

# **Effective Strength Training**

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# ***LEARNING OBJECTIVES:***

After reading **Chapter 1** of *Effective Strength Training*, a student should be able to:

1. Provide a working definition for the term resistance training that encompasses both the science and the art of the meaning.
2. Describe factors other than training that impact on one's ability to gain size and strength.
3. Discuss the physiological mechanism for increasing strength both early in a program and as the program continues.
4. Explain the validity of many of the myths that surround strength training.
5. Describe several types of resistance training equipment.
6. Discuss variables that should be considered when naming exercises.

After reading **Chapter 2** of *Effective Strength Training*, a student should be able to:

7. Identify the major bones that make up the axial and appendicular skeletons.
8. Understand and identify the major muscles of the body referred to as prime movers.
9. Describe the 3 planes of motion and name several movements that would take place in each plane.
10. Demonstrate various joint actions such as abduction and adduction at the hip shoulder and scapula; flexion and extension at the knee, hip, elbow, trunk and shoulder; scapula elevation and depression; ankle eversion,

inversion, plantar flexion, and dorsi flexion; forearm supination and pronation; hip inward and outward rotation; horizontal flexion and extension and circumduction in the shoulder.

11. Describe the mechanics of muscular movement.
12. Discuss force production in terms of isometric, concentric and eccentric contractions.
13. Discuss various types of resistance such as dynamic constant, dynamic variable, dynamic progressive and isokinetic.

After reading **Chapter 3** of *Effective Strength Training*, a student should be able to:

14. List and explain five benefits to participating in a strength training program.
15. Discuss ways in which strength training can impact on one's health.
16. Describe psychological health benefits associated with strength training.
17. Learn how strengthening muscles reduces risk of injury.
18. Learn how strength training can improve appearance.

After reading **Chapter 4** of *Effective Strength Training*, a student should be able to:

19. Discuss the 10 steps to creating and selecting effective resistance training exercises.
20. Give an example of finding a creative solution for an exercise that is unacceptable for a given client.

21. List and discuss the seven principles that should be incorporated in all resistance exercise programs.

22. Understand reps, loads and intensity.

23. Find creative solutions to exercise modification.

24. Analyze the risks and benefits of a given exercise.

After reading **Chapter 5** of *Effective Strength Training*, a student should be able to:

25. Explain the importance of the trunk as the “power center” for connecting movements between the upper and lower body.

26. Describe the normal curvature of the vertebral column and neutral spinal posture.

27. Identify neutral lumbar posture using the wall method or the “rock ‘n roll” method.

28. Discuss the potential mechanisms for back pain.

29. Describe factors that contribute to disc nutrition and disc health.

30. Describe the rectus abdominis musculature and its functions in the trunk.

After reading **Chapter 6** of *Effective Strength Training*, a student should be able to :

31. Describe and demonstrate several appropriate exercises to improve trunk stabilization.

32. Describe and demonstrate several exercises that involve active trunk flexion.

33. Describe and demonstrate several exercises that involve active reverse trunk flexion.
34. Describe and demonstrate several exercises that involve active trunk flexion with rotation.
35. Describe and demonstrate several exercises that involve active lateral trunk flexion.
36. Describe and demonstrate several appropriate exercises for active trunk extension, reverse trunk extension and trunk extension with rotation.

After reading **Chapter 7** of *Effective Strength Training*, a student should be able to:

37. Demonstrate and describe several appropriate exercises for the rotator cuff muscles using free weights and cables.
38. Discuss and demonstrate at least one exercise for scapula elevation, depression and retraction.
39. Describe and demonstrate several variations of chest presses and flyes using machines, free weights and cables.
40. Describe and demonstrate several exercises for the upper back and shoulders using various body positions and types of equipment.
41. Demonstrate and discuss several exercises for the elbow flexors and extensors.
42. Discuss anatomical facts about the elbow flexors and extensors in terms of wrist and shoulder positioning and muscle recruitment.

After reading **Chapter 8** of *Effective Strength Training*, a student should be able to:

43. Discuss and demonstrate at least 2 exercises that target the hip flexors and extensors.
44. Discuss and demonstrate several exercises for the hip abductors and adductors.
45. Describe and demonstrate one exercise for hip internal and external rotation.
46. Discuss and demonstrate several variations of compound exercises in the lower body such as the squat and the lunge.
47. Discuss and demonstrate several isolation exercises for knee extension and flexion.
48. Describe and demonstrate several exercises to target the ankle plantar and dorsi flexors.

After reading **Chapter 9** of *Effective Strength Training*, a student should be able to:

49. Understand the value of evaluating exercises in terms of their “relative risk” as it relates to the training goal, the individual and human anatomy.
50. Understand the concept of the term “contraindicated” as it applies to specific circumstances.
51. Discuss reasons to use scapula retraction to stabilize the shoulder girdle prior and during the performance of a resistance exercise and offer reasons for not fixing and or holding the scapula in retraction.
52. Explain how it is possible to innervate different regions of the pectoralis major muscle.
53. Discuss the depth of a chest press or flye.

54. Describe shoulder impingement in terms of possible causes, exercises that increase the risk and modification that can decrease the risk.
55. Discuss knee flexion and extension controversies in terms of patellar compressive forces and shear forces in relation to popular exercises such as the squat, leg extensions and the lunge
56. Describe the mechanism of risk during trunk flexion.

After reading **Chapter 10** of *Effective Strength Training*, a student should be able to:

57. List and describe the steps to designing a resistance training program including analyzing the client's needs, matching the client's goals to the right system, and identifying the appropriate overload.
58. Discuss the concept of cross training within a resistance training program.
59. Describe the seven steps to periodizing a resistance program for a client interested in health and fitness.
60. Understand when a strength program needs to be changed.
61. Perform a "needs analysis" for a client.
62. Design a personalized strength workout for a client.

After reading **Chapter 11** of *Effective Strength Training*, a student should be able to:

63. Explain the concept of a training program continuum that ranges from cardiovascular training to maximal power training.
64. Discuss the specific training responses related to strength training.
65. Understand the disadvantage of performing high repetitions with small overloads in terms of fitness benefits.



66. Describe the order in which slow twitch and fast twitch muscle fibers are recruited.
67. Understand and apply during the development of resistance programs the interaction between repetitions, intensity and sets in terms of achieving various client goals.
68. Understand the importance of planning rest periods to match expected training outcomes and the client's current level of fitness.
69. Discuss resistance training variables such as number of exercises, exercise order, speed of movement, breathing, increasing loads, technique and safety.
70. Explain the role of spotting in terms of safety and effectiveness in a resistance training program.

After reading **Chapter 12** of *Effective Strength Training*, a student should be able to:

71. List which training variables (repetitions, sets, intensity, exercise order and training systems) can be manipulated to add variety to client's strength training programs.
72. Discuss the concept of high intensity training in terms of its definition, theoretical basis and appropriateness for specific clients.
73. Describe high intensity training techniques including: breakdown, pyramid, assisted or forced reps.
74. Describe high intensity training techniques including: negative, super slow, super set and compound training.
75. Understand the importance of exercise quality versus exercise quantity.

After reading **Chapter 13** of *Effective Strength Training*, a student should be able to:

76. Discuss the 10-point checklist for effective strength training.

77. Describe several ways to determine the effectiveness of a client's resistance program.

78. Understand the importance of body positioning during exercise.

79. Determine functional ROM (range of motion) for a client.

80. Understand the importance of stabilization during an exercise.

81. Understand the importance of controlling movement speed.

82. Evaluate risk versus effectiveness.



***CEC/CEU TEST FOR CHAPTER 1 OF  
Effective Strength Training***

***Please put all answers on the answer sheet.***

1. Which of the following is true about the terms “resistance training,” “strength training,” “weight lifting,” and “pumping iron?”
  - a. They all mean something different
  - b. Resistance and strength mean the same
  - c. Only weight lifting and pumping iron mean the same
  - d. They all mean the same
  
2. Levels of testosterone in men are \_\_\_\_\_ times higher than in women.
  - a. 5
  - b. 10-30
  - c. 20-50
  - d. 40-60
  
3. Which of the following factors impact on a client’s ability to gain size and strength with resistance training?
  - a. Hormone levels
  - b. Illegal drugs
  - c. Genetics
  - d. All of the above
  
4. Men and women of all ages can increase their strength by \_\_\_\_\_ in just 2 months of strength training.
  - a. 50%
  - b. 25%
  - c. 60%
  - d. 30%
  
5. Strength gains in the first 4-6 weeks of training are due to:
  - a. Hypertrophy
  - b. Hyperplasia
  - c. Changes in the nervous system
  - d. Increased hormone levels

6. Other than better genetics, what would you recommend to a client who wants definition in their muscles?
  - a. Lose fat, eat more protein, strength train, and eat more carbohydrates
  - b. Lose fat, strength train
  - c. Lose fat, eat more protein, strength train
  - d. Lose fat, strength train, eat more carbohydrate
7. Which of the following statements is true in regard to strength training and men versus women? ?
  - a. Women should train differently than men
  - b. Female muscle is different than male muscle
  - c. Female muscle is no different than male muscle
  - d. Many exercise techniques are different for women
8. Elastic tubing can be classified as:
  - a. A cable system
  - b. A multi-station weight machine
  - c. Free weights
  - d. Calisthenics
9. Which of the following variables should be considered when naming an exercise?
  - a. Body position
  - b. Joint action
  - c. Target muscle group
  - d. All of the above
10. Which of the following are limitations to using body weight only in a resistance training program?
  - a. Load can be too easy
  - b. Load can be too hard
  - c. Difficult to progress
  - d. All of the above
11. Which of the following statements is true regarding the various types of resistance equipment?
  - a. Free weights are safest
  - b. No one type can be classified as superior in terms of physical conditioning
  - c. Multi-station weight machines must be performed with a spotter
  - d. Pulley/cable systems are superior for conditioning
12. What is the minimal commitment per week in terms of time in order to get results from a strength training program?
  - a. 3 one hour session
  - b. 3 thirty minute session
  - c. 2 twenty minute session
  - d. 1 one hour session
13. Which of the following are benefits for overweight clients who perform strength training?
  - a. Increased strength can protect joints from injury
  - b. It is non impact
  - c. It burns calories, increases metabolism and causes fat loss
  - d. All of the above

14. Which of the following is true in regard to muscle and the cessation of a strength training program?
- The muscle will turn to fat
  - Muscle & fat are similar tissues
  - Fat gain is due to excess calories and muscle atrophy
  - The muscles will retain their size
15. What percentage of the strength gains in a resistance training program are neurological?
- 20-25%
  - 40-50%
  - 75-80%
  - 90%
16. What percentage of the strength gains in a resistance training program are due to hypertrophy?
- 20-25%
  - 50-60%
  - 75-80%
  - 10%
17. Which is true in regard to strength in boys and girls prior to puberty?
- It is similar
  - Boys have superior strength
  - Girls have superior strength
  - It is too dangerous to test strength in boys and girls
18. An increase in the size of a muscle is known as:
- Hyperplasia
  - Hypertrophy
  - Atrophy
  - B and c
19. Which of the following statements is most true in regard to similar clients performing the same program?
- Their results will be exactly the same
  - Results will be similar
  - No two people will respond exactly the same to a program
  - Size gains will be the same, strength gains are variable
20. A complete approach to strength training includes which of the following?
- Setting a goal
  - Using sufficient intensity
  - Understanding the desired joint action
  - All of the above

***CEC/CEU TEST FOR CHAPTER 2 OF  
Effective Strength Training***  
***Please put all answers on the answer sheet.***

21. How many bones make up the skeletal system?
- a. 100
  - b. 206
  - c. 400
  - d. 450
22. The head, neck and trunk bones make up the:
- a. Axial skeleton
  - b. Appendicular skeleton
  - c. Vertebrae
  - d. Metatarsals
23. Another name for the frontal plane is:
- a. Sagittal
  - b. Median
  - c. Coronal
  - d. Transverse
24. Activities such as running and stepping occur in which of the following planes?
- a. Sagittal
  - b. Horizontal
  - c. Transverse
  - d. Frontal
25. Raising the arms from the sides to the horizontal position is known as:
- a. Adduction
  - b. Flexion
  - c. Extension
  - d. Abduction
26. Drawing the top of the foot toward the lower leg bone is known as:
- a. Inversion
  - b. Eversion
  - c. Dorsi flexion
  - d. Plantar flexion
27. Turning the hand so the palm is facing up is known as:
- a. Supination
  - b. Pronation
  - c. Flexion
  - d. Extension

28. When the foot is rolled with the bottom of the foot turned inward, the joint action is known as:
- Plantar flexion
  - Inversion
  - Dorsi flexion
  - Eversion
29. Rotating the femur outward is known as:
- Hip flexion
  - Hip extension
  - Hip internal rotation
  - Hip external rotation
30. Taking the arm in a circle is known as:
- Horizontal flexion
  - Circumduction
  - Horizontal extension
  - Flexion
31. Drawing the humerus from a side-horizontal position toward the midline of the body is known as:
- Shoulder horizontal flexion
  - Shoulder horizontal extension
  - Shoulder extension
  - Shoulder flexion
32. Lying prone and lifting the trunk is known as:
- Trunk flexion
  - Trunk extension
  - Lateral flexion
  - Lateral extension
33. Moving the leg forward with a straight knee is known as:
- Hip abduction
  - Hip adduction
  - Hip extension
  - Hip flexion
34. Raising the arm in front of the body and overhead is known as:
- Shoulder abduction
  - Shoulder adduction
  - Shoulder flexion
  - Shoulder extension
35. What type of force production consists of an increase in muscle tension with no significant movement at the joint?
- Eccentric
  - Concentric
  - Isometric
  - Isokinetic

36. The type of force production that is also referred to as positive and involves muscle shortening is known as:
- Eccentric
  - Concentric
  - Isometric
  - Isokinetic
37. The type of force production that is associated with delayed onset muscle soreness is known as:
- Eccentric
  - Concentric
  - Isometric
  - Isokinetic
38. Dumbbells are an example of:
- Dynamic variable resistance
  - Dynamic constant resistance
  - Progressive resistance
  - Isokinetic
39. Elastic tubing and springs which provide more resistance as they stretch are known as:
- Dynamic variable resistance
  - Dynamic constant resistance
  - Progressive resistance
  - Isokinetic
40. Type of equipment that holds limb movement velocity constant is known as:
- Dynamic variable resistance
  - Dynamic constant resistance
  - Progressive resistance
  - Isokinetic



**CEC/CEU TEST FOR CHAPTER 3 OF**  
**Effective Strength Training**  
***Please put all answers on the answer sheet.***

41. In the absence of strength training, what percent of muscle is lost annually after the age of 30?
- One tenth of a percent
  - One percent
  - 10 percent
  - One half of a percent
42. Which of the following is **not** a benefit of strength training?
- Reduced risk of injury
  - Decreased metabolism
  - Stronger bones
  - Improved appearance
43. The observed decline in health as aging occurs is due primarily to:
- Loss of muscle mass
  - Fat loss
  - Increases in metabolism
  - Inability of the nervous system to communicate with the muscles
44. The number of calories that are burned each day whether sleeping or exercising is known as:
- Lean tissue
  - Fat tissue
  - Body composition
  - Metabolism
45. Strength training can positively impact on blood lipid profiles primarily by:
- Lowering HDL
  - Raising HDL
  - Maintaining LDL
  - Raising LDL
46. Strength training can improve the structural and functional integrity of which of the following tissues?
- Tendons
  - Ligaments
  - Joints
  - All of the above
47. Which of the following benefits of strength training reduce the risk of diabetes?
- Building muscle, losing fat, increasing insulin sensitivity, decreasing insulin resistance
  - Building muscle, losing fat, increasing insulin sensitivity
  - Building muscle, losing fat, decreasing insulin resistance
  - Losing fat, increasing insulin sensitivity

48. Which of the following contributes to weak, unhealthy bones?
- a. Increased muscle mass
  - b. Inactivity
  - c. Weight bearing cardiovascular exercise
  - d. Strength training
49. Using moderate loads of 15-20 repetitions and decreasing alcohol and salt are beneficial in:
- a. Preventing osteoporosis
  - b. Reducing blood pressure
  - c. Reducing the risk for diabetes
  - d. Improving self esteem
50. Which of the following statements is true in regard to strength training?
- a. Calories are burned during the activity only
  - b. It does not contribute to fitness
  - c. Metabolic rate does not change
  - d. Metabolic rate is increased from 30 to 60 minutes or longer after training

**CEC/CEU TEST FOR CHAPTER 4 OF**  
**Effective Strength Training**  
***Please put all answers on the answer sheet.***

51. Resistance training exercises should be chosen more for:
- Safety, novelty, effectiveness, proper biomechanics
  - Safety, effectiveness, proper biomechanics
  - Safety, novelty, effectiveness
  - Safety, novelty, proper biomechanics
52. Which of the following statements is true regarding resistance training exercises?
- Neither the type of equipment nor the body position should alter correct mechanics
  - The process for developing resistance training programs stays the same regardless of the type of equipment being used
  - The risks of an exercise should never outweigh the benefits
  - All of the above
53. What is the goal during the performance of an unsupported bent-over row?
- Target the elbow extensors
  - Target the chest
  - Target the upper back
  - Target the lower legs
54. Which of the following joint movements occur during an unsupported bent-over row?
- Elbow flexion, scapular abduction or protraction, horizontal shoulder abduction, shoulder extension
  - Elbow flexion, scapular abduction or protraction, horizontal shoulder abduction
  - Elbow flexion, horizontal shoulder abduction, shoulder extension
  - Elbow flexion, scapular abduction or protraction, shoulder extension
55. Which of the following is **not** a major muscle involved in the performance of an unsupported bent-over row?
- Triceps
  - Biceps
  - Posterior deltoid
  - Rhomboids
56. In order to determine a client's active range of motion, you would have them perform the exercise:
- With resistance
  - With no resistance
  - At a slower speed
  - At a faster speed

57. In order to maintain horizontal abduction in the shoulder during the performance of an unsupported bent-over row, you would have the client:
- Avoid internal or external rotation at the shoulder
  - Include internal rotation at the shoulder
  - Include external rotation at the shoulder
  - Avoid internal rotation only
58. Which of the following statements is true in regard to the unsupported bent-over row?
- The effectiveness of the exercise is high
  - The direction of the resistance directly opposed the movement
  - It has a high risk for potential injury or cumulative stress to the spine
  - All of the above
59. Which of the following exercises could serve as a safer alternative to the unsupported bent-over row?
- Seated chest press
  - Squat
  - Seated row machine
  - Overhead press
60. During the performance of an unsupported bent-over row the:
- Trunk is flexed 90 degrees
  - The hips are flexed 90 degrees
  - The trunk is extended 90 degrees
  - The hips are extended 90 degrees

***CEC/CEU TEST FOR CHAPTER 5 OF  
Effective Strength Training  
Please put all answers on the answer sheet.***

61. Which of the following muscles are generally tight in sedentary populations?
- Rectus femoris
  - Iliacus
  - Psoas
  - All of the above
62. Tight hip flexors can lead to:
- An anterior pelvic tilt
  - A posterior pelvic tilt
  - A lateral pelvic tilt
  - Improved pelvic position
63. Tight hamstrings can lead to:
- An anterior pelvic tilt
  - A posterior pelvic tilt
  - A lateral pelvic tilt
  - Improved pelvic position
64. An anterior pelvic tilt results in:
- A decrease in the lumbar curve
  - An increase in the lumbar curve
  - A lateral shift of the pelvis to the right
  - A lateral shift of the pelvis to the left
65. The thoracic spine consists of \_\_\_\_\_ vertebrae.
- 7
  - 5
  - 12
  - 4
66. Which of the following muscles opposes the force of gravity to maintain an erect posture while controlling the degree of forward flexion in the upright posture?
- Rectus abdominis
  - Internal obliques
  - External obliques
  - Spinal extensors
67. Which of the following muscles is important in preventing the hip flexors from the pelvis into an anterior position?
- Rectus abdominis
  - Internal obliques
  - External obliques
  - Spinal extensors

68. Spinal flexion causes compression to the \_\_\_\_\_ aspect of the vertebral discs.
- Lateral right
  - Lateral left
  - Anterior
  - Posterior
69. The best cue for proper lumbar positioning during the performance of exercises such as abdominal curls, the bench press, and the overhead press is:
- Keep the back flat
  - Maintain neutral position
  - Begin in a posterior tilt
  - Begin in an anterior tilt
70. Which of the following best describes the most common cause of back pain?
- It is the result of a single event
  - It is a result of direct contact to the vertebrae
  - It is the result of accumulated trauma over time
  - It is genetic
71. The skeletal foundation of the body's trunk consists of which of the following?
- Spine, pelvis, sternum, ribs
  - Spine, pelvis
  - Sternum, ribs
  - Spine, pelvis, ribs
72. The outer fibrous covering of the vertebral discs is known as:
- The nucleus
  - The annulus
  - The sacrum
  - The facet joint
73. The lumbar spine is capable of about \_\_\_\_\_ degrees of trunk flexion.
- 10
  - 15
  - 30
  - 45
74. The depth and width of the tendinous inscriptions is:
- A result of strength training
  - A result of aerobic training
  - A result of genetics
  - A result of diet

75. Which of the following statements is most correct in regard to the abdominal muscles?
- There is no such thing as an upper and lower abdominal muscle
  - An upper and lower abdominal muscle does exist
  - Segmental nerve innervation allows clients to feel different regions of the abdominal area depending on the exercise
  - The upper abs can be activated while the lower abs are dormant
76. Disc nutrition is accomplished by:
- Direct blood supply
  - Imbibition
  - Osmosis
  - B and c
77. The available motion at the spine during a reverse curl is:
- 9-10 degrees
  - 11-18 degrees
  - 20-25 degrees
  - 30-35 degrees
78. Spinal movement during a crunch consists of:
- 10-15 degrees
  - 30-35 degrees
  - 60 degrees
  - 90 degrees
79. Neutral spinal posture should be preserved during which of the following activities?
- Sitting at a desk
  - Driving in a car
  - Walking
  - All of the above
80. The spine is capable of which of the following motions?
- Extension
  - Flexion & lateral flexion
  - Rotation
  - All of the above

**CEC/CEU TEST FOR CHAPTER 6 OF**  
**Effective Strength Training**  
***Please put all answers on the answer sheet.***

81. Which of the following exercises is most appropriate for improving trunk stabilization?
- Prone bent-elbow plank
  - Prone trunk extension
  - Stability ball trunk flexion
  - Stability ball reverse trunk flexion
82. Joint actions during the performance of the prone opposite arm and leg raise include which of the following?
- Shoulder extension, hip flexion
  - Shoulder and hip abduction
  - Shoulder flexion, hip extension
  - Shoulder and hip adduction
83. Safety considerations during the performance of the prone opposite arm and leg raise include:
- Avoid lifting the chest, hips or head
  - Avoid rotating, twisting or rolling the body
  - Maintain neutral lumbar posture
  - All of the above
84. The supine plank exercise targets which of the following body parts?
- Shoulders, abdominals, hips, legs
  - Shoulders, low back, hips, legs
  - Forearms, abdominals, hips
  - Chest, low back, abdominals, legs
85. What would you suggest for a client who cannot maintain a neutral lumbar posture during the performance of the stability ball prone plank exercise?
- Move the ball further away from the hips
  - Move the ball closer to the hips
  - Move the ball to the right
  - Move the ball to the left
86. Which of the following creates an additional balance and stabilization challenge during the performance of the stability ball supine bridge exercise?
- Bring feet into a narrow stance
  - Place the hands across the chest
  - Lift one leg off the floor
  - All of the above
87. Joint motions occurring during the anterior/posterior pelvic tilt on a stability ball include which of the following?
- Spinal extension (anterior tilt), spinal flexion (anterior tilt)
  - Spinal extension (anterior tilt), spinal flexion (posterior tilt)
  - Spinal extension (posterior tilt), spinal flexion (anterior tilt)
  - Spinal extension (posterior tilt), spinal flexion (posterior tilt)



88. Which of the following represents a progressive challenge from least to most difficult during the performance of the supine trunk flexion exercise?
- Arms down at sides, across the chest, behind the head, extended overhead
  - Arms extended overhead, behind the head, across the chest, down at the sides
  - Arms down at the sides, extended overhead, across the chest, behind the head
  - Arms behind the head, down at the sides, extended overhead, across the chest
89. The abdominals reach full contraction during the performance of the performance of the supine trunk flexion exercise at:
- 10-15 degrees of trunk flexion
  - 20-25 degrees of trunk flexion
  - 30-35 degrees of trunk flexion
  - 45-50 degrees of trunk flexion
90. During supine trunk flexion exercises which of the following decreases hip flexor involvement?
- Straightening the legs
  - Externally rotating the hips
  - Anchoring the feet
  - Curling into a full sit up
91. Which of the following is true in regard to the incline trunk flexion exercise?
- The hips are higher than the head
  - It is gravity resisted
  - It is gravity assisted making it easier
  - A and b
92. Which of the following represents correct progression from easiest to most difficult during the performance of stability ball trunk flexion?
- Incline, decline, supine
  - Supine, incline, decline
  - Decline, incline, supine
  - Incline, supine, decline
93. Which of the following is true in regard to the performance of the kneeling trunk flexion exercise?
- Maintain scapula retraction
  - Pull the bottom of the rib cage down towards the hips
  - Don't allow the hips to move
  - All of the above
94. The abdominals reach full contraction during the supine reverse trunk flexion exercise at:
- 9-10 degrees of trunk flexion
  - 15-20 degrees of trunk flexion
  - 30-35 degrees of trunk flexion
  - 40-45 degrees of trunk flexion

95. Which of the following represents an appropriate cue during the performance of the supine reverse trunk flexion exercise?
- Use active hip flexion to draw the knees toward the chest
  - Pull the pelvis toward the bottom of the rib cage
  - Swing the legs toward the chest
  - Lift the knees into the chest
96. The obliques can perform which of the following functions in the trunk?
- Flexion
  - Lateral flexion
  - Rotation
  - All of the above
97. Which of the following muscles are worked in the side-lying lateral trunk flexion exercise?
- Rectus abdominis, internal/external obliques, quadratus lumborum, erector spinae
  - Rectus abdominis, internal/external obliques
  - Rectus abdominis, internal/external obliques, quadratus lumborum
  - Internal/external obliques, quadratus lumborum, erector spinae
98. Place the following arm positions in order from easiest to most difficult during the prone trunk extension exercise.
- Arms extended overhead, arms near the head, arms down at the sides
  - Arms down at the sides, arms extended overhead, arms near the head
  - Arms down at the sides, arms near the head, arms extended overhead
  - Arms near the head, arms extended overhead, arms down at the sides
99. Which of the following exercises is not for the obliques?
- Side-lying lateral trunk flexion
  - Prone trunk extension with rotation
  - Stability ball trunk flexion with rotation
  - Stability ball biased trunk flexion with rotation
100. Which of the following represent appropriate cues during the performance of the stability ball prone trunk extension with rotation exercise?
- Avoid excessive or forced hyperextension of the low back
  - Lift and rotate the torso away from the floor
  - Do not allow cervical hyperextension
  - All of the above

**CEC/CEU TEST FOR CHAPTER 7 OF**  
***Effective Strength Training***  
***Please put all answers on the answer sheet.***

101. Which of the following joint actions will target the supraspinatus?
- Shoulder adduction
  - Shoulder abduction
  - Shoulder external rotation
  - Shoulder internal rotation
102. Which of the following actions is challenged during the sidelying dumbbell rotator cuff exercise when the top arm is working and flexed at 90 degrees?
- Shoulder external rotation
  - Shoulder internal rotation
  - Shoulder abduction
  - Shoulder adduction
103. The supraspinatus works from \_\_\_\_\_ of shoulder abduction.
- 0-30 degrees
  - 0-60 degrees
  - 30-90 degrees
  - 60-90 degrees
104. When performing standing cable shoulder internal and external rotation, you would caution your client to limit the movement to no more than \_\_\_\_\_ degrees of external rotation.
- 45
  - 60
  - 80
  - 90
105. During the performance of the standing barbell scapular elevation exercise, the client holds the barbell:
- High on the back
  - Low on the back
  - In front
  - Behind
106. Which of the following statements is true in regard to rotating the shoulders forward or backward during the performance of scapula elevation or depression exercises?
- It is a resisted action, it should be encouraged
  - It is a resisted action, it should not be encouraged
  - It is not a resisted action, it should not be encouraged
  - It is not a resisted action, it should be encouraged

107. Which of the following is true during the performance of the supine dumbbell chest press?
- Elbows are rotated outward
  - Thumbs are oriented towards one another
  - Wrists are neutral
  - All of the above
108. Which of the following represents the correct lowering position during the supine dumbbell chest press?
- When the hands reach chest level
  - When the top of the dumbbells reach chest level
  - When the upper arms are parallel to the floor and the elbows are flexed to 90 degrees
  - When the elbows are lower than the chest
109. Which of the following differentiates the chest press from the chest flye exercise?
- The shoulder joint actions are different
  - The wrist positions are different
  - There is no extension at the elbow in a chest flye
  - All of the above
110. Chest presses and flyes can be performed in which of the following body positions depending on the type of resistance equipment?
- Supine
  - Inclined or declined
  - Seated or standing
  - All of the above
111. Which area of the pectoralis major is placed in direct opposition to the resistance during the incline chest press?
- Clavicular portion
  - Lower sternal portion
  - Mid sternal portion
  - B and c
112. Which of the following represents the correct angle during a decline chest press?
- 10 degrees from horizontal
  - 20 degrees from horizontal
  - 45 degrees from horizontal
  - 50 to 60 degrees from horizontal
113. Which of the following represents the correct angle during an incline chest press?
- 10 degrees from horizontal
  - 20 degrees from horizontal
  - 45 degrees from horizontal
  - 50 to 60 degrees from horizontal
114. The shoulder joint action during a dip is:
- Shoulder horizontal flexion (adduction)
  - Shoulder flexion
  - Shoulder extension
  - Shoulder abduction

115. Joint actions occurring during the kneeling dumbbell high elbow row are:
- Shoulder and elbow extension
  - Shoulder and elbow flexion
  - Shoulder horizontal extension (abduction) and elbow flexion
  - Shoulder horizontal flexion (adduction) and elbow extension
116. Joint actions occurring during the kneeling dumbbell low elbow row are:
- Shoulder extension and elbow flexion
  - Shoulder and elbow flexion
  - Shoulder horizontal extension (abduction) and elbow flexion
  - shoulder horizontal flexion (adduction) and elbow extension
117. Which posture best places the lats in direct opposition to the resistance during a lat pulldown?
- Seated upright pulling in front
  - Seated upright pulling in back
  - 20 to 30 degree lean backward from the hip pulling in front
  - 20 to 30 degree lean backward pulling from the hip in back
118. Which of the following elbow flexors is used to the same degree regardless of wrist position?
- Brachioradialis
  - Brachialis
  - Biceps brachii long head
  - Biceps brachii short head
119. Which of the following heads of the triceps muscle is always active during elbow extension?
- Medial
  - Lateral
  - Long head
  - A and c
120. Which of the following is correct during the performance of the seated dumbbell press overhead?
- A 10 to 20 degree incline is used
  - Thumbs are oriented to one another
  - The weight is pressed up and slightly forward
  - All of the above

**CEC/CEU TEST FOR CHAPTER 8 OF**  
**Effective Strength Training**  
***Please put all answers on the answer sheet.***

121. During the standing machine hip flexion exercise, the axis of rotation of the machine is aligned:
- Above the hip joint
  - Below the hip joint
  - At the hip joint
  - At the knee joint
122. Hip flexion can be performed from which of the following positions?
- Side-lying
  - Standing
  - Supine
  - All of the above
123. During the standing machine hip extension exercise, the pad is placed:
- In front and just above the knee on the inside leg
  - At the back of the knee on the inside leg
  - On the medial side of the knee on the outside leg
  - On the lateral side of the knee on the inside leg
124. Which of the following are prime movers during the prone hip extension exercise?
- Gluteus maximus, hamstrings, erector spinae, abdominals
  - Gluteus maximus, hamstrings
  - Gluteus maximus, hamstrings, erector spinae
  - Erector spinae only
125. Bending the knees during the performance of the prone hip extension exercise will:
- Decrease the contribution of the hamstrings
  - Increase the contribution of the hamstrings
  - Decrease the contribution of the gluteus maximus
  - B and c
126. Which of the following are appropriate during the performance of a modified dead lift?
- An overhand (pronated) grip is used
  - The hand grip is slightly wider than the hips
  - Ankles, knees, and hips are slightly flexed
  - All of the above
127. Lowering the bar to about knee level during the modified dead lift approximates which of the following hip angles?
- 10
  - 20
  - 30
  - 60

128. Which of the following muscles comes more into play when hip abduction is performed from a horizontal position the hip flexed?
- Tensor fasciae latae
  - Gluteus medius
  - Gluteus minimus
  - Gluteus maximus
129. Which of the following statements is true in regard to hip abduction?
- The more extended the hips are the less the gluteus minimus and medius line up with the line of pull
  - The more extended the hips are the more the gluteus minimus and medius line up with the line of pull
  - Hip position does not affect the line of pull
  - Hip position only affects the line of pull in the adductors
130. Which of the following muscles is **not** an internal hip rotator?
- Gluteus medius
  - Gluteus minimus
  - Tensor fasciae latae
  - Gluteus maximus
131. In order to challenge the hip external rotators with tubing, you would use the leg:
- Closest to the attachment
  - Furthest from the attachment
  - That is in front of the attachment
  - That is behind the attachment
132. Which of the following are appropriate cues during the performance of a squat?
- Keep the chest lifted and the scapula retracted
  - Knees should always follow the direction the toes are pointing
  - Lean forward from the hips keeping the trunk erect and properly aligned
  - All of the above
133. Which of the following represent the end point during the down phase of a squat?
- When a depth of 60-90 degrees of knee flexion is reached
  - When the heels lift
  - When the knees travel beyond the toes
  - All of the above
134. Which of the following exercises closely resembles a one-legged squat?
- Lunge
  - Dead lift
  - Standing hip extension
  - Standing hip abduction

135. Sitting forward with the hips flexed to a greater degree during seated machine knee extensions will?
- Increase the contribution of the rectus femoris and increase the load on the vastus muscles
  - Increase the contribution of the rectus femoris and decrease the load on the vastus muscles
  - Decrease the contribution of the rectus femoris and increase the load on the vastus muscles
  - Decrease the contribution of the rectus femoris and decrease the load on the vastus muscles
136. During the performance of the seated machine knee extension the pad should be in contact with:
- The top of the foot
  - The shins
  - The knee
  - The ankle
137. During the performance of the prone machine knee flexion the kneecaps should:
- Be right above the edge of the bench
  - Be at least 1 foot off the edge of the bench
  - Be off the edge of the bench
  - Be 12 inches above the edge of the bench
138. Which of the following is true when heel raises are performed with the knee flexed?
- The gastrocnemius takes most of the load
  - The anterior tibialis takes most of the load
  - The gastrocnemius is on "stretch"
  - The soleus takes most of the load
139. Which of the following statements is true in regard to the toes turned in or out during heel raises?
- The outer calf is working when the toes are turned out
  - The inner calf is working when the toes are turned in
  - The rotation occurs at the hip so there is no effect on the line of pull
  - A and b
140. Performing isolated ankle dorsi flexion targets which of the following muscles?
- Gastrocnemius
  - Soleus
  - Tibialis anterior
  - A and b



**CEC/CEU TEST FOR CHAPTER 9 OF**  
***Effective Strength Training***  
***Please put all answers on the answer sheet.***

141. Which of the following indicate a reason for the use of scapula retraction during some exercises that involve the shoulder joint?
- More efficient loading of the pectoralis major
  - Protects small muscles from heavy loads
  - Train key postural muscles and avoid momentum
  - All of the above
142. Key postural muscles in the upper back are:
- Rhomboids, mid-trapezius
  - Upper trapezius, rhomboids
  - Pectoralis major, pec minor
  - Upper and lower trapezius
143. Which of the following statements is true in regard to the pectoralis major?
- Wide grips during chest exercises will emphasize the “outer” pecs
  - Cable crossovers use the “inner” pecs
  - An “inner” and “outer” pec does not exist
  - A and b
144. Which of the following joint positions places the shoulder joint capsule at risk for injury during a chest press or flye?
- Unloaded shoulder adduction and external rotation
  - Loaded shoulder flexion
  - Loaded shoulder horizontal abduction (extension)
  - Unloaded shoulder extension
145. Which of the following represents the correct depth of a chest press or flye?
- Bring the fists to the level of the chest
  - The elbow-shoulder line should not go past the line of the frontal plane
  - Touch the chest with the barbell
  - Bring the elbow-shoulder line as far past the line of the frontal plane as possible
146. Which rotator cuff muscle is most commonly injured in clients with shoulder impingement?
- Supraspinatus
  - Infraspinatus
  - Teres minor
  - Subscapularis
147. Which of the following exercises increase the risk of shoulder impingement?
- Upright rows
  - Lat pulldowns behind the neck
  - Overhead presses behind the neck
  - All of the above

148. Which of the following modifications would reduce the risk of impingement during the upright row?
- Move hands further apart
  - Use dumbbells or cables
  - Limit the range of motion
  - All of the above
149. Impingement occurs at or around \_\_\_\_\_ degrees of abduction.
- 30
  - 60
  - 90
  - 120
150. Modifications for avoiding impingement using the pec deck machine include:
- Perform with the neck in neutral position
  - Adjust so the starting position places the elbow-shoulder line even with or in front of the frontal plane
  - Internally rotate the shoulders back to neutral
  - All of the above
151. Anterior shoulder instability is often the result of exercises such as the press overhead behind the neck because it places the shoulder in:
- Extreme internal rotation
  - Extreme external rotation and abduction
  - Extreme extension
  - Extreme adduction
152. At 90 degrees of knee flexion the knee takes on \_\_\_\_\_ the compressive force as measured in body weight.
- 3 times
  - 5 times
  - 7 times
  - 8 times
153. Which of the following is true as the depth of a squat approaches 90 degrees of knee flexion and beyond?
- Compression force increases at a much faster rate
  - Shear forces occur in a position where the articular cartilage is thinnest
  - The posterior cruciate ligament is placed on full stretch
  - All of the above
154. To avoid tibiofemoral shear forces during the use of the knee extension machine you would have your client:
- Fully extend the knee and move 5 degrees into hyper-extension
  - Use 0 to 60 degrees of knee flexion
  - Stop 5 to 10 degrees shy of full extension
  - Use full extension but avoid hyperextension

155. Which of the following statements is **not** true in regard to the squat?
- a. Perfect execution of a squat with deep flexion eliminates all risk of injury
  - b. Straight leg positions at the beginning and end of the squat do not pose the same risk as those seen with a leg extension machine
  - c. Lumbar spinal stability should be maintained throughout the exercise
  - d. The depth of a squat should be determined by proper technique and amount of knee flexion
156. Which of the following athletes had the greatest prevalence of osteoarthritis in the knee?
- a. Runners
  - b. Weight lifters
  - c. Soccer players
  - d. Shooters
157. Intradiscal pressure doubles at about \_\_\_\_\_ degrees of spinal flexion.
- a. 30
  - b. 40
  - c. 60
  - d. 90

***CEC/CEU TEST FOR CHAPTER 10 OF  
Effective Strength Training***  
***Please put all answers on the answer sheet.***

158. A combination of sets, reps and loads is referred to as:
- A training system
  - A model
  - Periodization
  - Cycle
159. Common goals for resistance training programs include which of the following?
- Increased performance
  - Decreased body fat
  - Physical independence
  - All of the above
160. Goal repetitions can be chosen based on which of the following criteria?
- Client's fitness level
  - Client's stated goals
  - Exercise history
  - All of the above
161. Which of the following is an example of cross training within a resistance training program?
- Change the sequence of the exercises the client is performing
  - Replace old exercises with new ones for the same muscle groups
  - Change the focus from strength to endurance and adjust the reps and loads
  - All of the above
162. Daily workouts in a periodization program are referred to as:
- Meso cycles
  - Macro cycles
  - Micro cycles
  - Demi cycles
163. A 4 to 6 week period of progressive overloads in a periodization program should always be followed by:
- Several sessions of maximum loads
  - Several sessions of active recovery
  - Several sessions of power training
  - Any of the above
164. The point at which a program has hit a plateau and the client is in a state of positive training where their fitness is at an optimal level is known as:
- Maintenance
  - Progression
  - Periodization
  - Regression

165. Valid reasons for changing a resistance program include which of the following?
- Boredom
  - Lack of results
  - Change in program goals
  - All of the above
166. Which of the following is true regarding the meso cycle that follows active recovery in a periodization program?
- It begins at a slightly higher intensity than the previous meso cycle
  - It begins at the same intensity as the previous meso cycle
  - It begins at a slightly lower intensity than the previous meso cycle
  - A or b
167. Which of the following are steps in designing a periodization program?
- Setting the goals
  - Identifying training phases
  - Regularly evaluating the program
  - All of the above

**CEC/CEU TEST FOR CHAPTER 11 OF**  
**Effective Strength Training**  
***Please put all answers on the answer sheet.***

168. Which of the following are responses to a strength training program?
- a. More effective recruitment of muscle fibers
  - b. Increased production of anabolic hormones
  - c. Assimilation of amino acids to build muscles
  - d. All of the above
169. The ability to sustain repeated contractions without undue fatigue over a longer period of time is known as:
- a. Muscle endurance
  - b. Muscle strength
  - c. Power
  - d. Hypertrophy
170. Which of the following is **not** a goal of a resistance training program?
- a. Muscular strength
  - b. Muscular endurance
  - c. Cardiovascular fitness
  - d. Hypertrophy
171. Muscle fibers are recruited in which of the following orders?
- a. Type IIa, Type I, Type IIb
  - b. Type I, Type IIa, Type IIb
  - c. Type IIb, Type IIa, Type I
  - d. Type I, Type IIb, Type IIa
172. Which of the following is the key factor in determining resistance training results?
- a. Intensity
  - b. Repetitions
  - c. Sets
  - d. Rest
173. In order to activate the fast twitch fibers during strength training the loads should be:
- a. Less than 70% of 1RM
  - b. Less than 50% of 1 RM
  - c. Greater than 70% of 1RM
  - d. Greater than 50% of 1 RM
174. Light loads during resistance training recruit primarily which of the following fibers?
- a. Type IIb-fast twitch
  - b. Type I-slow twitch
  - c. Type IIa-fast twitch
  - d. A and c

175. Another term for reaching momentary concentric muscle failure is:
- Maximal volitional muscular fatigue
  - Muscle failure
  - Maximal voluntary muscle action
  - All of the above
176. The number of repetitions to “fatigue” necessary for effectiveness in a strength training program is:
- 6-20
  - 15-30
  - 1-6
  - Greater than 20
177. A client performing 15 to 20 repetitions is most likely training for:
- Muscle strength
  - Muscle hypertrophy
  - Muscle endurance
  - Maximal muscle strength
178. Clients new to strength training should begin with a weight that allows \_\_\_\_\_ repetitions to fatigue.
- 6-10
  - 15-20
  - 6-12
  - 1-6
179. Which of the following represents the minimum number of sets to fatigue in order to see strength benefits during the initial stages of training?
- 1
  - 2
  - 3
  - 3-6
180. Which of the following represents the minimum number of training days per week necessary to receive health and fitness benefits during strength training in a novice client?
- 1
  - 2
  - 3
  - 4 or more
181. The minimum number of exercises to challenge all the major muscle groups is:
- 4-6
  - 6-8
  - 8-10
  - 10-12

182. Which of the following represents a correct exercise order?
- Triceps exercises followed by chest exercises
  - Quadricep exercises followed by squats
  - Chest exercises followed by back exercises
  - Biceps exercises followed by back exercises
183. Which of the following represents appropriate rest for a client performing heavy strength training consisting of multiple sets at 85% of 1RM?
- 2-5 minutes
  - 20-60 seconds
  - 1 minute
  - 90 seconds
184. A 10 RM lift roughly equates to what percentage of the client's 1 RM?
- 50
  - 65
  - 75
  - 85
185. Which of the following occur if the breath is held throughout the entire lift?
- Increase in blood pressure
  - Increase stress to the heart
  - Increase stress to the vascular system
  - All of the above
186. The goals of spotting include which of the following?
- Facilitate correct movement
  - Help client understand or "feel" the exercise
  - Keep the client from being injured
  - All of the above
187. Ideally a repetition should be completed in:
- 1-2 seconds
  - 60-90 seconds
  - 4-7 seconds
  - 14-20 seconds



**CEC/CEU TEST FOR CHAPTER 12 OF**  
**Effective Strength Training**  
***Please put all answers on the answer sheet.***

188. Which of the following is an acceptable method for moving a client past a strength training plateau?
- a. Reduce recovery between sets targeting the same muscle group
  - b. Either increase or decrease the number of repetitions
  - c. Increase the number of sets
  - d. All of the above
189. Which of the following accounts for approximately 50% of the muscle building in a strength-training program but is often overlooked?
- a. Rest
  - b. Sets
  - c. Training system
  - d. Technique
190. High intensity training methods should be used:
- a. Every time a client trains
  - b. No more than once or twice a week
  - c. Three days a week
  - d. Once every other week
191. High intensity workouts should consist of approximately 10 exercises that can be completed within:
- a. 60-90 minutes
  - b. 50-60 minutes
  - c. 30-45 minutes
  - d. 20-30 minutes
192. Which of the following clients is appropriate for high intensity training techniques?
- a. 25-year-old first time lifter
  - b. Pregnant client who has been lifting for 6 months
  - c. 40-year-old who has been lifting for 2 months
  - d. Highly motivated 32-year-old who has been lifting for 2 years
193. Which of the following high intensity methods involves reducing the weight by 5-15% following the point of fatigue so an additional 2-4 repetitions can be completed?
- a. Assisted training
  - b. Pyramid training
  - c. Super set training
  - d. Breakdown training

194. Performing an exercise for the biceps immediately followed by an exercise for the triceps is an example of which of the following high intensity protocols?
- Super set training
  - Compound training
  - Negative training
  - Forced reps
195. The best rep range when performing super set and compound training is:
- 1-4
  - 4-6
  - 6-10
  - 10-12
196. Adding manual resistance during the lowering phase of an exercise is an example of:
- Assisted training
  - Negative training
  - Compound training
  - Super slow training
197. The type of training where the trainer takes 5-15% of the load after the client has reached fatigue so they can perform an additional 2-4 repetitions is known as:
- Compound training
  - Super slow training
  - Assisted training
  - Negative training
198. The type of training which increases muscle tension by reducing momentum due to the length of time to complete a repetition is known as:
- Super slow training
  - Negative training
  - Pyramid training
  - Super set training
199. Performing a chest flye immediately followed by a chest press is an example of:
- Super set training
  - Compound training
  - Super slow training
  - Breakdown training
200. During super slow training the greater the duration of the repetition the:
- Greater the strength gain
  - Less the strength gain
  - Less the endurance gain
  - Greater the power gain

**CEC/CEU TEST FOR CHAPTER 13 OF**  
***Effective Strength Training***  
***Please put all answers on the answer sheet***

201. Which of the following can be used to determine the effectiveness of a client's strength training program?
- Body fat & circumference measurements
  - Client feedback
  - Appropriate testing
  - All of the above
202. Which of the following represents correct breathing during strength training?
- Breathe out during concentric contractions, breathe out during eccentric contractions
  - Breath out during concentric contractions, breathe in during eccentric contractions
  - Breath in during concentric contractions, breathe out during eccentric contractions
  - Breathe in during concentric contractions, breathe in during eccentric contractions
203. Which of the following statements is **not** true in regard to strength training?
- It is not recommended but you can get results with poor technique
  - Correct spinal alignment does not change regardless of the exercise
  - You can get significant strength gains with resistance that is light
  - breathing should be continuous during isometric contractions
204. Which of the following best represents the principle of evaluating risk versus effectiveness?
- Replacing the "good morning" exercise with a modified dead lift for a client with a bad back
  - Replacing the chest flye with a chest press for a client with and injured elbow
  - Replacing a front shoulder raise with an upright row
  - All of the above
205. Active range of motion is determined by having the client perform the exercise:
- Resisted maximally
  - Unresisted
  - Resisted so at least 10 repetitions can be performed
  - Resisted so 3 repetitions can be performed
206. Which of the following best demonstrates a client's ability to control the speed of movement?
- Performing a repetition in less than 2 seconds
  - Using momentum to lift a heavier weight
  - Being able to stop the motion on command
  - A break in form during the eccentric contraction
207. Which of the following is true in regard to stabilization or the start position during the execution of a resistance training exercise?
- It is held only at the beginning
  - It is held at the beginning and the end
  - It is held only to the middle of the exercise
  - It is held before and during the exercise

208. Programming at an intensity that allows 15-20 repetitions to be completed for a client wanting to improve muscular endurance best demonstrates which of the 10 points for effective strength training?
- Evaluating risk versus effectiveness
  - Understanding the goal to be accomplished
  - Positioning the body position
  - focusing on execution
209. Accurate lifting records are essential to the success of a client's resistance program. Which of the following should be included in client lifting records?
- Reps & intensity
  - Sets
  - Exercise order
  - All of the above
210. Which of the following best demonstrates an understanding of placing the resistance in direct opposition to the exercise motion?
- Performing lateral raises with dumbbells from a standing position
  - Performing a lat pull down with dumbbells from a standing position
  - Performing a chest flye with dumbbells from a standing position
  - Performing trunk flexion to work the abdominals from a standing