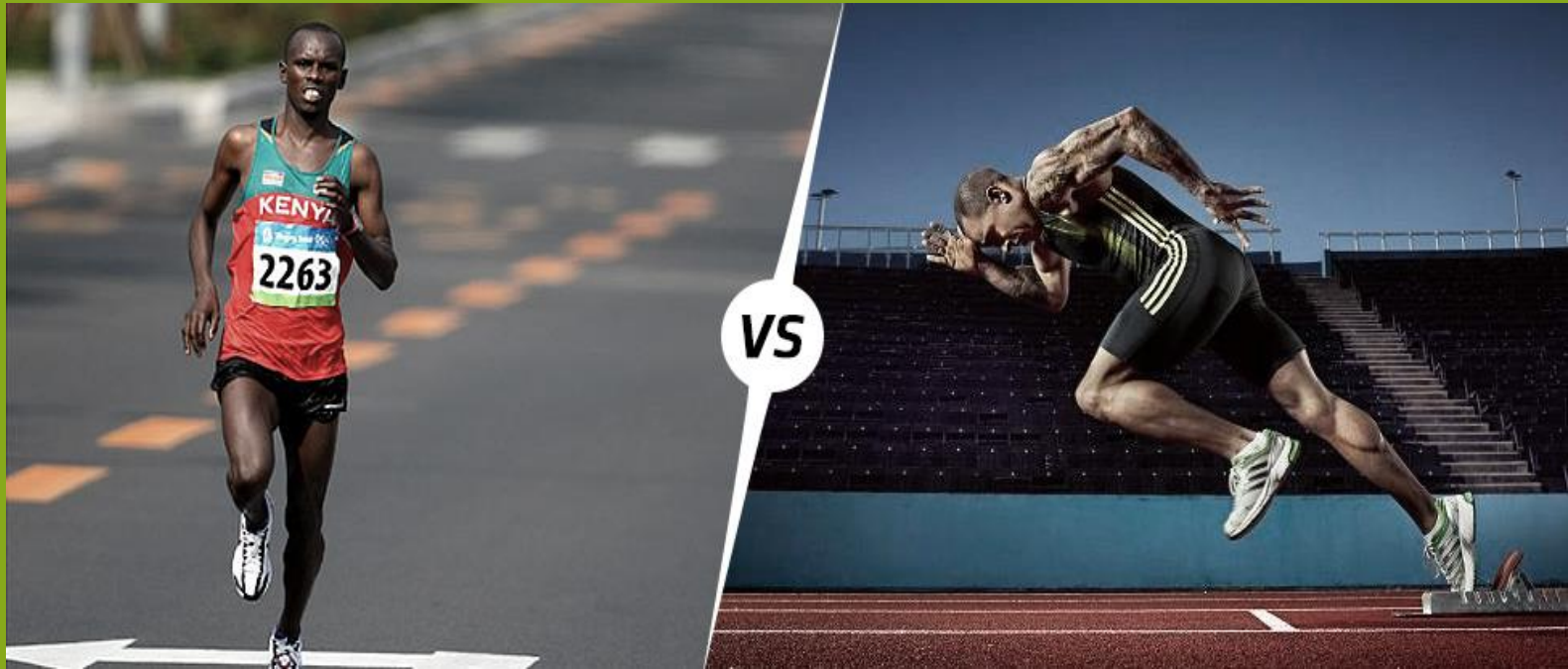




PAF30-PAF40

PERSONAL FITNESS

AEROBIC vs ANAEROBIC ENERGY SYSTEMS



Anaerobic



Weightlifter



Gymnast



Sprinter

Aerobic



Runner



Cyclist

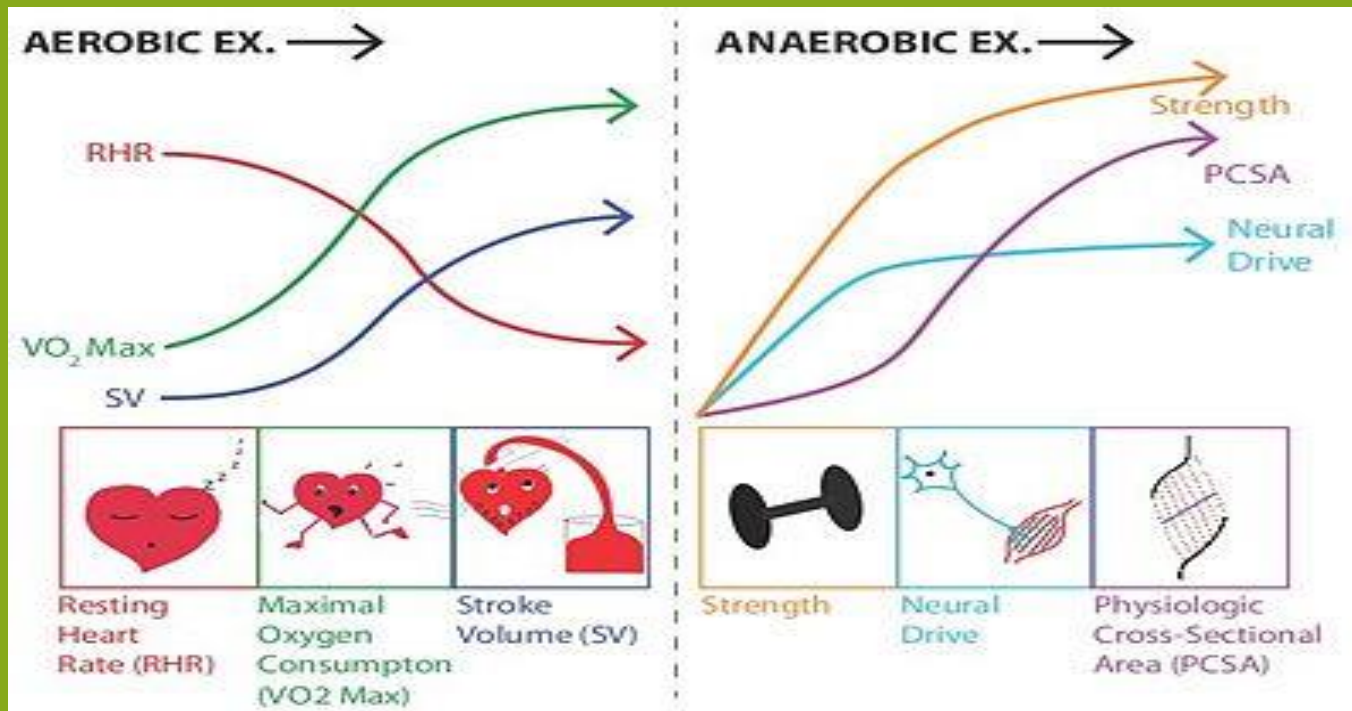


Triathlete

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 (VO₂max)
- 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

A E R O B I C

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 ⁺ 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

	Aerobic	Flexibility	Muscular Endurance	Muscular Strength	Body Composition
F	<ul style="list-style-type: none"> • 3-5 times / week 	<ul style="list-style-type: none"> • Daily • Warm-up • Cool down 	<ul style="list-style-type: none"> • Daily for some muscle groups • 3-4 times / week 	<ul style="list-style-type: none"> • 3 times / week • Different muscle groups 	<ul style="list-style-type: none"> • Daily exercising • Follow Canada's Food Guide
I	<ul style="list-style-type: none"> • 60-90% of max. heart rate 	<ul style="list-style-type: none"> • Hold 15-30 seconds • Total body • 1-3 reps 	<ul style="list-style-type: none"> • 15+ reps • ,50% max. weight • Body weight • 1-3 sets • 8-12 exercises 	<ul style="list-style-type: none"> • 70-90% of 1-rep max. • 1-4 sets • 8-12 reps • 8-12 exercises 	<ul style="list-style-type: none"> • Light to moderate
T	<ul style="list-style-type: none"> • 15-60 minutes of continuous activity • Progressive 	<ul style="list-style-type: none"> • 10-20 minutes 	<ul style="list-style-type: none"> • 30-60 minutes • Progressive 	<ul style="list-style-type: none"> • 15-60 minutes • Progressive 	<ul style="list-style-type: none"> • 30-60 minutes • Progressive
T	<ul style="list-style-type: none"> • Large muscle groups • Continual rhythmic • Running, cycling, swimming • Games 	<ul style="list-style-type: none"> • static stretch • controlled dynamic stretch 	<ul style="list-style-type: none"> • resistance training • body weight • circuit training 	<ul style="list-style-type: none"> • resistance training 	<ul style="list-style-type: none"> • aerobic activity • walking, running, cycling, swimming

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 BE 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.

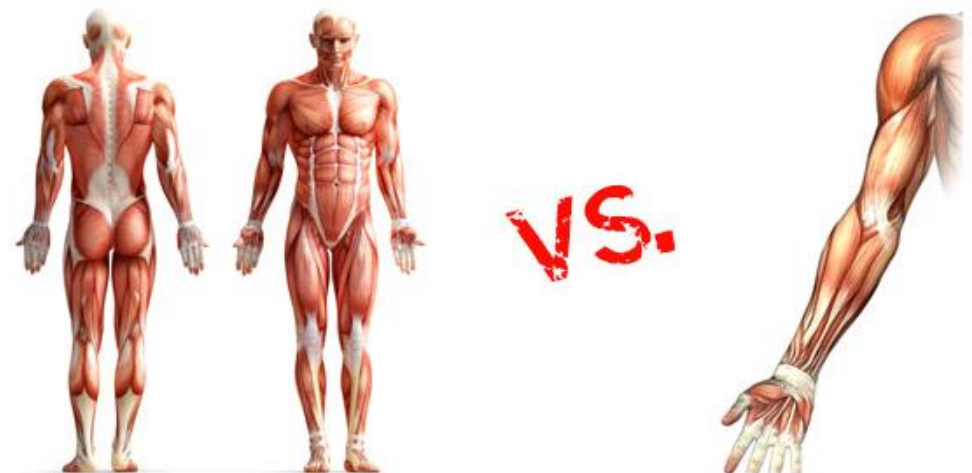
7. Make sure it works.

- 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

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

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

