

Strength Training  
&  
Conditioning:  
Using A Circuit Training System  
from 6<sup>th</sup> Grade to Post Graduate

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## Should pre-adolescent/adolescent students lift weights?

If the proper precautions are taken, there usually are no problems with pre-adolescent and/or adolescent students lifting weights.

See: Mayo Clinic article “Strength Training: OK for kids when done correctly”

<http://www.mayoclinic.com/health/strength-training/HQ01010#>

“Strength training offers kids many benefits, but there are important caveats to keep in mind. Here's what you need to know about youth strength training.”

Also See NSCA: “Position Statement - Youth Resistance Training”

<http://www.nsca-lift.org/Publications/YouthforWeb.pdf> )

For several years at the junior high level (12 years), we had a successful strength training program in our physical education classes and in our after school intramural lifting program. We did not have any major problems with student injuries or parental complaints. Guidelines that we used to help assure that the students were lifting and training safely are as follows:

1. Never allow the lifter to do an actual 1 repetition maximum. (Never allow the student to do an actual 1 repetition test to see how strong or how much weight they can lift 1 time, on any particular exercise/lift.)  
See: [http://teachfitnessconcepts.com/Find\\_Your\\_Strength\\_level.htm](http://teachfitnessconcepts.com/Find_Your_Strength_level.htm)
2. Never allow the lifter to lift or work out alone. Always use a partner on weighted stations.
3. A partner/spotter must be present and very close by, ready to assist the lifter at all times during the lifting exercise, especially on weighted stations.
4. You must teach the partner/spotter how to spot the lifter for each exercise in the room.
5. Reinforce the concept of high repetitions and low weight when teaching weight training, especially with pre-adolescent and adolescent students and with beginning/inexperienced lifters.  
**[In all weighted exercises the students should complete 10 to 15 repetitions within the 30 seconds interval. Any repetitions less than 10 the lifter used too high of weight, and repetitions higher than 15 the lifer used too light of weight.]**
6. Reinforce the concept that lifting technique is more important than immediate strength gains, especially with pre- adolescent, adolescent students, and beginning and inexperienced lifters.
7. If you are coaching students to do squats, power cleans, & power jerks, make the student lifter wear a weight belt on any exercise that involves these exercises or any similar exercise where the back needs extra support. Note: These lifts are not recommended for the adolescent student. Practicing these movements with just a broom stick is OK, just to introduce these exercises and work on technique for when they have matured and are ready to do these exercises with weight.
8. Post the weight room rules, and review the rules frequently.
9. Post lifting directions and warning posters at several key areas throughout the strength training room and supervise the students closely, reminding them to follow the posted rules & reminders.
10. Close supervision by the professional in charge is a must! Don't lift with the students! Move continually throughout the room, teaching, coaching, and supervising them at all times!
11. Stress to all lifters that safety is always first!

This list is not a conclusive list of rules that would apply to all schools and all facilities. However, it is a good starting point for most schools and most facilities. Always look for ways to help the students lift successfully with the elimination or probability of injuries. Then you will have a good quality strength training program for pre-adolescent and adolescent students.

### **What are the benefits of circuit strength training program?**

The number one benefit of the circuit strength training program is the fact that the student lifter/exerciser is going to complete a workout that will increase his/her heart rate, provide strength development in those muscles working, and eliminate the possibility of standing around, looking around, with a what-do-I-do-next attitude. It is a fast paced workout that controls the lifters' movement throughout the room. It sets an exercising tempo to which the lifter must adhere. It makes the lifters go to exercise stations that they might not otherwise choose. It gives the instructor free hands and allows them to watch their students and to work with those student lifters who need help. It manages the time frame of the class because you will know how many stations the students will complete, before you start the class. It is an excellent starting program with low intensity for the pre-adolescent, adolescent students and for beginning & inexperienced lifters.

### **How much weight should the student use?**

#### **Weight selection and repetitions in the 30 seconds interval**

The exercising lifter should choose a weight that will allow him/her to complete between 10-15 repetitions with full range of movement, and good lifting form on all exercise stations, within the 30-second exercise interval. If the lifter completes more than 15 repetitions in the 30-seconds, then he/she has selected a weight that is too light. If the lifter does less than 10 repetitions in the 30 seconds interval he/she has selected a weight that is too heavy. This prescribed repetitions and weight selection (intensity) is for the pre-adolescent, adolescent, and beginning & inexperienced lifters. Lifting technique is emphasized over strength gains, however all students will increase their strength if you spend a few weeks (alternating days) doing circuit training lifting/exercise program.

#### **When should the lifter increase the weight and how many pounds should the student increase on each exercise?**

When a student can easily handle the weight up to fifteen repetitions within the 30-second interval, have the student increase the weight the next time he/she is at that same station. With the younger and smaller students, the amount of weight increase should be proportional to the muscle working and their body size. The increase in weight should be 2.5 pounds to 5 pounds. For the older more mature student, a 5-10 pound increase can be made if they are strong enough to handle that amount of increase. In addition, keep in mind the muscles being worked while the student is lifting. The larger muscle groups can handle bigger increases in weight, whereas the smaller muscle groups cannot handle big increases. Paying attention to the experience level of the person who is increasing the weight is important. An inexperienced lifter will not be able to handle a large increase in weight whereas an experienced lifter can go a little higher on his/her weight increase. Do not allow big weight jumps for the inexperienced or less mature lifter. Remember that the whole objective of unit at the pre-adolescent, adolescent level, and at the beginning & inexperienced level is to teach correct lifting technique, to instill a good work ethic at a young age, and to start an increase in muscular strength. Beneficial strength gains can be made only after the first two objectives are met.

## **Should girls lift weights and have the same work load as boys?**

There should not be any gender differences when using the circuit training program and/or selection of weight (resistance/intensity). Girls should follow the same guidelines as boys; select a weight that you can lift/complete 10 to 15 repetitions. They may choose a lighter weight, than boys, if they have a smaller lighter body frame. Additionally, females will not develop large muscular body building physiques due to the lack of testosterone in their body. Males will slowly develop muscle size, muscle definition, and larger musculature physiques as the natural testosterone level in their body increases with maturation. I have had many girls ask me if they will become muscular looking like some guys and I always tell them no, unless you are taking some form of testosterone medicine, which usually ends the conversation. Girls will develop muscle tone and shape, but will not experience the cut-up look as some boys may achieve. See: "[Myth 5: Strength training makes women bulk up](#)" from About.com.

### **The Importance of Full Range of Motion during all exercises/lifting stations**

Along with proper lifting technique and posture, it is extremely important that you teach your students to complete a full range of motion on all exercises/lifting stations. Full range of motion will develop all major and minor muscles involved/working at each particular exercise/lifting station. If a lifter were to only do partial range of movement, only those muscles moving will develop and they will not develop to their fullest potential. An example of this would be a body builder doing only ½ of the curling motion to develop the lower head of the bicep, or ½ the motion of a triceps extension to develop the upper head of the triceps. I would not allow my student lifters to do partial range of motion movements. Developing 6<sup>th</sup> - 12<sup>th</sup> grade students need to work the entire muscle on each lift/exercise to develop & attain the full benefit of each exercise, and to increase flexibility, with strength, on each muscle/movement due to this daily practice/habit. Here is a paragraph from About.com that addresses this issue:

#### **[Exercise Through Full Range of Motion](#)**

*"Perform each exercise through a full range of motion, with emphasis on the end of the positive phase. Full range exercise movements are advantageous for strengthening the prime-mover, or agonist muscles--the muscles directly trained in the exercise, such as the biceps in the biceps curl. Lifting in the full range of motion is also advantageous for stretching the antagonist muscles, the muscles that act in opposition to the agonist. In the Biceps Curl, the triceps is the antagonist. Training in the full range of motion enhances both muscle strength and joint flexibility."*

## Organizational details you should consider in setting up your strength development room

Create enough workout stations to meet the needs of your largest class size. If you have a class of 30 students, then you will need at least 15 stations. If you have a class of 40 students you will need at least 20 stations, etc... Remember that these workout stations can be both weighted and non-weighted, and they should be set up in a logical rotation for the students to be able to move quickly and smoothly from one station to the next, with the ability of you to supervise all of the stations you have created. It is extremely important that you can supervise/see all of the workout stations from at least one vantage point in your room/gymnasium.

Consider making an instructional video tape that illustrates how to use each exercise station correctly and demonstrates the correct rotation from station to station. The students will be able to see a good visual example of each exercise and the correct rotation before he/she begins to using the strength development equipment and/or start the circuit training session.

**Important:** Number each station with a laminated number that is taped either to the equipment, or next to the station, or on the wall next to the station.

Consider having an “Instructional” poster or “Muscles Working” poster at each station, to give the student a visual example of what he/she is required to do at that station and/or what muscles are at work. This is a great educational suggestion so the students are learning about the names of the muscles at work as they are exercising

Consider a laminated name for each exercise station and post it just under the laminated station number. Numbering the stations, naming the stations, having an instructional poster of how to do the exercise, and having a muscle at work poster at each exercise station will help greatly with the students moving in the correct direction, knowing the name of the station, knowing what muscles are working and how they should perform each particular exercise.

Have weight room rules clearly posted. Fully expect the students to read and follow all rules. The student's safety in this environment is your first concern. Posting warning signs and safety reminders throughout the room to reduce the risk of injury is paramount.

Consider having a posted maintenance check sheet for each instructor to fill out on a daily basis. Check mechanical equipment daily to ensure that it is safe and useable. Report all needed repairs and maintenance work to your building Principal, Supervisor, and/or coordinator, as soon as possible.

Consider setting up a plyometric exercise area with several plyometric stations as part of the strength development program. Utilize medicine balls, weighted jump ropes, lateral bag jumps, box jumps, and depth jumps. For pre-adolescent and adolescent students, you should limit the height of the box jumps and depth jumps due to the high impact on exercises have on students' legs and back. For more information on Plyometric training see “Plyometric Training for Youth” by Donald A. Chu, Ph.D., PT, ATC, CSCS. <http://www.donchu.com/articles/article7/> .

## **What stations can be set up with a limited physical education budget?**

A great way to get a strength development program started with a limited budget is to utilize plyometric exercises. Plyometric exercises are very inexpensive and are good for overall strength development.

**Note:** Be careful of the height of the box jumps and/or the depth jumps for pre-adolescent, adolescent students. Their legs cannot take the big jumps without causing injury. See “**Plyometric Training for Youth**” by **Donald A. Chu, Ph.D., PT, ATC, CSCS**. <http://www.donchu.com/articles/article7/>. Dr. Donald Chu is one of the top experts, if not THE top expert on Plyometric training.

For pre-adolescent & adolescent students the standard weights make more sense to purchase because of the weight difference, which can be another cost saver for your program. Additionally the use of dumbbells and fixed standard barbells will help with cost and eliminate the need to constantly change the weight. The standard barbell weights (1" center hole) are a lot cheaper and lighter in pounds than the conventional Olympic weights (Just the Olympic bar alone weighs 45 pounds.). Fixed weight dumbbells can be used for a wide variety of exercises. However precautions must be taken to keep the students from hitting one another and a spotter must be very close to the lifter to spot correctly. This is a taught skill that the teacher should not ignore or overlook.

Including exercise bands is another cost saving station that you can utilize in your circuit training program. Exercise bands come in different lengths and resistance. You can set up several exercise bands stations throughout your weight room and save a lot of money compared to expensive weight equipment. Remember that your goal is to get the pre-adolescent, adolescent lifer started on lifting form and strength gains, so this would be a good starting point for these students, before exposing them to an actual weight room environment.

### **Fund Raising**

We have found that fund raisers just for physical education equipment and weight room equipment have been very successful. Please consider not selling candy and/or high fat foods for your fund raising program. One of the best fund raisers I have seen lately is the “Parents night out” fund raiser where the parents, for a fee of \$25 to \$30, drop off their son/daughter at the school from 6:00pm to 9:00pm and the students do a variety of activities in the gymnasium or on the playing fields, while the parents go out for dinner or shop. One school I know has raised thousands of dollars doing this fund raiser approximately one time per month. The parents enjoy this program and the students enjoy the extra physical activity and extra social time with their friends.

Suggestion: Whenever you have a successful fund raiser, purchase the equipment as soon as possible, this reinforces the students’ fund raising efforts and they will see immediate benefits/use from the funds that were raised. Also the additional equipment in the room builds their excitement to do more fundraising the next year.

## Should the exercise stations be organized by muscle groups or alternated muscle groups?

At the school where I taught we had thirty-six different stations that were arranged as much as possible into the various muscle groups, upper body and lower body. We decided to group them into similar muscle groups to increase the possibility of fatigue. If a particular muscle group is fatigued and the proper rest is applied, the muscles will recover to a stronger state

(see Principle of Overload [http://teachfitnessconcepts.com/Fitness\\_Concepts\\_page.htm#Principle\\_of\\_Progression/Over\\_Load](http://teachfitnessconcepts.com/Fitness_Concepts_page.htm#Principle_of_Progression/Over_Load))

In the circuit training program, the ability to totally fatigue a particular muscle group is not very common, due to the limited time in the strength training room each hour. We have found that the students will not reach all thirty-six stations in one gym class session. In addition, the intensity (weight selection) is usually not high enough to totally fatigue the muscle working. Ideally, it would be great if the students could get to all 36 stations, which would be a total body workout. So in our program, we asked students to remember the station number where they last worked out and to return to the next station number the next time they come back to our circuit training program. This constant rotation allowed the students the opportunity to work at all thirty-six stations after two class sessions, and it allowed them to work at different exercise stations each class period. If a student start in the leg area on one day, the next day they would be in the chest area or arm area of the room. This type of program makes strength training less boring, and muscle recovery is excellent. In the after-school strength training program, arranging similar muscle groups together allows the lifter the opportunity to fatigue each muscle group totally, one day at a time.

Another common practice in strength training today is called the split-4 routine. A Split-4 is; Monday/Thursday workouts are in the upper body area, and Tuesday/Friday workouts are in the lower body area. When this type of strength training occurs the benefits are tremendous. Remember that proper rest is a key component in any lifting program and especially in the alternating split-4 routine.

(See [http://teachfitnessconcepts.com/Fitness\\_Concepts\\_page.htm#Rest\\_and\\_Recovery](http://teachfitnessconcepts.com/Fitness_Concepts_page.htm#Rest_and_Recovery) )

Lastly, you can set up your circuit stations by alternating muscle groups to be sure to get in a total body workout, regardless of the length of the class period and the number of stations achieved. Setting up your room with his concept in mind would look something like this: Chest/Back exercises, Bicep/Triceps arm exercises, quads/hamstrings leg exercises, etc... Again, this would create a total body workout using the front/back concept when exercising various body parts. In the front/back concept you work the agonist muscle first, then the antagonist muscle second, repeating this sequence until you have completed all of the exercise stations you have created in your circuit training program. NOTE: *the antagonist muscles are the muscles that act in opposition to the agonist.*  
*Example: bicep curl/triceps extensions, leg curl/leg extensions.*



## What Teacher aids can/should be used in Strength Training?

One of the best teaching aids in strength training is the use of visual examples. There are several video tape programs available to physical education teachers and strength training coaches on the subject of strength training and proper lifting techniques used in various upper body and lower body strength train exercises. One of the better videotape programs is sold by the National Strength and Conditioning Association “**Free Weight and Machine Exercise Techniques**” DVD. **Additionally the NSCA has a “Free on-line video presented by DartFish” of various lifting exercises.**

(see: <http://www.nsca-lift.org/videos/displayvideos.asp>)

If you plan on having plyometric exercises in your strength training program, a good DVD program on Plyometric instruction is from Don Chu “**Complete Guide to Plyometric Training**” (see: [http://www.donchu.com/plyo\\_products/#videos](http://www.donchu.com/plyo_products/#videos)). The National Strength and Conditioning Association also has a program, Plyometrics for the Strength-Power Athlete-DVD (see: <https://www.nsca-lift.org/secure/NMStore/nmhome.asp> click on search by category and then select Videos).

If the cost of purchasing a videotape instruction program is a problem for your limited physical education budget, look into video taping eight to ten of your best strength training students. You will need to be wise in your selection of students; be sure to select both boys and girls. You can use this video tape to illustrate the proper lifting techniques needed at each of your exercise stations. This videotaped instruction will provide an excellent visual example for your physical education students.

Another visual example for the students is the use of exercise posters and muscles working charts. At each exercise station, place an exercise poster which illustrates the exercise and what muscles that are at work during that particular exercise. Buy charts/posters that show color illustrations of the muscles at work in several upper body and several lower body exercises. These charts come in various sizes, laminated and in various groupings (body areas).

### What can be accomplished with a good after school intramural program?

When I taught at the junior high level, most visitors to our weight room stated that our after-school intramural strength training program for both boys and girls was especially remarkable for a junior high school. As part of our weight room equipment, we set up a computer center with a printer where we would individualize each student's workout through a software program called Power 5.1. (see: <http://www.power51.com/>). This software program would print out a strength training workout that was very specific to each individual student's strength level and athletic interest. Through a series of questions aimed at the individual student needs, we were able to provide each student lifter with a six to eight week strength training program that told them all of the information they would need to know. On a computer generated print out the program provided each lifter the following information; a very specific workout which told them which exercises to do, how much weight to use for each exercise listed, and how many sets, and how many repetitions they were to accomplish for each exercise on their list. All of this information is based on the students own strength level (estimated 1 rep max).

To reward the student's efforts in the after school training program, we awarded weight training t-shirts to the students. The t-shirt would have various total weight clubs printed on the front of the shirt. To receive a weight training t-shirt the student must find his/her strength level (estimated 1 rep max) at three different lifting stations. We use the bench press, leg press, and the shoulder press stations for the three total lifts. The student then added up the three weights (maximum efforts; see: estimated 1 rep max [http://teachfitnessconcepts.com/Find\\_Your\\_Strength\\_level.htm](http://teachfitnessconcepts.com/Find_Your_Strength_level.htm) ) together to get the total poundage for all three lifts. To find a student's estimated 1-repetition maximum at the three lifting stations, we use the Boyd Eply's strength level chart. The Boyd Eply strength level chart will estimate the students 1-repetition maximum based on the number of repetitions they achieve to any given weight. (see: [http://teachfitnessconcepts.com/PDF%20files/estimated\\_max.pdf](http://teachfitnessconcepts.com/PDF%20files/estimated_max.pdf) ).

To find the estimated 1-repetition maximum, the student was instructed to do a light warm-up set of 10 to 12 repetitions. Then they are instructed to select a weight at which they know they cannot do/complete more than 8 to 12 repetitions before becoming completely fatigued on that exercise. The student then does the weighted exercise until fatigued, they write down the weight they lifted, and the number of repetitions they achieved, and then look at the estimated 1 rep max chart to find their estimated 1 repetition maximum. Example: At the bench press station, if the student lifted the weight of 200 pound for 8 repetitions, then his/her estimated 1-repetition maximum on that exercise would be 250 pounds. This estimated 1-repetition is accurate enough to set up the student's workout program for the next 6-8 weeks. A great benefit of the estimated 1 repetition maximum is the fact the student will not be handling a large weight that can cause injury, yet the student is still able to find his/her strength level. I would not use any other one repetition max-out program. A true 1-repetition maximum can be very dangerous, especially for pre-adolescent, adolescent, and beginning & inexperienced lifters, and even for the advanced lifter, if he/she is handling a high 1 repetition maximum weight. In the last case scenario, I believe the lifter and the spotter are both at serious risk of injury, due to the high weight that is being handled.

## Objectives in strength training and advanced strength training What will the Students Learn in the Weight Room?

Lower grade levels (grades 6-8) should concentrate on the basic fundamentals of strength training. Place low emphasis on large strength gains or body weight gain and high emphasis on lifting technique, knowledge of how to execute various lifts, and names of the muscle groups that are being worked. By the end of the unit the student should achieve the following objectives:

### Beginning Strength Training Unit

1. Knowledge of the following various types of lifting programs available to the average person:
  - a. Endurance/Circuit Training
  - b. Basic Strength Training
  - c. Power Strength Training
  - d. Individualized Strength Training

NOTE: See <http://teachfitnessconcepts.com/Theprogression.htm> for specifics about these 4 different strength training routines. At the pre-adolescent, adolescent level and for the beginning & inexperienced lifter, I highly recommend that you only teach Endurance/Circuit Training, with only an introduction to Basic Strength Training.
2. Knowledge of how to execute the various upper body and lower body exercises.
3. Knowledge of how to safely spot a fellow lifter in several upper body and lower body lifts.
4. Knowledge of the importance of executing a full range of motion on all exercise/lifting stations.
5. Knowledge of all safety rules and precautions in a weight training environment.
6. Knowledge of how to properly warm-up and cool down for any vigorous physical activity/workout program.
7. Knowledge of the importance of having flexibility, in conjunction with a strength-training program.
8. Knowledge of the names of the various muscle groups involved in the upper body and lower body strength training.
9. Knowledge of how to find ones own *estimated one (1) repetition maximum* on various upper body and lower body lifts
10. Demonstrate the ability to execute the various upper body and lower body exercises.
11. Demonstrate the ability to spot safely, a fellow lifter in several upper body and lower body lifts.
12. Demonstrate the ability to execute a circuit interval strength training program.
13. Demonstrate the ability to follow all safety rules and precautions involved in strength training environment.
14. Demonstrate proper warm-up and cool down
15. Increase flexibility due to static stretching during cool down and due to full range of motion during exercise/lifting program

## Advanced Strength Training Unit

Upper grade levels (grades 9-12) will review and demonstrate the basic fundamentals of strength training before beginning the advanced program for strength training. The advanced unit for strength training will concentrate on larger strength gains and more advanced lifts. Lifting form is still emphasized and important however a shift to more intensity (work load/overload) in the lifting program will be necessary to achieve larger strength gains. By the end of the advanced strength training unit the student should achieve the following objectives:

1. Knowledge of all the basic fundamentals from the beginning strength-training unit.
  - a. Endurance/Circuit Training
  - b. Basic Strength Training
  - c. Power Strength Training
  - d. Individualized Strength Training
2. Knowledge of proper spotting techniques specifically used Strength & Power & Individualized strength training routine programs.
3. Knowledge of the various lifts involved in Strength & Power & Individualized strength training routines (larger muscle mass development program due to higher weight (intensity/resistance) with lower repetitions (2-10 reps), and higher sets (4-5 sets)).
4. Knowledge of the name of each muscle group that is being strengthened at each exercise station.
5. Knowledge of how to find ones own *estimated one (1) repetition maximum* on various upper body and lower body lifts.
6. Knowledge of the various lifts Involved in Strength & Power & Individualized strength training routine programs.
7. Demonstrate the proper spotting techniques specifically used Strength & Power & Individualized strength training routine programs
8. Demonstrate the various lifts involved in Strength & Power & Individualized strength training routines (larger muscle mass development program due to higher weight (intensity/resistance) with lower repetitions (2-10 reps), and higher sets (4-5 sets)).
9. Demonstrate the ability to find ones own estimated one (1) repetition maximum in at least two lower body lifts and three upper body lifts.
10. Demonstrate the ability accurately self evaluate and evaluate other student lifters on their lifting technique and spotting technique of various upper body and lower body exercises.

## Warm-up/Cool Down & Safety Precautions

### Warm Up Activity

Proper warm up of the body before beginning any strength training program is very important. The purpose of the warm-up is to increase circulation of blood flow to all parts of the body, and to increase the heart rate to prepare it for the stress that it will be asked to handle. This can be achieved in many ways; jogging, jumping rope, and/or having the students do a dynamic warm-up. A dynamic warm-up is warm-up of the various body parts with slow movement that includes simulating the actual activity that you are about to perform, with no resistance other than gravity and their own body weight. You should allow the students at least five minutes to warm up properly. I particularly like for pre-adolescent and adolescent students to do a jump rope routine/program for their warm up. The Jump rope program will warm the muscle tissues, increase the heart rate, and provide the students with an opportunity to work on coordination, agility, and jump rope skills. Additionally you could have the students do form running drills, with the focus on proper form and smoothness of movement. You will be accomplishing two objectives in both jump rope routines and form running drills, if you choose these as your dynamic warm-up routine, a learned skill and the actual increase circulation of blood to all of the body parts.

### Warm Down Activity

A good warm down activity is very important to the student lifters. The purpose of the warm down activity is to stretch out the tightened muscles and to slowly release lactic acid from the fatigued muscle, which will help reduce soreness. If a good warm down activity is achieved, the results will be more flexibility in your students and less soreness, which means that the strength gains will occur more rapidly. The warm-down should last at least 5 to 10 minutes. With a good warm-down routine/program there is a great opportunity to teach static stretching and increase flexibility in all muscle groups.

### Safety Precaution

Throughout the strength training room, warning signs should be posted for the students to read and follow. Have the list of weight room rules listed in bold print somewhere in the room where all students can see, read, and follow these rules. Consider having signs to remind the students to use spotters at all free lifting stations. For your own records, consider having a log book to record maintenance performed at any strength training station. Check the machines' pulleys and cables and lubricate the guide rods on a regular basis. Check the free lifting bars for tightness of the set-pins and check the upholstery on the benches for holes or cracks. Close down any exercise station that is in need of repair with a posted "Do not use" sign. Report repairs to your building supervisor as soon as possible so that he/she can make a request for someone to come to your facility and repair the equipment. Lastly, create a routine of wiping down and cleaning of the upholstery/equipment on a daily basis. This is important to help eliminate germs and possible spread of diseases. If you have classes that occur one after another, teach the students to wipe down the upholstery before they leave the room. If a student is perspiring profusely, they should wipe down the upholstery before moving to the next station. This is a very common practice in all professional workout gyms/facilities. A product that we use in Rockwood is called "[Sani-Shield](#)" it is a great, safe product that we provide to our teachers to use in all of our strength training facilities.

## What is Circuit Strength Training?

Circuit training is a series of exercise stations, set up to exercise various body parts at a quick, high repetition pace, during a short time interval and with a short rest interval. Each exercise station has a name and a number. To begin the circuit, the students start at any numbered station. They will exercise for a certain timed interval, then rest/spot their partner, then rotate to the next numbered station. The time interval at each exercise station can vary and the intensity of the exercise can be adjusted according to the grade level and the experience level of the lifter. The most common exercise interval and rest interval used for circuit training is 30 seconds.

### 30-Second Interval Program

The students are instructed to find a lifting partner and to report to an exercise station. The students are then asked to decide which partner will be "A" lifter and which partner will be "B" lifter. At each exercise station the two people will work together as partners. One person will be lifting weights or exercising, while the other person is spotting and resting. Every 30 seconds the two partners will switch places and assignments. The circuit/cycle will go as follows: exercise for 30 seconds, spot/rest for 30 seconds, and then rotate to a new exercise station. This sequence will continue until the desired number of stations prescribed is completed.

Five circuit training audio CD's were specifically designed for a circuit training program at the Middle School level and/or for the beginning & inexperienced lifter. The circuit training audio CD's will tell the student (partner A) when to start lifting/exercise, when to stop lifting/exercise, when to switch places with his/her partner, (partner B) when to start lifting/exercise, when to stop lifting/exercise, and then when to rotate (partner A & B) to the next lifting/exercise station. This circuit training audio CD is extremely valuable to the teacher because it allows the teacher to closely monitor the students and work with the students who need help, without watching a stop watch or using a whistle to get the students attention.

## What variations can be used for Circuit Training?

### 30-Second Interval - with 2 Set Rotation

This circuit training interval program is for students who have good lifting technique and are ready to increase their overall muscular strength. The two-partner system is still used just like the 30-second interval, however, when it is time to rotate to the next station, they do not rotate, they stay at their exercise station to do a second set of the same exercise/lift. This program will allow the student to do two sets of the same exercise before rotating to the next station. In this interval program the teacher can encourage the lifter to add a little more weight to the lifting station and lower the number of repetitions. A possible change in repetitions would be from 10 to 15 repetitions per exercise to 8 to 12 repetitions per exercise. This modification in the 30-second program will increase strength gains and build more endurance.

#### **IMPORTANT NOTE:**

**For pre-adolescent students, I would not increase the weight and I would not lower the repetitions. The Pre-adolescent and adolescent students should stay with light weight and 10 to 15 repetitions. Their body and muscles may not be ready for this higher intensity/stress workout.**

### **1 minute Interval - 1 set Rotation**

This circuit training interval program can be used for gymnasium exercise stations set up in circular pattern around the gymnasium. The one minute interval would be used to achieve more duration in the muscles being worked. The student would work continuously for the 1 minute interval. Examples of gymnasium exercise stations: jumping rope, various medicine ball activities, various plyometric drills, agility drills, balancing activities, juggling, form running drills, various stability ball exercises, and any other own body weight resistant exercises you can create. You still use the two-partner system, just like the 30-second interval.

### **1 minute Interval - 2 sets Rotation**

In the one minute interval with a two set rotation, the student does not rotate until he/she has completed two sets of the same exercise. This program will allow the student to do two sets of the same exercise, again building strength and endurance. This circuit will be very challenging for most students and you should expect them to get tired quickly. I would recommend that you work with your students with the one minute interval one set rotation for several weeks before trying the two sets rotation.

### **3-Minute Interval**

This interval lifting program is for the more advanced lifter who is ready to add a larger amount of weight and reduce the repetitions, which will increase the intensity of the workout. The two-partner system is still used, just like the 30-second interval program, but the partners will switch places independently, on their own initiative. This will allow the other partner his/her opportunity to lift and allow time for recuperation of the muscles before the next set is performed. Each partner will complete two sets of 8 to 10 repetitions at a moderate weight within the three-minute interval. If the lifters have completed the prescribed two sets and the time interval is not up yet, they will start a third set of 8 to 10 repetitions. The audio CD will instruct the lifters when to start lifting, and at the end of the three-minute interval the audio CD will instruct the lifters to stop lifting, and then tell them to rotate to the next lifting station. Lifting technique is still emphasized in the 3-minute interval, and strength gains should be significantly better with this type of lifting cycle.

#### **IMPORTANT NOTE:**

**For pre-adolescent students, I would not use the 3 minute interval and/or not allow them to increase the weight and I would not lower the repetitions. The Pre-adolescent and adolescent students should stay with light weight and 10 to 15 repetitions. Their body and muscles may not be ready for this higher intensity/stress.**

### **Circuit Training Interval Audio CD's**

1. 30 seconds exercise interval, for two people per station (A & B partners), with a one set rotation to the next exercise station.
2. 30 seconds exercise interval, for two people per station (A & B partners), with two sets rotation before they move to the next exercise station.
3. 1 minute exercise interval, for two people per station (A & B partners), with a one set rotation to the next exercise station.
4. 1 minute exercise interval, for two people per station (A & B partners), with two sets rotation before they move to the next exercise station.
5. 3 minute exercise interval, for two people per station (A & B partners), with a one set rotation to the next exercise station.

## Circuit Strength Training Program

Integrating a Circuit Strength Training Unit for all boys and girls in physical education class and in an after school intramural program is an excellent way to expose pre-adolescent, adolescent students, and beginning & inexperienced lifters to strength training and fitness activities. The circuit strength training program has proven to be popular and very productive for these groups of students. In fact, I believe that all students should be exposed to at least 2 to 4 weeks of circuit training for strength & endurance, during their lifting program/cycle. As a member of the National Strength & Conditioning Association (NSCA) since 1985, I often look for articles that discuss the position and current practices regarding pre-adolescent, adolescent students in the area of strength training. Here is the **NSCA position statement on Youth Resistance Training**:

### *Position Statement*

#### *Youth Resistance Training*

*It is the current position of the NSCA that:*

- 1. A properly designed and supervised resistance training program is safe for children.*
- 2. A properly designed and supervised resistance training program can increase strength of children*
- 3. A properly designed and supervised resistance training program can help to enhance the motor fitness skills and sports performance of children.*
- 4. A properly designed and supervised resistance training program can help to prevent injuries in youth sports and recreational activities.*
- 5. A properly designed and supervised resistance training program can help to improve the psychosocial well-being of children*
- 6. A properly designed and supervised resistance training program can enhance the overall health of children.*

(See: <http://www.nscalift.org/Publications/YouthforWeb.pdf> )

At the middle school level, I advocate non-weighted exercises (body weight resistance) first, weight machine resistance training second, plyometric exercises third, and free weights last. Once the correct weight machine precautions are taught and proper body position & exercise techniques are taught, and the recommended height for plyometric exercises are taught to the students, the safety of the environment with non-weighted stations, weighted machines stations, and plyometric exercise stations, is better than the safety environment of free weights. However all four types of strength training stations can be used and can coexist with proper instruction, proper student orientation, and proper supervision in place.



### **Portable Fitness Equipment for High School Phys Ed classes**

A large portable equipment cage with the following equipment items in each High School cage;

<b><u>Quantity</u></b>	<b><u>Equipment item</u></b>
10	12" mini Hurdles (Banana steps)
10	18" mini Hurdles (Banana steps)
4	30' ABC Agility Ladders
5	First Place Elite 8 lb Med Balls
5	First Place Elite 10 lb Med Balls
10	PB Disc - Stability Pillows
2 sets of 6	Agility Dots
5	50' Training Rope (2")
10	Valslide (sliders)
5-Orange	All-Purpose Medium Exercise Bands
5-Yellow	All-Purpose Heavy Exercise Bands
5	1 ¾" wide Superband
5	2 ½" wide Superband
1	Superband Training DVD
5	55cc Stability Ball Plus
5	65cc Stability Ball Plus
5	75cc Stability Ball Plus
1	Sport pump for Stability Ball Plus
10	Bosu Balance Trainer
1	Bosu Balance Trainer Rack
1	Bosu Total Body DVD's/Manuals/Exercise logs

### **Portable Fitness Equipment for Middle School Phys Ed classes**

A large portable equipment cage with the following equipment items in each Middle School cage;

<b><u>Quantity</u></b>	<b><u>Equipment item</u></b>
10	6" mini Hurdles (Banana steps)
10	12" mini Hurdles (Banana steps)
4	15' ABC Agility Ladders
5	First Place Elite 6 lb Med Balls
5	First Place Elite 8 lb Med Balls
10	PB Disc - Stability Pillows
2 sets of 6	Agility Dots
5	40' Training Rope (1 ½")
10	Valslide (sliders)
5-Pink	All-Purpose Light Exercise Bands
5-Orange	All-Purpose Medium Exercise Bands
5	1" wide Superband
5	1 ¾" wide Superband
1	Superband Training DVD
5	55cc Stability Ball Plus
5	65cc Stability Ball Plus
1	Sport pump for Stability Ball Plus
10	Bosu Balance Trainer
1	Bosu Balance Trainer Rack
1	Bosu Total Body DVD's/Manuals/Exercise logs

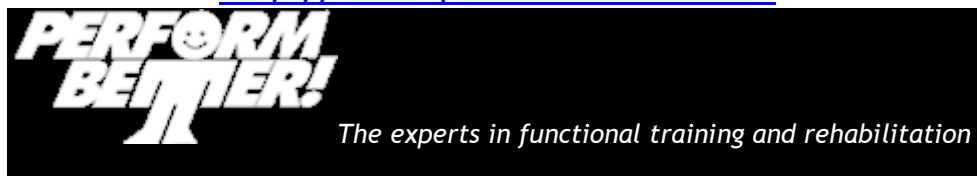
## Portable Fitness Equipment for Elementary School Phys Ed classes

A large portable equipment cage with the following equipment items in each Elementary cage;

<u>Quantity</u>	<u>Equipment item</u>
10	6" mini Hurdles (Banana steps)
10	12" mini Hurdles (Banana steps)
4	15' ABC Agility Ladders
5	First Place Elite 4 lb Med Balls
5	First Place Elite 6 lb Med Balls
10	PB Disc - Stability Pillows
2 sets of 6	Agility Dots
5	30' Training Rope (1 ½ ")
10	Valslide (sliders)
5 – Purple	All-Purpose Extra Light Bands
5-Pink	All-Purpose Light Exercise Bands
5-Orange	All-Purpose Medium Exercise Bands
5	½" wide Superband
5	1" wide Superband
1	Superband Training DVD
5	45cc Stability Ball Plus
5	55cc Stability Ball Plus
1	Sport pump for Stability Ball Plus
10	Bosu Sport %% Balance Trainer
1	Bosu Balance Trainer Rack
1	Bosu Total Body DVD's/Manuals/Exercise logs

All equipment in Portable Locker/Cage is from

<http://www.performbetter.com>



Portable Fitness Equipment from <http://www.performbetter.com>

## Banana Steps



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## Speed / Agility Ladders - ABC Agility Ladder



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## First Place Elite Medicine Balls



## **PB Disc Pillow**



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## **Agility Dots (set of 6)**



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## **Training Ropes**



## [Valslide](#)



### Description

The Valslide is a pair of discs that provide an unstable training surface that allows you to simulate many slideboard exercises.

### Features

Turns carpet, tile and linoleum floors into an unstable training surface.

Lightweight and portable.

### Benefits

Use them to target multiple body parts such as your legs, inner thighs, and butt all at the same time.

Use them to stretch and tone your shoulders, chest and back.

### Includes

2 ValSlide discs., 1 mesh carry bag, Valslide Exercise Sheet

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## [All-Purpose Exercise Bands](#)



### Description

Two 56" heavy-duty bands connected to a 10" loop.

### Benefits/Uses

Each arm can push and pull independently.

Train with a partner or connect loop to any secure object

Lets you train in all planes of motion (Sagittal, Frontal, and Transverse)

### Features

Extremely strong and durable

Available in 6 sizes

1 Year Warranty

### [View the Instructional Exercise Video](#)

For articles on using Bands & Tubing check out our

[Bands & Tubing Training Zone](#)

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## Superbands



**Description** - Superbands are extra-strong, long resistance bands designed for heavy duty use. Superbands are 40" Long x 3/16" thick and come in 4 different widths: 1/2" wide, 1" wide, 1 3/4" wide or 2 1/2" wide.

### **Benefits/Uses**

- Effective for both upper and lower body training.
- Use Superbands for assisted chin ups and dips.

### **Resistance Level**

1/2" = 25 LBS

1" = 50 LBS

1 3/4" = 75 LBS

2 1/2" = 100 LBS

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## BOSU Pro Balance Trainer



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## \*BOSU Club Package

