

UNIT 5 : Weight Training and Body Shaping

GRADE LEVEL: 8-12

TIME RANGE: No less than 15 days

GRADING PERIOD: ANY

LESSON/UNIT PLANS

UNIT: 5

TOTAL LESSONS: 6 out of 15 LESSONS

OBJECTIVES:

1. Identify the factors that directly or indirectly affect muscular strength and endurance;
2. Cite the advantages of acquiring and maintaining adequate muscular strength and endurance throughout life;
3. Design a personalized strength-development program using weights that applies sound training principles and meets your fitness objectives;
4. Design a personalized strength-development program without using weights that applies sound training principles and meets your fitness objectives;
5. Complete a strength and endurance routine using one of the methods described in this section;
6. Design a body-shaping program involving aerobic exercise, dietary restriction, and weight training that will reduce body fat, add muscle mass and definition, and change the way you look.

Students can reach these objectives through the following methods:

1. Complete an awareness inventory that describes, defines and discusses the above objectives.
2. Complete an assessment to determine if you need to start a strength-training program.
3. Prepare a strategy plan to achieve your fitness goals that covers the below areas:
 - a. Finding your student's 6 RM for each exercise
 - b. Design a training log of exercises
 - c. Design proper warm-up and cool down exercises around weight training

Service-Learning Activity for Principles of Exercise

Have students design an electronic portfolio that identifies and defines how to perform each exercise with digital pictures/videos. Or, students can conduct a workshop to the class on how to design and develop a weight training program and/or weight loss program.

LESSON 1:

Identify the factors that directly or indirectly affect muscular strength and endurance.

LESSON FOCUS:

Complete an awareness inventory that describes, defines and discusses the above objectives.

LESSON PLAN:

1. As a warm-up conduct a 10-15 minute instant activity that gets the students moving throughout the gym and prepares them for the main physical activity.
2. Have students complete an awareness inventory that describes, defines and discusses the above objectives. See below Awareness Inventory
3. After students complete the wellness inventory share the answers with them and discuss each question with the class.
4. Explain the below to the students the difference between muscular strength and endurance.

Muscular Strength – the ability of a muscle to exert maximum force against resistance; 1 RM (Repetition Maximum).

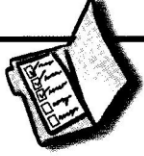
Muscular Endurance – the ability of a muscle to exert sub-maximal force repeatedly over a period of time.

We all are familiar with the traditional definitions of Muscular Strength/Endurance, but how do we answer the question: “is anything beyond the one repetition max (1 RM) threshold working Muscular Endurance?”. Let’s take a look at a 2, 3, or 4 sub-maximal repetition lift. Can one honestly say that an individual is not gaining Muscular Strength when you perform this? Or that you are gaining only Muscular Endurance because it is beyond the scope of the 1RM. I agree that a 1 RM test measures the individual’s ability to exert maximal force against resistance; but does this lead us to believe that a sub-maximal 2, 3 or 4 repetition lift against resistance is a test of Muscular Endurance? I would have to disagree wholeheartedly to this statement and what it suggests. What it’s suggesting is that there is an “absolute” answer when it comes to defining both Muscular Strength and Muscular Endurance and although scientific research can help us, there is an awful large “grey area” within the definition.

Muscular strength is the ability to generate force with a muscle or group of muscles; whereas, **muscular endurance** is the ability to perform repeated contractions with a muscle or group of muscles. The difference between muscular strength and muscular endurance can be better understood by reviewing how each is assessed. Muscular strength is assessed by determining the maximal amount of force that an individual can apply against resistance-one time (1 RM), such as with a bench press or possibly a push up. Muscular endurance is assessed by determining how many times that an individual can apply sub-maximal force upon a weight (or body weight), such as bench-pressing x pounds twenty five times, or the total number of sit-ups, or push-ups one can perform.

Above all, it is important not to be confused by the assessments of muscular strength and of muscular endurance. The 1 RM lift is an assessment of Muscular Strength; however, Muscular Strength is developed by working with resistance that is correlated to 80% or more of the individual's 1RM. Muscular Endurance is assessed by using 70% or less of an individual's 1 RM and determining how many repetitions can be performed.

If physical educators want to be able to properly define the relationship between muscular strength and muscular endurance, they must look at the two in a way that defines their association with each other, not their differences. The most beneficial way that I have found to accomplish this is to use a Strength Training Continuum which states: If a workload is less than 70% of an individual's 1RM, then muscular endurance is the primary outcome of the activity (however, muscular strength is still being developed at a lower level); if a workload is greater than 80% of an individual's 1RM, then muscular strength is the primary outcome of the activity (however, muscular endurance is still being developed at a lower level); if the workload is between 70-80% of an individual's 1 RM, then muscular strength and muscular endurance are being developed somewhat equally. The use of the Pathway to the Development of Muscular Strength and Endurance provides the students with a visual and subjective measurement to increase their comprehension of the concepts of muscular strength and muscular endurance as used in physical education. From here, a physical educator must begin to expand on the topic of strength training by applying the terms: overload, specificity and variation along with reviewing the FITT principle, only then can a student fully comprehend how strength training can effect their bodies and how to utilize strength training in their short and long term health/fitness goals.



Awareness Inventory

Name _____ Date _____

Check the space by the letter T for the statements that you think are true and the space by the letter F for the statements that you think are false. The answers appear following the list of statements. This chapter will present information to clarify these statements for you. As you read the chapter, look for explanations for the reasons why the statements are true or false.

- T___ F___ 1. Weight training burns few calories and does not help you lose weight.
- T___ F___ 2. Regular weight training will change your fatty tissue to muscle tissue.
- T___ F___ 3. Fibrous bands that attach some muscles to the bones to allow movement when muscles contract are called tendons.
- T___ F___ 4. Using heavy weight, low repetitions, and multiple sets is an excellent way to improve your muscular endurance.
- T___ F___ 5. You can easily add 4 to 7 pounds of muscle to your body each month through weight training.
- T___ F___ 6. One of the problems with strength training is that muscle will turn to fat when you stop training.
- T___ F___ 7. Anyone can develop a flat midriff by using a sound upper and lower abdominal exercise program daily.
- T___ F___ 8. One acceptable breathing technique is to exhale during the exertion or lifting phase and inhale during the relaxation phase.
- T___ F___ 9. You can completely reshape your body in 2 to 3 months through weight training.
- T___ F___ 10. Approximately 48 hours (2 days) of rest is recommended between weight-training workouts to allow full recovery and receive the full benefits of a workout.

Answers: 1-F, 2-F, 3-T, 4-F, 5-F, 6-F, 7-F, 8-T, 9-F, 10-T

LESSON 2:

Cite the advantages of acquiring and maintaining adequate muscular strength and endurance throughout life.

LESSON FOCUS:

Complete an assessment to determine if you need to start a strength-training program.

LESSON PLAN:

1. Explain and conduct an instant activity or the pacer test/run as a warm-up to the activity. This should take approximately 15-20 minutes.
2. Have students complete an Analyze Yourself/Do You Need to Start a Strength-Training Program that describes, defines and discusses the above objectives. See below Analyze Yourself.
3. After students complete the assessment share the answers with them and discuss each question with the class.
4. Divide the students into groups of 2-4 and assign them a below benefit and have them discuss this benefit. Explain to the students that they should be prepared to share their findings with the entire class prior to the end of the class period.
 - a. Management of body weight and fat.
 - b. Improved appearance, body image, and self-concept
 - c. Increased strength and endurance for work and daily activities
 - d. Increased bone-mineral content
 - e. Heart health.
 - f. Benefits for college men and women
 - g. Benefits for young boys and girls
 - h. Benefits for the elderly
 - i. Improved performance in sports and recreational activities
 - j. Decreased incidence of sports and work-related injuries
5. For additional information refer to the following website:
<http://weighttraining.about.com/od/benefitsofweighttraining/a/benefits.htm>



Analyze Yourself

Do You Need to Start a Strength-Training Program?

Name _____ Date _____

Instructions: Answer each question with a yes or no before reading the interpretation section to find out how badly you are in need of a strength-training program.

Yes No

1. ___ ___ Have you been on a diet within the past 6 to 12 months?
2. ___ ___ Have you ever lost, then regained, 8 to 10 pounds in the same year?
3. ___ ___ Do you find it difficult to control your body weight?
4. ___ ___ Do you have excess, sagging skin on the back of your upper arms, thighs, back of the legs, abdomen, or other body part?
5. ___ ___ Are you interested in changing your appearance by adding muscle and reducing the size of fat deposits?
6. ___ ___ Would a firmer, more muscular body help your body image, how you feel about yourself, and how you think others feel about you?
7. ___ ___ Would additional strength or endurance improve performance in any sports or exercise activity?
8. ___ ___ Would additional strength or muscular endurance help performance on the job or at home?
9. ___ ___ Would you like to strengthen any specific muscle groups in your body?
10. ___ ___ Have you sustained a soft-tissue (muscle, tendon, ligament) injury within the past 12 months, such as an ankle sprain, pulled muscle, or contusion?

Interpretation

If you answered yes to two or more of the questions, you need a strength-training program.

Questions 1 through 3 are concerned with body weight and fat. Strength training can help your skin fit better, help you focus on your body, help you shrink fat cells, and add muscle mass.

Questions 4 through 6 are concerned with body image and your interest in improving your appearance through strength training.

Questions 7 through 9 are concerned with the need for additional strength to aid performance on the job, at home, and in recreational activities.

Question 10 is concerned with the prevention of job, home, and exercise-related injuries.

LESSON 3, 4, and 5:

1. Design a personalized strength-development program using weights that applies sound training principles and meets your fitness objectives;
2. Design a personalized strength-development program without using weights that applies sound training principles and meets your fitness objectives;
3. Complete a strength and endurance routine using one of the methods described in this section;

LESSON FOCUS:

1. Prepare a strategy plan to achieve your fitness goals that covers the below areas:
 - a. Finding your student's 6 RM for each exercise
 - b. Design a training log of exercises
 - c. Design proper warm-up and cool down exercises around weight training

LESSON PLAN:

1. Set-up 6-10 circuit training stations that will get students into their training heart rate zone. Provide music that is a fast beat to motivate the students and it is recommended that students can bring in their own music if it is clean and free of inappropriate content. How to use the above PRE instead of the usual duration at each station that you have done in the past (i.e., 20-30 seconds at each station) make the station longer for 30-40 seconds before rotating to the next station.
2. The circuit training activity should last from 20-30 minutes that focuses on muscular strength.
3. Next explain and discuss the below basic weight training principles:
4. There are many different ways to build muscle strength, but they all boil down to some very basic principles. These four principles are the foundation upon which to build an efficient and productive strength training routine.
5. **Strength Exercise Selection**
What exercises you choose to do are the starting point for creating an optimal workout. You have to make wise selections that make the most of each exercise. My advice is to choose strength exercises that are multi-joint

exercises rather than single joint movements. For example, choose a squat over a leg extension and you get far more return on your exercise investment. Additionally, this sort of exercises selection is much more likely to simulate real life or real sports movements. In real life we use many muscles and joints in very rapid succession to move. Working out this way eliminates the need for isolated movements like bicep curls. Keep this in mind when you select your exercises during training.

6. Keep the number of exercises manageable. Three to five high intensity exercises is about right. Don't think you can do 15 strength exercises in one session and still get a high intensity workout. With too many exercises, you tend to fatigue before you finish or lower your overall output and get a lesser quality workout. The optimal time for a full strength training workout at high intensity is about 30 minutes.

7. **Frequency of Strength Training Session**

The two factors that determine your strength gains are the intensity of the exercise performed and allowing an appropriate rest and recovery period after the workout. For this reason, most strength workouts are built around the concept of short, high intensity weight workouts followed by one to two days of rest to let the muscles rebuild and become stronger. Research shows that muscles continue to build fibers and become stronger for up to a week after a workout that is performed to muscle failure. This underscores the importance of alternating a high training intensity with adequate rest periods in order to build muscle.

8. **Number of Sets Performed**

There is a lot of discussion about how many sets of an exercise to do. The bottom line is if you can do one set to exhaustion, that is probably enough. The reason many people need to do multiple sets is that they didn't perform the first one at maximum intensity. There are other reasons to perform multiple sets and the biggest one is safety. Performing one set of maximum effort can increase your risk of injury if you haven't thoroughly warmed up or if you don't use perfect lifting technique. Sometimes it's smart to use a set to make sure you don't over-lift (lift more than you are capable of lifting in a safe manner). If you are experienced and skilled at weight lifting, go ahead and perform the first set at max effort and work to failure. Research backs up the idea that one set training produces the same strength gains as multiple sets and it does this in less time.

9. **Number of Repetitions Performed per Set**

There are a lot of different recommendations regarding how many reps to

perform during weight training. How many you should do depend on your training goals and current level of fitness. Keep in mind that strength training promotes increases in both functional strength (how much you can lift) and muscle hypertrophy (how big your muscles grow). Higher repetition during weight lifting sessions stimulate the slow twitch muscle fibers and promote muscle endurance. Lower repetitions during weight training (at a higher intensity) activate the fast twitch muscle fibers and increase strength and muscle size. One simple way to get the best of both of these training methods is to vary your training repetitions. Because both are important for overall athletic conditioning, and many strength training experts will recommend varying the number of repetitions through a 8-10 week training cycle. Keep in mind that performing high intensity lifts is still necessary even if you are performing 50 repetitions. The weight must be heavy enough that you reach fatigue at the last repetition in order to promote functional muscle growth.

10. Distribute the below Discovery Activity 7.1/Finding Your 6RM for Each Exercise. The teacher should first demonstrate each exercise prior to the students starting.
11. This activity can be divided up into stations so each group can rotate through all stations to complete each exercise.
12. Based on the above weight training principles have the students design a personalized strength-development program using weights that applies sound training principles and meets your fitness objectives. This can be completed by dividing the students into groups of 2-4 students.
13. After the students develop a plan they will then demonstrate with the class how to perform this plan.
14. Based on the above weight training principles have the students design a personalized strength-development program without using weights that applies sound training principles and meets your fitness objectives. This can be completed by dividing the students into groups of 2-4 students.
15. After the students develop a plan they will then demonstrate with the class how to perform this plan.
16. The teacher can divide this lesson into 3 separate lessons: 1st lesson is explaining the principles of weight training and Activity 7.1, the 2nd lesson can be the designing of the weight training session with weights, and the 3rd lesson can be designing the session without using weights.
17. See below handouts to design workouts and/or the following website:
<http://www.exrx.net/WeightTraining/WorkoutLogs.html>



Discovery Activity 7.1

Finding Your 6RM for Each Exercise: Your First Weight-Training Workout

Name _____ Date _____

Instructions: Your first weight-training session focuses on mastery of the proper form for each exercise and finding the amount of weight you can lift a maximum of six times for each exercise.

- Ask an instructor to show you the proper form and technique for each exercise in the basic program in table 7.2. Use light weight and practice this form as an instructor observes your technique.
- Return to each exercise and find your 6RM. If you can bench-press 90 pounds just six times but not seven, you have a 6RM of 90 pounds. This is your starting weight for the bench press. Take your time and begin each exercise with a weight you know you can handle. If you complete six repetitions easily, rest 2 minutes, add 5 to 10 pounds, and again attempt to complete six repetitions. The first low estimate also serves as a warm-up procedure for each exercise. Continue this procedure until you find the weight that permits only six

repetitions. Record your starting weight in table 7.A. If you have a good idea of how much weight you can lift, begin with that amount. Rest 2 to 3 minutes and either add or remove weight before attempting the next set.

TABLE 7.A

Exercise	Repetitions	Starting weight
Two-arm curl	6-10	_____ (8RM)
Military press	6-10	_____ (8RM)
Rowing (upright)	6-10	_____ (8RM)
Bench press	6-10	_____ (8RM)
Squat	6-10	_____ (8RM)
Heel raise	15-25	_____ (15RM)
Deadlift (bent knee)	6-10	_____ (8RM)
Sit-ups (crunch)	25-50	_____ (25RM)*

*Hold a light weight of 5 to 11 lb with both hands behind the head.

LESSON 6:

Design a body-shaping program involving aerobic exercise, dietary restriction, and weight training that will reduce body fat, add muscle mass and definition, and change the way you look.

LESSON FOCUS:

Service-Learning Activity for Principles of Exercise

Have students design an electronic portfolio that identifies and defines how to perform each exercise with digital pictures/videos. Or, students can conduct a workshop to the class on how to design and develop a weight training program and/or weight loss program.

LESSON PLAN:

1. Set-up 6-10 circuit training stations that will get students into their training heart rate zone. Provide music that is a fast beat to motivate the students and it is recommended that students can bring in their own music if it is clean and free of inappropriate content. How to use the above PRE instead of the usual duration at each station that you have done in the past (i.e., 20-30 seconds at each station) make the station longer for 30-40 seconds before rotating to the next station.
2. The circuit training activity should last from 20-30 minutes that focuses on muscular strength.
3. Have students design a body-shaping program involving aerobic exercise, dietary restriction, and weight training that will reduce body fat, add muscle mass and definition, and change the way you look. This program should be presented by students designing an electronic portfolio that identifies with digital pictures/videos that identifies and defines each part of the program/exercises.
4. Have students complete the Discovery Activity 7.3/Service-Learning for Weight Training. Students should complete the activity as if they were presenting to an actual group. The presentation should be conducted to the entire class for a grade.



Discovery Activity 7.3

Service-Learning for Weight Training

Many communities conduct youth sports leagues—soccer leagues, basketball leagues, baseball leagues, or other organized sports leagues. Volunteers who coach and conduct these leagues, even those who are knowledgeable about the particular sport, often have limited knowledge of physical fitness. Weight training, although not traditionally a part of what is taught during these organized sport activities, can help participants become more proficient. You can offer to conduct a weight-training workshop for youth participants at the beginning of the sports season. Often, players and coaches participate in an orientation session before the season starts. This event would be a good time to introduce the availability of the weight-training workshop and to schedule sessions for the various teams or the league as a whole. Make sure to incorporate weight-training activities that are appropriate for the age group and specific to the sport in question.

From *Physical fitness and wellness, third edition*, by Jerrold S. Greenberg, George B. Dintiman, and Barbee Myers Oakes, 2004, Champaign, IL: Human Kinetics.
