



Special Olympics

COACHING GUIDE

Athlete Nutrition, Safety and Fitness

Athlete Nutrition, Safety and Fitness

Table of Contents

Table of Contents

Nutrition

- Hydration - Keeping Water in the Body
- Calories
- Energy Balance
- Nutrient Balance
- Types of Nutrients
- Balanced Diet
- Pre-Competition Meal/Nutrients
- During Competition Nutrients
- Post-Competition Nutrients
- Analyze Your Diet

Fitness

- Sample Fitness Program
- Fitness Triangles
- Things to Keep Athletes Tobacco Free

Principles of Training

- Law of Overload
- Law of Reversibility
- Law of Specificity
- Principle of Individualism
- Principle of Variety
- Principle of Active Involvement
- Training Principles Summary
- Training Periods

Systems Training

- Energy Systems
 - Aerobic System (with oxygen)
 - Anaerobic Lactic System (without oxygen)
 - Muscular System

Strength Training and Conditioning

Strength

Principles of Strength Training and Conditioning at-a-Glance

Muscle-Specific Strength Exercises

Exercises to Develop Back and Abdomen Muscles

Exercises to Develop Arm and Shoulder Muscles

Exercises to Develop Foot and Leg Muscles

Exercises for Agility and Conditioning

Plyometrics Training

Coaches Guidelines for Teaching Plyometrics

Plyometric Drills

Designing a Strength and Conditioning Circuit

Circuit Training

Training Considerations

Setting up the Circuit

Sample Training Circuit Routines

General Conditioning Circuit – Sample 1

General Conditioning Circuit – Sample 2

Nutrition

In this section, we will see how the food we eat impacts successful training and competition. Nutrition basically means all the food we eat and the beverages we consume. Food is our body's energy source which gives us our "get up and go." Without it, athletic performance goes down.

Hydration - Keeping Water in the Body

During exercise, the body loses water primarily through sweat, even in cold weather or in water. The body has several mechanisms to protect itself from the negative effects of dehydration, but thirst does not occur until the person is already dehydrated! As small a loss as 4 percent of body weight (4 pounds in a 100 pound person) can seriously affect performance.

The goal is to keep the athlete hydrated and not allow him/her to become dehydrated. The easiest way is to create a simple, routine system that all your athletes follow:

When to Drink Water	How Much Water to Drink
Night before practice or competition	Glass of water (8 oz/250ml)
Four hours before event	Glass of water (8 oz/250ml.)
15 minutes before event	One-half glass of water (4 oz/125ml)
During event of less than one hour	One water break
During event of more than one hour	One-half glass every 20 minutes
After event	Glass of water every three hours until next day

Athletes need to be instructed to "drink as much water as they want." Several serious medical conditions can occur from too much water. If you are practicing in warm environments, you may need to increase the frequency of water breaks. The athlete can hydrate with several types of liquids; however, the best replacement for most events is plain water.

- Water
- Carbohydrate drinks (PowerAde, Gatorade)
- Mixture of one-third fruit juice and two-thirds water is best used when the activity is of longer duration than one hour

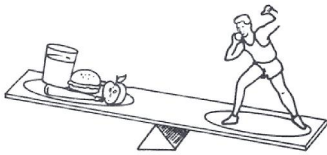
Calories

The energy the body gets is measured in calories. Different foods provide different amounts of energy, therefore varying amounts of calories. The amount of calories a person needs depends on many factors. Our metabolic rate is the speed at which we convert food to energy. This rate can be fast, slow or moderate, depending on the athlete. For example, younger athletes require about 3,000 calories per day. This may decrease for some older athletes that have less stringent training and competition programs. All these factors determine an athlete's diet. If insufficient calories are not consumed, an athlete's performance will be negatively impacted.

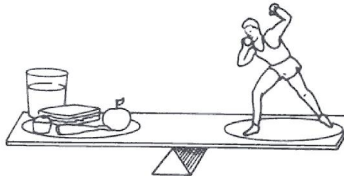
Energy Balance

Energy balance is important for successful training and competition.

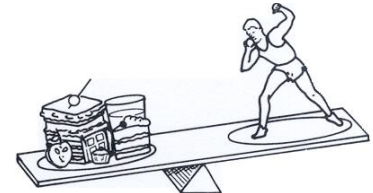
Energy Intake < Energy Output



Energy Intake = Energy Output



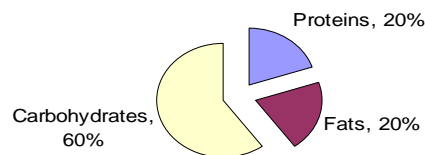
Energy Intake > Energy Output



Nutrient Balance

Nutrients have different jobs, though they work together or need the presence of others to work properly. Nutrient balance is like the energy balance. Athletes must take in all the nutrients they require to be healthy and strong in training and competition. A typical high performance diet for an athlete will provide most energy from carbohydrates, with low and almost equal amounts of fat and protein.

Recommended High Performance Diet



Types of Nutrients

Protein—main body building nutrient

- ♦ Constant need for regular intake
- ♦ High quality: eggs, milk, fish, meat
- ♦ Low quality: nuts, lentils, beans
- ♦ Too much protein converts into energy source or stored as body fat

Carbohydrates—our energy food

- ♦ Body's major energy source
- ♦ Breaks down quickly and easily in digestive system
- ♦ Good sources (complex): rice, corn, potatoes, beans, fruits
- ♦ Poor sources: white sugar, honey, soft drinks, chocolate bars
- ♦ Complex carbohydrates need to be main part of diet

Fats—slow energy food

- ♦ Concentrated energy source, twice as much as carbohydrates
- ♦ Breaks down very slowly and uses more oxygen to create energy
- ♦ Need small amounts for optimal health
- ♦ Visible fats: butter, margarine, plant and fish oils, fat on meat
- ♦ Invisible fats: milk, cheese, nuts, certain vegetables (vegetable fat is better for us)

Vitamins—most easily consumed through well-balanced diet

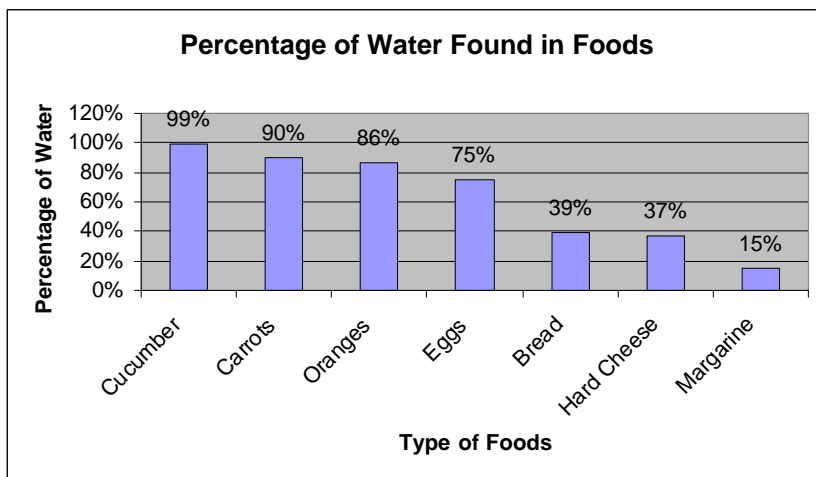
- ♦ Need small amounts daily
- ♦ Low levels can reduce performance
- ♦ Highest proportions in natural, fresh foods
- ♦ Fat soluble: stored in body and ready for use
- ♦ Water soluble: cannot be stored, must be in daily food intake
- ♦ Vitamin C cannot be used without iron

Minerals—most easily consumed through well-balanced diet

- ♦ Need small amounts daily
- ♦ Essentials: calcium, sodium, potassium, iron, iodine
- ♦ Iron is essential for oxygen transport throughout the body
- ♦ Iron cannot be used without Vitamin C
- ♦ Iodine controls rate that energy is released
- ♦ Calcium helps muscles react normally and recover from exercise

Water—required by the body for survival

- ♦ Performance is impacted immediately if water needs are not met, especially for aquatics athletes
- ♦ The harder you train and exercise, the more water you need
- ♦ Drink water often and in small amounts before, during and after competition
- ♦ Food contains more water than we think



Fiber—important though often ignored

- ♦ Not absorbed by body
- ♦ High fibers: natural plant foods
- ♦ Good fibers (bran): wheat, oats, brown rice
- ♦ Low fibers (processed foods): white flour, white sugar, white rice, white pastas
- ♦ Make you feel full without getting fat

Balanced Diet

A balanced diet maintains proper energy and nutrient balance. It does not have to be expensive when you follow some of the ideas below.

Guidelines for a Balanced Diet

- ♦ Eats lots of different kinds of food – vegetables, fruits, fish, meats, dairy produce and grains
- ♦ Eat fresh food rather than ready prepared, canned or frozen foods
- ♦ Eat a high proportion of complex carbohydrate rich foods
- ♦ Grill, steam or bake foods. Avoid boiling or frying
- ♦ Avoid fatty meals and sweet and salty snacks
- ♦ Check fiber intake by eating whole grain breads, cereals, pastas
- ♦ Eat brown rice instead of white rice
- ♦ Flavor food with herbs and spices rather than salt
- ♦ Drink small amounts of water and fruit juices often

Pre-Competition Meal/Nutrients

The body's energy levels need to be high before training and competition. The high performance diet above will supply this everyday requirement. Athletes are individuals and require different foods and their body responds differently to certain foods. Generally speaking, the guidelines below will help your athletes consume the proper nutrients before competition.

- Eat a small, easily digestible meal, usually less than 500 calories
- Eat about 2½-4 hours before competing
- Limit proteins and fats since they digest slowly
- Avoid foods which form gas in digestive system
- Drink small amounts of water often, before, during and after competing

During Competition Nutrients

- Besides hydration, nutrients are not needed for events that last less than one hour.
- For events that have more than one hour of continuous activity, carbohydrate drinks or fruit will supply the needed energy for continued effort.
- During tournaments lasting more than two hours, let your athletes nibble on small pieces of banana, peanut butter sandwiches, noodles or plain pasta (complex carbohydrates) when they have at least a half-hour break before their next game. This will help them keep their energy levels up. Do not fast your athletes for the duration of a 6-8 hour event.

Post-Competition Nutrients

- To replenish energy, foods with readily available carbohydrates (fruit, carbohydrate drink, granola bars) should be eaten in small amounts immediately following exercise.
- Throughout the remainder of the day, meals should contain 65 percent complex carbohydrates to replenish energy.

Athlete Nutrition, Safety and Fitness Nutrition

Analyze Your Diet

The following questions will help you analyze your athlete's diet (and yours). Mark the column with the most accurate reply.

Question	Yes	No	Do Not Know
Are there a lot of different foods in your diet?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you eat enough carbohydrates?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you eat mostly complex carbohydrates?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you eat animal proteins?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If yes, are they mostly red meat?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mostly fish and white meat?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you eat eggs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you eat dairy produce?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you eat a variety of plant proteins?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are there a lot of vegetable fats in your diet?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is your food mostly fresh?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is your food mostly canned?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you drink a liter, or more of water a day?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you drink mostly soft drinks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is there enough fiber in your diet?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How do you prepare your food mostly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Steamed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Grilled	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Baked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stir Fried	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Boiled	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fried	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Recommendations

Foods to Add	
Foods to Decrease	
Changes in Storage	
Changes in Cooking	

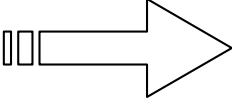
Fitness

Fitness is how well a person is adapted to and capable of living a certain lifestyle. The fitness requirement of our athletes is greater than that of non athletes. Training theory brings together all the information about sport from social and scientific sources. The coach and athlete work together to produce an effective training program to increase an athlete's fitness and ultimately improve their athletic performance.

Fitness is made up of five basic components.

1. Strength
2. Endurance
3. Speed
4. Flexibility
5. Coordination

Each exercise in training develops a specific component. Different events have different demands on fitness.

Exercise	Requires	Load
Strength		Maximal
Endurance		Duration and distance maximal
Speed		Quickness and frequency
Flexibility		Agility and conditioning
Coordination		Complex movements

Sample Fitness Program

Focus on overall general fitness for Special Olympics athletes. The program below has three major components—warm-up, exercises and cool-down. The number of reps and sets will determine the goal of your program: muscle endurance or muscle strength. Review the following muscle specific strength exercises and plyometric drills to develop your own fitness program.

Activity	Duration
Warm-Up	
Easy aerobic walk/jog/run	3-5 min
Stretching	15-20 min
<ul style="list-style-type: none">Upper Body	3-5 exercises of each muscle group
<ul style="list-style-type: none">Low Back-Glutes	
<ul style="list-style-type: none">Lower Body	
Exercises	
Agility & Conditioning	
<ul style="list-style-type: none">Acceleration Strides	3 x 30m
<ul style="list-style-type: none">Leg Swings (F/S)	1 x 10 each leg
<ul style="list-style-type: none">Calf Raises	1 x 10 each leg
Arms & Shoulders	
<ul style="list-style-type: none">Push ups: Wide	5 reps
<ul style="list-style-type: none">Triceps Dip	5 reps
<ul style="list-style-type: none">Push ups: Regular	5 reps
Back & Abdomen	
<ul style="list-style-type: none">Sit Ups: Side Lifts	10 reps
<ul style="list-style-type: none">Leg Raises	10 reps
<ul style="list-style-type: none">Trunk Twists	10 reps
Foot & Legs	
<ul style="list-style-type: none">Lunges – Walking	3 x 30m
<ul style="list-style-type: none">Squats	10 reps
<ul style="list-style-type: none">Kangaroo Hops	2 x 5
Cool-Down	
Easy aerobic walk/jog/run	3-5 min
Light Stretching	10-15 min

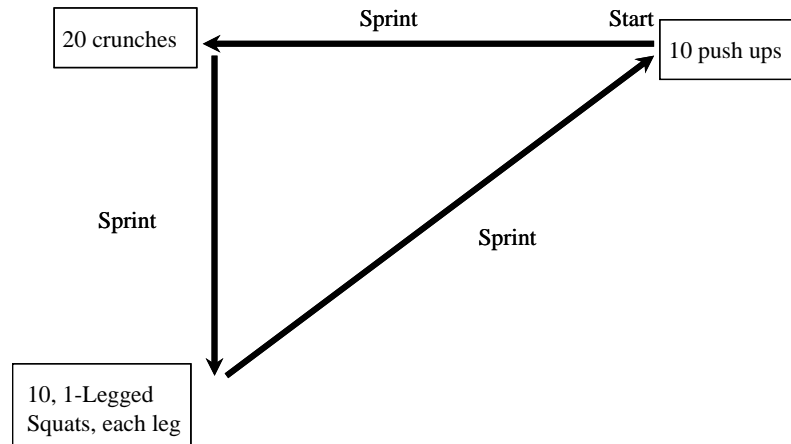
An Athletics Example

A strength training and conditioning circuit can be used in the exercise section above within your fitness program.

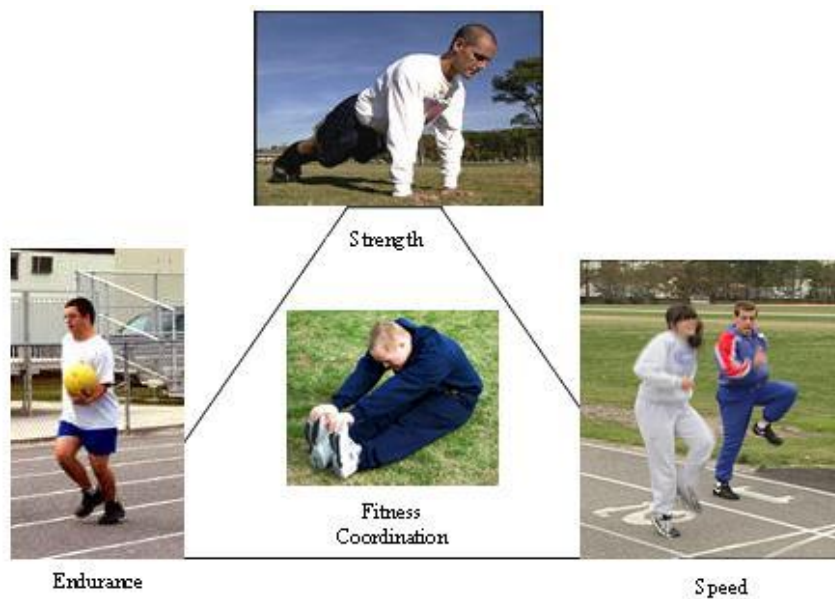
Fitness Triangles

Fitness triangles are an excellent way to attain good fitness. A fitness triangle exercise can easily be integrated into a strength and/or conditioning circuit. Maintaining proper running form and building muscular strength is the purpose of the fitness triangle below. Repeat this triangle several times after a long warm-up. A good warm-up would start with a 1-1½ mile jog and ample stretching. Running or jogging to a park is a good break from the track.

Fitness Triangle - Example 1



Fitness Triangle - Example 2



Things to Keep Athletes Tobacco-Free

Top physical conditioning is not accidental. It is the result of lots of hard work and proper guidance that promotes positive athlete behavior. As a coach, you have tremendous influence on an athlete's nutrition, physical conditioning, sportsmanship, personal responsibility and goal setting. The effects of tobacco use are extremely limiting to athletic performance, especially when athletes are recovering from injuries. The following are a few things to help keep your athletes and their sporting environment – tobacco free.

1. Never use tobacco products around your athletes. Recognize the influence you have over them. Model the behavior you would like them to assume.
2. Adopt a tobacco-free policy for you and your players.
3. Share your tobacco-free policies with athlete's family members and caregivers.
4. Distribute tobacco-free information to your athletes.
5. Work with assistant coaches and athlete family members to make the field of play tobacco-free.
6. Connect with a community group that is also working for a tobacco-free community.
7. Talk to you athletes about the health effects of tobacco. Remember they will relate more to messages about the immediate effects of tobacco use – such as poor athletic performance – than to it long term health effects. Make the following points over and over.
 - Tobacco cuts down on fitness. So if you smoke or use other tobacco products, you are not going to be able to run as fast or as far as your tobacco-free teammates and competitors.
 - There are no safe tobacco products. Spit tobacco and cigars also cause cancer and harm your athletic performance.
 - Tobacco slows down your lung growth and reduces lung function. That can leave you gulping for air when you need it most.
 - Teen smokers suffer from shortness of breath almost three times as often as teens who do not smoke. Breath is something and athlete cannot afford to be short of!
 - A smoker's heartbeat is three times faster than that of a non smoker. So in competition, your body wastes a lot of heartbeats just trying to keep up with non smokers.
 - Young smokers produce phlegm (yuck!) more than twice as often as those who do not smoke. Ever try breathing and trying to spit at the same time?
 - Three out of four young people who smoke say they keep smoking because it is really hard to quit. Do you want to be hooked on nicotine or sports?
 - Teens who smoke are more likely to drink heavily and use illegal drugs such as marijuana and cocaine. So, if you think, "it is just cigarettes," think again.
 - The long term health effects of smoking may seem to be in the distant future, but they are real. Each year, smoking kills more people than AIDS, alcohol, drug abuse, car crashes, murders, suicide and fires – combined! Smoking and athletic performance definitely do not mix.
8. Spread the word about tobacco on athletes and their bodies and athletic performance.

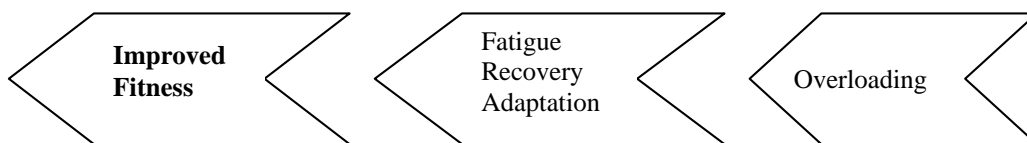
Principles of Training

Training is a systematic process in which athletes improve their fitness to meet the demands of their sport. Training is a long-term process that is progressive and meets the individual athlete at their level of fitness and conditioning. Training uses both general and event-specific exercises to develop an athlete for their sport. Training is a cyclical process: tear down, recovery, super-compensation and buildup (adaptation).

When we train, we do specific damage to some cells, and use up cellular resources (fuel, water, salts). When you walk off the track or get out of the pool after a workout, you are weaker, not stronger. How much weaker depends on the amount and intensity of the exercise. After the training session, if the body is given proper rest and food, the body will adjust to super-compensate and prepare for the next stress.

Law of Overload

Overloading is perhaps the fundamental principle of fitness. It is basically an increase in demand to force bodily adaptation. A training load is the work or exercise that an athlete performs in a training session. Loading is the process of applying training loads—training programs.



When an athlete's fitness is challenged by a new training load there is a response from the body. This bodily response is called an adaptation. The initial response is fatigue. When the loading stops there is a process of recovery. Recovery and adaptation take the athlete to a higher level of fitness from where he/she started.

It is safest to alter one of the three factors below to overload the body. We will address these three factors event specifically in each sport specific coaching guide. The load is changed in a slow, systematic manner to allow gradual adaptation of the body.

Frequency	how often
Duration	how long
Intensity	how hard

The body's ability to adapt explains how training works. If the training load is not great enough there is little or no increase in fitness level or athletic performance. A loading that is too great can result in injury or illness to the athlete.

Law of Reversibility

You know the saying, "If you do not use it, you lose it." If athletes are not training regularly, there is no need for their bodies to adapt. Be creative and innovative in getting your athletes to train and compete more often. Increased training frequency will not only help them improve their athletic performances, but their fitness levels will improve as a direct result of increased training. That will have a positive impact on their overall quality of life—they'll be healthier.

It is also important to not over train or overload the body so much that it experiences incomplete adaptation. Rest is no longer adequate for recovery. Decline in performance caused by incomplete adaptation is one of the most obvious signs of over training.

Additional common signs of over training include the following.

- Irritability and moodiness

Athlete Nutrition, Safety and Fitness

Principles of Training

- Altered sleep patterns
- Loss of appetite
- Loss of motivation or competitive drive
- Persistent muscle soreness that does not go away
- Fatigue not relieved by rest
- Increased incidence of minor illness or injury

Law of Specificity

The specific nature of a training load produces its own specific response and adaptations. The exercise will have a very specific pattern of joint and muscle coordination. The training load must be specific to both the individual athlete and the demands of their chosen event. This does not negate general training. General training prepares athletes for specific training. The greater the volume of general training, the greater the capacity is for specific training.

Principle of Individualism

Athletes respond in their own individual way to fitness activities. Athletes bring their unique talents, capabilities, capacities and responses to training. Heredity determines many physiological factors such as heart and lung size, characteristics of muscle fiber, physique and balance. The amount of rest and sleep as well as responses to the environment (heat/cold, pollution, stress and altitude) vary from one athlete to another. Nutrition and past or current illness or injury will also have an influence on ability to perform.

The body's physiological readiness for training is another important factor. Athletes at the same chronological age can be at very different levels of maturity, and up to four years apart in their developmental and biological ages. In addition, training age, the length of time an athlete has been training, must also be considered.

Athletes – Same Chronological Age – Different Training Capacities

Chronological Age	Biological Age	Training Age
11	9	1
11	13	3

Athletes – Same Chronological Age – Similar Training Capacities

Chronological Age	Biological Age	Training Age
12	13	2
15	13	2

Principle of Variety

Training is a long-term process and loading and recovery can become boring. Plan variety into your athlete's training program. Build in cross-training workouts and add pool workouts to the program. Be creative. Variation is an alternation of stress and is a necessary part of an athlete's progression. A weekly and monthly schedule should contain alternating periods of hard and easy work. Work should alternate with periods of rest to allow the body to adapt to the changes that have occurred.

Principle of Active Involvement

Perhaps the most important principle, active involvement, requires the athlete wanting to actively and willingly participate in their training program. Improvement in overall fitness requires long-term commitment by the coach and especially the athlete. This requires that all aspects of an athlete's life contribute to the success of his/her performance on the field of play.

Training Principles Summary

Law of Overload

- Body adapts to training loads—explains how training works
- Adequate training loads improve overall fitness and increase performance
- Factors impacting training load—frequency, duration and intensity

Law of Reversibility

- Training loads that increase progressively create higher fitness levels
- No increase in fitness will occur if loading is too far apart or stays the same
- Over training or incomplete adaptation occurs when training loads are too great or too close

Law of Specificity

- Specific training load produces specific response and adaptations
- General training prepares athletes for specific training
- Greater the volume of general training, greater the capacity for specific training

Principle of Individualism

- Athletes bring their unique talent, capabilities and capacities to training
- Heredity determines many physiological factors that impact training
- Chronological, biological and training ages must be considered when designing a training and competition plan

Principle of Variety

- Training is a long-term process and loading and recovery can become boring
- Make it fun for the athlete
- Be creative

Principle of Active Involvement

- Athlete has to want to actively and willingly participate in their training program
- Athlete has to be committed
- All aspects of an athlete's life contributes to their athletic success

Training Periods

Improvements in performance are not linear but occur at different rates in the physiological systems. For those reasons, fitness and/or sports training should be divided into useful periods with varying goals, depending on the time relation to the actual athletic event. A well-designed fitness plan not only changes its focus from period to period but also varies from hard to easy and from activity to rest within each seasonal period.

The most logical division of the year for athletes involved in one or more sporting activities is into periods related to that sport. If the athlete is involved in more than one athletic event, these periods must be tailored around the several athletic pursuits.

Pre Season (8-12 Week Period Prior to Competition)

The goals of the pre-season period include the following:

- ♦ Development of sport-specific muscle strength and endurance
- ♦ Development of appropriate aerobic (endurance) vs. anaerobic (high-intensity) conditioning
- ♦ Development of muscle power (as needed for activity)
- ♦ Development of sport-specific skills and team play

In Season (Competitive Period)

The training program during the actual season has two primary goals:

- ♦ Maintenance of the gains of pre-season training
- ♦ Continued specific attention to areas of the body at risk?either from past injury or the particular risks of the sport

Post Season (3-4 Week Period or Less Following the End of Competition)

- ♦ Short period
- ♦ The goal of this period is rest and physical and mental recovery of the athlete

Off Season (Longest Period of Time between Post and Pre Seasons)

The focus of the off season is recovery and rehabilitation of injuries; overall aerobic conditioning; development of general, balanced muscle endurance and strength; and development of neuromuscular balance and coordination.

Systems Training

Different exercises use different fuels via different pathways, depending on the intensity and duration of the activity and the fitness level of the athlete. The goal of effective training is to make the appropriate system most efficient when the activity is performed. There are two primary systems of the body that have to become fit for activity—the energy system and the muscular system. This sounds more complicated than it actually is.

Sport coaches must understand the energy system capabilities and limitations to design sequenced training programs. In teaching athletes to listen to their bodies during training sessions, adjustments can be furnished in the sequenced workout with careful understanding of the energy system. Remember that all energy systems turn on at basically the same time; intensive tempo running makes high demands on both the aerobic and anaerobic and, thus, is a sharing system.

Energy System

Ask yourself these quick, easy questions to determine which system your exercise is using.

1. Is oxygen required? (or, is running or jumping involved)
 - If yes, the energy system is Aerobic—with oxygen
 - If no, the energy system is Anaerobic—without oxygen
2. Is lactic acid produced?
 - If no, the energy system is Anaerobic Alactic (0-10 seconds energy)
 - If yes, the energy system is Anaerobic Lactic (10 seconds-1 minute energy)

Athletes are capable of using one or a combination of the two energy systems. Different events demand different types and amounts of muscle activity. Different systems dominate in various events. Our goal is to design a training program that increases the capacity of a specific energy and muscular system, therefore increasing performance.

Aerobic System (with oxygen)

Aerobic training is good for the development of the cardiovascular system. It enables athletes to recover from tough workouts and helps develop the capacity increase repetitions.

- Very efficient, does not produce fatigue-producing waste products
- Lower intensity exercises
- Important in the recovery process for all exercises
- Heart and lungs are critical
- Resists fatigue
- Takes longer to overload than the anaerobic systems
- Requires a minimum 20 minutes duration training period
- Workload can be continuous or broken up into interval training
- Examples of aerobic activities include jogging, running, walking

Anaerobic Lactic System (without oxygen)

- Less efficient, produces lactic acid, hastening muscle fatigue
- High intensity level
- Body must burn carbohydrates stored in muscle
- Lactic acid must be removed?can take up to one hour
- Carbohydrates must be replaced for further activity to occur
- First ten minutes of active recovery produces greatest reduction in lactic acid
- Provide majority of energy requiring high bursts of speed or resistance lasting up to 10 seconds
- Built by alternating periods of work and rest
- Several easy indications of anaerobic effort are difficulty with breathing, or difficulty with sustaining effort
- Builds on the aerobic base, and challenges the athlete at the upper level of aerobic capacity
- Examples of anaerobic activities include weight training, sprints, starts, jumping, interval training, training at various speeds or training at a defined pace

Muscular System

Just as with the energy system, the muscular system must be developed for efficiency of action. The muscular system can be trained for endurance, strength, power and speed.

Muscle Endurance

Muscular endurance is the ability of the muscle to perform repetitive contractions over a long period of time. The number of repetitions needed is dependent on the particular activity. However, it is important to count minutes of activity, not sets. Muscle endurance is increased by adding 1-3 minutes to a workout each week. This training is usually completed in sets and repetitions. Repetition also trains the athlete to perform the activity correctly before any additional load is added.

Muscle Strength

Muscular strength is the development of maximal force in a muscle or group of muscles. Once muscular endurance has been developed, the activity can switch to development of more force in specific muscles. Again, the number of sets and repetitions must be designed with the activity in mind, but usually 5-6 repetitions in 2-3 sets will be effective for most strength activities. Ultimately the athlete will be able to lift 2-2½ times more resistance than they will encounter in their activity.

Muscle Power

Muscle power is the ability to quickly exert force (strength) over a distance in relation to time. Power cannot be developed until the athlete has first developed strength. This is a common error in training that can lead to injury. Training for power combines force and speed in a sport-specific activity. For example, instruct the athlete to lift 30-60 percent of the maximal amount quickly for 15 repetitions in two sets. Another example of power activities is plyometrics, or explosive activities, that build the strength necessary for jumping or bounding activities.

Muscle Speed

Muscle speed is training those sprint muscles to punch it. Training for speed takes athletes outside of the energy system requirements preset in the sprint. For example, a 200m athlete training for speed endurance needs to run very fast, at a very high percentage of maximum effort. Therefore, the athlete cannot train for speed endurance at less than 90 percent or he/she will be locked into a slower muscular recruitment, thereby getting a slower muscular response—and no speed. Want to run fast? Train fast.

Strength Training and Conditioning

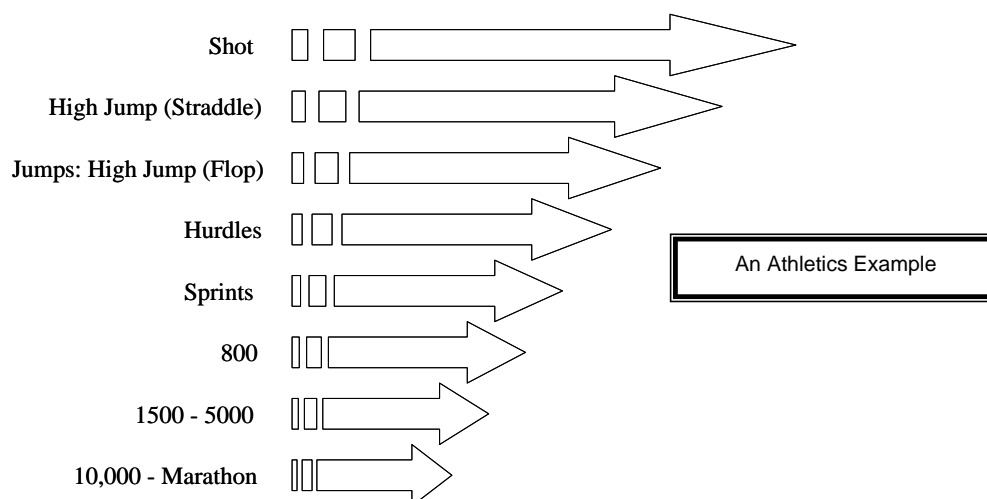
In this section we will focus on exercises that can be performed outside of the weight room, as many may not have access to weight-room facilities. A comprehensive strength and conditioning program can be performed on the track infield or soft surface for almost every muscle and movement associated with sport by utilizing medicine ball drills, plyometrics, traffic cones or body-weight resistance exercises. Please refer to the end of this section for weight training exercises.

Strength

Muscular strength is the ability of the body to exert force. Strength is important to every event in athletics. The strength information here is designed to take athletes through a systematic set of exercises that will lead to specific results. Therefore, the strength training program you design for athletes needs to enhance, not replace, the actual event-specific training of each athlete.

Types of Strength

1. Maximum Strength
2. Elastics Strength
3. Strength Endurance



Elastic Strength

Elastic strength is our source of power. It is the combination of speed of contraction and speed of movement. Elastic strength is most important in explosive events? sprints, jumping and throwing.

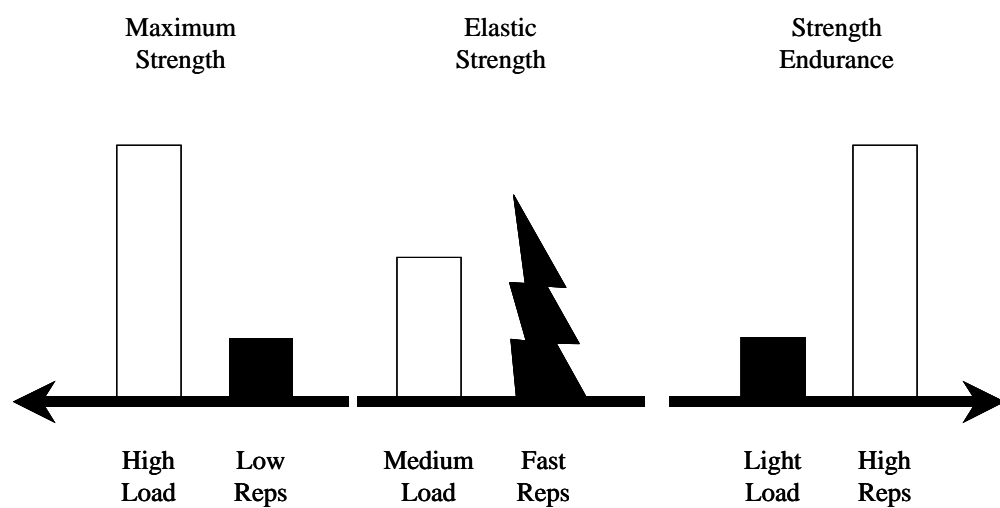
Strength Endurance

Strength endurance is the ability to continue to exert force while increasing fatigue. Performing sit-ups to exhaustion is a test of strength endurance. Runs between 60 seconds and eight minutes require greater strength endurance.

Developing Strength

Both resistance and weight training develop strength. Avoid weight training with young athletes. Resistance exercises with body weight, circuit training and medicine ball exercises will help athletes meet their desired goals.

Strength Development



Principles of Strength Training and Conditioning at-a-Glance

Strength and conditioning training is designed to assist athletes in their overall development. There are two types of strength training programs: general and specific. The exercises used in each program reflect the athlete's need for strength development. A general strength and conditioning training program gives athletes extra strength in the particular muscles that are needed to perform well in their sport-specific events. In addition, strength and conditioning training can help to prevent injury to athletes by building healthier, flexible and stronger muscles and bones.

Flexibility

- Stretch slowly and with control
- Do not bounce or feel pain
- Breathe slowly and rhythmically; do not hold your breath
- Easy stretch: slight tension to no tension—hold for 5-12 seconds
- Developmental stretch: stretch further feeling slight tension again?hold for 15-30 seconds

Muscle Balance

- Train both the front and the back muscles when strength training
- Example: if training the biceps, also train the triceps
- Important in preventing injury

Selection of Exercises

- Emphasize total body condition

Order of Exercises

- Very important in getting the most out of each exercise
- Exercises and lifts that work many muscle groups and require more mental concentration—perform early in the workout
- Exercises and lifts that work small muscle groups and require little concentration?perform last in the workout

Frequency of Training

- Always include one day of rest between strength training workouts

Number of Sets

- One set of each exercise is recommended during the first and second week of training. Increase the number of sets as your training program progresses.

Rest between Sets

- Depends upon the desired results of the workout
- Muscular endurance: short rest period—full recovery not required
- Strength and power: longer rest period?full recovery required

Active Rest

- An active period, recreational level, after the completion of a season of sport
- May or may not include strength training
- Gives athletes a break and their bodies time to regenerate and rest

Muscle-Specific Strength Exercises

It is recommended that Special Olympics coaches concentrate on developing the overall body strength of their athletes. The types of exercises used for an athlete's general strength and conditioning training program can include the following exercises to develop the various muscle groups. The primary exercises in this guide uses body weight as resistance and medicine ball exercises. As an athlete matures, weight training and other more demanding strength and conditioning exercises can be introduced.

Arms & Shoulders	Back & Abdomen	Foot & Legs	Agility & Conditioning
Push-Ups	Sit-Ups	Jump and Reach	Leg Swings
• Regular	• Regular	Kangaroo Hops	• Front
• Wide	• Crunches	Squats—Slow	• Side
• Narrow	• Side Lifts	Lunges	• Front Eagle
• With a Clap	• w/ Medicine Ball	• Single Leg	• Back Eagle
Horizontal Swing	Trunk Lifts	• Walking	
Triceps Dip	Ball Trunk Twists	Burpees	
Medicine Ball Throws:	Leg Raises	Mountain Climbers	
• Kneeling—Overhead		Calf Raises	
• Standing?Overhead			
• Standing—Chest Pass			
• Standing?One Arm			
• Standing—Side Twists			

There are many types of exercises that cover each of these three major muscle groups and agility and conditioning exercises. Coaches should consider exercises for an athlete based upon the athlete's stage of development and level of ability. The exercises described below are acceptable in a general strength training program for Special Olympics athletes. Please refer to Teaching Skills in the sport specific coaching guides integrating these exercises into event/sport-specific training.

Exercises to Develop Back and Abdomen Muscles

Sit-Ups

For all sit-up exercises, start with repetitions (reps) of 2 sets x 10 with your athletes. Gradually increase to 20 reps or more as athletes' conditioning increases. There are also many variations that you can perform with sit-ups to develop abdomen and back muscles. We have included a few of the basics here to get you started.

Points of Emphasis	<ul style="list-style-type: none">• Squeeze abdominals as you lift• Breathe out on the lift?breathe in on return to start position• Never jerk or stress neck—keep chin up and out
When to Use	All the time, anytime you can

Sit-Ups: Regular

1. Lie on floor with knees bent
2. Hands can be on chest, shoulders or on side with fingers touching ears
3. Elbows are out to the side
4. Keep back straight; slowly lift shoulders, reaching sitting position
5. Slowly return to start position



Sit-Ups: Crunches

1. Perform steps 1-3 above
2. Keep back straight; slowly lift shoulders about 45 degrees
3. Slowly return to start position.



Sit-Ups: Side Lifts

1. Lie on left side, resting on elbow, arm is at 90 degrees, knees are 45 degrees
2. Lift hips off ground until body is in a straight line
3. Slowly return to start position.
4. Switch sides and perform lifts

Sit-Ups: With Medicine Ball

Reps: 2x5

1. Lie on floor with arms and legs outstretched
2. Hold medicine ball between hands
3. Slowly lift ball and legs off ground at 45 degrees
4. Slowly return to start position.



Trunk Lifts

Reps: 2x10

1. Lie face down on the floor with toes pointed back
2. Hands and legs are straight out
3. Slowly raise upper body off the ground as high as possible
4. Slowly return to start position



Athlete Nutrition, Safety and Fitness

Muscle-Specific Strength Exercises

One Arm Lifts

You can also add variety to this exercise alternating arm lifts.



Points of Emphasis	<ul style="list-style-type: none">• Can also be performed by lifting only legs or alternating arms and legs• Do not use arms for leverage• Keep hips, thighs, knees, and feet on the ground
When to Use	Early season and throughout season as maintenance if desired

Horizontal Swings

Reps: 2x10

1. Stand with feet shoulder width apart
2. Hold dumbbell or weighted object with both hands straight out in front of body, chest level
3. Swing toward one side
4. As momentum increases, check the motion by pulling in opposite direction
5. Repeat swinging action from side-to-side

Points of Emphasis	Allow work to come from the shoulders and arms
When to Use	Early season and throughout season as maintenance if desired

Ball Trunk Twists

Reps: 1x10

1. Stand back-to-back with a teammate with feet spread wider than shoulders
2. One athlete is holding ball next to body
3. Begin rapidly twisting the torso in the opposite direction of the ball
4. Check the twist, with one in the opposite direction, releasing ball to teammate
5. Concentrate on rapid cocking action before twisting in the direction of the throw

Points of Emphasis	Use lighter ball, football at beginning, works towards using a heavier ball
When to Use	<ul style="list-style-type: none">• Early season and throughout season as maintenance if desired• Can also practice with or without a partner



Athlete Nutrition, Safety and Fitness

Muscle-Specific Strength Exercises

Leg Raises

Reps: 2x10

1. Lie on back with upper body raised on elbows
2. Lift one leg up about 20 centimeters (about eight inches) from ground
3. Alternate legs

Points of Emphasis	Can also be performed lifting both legs at same time
When to Use	Early season and throughout season as maintenance if desired



Remind your athletes to keep their toes up to the sky as they lift their leg from the hip joint and not the trunk.



As your athlete progresses, help them extend their range of motion by gently, lifting their leg higher. Remember, a little tension is okay, pain is not good.



You do not want your athlete to lean back on their arms. Stress the importance of doing the exercise correctly, to improve their athletic performance and confidence.



This is almost correct; ask the athlete to extend their arms fully, until their elbows and back are straight, tummy tucked tight.

Exercises to Develop Arm and Shoulder Muscles

Push-Ups

For all push-up exercises, start with reps of 2 sets x 5 with your athletes. Gradually increase to 10 reps or more as athlete's conditioning increases. There are also many variations to push-up exercises to develop arm and shoulder muscles. We have included a few of the basics here to get you started. It is also important to remember that push-ups can be performed with knees on or off the ground. Either way achieves arm and shoulder strength. The major goal is to make sure the back is kept straight and the abdominals tight.

Points of Emphasis	<ul style="list-style-type: none">• Keep the back straight! keep those abdominals tight!• Squeeze abdominals as you lift• Keep head up and the back straight• Breathe out on down position—breathe in on return to start position
When to Use	All the time, anytime you can



Push-Ups: Regular

Reps: 1x10; Gradually increase to 3x10 or more

1. Kneel down
2. Place hands on ground in front of body, shoulder-width apart with a straight back
3. Move feet back behind until you are on toes
4. Weight is on both hands and feet
5. Slowly bend arms until parallel to ground, dropping chest 4-5 inches from ground
6. Push up to starting position



Athlete Nutrition, Safety and Fitness

Muscle-Specific Strength Exercises

Push-Ups: Wide

1. Same as above, except hands are spread wider than shoulder-width apart
2. Perform steps 3-6



Push-Ups: Narrow

1. Same as above, except hands form a triangle under body
2. Perform steps 3-6



Push-Ups: With a Clap

Reps: 1x3; Increase to 2x5 or more

1. Kneel down
2. Place hands on ground in front of body, shoulder width apart with a straight back
3. Move feet back behind until you are on toes
4. Weight is on both hands and feet
5. Slowly bend arms until parallel to ground, dropping chest 4-5 inches from ground
6. Push up powerfully off ground, clap hands, and end in starting position.



Points of Emphasis	Action is very controlled
When to Use	Early season and throughout season as maintenance if desired

Triceps Dip

Reps: 2x5; Increase to 3x10

1. Stand with back to chair/box
2. Using chair/box for support, legs are outstretched, arms straight, hands forward on chair/box
3. Bend elbows slowly, until arms are parallel to ground
4. Straighten elbows slowly



Points of Emphasis	<ul style="list-style-type: none">• Keep back straight and abdominals tight• Very controlled
When to Use	Early season and throughout season as maintenance if desired

Medicine Ball Exercises

The following diagrams show medicine ball exercises that are effective in offering resistance through various ranges of motion. Many are extremely helpful in developing abdominal and back muscles. Exercises in which the ball is released get the best results when performed explosively.

Purpose

- ♦ To develop explosiveness, strength, flexibility and coordination
- ♦ Reps: 1 x 10; Increase to 20 or more

Points of Emphasis	<ul style="list-style-type: none">• Actions is very controlled• Ball is pushed or thrown rapidly during action• Extend arms to full length
---------------------------	--

Kneeling Overhead



Kneeling Overhead 2



Kneeling Overhead Out



Kneeling Overhead Side



Running



Sit-Ups: Leg-Arms Extended



Standing Chest Pass



Standing Overhead



Standing Overhead Side



Standing Side Twists



Standing One Arm



Standing Squat Throws



Standing Overhead Back



Exercises to Develop Foot and Leg Muscles

In all of the exercises used, make sure the athlete's feet and toes are straight ahead and pointing in the direction that they are moving. You may have to take a few moments at the beginning of each exercise to right the athlete's body position.



Jump and Reach

Reps: 10-12 jumps in a row

Teaching Steps

1. Take "hips tall" position, feet slightly apart
2. Bend knees and hold arms down toward ground
3. Swing arms forward and up; reach as high up as possible while powerfully jumping straight up
4. Flex knees and ankles to soften landing
5. Return to start position



Athlete Nutrition, Safety and Fitness

Muscle-Specific Strength Exercises



Points of Emphasis	Push strongly off ground with feet
When to Use	Conditioning or fitness circuits

Kangaroo Hops

Reps: 10-12 jumps in a row

Teaching Steps

1. Take “hips tall” position, feet slightly apart
2. Move weight to balls of feet
3. Drive knees up to chest (hopping up)
4. Arms drive out and up with knees
5. Land on flat feet





Points of Emphasis	Keep head up and arms out
When to Use	Conditioning or fitness circuits

Athlete Nutrition, Safety and Fitness

Muscle-Specific Strength Exercises

Squats: Slow

Reps: 10-12 squats

Teaching Steps

1. Stand with feet shoulder-width apart and pointing forward
2. Hold arms in running form
3. Squat slowly until knees are at 90 degrees
4. Return to start position



Points of Emphasis	<ul style="list-style-type: none">• Keep head up and back straight• Can also add weight for increased resistance, i.e., medicine ball
When to Use	Throughout season; conditioning or fitness circuits

Lunges: Single Leg

Reps: 10-12 squats

Teaching Steps

1. Stand with feet shoulder-width apart and pointing forward
2. Step out and squat with right leg until knee is 90 degrees
3. Push up powerfully on ball of foot
4. Return to start position
5. Alternate legs



Points of Emphasis	<ul style="list-style-type: none">• Keep head up and back straight• Can also add weight for increased resistance, i.e., medicine ball
When to Use	Throughout season; conditioning or fitness circuits

Lunges: Walking

Reps: 2x20M Increase to 3x30M

Teaching Steps

1. Stand with feet shoulder-width apart and pointing forward
2. Step out and squat with right leg until knee is 90 degrees
3. Push up powerfully on ball of foot
4. Drive back leg forward, stepping out until knee is 90 degrees
5. Continue walking

Points of Emphasis	<ul style="list-style-type: none">• Keep head up and back straight• Can also add weight for increased resistance, i.e., medicine ball
When to Use	Throughout season; conditioning or fitness circuits, recovery exercise

Burpees

Reps: 10-20 in a row

Athlete Nutrition, Safety and Fitness

Muscle-Specific Strength Exercises

Teaching Steps

1. Take “hips tall” position, bend down, placing hands in front of feet
2. Jump, pushing both feet back, push-up position
3. Jump back to crouch position
4. Jump as high as possible



Points of Emphasis	<ul style="list-style-type: none">• Keep head up• Stay on balls of feet
When to Use	Conditioning or fitness circuits

Mountain Climbers

Reps: 10-20 in a row

Teaching Steps

1. Take “hips tall” position, bend down, placing hands in front of feet
2. Extend one leg straight back, resting on its toes
3. Support the weight of the body with the bent leg and hands.
4. Switch legs quickly, moving one forward and one back.
5. Repeat the switches to resemble climbing up a mountain.



Points of Emphasis	<ul style="list-style-type: none">• Keep head up• Stay on balls of feet
When to Use	Conditioning or fitness circuits

Calf Raises

Reps: 10 each foot

Purpose

- ♦ Develops flexibility and strength in the ankle joint

Teaching Steps

1. Take “hips tall” position with ball of feet on curb/step
2. Slowly let heel fall below curb/step, slowly move weight to toes
3. Continue up and down action

Points of Emphasis	Slow and controlled, full range of motion
When to Use	Warm-up

Exercises for Agility and Conditioning

Free Leg Swings: Front

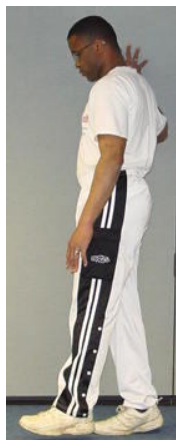
Reps: 1x10; Increase to 3x10

Purpose

- ♦ Develops dynamic flexibility in the hip joint

Teaching Steps

1. Begin at “hips tall” position next to fence or wall
2. Leg away from fence or wall swings loosely
3. Swing this leg up towards torso, leg extended
4. Drive leg down and through behind you
5. Bend knee as reaches other leg
6. Drive knee through, bringing foot behind body up and out



You want the athlete's legs to swing like a pendulum. The upper body is tall and straight with a slight lean.

Forward Swing



Here, we want the athlete to rise to the ball of the foot while performing the exercise. Remember, to pull in those abdominals and stand tall.



Again, the athlete may need help in achieving greater range of motion after they have been practicing this exercise over a period of time.

Back Swing



To keep the athlete from rotating their hips, hold their waist. Make sure you stand behind the athlete, opposite the leg that is swinging backward.

Points of Emphasis	<ul style="list-style-type: none">• Maintain “hips tall” position and erect posture• Similar to kicking a soccer ball
When to Use	Warm-up

Athlete Nutrition, Safety and Fitness

Muscle-Specific Strength Exercises

Free Leg Swings; Side

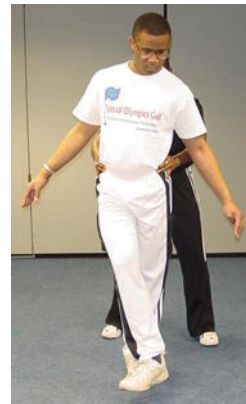
Reps: 1x10; Increase to 3x10

Purpose

- ♦ Develops dynamic flexibility in the hip joint

Teaching Steps

1. Begin at “hips tall” position next to fence or wall for support
2. Step one foot away from support
3. Swing leg closest to support in front of you until parallel to ground
4. Drive swinging leg down and out, bringing foot up and out towards sky



Body Position



Above, our athlete is leaning too much away from the leg swing out, decreasing his range of motion.



Focus on keeping the athlete's body as straight and tall as possible. You can help by holding the hips on both sides and gently pressing down on hip of the leg that is swinging.

Points of Emphasis	<ul style="list-style-type: none">• Maintain “hips tall” position and erect posture• Allow hips to swivel for greater range of motion
When to Use	Warm-up

Athlete Nutrition, Safety and Fitness

Muscle-Specific Strength Exercises

Front Eagle

Reps: 1x10; Increase to 3x10

Purpose

- ♦ Develops dynamic flexibility in the hip joint

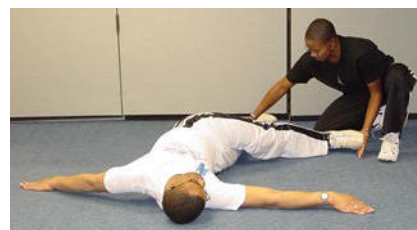
Teaching Steps

1. Lay face down on track, feet shoulder-width apart
2. Shoulders resting on lane line, arms outstretched along the lane line
3. Swing right leg to opposite side, right toe touches back of left hand
4. Alternate legs

Points of Emphasis	Maintain shoulder contact with track
When to Use	Warm-up



You may want to start doing this exercise with your athletes. Have a little fun with them.



Once your athletes get the hang of it, help them to get in the correct position – reaching with the foot to the opposite hand.

Back Eagle

Reps: 1x10; Increase to 3x10

Purpose

- ♦ Develops dynamic flexibility in the hip joint

Teaching Steps

1. Lay with back on track, feet shoulder-width apart
2. Shoulders resting on lane line, arms outstretched along the lane line
3. Swing right leg to opposite side, right toe touches left hand
4. Alternate legs



Emphasize reaching toward the opposite hand with little tension. Do not force the motion.



Sometimes a demonstration is necessary. Coach by being the example.

Points of Emphasis	Maintain shoulder contact with track
When to Use	Warm-up

Plyometrics Training

Plyometric exercises are the rapid deceleration and acceleration of muscles that create a stretch-shortening cycle. The exercises train the muscles, connective tissue and nervous system to effectively carry out the stretch-shortening cycle, thereby improving an athlete's performance. Plyometric drills can be a fundamental part of training for each and every event in sport. Most competitive sports require a rapid deceleration of the body followed by almost immediate acceleration in the opposite direction.

Plyometric drills help develop rhythm, speed, power and even muscular endurance. Plyometrics, used correctly and for a specific purpose, can be a tremendous asset to your individual athlete as well as to the general and specific conditioning of your entire sport program.

Plyometrics—Quick Reference Chart

Plyometric Drill/Event	[Event]	[Event]	[Event]	[Event]	[Event]	[Event]
Exploding Harvards						
Bounding:						
• Low Slow						
• Power						
• Speed						
• Straight Leg						
• Single Leg						
• Double Leg						
Depth Jumping						
Hops:						
• Swedish						
• Single Leg						
• Double leg						
• Hurdle						
Drum Major						
Skipping						

Coaches Guidelines for Teaching Plyometrics

1. All plyometric exercises must be done in flats on a soft surface.
2. Start with one set of each exercise, working toward three more sets.
3. Judge whether the athlete has the proper motor skills for properly executing the drills. If the athlete has poor form, stop the drill.
4. Always start with simple drills and progress to more difficult.
5. Properly warm-up and stretch before each plyometric workout and follow with a proper cool-down.
6. Have the athletes execute the drills with 100 percent effort to ensure best training results.
7. Take a 1-2 minute rest between successive exercise sequences.
8. Perform a number of repetitions according to the intensity of the drill and the condition of the athlete. The athlete will only benefit from reps performed properly.
9. Never perform plyometric drills on the same day as a weight training session.
10. Each set should last no longer than 6-8 seconds.
11. Full recovery should occur between sets.
12. Start with easy exercises and develop in intensity and complexity.
13. Stop before fatigue breaks down technique.
14. Always emphasize proper technique.
15. Integrate plyometrics as a part of the training program.
16. Remember a large part of the initial training may be spent on teaching your athletes.

Plyometric Drills

Exploding Harvards

Reps: 10 jumps each leg, gradually increase to 20 jumps each leg

Purpose

- ♦ Introduce athletes to plyometric training

Equipment

- ♦ Box or step to create knee angle of 80-120 degrees

Teaching Steps

1. Take “hips tall” position facing box
2. Step one foot up onto box; weight is forward and over flexed leg on box
3. Arms are in sprint motion
4. Powerfully push down leg on box, bring hips directly over leg on box; maintain “hips tall” position
5. Return to starting position
6. Repeat quickly

Points of Emphasis	<ul style="list-style-type: none">• A knee angle much less than 80 degrees puts undue stress on knee• Obtain maximum height
When to Use	Start in second week of training; stop two weeks prior to major competitions

Bounding Drills

Low Slow Bounding

Reps: 2x30M, gradually increase to 3x50M

Purpose

- ♦ Develops dynamic flexibility in the hip joint
- ♦ Develops strength and power

Teaching Steps

1. Take “hips tall” position and bend to squat position
2. Jump outward, driving bending right knee to chest while extending left leg
3. Stay low
4. Upon landing, powerfully extend forward leg while driving back leg knee to chest
5. Arm swing is in sprinting action

Points of Emphasis	<ul style="list-style-type: none">• Briefly float at the top of bound?both legs are off ground• Foot strike is toward ball of foot
When to Use	Start in second week of training; stop two weeks prior to major competitions

Power Bounding

Reps: 2x30M, gradually increase to 3x50M

Purpose

- ♦ Develops dynamic flexibility in the hip joint
- ♦ Develops strength and power
- ♦ Creates greater responsiveness to exercises

Teaching Steps

1. Take “hips tall” position
2. Jump outward and upward, driving bending right knee to chest while extending left leg
3. Upon landing, powerfully extend forward leg while driving back leg knee to chest
4. Arm swing is in sprinting action

Points of Emphasis	<ul style="list-style-type: none">• Small beginning jog builds momentum and velocity• Hang time is long, longer than low slow bound• Torso and trunk are also tall• Foot strike is more of a flat foot
When to Use	Start in second week of training; stop two weeks prior to major competitions

Speed Bounding

Reps: 2x30M, gradually increase to 3x50M

Purpose

- ♦ Develops power

Teaching Steps

1. Take “hips tall” position
2. Jump outward and upward, driving bending right knee to chest while extending left leg
3. Upon landing, powerfully extend forward leg while driving back leg knee to chest
4. Arm swing is in sprinting action

Points of Emphasis	<ul style="list-style-type: none">• Beginning run builds velocity• Short ground contact time—be very quick• No hang time• Foot strike is very active and toward ball of foot
When to Use	Start in second week of training; stop two weeks prior to major competitions

Athlete Nutrition, Safety and Fitness

Plyometrics Training

Straight Leg Bounds

Reps: 2x30M, gradually increase to 3x50M

Purpose

- ♦ Develops strength, especially quadriceps

Teaching Steps

1. Take “hips tall” position, begin jogging
2. Extend left leg and drive up toward sky, foot is flexed
3. Alternate legs
4. Arm swing is in sprinting action

Points of Emphasis	<ul style="list-style-type: none">• Feels as if pulling ground past feet• Short ground contact time—be very quick• Ground contact time is slightly in front of body• Foot strike is very active and on ball of foot
When to Use	Start in second week of training; stop two weeks prior to major competitions

Hops

Swedish Hops

Reps: 2x30M, gradually increase to 3x50M

Purpose

- ♦ Develop effective use of the legs

Teaching Steps

1. Take “hips tall” position
2. Step out with one foot; jumping upward, drive up the other knee as high as possible
3. Flex the bent leg completely, with foot under buttock
4. Use arms to achieve maximum lift
5. Upon landing, jump quickly upward again driving back leg up toward sky, foot under buttock

Points of Emphasis	<ul style="list-style-type: none">• Emphasis is on maximum lift• Work at gaining height and distance; do not sacrifice repetition rate• Looks like continuous high skipping
When to Use	Start in second week of training; stop two weeks prior to major competitions

Single Leg Hops

Reps: 2x30M, gradually increase to 3x50M

Purpose

- ♦ Develops coordination and strength

Teaching Steps

1. Take “hips tall” position, placing one leg in front of other; front leg is hopping leg
2. Drive hips up and forward powerfully
3. Pull heel of hopping leg to buttock, followed by swinging knee forward and up
4. When thigh is parallel to ground, abruptly extend leg
5. Strike ground with high backward foot speed
6. Opposite foot cycles as if used, yet does not touch ground
7. Arm swing is in sprinting action

Points of Emphasis	Foot strike is flat of foot
When to Use	Start in second week of training; stop two weeks prior to major competitions

Double Leg Hops

Reps: 2x30M, gradually increase to 3x50M

Purpose

- ♦ Develops strength

Teaching Steps

1. Take “hips tall” position and bend to squat position
2. Bend at hips while driving arms back
3. Jump powerfully up and out, extending legs, driving arms up over head

Points of Emphasis	Foot strike is flat of foot
When to Use	Start in second week of training; stop two weeks prior to major competitions

Athlete Nutrition, Safety and Fitness

Plyometrics Training

Hurdle Hops

Reps: 2x30M, gradually increase to 3x50M

Purpose

- ♦ Develops dynamic flexibility in the hip joint
- ♦ Develops explosiveness and power
- ♦ Strengthens abdominals

Teaching Steps

1. Take “hips tall” position
2. Jump, drive both knees toward chest
3. Arms drive up as you reach top of hurdle
4. Repeat over 5-8 hurdles

Points of Emphasis	High, powerful knee drive
When to Use	Start in second week of training; stop two weeks prior to major competitions

Skipping

Reps: 2x40-50M, gradually increase to 3x100m

Purpose

- ♦ Develop effective use of the legs

Teaching Steps

1. Begin with one leg forward
2. Drive off the back leg; start short skipping step with opposite leg
3. Drive knee up toward chest
4. Upon landing, repeat with other leg

Points of Emphasis	<ul style="list-style-type: none">• Gain as much height as possible with maximum hang time• Good for long and high jumps
When to Use	Start in second week of training; stop two weeks prior to major competitions

Drum Major

Reps: 2x30M, gradually increase to 3x50M

Purpose

- ♦ Develops dynamic flexibility in the hip joint
- ♦ Strengthens abdominals

Teaching Steps

1. Take “hips tall” position
2. Drive right knee toward chest
3. Extend leg out, foot flexed
4. Drive leg down to ground
5. Alternate legs

Points of Emphasis	High, powerful knee drive
---------------------------	---------------------------

Depth Jumping for Jumpers

Reps: 10 jumps each leg; gradually increase to 20 jumps each leg

Purpose

- ♦ Develop leg power

Teaching Steps

1. Stand on box in “hips tall” position
2. Jump down from box and immediately drive knees up jumping onto next box

Or

Teaching Steps

1. Take “hips tall” position
2. Drive knees/arms up as jumping on box
3. Jump down from box and immediately drive knees/arms up, jumping onto next box

Jump Variations

- Low Box—Ground—Low Box
- Low Box—Ground—High Box
- Low Box—Ground—High Box—Ground—Low Box
- High Box—Ground—High Box—Ground—Low Box

Points of Emphasis	<ul style="list-style-type: none"> • Single leg box jumps; box is approximately 12 inches high • Double leg box jumps; box is approximately 18-24 inches high
When to Use	<ul style="list-style-type: none"> • 1-2 times per week with 1-2 days between sessions • Athletes need 10-14 days recovery before competition

Designing a Strength and Conditioning Circuit

Start your athletes training circuit with low intensity exercises and gradually increase the intensity as the year advances. It is a good idea to start the season with a 2-3 weeks general conditioning period before beginning a training circuit such as this, although athletes who have just finished another sport season may be sufficiently conditioned to begin right away.

Make sure you incorporate at least 15-20 minutes of strength training and conditioning exercises in the first 2-3 weeks of the season. This will help your athletes develop a solid foundation to begin more strenuous practices, enhancing their competitive experiences.

Circuit Training

Circuit training is the term given to resistance exercises grouped together to achieve general or specific conditioning. Exercises are performed in a circular arrangement that allows athletes to progress from one exercise station to the next until all stations have been completed. The completion of all exercises is one circuit. This type of training is ideal for small or large groups of athletes. Circuit training is also a very good fitness development tool.

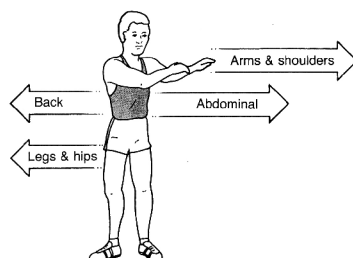
Training Considerations

Before starting a training circuit, a number of pre-training considerations need to be determined before prescribing exercises for all your athletes.

1. Look at the age, body weight and the physical state of development of each athlete.
2. Look at prior and current training levels of each athlete with regard to their strength and speed training.
3. Evaluate the strength training needs of each group of athletes as classified by their event.

Setting up the Circuit

When setting up the training circuit, focus on the order and frequency of the exercises that are to be performed. It is recommended that each training session consist of 2-4 exercises from each of the four exercise categories, and that there is adequate rest time between stations. The order of exercises should follow a pattern: upper body to lower body, or agility and conditioning to abdominal exercises, and then repeat the same order. This type of arrangement will allow for more recovery time for a specific muscle group because it is not being used in successive exercises.



The training circuit should be performed on the grass infield of the track for the majority of the exercises. That surface reduces the shock of the ground impact, which is especially important for lower body plyometrics exercises. Ideally, the training circuit can be performed up to three times per week on a schedule that allows at least 48 hours of rest between sessions. Once the competitive season begins, the training circuit may be cut back to twice a week to allow ample rest before competitions. If the coach plans a schedule that uses the training circuit only twice a week, he/she may choose to allow 72 hours of recovery between sessions.

Athlete Nutrition, Safety and Fitness Designing a Strength and Conditioning Circuit

Training Options

Training Days	Day 1	Day 2	Day 3	Day 4	Day 5
Training 5 days/week	ST&C Circuit			ST&C Circuit	
		ST&C Circuit			ST&C Circuit
Training 4 days/week	ST&C Circuit			ST&C Circuit	
Training 3 days/week	ST&C Circuit				

ST&C = Strength Training & Conditioning

Sample Training Circuit Routines

When prescribing exercises, you need to focus on the exercises that will help the specific needs of your athlete in a particular position. The table below is a basic guideline to help get you started. These exercises can be incorporated into a training circuit to provide a variety of exercises for all your athletes that will be fun to do. Change the exercises a little, if you notice that an athlete has mastered the exercise and is getting bored.

An Athletics Example

All Athletics athletes	<i>can benefit from</i>	Agility & Conditioning Abdominal & Back
Sprinters, Jumpers, Throwers (power-oriented athletes)		Agility & Conditioning Plyometrics
Throwers w/developed upper bodies		Plyometrics
All Athletics athletes Throwers		Medicine Ball Drills

Using conditioning circuits takes the pressure off athletes by focusing on the time at each station, not the number of repetitions. The goal is to get the athletes to do as many reps as they can, as correctly as they can, in the specified time.

Exercise	Duration
Push-ups	30 seconds
Crunches	30 seconds
Leg raises	1 minute
Lunges	30 seconds
Tricep dips	30 seconds
Running	1½ minutes

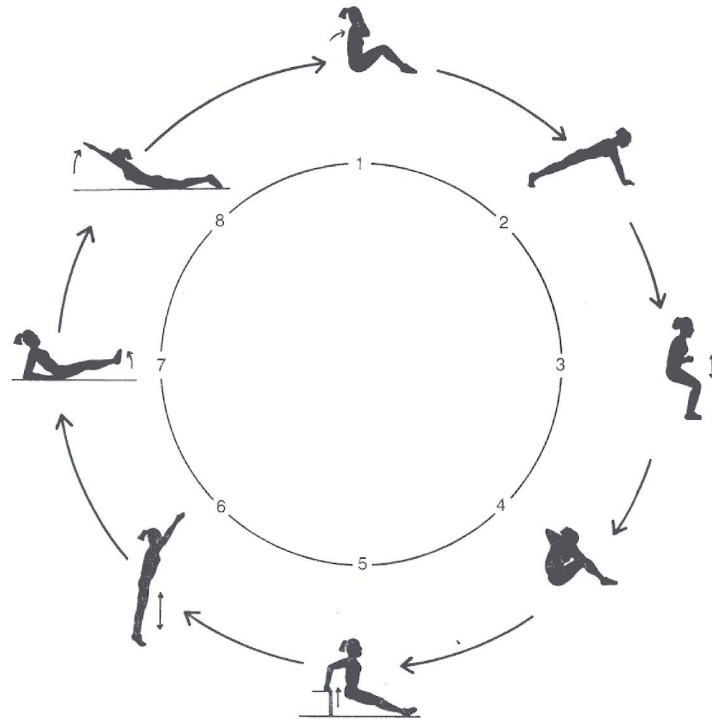
An Athletics Example

Athlete Nutrition, Safety and Fitness

Designing a Strength and Conditioning Circuit

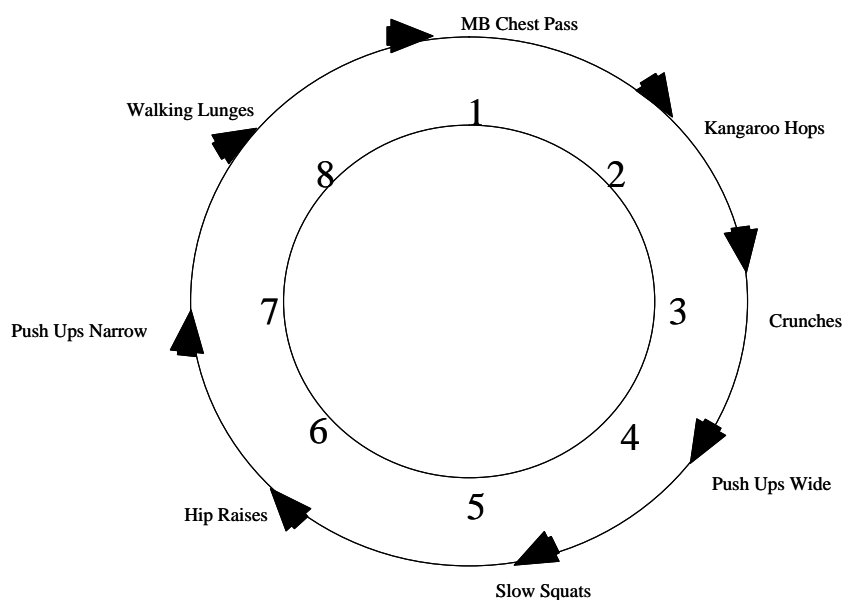
General Conditioning Circuit – Sample 1

Number of circuits:	1-5
Time at each station:	30 sec to 1½ min
Recovery between exercises:	15-45 sec
Recovery between circuits:	2-5 min



General Conditioning Circuit – Sample 2

Number of circuits:	1-5
Time at each station:	30 sec to 1½ min
Recovery between exercises:	15-45 sec
Recovery between circuits:	2-5 min



This document was created with Win2PDF available at <http://www.daneprairie.com>.
The unregistered version of Win2PDF is for evaluation or non-commercial use only.