

KNR 240

**PRINCIPLES AND APPLICATIONS
OF FIELD-BASED FITNESS ASSESSMENT**

COURSE MATERIALS

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***SCHOOL OF KINESIOLOGY AND RECREATION
ILLINOIS STATE UNIVERSITY***

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INTRODUCTION

COURSE OBJECTIVES

- GAIN AN AWARENESS OF THE VALUE OF FITNESS/PHYSICAL ACTIVITY
- LEARN BASIC METHODOLOGY OFTEN USED IN THE FIELDS RELATED TO EXERCISE SCIENCE
- APPLY THE PRINCIPLES OF EXERCISE PHYSIOLOGY
- DEVELOP SKILLS IN THE UNDERSTANDING AND INTERPRETATION OF FITNESS TESTING RESULTS

GENERAL COURSE REQUIREMENTS: THE FOLLOWING ARE EXPECTED/REQUIRED OF EACH STUDENT

- ATTENDANCE IS **REQUIRED**. SINCE THIS IS A HANDS-ON, NON-LECTURE TYPE CLASS, ATTENDANCE IS ESSENTIAL. CLASS CONTENT/TESTING WILL NOT BE REPEATED DUE TO TIME AND EQUIPMENT NEEDS.
- MAKE-UP EXAMS, LABS, ASSIGNMENTS, ETC. WILL ONLY BE ALLOWED FOR LEGITIMATE EXCUSES INCLUDING MEDICAL, DEATH IN FAMILY, OR ISU EXCUSED ABSENCES. YOUR *INSTRUCTOR MUST BE CONTACTED* THE DAY OF THE ABSENCE. WRITTEN DOCUMENTATION OF REASON FOR ABSENCE MAY BE REQUIRED.
- STUDENTS SHOULD SHOW UP TO CLASS ON TIME.
- STUDENTS SHOULD BRING THEIR TEXTBOOK AND WORKBOOK TO EACH CLASS.
- STUDENTS SHOULD READ THE ASSIGNED MATERIAL **BEFORE** CLASS.
- STUDENTS SHOULD BE DRESSED APPROPRIATELY FOR PARTICIPATION IN THE CLASS. VIEW THE CLASS SCHEDULE FOR DAYS THAT YOU MUST COME DRESSED FOR ACTIVITY.
- LOOK AT THE COURSE SCHEDULE ON A REGULAR BASIS TO SEE WHAT IS BEING COVERED IN CLASS AND WHAT ASSIGNMENTS ARE DUE. HOWEVER, THE COURSE SCHEDULE MAY NEED TO BE CHANGED OCCASIONALLY DUE TO INHERENT SCHEDULING CONFLICTS. YOUR INSTRUCTOR WILL INFORM YOU (IN CLASS) OF ANY NEEDED SCHEDULING CHANGES.
- ASSIGNMENTS **WILL NOT** BE ACCEPTED LATE. STUDENTS HAVE UNTIL 4:30 OF THE DAY AN ASSIGNMENT IS DUE TO TURN IN ANY ASSIGNMENTS.
- ASSIGNMENTS SHOULD BE TYPED (OR NEATLY WRITTEN-WITH PERMISSION). ASSIGNMENTS THAT ARE UNREADABLE WILL BE RETURNED TO THE STUDENT TO BE RE-WRITTEN. YOUR GRADE FOR THAT ASSIGNMENT WILL BE A ZERO UNTIL IT IS RE-SUBMITTED, AND LATE PENALTY POINTS DEDUCTED FROM YOUR FINAL SCORE.
- ANY INFRACTION OF ACADEMIC DISHONESTY WILL BE REFERRED TO THE STUDENT JUDICIAL OFFICE FOR ACTION (READ THE STUDENT HANDBOOK-STUDENT CODE OF CONDUCT)

SPECIAL ACCOMMODATIONS

IF YOU HAVE SPECIAL MEDICAL OR PHYSICAL LIMITATIONS THAT MAKE THE ACTIVITIES PERFORMED IN CLASS DIFFICULT OR IF YOU NEED MODIFICATIONS PLEASE CONTACT THE INSTRUCTOR. SAFETY IS A HIGH PRIORITY IN THIS CLASS. YOU WILL NOT BE FORCED TO DO ANYTHING THAT YOU FEEL IS BEYOND YOUR CAPABILITIES. IN ADDITION, IF YOU NEED A SPECIAL ACCOMMODATION TO FULLY PARTICIPATE IN THIS CLASS, PLEASE CONTACT DISABILITY CONCERNS AT 438-5853 (VOICE), 438-8620 (TDD).

GRADING

EXAMS AND QUIZZES

THERE WILL BE TWO EXAMS, INCLUDING A COMPREHENSIVE FINAL EXAM. QUIZZES MAY BE GIVEN ON ANY DATE WITHOUT PRIOR ANNOUNCEMENT.

CLASS PARTICIPATION

STUDENTS WILL **LOSE 5 PTS** FOR EACH CLASS MISSED OR NOT PARTICIPATED IN. **NOT** BEING DRESSED APPROPRIATELY OR COMING TO CLASS LATE MAY ALSO RESULT IN LOSS OF PARTICIPATION POINTS. IT IS VERY IMPORTANT THAT STUDENTS MAKE EVERY EFFORT TO ATTEND CLASS. MANY ASSIGNMENTS ARE BASED ON DATA COLLECTED IN CLASS, OR FROM INFORMATION GIVEN IN CLASS. IF YOU MISS A CLASS IN WHICH DATA HAS BEEN COLLECTED, YOU WILL NOT BE ALLOWED TO MAKE THIS UP, AND THEREFORE WILL NOT BE ABLE TO COMPLETE THE ASSIGNMENT. THEREFORE, MISSED CLASSES CAN HAVE A SIGNIFICANT DETRIMENTAL EFFECT ON YOUR FINAL GRADE.

ASSIGNMENTS

FITNESS ASSESSMENTS

DIETARY ANALYSIS ASSIGNMENT

CASE STUDIES

ADDITIONAL ASSIGNMENTS COULD BE ADDED AS NEEDED

AT THE DISCRETION OF YOUR INSTRUCTOR, EXTRA CREDIT ASSIGNMENTS MAY BE GIVEN/REQUESTED. ALL EXTRA-CREDIT WORK MUST BE PRE-APPROVED BY YOUR INSTRUCTOR, AND WILL BE DUE PRIOR TO THE LAST WEEK OF CLASSES.

YOUR GRADE WILL BE DETERMINED BY YOUR COMBINED PERFORMANCE ON YOUR EXAMINATIONS AND QUIZZES, ASSIGNMENTS, AND CLASS PARTICIPATION.

100-90% = A

89-80 % = B

79-70% = C

69-60% = D

59- BELOW = F

Resources To Use For This Course

GENERAL HEALTH/FITNESS INFORMATION:

[WWW.MAYOCLINIC.COM](http://www.mayoclinic.com)

[HTTP://WWW.ACSM.ORG/HEALTH% 2BFITNESS/INDEX.HTM](http://www.acsm.org/health%20fitness/index.htm)

[HTTP://WWW.AMERICANHEART.ORG/PRESENTER.JHTML?IDENTIFIER=1200000](http://www.americanheart.org/presenter.jhtml?identifier=1200000)

[HTTP://WWW.CDC.GOV/](http://www.cdc.gov/)

BLOOD PRESSURE:

[HTTP://WWW.MAYOCLINIC.COM/INVOKE.CFM?ID=DS00100](http://www.mayoclinic.com/invoke.cfm?id=DS00100)

[HTTP://WWW.AMERICANHEART.ORG/PRESENTER.JHTML?IDENTIFIER=2112](http://www.americanheart.org/presenter.jhtml?identifier=2112)

[HTTP://WWW.NHLBI.NIH.GOV/GUIDELINES/HYPERTENSION/PHYCARD.PDF](http://www.nhlbi.nih.gov/guidelines/hypertension/phyocard.pdf)

BODY COMPOSITION:

[HTTP://WWW.INSITEFITNESS.COM.AU/LESSONS/FITNESS% 20TESTING/ANTHROPOMETRY/SKINFOLD.HTM](http://www.insitefitness.com.au/lessons/fitness%20testing/anthropometry/skinfold.htm)

[HTTP://WWW.TOPENDSPORTS.COM/TESTING/BODYCOMP.HTM](http://www.topendsports.com/testing/bodycomp.htm)

[HTTP://WWW2.GSU.EDU/~WWWFIT/BODYCOMP.HTML](http://www2.gsu.edu/~wwwfit/bodycomp.html)

[HTTP://WWW.AM-I-FAT.COM/IDEAL_BODY_WEIGHT.HTML](http://www.am-i-fat.com/ideal_body_weight.html)

NUTRITION:

[HTTP://MYPYRAMID.GOV](http://mypyramid.gov)

[HTTP://WWW.USDA.GOV/CNPP/DIETARY_GUIDELINES.HTML](http://www.usda.gov/cnpp/dietary_guidelines.html)

<http://www.castonline.ilstu.edu/brown/idph/>

PAR-Q, HEALTH HISTORY, INFORMED CONSENT

A PAR-Q IS A BRIEF QUESTIONNAIRE, PRIMARILY RELATING TO CARDIOVASCULAR SYMPTOMS, THAT MAY INDICATE A NEED FOR AN INDIVIDUAL TO SEEK MEDICAL EVALUATION PRIOR TO EXERCISE TESTING AND/OR STARTING AN EXERCISE PROGRAM. A PAR-Q DOES NOT GIVE ENOUGH MEDICAL INFORMATION IN ORDER TO PERFORM RISK STRATIFICATION HOWEVER.

A HEALTH/MEDICAL HISTORY FORM (INCLUDING LIFESTYLE BEHAVIORS) IS NEEDED IN ORDER TO PROPERLY CLASSIFY AN INDIVIDUAL INTO ONE OF THREE “RISK STRATIFICATIONS” ACCORDING TO ACSM. THESE RISK STRATIFICATIONS ARE:

LOW RISK INDIVIDUALS: “ASYMPTOMATIC MEN AND WOMEN WHO HAVE < OR 1 CVD RISK FACTOR” (SEE TABLE 2.2, PAGE 18 ACSM TEXT).

MODERATE RISK INDIVIDUALS: “ASYMPTOMATIC MEN AND WOMEN WHO HAVE 2 OR MORE RISK FACTORS (SEE TABLE 2.2, PAGE 18, ACSM TEXT).

HIGH RISK INDIVIDUALS: “INDIVIDUALS WHO HAVE KNOWN CARDIOVASCULAR, PULMONARY, OR METABOLIC DISEASE **OR** 1 OR MORE SIGN OR SYMPTOM OF CVD (SEE TABLE 2.3, PAGES 23-24, ACSM TEXT).

REFER TO PAGE 22 OF YOUR TEXT (ACSM’S HEALTH-RELATED PHYSICAL FITNESS ASSESSMENT MANUAL) FOR A LIST OF RISK FACTORS, AND PAGES 23-24 FOR SIGNS AND SYMPTOMS OF DISEASE.

AN INFORMED CONSENT FORM IS COMPLETED IN ORDER TO COMMUNICATE TO EACH INDIVIDUAL UNDERGOING FITNESS TESTING THE PURPOSES OF THE ASSESSMENTS, THE PROCEDURES TO BE USED, ANY RISKS AND/OR DISCOMFORT ASSOCIATED WITH THE ASSESSMENTS, AND HOW THE TESTING INFORMATION WILL BE USED. THE SIGNING OF THIS FORM INDICATES A WILLINGNESS OF THE CLIENT TO UNDERGO THE TESTING, AND AN ACCEPTANCE OF THE RISKS INVOLVED. EACH INDIVIDUAL SHOULD BE GIVEN THE OPPORTUNITY TO ASK QUESTIONS AND HAVE THEM ANSWERED PRIOR TO ANY TESTING.

TO DOWNLOAD A COPY OF THE PAR-Q, GO TO THE FOLLOWING WEB SITE:

[HTTP://WWW.ME.VCCS.EDU/FORMS/PAR_Q.PDF](http://www.me.vccs.edu/forms/par_q.pdf)

REFER TO PAGES 20-21, PAGE 25 FOR AN EXAMPLE OF A HEALTH-HISTORY QUESTIONNAIRE.

REFER TO PAGES 13-14 FOR AN EXAMPLE OF AN INFORMED CONSENT FORM.

Risk Stratification Worksheet

Please determine which ACSM risk stratification profile each of the following “clients” fall into, and if the specific procedures listed can be performed by you *without a physician present*.

1. Patty is a 45 year old female. She comes to you for an exercise assessment. She does not smoke, is active, and she eats “healthfully,” focusing on fruits and vegetables in her diet. She is not obese, nor does she have any family history of heart disease. She is on medication for her blood pressure.
 - a. What are her risk factors, if any? _____
 - b. What is her ACSM risk stratification profile? _____
 - c. Can you do a maximal exercise assessment on her? _____ A sub-maximal test? _____

2. John is a 55 year old male. He works construction and is active most of the day. He has a great deal of muscular strength, but he is concerned about his cardiorespiratory fitness. Since his dad died at age 50 from a massive heart attack, he decides he needs to start developing his CRF to prevent the same from happening to himself. He smokes 1 pack of cigarettes per day. His doctor told him his blood pressure was “OK, but that his cholesterol was high (LDL 160).” He was told to eat a “heart-healthy” diet.
 - a. What are his risk factors, if any? _____
 - b. What is his ACSM risk stratification profile? _____
 - c. Can you do a maximal exercise assessment on him? _____ A sub-maximal test? _____

3. Susie is a 16 year old high school sophomore. Susie is in your PE class. She is not obese, nor does she smoke. She does not know her blood pressure or cholesterol. She has no family history of heart disease, but she is a Type I diabetic, and on an insulin pump.
 - a. What are her risk factors, if any? _____
 - b. What is her ACSM risk stratification profile? _____
 - c. Can you do a maximal exercise assessment on her? _____ A sub-maximal test? _____

4. Sam is a 32 year old male who hasn’t stopped partying since college. He really enjoys this lifestyle, however, as a result of over-consumption of calories from beer, in addition to a decrease in exercise due to a desk job, he has gained considerable weight. He now weighs in at 240, yet he is only 5’5”. He enjoys drinking the beer with a few cigarettes as well. His blood pressure is now reading in at 138/96. His cholesterol level is 240 mg/dl.
 - a. What are his risk factors, if any? _____
 - b. What is his ACSM risk stratification profile? _____
 - c. Can you do a maximal exercise assessment on him? _____ A sub-maximal test? _____

5. Sally is a 58 year old female. She currently exercises 3 times per week for 45 minutes each time. She quit smoking 10 years ago, her blood pressure is 128/76, and her HDL cholesterol is 84 mg/dl. Her father died of a heart attack at age 65, and she is concerned about recent episodes of feeling short of breath and a sense of heaviness in her chest.
 - a. What are her risk factors, if any? _____
 - b. What is her ACSM risk stratification profile? _____
 - c. Can you do a maximal exercise assessment on her? _____ A sub-maximal test? _____

REVIEW OF BLOOD PRESSURE

WHAT IS BLOOD PRESSURE?

ARTERIAL BLOOD PRESSURE: THE LATERAL PRESSURE OR FORCE, EXERTED BY THE BLOOD ON AN AREA OF THE BLOOD VESSEL WALL. THIS CONSTANTLY CHANGES DURING THE COURSE OF THE CARDIAC CYCLE. THE HIGHEST PRESSURE IN THE CYCLE IS CALLED THE **SYSTOLIC** PRESSURE; THE LOWEST IS THE **DIASTOLIC** PRESSURE.

SYSTOLIC: PRESSURE AGAINST THE BLOOD VESSEL WALL DURING CONTRACTION OF HEART.

DIASTOLIC: PRESSURE AGAINST THE BLOOD VESSEL WALL DURING RELAXATION BETWEEN CONTRACTIONS.

PULSE PRESSURE: NUMERICAL DIFFERENCE BETWEEN THE SYSTOLIC AND DIASTOLIC PRESSURE.

WHAT IS CONSIDERED NORMAL AND HYPERTENSIVE:

SYSTOLIC: LOWER THAN 120=NORMAL
120-139= PRE-HYPERTENSION
140-159= STAGE 1 HYPERTENSION
160- 179= STAGE 2 HYPERTENSION
180 AND HIGHER= STAGE 3 HYPERTENSION

DIASTOLIC: LOWER THAN 80=NORMAL
80-89=PRE-HYPERTENSION
90-99= STAGE 1 HYPERTENSION
100-109= STAGE 2 HYPERTENSION
110 OR HIGHER= STAGE 3 HYPERTENSION

TYPES OF EQUIPMENT USED TO MEASURE BLOOD PRESSURE:

MERCURY-GRAVITY MANOMETER: MOST RELIABLE METHOD, DOES NOT REQUIRE CALIBRATION, BUT MUST BE KEPT IN VERTICAL POSITION. MERCURY IS A TOXIC SUBSTANCE.

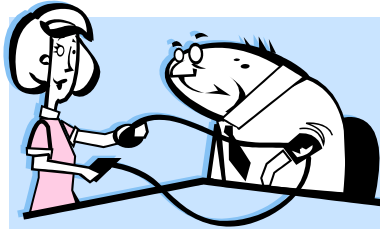
ANEROID MANOMETER: MORE PORTABLE, MUST BE CALIBRATED, MORE DIFFICULT TO REPAIR.

AUTOMATED DIGITAL MANOMETER: VARIABLE QUALITY, STETHOSCOPE NOT NEEDED

DOPPLER ULTRASOUND: EXPENSIVE EQUIPMENT, EASIEST TO HEAR.

CATHETER: USED IN HOSPITAL OR RESEARCH SETTINGS, DIRECT, INVASIVE MEASUREMENT

BLOOD PRESSURE TECHNIQUE



1. THE PERSON SHOULD BE COMFORTABLY SEATED, WITH THE ARM STRAIGHT OR SLIGHTLY FLEXED, PALM UP, AND THE WHOLE FOREARM SUPPORTED AT HEART LEVEL ON A SMOOTH SURFACE. FOR THE MOST ACCURATE RESTING MEASUREMENT, THE PERSON SHOULD HAVE BEEN SITTING QUIETLY FOR AT LEAST FIVE MINUTES PRIOR TO TAKING THE BLOOD PRESSURE READING.
2. USE THE PROPER SIZE CUFF. THE THREE MOST FREQUENTLY USED CUFF SIZES ARE CHILD (13-20 CM), ADULT (17-26 CM), AND LARGE ADULT (32-42 CM). IF THE PERSON'S ARM IS LARGE, THE NORMAL SIZE CUFF WILL BE TOO SMALL, MAKING THE READING HIGHER THAN IT SHOULD BE (AND VISA VERSA).
3. PLACE THE DEFLATED CUFF WITH THE LOWER MARGIN ABOUT 1 INCH ABOVE THE INNER ELBOW CREASE (ANTECUBITAL SPACE). THE MANOMETER SHOULD BE CLEARLY VISIBLE, AND IF A MERCURY GAUGE IS USED, POSITION IT AT EYE LEVEL.
4. INSERT THE STETHOSCOPE EAR TIPS DIRECTLY DOWN EACH EAR CANAL. GENTLY TAP THE DIAPHRAGM TO ENSURE SUITABLE DETECTION OF SOUND.
5. POSITION THE STETHOSCOPE DIAPHRAGM FIRMLY (BUT NOT TOO FIRM) OVER THE **BRACHIAL** ARTERY. (PALPATE THE ARTERY FIRST) THE STETHOSCOPE SHOULD NOT TOUCH CLOTHING, THE CUFF, OR THE CUFF TUBING (TO AVOID UNNECESSARY SOUNDS).
6. TIGHTEN THE AIR-RELEASE VALVE BY TURNING IT CLOCKWISE (“TO THE RIGHT IS TIGHT”) AND QUICKLY INFLATE THE CUFF TO 150-160 MM (OR TO 20-30 MM ABOVE THE EXPECTED SBP). INFLATING THE CUFF TOO MUCH WILL CAUSE UNNECESSARY DISCOMFORT TO YOUR SUBJECT.
7. TURN THE AIR-RELEASE VALVE COUNTER-CLOCKWISE (“TO THE LEFT IS LOOSE”) AND RELEASE THE CUFF PRESSURE AT A SLOW, STEADY RATE OF ABOUT 2-5 MMHG PER SECOND. (IF YOU RELEASE IT TOO QUICKLY, YOU WILL MISS THE FIRST SOUND, AND IF TOO SLOWLY, IT WILL CAUSE YOUR SUBJECT SOME ARM DISCOMFORT.)
8. LISTEN CAREFULLY AND MENTALLY NOTE THE PRESSURE AT WHICH THE KOROTKOFF SOUNDS FIRST APPEAR (SBP) AND DISAPPEAR (DBP). PHASE ONE (KOROTKOFF SOUND) IS MARKED BY THE FIRST APPEARANCE OF FAINT, CLEAR TAPPING SOUNDS WHICH GRADUALLY INCREASE IN INTENSITY. THE FIFTH PHASE (KOROTKOFF SOUND) IS THE DISAPPEARANCE OF THE PULSE/TAPPING SOUND. PHASE 1 IS THE SYSTOLIC PRESSURE, AND PHASE 5 IS THE DIASTOLIC PRESSURE.
9. RELEASE THE PRESSURE QUICKLY AFTER YOU ARE SURE THAT YOU HAVE OBTAINED THE DIASTOLIC PRESSURE. IF A REPEAT BLOOD PRESSURE MEASUREMENT IS NEEDED, DEFLATE THE CUFF COMPLETELY, AND ALLOW AT LEAST 30 SECONDS TO ALLOW THE BLOOD CIRCULATION TO RETURN TO NORMAL.
10. RECORD THE BLOOD PRESSURE READING, NOTING DATE AND TIME OF DAY.

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BLOOD PRESSURE ASSIGNMENT

NAME OF SUBJECT: _____ AGE: _____

BP READING #1: _____ BP READING #2: _____

CLASSIFICATION: _____

NAME OF SUBJECT: _____ AGE: _____

BP READING #1: _____ BP READING #2: _____

CLASSIFICATION: _____

NAME OF SUBJECT: _____ AGE: _____

BP READING #1: _____ BP READING #2: _____

CLASSIFICATION: _____

COMMENTS/EVALUATION:

YOUR NAME: _____ DATE: _____

Blood Pressure and Heart Rate

Assessment of Heart Rate

INSTRUCTIONS: Practice taking your heart rate (HR) by using the techniques described in class. Practice finding the pulse as rapidly as possible so that it may be found readily when needed. Practice taking both your carotid (neck) pulse and your radial (wrist) pulse, and use whichever one feels the most comfortable for you. Remember to count as accurately as possible.

Take **your** HR under the following situations:

1. After lying down for 3 minutes (60 sec. count). _____
2. After standing up for 2 minutes (60 sec. count). _____
3. After doing vigorous jumping jacks for 1 minute, record your heart rate during:
 - a. a 10 second period from 5-15 seconds after the cessation of exercise _____
 - b. a 10 second period after 1 minute of recovery. _____
 - c. a 10 second period after 3 minutes of recovery _____

Take **someone else's** HR under the following situations:

1. After lying down for 3 minutes (60 sec. count). _____
2. After standing up for 3 minutes (60 sec. count). _____
3. After doing vigorous jumping jacks for 1 minute, record your heart rate during:
 - a. a 10 second period from 5-15 seconds after the cessation of exercise. _____
 - b. a 10 second period after 1 minute of recovery. _____
 - c. a 10 second period after 3 minutes of recovery _____

Assessment of Resting Blood Pressure

INSTRUCTIONS: A resting blood pressure should be taken after you have been sitting quietly for several minutes. Blood pressure should be measured at least two different times, preferably at the same time of day.

Have someone else in class take **your** blood pressure and record it from two different days.

DATE: _____ BP: _____
DATE: _____ BP: _____

Practice taking **someone else's** blood pressure in class.

Initials _____	BP: _____	Initials _____	BP: _____	Initials _____	BP: _____
Initials _____	BP: _____	Initials _____	BP: _____	Initials _____	BP: _____
Initials _____	BP: _____	Initials _____	BP: _____	Initials _____	BP: _____
Initials _____	BP: _____	Initials _____	BP: _____	Initials _____	BP: _____

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Fitness Assessment Activity

Cardiorespiratory Endurance Testing

<u>Assessment of Cardiorespiratory Endurance</u>	<u>Your Score (VO₂)</u>	<u>Classification</u>
1. 1 mile walk	_____	_____
2. 1.5 mile run/walk	_____	_____
3. Step test (Queens College)	_____	_____
4. Houston Non-Exercise test	_____	_____

Determining VO₂ from Walk test:

Insert values for your age, gender, weight, walking time, and exercise heart rate in the following equation, where:
W= your weight in pounds; **A**= age in years; **G**= gender (male=1, female=0) ; **T**= time to complete 1 mile in minutes; and **H**=
 exercise heart rate in beats per minute

$$VO_{2max} = 132.853 - (0.0769 \times \text{_____} W) - (0.3877 \times \text{_____} A) + (6.315 \times \text{_____} G) - (3.2649 \times \text{_____} T) - (0.1565 \times \text{_____} H) = \text{_____} ml/kg/min$$

Determining VO₂ from Run test:

To determine estimated VO₂ from **1.5 mile run**, use the following equation:

$$3.5 + 483 / \text{_____} \text{ run time} = \text{_____} VO_{2max}$$

(**Note** : you must convert the seconds to a fraction of a minute. (Divide the seconds by 60) For example, if your time was 11 minutes, 12 seconds, then 12/60= 0.2, and the number you would use in your formula would be 11.2, not 11.12)

Determining VO₂ from Step Test:

Insert values for heart rate recovery (**HR**) into the following equation:

Males: $VO_{2max} = 111.33 - (0.42 \times \text{_____} HR) = \text{_____} ml/kg/min$

Females: $VO_{2max} = 65.81 - (0.1847 \times \text{_____} HR) = \text{_____} ml/kg/min$

HOUSTON NON-EXERCISE TEST VO₂MAX PREDICTION EQUATION

THIS FORMULA WAS DEVELOPED BY RESEARCHERS AT THE UNIVERSITY OF HOUSTON IN ORDER TO EASILY PREDICT VO₂ FROM A VARIETY OF FACTORS USING AGE, PHYSICAL ACTIVITY STATUS, AND BODY MASS INDEX (BMI) OR PERCENT BODY FAT. IT IS FELT THAT THE PERCENT BODY FAT EQUATION IS SLIGHTLY MORE ACCURATE THAN THE BMI EQUATION.

STEP 1: RATE YOUR PHYSICAL ACTIVITY STATUS: (PA-R)

- A. GIVE YOURSELF **0** POINTS IF YOU DO NOT PARTICIPATE REGULARLY IN PROGRAMMED RECREATION, SPORT, OR PHYSICAL ACTIVITY.
- B. GIVE YOURSELF **1** POINT IF YOU WALK FOR PLEASURE, ROUTINELY USE STAIRS, OR OCCASIONALLY EXERCISE SUFFICIENTLY TO CAUSE HEAVY BREATHING OR PERSPIRATION.
- C. GIVE YOURSELF **2** POINTS IF YOU PARTICIPATE REGULARLY IN RECREATION OR WORK REQUIRING MODERATE PHYSICAL ACTIVITY, SUCH AS GOLF, HORSEBACK RIDING, CALISTHENICS, TABLE TENNIS, BOWLING, WEIGHT LIFTING, OR YARD WORK FOR 10-60 MINUTES PER WEEK.
- D. GIVE YOURSELF **3** POINTS IF YOU PARTICIPATE REGULARLY IN RECREATION OR WORK REQUIRING MODERATE PHYSICAL ACTIVITY (AS DESCRIBED IN C) FOR MORE THAN ONE HOUR PER WEEK.
- E. GIVE YOURSELF **4** POINTS IF YOU PARTICIPATE REGULARLY IN VIGOROUS PHYSICAL EXERCISE (SUCH AS RUNNING, JOGGING, SWIMMING, ROWING, SKIPPING ROPE, PLAYING TENNIS, BASKETBALL, OR HANDBALL) FOR LESS THAN 30 MINUTES PER WEEK OR RUN LESS THAN 1 MILE PER WEEK.
- F. GIVE YOURSELF **5** POINTS IF YOU PARTICIPATE REGULARLY IN VIGOROUS PHYSICAL EXERCISE (AS DESCRIBED IN E) FOR 30-60 MINUTES PER WEEK OR RUN BETWEEN 5-10 MILES PER WEEK.
- G. GIVE YOURSELF **6** POINTS IF YOU PARTICIPATE REGULARLY IN VIGOROUS PHYSICAL EXERCISE (AS DESCRIBED IN E) FOR 1-3 HOURS PER WEEK OR RUN BETWEEN 5-10 MILES PER WEEK.
- H. GIVE YOURSELF **7** POINTS IF YOU PARTICIPATE REGULARLY IN VIGOROUS PHYSICAL EXERCISE (AS DESCRIBED IN E) FOR MORE THAN 3 HOURS PER WEEK OR RUN MORE THAN 10 MILES PER WEEK.

STEP 2: CALCULATE YOUR BODY MASS INDEX (BMI):

BMI= WEIGHT IN KG DIVIDED BY HEIGHT IN METERS SQUARED

- 1. WEIGHT IN KG= WEIGHT IN LBS DIVIDED BY 2.2
- 2. HEIGHT IN METERS= HEIGHT IN INCHES MULTIPLIED BY 0.0254
- 3. YOUR WEIGHT IN LBS=_____ YOUR WEIGHT IN KG:_____
- 4. YOUR HEIGHT IN INCH=_____ YOUR HEIGHT IN METERS:_____
- M²:_____
- 5. YOUR BMI= _____ KG/ _____ M²= _____

STEP 3: ESTIMATE YOUR VO₂ USING THE FOLLOWING EQUATION:

- A. $56.363 + (1.921 \times \text{PA-R}) - (0.381 \times \text{age}) - (0.754 \times \text{BMI}) + (10.987 \times \text{f}=0 \text{ or } \text{m}=1)$
- B. YOUR VO₂= _____
- C. YOUR CLASSIFICATION= _____

VO₂MAX NORMS

	LOW	FAIR	AVERAGE	GOOD	HIGH	ATHLETIC	OLYMPIC
WOMEN							
20-29	<28	29-34	35-43	44-48	49-53	54-59	60+
30-39	<27	28-33	34-41	42-47	48-52	53-58	59+
40-49	<25	26-31	32-40	41-45	46-50	51-56	57+
50-65	<21	22-28	29-36	37-41	42-45	46-49	50+
MEN							
20-29	<38	39-43	44-51	52-56	57-62	63-69	70+
30-39	<34	35-39	40-47	48-51	52-57	58-64	65+
40-49	<30	31-35	36-43	44-47	48-53	54-60	61+
50-59	<25	26-31	32-39	40-43	44-48	49-44	56+
60-69	<21	22-26	27-35	36-39	40-44	45-49	50+

NIEMAN, DC. (2003) 5TH ED. EXERCISE TESTING AND PRESCRIPTION, A HEALTH-RELATED APPROACH. MCGRAW HILL: BOSTON.

	POOR	FAIR	GOOD	EXCELLENT	SUPERIOR
WOMEN					
20-29	<31	32-34	35-37	38-41	42+
30-39	<29	30-32	33-35	36-39	40+
40-49	<27	28-30	31-32	33-36	37+
50-59	<24	25-27	28-29	30-32	33+
60+	<23	24-25	26-27	28-31	32+
MEN					
20-29	<37	38-41	42-44	45-48	49+
30-39	<35	36-39	40-42	43-47	48+
40-49	<33	34-37	38-40	41-44	45+
50-59	<30	31-34	35-37	38-41	42+
60+	<26	27-30	31-34	35-38	39+

THE PHYSICAL FITNESS SPECIALIST CERTIFICATION MANUAL, THE COOPER INSTITUTE FOR AEROBICS RESEARCH, DALLAS, TX. REVISED 1997.

Target Heart Rates (THR)

1. *Estimate your Maximal Heart Rate:*

Method #1: $220 - \text{your age} = \text{maximal heart rate}$

Method #2: $208 - (0.7 \times \text{age}) = \text{maximal heart rate}$

2. *Estimate your Training or Target Exercise Heart Rates*

Method #1 (Heart rate reserve method)

A. Subtract the resting heart rate (RHR) from the Maximal heart rate (MxHR) to obtain HRR (heart rate reserve).

B. Calculate 60% and 80% of HRR.

C. Add RHR to value to obtain THR (training exercise heart rate).

Example: Joe is 40 years old, with an estimated Maximal heart rate of 180 beats per minute. His resting heart rate is 70 beats per minute.

$$180 - 70 = 110$$

$$110 \times .60 = 66$$

$$66 + 70 = 136 \text{ beats per minute (THR)}$$

$$180 - 70 = 110$$

$$110 \times .80 = 88$$

$$88 + 70 = 158 \text{ beats per minute (THR)}$$

Method #2 (Percentage of Maximal Heart Rate)

A. Calculate 65% and 85% of estimated Maximal Heart Rate.

Example: Joe is 40 years old, with an estimated Maximal heart rate of 180 beats per minute.

$$180 \times .65 = 117$$

$$180 \times .85 = 153$$

Guidelines for using THR's:

1. People who are less active, have more risk factors, and/or have a low VO₂ max should use lower percentages in the THR calculations (40%-60% HRR).
2. Health benefits should occur at the lower intensity levels. For development of CRE fitness however, the intensity should be at least 50-60% HRR. For performance benefits or maintenance, the intensity is usually between 70%-85% HRR.
3. Keep in mind that both formulas for THR utilize an *estimate* of maximal heart rate. An individual's true maximal heart rate can only be determined by a maximal exercise test, and there can be extreme variability (+ or - 10 beats) in true maximal heart rates.
4. Certain medications (blood pressure ones in particular) can lower both resting heart rate and exercise heart rate. If an individual is taking a beta blocker type of medication, one should not use *either* method for calculating exercise heart rates, and use the RPE method of determining exercise intensity instead.

NAME: _____

THR Calculations

(Karvonen or Heart Rate Reserve Method)

1. Estimate maximal heart rate (MXHR):
 $220 - \text{AGE} = \text{_____} = \text{APMXHR}$ (Age predicted maximal heart rate)
 $208 - (.70 \times \text{age}) = \text{_____} \text{APMXHR}$ (new formula)
2. Heart Rate Reserve (HRR) = $\text{APMXHR} - \text{Resting Heart Rate (RHR)}$
 $\text{APMXHR} - \text{RHR} = \text{_____} = \text{HRR}$ (Heart rate reserve)
3. Heart Rate Reserve X .40 + Resting Heart Rate = THR
(Your training heart rate at lowest intensity)
 $(\text{HRR} \times .40) + \text{RHR} = \text{_____}^*$
4. Heart Rate Reserve X .85 + Resting Heart Rate = THR
(Your training heart rate at highest intensity)
 $(\text{HRR} \times .85) + \text{RHR} = \text{_____}^*$

Summary of Calculations (Round your numbers!)

5. YOUR TRAINING HEART RATES:

- | | | |
|---|---------------------|-------------|
| A. $(\text{HRR} \times .40) + \text{RHR} = \text{_____}$ THR* | divide by 6 = _____ | 10 sec. THR |
| B. $(\text{HRR} \times .50) + \text{RHR} = \text{_____}$ THR | divide by 6 = _____ | 10 sec. THR |
| C. $(\text{HRR} \times .60) + \text{RHR} = \text{_____}$ THR | divide by 6 = _____ | 10 sec. THR |
| D. $(\text{HRR} \times .70) + \text{RHR} = \text{_____}$ THR | divide by 6 = _____ | 10 sec. THR |
| E. $(\text{HRR} \times .75) + \text{RHR} = \text{_____}$ THR | divide by 6 = _____ | 10 sec. THR |
| F. $(\text{HRR} \times .80) + \text{RHR} = \text{_____}$ THR | divide by 6 = _____ | 10 sec. THR |
| G. $(\text{HRR} \times .85) + \text{RHR} = \text{_____}$ THR* | divide by 6 = _____ | 10 sec. THR |

Based on my initial Cardiovascular Endurance evaluation, my appropriate training intensity is a

THR of from _____ to _____, or a percent intensity of from _____% to _____%.

Criteria for Choosing Exercise Intensity Percentile for Heart rate Reserve (Karvonen) Formula:

Low Fitness Status and/or desiring lower intensity, longer duration program: **40-60% intensity**

Average Fitness Status, Health benefits **50-70% intensity**

Excellent Fitness Status and/or athlete desiring to improve fitness for competition **65-85% intensity**

KNR 240

Workout at your Target Heart Rates

Name: _____ Date: _____

1. YOUR RESTING HEART RATE IS: _____

2. YOUR FITNESS LEVEL IS: _____

A. Health Benefits/Low fitness= 40-60% INTENSITY

B. Fitness Benefits/Average= 50-70%% INTENSITY

C. Performance Benefits/Very Fit = 65-85% INTENSITY

3. **YOUR** WORKOUT INTENSITY SHOULD BE: _____%

Instructions: Select an activity (walking, jogging, or cycling) and exercise for 3- 5 minutes at each three categories of exercise intensity, recording your average heart rate and RPE (rating of perceived exertion) at each level. Try to sustain your THR within each "zone", and adjust your level of effort accordingly.

4. WORKOUT AT 40-60%= _____THR's

A. Activity= _____

B. Average Heart rate: _____

C. RPE: _____

5. WORKOUT AT 50-70%= _____THR's

A. Activity= _____

B. Average Heart rate: _____

C. RPE: _____

6. WORKOUT AT 65-85%= _____THR's

A. Activity= _____

B. Average Heart rate: _____

C. RPE: _____

KNR 240 Body Composition

Skinfold descriptions:

Triceps: Vertical fold; on the posterior midline of the upper arm, half-way between the acromion (tip of shoulder) and olecranon process (tip of elbow)

Abdomen: Vertical fold; 2 cm to the right side of the umbilicus (navel).

Chest: Diagonal fold, one-half the distance between the anterior axillary line and the nipple (males), or one-third of the distance between the anterior axillary line and the nipple (females).

Subscapular: Diagonal fold (at a 45-degree angle); 1-2cm below the inferior angle of the scapula

Suprailiac: Diagonal fold; immediately above the iliac crest in line with the anterior axillary line

Thigh: Vertical fold; on the anterior midline of the thigh, midway between the upper edge of the patella and the fold of the thigh when flexed (inguinal crease)

Midaxillary: Vertical fold; on the midaxillary line at the level of the xiphoid process of the sternum

Medial Calf: Vertical fold; at the maximum circumference of the calf on the midline of its medial border

Formulas to calculate Body Composition

Formula #1

Four-site formula: use the sum of abdomen, suprailiac, tricep, and thigh skinfolds

$$\text{Males: } [0.29288 \times (\text{SKF})] - [0.0005 (\text{SKF})^2] + [0.15845 \times (\text{age})] - 5.76377 = \text{ ______ \%fat}$$

$$\text{Females: } [0.29669 \times (\text{SKF})] - [0.00043 (\text{SKF})^2] + 0.02963 \times (\text{age}) - 1.4072 = \text{ ______ \%fat}$$

Formula #2

Three-site formula: use the sum of triceps, abdomen, and suprailiac skinfolds

$$\text{Males: } [0.39287 \times (\text{SKF})] - [0.00105 \times (\text{SKF})^2] + [0.15772 \times (\text{age})] - 5.18845 = \text{ ______ \%fat}$$

$$\text{Females: } [0.41563 \times (\text{SKF})] - [0.00112 \times (\text{SKF})^2] + [0.03661 \times (\text{age})] + 4.03653 = \text{ ______ \%fat}$$

Formula #3

Seven-site formula: use the sum of chest, midaxillary, triceps, subscapular, abdomen, suprailiac and thigh.

$$\text{Males: } \text{Body Density} = 1.112 - 0.00043499(\text{sum of 7 skinfolds}) + 0.00000055(\text{sum of 7 skinfolds})^2 - 0.00028826(\text{age})$$

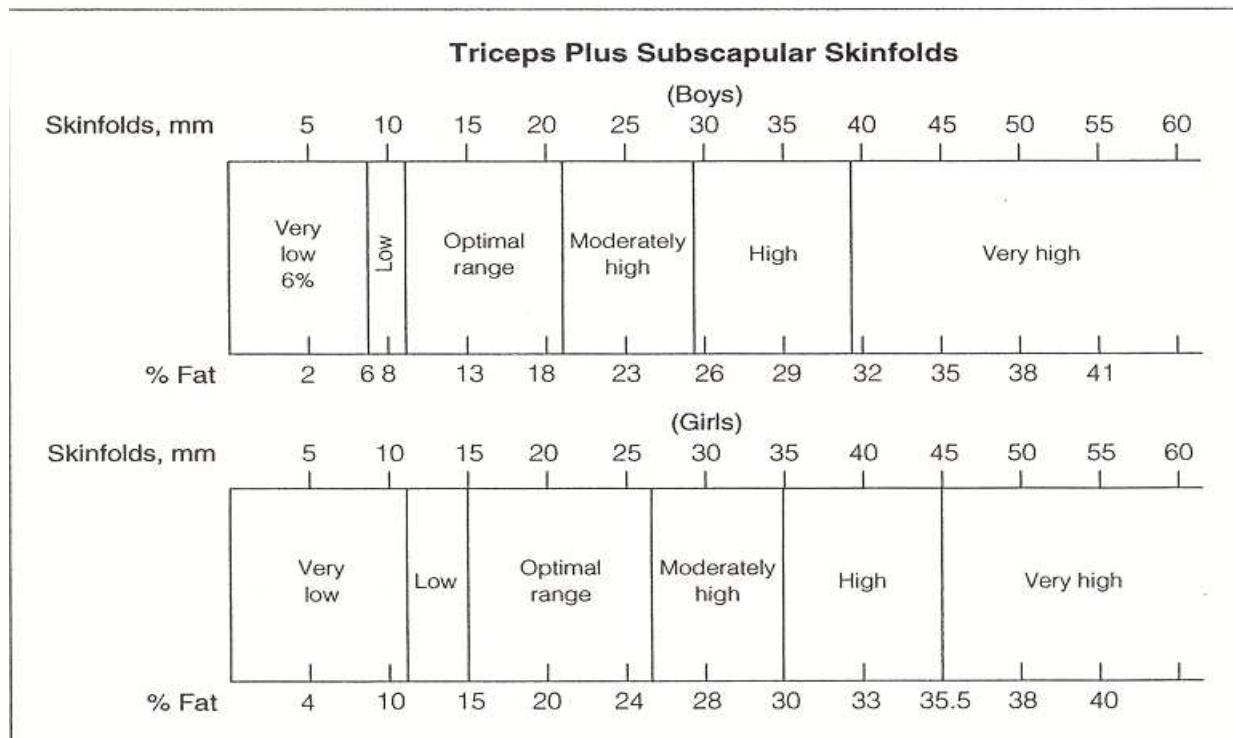
To convert **body density** to **% body fat**, refer to page 61 in the ACSM text. Use either the appropriate population specific equation. ______ \%fat

$$\text{Females: } \text{Body Density} = 1.097 - 0.00046971(\text{sum of 7 skinfolds}) + 0.00000056(\text{sum of 7 skinfolds})^2 - 0.00012828(\text{age})$$

To convert **body density** to **% body fat**, refer to Table page 61 in the ACSM text. Use either the appropriate population specific equation. ______ \%fat

FORMULA #4

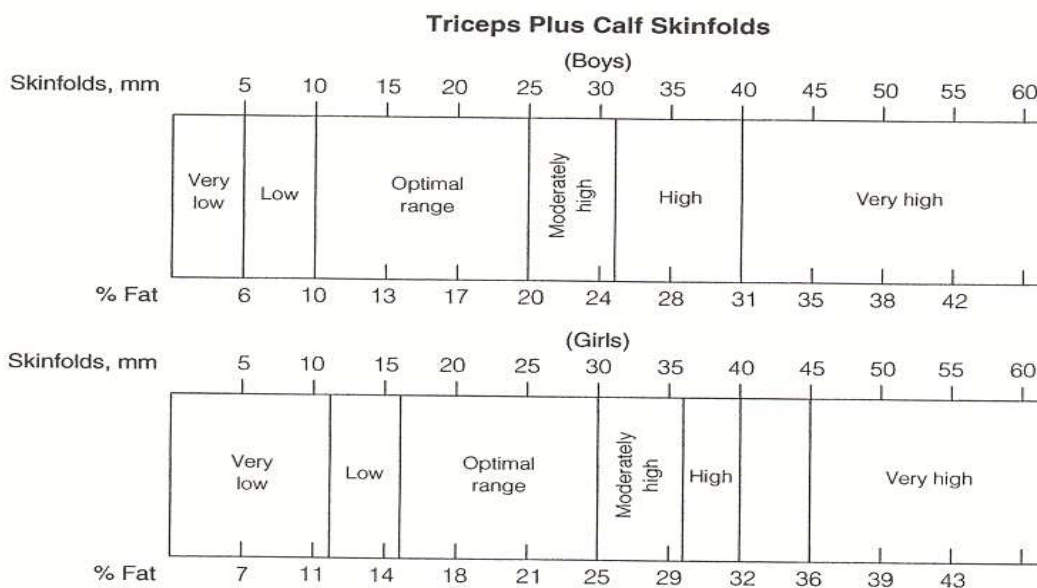
BODY FAT STANDARDS FOR CHILDREN/YOUTH AGES 6-17 YEARS USING THE TRICEPS AND SUBSCAPULAR SKINFOLDS (SUM).



LOHMAN TG. THE USE OF SKINFOLD TO ESTIMATE BODY FATNESS ON CHILDREN AND YOUTH. *JOPERD*, NOVEMBER/DECEMBER 1987, 98-102.

FORMULA #5

BODY FAT STANDARDS FOR CHILDREN/YOUTH AGES 6-17 YEARS USING THE TRICEPS AND MEDIAL CALF SKINFOLDS (SUM).



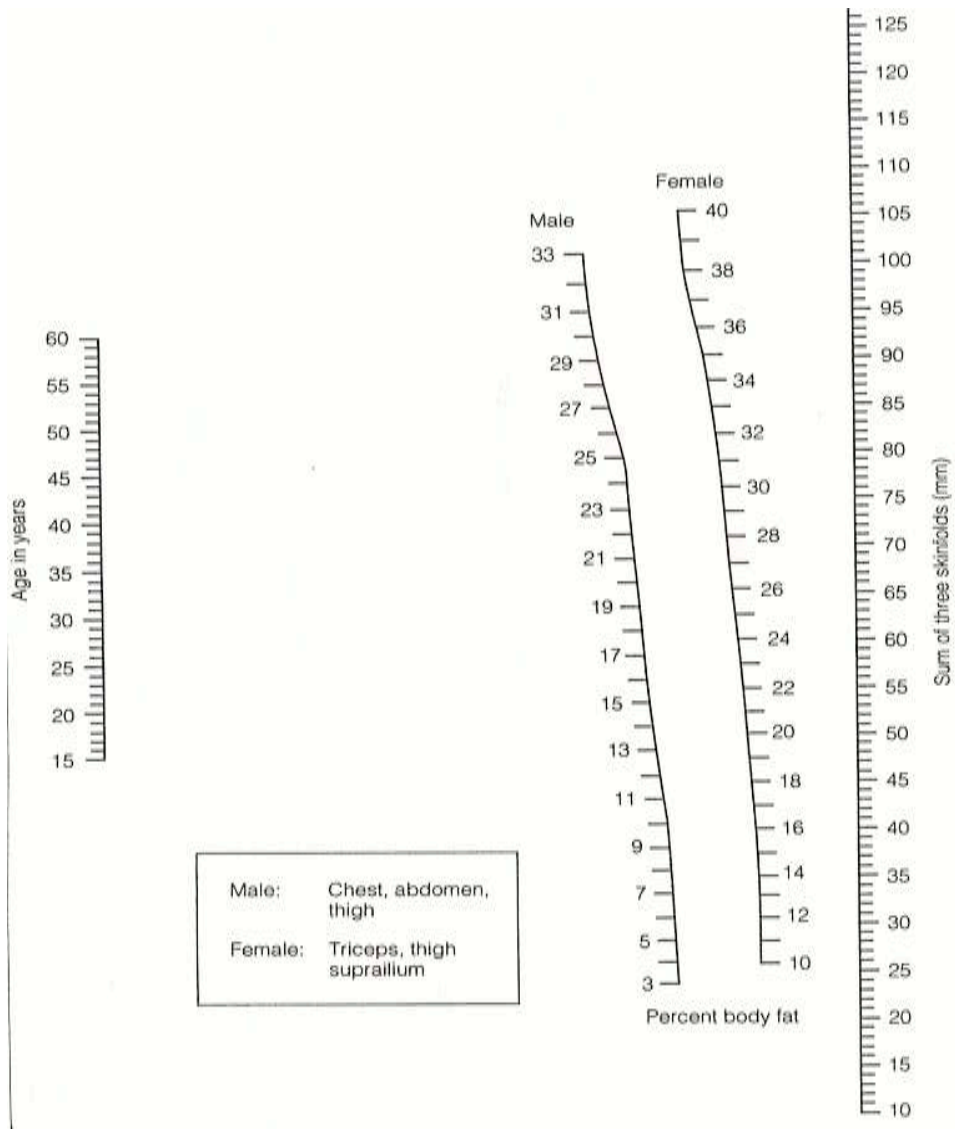
LOHMAN TG. THE USE OF SKINFOLD TO ESTIMATE BODY FATNESS ON CHILDREN AND YOUTH. *JOPERD*, NOVEMBER/DECEMBER 1987, 98- 102.

FORMULA #6

THREE-SITE FORMULA: USE NOMOGRAM.

MALES: CHEST SKINFOLD + ABDOMEN SKINFOLD + THIGH SKINFOLD= _____MM= _____%FAT
FEMALES: TRICEPS SKINFOLD + SUPRAILLIAC SKINFOLD + THIGH SKINFOLD= _____MM= _____%FAT

NOMOGRAM FOR ESTIMATING PERCENT BODY FAT FROM SUM OF THREE SKINFOLDS.



BAUN WB, BAUN MR, RAVEN PB. A NOMOGRAM FOR THE ESTIMATE OF PERCENT BODY FAT FROM GENERALIZED EQUATION. *RES QUART EXERC SPORT* 52:380-384, 1981.

CLASSIFICATIONS OF BODY COMPOSITION

PERCENT BODY FAT STANDARDS FOR AGES 18 AND OLDER

CLASSIFICATION	MALE	FEMALE
<i>UNHEALTHY RANGE (TOO LOW)</i>	<5%	<8%
<i>ACCEPTABLE RANGE (LOWER END)</i>	6-15%	9-23%
<i>ACCEPTABLE RANGE (HIGHER END)</i>	16-24%	24-31%
<i>UNHEALTHY RANGE (TOO HIGH)</i>	>25%	>32%

Percent Body Fat Standards for College Age Students

Classification	Male	Female
<i>UNDERFAT (NOT HEALTHY)</i>	<3%	<9%
<i>HEALTHY</i>	3-19%	12-30%
<i>OVERFAT</i>	20-25%	30-35%
<i>OBESE (NOT HEALTHY)</i>	>25%	>35%

AVERAGE BODY FAT RANGES FOR ELITE ATHLETES

CLASSIFICATION	MALE	FEMALE
<i>ENDURANCE ATHLETES</i>	4-15%	12-26%
<i>TEAM SPORTS</i>	7-21%	17-27%
<i>POWER ATHLETES</i>	5-20%	17-30%
<i>ATHLETES IN SPORTS THAT EMPHASIZE LEANNESS</i>	4-10%	10-19%

Body Composition/Skinfold Assignment

Subject #1: Name: _____ Age: _____ Gender: _____

<u>Site</u>	<u>Trial #1</u>	<u>Trial #2</u>	<u>Trial #3</u>	<u>average</u>
Triceps	_____	_____	_____	_____
Abdominal	_____	_____	_____	_____
Chest	_____	_____	_____	_____
Subscapular	_____	_____	_____	_____
Suprailiac	_____	_____	_____	_____
Thigh	_____	_____	_____	_____
Mid-axillary	_____	_____	_____	_____
Medial Calf	_____	_____	_____	_____

		% Fat	Classification
Formula #1	(Abdominal, Suprailiac, Triceps, Thigh):	_____	_____
Formula #2	(Triceps, Abdominal, Suprailiac):	_____	_____
Formula #3	(Seven-site formula) Body Density=_____ Conversion to %fat:	_____	_____
Formula #4	(Triceps and Subscapular)	_____	_____
Formula #5	(Triceps, Medial Calf)	_____	_____
Formula #6:	Chest, Abdominal, Thigh (M): Or Triceps, Suprailiac, Thigh (W)	_____	_____

Subject #2: Name: _____ Age: _____ Gender: _____

<u>Site</u>	<u>Trial #1</u>	<u>Trial #2</u>	<u>Trial #3</u>	<u>Average</u>
Triceps	_____	_____	_____	_____
Abdominal	_____	_____	_____	_____
Chest	_____	_____	_____	_____
Subscapular	_____	_____	_____	_____
Suprailiac	_____	_____	_____	_____
Thigh	_____	_____	_____	_____
Mid-axillary	_____	_____	_____	_____
Medial Calf	_____	_____	_____	_____

		% Fat	Classification
Formula #1	(Abdominal, Suprailiac, Triceps, Thigh):	_____	_____
Formula #2	(Triceps, Abdominal, Suprailiac):	_____	_____
Formula #3	(Seven-site formula) Body Density=_____ Conversion to %fat:	_____	_____
Formula #4	(Triceps and Subscapular)	_____	_____
Formula #5	(Triceps, Medial Calf)	_____	_____
Formula #6:	Chest, Abdominal, Thigh (M): Or Triceps, Suprailiac, Thigh (W)	_____	_____

Name: _____

Subject #3: Name: _____ Age: _____ Gender: _____

<u>Site</u>	<u>Trial #1</u>	<u>Trial #2</u>	<u>Trial #3</u>	<u>average</u>
Triceps	_____	_____	_____	_____
Abdominal	_____	_____	_____	_____
Chest	_____	_____	_____	_____
Subscapular	_____	_____	_____	_____
Suprailiac	_____	_____	_____	_____
Thigh	_____	_____	_____	_____
Mid-axillary	_____	_____	_____	_____
Medial Calf	_____	_____	_____	_____

		% Fat	Classification
Formula #1	(Abdominal, Suprailiac, Triceps, Thigh):	_____	_____
Formula #2	(Triceps, Abdominal, Suprailiac):	_____	_____
Formula #3	(Seven-site formula) Body Density= _____ Conversion to %fat:	_____	_____
Formula #4	(Triceps and Subscapular)	_____	_____
Formula #5	(Triceps, Medial Calf)	_____	_____
Formula #6:	Chest, Abdominal, Thigh (M): Or Triceps, Suprailiac, Thigh (W)	_____	_____

Subject #4: Name: _____ Age: _____ Gender: _____

<u>Site</u>	<u>Trial #1</u>	<u>Trial #2</u>	<u>Trial #3</u>	<u>Average</u>
Triceps	_____	_____	_____	_____
Abdominal	_____	_____	_____	_____
Chest	_____	_____	_____	_____
Subscapular	_____	_____	_____	_____
Suprailiac	_____	_____	_____	_____
Thigh	_____	_____	_____	_____
Mid-axillary	_____	_____	_____	_____
Medial Calf	_____	_____	_____	_____

		% Fat	Classification
Formula #1	(Abdominal, Suprailiac, Triceps, Thigh):	_____	_____
Formula #2	(Triceps, Abdominal, Suprailiac):	_____	_____
Formula #3	(Seven-site formula) Body Density= _____ Conversion to %fat:	_____	_____
Formula #4	(Triceps and Subscapular)	_____	_____
Formula #5	(Triceps, Medial Calf)	_____	_____
Formula #6:	Chest, Abdominal, Thigh (M): Or Triceps, Suprailiac, Thigh (W)	_____	_____

YOUR BODY COMPOSITION DATA

NAME: _____ AGE: _____ Gender: _____

HEIGHT: _____ in. HEIGHT: _____ cm. (to convert in. to cm multiply by 2.54)

WEIGHT: _____ lbs. WEIGHT: _____ kg (to convert lbs. to kg divide by 2.2)

Calculate your Body Mass Index:

BMI = weight in kg/ height in meters squared

Your weight in kg: _____

Your height in m²: _____

Your BMI= _____ Classification: _____

Calculate your Disease Risk Relative to your Waist to Hip Ratio:

Waist Circumference: _____ in. Hip Circumference: _____ in. W/H Ratio: _____

CLASSIFICATION: ____ Low Risk or ____ High Risk

Calculate your Frame Size:

ELBOW BREADTH: _____ cm (to convert cm. to in. divide by 2.54) _____ inches

FRAME SIZE: _____

Your suggested weight range according to the Metropolitan Height/Weight table: _____

Calculate your Relative Weight using the Metropolitan Height/weight table: _____

Calculation of Percent Body Fat from Skinfolds:

<u>Site</u>	<u>Trial #1</u>	<u>Trial #2</u>	<u>Trial #3 and/or Average</u>
Triceps	_____	_____	_____
Abdominal	_____	_____	_____
Chest (M)	_____	_____	_____
Subscapular	_____	_____	_____
Suprailiac	_____	_____	_____
Thigh	_____	_____	_____
Midaxillary	_____	_____	_____
Medial Calf	_____	_____	_____

% Fat

Classification

Formula #1 (Abdominal, Suprailiac, Triceps, Thigh): _____

Formula #2 (Triceps, Abdominal, Suprailiac): _____

Formula #3 (Seven-site formula)

Body Density= _____ Conversion to %fat: _____

Formula #4 (Triceps and Subscapular) _____

Formula #5 (Triceps, Medial Calf) _____

Formula #6: Chest, Abdominal, Thigh (M)

Or Triceps, Suprailiac, Thigh (W) _____

Percent Body Fat from Tanita BF Scale: _____ (Standard) _____ Classification

_____ (Athletic) _____ **Classification**

Calculate your **Target Body Weight**, using a healthy, realistic percent body fat. Show all work.

Measurement of Body Frame Size

Directions: Extend the person's right arm forward, perpendicular to the body, with the arm bent so the angle at the elbows forms 90 degrees with the fingers pointing up and the palm turned towards the body. The greatest width across the elbow joint is measured with the sliding caliper on the two prominent bony areas (medial and lateral epicondyles) of the elbow. This width represents elbow breadth. The calipers measure in centimeters, so you will have to convert your measurement to inches. (Centimeters divided by 2.54 = inches) Then look on the chart below to find your frame size.

		Elbow breadth (in inches)		
	Height (in inch)	Small frame	Medium frame	Large frame
Men	61-62	< 2 ½	2 ½ to 2 7/8	> 2 7/8
	63-66	< 2 5/8	2 5/8 to 2 7/8	> 2 7/8
	67-70	< 2 ¾	2 ¾ to 3	> 3
	71-74	< 2 ¾	2 ¾ to 3 1/8	> 3 1/8
	75+	< 2 7/8	2 7/8 to 3 1/4	> 3 1/4
Women	57-58	< 2 ¼	2 ¼ to 2 1/2	> 2 1/2
	59-62	< 2 ¼	2 3/8 to 2 5/8	> 2 1/2
	63-66	< 2 3/8	2 3/8 to 2 5/8	> 2 5/8
	67-70	< 2 3/8	2 3/8 to 2 5/8	> 2 5/8
	71+	< 2 1/2	2 ½ to 2 ¾	> 2 ¾

Assessment of Musculoskeletal Fitness

Name: _____ Date: _____

Type of Test	Your Score	Classification or Category
1.Curl-up Test (p. 87)		Table 5.6 (pg.88)
Push-up Test (p. 86)		Table 5.5 (pg. 87)
Pull-up Test (optional)		
Grip Strength Test (p. 80)		Table 5.1 (pg. 79)
Predicted 1-RM Bench Press Test (See next page) OR 1RM Bench (pg. 82)		Table 5.2 (pg. 83-84)
Sit and Reach Flexibility tests (pg. 95) Canadian test YMCA test		Table 6.1 (pg. 98) and Table 6.2 (pg. 98)
Shoulder Flex Test		Male & Female – College-Age Norms: Excellent >= 5 Above Avg 2-4.75 Avg. 0-1.75 Below Avg. -1 to -0.25 Needs improvement <-1

Nieman, DC. (2003) 5th Ed. Exercise testing and prescription, a health-related approach. McGraw Hill: Boston.

Optional Tests:
YMCA Bench Press test
Leg press test

KNR 240

Predicted Maximal Bench Press Test

Directions:

Select a warm-up weight. Choose a test weight based on your body weight and gender. (45% for females, 75% for males). Example: If you are a male and weigh 160 pounds, your warm-up weight is 120 lbs. You should be able to comfortably complete from 4-6 repetitions as a warm-up. If the weight feels too light or easy or if you feel that you would be able to complete more than 10 repetitions at this weight, select a heavier test weight.

You should be able to complete from 2-10 repetitions of the test weight.

1. Bench press test weight using correct form and technique.
2. Record the number of repetitions completed.
3. Look on the chart to obtain the Rep-factor number.
4. Multiply test weight by the Rep-factor to get an estimate of your 1RM.

Test-weight: _____ Total repetitions: _____

Rep-factor: _____

Estimated 1RM: _____ (Test weight x Rep-factor)

Prediction of 1RM:

Reps completed	Rep factor
1	1.0
2	1.07
3	1.10
4	1.13
5	1.16
6	1.20
7	1.23
8	1.27
9	1.32
10	1.36

Weight Ratio = $\frac{\text{Estimated 1RM}}{\text{Body weight}}$ = _____ Strength rating category: _____

Classification: College-Age Norms

	Poor	Below Avg	Avg.	Above Avg.	Excellent
Male	<0.77	0.77-0.89	0.90-1.06	1.07-1.19	>1.19
Female	<0.42	0.42-0.53	0.54-0.58	0.59-0.65	>0.65

Nieman, DC. (2003) 5th Ed. Exercise testing and prescription, a health-related approach. McGraw Hill: Boston.

Dietary Intake and Caloric Balance Assessment

1. Record all food and liquid intake for a minimum of three days. At least one of the days must be a Saturday or Sunday. Write down the amounts and type of food/beverage consumed.

Example: One chicken breast, boneless, skinless, broiled-5 oz.
 ½ cup Minute Rice with one tablespoon of butter
 ½ cup canned peas
 1 slice Butternut bread, with 1 tablespoon of margarine
 1-12 oz. can Coke

2. Using the choosemyplate.gov website, you will analyze your intake.
3. On the choosemyplate.gov homepage, select “SuperTracker”
4. Click on “Create Profile” on right side and fill in the information for Step 1. Use your initials for your profile name.
5. Step 2 – Register to save data.
6. Step 3 – Print “My Plan”
7. Click on “Food Tracker”. Make sure that you have the correct date, as you will need to enter your intake for each day separately. You can use the arrow to change days.
8. To enter food items:
 - a. Select category or “All Foods” and type in the food or beverage
 - b. Click on the specific food item you ate, or one that best matches what you ate.
 - c. Choose the amount and the meal and hit the +Add button.
 - d. Complete this process for items for all 3 days.
9. After your 3 days of intake have been entered, you need to go to the “Physical Activity Tracker” and enter in your workouts or activity for each day.
10. Go to “My Reports” at the top and select “Overview”
11. You will need to enter the dates and print out the following reports:
 - a. Food Groups and Calories Report
 - b. Nutrient Report
 - c. Meal Summary Report (Click on “all meals”)
 - d. Physical Activity Report
12. You are now ready to complete the Diet Analysis Worksheet on my website. Type into that document.
13. When submitting this project, please put all documents in this order. They need to be STAPLED OR SECURED together when turned in.
 - a. Diet Analysis Worksheet
 - b. My Plan
 - c. Food Groups & Calories
 - d. Nutrient Report
 - e. Meal Summary Report
 - f. Physical Activity Report

DIET ANALYSIS

NAME _____ DATE _____

TYPE THIS

THE FIRST COLUMN IS YOUR INTAKE IN PERCENTAGES OF CALORIES FROM CARBOHYDRATES, PROTEINS, AND FATS AS COMPARED TO THE RECOMMENDED.

WHAT WILL YOU SPECIFICALLY DO TO MAINTAIN OR MODIFY YOUR INTAKE TO MEET THE DIETARY RECOMMENDATIONS? LIST AT LEAST TWO SPECIFIC FOODS YOU CAN ADD TO OR LIMIT FROM YOUR DIET, AND HOW YOU WILL ACCOMPLISH THIS.
ANALYSIS

% CARBOHYDRATE INTAKE	% CHO RECOMMENDED	CIRCLE CORRECT RESPONSE: TOO MUCH RIGHT AMOUNT NOT ENOUGH	ANALYSIS

% PROTEIN INTAKE	% PROTEIN RECOMMENDED	CIRCLE CORRECT RESPONSE: TOO MUCH RIGHT AMOUNT NOT ENOUGH	ANALYSIS

% FAT INTAKE	% FAT RECOMMENDED	CIRCLE CORRECT RESPONSE: TOO MUCH RIGHT AMOUNT NOT ENOUGH	ANALYSIS

YOUR BREAKDOWN OF TYPES OF FAT AS COMPARED TO THE RECOMMENDED.

WHAT WILL YOU SPECIFICALLY DO TO MAINTAIN OR MODIFY YOUR INTAKE TO MEET THE DIETARY RECOMMENDATIONS? LIST AT LEAST TWO SPECIFIC FOODS YOU CAN ADD TO OR LIMIT FROM YOUR DIET, AND HOW YOU WILL ACCOMPLISH THIS.

% SATURATED FAT INTAKE	% RECOMMENDED	CIRCLE CORRECT RESPONSE: TOO MUCH RIGHT AMOUNT NOT ENOUGH	ANALYSIS

% POLYUNSATURATED FAT INTAKE	% RECOMMENDED	CIRCLE CORRECT RESPONSE: TOO MUCH RIGHT AMOUNT NOT ENOUGH	ANALYSIS

% MONOUNSATURATED FAT INTAKE	% RECOMMENDED	CIRCLE CORRECT RESPONSE: TOO MUCH RIGHT AMOUNT NOT ENOUGH	ANALYSIS

YOUR FOOD GUIDE PYRAMID AS COMPARED TO THE USDA FGP

WHAT WILL YOU SPECIFICALLY DO TO MAINTAIN OR MODIFY YOUR INTAKE TO MEET THE DIETARY RECOMMENDATIONS? LIST AT LEAST TWO SPECIFIC FOODS YOU CAN ADD TO OR LIMIT FROM YOUR DIET, AND HOW YOU WILL ACCOMPLISH THIS.

GRAINS

ANALYSIS

YOUR INTAKE	RECOMMENDED INTAKE	CIRCLE CORRECT RESPONSE: TOO MUCH RIGHT AMOUNT NOT ENOUGH	
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VEGETABLE GROUP

ANALYSIS

YOUR INTAKE	RECOMMENDED INTAKE	CIRCLE CORRECT RESPONSE: TOO MUCH RIGHT AMOUNT NOT ENOUGH	
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FRUIT GROUP

ANALYSIS

YOUR INTAKE	RECOMMENDED INTAKE	CIRCLE CORRECT RESPONSE: TOO MUCH RIGHT AMOUNT NOT ENOUGH	
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MILK, YOGURT, & CHEESE GROUP

ANALYSIS

YOUR INTAKE	RECOMMENDED INTAKE	CIRCLE CORRECT RESPONSE: TOO MUCH RIGHT AMOUNT NOT ENOUGH	
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MEAT, POULTRY, DRY BEANS, EGGS & NUTS GROUP

ANALYSIS

YOUR INTAKE	RECOMMENDED INTAKE	CIRCLE CORRECT RESPONSE: TOO MUCH RIGHT AMOUNT NOT ENOUGH	
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COMPARE YOUR INTAKE OF THE FOLLOWING AS COMPARED TO THE RECOMMENDATIONS.

SODIUM

ANALYSIS

YOUR INTAKE	RECOMMENDED INTAKE	CIRCLE CORRECT RESPONSE: TOO MUCH RIGHT AMOUNT NOT ENOUGH	
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CALCIUM

ANALYSIS

YOUR INTAKE	RECOMMENDED INTAKE	CIRCLE CORRECT RESPONSE: TOO MUCH RIGHT AMOUNT NOT ENOUGH	
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IRON

ANALYSIS

YOUR INTAKE	RECOMMENDED INTAKE	CIRCLE CORRECT RESPONSE: TOO MUCH RIGHT AMOUNT NOT ENOUGH	
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FIBER

ANALYSIS

YOUR INTAKE	RECOMMENDED INTAKE	CIRCLE CORRECT RESPONSE: TOO MUCH RIGHT AMOUNT NOT ENOUGH	
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FOLATE

ANALYSIS

YOUR INTAKE	RECOMMENDED INTAKE	CIRCLE CORRECT RESPONSE: TOO MUCH RIGHT AMOUNT NOT ENOUGH	
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CHOLESTEROL

ANALYSIS

YOUR INTAKE	RECOMMENDED INTAKE	CIRCLE CORRECT RESPONSE: TOO MUCH RIGHT AMOUNT NOT ENOUGH	
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AVERAGE DAILY CALORIE INTAKE.

ANALYSIS

YOUR INTAKE (AVERAGE OF CALORIES CONSUMED MINUS ENERGY REQUIREMENT)		CIRCLE CORRECT RESPONSE: TOO MUCH RIGHT AMOUNT NOT ENOUGH	
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FOOD LABEL ASSIGNMENT

The new requirements for food labeling make it fairly easy for you to determine if your food selection is a healthy choice. In this assignment, we will compare two different types of food, and determine which gives us the highest nutritional value for the calories that it contains.

Name of food product (brand name)

Category of food product (food group)

Total size of food product (quantity)

Serving Size: _____

Servings per package: _____

Total calories per serving: _____

Grams of fat per serving: _____

Calories of fat per serving: _____

Percent of total calories: _____

Grams of saturated fat per serving: _____

Calories of saturated fat per serving: _____

Percent of total calories: _____

Grams of carbohydrate per serving: _____

Calories of carbohydrate per serving: _____

Percent of total calories: _____

Grams of simple sugar per serving: _____

Calories from sugar per serving: _____

Percent of total calories: _____

Grams of protein per serving: _____

Calories of protein per serving: _____

Percent of total calories: _____

Vitamins in this product (list): _____

Minerals in this product (list): _____

Fiber in this product (grams): _____

Name of food product (brand name)

Category of food product (food group)

Total size of food product (quantity)

Serving size: _____

Servings per package: _____

Total calories per serving: _____

Grams of fat per serving: _____

Calories of fat per serving: _____

Percent of total calories: _____

Grams of saturated fat per serving: _____

Calories of saturated fat per serving: _____

Percent of total calories: _____

Grams of carbohydrate per serving: _____

Calories of carbohydrate per serving: _____

Percent of total calories: _____

Grams of simple sugar per serving: _____

Calories from sugar per serving: _____

Percent of total calories: _____

Grams of protein per serving: _____

Calories of protein per serving: _____

Percent of total calories: _____

Vitamins in this product (list): _____

Minerals in this product (list): _____

Fiber in this product (grams): _____

1. Which food selection would be your "healthier" choice, based on the percentages of fat, saturated fat, carbohydrates, sugars, and protein? Is this food choice also lower in total calories per serving?
2. Which food product provides more vitamins, minerals, and fiber? About what percent of your total daily needs does it provide?
3. Identify all of the factors that you take into consideration when selecting a food product: taste, convenience, calories, vitamin/mineral/fiber, low fat, low sugar, etc.

MEAL CALCULATIONS

Perform the necessary calculations, showing your work!

George ate the following breakfast:

Bagel	245 calories
	9.3 gr. Protein
	1.4 gr. Fat
	47.5 gr. CHO

Cream Cheese	198 calories
	4.3 gr. Protein
	19.8 gr. Fat
	1.5 gr. CHO

Orange Juice	82 calories
	1.5 gr. Protein
	0.5 gr. Fat
	18.8 gr. CHO

2 boiled eggs	150 calories
	12.4 gr. Protein
	10.2 gr. Fat
	1.2 gr. CHO

Flo ate the following Wendy's lunch:

Baked Potato with broccoli & cheese	480 cal.
	9.0 gr. Protein
	14 gr. Fat
	81 gr. CHO

Small Chili	200 cal.
	17 gr. Protein
	6.0 gr. Fat
	21 gr. CHO

Med. Frosty	440 calories
	11 gr. Protein
	11 gr. Fat
	73 gr. CHO

Provide the following information:

1. The total number of calories for the meals.
2. The total number of calories for each nutrient.
3. The percentage of each of the nutrients for that meal.
4. What and how much exercise will each have to do to burn off the meals?
George weighs 172 lb. and Flo weighs 134 lbs. Show the calculations.
~Jogging – moderate=.060 cal/lb/min.
~Basketball – moderate=.045 cal/lb/min.

KNR 240
Client Fitness Testing & Exercise Prescription Assignment

PART 1: Client Description

Name: _____ Age: _____ Gender: _____

Health Status: (include ParQ and Health Screening Questionnaire with risk stratification
____ Low Risk ____ Moderate Risk ____ High Risk

Include current activity level _____ Classification: _____ (Low, Moderate, High)

PART 2: Client Fitness Testing Results

Body Composition/Anthropometric measurements:

Height: _____ Weight: _____ BMI: _____ Waist circumference: _____ W:H ratio _____

Disease Risk: ____ low ____ high

Sum of Skinfolds: _____ Estimated %body fat: _____ Classification: _____
(indicate what formula that you used)

Recommended acceptable range% body fat: _____ (Use packet material)

Cardiorespiratory Endurance:

Resting Heart Rate: _____ date: _____ Resting Blood Pressure: _____ date: _____

Type of Test: (mile walk, mile run, 1½ mile run, step-test, PACER): record appropriate raw data = time, HR, etc.

Estimated VO2: _____ (show calculations) Classification: _____

PART 2: Client Fitness Testing Results (continued)

(provide on a separate sheet of paper)

Musculoskeletal Fitness: (must include a **description** of each test used)

Muscle Strength Test/Score/Classification: (minimum of one test)

Muscle Endurance Tests/Scores/Classifications: (minimum of 2 tests)

Flexibility Tests/Scores/Classifications: (minimum of one test)

PART 3: FITNESS GOALS

A. SETTING GOALS:

Based on the fitness testing scores, list your client's strengths and weaknesses. Consider a strength any test item in which the rating was **Above Average**. Consider a weakness a score of **Average** or below. (needs improvement!) Body composition must be included however the classifications range from Unhealthy low to Unhealthy high.

<u>STRENGTHS:</u> (maintain)	Score	Classification
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Example:

<u>Bench Press Upper body strength</u>	<u>1.2</u>	<u>Excellent</u>
_____	_____	_____
_____	_____	_____

<u>WEAKNESSES:</u> (improve)	Score	Classification
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Example:

<u>VO2 from 1 mi. run</u>	<u>45ml/min</u>	<u>average</u>
_____	_____	_____

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Continue listing all of the tests that you performed

This is a **contract of commitment to exercise**: Based on the list above, rate the *fitness components*, in priority order, that your client would like to work on to improve from their present level. (#1 is the highest priority) Be specific. Each goal should have a standard to achieve by a certain date. You may add other non-performance related goals.. Example: I (client's name) intend to:

1. improve my VO2max from 45 ml O2/kg/min to 51 ml O2/kg/min

2.

3.

I, _____ (name) commit myself to the effort required to achieve these goals within a period of _____ weeks. Post testing scheduled for _____(date).

B. MOTIVATIONAL STRATEGIES:

The number of motivational factors, barriers to change and strategies will vary form subject to subject. This is an excellent opportunity to educate your client about the health-related benefits correlated with each fitness component

List several possible motivational factors (incentives) that would help your client achieve their goals.

- 1.
- 2.
- 3.

List several possible factors that could prevent or reduce your client's ability to achieve their goals.

- 1.
- 2.
- 3.

Suggest some specific strategies for overcoming or preventing the potential problems listed above.

- 1.
- 2.
- 3.

PART 4: CARDIORESPIRATORY/BODY COMPOSITION FITNESS PRESCRIPTION

- A. Suggested warm-up exercises designed to increase core temperature and R.O.M. (describe specific exercises to include):
- B. Modes or types of aerobic activity recommended (at least two different activities, plan indoor access for at least one option):
- C. Initial Frequency and Duration of workouts (cardio only)
- D. Intensity of activity/Training Heart Rates: (show all of your calculations-use new HR max formula)
1. Maximal Heart rate: _____
 2. HRR(heart rate reserve= MxHr- RHR): _____
 3. Initial range for training intensity: _____% (select one: 40-60%, 55-75%, or 65-85%)
 4. Initial target heart rates: _____ (1 min. rates) _____ (10 or 15 sec. rates)
 5. Target (goal) training intensity: _____%
 6. Target (goal) training heart rates: _____ (1 min. rate) _____ 10 or 15 sec. rate)
- E. Cool-Down: Plan specific exercises to stretch muscles used during workout and for maintenance or improvement of R.O.M. from flexibility test results:

PART 5: MUSCULOSKELETAL/ BODY COMPOSITION EXERCISE PRESCRIPTION

A. Types(s) or Mode of Strength/Endurance Activities:

_____Free-weights _____Weight machines _____Calisthenics _____Combo or other? (specify)

B. Warm up activities for resistance workout

C. Frequency of Muscular Strength/Endurance activities

D. Description of Muscular Strength/Endurance Exercises (specify order, describe each, include # of reps/sets, intensity when possible)

Guidelines require a minimum of EIGHT major muscle groups

1.

2.

3.

4.

5.

6.

7.

8.

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