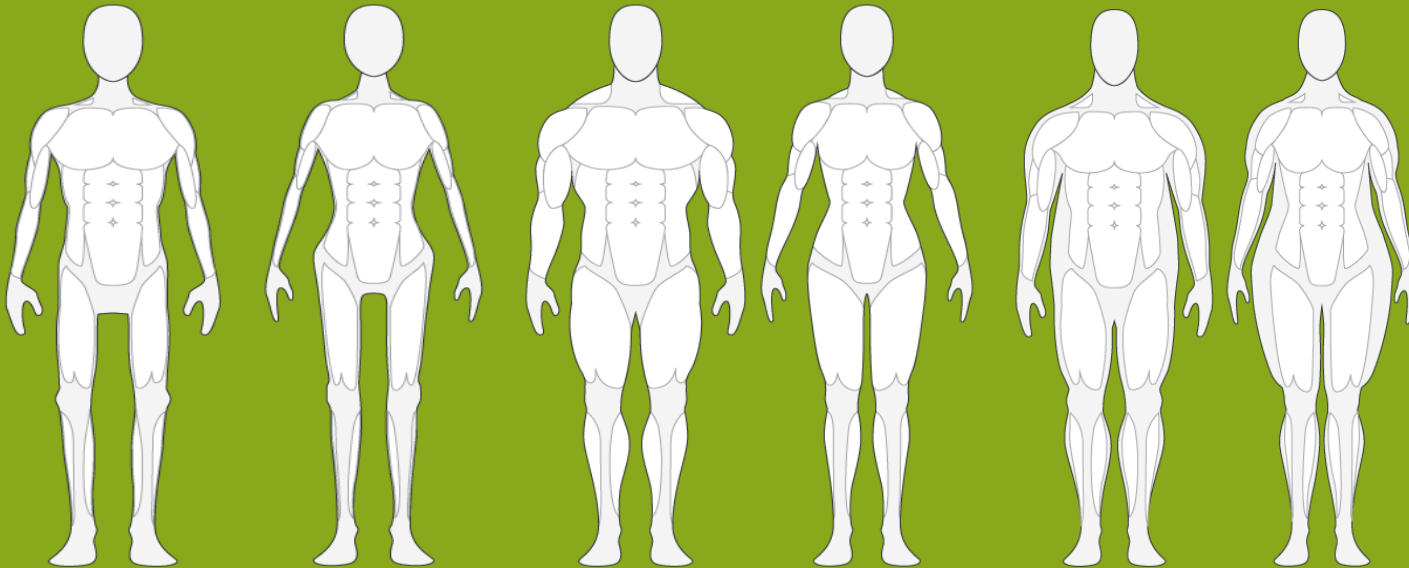
Underfat Athletic Fit Healthy Overfat Obese



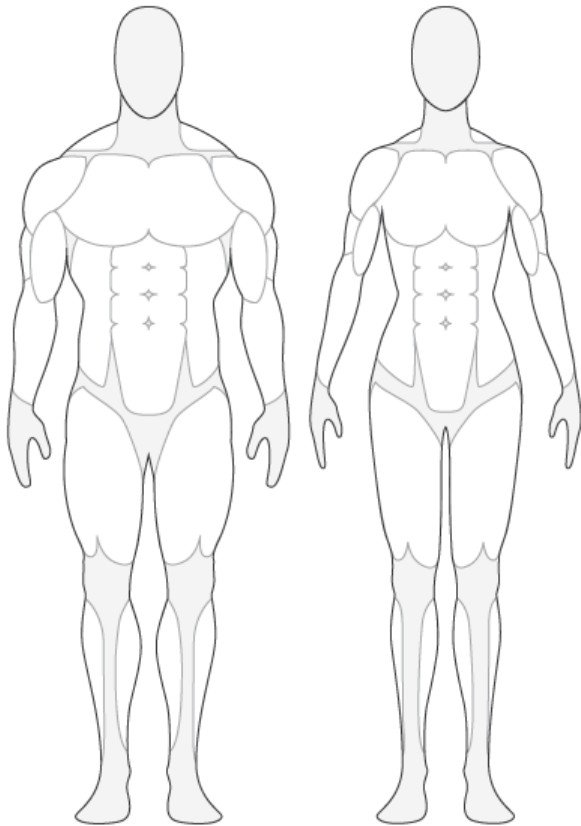
**Underweight**

**Muscular**

**Overweight**



## Muscular



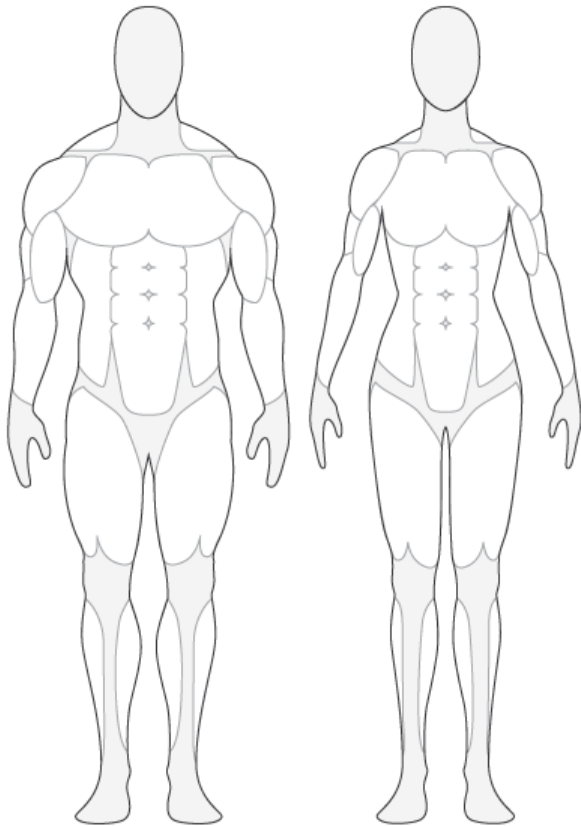
# MESOMORPH

## CHARACTERISTICS

- Solid bone & muscle structure
- Athletic & strong
- Rectangular in shape
- Can gain or lose weight quickly
- Can put on muscle quickly



## Muscular



# MESOMORPH

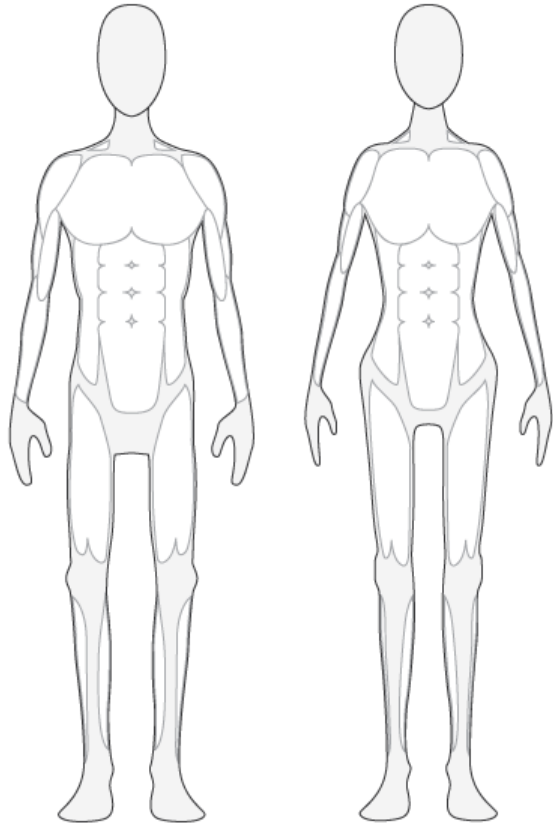
## TRAINING TO MAXIMIZE BODY TYPE

- Heavy weights with explosive training
- Use a variety of exercise
- Moderate rest between sets
- Mix weights and training to maintain proper body fat percentage (10%)
- Isolate body parts to concentrate on

## DIET CONSIDERATIONS

- High protein intake
- Moderate carbohydrate
- Healthy fats

**Underweight**

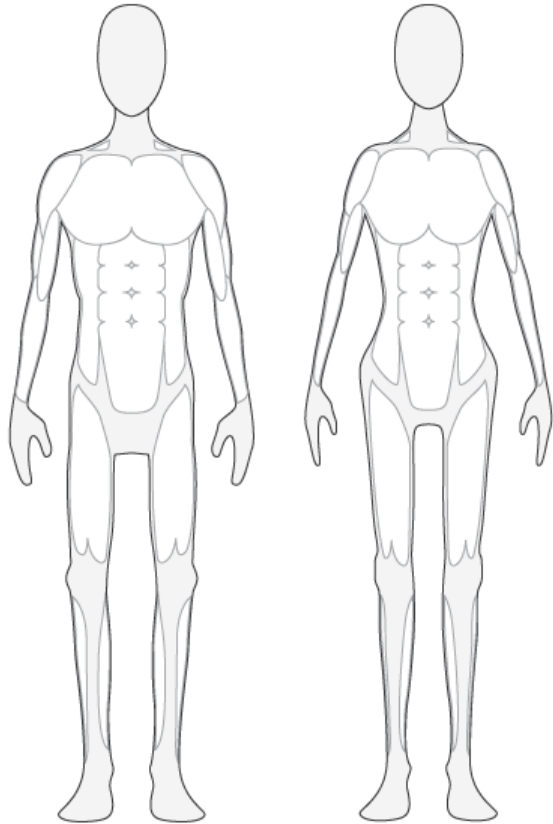


## ECTOMORPH

### CHARACTERISTICS

- Small bone structure – narrow shoulders
- Low muscle mass – flat chest
- High metabolic rate
- Do not gain weight easily
- Hard to build muscle due to lack of extra fuel

**Underweight**



## ECTOMORPH

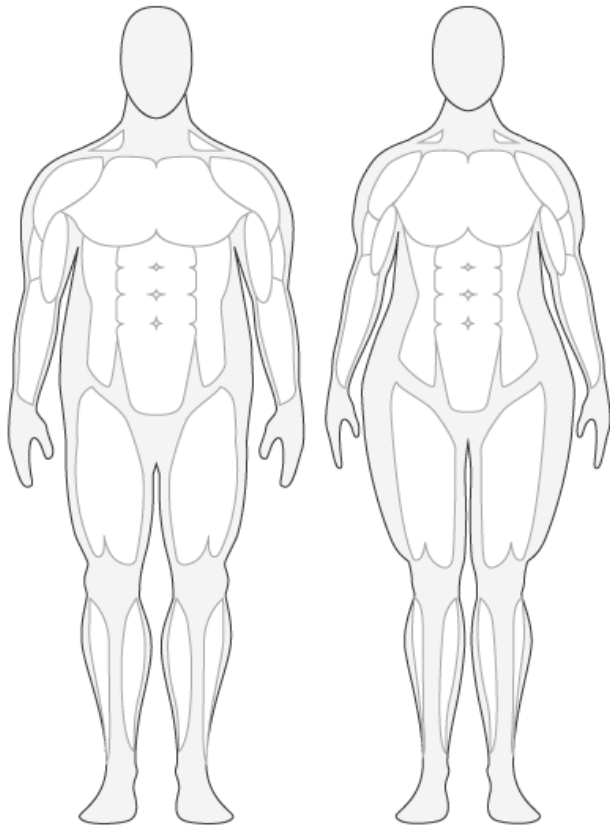
### TRAINING TO MAXIMIZE BODY TYPE

- Heavy weights with explosive training
- Compound exercises 3x a week
- Concentrate on the big “6”

### DIET CONSIDERATIONS

- High calorie diet – rich in carbohydrates
- High in proteins
- Low in fats

## Overweight

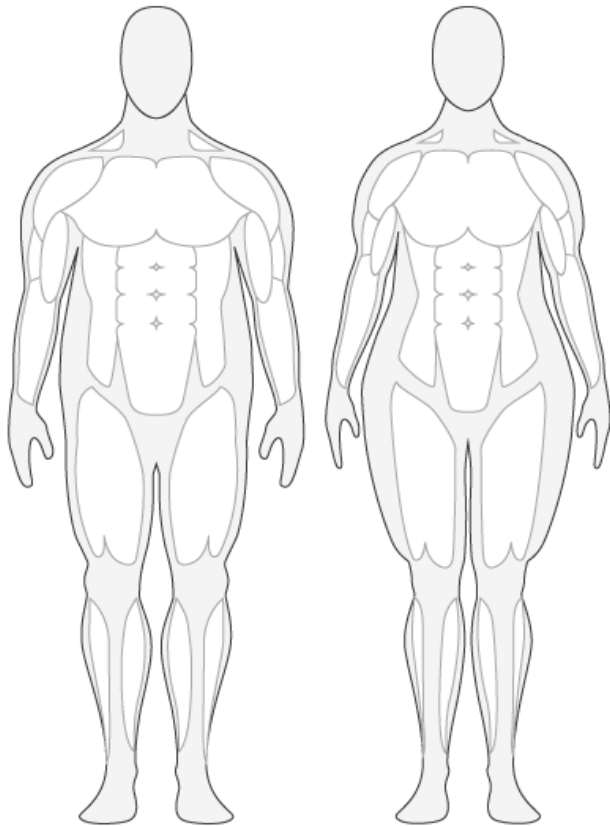


## ENDOMORPH

### CHARACTERISTICS

- Round
- Small to Medium Height
- Bony frame work
- Slow metabolism
- Hard time loosing weight

## Overweight



## ENDOMORPH

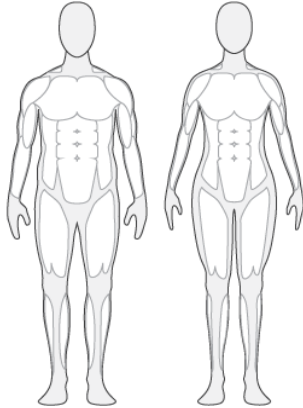
### TRAINING TO MAXIMIZE BODY TYPE

- Cardio training is important to burn calories
- Higher rep training to elevate heart rate
- Have to burn more calories than you take in

### DIET CONSIDERATIONS

- Limit carbohydrate intake to after workout
- High protein
- Low fats

**Underweight or Average**



**Time**

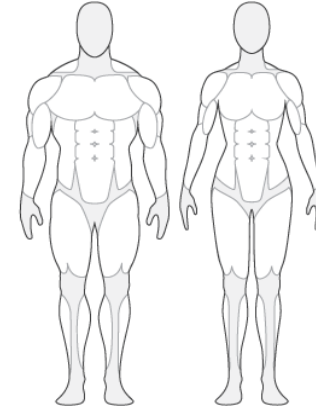


Increase weights, reps,  
sets, volume, or intensity

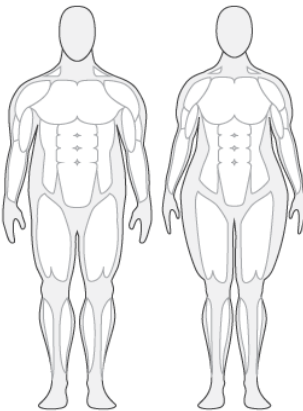


Increase calories with  
proper macronutrient ratios

**To Fit**



**Overweight**



**Time**

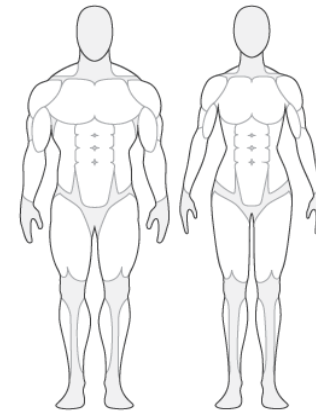


Increase or maintain weights, reps,  
sets, volume, or intensity



Decrease calories with  
proper macronutrient ratios

**To Fit**



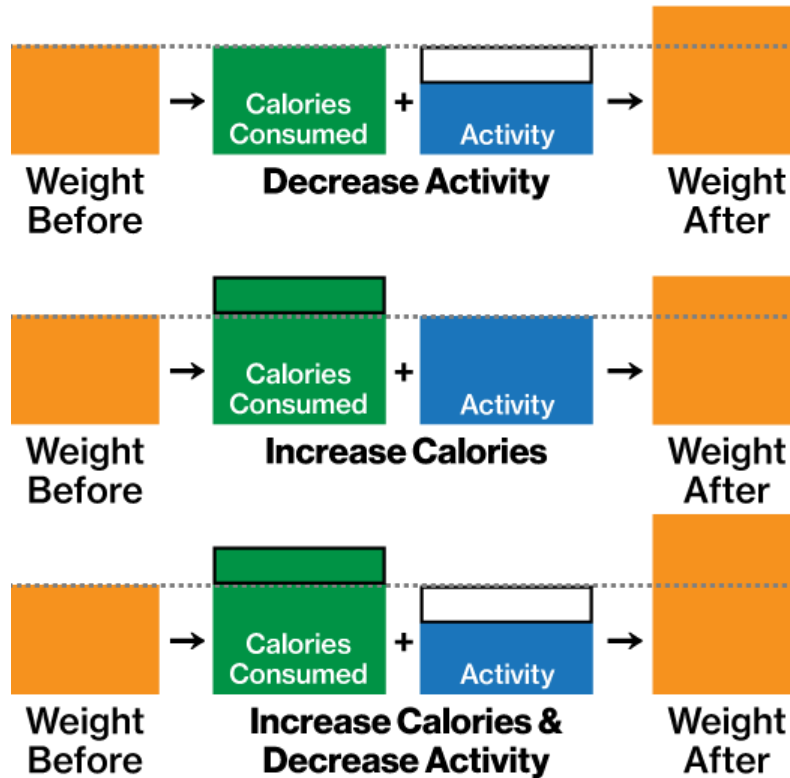
# MESOMORPH

Maintain Weight



# ECTOMORPH

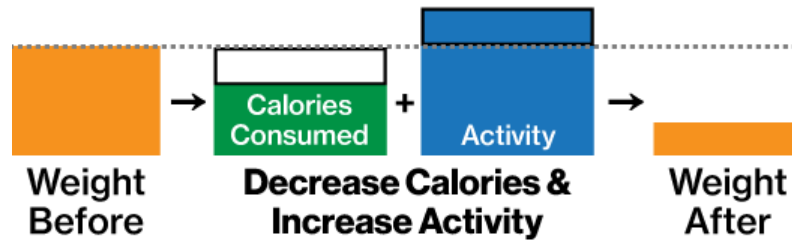
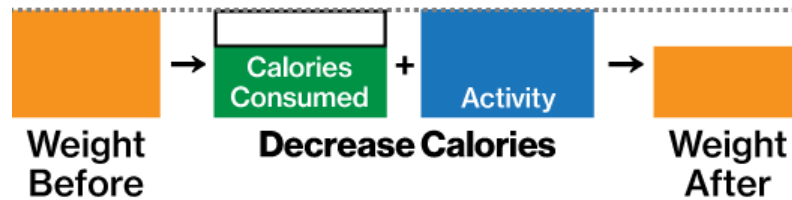
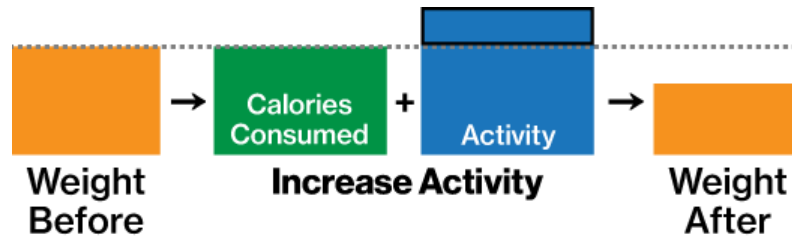
Increase Size



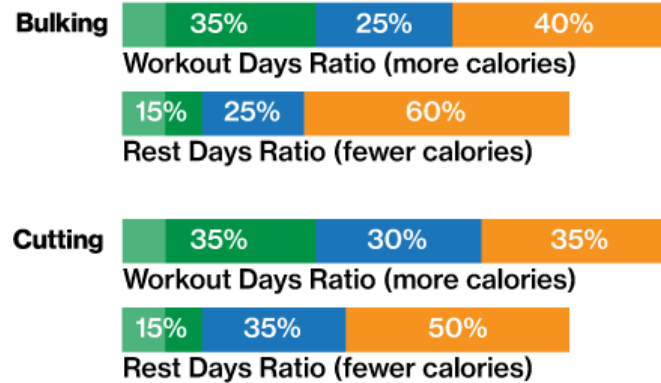


# ENDOMORPH

Loose Weight



## Caloric Intake



## Portion Sizes



### Legend

- Carbs (Vegetables)
- Carbs (Starches)
- Proteins
- Fats

### Note

Vegetables are in larger portion sizes since they are low in calories. Fats are higher in calories so smaller portion sizes are suggested.



# Goals

1. Thinking

2. Planning

3. Get Started

## Create S.M.A.R.T. Goals



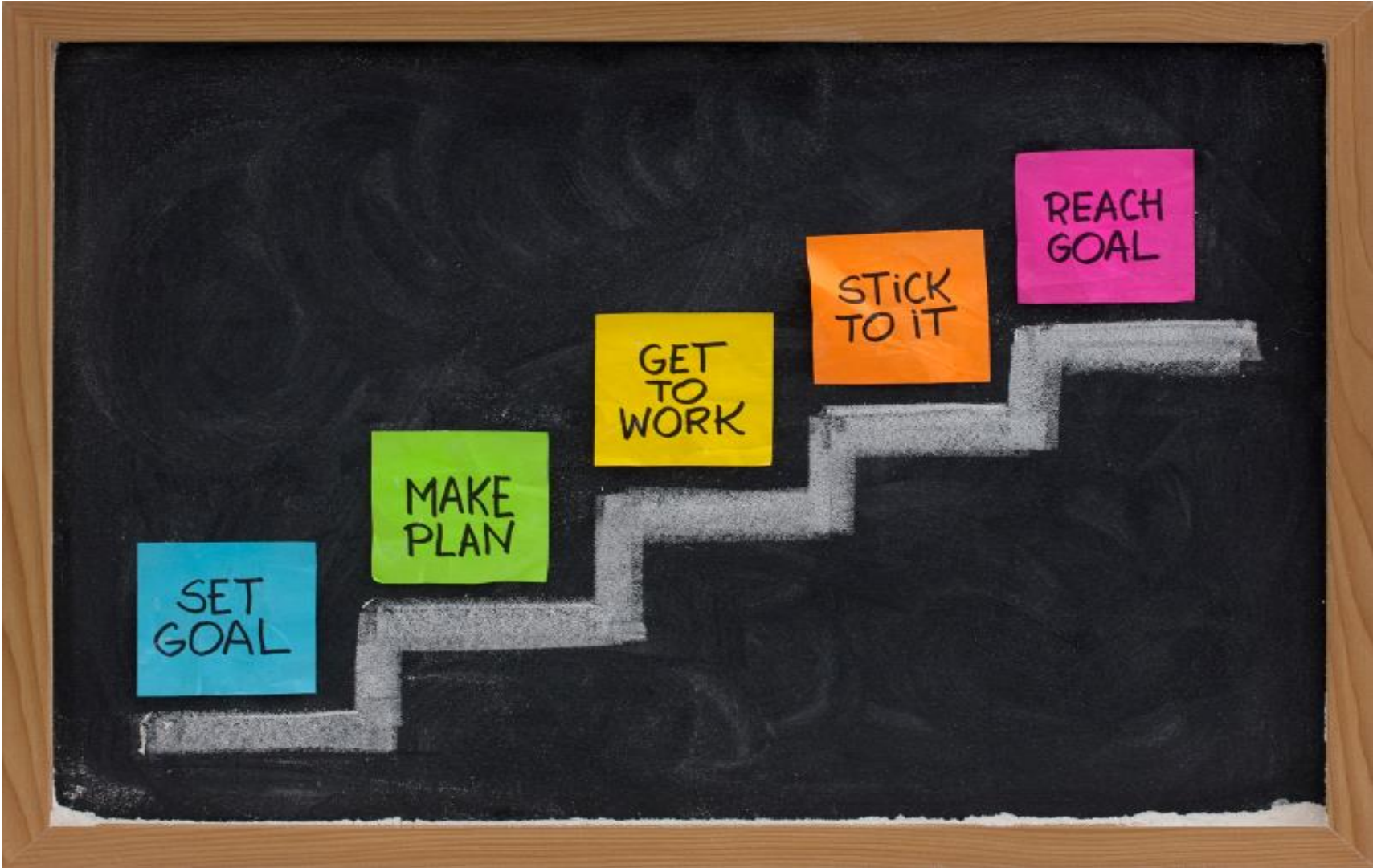
SET  
GOAL

MAKE  
PLAN

GET  
TO  
WORK

STICK  
TO IT

REACH  
GOAL



# MISTAKES IN SETTING GOALS

too  
BIG

too  
MANY

not  
SPECIFIC

not  
WRITTEN

# GOAL SETTING

[WHAT IS A GOAL?](#) | [SMART GOALS](#) | [FITNESS TERMINOLOGY](#) | [GOAL SETTING WORKSHEET](#)

## What is a goal?

A goal is something a person works towards and strives for, and eventually can achieve. Goals can be short term and long term.

### SMART Goals:

**S** – SPECIFIC – Is your goal clearly defined with specific details?

**M** – MEASURABLE – Measurable numbers involved.

**A** – ATTAINABLE – Is reaching your goal impossible? Or too easy?

**R** – REALISTIC – How likely is it to reach your goal?

**T** – TIME-LINE – What is the time-line for reaching your goal?

FITNESS GOALS NEED FITNESS TERMINOLOGY	FITNESS TERMINOLOGY	
Fitness Term:	Definition:	Fitness Test involved:
Muscular Strength	The maximum force a muscle can exert in a single contraction.	Grip Strength Test, weight room lifts
Muscular Endurance	A muscle's ability to perform repeatedly without fatigue.	Push-ups, Sit-ups, Sitting tucks, flexed arm hang.
Agility	The ability to quickly change direction.	Shuttle run
Power	The ability to exert a large amount of force as QUICK as possible.	Vertical jump, standing long jump, medicine ball throw.
Aerobic (Cardio)	The efficiency of your heart and lungs during vigorous exercise.	Beep Test, 1 mile run, 12 minute run



## Goal Setting Worksheet

- Must create a minimum of 3 fitness testing goals directly related to your fitness testing and/or weight-room testing.
- Must create a minimum of 1 body composition/body measurement goal.
- Optional: You can include a personalized sports related goal or an appearance related goal.

### Examples:

By the end of the semester, my goal is to improve my Aerobic system and reach level 10 on the beep test. I want to improve my muscular endurance and reach 50 push-ups in a minute. I want to improve my strength and be able to bench press 200 lbs for 4 reps, and squat 280 lbs for 5 reps. I want to reduce my body fat to under 7%. I want to achieve a clearly defined 6-pack abs. Lastly, I want to make 1<sup>st</sup> team All-City for basketball.

### **What are your fitness goals (for the end of the semester)?**

Fitness Testing Goals: (min. 3)

Body Composition/Measurement Goals:

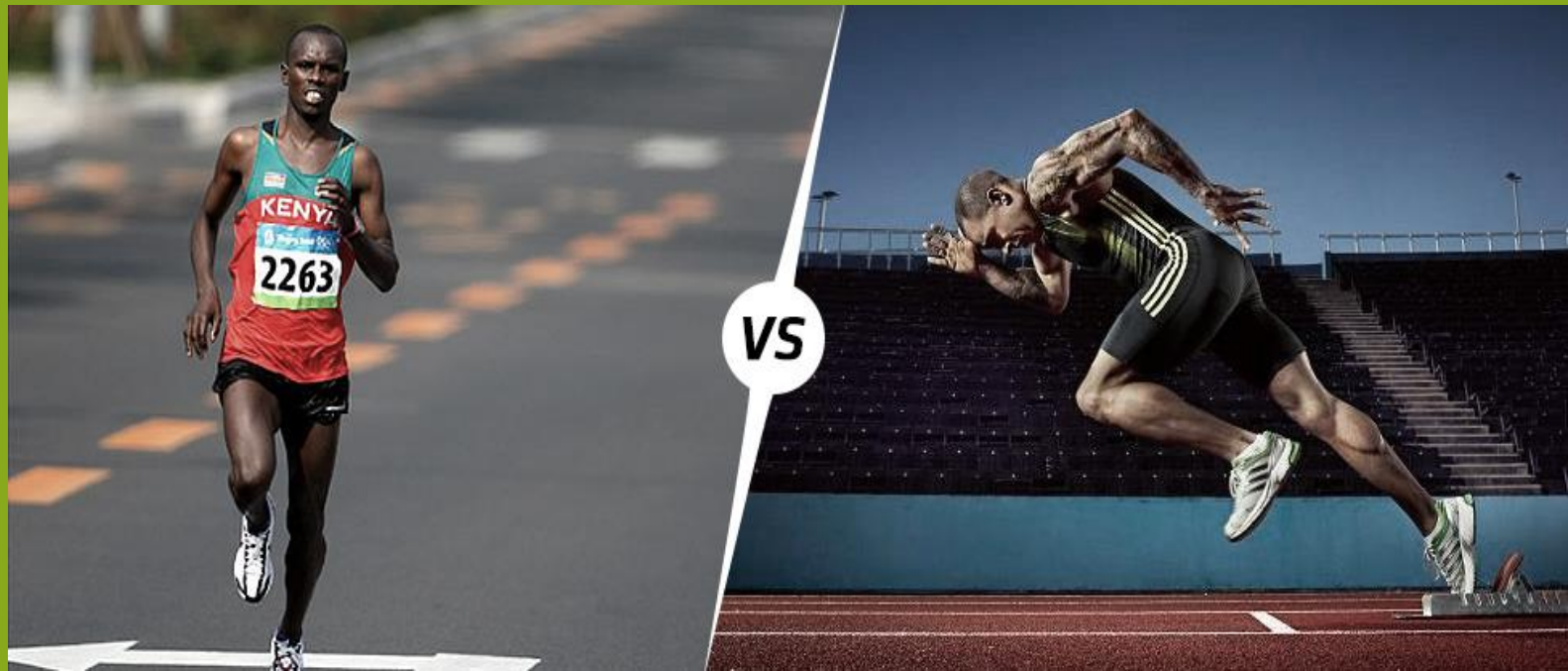
Health/Optional Goals:

Adjustments throughout the semester? (Write below)

**GOAL ACHIEVED**

The image features the words "GOAL ACHIEVED" in a bold, red, 3D sans-serif font. The letter "O" in "GOAL" is replaced by a target symbol with concentric red and white rings. A blue dart with a yellow tip is shown hitting the center bullseye of the target. The entire scene is set against a plain white background, and the 3D letters cast a soft, white reflection on the surface below them.

# AEROBIC vs ANAEROBIC ENERGY SYSTEMS



**Anaerobic**



**Weightlifter**

**Aerobic**



**Runner**



**Gymnast**



**Cyclist**



**Sprinter**

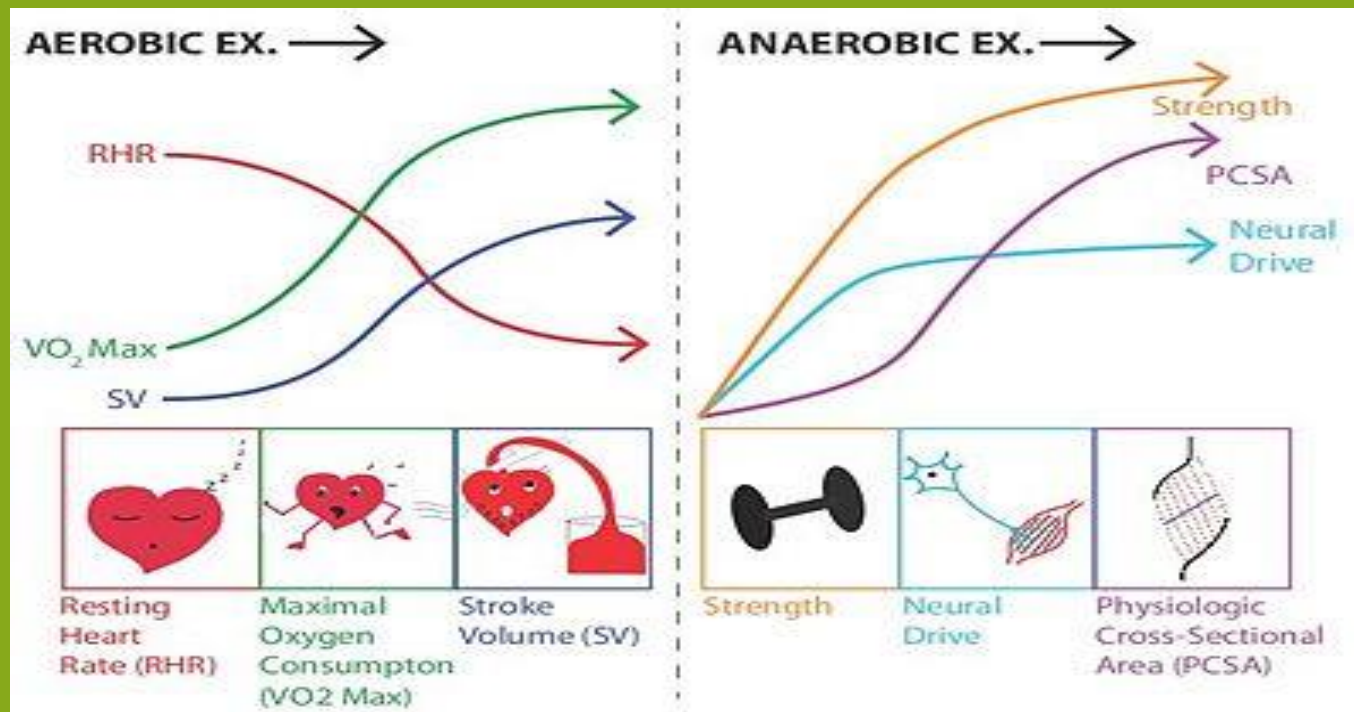


**Triathlete**

# AEROBIC VS ANAEROBIC

*ANAEROBIC AND AEROBIC:* ANAEROBIC RESPIRATION MEANS THE "ABSENCE OF OXYGEN" AND AEROBIC RESPIRATION MEANS "WITH OXYGEN." ANAEROBIC EXERCISES REQUIRE SHORT BURSTS OF ENERGY WHILE AEROBIC EXERCISES CAN BE PERFORMED OVER LONG PERIODS OF TIME.

# COMPARING ADAPTATIONS OF AEROBIC vs ANAEROBIC EXERCISE



# AEROBIC vs ANAEROBIC

## AEROBIC TRAINING

### BENEFITS

- Increased cardiovascular function (VO<sub>2</sub>max)
- Decreased body fat
- Increased endurance capacity
- Stronger heart

## ANAEROBIC TRAINING

### BENEFITS

- Increased muscle mass
- Increased strength
- Increased power
- Increased speed
- Some decrease in body fat

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## Aerobic Energy System



Share

Primary energy source:	Glycogen, glucose, fats, proteins
Duration of activity:	> 3 min
Sporting events:	Walking, jogging, swimming, walking up stairs
Advantages:	Large output of energy over a long period of time, removal of lactic acid
Limiting factors:	Lung function, max.blood flow, oxygen availability, excess. energy demands



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## Lactic Acid Energy System



Primary energy source:	Stored glycogen, blood glucose
Duration of activity:	12 s – 3 min
Sporting events:	800m run, 200m swim, downhill ski racing, 1500 speed skating
Advantages:	Ability to produce energy under conditions of inadequate oxygen
Limiting factors:	Lactic acid build up, H <sup>+</sup> ions build up (decrease of pH)

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## Creatine Phosphate System



Primary energy source:	Stored ATP, CP
Duration of activity:	7-12 s
Sporting events:	Weight lifting, high jump, long jump, 100m run, 25m swim
Advantages:	Produce very large amount of energy in a short amount of time
Limiting factors:	Initial concentration of high energy phosphates (ATP, PC)

## THE FITT FORMULA: PHYSICAL FITNESS

	<b>Aerobic</b>	<b>Flexibility</b>	<b>Muscular Endurance</b>	<b>Muscular Strength</b>	<b>Body Composition</b>
<b>F</b>	<ul style="list-style-type: none"> <li>• 3-5 times / week</li> </ul>	<ul style="list-style-type: none"> <li>• Daily</li> <li>• Warm-up</li> <li>• Cool down</li> </ul>	<ul style="list-style-type: none"> <li>• Daily for some muscle groups</li> <li>• 3-4 times / week</li> </ul>	<ul style="list-style-type: none"> <li>• 3 times / week</li> <li>• Different muscle groups</li> </ul>	<ul style="list-style-type: none"> <li>• Daily exercising</li> <li>• Follow Canada's Food Guide</li> </ul>
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<b>T</b>	<ul style="list-style-type: none"> <li>• 15-60 minutes of continuous activity</li> <li>• Progressive</li> </ul>	<ul style="list-style-type: none"> <li>• 10-20 minutes</li> </ul>	<ul style="list-style-type: none"> <li>• 30-60 minutes</li> <li>• Progressive</li> </ul>	<ul style="list-style-type: none"> <li>• 15-60 minutes</li> <li>• Progressive</li> </ul>	<ul style="list-style-type: none"> <li>• 30-60 minutes</li> <li>• Progressive</li> </ul>
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# FITT – AEROBIC TRAINING

	AEROBIC TRAINING
FREQUENCY	Min. 3 x's per week
INTENSITY	60%-90% of max. effort
TIME	Min. 30-60 minutes per class
TYPE	C.I.T., Fartlek, Interval

# FITT – ANAEROBIC TRAINING

	ALACTIC TRAINING	LACTIC TRAINING
FREQUENCY	Min. 3 x's per week	Min. 3 x's per week
INTENSITY	85%-100% of max. effort	75%-85% of max. effort
TIME	20-30 minutes per class	10-20 minutes per class
TYPE	Resistance, Interval	Interval, C.I.T.

# WHAT IS TRAINING?

- Makes the body more efficient
- Makes the body better able to perform certain
- Can make the human machine more effective
- We can run faster, jump higher, and throw further

# PROGRAM DESIGN



- Determine whether you need to use a Concurrent or Periodization Training Design
- Base your training program around a goal
- All training programs must follow the FITT principle
- Training should incorporate all 3 energy systems but emphasis should be placed on the specific energy system requirements of the athlete
- Remember the 3 keys to good training design: **Variety, Functionality & High Intensity**



# EXERCISE PROGRAM DESIGN



# EXERCISE PROGRAM DESIGN

- DETERMINE WHETHER YOU NEED TO USE A CONCURRENT OR PERIODIZATION TRAINING DESIGN
- BASE YOUR TRAINING PROGRAM AROUND A GOAL
- ALL TRAINING PROGRAMS MUST FOLLOW THE FITT PRINCIPLE
- TRAINING SHOULD INCORPORATE ALL 3 ENERGY SYSTEMS BUT EMPHASIS SHOULD PLACED ON THE SPECIFIC ENERGY SYSTEM REQUIREMENTS OF THE ATHLETE
- REMEMBER THE 3 KEYS TO GOOD TRAINING DESIGN  
Variety, Functionality & High Intensity

# **PROGRAM DESIGN BASICS**

## **Warm-up**

- Prepares your body for the workout, by stimulating the heart and lungs and increasing blood flow to working muscles.
- Helps to stretch and prepare muscles and tendons for more strenuous contractions.
- Prepares you mentally for the workout.
  
- Should consist of an activity that will prepare the entire body, especially the larger muscle groups, such as a light jog, or a short ride on an exercise bike.
- Should be done long enough to induce sweat, usually 7-10 minutes (this is an indicator of physiological readiness for the workout).
- Should include some dynamic stretching to ready the body for exercise.

## **Main Workout**

Depending on the focus of the workout, this portion will consist of resistance training exercises, body weight or functional exercises, or aerobic training exercises, or a combination of all three.

### **STEPS TO CONSIDER WHEN DESIGNING YOUR PROGRAM:**

- 1. Figure out your goal and training status.**
  - Before you can do anything, you need to decide why you're working out. Meaning, what's your specific goal? Building muscle? Losing fat? Increasing strength? Getting toned? You need to establish this before you can start designing your program.
  - You also need to identify what your training status is.... beginner, intermediate or advanced. You need to design a program that meets your current fitness status.
- 2. Figure out your ideal training or workout frequency.**
  - Training or workout frequency refers to how often you're going to workout, workout each muscle group, or movement pattern over the course of a week.
- 3. Choose a workout split that fits your ideal frequency and schedule.**
  - Once you've figured out the ideal workout frequency is for you, the next step is to pick a workout split that not only allows for the ideal frequency to be reached, but one that you can fit into your weekly schedule.
- 4. Figure out your ideal training volume.**
  - Workout volume refers to the amount of work you'll be doing. This refers to how many exercises, sets, reps, distance will you be performing each workout and in a week.

#### 5. Figure out your ideal training intensity.

- Workout intensity basically refers to how hard you're going to be working. For example, how much weight will you be lifting, how heavy or light is that weight for you, and how many reps can you do with that weight.

#### 6. Choose your exercises and properly implement them.

- Once you know how much volume you'll be doing, the next step is to select the exercises that are most ideal for you and your goals. Then you need to properly implement them into your workout routine.

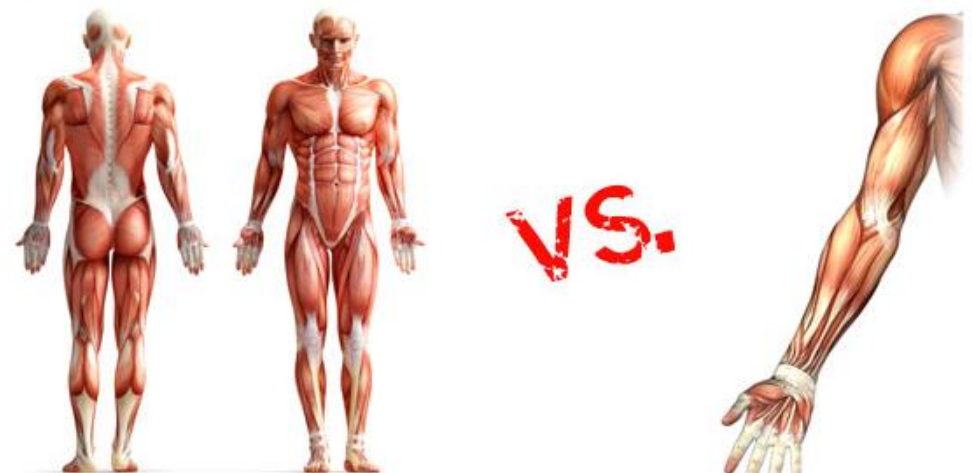
#### 7. Make sure it works.

- This is the final step where all the previous steps come together along with the remaining requirements of your program. It must be in a logical order for it to be successful. This program should be coupled with some form of **progression** and a **diet** program that will support your program and your goals.

#### 8. Use the FITT sheet to guide you in your program design.

### Cool-down

- Helps return the body to a state of homeostasis, returning your intensity level to normal.
- Helps return blood from your extremities and working muscles back to the heart.
- Minimizes soreness and tightening following a workout.
- Static stretches and some light aerobic activities should be used.



# SETS AND REPS EXPLAINED

<b>Power Lifting</b>	<b>Bodybuilding (Strength)</b>	<b>Bodybuilding (Aesthetics)</b>	<b>Cardiovascular</b>
<b>Strength</b>	<b>Myofibrillar Hypertrophy</b>	<b>Sarcoplasmic Hypertrophy</b>	<b>Endurance</b>
<b>1–5 reps</b>	<b>4–8 reps</b>	<b>8–15 reps</b>	<b>15+ reps</b>
<b>3–5 sets</b>	<b>3–4 sets</b>	<b>4–5 sets</b>	<b>2–4 sets</b>
<b>2–5' rest</b>	<b>1–3' rest</b>	<b>0.5–1.5' rest</b>	<b>0.5–1.5' rest</b>

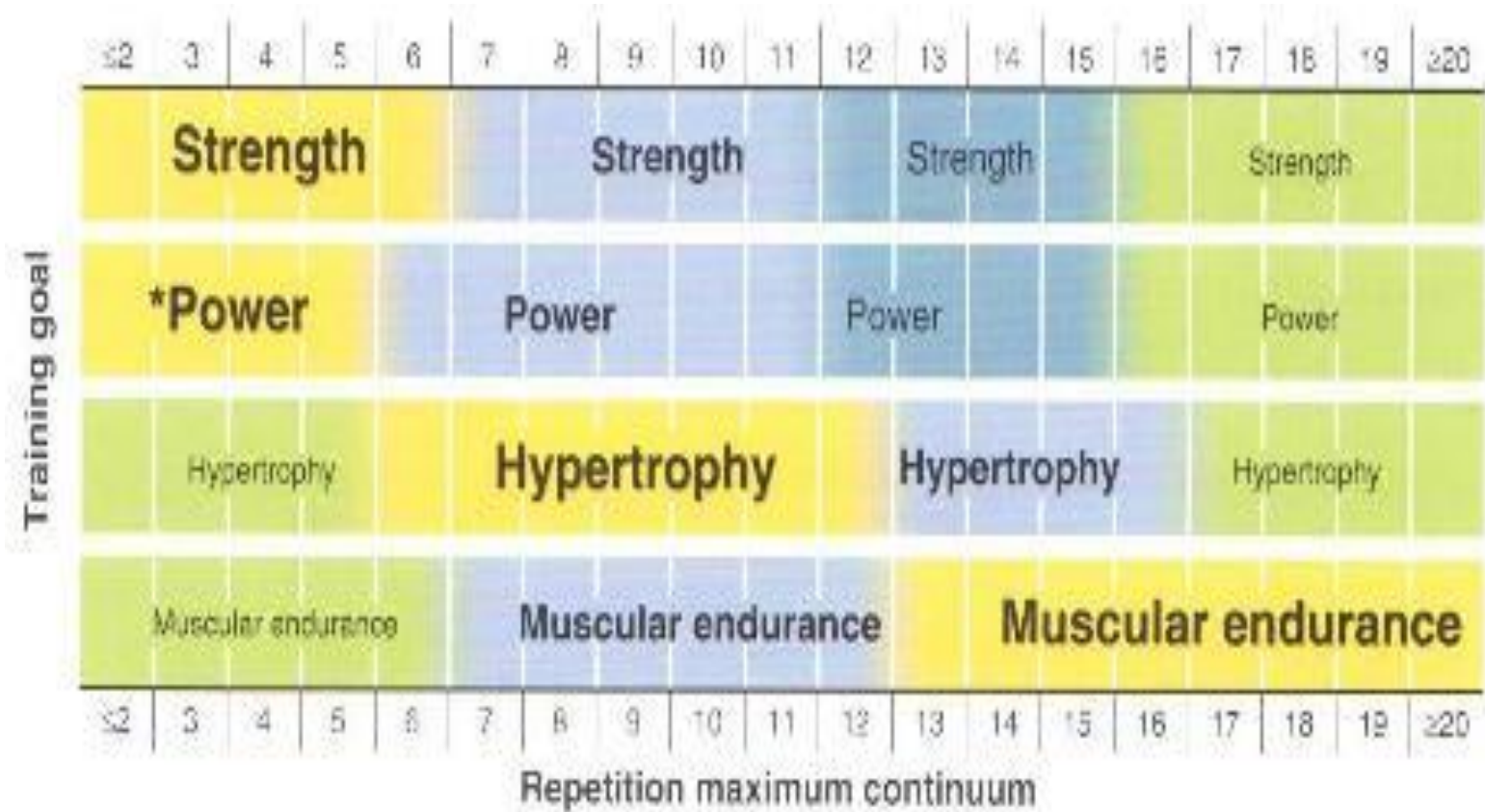
# ESTIMATING 1RM AND TRAINING LOADS

Estimating 1RM and Training Loads

Max Reps (RM)	1	2	3	4	5	6	7	8	9	10	12	15
% 1 RM	100%	95%	93%	90%	87%	85%	83%	80%	77%	75%	67%	65%
Load (lb or kg)	10	10	9	9	9	9	8	8	8	8	7	7
	20	19	19	18	17	17	17	16	15	15	13	13
	30	29	28	27	26	26	25	24	23	23	20	20
	40	38	37	36	35	34	33	32	31	30	27	26
	50	48	47	45	44	43	42	40	39	38	34	33
	60	57	56	54	52	51	50	48	46	45	40	39
	70	67	65	63	61	60	58	56	54	53	47	46
	80	76	74	72	70	68	66	64	62	60	54	52
	90	86	84	81	78	77	75	72	69	68	60	59
	100	95	93	90	87	85	83	80	77	75	67	65
	110	105	102	99	96	94	91	88	85	83	74	72
	120	114	112	108	104	102	100	96	92	90	80	78
	130	124	121	117	113	111	108	104	100	98	87	85
	140	133	130	126	122	119	116	112	108	105	94	91
	150	143	140	135	131	128	125	120	116	113	101	98
	160	152	149	144	139	136	133	128	123	120	107	104
	170	162	158	153	148	145	141	136	131	128	114	111
	180	171	167	162	157	153	149	144	139	135	121	117
	190	181	177	171	165	162	158	152	146	143	127	124
	200	190	186	180	174	170	166	160	154	150	134	130
	210	200	195	189	183	179	174	168	162	158	141	137
	220	209	205	198	191	187	183	176	169	165	147	143
	230	219	214	207	200	196	191	184	177	173	154	150
	240	228	223	216	209	204	199	192	185	180	161	156
	250	238	233	225	218	213	208	200	193	188	168	163
	260	247	242	234	226	221	216	208	200	195	174	169
	270	257	251	243	235	230	224	216	208	203	181	176
	280	266	260	252	244	238	232	224	216	210	188	182
	290	276	270	261	252	247	241	232	223	218	194	189
	300	285	279	270	261	255	249	240	231	225	201	195

Ref: Baechele, Thomas, Earle, Roger, *Essentials of Strength Training and Conditioning, 2nd Ed.*

# SETS AND REPS EXPLAINED



# TRAINING PRINCIPLES

- FITT PRINCIPLE
- PRINCIPLE OF OVERLOAD
- PRINCIPLE OF PROGRESSION
- PRINCIPLE OF SPECIFICITY
- PRINCIPLE OF INDIVIDUAL DIFFERENCE
- PRINCIPLE OF REVERSIBILITY
- PRINCIPLE OF DIMINISHING RETURNS
- PRINCIPLE OF RECOVERY
- PRINCIPLE OF TEDIOUSNESS
- PRINCIPLE OF CEILING EFFECT

# FITT PRINCIPLE

## THE FITT FORMULA: PHYSICAL FITNESS

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# FREQUENCY

- The number of training sessions per week spent training
- General guideline is 3-5 times per week
- Determination of frequency depends greatly on the athlete's level of fitness, athletic aspirations, and type of training

# INTENSITY

- How hard the individual must work
- Taken as a percentage of the individuals maximal aerobic and anaerobic power
- General guideline is 50%-100% of the athlete's maximal ability/effort
- Intensity is also altered by changing the rest of time

# TIME

- Amount of time spent in a single training session
- Depends on the athlete's level of fitness, athletic aspirations, and type of training

# TYPE

- Refers to the type of training method used
- Depends on the athlete's level of fitness, athletic aspirations, and sport or activity for which he or she is training

# PRINCIPLE OF OVERLOAD

- For physiological change, the body must perform tasks that are more challenging than those to which it is accustomed
- Over time the body will adapt, therefore in order to continue to grow, new demands must be incorporated
- Overload can include all aspects of training, i.e., physiological, emotional, mental, and psychological

# PRINCIPLE OF PROGRESSION

- In order to constantly improve, an athlete must progressively increase the overload over time
- The athlete must be aware that loads and demands on the body must occur over time to increase performance and decrease injury

# PRINCIPLE OF SPECIFICITY

- In order for specific outcomes to occur, training must be specific to those outcomes
- Example: if you want to improve your vertical jump, your exercise prescription should include explosive power exercises that target the legs
- Specific physiological adaptations will occur if training is specific
- Training must reflect athlete's sport specific needs

# PRINCIPLE OF INDIVIDUAL DIFFERENCES

- Every athlete has a different physical and psychological make-up
  - Pre-training fitness levels
  - Requirements within their sport
  - Age and gender
  - Ability to recover from workouts
  - Ability to recover from injury
  - Body type



# PRINCIPLE OF REVERSIBILITY

- “Use it or lose it”
- Muscles will start to lose training effects as soon as training stops
- Atrophy (muscle degeneration) will occur during sustained period without training
- Significant training benefits can be lost after 2 weeks of not training – i.e. Christmas Break
- Reasons include: injury, lack of motivation, overtraining, and burnout

# PRINCIPLE OF DIMINISHING RETURNS

- A person's training gains will reflect that person's prior level of training
- Individuals who do not train or train very little will see significant gains
- Highly trained individuals will see little gains as they experience performance plateaus
- Changing training programs and philosophy are ways to help prevent performance plateaus

# CEILING EFFECT

- As you approach your ATHLETIC POTENTIAL (genetic) the rate of increase in your fitness and strength will start to slow.
- When this occurs a temporary lay-off, change of routine, or a decrease in intensity may be needed to further your progress.



# PRINCIPLE OF RECOVERY

- Adequate rest is important in a training program because the body repairs itself when you rest (sleep) and grows.
- Along with proper rest, it is equally important that you refuel the body with proper nutrition as close as you can after the workout.



- **General Rules:**
  - Aerobic Activity = 24 hours between workouts
  - Anaerobic Activity = 48 hours between workouts
  - Intensity and Duration may dictate the rest period

# PRINCIPLE OF REVERSIBILITY

- If a training program is discontinued completely, the training effect will be lost at 1/3 of the rate it took to obtain it.
- For example: An improvement in muscular strength that took 2 months to obtain will be lost completely in 6 months.
- The rate of regression is even faster when talking about aerobic fitness decreases.

# TEDIUM

- Tedium means boredom
- Basically if you carry out the same workout routine day after day, you are likely to become bored with the program. You may lose motivation.
- To keep the motivation high you should vary your program by adding new exercises, training a different energy system, or change up your workout venue.



# **ATHLETES HAVE SPECIAL NEEDS!**

- ✓ Require More Nutrients
- ✓ Increase in Protein
- ✓ Increase in Carbohydrates
- ✓ Increase in Vitamins and Minerals



# BENEFITS OF PROPER NUTRITION

- Decreased time of recovery
- Increased energy
- Decreased loss of muscle tissue in-season
- Increased stamina
- Decreased percent body fat
- Injury prevention
- Improved health
- **IMPROVED PERFORMANCE!!**

# MACRONUTRIENTS



# CARBOHYDRATE

- *4 calories per gram.*
- The Good
  - Carbohydrate sources such as fruits and vegetables are very dense in vitamins and fiber. Carbs are also the body's [preferred source](#) of energy other than alcohol, especially for [anaerobic](#) and [long-duration](#) exercise.
  - Starchy complex carbohydrate sources such as potatoes and long-grain rice help [replenish muscle glycogen](#) stores. Muscle glycogen is used as fuel and depletes during strenuous exercise. Starchy foods also contain resistant starch, which resists digestion, functioning similarly to fiber. It is [satiating](#) and promotes health in the [gut microbiota](#).
- The Bad
  - Refined carbohydrate sources such as sugar and wheat- and corn-based products induce [appetite cravings](#) and contributes to [body fat gains](#), [cardiovascular disease](#), [higher LDL cholesterol](#), [higher triglycerides](#), and [lowering HDL \(good\) cholesterol](#). Overconsumption of refined carbohydrates in [combination](#) with fats are the driving forces for the [obesity epidemic](#).



# FAT

- *9 calories per gram.*
- The Good
  - Most foods that are naturally high in fat, such as animal sources, nuts, avocados, and coconuts, contain an abundance of [vitamins and minerals](#), as well as essential fatty acids required for body functioning and [health](#). It is also a very good source of [body fuel](#) and contributes to [weight loss](#). Crucial vitamins A, D, E, and K, are fat-soluble which means fats are required for [bioabsorption](#).
  - Monounsaturated and saturated fats from animal sources, eggs, butter, avocados, coconut oil, and extra virgin olive oil are [health-promoting](#).
- The Bad
  - Although [fats are important](#) for weight loss, they are high in energy density, compounded by fried foods.
  - The body functions well with an omega-3 and omega-6 ratio of 1:1 or 1:2. Most of us consume [1:15 or higher](#), which contributes to [inflammation](#) and [oxidative stress](#), leading to a host of [critical diseases](#). Sources high in omega-6 polyunsaturated fats are margarine, canola oil, and vegetable oil.
  - Saturated fat is detrimental to health [when combined](#) with refined carbohydrate sources.



# PROTEIN

- *4 calories per gram.*
- The Good
- Protein is the most [satiating](#) macronutrient and is crucial for [weight management](#). Proteins are the building blocks for muscle and is essential to sustain life.
- The Bad
- Proteins are poor fuels for energy.



# SPORT-SPECIFIC NUTRITION

## EXPLOSIVE ATHLETES

- ✓ Explosive strength and power is required on a sustained, repetitive basis.
- ✓ Muscle glycogen is immediate energy source.
- ✓ *High* protein requirements
- ✓ Constant supply of carbohydrates to refuel bodies glycogen stores.

### ▪ **Total Caloric Ratio Need**

- ✓ 20% Fat
- ✓ 25% Protein
- ✓ 55% Carbohydrate

## ENDURANCE ATHLETES

- ✓ Aerobic pathway is primary energy source.
- ✓ Fatty acids & Muscle glycogen main fuels.
- ✓ *Moderate* protein requirements
- ✓ Constant supply of carbohydrates to refuel bodies glycogen stores.

### ▪ **Total Caloric Ratio Need**

- ✓ 20% Fat
- ✓ 20% Protein
- ✓ 60% Carbohydrate

# MACRONUTRIENT SUGGESTIONS

## Caloric Intake



Workout Days Ratio (more calories)



Rest Days Ratio (fewer calories)



Workout Days Ratio (more calories)



Rest Days Ratio (fewer calories)

## Portion Sizes

**Workout Days**  
(larger plate)



**Rest Days**  
(smaller plate)



### Legend

- Carbs (Vegetables)
- Carbs (Starches)
- Proteins
- Fats

### Note

Vegetables are in larger portion sizes since they are low in calories. Fats are higher in calories so smaller portion sizes are suggested.

# WHY THESE COMBINATIONS

- Carbohydrates, proteins, and fats are adjusted according to workout or rest days.
- Workout days [require more](#) carbohydrates and calories to fuel workouts.
- In contrast, since we are more sedentary on rest days, we [benefit](#) from lower carbohydrate consumption. Higher protein consumption is used on workout days to improve [protein synthesis](#) and muscle recovery. Higher protein intake is also beneficial in cutting to preserve lean mass and promote satiety.
- The macronutrient ratios do not fit all athletes, however, as endurance and high-performance athletes require [more carbohydrates](#).






<b>GRAINS</b> Make half your grains whole	<b>VEGETABLES</b> Vary your veggies	<b>FRUITS</b> Focus on fruits	<b>MILK</b> Get your calcium-rich foods	<b>MEAT &amp; BEANS</b> Go lean with protein
<p>Eat at least 3 oz. of whole-grain cereals, breads, crackers, rice, or pasta every day</p> <p>1 oz. is about 1 slice of bread, about 1 cup of breakfast cereal, or ½ cup of cooked rice, cereal, or pasta</p>	<p>Eat more dark-green veggies like broccoli, spinach, and other dark leafy greens</p> <p>Eat more orange vegetables like carrots and sweetpotatoes</p> <p>Eat more dry beans and peas like pinto beans, kidney beans, and lentils</p>	<p>Eat a variety of fruit</p> <p>Choose fresh, frozen, canned, or dried fruit</p> <p>Go easy on fruit juices</p>	<p>Go low-fat or fat-free when you choose milk, yogurt, and other milk products</p> <p>If you don't or can't consume milk, choose lactose-free products or other calcium sources such as fortified foods and beverages</p>	<p>Choose low-fat or lean meats and poultry</p> <p>Bake it, broil it, or grill it</p> <p>Vary your protein routine – choose more fish, beans, peas, nuts, and seeds</p>

For a 2,000-calorie diet, you need the amounts below from each food group. To find the amounts that are right for you, go to [MyPyramid.gov](http://MyPyramid.gov).

Eat 6 oz. every day	Eat 2½ cups every day	Eat 2 cups every day	Get 3 cups every day; for kids aged 2 to 8, it's 2	Eat 5½ oz. every day
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**Find your balance between food and physical activity**

- Be sure to stay within your daily calorie needs.
- Be physically active for at least 30 minutes most days of the week.
- About 60 minutes a day of physical activity may be needed to prevent weight gain.
- For sustaining weight loss, at least 60 to 90 minutes a day of physical activity may be required.
- Children and teenagers should be physically active for 60 minutes every day, or most days.



**Know the limits on fats, sugars, and salt (sodium)**

- Make most of your fat sources from fish, nuts, and vegetable oils.
- Limit solid fats like butter, stick margarine, shortening, and lard, as well as foods that contain these.
- Check the Nutrition Facts label to keep saturated fats, trans fats, and sodium low.
- Choose food and beverages low in added sugars. Added sugars contribute calories with few, if any, nutrients.

# WATER & ATHLETIC PERFORMANCE

- Water replenishment is the most important factor during exercise.
- Outside the narrow range of 98-100°F, your body will always sacrifice muscle function for temperature regulation.
- Drink a minimum of 3.5 to 5 litres/day.
  - ✓ Flushes out metabolic waste products
  - ✓ Maintains the bodies cooling system
  - ✓ Prevents muscle cramps, strains and pulls



# ERGOGENIC AIDS & NUTRITIONAL SUPPLEMENTATION

- Supplements are just that...**Supplemental!!**
- Whole foods should supply basic total caloric intake of an athlete's diet.
- Choose supplements that are high quality, professional grade. Research!
- **There is no magic pill formula to success!!**

