LEVEL 2-A

WELLNESS TOPICS FOR PHYSICAL EDUCATION

NAME: _____
TEACHER: _____
BLOCK: _____

Developed by the
Rush-Henrietta Senior High School
Physical Education Staff

Jennifer Bugbee
Ken Hammel
Kim Iak
Maureen Nolan-Decillis
Dick Puccio
Sue Raymond

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INTRODUCTION

WHY THIS MANUAL?

Physical education is based upon the acquisition of knowledge and skills as a foundation for engaging in physical activity. However, the mere acquisition of knowledge and skills is not enough. The mission of physical education is to enable students to sustain regular, life-long physical activity as a foundation for a healthy, productive, and fulfilling life. (Adapted from the Content Standards of the National Association for Sports and Physical Education)

Personal fitness/wellness, a focus of study that has become well established in the past twenty years, is based on a balance of behaviors and actions that enhance good health, quality of life, and well being. This balance extends beyond physical fitness to disease prevention, stress management, substance abuse control, nutrition, and safety. Teaching physical fitness is grounded in concepts from physiology and physiology of exercise.

Students gain an understanding of the importance of developing and maintaining optimum fitness in the areas of cardiorespiratory endurance, flexibility, muscular strength and endurance, and body composition.

This Health Topics Manual will be used in conjunction with physical education classes to help meet the New York State Learning Standards for Health, Physical Education, and Home Economics. The performance indicators that follow each standard will be used to determine the effectiveness of this manual. These performance indicators were taken from the New York State Standards Guide for Health, Physical Education, and Home Economics, May 1996.

THE NEW YORK STATE LEARNING STANDARDS AND PERFORMANCE INDICATORS
HEALTH, PHYSICAL EDUCATION, AND HOME ECONOMICS

STANDARD #1: PERSONAL HEALTH AND FITNESS

Students will have the necessary knowledge and skills to establish and maintain physical fitness, participate in physical activity, and maintain personal health.

STANDARD #1 Performance Indicators

-Students will understand prevention and risk reduction strategies which can delay the onset or reduce the risk of potential problems into adulthood.
-Students will be able to evaluate how the multiple influences which affect health decisions and behaviors can be altered.
-Students will know the components of personal wellness and engage in appropriate activities to improve or sustain their own fitness.
-Students will complete a self-analysis of wellness lifestyles, target heart range during cardiovascular exercise, body composition, and calories and fat requirements per day.
-Students will gain knowledge of food choices and menus to understand a balanced diet and how to control weight.

STANDARD #2: A SAFE AND HEALTHY ENVIRONMENT

Students will acquire the knowledge and ability necessary to create and maintain a safe and healthy environment.

STANDARD #2 Performance Indicators

-Students will accept physical activity as an important part of life. They will understand that self-renewal, productivity, energy, fitness, weight control, stress management, and reduction in health costs are benefits of physical activity.
-Students will be able to recognize hazardous conditions in the home, school, work place, and community.

STANDARD #3: RESOURCE MANAGEMENT

Students will understand and be able to manage their personal and community resources.

STANDARD #3 Performance Indicator

-Students will be able to recognize the importance of physical activity as a resource for everyone regardless of age or ability.

WELLNESS

What is Wellness?

Wellness is the constant and deliberate effort to stay healthy and achieve the highest potential for well being. It includes 12 different aspects:

- **Safety** – Includes all aspects of safety such as using a seat belt, wearing a bike helmet, not drinking and driving, having fire detectors, posting emergency numbers etc.
- **Physical fitness** – Getting regular vigorous exercise to control weight, keep the heart healthy, and reduce stress.
- **Nutrition** – Following the food pyramid and eating a well balanced diet from a variety of foods choices.
- **Preventing Cancer** – Following the American Cancer Society Guidelines for preventing cancer. (Exercise, not smoking, eating fruits and vegetables, vitamins, regular checkups etc.)
- **Preventing CVD** – Following the American Heart Associations Guidelines for Preventing Heart Diseases. (Weight control, low fat/low sodium diet, exercise, not smoking etc.)
- **Not Smoking** – Or quitting smoking.
- **Stress Management** – Controlling the things that are stressing to you and taking time for relaxation and leisure activities.
- **Substance Abuse** – Limiting the use of alcohol and over the counter medications as well as not using illegal drugs and fully understanding the prescription medications you may take.
- **Medical Exams –** Getting annual medical checkups and being a good health care consumer. Asking questions of your doctor and taking an active role in your medical care.
- **Sexuality** – Being informed about sexually transmitted diseases, HIV, AIDS, birth control and pregnancy, and getting educated about human sexuality.
- **Spirituality** – Understanding that people need time for spiritual reflection and meditation – regardless of religious beliefs. Taking the time in your own life to reflect and/or meditate.
- **Health Education –** Being an educated and informed health consumer: Knowing the difference between health scams, truth in health advertising, and a knowledge that there are no quick fixes when it comes to any aspect of our health or our wellness.

Wellness Lifestyle Questionnaire

Please circle the appropriate answer to each question and total your points as indicated at the end of the questionnaire. Circle 5 if the statement is "Always True", 4 if the statement is "Frequently True", 3 if the statement is "Occasionally True", 2 if the statement is "Seldom True", and circle 1 if the statement is "Never True".

5	**4**	**3**	**2**	**1**	1. I am able to identify the situations and factors that over stress me.
5	**4**	**3**	**2**	**1**	2. I eat only when I am hungry.
5	**4**	**3**	**2**	**1**	3. I don't take tranquilizers or other drugs to relax.
5	**4**	**3**	**2**	**1**	4. I support efforts in my community to reduce environmental pollution**.**
5	**4**	**3**	**2**	**1**	5. I avoid buying foods with artificial colorings.
5	**4**	**3**	**2**	**1**	6. I rarely have problems concentrating on what I am doing because of worrying about other things.
5	**4**	**3**	**2**	**1**	7. My school takes measures to ensure that my study place is safe.
5	**4**	**3**	**2**	**1**	8. I try not to use medications when I feel sick.
5	**4**	**3**	**2**	**1**	9. I am able to identify certain bodily responses and illnesses as my reactions to stress.
5	**4**	**3**	**2**	**1**	10. I question the use of diagnostic X-rays.
5	**4**	**3**	**2**	**1**	11. I try to alter personal living habits that are risk factors for heart disease, cancer, and other lifestyle diseases.
5	**4**	**3**	**2**	**1**	12. I avoid taking sleeping pills to help me sleep.
5	**4**	**3**	**2**	**2**	13. I try not to eat foods with refined sugar or corn sugar ingredients.
5	**4**	**3**	**2**	**1**	14. I accomplish goals I set for myself.
5	**4**	**3**	**2**	**1**	15. I stretch for several minutes each day to keep my body flexible.
5	**4**	**3**	**2**	**1**	16. I support immunization for all children for common childhood diseases.
5	**4**	**3**	**2**	**1**	17. I try to prevent friends from driving after they have been drinking alcohol.
5	**4**	**3**	**2**	**1**	18. I minimize extra salt intake.
5	**4**	**3**	**2**	**1**	19. I don't mind when other people and situations make me wait or lose time.

5	**4**	**3**	**2**	**1**	20. I walk four of fewer flights of stairs rather than take the elevator.
5	**4**	**3**	**2**	**1**	21. I eat fresh fruits and vegetables.
5	**4**	**3**	**2**	**1**	22. I use dental floss at least once a day.
5	**4**	**3**	**2**	**1**	23. I read product labels on foods to determine the ingredients.
5	**4**	**3**	**2**	**1**	24. I try to maintain a normal body weight.
5	**4**	**3**	**2**	**1**	25. I record my feelings and thoughts in a journal or diary.
5	**4**	**3**	**2**	**1**	26. I have no difficulty falling asleep.
5	**4**	**3**	**2**	**1**	27. I engage in some form of vigorous physical activity at least three times a week.
5	**4**	**3**	**2**	**1**	28. I take time each day to quiet my mind and relax.
5	**4**	**3**	**2**	**1**	29. I am willing to make and sustain close friendships and intimate relations.
5	**4**	**3**	**2**	**1**	30. I obtain an adequate daily supply from my food or vitamin supplements.
5	**4**	**3**	**2**	**1**	31. I rarely have tension or migraine headaches or pain in the neck or shoulders.
5	**4**	**3**	**2**	**1**	32. I wear a seat belt when in a car.
5	**4**	**3**	**2**	**1**	33. I am aware of the emotional and situational factors that lead me to overeat.
5	**4**	**3**	**2**	**1**	34. I avoid driving after drinking any alcohol.
5	**4**	**3**	**2**	**1**	35. I am aware of the side effects of the medicines I take.
5	**4**	**3**	**2**	**1**	36. I am able to accept feelings of sadness, depression, and anxiety knowing that they are almost always passing.
5	**4**	**3**	**2**	**1**	37. I would seek several additional professional opinions if my doctor was to recommend surgery for me.
5	**4**	**3**	**2**	**1**	38. I agree that non-smokers should not have to breathe the smoke from cigarettes in public places.
5	**4**	**3**	**2**	**1**	39. I agree that pregnant women who smoke harm their babies.
5	**4**	**3**	**2**	**1**	40. I think I get enough sleep.

5	**4**	**3**	**2**	**1**	41. I ask my doctor why a certain medication is being prescribed and I inquire about alternatives.
5	**4**	**3**	**2**	**1**	42. I am aware of the calories expended in my activities.
5	**4**	**3**	**2**	**1**	43. I am willing to give priority to my own needs for time and psychological space by saying no to others requests of me.
5	**4**	**3**	**2**	**1**	44. I walk instead of drive whenever feasible.
5	**4**	**3**	**2**	**1**	45. I eat a breakfast that contains about 1/3 of my daily need for calories, protein, and vitamins.
5	**4**	**3**	**2**	**1**	46. I discourage smoking in my home.
5	**4**	**3**	**2**	**1**	47. I remember and think about my dreams.
5	**4**	**3**	**2**	**1**	48. I seek medical attention only when I have symptoms, or believe that some (potential) condition needs checking, rather than have routine yearly checkups.
5	**4**	**3**	**2**	**1**	49. I endeavor to make my home accident free.
5	**4**	**3**	**2**	**1**	50. I ask my doctor to explain the diagnosis of my problem until I understand all that I care to.
5	**4**	**3**	**2**	**1**	51. I try to include fiber or roughage (whole grains, fruits, and bran or vegetables) in my daily diet.
5	**4**	**3**	**2**	**1**	52. I can deal with my emotional problems without alcohol or other mood altering drugs.
5	**4**	**3**	**2**	**1**	53. I am satisfied with my work/school.
5	**4**	**3**	**2**	**1**	54. I would require children riding in my car to be in infant seats or shoulder harnesses.
5	**4**	**3**	**2**	**1**	55. I try to associate with people who have a positive attitude about life.
5	**4**	**3**	**2**	**1**	56. I try not to eat snacks of candy, pastry, or other “junk” foods.
5	**4**	**3**	**2**	**1**	57. I avoid people who are down all the time and bring down those around them.
5	**4**	**3**	**2**	**1**	58. I am aware of the calorie content of the foods I eat.

5	**4**	**3**	**2**	**1**	59. I brush my teeth after meals.
5	**4**	**3**	**2**	**1**	60. (for females only) I routinely examine my breasts.
5	**4**	**3**	**2**	**1**	61. (for males only) I am aware of the signs for testicular cancer.

How to score: Enter the number you circled next to the question number and total you score for each category. Then determine your degree of wellness for each category using the wellness status key.

Emotional Health	**Fitness**	**Environmental Health**	**Medical Responsibility**	**Stress**	**Nutrition**	
6_____	**15**_____	**4**_____	**8**_____		**1**_____	**2**_____
12_____	**20**_____	**7**_____	**10**_____		**3**_____	**5**_____
25_____	**22**_____	**17**_____	**11**_____		**9**_____	**13**_____
26_____	**24**_____	**32**_____	**16**_____		**14**_____	**18**_____
36_____	**27**_____	**34**_____	**35**_____		**19**_____	**21**_____
40_____	**33**_____	**38**_____	**37**_____		**28**_____	**23**_____
47_____	**42**_____	**39**_____	**41**_____		**29**_____	**30**_____
52_____	**44**_____	**46**_____	**48**_____		**31**_____	**45**_____
55_____	**58**_____	**49**_____	**59**_____		**43**_____	**51**_____
57_____	**59**_____	**54**_____	**60**_____		**53**_____	**56**_____
= _____	= _____	= _____	= _____		= _____	= _____

Wellness Status: For each category, compare your score to this key.

10-34 Needs Improvement **35-44 Good** **45-50 Excellent**

Your highest score reflects your wellness strength. Your lowest score points out your wellness weakness and the area you need to work on most.

REFERENCE:
Discovering Food Student Workbook. MacMullan/Mc Graw Hill

PHYSICAL FITNESS

What is Physical Fitness?

Physical fitness is one of the 12 aspects of wellness. It is defined as an adapting state of energy and vitality that allows a person to carry out daily tasks, take an active part in recreation and leisure pursuits, and to meet unforeseen emergencies without undue fatigue.

There are 2 types of fitness:

Health Related Fitness: Health related fitness consists of five components: Cardiovascular Endurance, Muscular Strength, Muscular Endurance, Flexibility, and Body Composition. This is the type of physical fitness we need to incorporate into our plan for wellness. Athletes gain health-related fitness through their conditioning programs. A non-athlete can achieve health-related fitness through a weekly exercise program.

Skill Related Fitness: Skill related fitness is athletics and sports performance based. It includes Power, Speed, Balance, Coordination, Agility, and Reaction Time. These are not totally necessary for fitness as it pertains to wellness but they are necessary in order to take part in competitive sports activities.

<u>ASSIGNMENT</u>
Define Wellness:

Define Physical Fitness:

What type of fitness is included in the wellness model?

What is your wellness strength? What is your wellness weakness? (Refer to page 6)

What is one thing you can do to improve your weakness and get better wellness?

HOW FIT ARE YOU?

Physical fitness is defined *as an adopting state of energy and vitality that allows a person to carry out daily tasks, take an active part in recreation and leisure pursuits, and meet unforeseen emergencies without undue fatigue.*

There are two types of fitness – skill related fitness and health related fitness. As you learned, skill related fitness is athletics and sports performance based since it includes such things as power, speed, balance, coordination, agility, and reaction time. These components are necessary in order to take part in competitive sports activities but are not totally necessary to be well. Health related fitness on the other hand is essential to wellness since it consists of cardiovascular endurance, muscular strength, muscular endurance, flexibility, and body composition. This is the type of physical fitness that needs to be incorporated into any wellness plan.

In order to develop your own personal fitness plan, you need to know where you stand in each of the health related fitness areas so that you have a starting point from which to work. The following measures will be used to determine your fitness at this time: 1.5 mile run/walk, sit-ups, push-ups, sit and reach wall test, and body composition calculation.

CARDIOVASCULAR ENDURANCE is the ability of the heart and blood vessels to withstand disease, fatigue, or stress. It refers to the capacity of the respiratory and circulatory systems to supply oxygen and nutrients to the muscle cells so activity can continue for a long period of time. To measure your cardiovascular endurance we are going to use the 1.5 mile run/walk test.

1.5 Mile Run/Walk Test: Select someone to be your partner. One-half of the group will take the test at one time while the other half will record the time it takes for their partner to complete the required distance. The object of the test is to run/walk the 1.5 miles as quickly as possible. Warm up before taking the test. This is a test of your maximum capacity, so do the best you can. Push yourself to cover the 6 laps of the track as fast as possible without overdoing it. Try to maintain a continuous, even pace. Run as long as you can, then walk when necessary. When you need to walk, move to the outer lanes of the track so that the runners have the right away on the inside lanes. When you have completed the six laps, your partner will record your time on page 8.3. You should cool down with walking and stretching.

MUSCULAR FITNESS consists of both muscular strength and muscular endurance. *Muscular endurance* is the ability of the muscle to perform contractions repeatedly for extended periods of time. *Muscular strength* is the ability of a muscle or muscle group to exert force against resistance. It refers to the maximum amount of tension the muscle or muscle groups can apply in a single effort. To measure your muscular fitness we are going to use sit-ups and push-ups.

Sit-ups: Lie on your back with your knee's bent at 90 degrees, feet flat on the floor. Place your arms across your chest, hands on opposite shoulders. Slowly curl your head, shoulders, and upper back off the floor bringing your elbows to your thighs. Breathe out as you curl up and then return to starting position while breathing in. Do as many sit-ups as you can do in one minute. (One complete sit-up is counted each time you return to the starting position on the floor,) Your partner will count for you and record your score on page 8.3.

Push-ups: Lie face down on the floor in push-up position with hands under shoulders, fingers straight, and legs straight, parallel, and slightly apart, with toes supporting the feet. (Females may do modified push-ups with their hands and knees supporting their weight and their head in line with their spine.) Straighten your arms, keeping your back and knees straight, then lower your body until there is a 90 degree angle at the elbows, with the upper body parallel to the floor. Your partner will hold his/her hands at the point of the 90 degree angle so that you will go down only until your shoulders touch your partner's hands, then back up. You are to do as many push-ups as you can do in one minute. (One complete push-up is counted each time your return to the starting position.) Your partner will record your score on page 8.3.

FLEXIBILITY is the ability to move muscles and joints through their full ranges of motion. To test your flexibility we will use the sit and reach wall test.

Sit and Reach Wall Test: Warm up by walking and static stretching. Take off your shoes, sit facing a wall, and place your knees straight. Reach forward as far as possible to touch fingertips, knuckles, or palms to wall, and hold for 3 seconds. Your partner will record what part of your body touched the wall on page 8.3.

Reference:

Robbins, Gwen, Debbie Powers, and Sharon Burgess-Troxell. The Wellness Way of Life. Wm. C. Brown Publishers. 1990.

BODY COMPOSITION is what a body is composed of in terms of fat muscle and bone. It is the relative amounts of fat and lean body tissue. Fat is fat tissue and lean body tissue is muscle, connective tissue, bone, skin, hair, mails, etc. You will calculate your body composition by finding your body mass index (BMI).

Calculating Your BMI:

1. Multiply your weight in pounds by 705.

   Your weight _____ x 705 = _____

2. Divide the answer in #1 by your height in inches.

   Answer from #1 _____ - _____ height in inches = _____

3. Divide the answer in #2 by your height in inches again.

   Answer from #2 _____ - _____ height in inches = _____

Record your answer to #3 on the page below. This is your BMI.

TEST ITEM	TEST	SCORE	SCORE INTERPRETATION
Cardiovascular Endurance	1.5 mile Run/Walk		
Strength	Sit-ups		
	Push-ups		
Flexibility	Sit and Reach		
Body Composition	BMI		

ASSIGNMENT:

1. What are your strengths?

2. What are your weaknesses?

INTERPRETIG RESULTS

CARDIOVASCULAR ENDURANCE (1.5 mile run/walk test)

	FEMALE	MALE
Superior	below 11:50	below 8:37
Excellent	11:50 – 12:29	8:37 – 9:40
Good	12:30 – 14:30	9:41 – 10:48
Fair	14:31 – 16:54	10:49 – 12:10
Poor	16:55 – 18:30	12:11 – 15:30
Very Poor	over 18:31	over 15:31

Reference: The Aerobics Program for Total Well-Being by Dr. Kenneth H. Cooper. Bantam Books taken from The Wellness Way of Life by Gwen Robbins, Debbie Powers, Sharon Burgess-Troxell. Wm. C. Brown Publishers. 1990. p. 46.

STRENTH

SIT-UP RESULTS – FEMALE

	Grade 10	Grade 11	Grade 12
Superior	53+	53+	54+
Excellent	42 – 52	42 – 52	44 – 53
Good	33 – 41	33 – 41	34 – 43
Average	30 – 32	30 – 32	30 – 33
Fair	21 – 29	21 – 29	21 – 29
Poor	11 – 20	11 – 20	12 – 20
Very Poor	0 – 10	0 – 10	0 – 11

SIT-UP RESULTS – MALE

	Grade 10	Grade 11	Grade 12
Superior	63+	66+	70+
Excellent	53 – 62	55 – 65	57 – 69
Good	44 – 52	46 – 54	47 – 56
Average	40 – 43	41 – 45	42 – 46
Fair	31 – 39	32 – 40	33 – 41
Poor	22 – 30	23 – 31	23 – 32
Very Poor	0 – 21	0 – 22	0 – 22

Reference: Be New York Fit. *New York State Physical Fitness Screening Test*. 1984 Revision.

PUSH-UP RESULTS – FEMALE (modified) **MALES**

Excellent	46+	51+
Good	37 – 45	43 – 50
Average	27 – 36	34 – 42
Fair	17 – 26	25 – 33
Poor	0 –17	0 – 24

Reference: Adapted from Russell Harris; "The National Fitness Test" for living Well, Inc., The Houstonian Foundation, Houston, TX. Taken from Gwen Robbins, Debbie Powers, and Sharon Burgess-Troxell. The Wellness Way of Life. *Wm. C. Brown Publishers*. 1990. p. 57.

FLEXIBILTY (Sit and Reach Wall Test)

Excellent	Palms touch wall
Good	Knuckles touch wall
Average	Fingertips touch wall
Poor	Cannot touch wall

Reference: Robbins, Gwen, Debbie Powers, Sharon Burgess. A Wellness Way of Life. *Wm. C. Brown Publishers*. 1991. p. 80.

BMI

Excellent	BMI between 19 and 24.9
Moderately overweight	BMI between 25 and 29.9
Obese	BMI of 30 or higher

Reference: Donohue, Dr. Paul. "Number on your scale is not the final word on your weight." Democrat and Chronicle.

HEALTH RELATED COMPONENTS OF PHYSICAL FITNESS

CARDIOVASCULAR ENDURANCE

DEFINITION:

Cardiovascular refers to anything involving or pertaining to the heart and blood vessels.

Endurance refers to the physical strength to resist or withstand disease, fatigue, or stress.

Cardiovascular endurance, then, is the ability of the heart and blood vessels to withstand disease, fatigue, or stress. It refers to the capacity of the respiratory and circulatory systems to supply oxygen and nutrients to the muscle cells so activity can continue for a long period of time. Cardiovascular endurance is one of the components of health related fitness.

WHAT IS THE CONNECTION?

UNDERSTANDING THE HEART:

The heart pumps blood, which takes oxygen and nutrients to all of the billions of cells in your body. Then, on its return to the heart, the blood carries the waste material that collects in the cells. When the heart is strong, it pumps more blood per beat, and oxygen quickly reaches your muscles. A weak heart has to work harder and still doesn't get enough oxygen to where it's going.

THE RELATIONSHIP BETWEEN THE HEART AND THE LUNGS:

Lungs take in plenty of oxygen to complete most tasks, no matter how strenuous. The problem is getting that oxygen to the muscles, and that's the hearts job. Blood carries oxygen through the body, but a weak heart pumps insufficiently. The body knows it needs more oxygen, and the lungs try to compensate by working harder. (That's why you breathe hard when you're working out). Only a strong heart can help.

THE RELATIONSHIP BETWEEN OXYGEN AND MUSCLES:

Hard working muscles need plenty of blood, which delivers oxygen and other nutrients and takes away waste products. Without enough oxygen to feed and cleanse it, the muscle fatigues – that is, waste products build up, fuel runs out, and the muscle stops contracting.

BENEFITS OF CARDIOVASCULAR ENDURANCE

1. Makes your heart stronger and more effective which helps prevent heart disease.

2. Increases endurance (so you can participate in sports and activities longer before tiring).

3. Reduces excess fat.

4. Tones your muscles.

5. Improves circulation.

6. Burns calories while exercising and, over time, adds muscle, which raises metabolism.

HOW TO INCREASE CARDIOVASCULAR ENDURANCE:

The heart is a muscle, and just like every other muscle in the body, it gets stronger when it is used. The best way to make the muscle stronger is through cardiovascular – or aerobic exercise. When you exercise aerobically, the heart has to pump blood to the working muscles. Getting into better shape makes the heart work more efficiently, pumping more blood with each beat (increased stroke volume).

EXERCISE IS AEROBIC IF:

- You use the large muscles in the lower part of your body.
- You breathe more heavily without being out of breath and you feel warmer (heart rate is 60% to 85% of your maximum).
- You exercise 20 minutes at a time. The best way to maintain a good cardiovascular fitness level is to do 20 minutes of aerobic activities 3 or more times a week. To improve your endurance capacity, you should exercise longer and harder.

AEROBIC vs ANAEROBIC:

Aerobic means "with oxygen" and refers to energy derived from the oxidation of carbohydrates and fats. (Oxidation happens when you pump more oxygen-rich blood through your body as you do vigorous, continuous, and rhythmic aerobic activities). Aerobic activities usually require a low-energy out-put for a longer period of time during which oxygen is supplied to the body by way of the cardiovascular system. Examples of aerobic activities are distance running, cross- country skiing, cycling, dancing, rowing, and lifting light -weights with many reps.

Anaerobic means "without oxygen" and refers to the out-put of energy for muscular contraction when the oxygen supply is insufficient. Anaerobic activities require short bursts of energy in which oxygen is used more rapidly than it is supplied; thus an oxygen debt is incurred that must be repaid during recovery periods. Examples of anaerobic activities are weightlifting (heavy weights with few reps), sprint running or swimming, football, and downhill skiing.

WHY IS CARDIOVASVULAR ENDURANCE INPORTANT:

In the 1996 Surgeon General's Report on Physical Activity and Health it was stated on page 87 that "despite a progressive decline since the late 1960's, cardiovascular diseases (CVDs), including coronary heart disease (CHD) and stroke, remain major causes of death, disability, and health care expenditures in the United States. In 1992, more than 860,000 deaths in the United States were attributed to heart disease and stroke. High blood pressure, a major risk factor for CVD, affects about 50 million Americans, including an estimated 2.8 million children and adolescents 6-17 years of age. The prevalence of CVD increases with age and is higher among African Americans than whites."

The 1999 statistics from the American Heart Association newsletter, concerning Jump Rope for Heart and Hoops for Heart state that: 50% of children are obese, 42% of children have high cholesterol, and that if these trends remain constant, 35 million of today's 85 million children will eventually die from heart and blood vessel disease.

The data reviewed in the Surgeon General's Report suggests that regular physical activity and higher cardiorespiratory fitness decrease overall mortality rates. Physically active people have a substantially lower overall risk for major coronary events. The literature also supports a relationship between physical activity levels or cardiorespiratory fitness and both cardiovascular diseases in general and coronary heart disease in particular. A smaller body of research supported similar findings for hypertension.

REFERENCES: For further information
American Heart Association
P. E. TV Teacher's Manuel. Whittle Communications Knoxville, Tennessee, 1994.
Physical Activity and Health: A Report of the Surgeon General. U.S. Department of Health and And Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, 1996.

ASSIGNMENT:
Define cardiovascular endurance:

Why do you breathe hard when you are working out?

What is the best way to increase cardiovascular endurance?

On page 30, rate the activities from 1-5 on how they contribute to the enhancement of cardiovascular (cardiorepiratory) endurance?

Over the next week, calculate your heart rate, your resting heart rate, and your target heart range by using the information provided on the following pages.

CALCULATING HEART RATE

You should take your pulse using the carotid artery in the neck or the radial artery of the wrist. If you are using your carotid artery, do NOT press hard. Use your index and middle fingers, but not your thumb – it has a beat of its own. Take your pulse for 60, 30, 10, and 6 seconds.

60 seconds _____ x 1 = _____

30 seconds _____ x 2 = _____

10 seconds _____ x 6 = _____

6 seconds _____ x 10 = _____

Did you get the same beats per minute with each method? _____
Is one method more accurate than another? _____ If so, which one?

FIND AND RECORD YOUR RESTING HEART RATE

During heavy exercise, a heart rate may rise to 180 beats per minute. An athlete's healthy heart will return to its normal state in 2 to 3 minutes whereas an unfit person's could take as long as 10. One of the ways to detect improvement in cardiovascular fitness is to keep a record over time. Heart rates will drop as you become fit. Normal resting heart rates range from 60 to 90 beats per minute, but physically fit people can have resting heart rates in the 40s or 50s. With better cardiovascular shape, stroke volume increases, which means the heart becomes more efficient, pumping more blood with each beat.

Take your pulse for 3 consecutive mornings to find your resting heart rate. Each time you should be in the same position and use the same site for measurement (preferably when you first wake up before you get out of bed). Use the lowest number recorded during these three days as a baseline measurement.

Day #1 _____ Day #3 _____

Day #2 _____ Baseline _____

CALCULATING TARGET HEART-RATE RANGE

This is important because it will give you a sense of intensity level while you are exercising. Many people, who exercise to lose fat, work out at an intensity that is too high to burn fat (which means they work out anaerobically). They sweat more and feel like they have worked harder, when in fact, a lower-intensity exercise would benefit them more. Of course, many people work out at an intensity level too low for any benefits.

The intensity level of cardiovascular exercise should be between 60% and 85% of maximum heart rate for maximum benefits and minimum chance of injury.
Calculate your target heart rate range:
4. Subtract your age from 220 (this number estimates your maximum heart rate)

220
-_____ your age
your maximum heart rate

5. Subtract your resting heart rate from your maximum heart rate
   your maximum heart rate

   -_____ your resting heart rate (use your baseline rate from the previous page)

6. Multiply the answer you got in step 2 by .60 (60%)

   answer from #2

   x **.60**

7. Add your resting heart rate to the answer on step 3. This will give you your low-end number in the target heart-rate range.

   answer to #3

   +_____ your resting heart rate
   Low end of the target heart rate range

8. To find your high-end number in the target range, multiply you answer from step 2 by .85.

   answer from step #2

   x .85 (85% of maximum)

9. Add your resting heart rate to the answer in step #5 to get your high-end range.

   answer from #5

   + _____ your resting heart rate
   High end of the target heart rate range

10. My target heart range during cardiovascular exercise is:

    Low-end _____ to _____ high-end

MUSCULAR FITNESS

DEFINITION:

The two types of muscular fitness are endurance and strength. Both are important, and they develop together.

Muscular endurance is the ability of a muscle to perform contractions repeatedly for extended periods of time. It is associated with local areas of the body, such as the legs in running, swimming, or bicycling. Racket sports, shoveling snow or sand, and jogging require muscular endurance. Muscular endurance is developed by using light weights with many reps or aerobic training. Although muscular endurance is on the opposite end of the continuum from strength, it can be greatly influenced by the strength of the local muscle group.

Muscular strength is the ability of a muscle or muscle group to exert force against resistance. It refers to the maximum amount of tension the muscle or muscle group can apply in a single effort. Your arms, legs, and back exert force against a heavy chair, for example, when you try to lift it. Strength can be subdivided into two components: 1) static *strength*, meaning the maximum amount of tension the muscle can apply against a resistance, involving little or no movement in a muscle, and 2) dynamic *strength*, referring to the application of great force through a full range of motion. Strength training is anaerobic in nature and it affects the same fibers as anaerobic training. Muscular strength and muscular endurance are two components of health related fitness.

BENEFITS OF MUSCULAR FITNESS TRAINING

Improves posture
Helps your physical activity performance (strength and endurance are important in sports, dance, and even work activities)
Reduces fatigue
Helps prevent lower-back pain
- Helps prevent muscle soreness or injury
- Turns up the body's calorie-burning knob due to increased muscle mass
- Improves body composition

WAYS TO INPROVE MUSCULAR FITNESS

There are several ways to improve muscular fitness: lift weights, use the body as resistance (as with push-ups and sit-ups), or use other forms of resistance. Before trying to improve muscular fitness, however, it is important to know the difference between weight training, strength training, and progressive resistance training.

- **WEIGHT TRAINING** is a term avoided these days because it implies that only weights (dumbbells, machines) are used. Since we know that we can build strength by using the resistance of ones own body, the next two terms are more common today.
- **STRENGTH TRAINING** uses resistance (body weight, free weights, machines, bands) to increase the ability to exert or resist force (the push or pull of an object)
- **PROGRESSIVE-RESISTANCE** exercise strengthens muscles by increasing the amount of weight and the number of repetitions. The more reps, the more muscular endurance increases.

WHAT HAPPENS WHEN YOU BEGIN STRENGTH TRAINING

The muscles contract against the resistance and muscle fibers increase protein synthesis. The individual fibers that muscles are made of grow bigger by a complicated process that synthesizes new myofibrils (a structure within the muscle that contracts) and this helps the muscles grow.

You'll notice an increase in strength before you'll see your muscles get bigger. That's because in the first months of bodybuilding and strengthening, muscles will use more fibers when they lift. Later, these fibers increase in size as the covering of the individual muscle fiber thickens and toughens as do the tendons supporting the muscle. This is called hypertrophy. Hypertrophy, or this increase in muscle size, yields greater protection for the muscle and makes it less susceptible to injury. The increase in size is in no way proportional to increases in strength and muscular endurance.

BASIC ELEMENTS OF CONDITIONING

Three basic elements determine the effectiveness of fitness conditioning programs: Frequency, Intensity, and Time or duration, often referred to as the F. I. T. principle.

FREQUENCY - The number of times per week that you train is the measure of frequency. The frequency of physical training must fall in the two-to-four times per week range to produce training effects of value.

INTENSITY - The degree to which you work physically is a measure of the intensity of training. The more intense the training (whether aerobic or anaerobic) the greater the training effect. Duration can compensate for less intensity in aerobic conditioning.

TIME (Duration) - The duration of training refers to the length of time you actually work during a training session. The objective of the training (aerobic or anaerobic) will determine the duration. Aerobic training is conducted at lower intensities but greater duration than anaerobic training. Some anaerobic training is of high intensity for brief periods; duration is accomplished by repeated bouts of activity in a training session.

HOW IS MUSCULAR FITNESS INPROVED

To increase muscle size and strength: Concentrate on heavy resistance and few repetitions of each exercise. Strength is the force that muscles produce in one explosive effort like jumping, lifting, and heaving.

To increase muscle tone and endurance: Concentrate on lower resistance and more repetitions.

TYPES OF TRAINING

OVERLOAD TRAINING:

When a muscle is subjected to a greater-than-normal workload, it increases in size and strength. Overloading simply means continuously subjecting yourself to work loads greater than those to which you are normally accustomed. In strength training this is accomplished primarily by increasing the resistance (weight).

PROGRESSIVE TRAINING:

Progressive training is also an important aspect of effective training. Progressive training is accomplished by gradually increasing the intensity and duration of training as you become more physically fit.

INTERVAL TRAINING:

Interval training is alternating work and rest periods during a training session. A work bout is followed by a rest period, then another work bout, and so on.

ISOMETRIC TRAINING:

Isometrics are usually done by applying pressure to an immovable object, but may be done by simply contracting the muscles while holding the limb still. This type of muscle contraction involves no joint movement. The major disadvantage of isometric training is that the strength that is developed is only effective in a narrow range close to the point at which it was developed.

ISOTONIC TRAINING:

Isotonic training is done against resistance and involves muscle contractions of the limb or body movements. All movements of the body are technically isotonic movements, although some are not done against resistance. There are several types of isotonic contractions:

Concentric contraction involves shortening of the contracting muscle, which moves the resistance. The muscle overcomes the resistance, moving the limb through the motion by shortening itself. There is one level of tension throughout the contraction.

Eccentric contraction entails lengthening of muscle. This is done when a weight is lowered through the range of motion. The muscle simply yields to the resistance, allowing it to be stretched. An example of this would be the biceps in letting the body down slowly from a chin-up.

Isokinetic contractions are created by controlling the speed of the contraction mechanically. The purpose is to allow a maximal contraction to be achieved throughout the entire movement (range of motion). The maximal force that can be achieved at any one point in the movement varies. The speed of movement also influences force.

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ASSIGNMENT

Define muscular strength:

Define muscular endurance:

How is muscular strength developed?

How is muscular endurance developed?

On page 30, rate the activities from 1-5 on how they contribute to the enhancement of muscular strength and muscular endurance.

FLEXIBILITY

DEFINITION:

Flexibility is the ability to move muscles and joints through their full range of motion. Flexibility is developed by stretching. Flexibility is also one of the health related components of fitness.

BENEFITS OF STRETCHING:

- Stretching can enhance physical fitness
- Stretching can optimize learning, practice, and performance of many types of skilled movement
- Stretching can increase mental and physical relaxation
- Stretching can promote development of body awareness
- Stretching can reduce the risk of back problems
- Stretching can reduce muscular soreness
- Stretching can reduce the severity of painful menstruation (dysmenorrhea) for females
- Stretching can reduce muscular tension

WHAT HAPPENS WHEN YOU STRETCH?

Several types of adaptation result from proper and regular stretching. When a muscle is suddenly stretched, the stretch reflex is initiated and the muscle being stretched contracts. Through proper training, the critical point at which the stretch reflex is initiated can be "reset" to a higher level. Consequently, your muscles relax farther into the stretch.

DIFFERENT METHODS OF STRETCHING

Stretching refers to the process of elongation. Stretching exercises are performed in a variety of ways depending upon your goals, abilities, and state of training. There are five basic stretching techniques: static, ballistic, passive, active, and proprioceptive. We are going to discuss the first four as the proprioceptive technique was designed and developed as a physical therapy procedure for patient rehabilitation.

STATIC STRETCHING

Static stretching involves holding a position. That is, you stretch to the farthest point and hold the stretch. Muscles should be stretched to the point of discomfort NOT pain. The most important advantage of static stretching is that it is the safest method of stretching. Other advantages include:

- It requires little expenditure of energy
- It allows adequate time to reset the sensitivity of the stretch reflex
- It permits semi-permanent change in length
- It can induce muscular relaxation if the stretch is held long enough

BALLISTIC STRETCHING

Ballistic stretching involves bobbing, bouncing, rebounding, and rhythmic types of movement. This technique is the most controversial stretching method because it can cause the most soreness and injury. Other disadvantages are:

- It fails to provide adequate time for the tissues to adapt to the stretch
- It initiates the stretch reflex and thereby increases muscular tension, making it more difficult to stretch out the connective tissues
- It does not provide adequate time for neurological adaptation of the stretch reflex to take place

Despite these disadvantages, there are several reasons why some athletes might use ballistic stretching. In terms of specificity of training it is appropriate for developing dynamic flexibility (movement due to momentum) this is essential for certain events and sports, such as ballet and karate.

PASSIVE STRETCHING

Passive stretching is a technique in which you are relaxed and make no contribution to the range of motion. These stretching exercises involve the use of a partner. The major disadvantage associated with passive stretching is its greater risk of resulting soreness and injury if a partner applies the external force incorrectly. In addition, it may initiate the stretch reflex if the stretch is too rapid, and the likelihood of injury increases with greater differences between active and passive flexibility.

ACTIVE STRETCHING

Active stretching is accomplished using your own muscles and without any assistance from an external force. Active stretching is important because it develops active flexibility, which in turn has been found to have a higher correlation with sports achievement.

WHAT CAUSES MUSCULAR SORENESS?

Everyone commonly experiences, discomfort, soreness, stiffness, or pain after working out or doing something different than they have done before. These afflictions fall into two general categories: those that occur during and immediately after the exercise or stretching, and those that usually do not appear until 24 or 48 hours later. Currently, there are four basic hypotheses that attempt to explain the nature of muscular soreness:

TORN TISSUE HYPOTHESIS - This hypothesis is that soreness results from the microscopic tearing of muscle fibers or connective tissues.

CONNECTIVE TISSUE DANAGE HYPOTHESIS - This hypothesis suggests that the soreness is due to irritation or damage of connective tissue – usually a result of exercises and training that utilize eccentric contractions (for instance, the elongation or stretching of a muscle while it is contraction under a resistance). Plyometrics is an example of a training technique that utilizes eccentric contractions.

METABOLIC ACCUMULATION HYPOTHESIS - This is a popular explanation of immediate muscle soreness. It suggests that the accumulation of waste products, especially lactic acid, is the chief culprit. Another explanation is that an excessive accumulation of metabolites (any of the various organic compounds caused by metabolism) causes an increased osmotic pressure: pressure on the sensory nerves creates the pain.

LOCALIZED SPASM OF MOTOR UNITS - This hypothesis is intended to explain delayed localized soreness. By this hypothesis, exercise above a minimal level causes decreased blood flow to the muscle, which in turn causes pain that results in a protective, reflex, tonic muscle contraction. The tonic contraction brings about more decreased blood flow and a vicious cycle is born.

STRETCHING GUIDELINES

Before beginning a stretching routine, always follow these guidelines:

- Warm up prior to stretching
- Develop a positive mental attitude
- Isolate the muscle group to be stretched
- Move slowly and smoothly into the stretch to avoid the initiation of the stretch reflex
- Use proper mechanics and strive for correct alignment
- Breathe normally and freely, but accentuate the exhalation when moving deeper into the stretch
- Hold the stretch (usually about 20 seconds to 1 minute) and relax. Do not strain or passively force a joint beyond its normal range of motion
- Concentrate and feel the stretch
- Anticipate and communicate when stretching with a partner
- Come out of each stretch as carefully as you went into it

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Timmermans, Helen M. and Malissa Martin. "Top Ten Potentially dangerous Exercises". *Journal of Physical Education, Recreation, and Dance.* August 1987.

ASSIGNMENT
Define flexibility:

How is flexibility developed?

What is the difference between ballistic and static stretching?

What is the difference between active and passive stretching?

On page 30, rate the activities from 1-5 on how they contribute to the enhancement of flexibility.

TOP TEN POTENTIALLY DANGEROUS EXERCISES

HELEN M. TIMMERMANS MALISSA MARTIN

Conditioning exercises are often used for a number of reasons, including the improvement of muscular strength and flexibility. There is often confusion, however, as to which exercise may contribute to fitness development and which exercises are actually potentially harmful to the body. Listed here are five exercises that are not recommended due to the injury hazards to the participants, and five exercises that could *potentially* be injurious to a person, particularly to a person who already has problems with that specific part of the body. A brief description of the reason(s) each is considered harmful, and alternative exercises to accomplish the intended fitness goal(s) are given.

Exercises Not Recommended

Bad Exercise	**Reason (s)**	**Alternative Exercises**
The Plough	Tends to promote forward head and kyphosis (humpback) by further stretching already elongated muscles and ligaments. It is also easy to lose balance and injure neck or back. (Mazzeo, 1985: Corbin & Lindesy, 1985)	One Leg Stretcher

Figure 1

Figure 2

Hurdler's Stretch	The knee is placed in an unnatural position – the angle is putting an abnormal stress load on the joint may cause strain in the groin and laxity of medial ligament of the bent knee. Also puts stress on the cartilage of the bent knee (Corbin & Lindsey, 1985).	Lateral Straddle Stretch (with or without towel)

Figure 3

Figure 4

Sit-up with Legs Straight

Increases stress on low back due to activity of muscles that flex hip. (Mazzeo, 1985: Stokes. Moore. Moore & Williams. 1981: Corbin & Lindsey. 1985).

Sit-up with Bent Knees: Females – bend knees with legs spread, as this puts less stress on lower back and accommodates the female pelvis.

figure 5

Double Leg Lift

Tends to promote hypertension Of low back. (Mazzeo. 1985: Corbin & Lindsey. 1985).

Knee to Chest

Figure 6

Figure 7

Deep Knee Bends (past 90 degrees)

May harm the knee joint by stretching the ligaments and irritating the synovial membrane, particularly for anyone who has had anterior cruciate problems or cartilage removal. (Mazzeo, 1985; Stokes, Moore, Moore, & Williams, 1981; Corbin & Lindsey, 19850.

Wall Seat

Figure 8

Figure 9

Exercises Potentially Injurious

Bad Exercise	Reason (s)	Alternative Exercise
Sit-up with Hands Behind Neck	Pulls on neck which tends to put pressure on the cervical spine. (Corbin & Lindsey, 1985).	Hands on Chest

Figure 10

Figure 11

Standing Toe Touch	May overstress the Muscles and ligaments of the lumbar region. These are especially hazardous for a person with back problems of compression to the sciatic nerve which runs from the low back down the entire length of the back of each leg. (Mazzeo, 1985; Stokes, Moore, Moore. & Williams, 1981; Corbin & Lindsey, 1985).	Sitting Stretches

Figure 12

Figure 13

Shin & Quadriceps Stretch	Where the knee is hyperflexed 120 degrees or more may damage the knee by stressing the cartilage or by stretching the ligaments. (Corbin & Lindsey, 1985).	Use Opposite Hand and Foot

Figure 14

Figure 15

Neck Hypertension	Tipping the head backward or forward during any exercise, such as neck circling, can pinch arteries and nerves at the base of the skull and result in dizziness, severe compression of the disks in the neck, or arthritis of the cervical spine area. (Mazzeo, 1985; Corbin & Lindsey, 1985)	It can be done if done *moderately* or if neck is supported during exercise.

Figure 16

Figure 17

Ballistic Ballet Bar Stretches	Some experts believe when the extended leg is raised 90 degrees or more and the trunk is bent over the knee, it can lead to sciatica and pyriformis syndrome, *especially in the person who has limited flexibility*. (Corbin & Lindsey; 1985).	Bent Leg Stretches

Figure 18

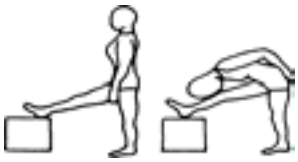

Figure 19

When designing a safe, adequate, and beneficial stretching program, one would use *static* stretching. Static stretching is a sustained stretch where one gently and slowly reaches and then holds a position for a designated time. Static stretching is highly recommended for all stretching programs as it provides for a slow, gentle stretch aiding in **t**ension reduction of the muscles. Muscles should be in a relaxed state while stretching. Ballistic or bounce-type stretching produces a contraction or tension within the muscles. It is for this reason that ballistic technique is not used. When using the static stretch, the exercise should be done slowly and gently until tightness is felt within the muscle. At no time should there be pain involved. This tightness position is then held for 20-30 seconds. The exercise is performed three-five times.

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Helen M. Timmerman is assistant professor of physical education, Blatt P. E. Center, University of South Carolina, Columbia, SC 29208. Malissa Martin is athletic trainer/curriculum director, Blatt P. E. Center, University of South Carolina, Columbia, SC 29208.

BODY COMPOSITION

DEFINITION

Body composition is what a body is composed of in terms of fat, muscle, and bone. It is the relative amounts (%) of fat and lean body tissue. Fat is fat tissue and lean body tissue is muscle, connective tissues, bone, skin, hair, nails, etc. Body composition is one of the health-related components of fitness.

HOW CAN YOU LEARN ABOUT YOUR BODY COMPOSITION

There are several methods that scientists use to estimate what percent of your body weight is lean and what percent is fat.

The method that scientists prefer is probably the least available to the average person. We know that fat floats in water and lean sinks. If you compare your weight on dry land with what you weigh under water (using a mathematical formula), you can estimate how much of your weight was floating and how much was sinking. Underwater or "hydrostatic" weighing is not completely accurate, but it does give the most reliable estimates. Hydrostatic weighing tends to be expensive and not readily available.

Another reasonably reliable method is less expensive and more available. Hold one arm out to the side and pinch the underside of your arm with your thumb and forefinger. Can you feel where the muscle begins? Everything between the skin and the muscle is fat. By using an instrument called a skin fold caliper, a trained person can measure the thickness of the layer of fat under your skin. Skin fold measurements are called "site specific" because measurements are taken in several areas of your body and computed with another mathematical formula to estimate your total body fat and total lean body mass.

Less accurate than these methods, is to measure body circumferences. Unfortunately, circumference measurements include muscle and bone in addition to fat. This, too, is a site-specific measurement but it is easy to do since it only requires a tape measure. This method is presented here because it can give you some concept of your own body composition. It is only an estimate and could be way off, especially if you are quite muscular. Remember that it is not the most accurate method.

FACTS ABOUT FAT AND LEAN TISSUE

You have both essential and storage fat. You can change the proportion of storage fat in your body through diet and exercise, but changing your essential fat could be harmful to your health.

Increasing lean tissue is the most effective way to reduce the proportion of storage fat in your body. The only way to build lean tissue or muscle is to exercise.

Finally, there is no widespread agreement in the scientific and medical community about any given person's optimal body composition. It is clear that people who have too high or too low a body fat percentage may have health risks. During adolescence there is a changing pattern and wide individual differences. That is why there is a range for each sex indicating what is normal and healthy.

FEMALES		MALES
10-20%	Storage Fat	5-9%
40-30%	Muscle	52-48%
13%	Essential Fat	3%
12%	Bone	15%
25%	Remainder	25%

HOW TO INPROVE BODY COMPOSITION:

To improve body composition and prevent disease:

- Exercise
- Eat more fruits, vegetables, bread, pasta, cereal, and beans
- Eat less fried foods, fatty meats, whole milk products, cheese, candy, chips, soft drinks, cookies, cakes, pastries
- Choose broiled and baked instead of fried food, nonfat instead of lowfat or whole milk, fruit instead of candy, bread and cereal instead of pastries and cookies; celery, radishes, cucumbers, zucchini, mushrooms, green peppers, instead of snack food.

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P. E. TV Teacher's Manuel. Whittle Communications. Knoxville, Tennessee, 1994.
Wilmore, J. H. *Sensible Fitness.* Leisure Press, 1986.

ASSIGNMENT

Define body composition:

What two types of fat does your body contain?

Which fat can you reduce and how?

On page 30, rate the activities from 1-5 on how they contribute to the enhancement of body composition.

Estimate your own body recipe by using the following pages to find your body composition.
(Females use the female pages and males use the male pages)

Diagrams to Estimate Your Own Body Recipe

FEMALES

Measure the circumference of the widest part of your hips. Put a dot at your hip measurement and another at your height on the chart below.

MALES

Measure your waist. Check your weight on a reliable scale. Weigh yourself without shoes. Put a dot at your weight and another at your waist measurement on the chart below.

Draw a straight line to connect these 2 dots.

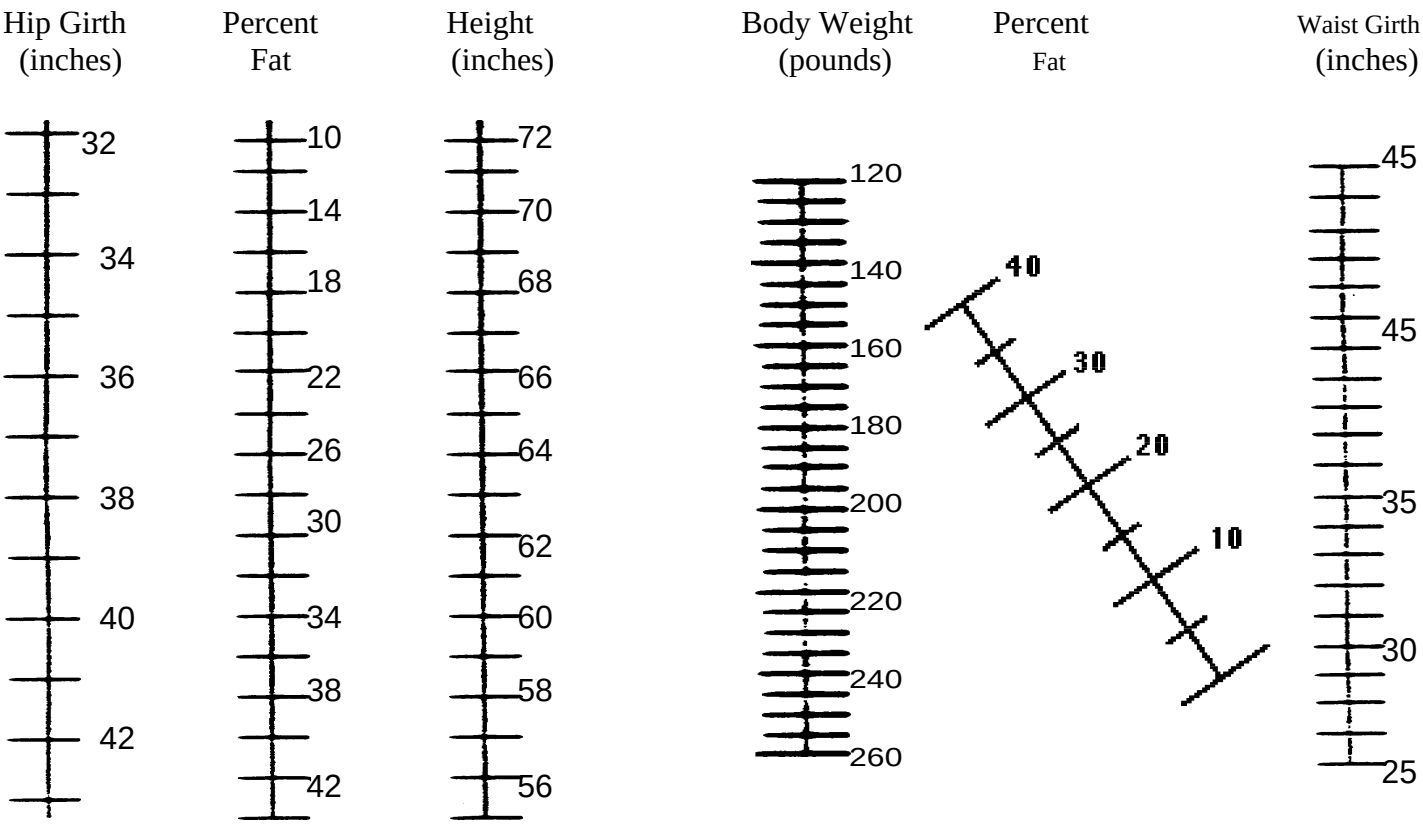
Example: Tammy
- Hips – 35.5 inches
- Height – 64 inches
- Body fat – 23 %
- Weight – 115 pounds

Example: Carlos
- Waist – 30.25 inches
- Weight – 150 pounds
- Body fat – 12 %

Where does your line cross the percent fat scale?

Enter the answer on page 28
(Females usually have about 21-26 %body fat)

Enter your answer on page 29
(Males usually have about 12-17 % body fat)

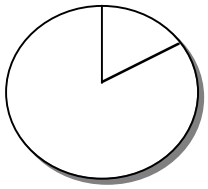


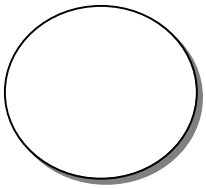
J.H. Wilmore. *Sensible Fitness*. Champaign, Ill: Leisure Press. 1986

Estimate Your Own Body Recipe: Females

Use this page along with the diagrams to estimate your body composition. Draw a straight line on the diagram from your hip measurement in the left column to your height in the right column (see page 27). The point where the line intersects the center is approximately your percent body fat, give or take 5 percent.

	Tammy	**You**
What is your estimate percent body fat?	23 percent	_____ percent





About what percent of your weight is lean body mass?

100 minus estimated body fat percentage = percent lean body mass

Tammy: 100 percent – 23 percent = 77 percent | 77 percent | _____ percent

You: _____

About how many pounds of your weight are lean?

Lean body percentage x your body weight = fat free or lean weight

Tammy: .77 x 115 pounds = 88.55 pounds | 88.55 pounds | _____ pounds

You: _____

About how many pounds of your weight are fat?

Body fat percentage x your weight = fat weight

Tammy: .23 x 115 pounds = 26.45 pounds | 26.45 pounds | _____ pounds

You: _____

About how many pounds of weight are essential body fat?

13 percent x your weight = essential fat

Tammy: .13 x 115 pounds = 14.95 pounds | 14.95 pounds | _____ pounds

You: _____

About how many pounds of weight are storage fat?

10 percent x your weight = storage fat

Tammy: .10 x 115 pounds = 11.5 pounds | 11.5 pounds | _____ pounds

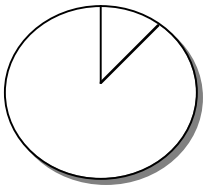
You: _____

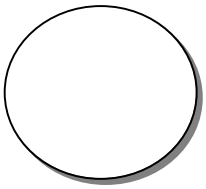
Nutrition for Life Grades 9-12 Developed by the Division of Nutritional Sciences Cornell University 1988

Estimate Your Own Body Recipe: Males

Use this page along with the diagrams to estimate your body composition. Draw a straight line on the diagram from your waist measurement to your height (see page 27). The point where the line crosses the center is approximately your percent body fat, give or take 5 percent.

	Carlos	**You**
What is your estimated percent body fat?	12 percent	_____ percent





About what percentage of your weight is lean body mass?

100 minus estimated body fat percentage = percent lean body mass
Carlos: 100 percent – 12 – 88 percent — 88 percent — _____ percent

You: _____

About how many pounds of your weight are lean?

Lean body percentage x your weight = fat free or lean weight
Carlos: .88 x 150 pounds = 132 pounds — 132 pounds — _____ pounds

You: _____

About how many pounds of your weight are fat?

Body fat percentage x your weight = fat weight
Carlos: .03 x 150 pounds = 4.5 pounds — 4.5 pounds — _____ pounds

You: _____

About how many pounds are storage fat?

9 percent x your weight = storage fat
Carlos: .09 x 150 pounds = 13.5 pounds — 13.5 pounds — _____ pounds

You: _____

RATING ACTIVITES
HEALTH RELATED FITNESS

The five components of Health Related Physical Fitness are:

Cardiovascular (cardiorespiratory) Endurance
Body Composition
Flexibility
Muscular Strength
Muscular Endurance

Since various forms of physical fitness activity contribute differently to the enhancement of the above components of Health Related Physical Fitness, rate the following activities with reference to their ability to enhance/develop these five Health Related components of Physical Fitness. Use the rating scale as follows:

1 – not at all 3 – average 5 – high
2 – below average 4 – above average

ACTIVITY	CARDIO RESP	MUSCULAR STRENGTH	MUSCULAR ENDURANCE	FLEXIBILITY	BODY COMPOSITION	TOTAL
Archery						
Basketball						
Bowling						
Canoeing,Row-ing, Kayaking						
Dance						
Football						
Hiking						
Horseback riding						
Soccer						
Speedball						
Swimming						
Tennis						
Volleyball						
Weight Training						

HEALTH RELATED FITNESS REVIEW

What are the 5 components of health related fitness?

Define the following terms:

- Cardiovascular Endurance -

- Muscular Strength –

- Muscular Endurance –

- Flexibility -

- Body Composition-

How do you monitor the development of your cardiovascular system?

What should be the intensity level of cardiovascular exercise for maximum benefits and minimum chance of injury?

How do you increase muscular strength?

How do you increase muscular endurance?

How do you improve flexibility?

Name 4 types of stretching:

How do you improve body composition?

How does health related fitness fit into wellness?

SKILL RELATED COMPONENTS OF FITNESS

SKILL RELATED FITNESS

Skill related fitness is one of the two types of fitness under physical fitness, which is one of the aspects of wellness. Skill related fitness is athletic and sports performance based. There are six components of skill related fitness: Power, Speed, Agility, Balance, Coordination, and Reaction time.

POWER

$$\text{Power} = \frac{\text{Work done (force x displacement)}}{\text{Time required}}$$

Power is defined as the ability of a muscle to perform one maximum explosive effort in as short a time as possible. Power consists of strength (magnitude of the muscle contraction) times speed (how fast the muscle is contracted). The amount of power that can be generated is directly related to the amount of force available. Humans can manipulate the availability of force in their bodies to increase force production (i.e. weight training). The factor that most influences force production is internal force production. Muscles are arranged in functional pairs that only pull. These pairs work together to provide internal force production, which leads to movement. Tendons attach muscles to bones-at this junction; force is applied to produce movement.

There is no "pure" measure of power since it involves the combination of strength and speed. The following tests are indirect measures of power, and can only provide an estimate of a persons overall power ability.

Softball throw for distance
Standing long or Vertical jump

ASSIGNMENT
What are 3 examples of sports skills that are based on power? (Name the sport and the skill involved, ie.: baseball – hitting the ball).

Define power:

What activity do you do or enjoy watching that incorporates a large amount of power ability?

Power is directly related to force. Fill in the missing arrows:

Power ↑ _____ Force _____ Power _____ Force ↓ _____

On page 40, rate the activities from 1-5 on how dependent they are on the skill of power.

SPEED

Speed is one of the skill related fitness components. Speed is defined as the time it takes to complete an activity. It is the ability to cover a distance in the shortest time possible. To measure speed the distance must be short (sprints) or the measure becomes one of muscular endurance.

Several factors that affect speed:
- Force production ability
- Movement patterns (running in a straight line versus cutting or zigzagging)
- Genetic factors such as type of muscle fibers and location of muscle attachment.

Fast twitch muscle fibers are made to produce speed. They contract rapidly but cannot sustain the contraction. Slow twitch muscle fibers contract slowly and the contraction can be sustained for longer periods of time. You have both types of muscle fibers in your muscles. Your muscle make-up is a percentage of each type. For example: a 100M dash sprinter might have 76 % FT (fast twitch) and 24 % ST (slow twitch) whereas a Cross Country Runner might have 80 % ST and 20 % FT. There has also been research done to show a third type of muscle fiber, a medium twitch fiber. Athletes can have a muscle biopsy performed to determine what percentage of fast twitch to slow twitch fiber exists. Keep in mind that you are born with your muscle fiber type percentage and it can not be changed.

Tests of speed:
20 or 30 yd dash

<u>ASSIGNMENT</u>
What are 3 examples of sports skills that are based on speed? (List the sport and the skill, ie: track – 200m)

Define speed:

What activity do you do or enjoy watching that incorporates a high amount of speed?

Who are the fastest man and the fastest women today on land? (Hint: 200m track) In water?
(Hint 100m freestyle)

On page 40, rate the activities from 1-5 on how dependent they are on the skill of speed.

BALANCE

Balance is another component of skill related fitness. Balance is defined as the ability to maintain stability while at rest or in motion. A component of balance is stability. The concepts of balance are:

- Base of support – the wider the base of support, the more stable you are
- Opposition – points need to balance out one another
- Center of Gravity – point in the body where weight is evenly distributed
- Line of Gravity – center of gravity in relation to center of earth
- Sensory Deprivation – how senses affect balance

To be balanced your center of gravity must be over your base of support. The center of gravity is an imaginary point in the body where a person's weight is equally distributed. It is usually located in the pelvic region of the body, and it varies from person to person. It is usually higher in males than in females and higher in children than in adults. The wider the base of support (your legs) the more stable you are. The line of gravity is an imaginary line dropped from your Center of Gravity straight down to the center of the earth. Any time your line of gravity is outside the base of support, you are less stable and less balanced.

<u>ASSIGNMENT</u>

What are 3 examples of sports skills that require a high amount of balance? (List the sport and skill – ie: gymnastics – balance beam routine)

Define balance:

What activity do you do or enjoy watching that requires a high amount of balance?

As your Center of Gravity gets lower…… your Balance _____

As your Base of Support gets wider…… your Balance _____

On page 40, rate the activities from 1-5 on how dependent they are on the skill of balance.

COORDINATION

Coordination is the ability to integrate your senses of hearing, sight, and touch with certain body parts to perform smooth and efficient movements. Coordination is also a component of skill related fitness. Often it is a series of movements connected together. There are many natural connections between coordination and rhythm. Almost every move we make in sports, fitness, or even daily living requires coordination. Walking, running, swimming, dance, tennis, typing, eating, even breathing all require some amount of coordination.

Coordination can be subdivided into eye-hand or eye-foot categories. Music and rhythm are good tools to use to improve your coordination for sports skills. Almost all dance movements, from social dance (ballroom) to classical dance (ballet/jazz), can be applied to most sports activities. For example: the Schottische, a European folk dance, uses the same footwork as a basketball lay-up.

Juggling is another good activity to use to improve coordination.

<u>ASSIGNMENT</u>

What are 3 examples of sports skills that require coordination? (List the sport and the skill. ie: basketball – lay-up shot)

Define coordination:

What activity do you do or enjoy watching that requires a high amount of coordination?

What is one example of a sports skill that requires hand-eye coordination? (List the sport and the skill. ie: tennis – serving)

What is one example of a sports skill that requires foot-eye coordination? (List the sport and the skill. ie: soccer – indirect kick)

AGILITY

Agility is the ability of the large body parts (arms, legs and trunk) to change positions with speed and accuracy when moving from point to point. Agility is a combination of balance, coordination, and strength. It is also a component of skill related fitness. Tag games are a good way to develop agility in children. The smaller the space, the more agility required of the players.

Some tests for agility are:

- Shuttle runs
- Soccer dribble knockout
- Basketball dribble knockout

ASSIGNMENT

What are 3 examples of sports skills that require a high amount of agility? (List the sport and the skill. ie: football – avoiding tackles)

Define agility:

What activity do you do or enjoy watching that incorporates a high amount of agility?

How can a person improve their agility?

On page 40, rate the activities from 1-5 on how dependent they are on agility.

REACTION TIME

The sixth skill related fitness component is reaction time. Reaction Time is the amount of time between recognizing a stimulus (ie: starters gun) and the beginning of a movement response. It is a connection between the senses of sight or sound through the brain to a muscle or muscle groups. Larger muscle groups react slower than do smaller individual muscles. Reaction time can be practiced, trained, and even improved upon. The quickness of a person's reaction is dependent on the connection between the neurons in the brain and the rest of the body.

One measure of reaction time is done with a yardstick. The yardstick is dropped between the fingers of your hand by a partner at various internals. You must try to grab the stick as quickly as possible. Your reaction time score is the average of three or more attempts. (In each attempt the score is the number at which you catch the stick).

<u>ASSIGNMENT</u>
What are 3 examples of sports skills that require great Reaction Time? (List the sport and the skill. ie: swimming – start from the gun)

Can reaction time be trained?

What activity do you do or enjoy watching that requires fast reaction time?

Is reaction time faster or slower for large muscle groups vs individual small muscles?

On page 40, rate the activities from 1-5 on how dependent they are on the skill of reaction time.

RATING ACTIVITIES
SKILL RELATED FITNESS

The six components of Skill Related Fitness are:

Power	Balance
Speed	Coordination
Agility	Reaction Time

Since various forms of physical activity depend on different performance based skill, rate the following activities with reference to their dependence on these six Skill-Related components of Fitness. Use the rating scale as follows:

1- not at all	4- above average
2- below average	5- high
3- average	

ACTIVITY	AGILITY	BALANCE	COORDINATION	POWER	REACTION TIME	SPEED
Archery						
Basketball						
Bowling						
Canoeing,Kay-aking, Rowing						
Dance						
Football						
Hiking						
Horseback Riding						
Soccer						
Speedball						
Swimming						
Tennis						
Volleyball						
Weight Training						

SKILL RELATED FITNESS REVIEW

How does skill related fitness fit into wellness?

How many components of skill related fitness are there?

Skill related fitness is one type of fitness related to physical fitness. What is the other type of fitness?

Using the six components of skill related fitness, put the correct component with its definition:

_____ a. This component consists of strength times speed.

_____ b. This component is a combination of balance, coordination, and speed.

_____ c. This is the ability to integrate your senses with your body parts to perform smooth and efficient movements.

_____ d. The amount of time between recognizing a stimulus and the beginning of a movement response.

_____ e. The amount of time it takes to complete an activity.

_____ f. The ability to maintain stability while at rest or in motion.

Skill related fitness is athletic and sports _____ based.

FITNESS

VS

ACTIVITY

PHYSICAL FITNESS, PHYSICAL ACTIVITY, AND EXERCISE

WHAT IS THE DIFFERENCE BETWEEN PHYSICAL FITNESS, PHYSICAL ACTIVITY, AND EXERCISE?

PHYSICAL FITNESS: the energy and vitality to carry out daily tasks, to engage in active leisure and recreational pursuits, and to meet unforeseen emergencies without undue fatigue

PHYSICAL ACTIVITY: any bodily movement produced by muscles that result in energy expenditure

EXERCISE: a subcategory of physical activity. It is planned, structured, repetitive, and purposeful activity done for the improvement or maintenance of fitness.

There are two kinds of exercise as you learned in Cardiovascular Fitness.

AEROBIC EXERCISE: Any activity/sport which uses oxygen for energy. It is the energy system used after 3 minutes of continuous movement. Aerobic activities are longer in duration, continuous and rhythmic in movement type, and lower in intensity. Fats are the predominant fuels. While one muscle group is working another is resting (i.e.: rowing, dancing, cross-country skiing, cycling, distance running and distance swimming)

ANAEROBIC EXERCISE: Any activity/sport that occurs without oxygen. It uses glycogen stored in the muscles for energy. The anaerobic energy system is used for exercise up to 3 minutes long. Carbohydrates are the predominant fuels. Anaerobic exercise is short in duration and very high in intensity. Anaerobic exercise uses multiple muscle groups at the same time (ie: sprint running, sprint swimming, weight lifting, downhill skiing, and football)

WHY EXERCISE?

Many people think of exercise only as a way to lose weight or get in shape but regular physical activity helps us in many other ways as well. From clearing our minds and arteries, to fighting off cancer, exercise promotes good health

Exercise:

- Protects against some cancers – Regular physical exercise reduces the risk of developing colon cancer and may also help prevent lung and breast cancer.
- Helps decrease chance of weight gain – Weight gain which can lead to obesity increases the risk of developing endometrial, kidney, breast, colon, and gallbladder cancers, as well as, diabetes, hypertension, and heart disease. Regular exercise helps keep weight down thus decreasing the risk. More muscle equals a more active metabolism and a higher metabolic rate helps lessen the chance of weight gain and obesity. Fun and activity also decrease boredom and time available for extra snacking or grazing at home.
- Reduces the risk of heart disease - Aerobic exercise strengthens the heart and blood vessels, increases good cholesterol, and lowers triglyceride levels.
- Helps lift mood - Chemicals that are released in the brain during exercise help eliminate feelings of anxiety, depression, and mental stress. These same chemicals may even reduce pain and induce feelings of happiness and well being.
- Lowers blood pressure.
- Bolsters the immune system - This may mean even fewer colds, viruses, and infections.

- Reduces the risk of developing diabetes – Exercise improves your body's ability to use the insulin it makes, lessening the chance of developing adult – onset diabetes.
- Helps maintain bones and joints – Physical activity is important for keeping joints and muscles strong, along with promoting flexibility and balance.
- Boosts self-esteem.
- It's fun – Find the right activity for you.

ASSIGNMENT

Put each activity into its proper category by putting the letter (s) PF (Physical Fitness), PA (Physical Activity) or E (Exercise) before each statement.

a._____ Walking to school

b._____ Distance swimming

c._____ Stocking shelves at Wegmans

d._____ Going to school all day and then playing on a sport team

e._____ Weight lifting every day during lunch

List 2 aerobic activities that you participate in:

List 2 anaerobic activities that you do:

Why do you exercise?

FITNESS BUILDING PRINCIPLES

FITNESS BUILDING PRINICIPLES

1. SPECIFICITY: The effects of training are specific to the body parts and energy systems that are used in the exercise. To perform well in a certain event, one must TRAIN in that event. (ie: swimmers must swim, runners must run, etc.)

2. VARIABILITY: To avoid training plateaus or boredom, the types of demands placed on the body may vary both in content and intensity.

3. REVERSIBLITY: Fitness must be maintained by regular exercise participation or the fitness level will be reversed until it is finally lost.

4. PROGRESSIVE: To avoid injury/ illness one should gradually increase the exercise load by increasing the amount, duration, and intensity.

5. USE and DISUSE:
   Hypertrophy: gain in muscle size and strength
   Atrophy: loss in muscle size and strength

6. OVERLOAD: Muscle and energy systems become stronger or weaker in response to the demands placed on them. You can overload a muscle or energy system by following the above principles and the F. I. T. Principle. (Refer to the Basic Elements of Conditioning under MUSCULAR FITNESS)

F. I. T. PRINCIPLE:

F = Frequency: Exercise should be performed regularly to be effective. 3-5 days per week is recommended.

I = Intensity: Exercise should be hard enough to require more exertion than normal to produce improvement. Too little intensity will not improve fitness of any kind; too much intensity will produce soreness or injury.

T = Time: An exercise period should be at least twenty minutes in length to be effective; longer duration (30-90 minutes is recommended for optimal fitness gain).

ASSIGNMENT

What is the F.I.T. Principle?

What is the opposite of hypertrophy?

Where did hypertrophy first come up in this handbook?

What building principle of fitness should be used to avoid illness or injury?

If fitness is not maintained by regular exercise participation, what happens?