

INSTRUCTOR GUIDE
FOR
AVIATION PREFLIGHT INDOCTRINATION COURSE
Q-9B-0020

UNIT 7

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January 2005

LESSON PLAN
CHANGE RECORD

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SECURITY AWARENESS NOTICE

This course does not contain any classified material.

SAFETY/HAZARD AWARENESS NOTICE

a. All personnel must be reminded that personal injury, death, or equipment damage can result from carelessness. Failure to comply with approved procedures, or violations of warning, cautions, and safety regulations.

b. CAUTION: Laser pointing devices may be used during this course. To include remote controls. Refer to NASC Inst. 5100.12

Review fire and environmental emergency procedures with class.

MISHAP/HAZARD REPORTING

a. Safe training is the number one goal. Each year at training commands lives are lost, and thousands of man-hours and millions of dollars are wasted as the result of accidents. Most accidents could have been prevented. They are the result of actions performed incorrectly, either knowingly or unknowingly, by people who fail to exercise sufficient foresight, lack the requisite training, knowledge, or motivation, or who fail to recognize and report hazards.

b. A mishap is any unplanned or unexpected event causing personnel injury, occupational illness, death, material loss or damage or an explosion whether damage occurs or not.

c. A near miss or hazardous condition is any situation where if allowed to go unchecked or uncorrected has the potential to cause a mishap.

d. It is the responsibility of all Department of Defense personnel to report all mishaps and near misses. If a mishap, hazardous condition or near miss occurs let your instructor know immediately.

e. Instructors will report all hazardous conditions and near misses to the command training safety officer via their divisional/departmental training safety officer. Reports can be hand written on the appropriate form. Injuries will be reported on the appropriate form.

NATRACOM DOR AND TRAINING TIME OUT POLICY

All NATRACOM courses are voluntary. Accordingly, students have the option to individually request termination of training. Any time the student makes a statement such as "I quit" or "DOR", he or she shall be immediately removed from the training environment and referred to the appropriate division or training officer for administrative action.

Any time a student or instructor has apprehension concerning his or her personal safety or that of another, he or she shall signal for a "training time out" to clarify the situation and receive or provide additional instruction as appropriate. "Training time out" signals other than verbal shall be appropriate to the training environment and clearly indicated in the appropriate curriculum instructor lesson topic guides and student guides.

COURSE TITLE: Physical Training
 Aviation Preflight
 Indoctrination Course,
 Q-9B-0020

CLASSIFICATION: Unclassified

LESSON TOPIC NUMBER: 7-1

LESSON TOPIC: Introduction To Physical
 Fitness Program and Heat
 Stress

ALLOTTED LESSON TIME: 1.0 Classroom

INSTRUCTIONAL SUPPORT:

1 Classroom instructor

INSTRUCTIONAL REFERENCES:

1. NAVAVSCOLSCOMINST 6310
2. CNATRA MSG DTG 082308Z JUL 88

INSTRUCTIONAL AIDS:

1. Heat Stress Film

TERMINAL OBJECTIVE:

Partially supported by this lesson topic:

- 7.0 Upon completion of this unit of instruction the student will demonstrate an understanding and application of physical training, health, and Navy/Marine Corps fitness standards; have passed a standard Navy PRT to NASC standards and have gained a sense of appreciation for an aggressive competitive spirit and the team concept without injury to personnel or damage to equipment.

ENABLING OBJECTIVES:

Completely supported by this lesson topic:

- 7.1 State physical training evolutions and division policies.
- 7.2 Define physical fitness and describe Navy/Marine Corps policies on physical fitness.
- 7.3 Identify heat related symptoms and injuries.

CRITERION TEST: None.

HOMEWORK: None.

INTRODUCTION

Display name and Lesson
 Topic.

OUTLINE OF INSTRUCTION

RELATED INSTRUCTOR ACTIVITY

A. Establish Contact

Take roll and record absentees.

1. Introduce self, give rank, and current job.
2. Give background, schools, duty stations, etc.
3. State question and answer policy.
4. State DOR and training time out policy.

B. State Lesson Objectives

Turn to cover page of lesson topic guide and paraphrase objectives.

C. Establish Readiness

1. Motivating Statements

Relate why physical fitness is important.

Physical fitness plays a key role in both aviation training and your career. Knowing the physical standards expected of you during aviation training and the Navy/Marine Corps' policies on biannual testing will enable you to be prepared for all events. Much emphasis is placed on fitness for aviation personnel due to the physical and psychological demands of the job.

2. Lesson Overview

The purpose of this lesson is to overview the physical training program. We will also explain the Navy/Marine Corps' policy on physical readiness testing and standards, and

OUTLINE OF INSTRUCTION

RELATED INSTRUCTOR ACTIVITY

how to prevent heat related injuries.

a. Lesson Topic: Introduction to Physical Fitness Program, and Heat Stress.

b. Major Teaching Points:

- (1) Physical training overview
- (2) Class policies
- (3) DOR/training time out policy
- (4) Medical problems/light duty
- (5) Failure to meet course requirements
- (6) Navy/Marine Corps fitness standards
- (7) Heat related injuries

Briefly outline material to be covered.

OUTLINE OF INSTRUCTION

RELATED INSTRUCTOR ACTIVITY

PRESENTATION

A. Physical Training Overview

1. Fitness Education

- a. The introduction class covers class policies, DOR/TTO, medical problems, light duty, failure to meet course requirements, Navy/Marine Corps fitness standards, and heat related injuries.
- b. The nutrition class covers diet fundamentals, fat/cholesterol, blood sugar, caffeine/alcohol, weight control, and coronary heart disease risk factors.
- c. The safety/sports medicine class covers exercise physiology, back injury, equipment, injuries and symptoms/sprains & strains, treatment, and overuse/overtraining.

2. Aviation Physical Readiness Indoctrination (APRI) test

- a. Tests overall strength and endurance using curl-ups, push-ups, and 1.5 mile run on cross country course.
- b. The student will be given an APRI screen during their indoctrination week. The student must pass this screen to continue his or her training. Once the student has entered training he/she will be given their actual

OUTLINE OF INSTRUCTION

RELATED INSTRUCTOR ACTIVITY

APRI test.

- c. Explain the Navy Physical Readiness Test policy IAW OPNAVINST 6110.1 on height/weight, body fat, and biannual testing.
- d. The minimum and maximum passing score required to complete the APRI test are:

	<u>AGES</u>	<u>MIN</u>	<u>MIN</u>	<u>MAX SCORE</u>	
		<u>MALE</u>	<u>FEMALE</u>	<u>Male</u>	<u>Female</u>
Curl-ups	17-19	62	62	109	109
	20-24	58	58	105	105
	25-29	54	54	101	101
	30-34	51	51	98	98
	35-39	47	47	95	95
	40-44	44	44	92	92
Push-ups	17-19	51	24	92	51
	20-24	45	21	87	48
	25-29	44	19	84	46
	30-34	41	17	80	44
	35-39	37	14	76	43
	40-44	34	12	72	41
1.5 mile run	17-19	11:00	13:30	8:15	9:29
	20-24	12:00	14:15	8:30	9:47
	25-29	12:53	14:53	8:55	10:17
	30-34	13:45	15:30	9:20	10:46
	35-39	14:08	15:53	9:25	10:51

OUTLINE OF INSTRUCTION

RELATED INSTRUCTOR ACTIVITY

3. Weight Training

- a. We provide an introduction to the equipment and suggest exercises to increase strength and endurance utilizing proper form for a compete body work out.
- b. Studies have proven that strength training is highly effective in increasing G-tolerance in aviators. The human factor is the limiting factor in the aircrew/aircraft combination in relation to pulling G's in tactical aircraft.
- c. Nautilus or other weight training equipment is provided at most recreational facilities Navy wide.

4. Team Sports

There will be a class period devoted to a team sport, such as volleyball or soccer, in order to promote the team concept, and competitive spirit.

B. Class Policies

- 1. Muster will be taken in the gym at Bldg. 3828 for all classes. Class leader is responsible for accurate muster.
- 2. Uniform PT gear will be worn to all syllabus PT events as follows:
 - a. Naval, Coast Guard, and Air Force Officers - solid white t-shirts over blue shorts, white

OUTLINE OF INSTRUCTION

RELATED INSTRUCTOR ACTIVITY

socks.

- b. Marine Officers green shirt over green shorts, white socks.
- c. International Officers P.T. uniform of country of origin, or solid white t-shirt over blue shorts, white socks.

- 3. ALL t-shirts will be free of any design, solid in color, and in serviceable condition.

Note: All students will wear court shoes for court events and running shoes for running events. Regulation sweats may be worn in cold weather. USN and USCG must wear gray or blue. USMC must wear gray or green.

- 4. Personal effects must be secured in lockers with a lock. Survival Department is NOT responsible for lost or stolen items. High value items should never be brought to class.
- 5. Student parking is permitted in the last row behind building 3828, or the parking lot behind building 633. Optional parking is located behind the bowling alley.

C. Drop on Request (DOR)/Training Time Out/Student Safety Policy.

- 1. All students shall be briefed on the "DOR" and "Training Time Out" policy prior to commencement of training.

OUTLINE OF INSTRUCTION

RELATED INSTRUCTOR ACTIVITY

2. Drop on Request (DOR) Students are enrolled in API on a voluntary basis; therefore, students may voluntarily request termination of training. Anytime a student makes a statement such as "I quit" or "DOR," they will be immediately removed from the training environment (pool, bay, classroom, etc.) and referred to the API Division Officer for administrative action. When the student exercises the option to terminate training as stated above, the API Division Officer shall:
 - a. Counsel the student on the consequences of the decision and ascertain the reason(s) behind the request.
 - b. Have the student make a written request (CNATRA Form 1542/16) to terminate or continue training, which shall become an official part of the student's training jacket.
 - c. Following a student's DOR request, the NAVAVSCOLSCOM Commanding Officer or Executive Officer is the only authority to return the student to training.
 - d. Students who are returned to the training environment will be assisted in the program by senior instructors until the student's confidence level is restored or it is determined the student's participation in the program is no longer warranted.
 - e. Training Time Out Policy. Students or instructors who have apprehension concerning their personal safety or that of another,

OUTLINE OF INSTRUCTION

RELATED INSTRUCTOR ACTIVITY

shall verbally request a "training time out" to clarify the situation and receive or provide additional instruction as appropriate. Students who refuse to participate in the training exercise after "training time out" instruction has occurred will be removed from training and referred to the API Division Officer for appropriate administrative processing.

4. Student Safety. Anytime a student demonstrates signs of panic, fear, extreme fatigue, or lack of confidence, instructors shall stop the training, identify the problem, and make a determination to continue or discontinue training. Instructors shall be constantly alert for any unusual behavior which may indicate a student is experiencing difficulty and shall immediately take appropriate action to ensure the student's safety.
 - a. All instructors and/or safety observers are certified by Red Cross in Standard First Aid, and CPR.
 - b. The color of the instructor's shirt designates the rank of the instructor. Commissioned officers, chief petty officers and civilians wear gold shirts. Petty Officers E-6 and below wear gray shirts.

Solicit questions - ensure understanding.

D. Medical Problems/Light Duty

If a student needs medical attention/appointment or is in a light duty status, he/she will muster with the class instructor or class leader prior to going to

OUTLINE OF INSTRUCTION

RELATED INSTRUCTOR ACTIVITY

medical. Light duty chits will be provided to the instructor and status recorded on class roster. The student will be considered medically down until the student can provide a medical up chit clearing them for training.

E. Failure to meet course requirements:

1. Students who fail course requirements during the test or are unable to participate due to light duty status will be removed from present class (pending API office decision). Remedial Physical Training will be given in the gym, bldg. 3828, or appropriate site depending on scheduled events.

F. Navy/Marine Corps Fitness Standards

1. It is very important to maintain a high level of physical fitness. The Navy and Marine Corps policy requires biannual and/or annual testing of fitness level, and students are expected to comply with body fat standards.
2. The aviation environment is both physically and mentally demanding. Being physically fit will increase your mental capabilities, chances of survival and reduce the daily stresses of the job.
3. The Navy's biannual Physical Readiness Test (PRT) consists of 2 minutes of curl-ups, 2 minutes of push-ups, and a 1.5 mile run or 500 yard swim. This test is graded on a curve that takes into consideration the members age. Body fat is measured biannually. The Navy uses a tape measure and table to figure the members body fat

OUTLINE OF INSTRUCTION

RELATED INSTRUCTOR ACTIVITY

percentage.

4. The Marine Corps' biannual Physical Fitness Test (PFT) consists of pull-ups, 2 minutes of sit-ups, and a 3 mile run. This test is also graded on a curve that takes into account the members age. Body fat is measured biannually using height versus weight tables.

G. Heat Related Injuries

1. Heat stress can be dangerous to persons who exercise and can result in serious injuries or death. It is important to understand the types of injuries and their symptoms, so recognition and treatment can occur quickly. Knowing how heat affects physical performance can help in the prevention of heat related injuries and allows you to perform at maximum effort safely. It is very important that you drink water before, during, and after physical exercise. Individuals who are sickle cell trait carriers and persons with blonde hair/fair complexion are more susceptible to heat related injuries.
2. This film will show you what can happen when heat stress and exercise are combined.
3. It is important to know the symptoms and treatment of all heat related injuries.
4. Personnel with Sickle Cell Trait (SCT) may be at very slightly increased risk of injury/death during periods of exertion or heat stress. SCT is an

Ask class if any individuals have medical conditions or injuries which could preclude them from participating in this event. Refer such individuals to the medical department.

Show Heat Stress film (optional).

Solicit/ask questions to ensure that the students understand all material.

OUTLINE OF INSTRUCTION

RELATED INSTRUCTOR ACTIVITY

inherited trait which is not physically disqualifying for naval personnel. A triggering mechanism which is not known can cause the red blood cells of personnel with SCT to alter shape and texture. This change can result in impaired blood circulation and may lead to unconsciousness and possibly death. Recent information suggests that individuals with SCT may be at slightly increased risk during strenuous exercise, particularly while exposed to hot or cold temperatures, or while exercising under hypoxic (high altitude/low oxygen) conditions. Additionally, SCT members may be at increased risk while recovering from serious illness and surgery. The cause and extent of this increased risk is not understood, but currently there is no basis for restricting the work or exercise of SCT personnel. However, certain present precautions steps can be taken to minimize risk when exercising or while exposed to temperature extremes. SCT members should drink adequate amounts of water before, during and after exposure to extreme temperatures. Consumption of 10 fluid ounces of water ten minutes before running and 8 fluid ounces after each 1.5 miles is recommended for SCT personnel. Due to the dehydrating effects of alcohol and caffeine, consumption of these substances is not recommended within 24 hours of strenuous activity.

OUTLINE OF INSTRUCTION

RELATED INSTRUCTOR ACTIVITY

SUMMARY AND REVIEW

A. State lesson objectives.

Turn to cover page for objective.

B. Review major teaching points.

Briefly Summarize

APPLICATION

See presentation for application.

EVALUATION

Complete Aviation Physical Readiness Indoctrination Test

ASSIGNMENT

None.

COURSE TITLE: Physical Training
Aviation Preflight
Indoctrination Course,
Q-9B-0020 (API)

CLASSIFICATION: Unclassified

LESSON TOPIC NUMBER: 7.2

LESSON TOPIC: Nutrition

ALLOTTED LESSON TIME: 1.0 classroom

INSTRUCTIONAL SUPPORT:

1 Classroom instructor

INSTRUCTIONAL REFERENCES:

1. Cox, Leslie. Navy Nutrition and Weight Control Self-Study Guide. NAVPERS 15602A, 1996.
2. Marcinik, E. J. Command Fitness Coordinator Exercise Leader Handbook. Navy Publication not dated. Chapter 8.
3. McArdle, Katch & Katch. Exercise Physiology. Williams & Wilkins, Baltimore, 1996.
4. Wheat Food Council & Washington State Dairy Council Fad Diet Comparison

TERMINAL OBJECTIVE:
Completely supported by this lesson topic:

- 7.0 Upon completion of this unit of instruction the student will demonstrate an understanding of physical training, health, and Navy/Marine Corps fitness standards; have passed a standard Navy PRT to NASC standards; and have gained a sense of appreciation for an aggressive competitive spirit and the team concept without injury to personnel or damage to equipment.

ENABLING OBJECTIVES:
Completely supported by this lesson topic:

- 7.4 Identify the six major nutritional requirements and their functions.
- 7.5 Describe the body's ability to metabolize proteins, carbohydrates, and fats.
- 7.6 Identify the role of cholesterol in coronary heart disease and how to control it.
- 7.7 Identify risk factors for coronary heart disease.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

INSTRUCTIONAL AIDS:

1. Chalkboard and equipment
2. Power Point Presentation
3. Overhead Projector or Proxima
4. Nutrition Hand out

7.8 Describe the effects of caffeine, ergogenic aids and alcohol on the body.

7.9 Describe guidelines for a safe weight loss program.

CRITERION TEST:

None.

HOMEWORK:

None.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

INTRODUCTION

A. Establish Contact	Display name and lesson topic.
1. Introduce self, give rank, current job.	
2. State background, schools, duty stations, etc.	Take role and record absentees.
3. State question and answer policy.	
B. State Lesson Objectives	Turn to cover page of Lesson Topic Guide and paraphrase objectives.
C. Establish Readiness	
1. Motivating statements	
a. The Navy and Marine Corps are concerned about (1) combat readiness and (2) potential future health problems.	
b. Officers should set the example.	
c. Nutrition is a critical component of personal wellness. Proper nutrition can prevent illness, increase energy, and improve physical performance required of the U.S. military.	Establish importance and relevance of lesson material using personal experience or anecdote.
2. Lesson overview	Briefly outline material to be covered.
a. Lesson Topic: Nutrition	
b. Major Teaching Points:	

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (1) Nutritional requirements
- (2) Metabolism
- (3) Cholesterol
- (4) Coronary Heart Disease Risk Factors
- (5) Caffeine
- (6) Ergogenic Aids
- (7) Alcohol
- (8) Weight Loss
- (9) Calorie Calculations

PRESENTATION

Run PowerPoint
presentation

A. Nutritional requirements

The major nutritional requirements are carbohydrates, protein, fats, vitamins, minerals, and water.

1. Carbohydrates

a. Definition and sources

Carbohydrates are chemical compounds containing carbon, hydrogen, and oxygen. Examples are starches, grain products, fruits, vegetables, sugars, and milk.

b. Functions

Carbohydrates are the most efficient fuel for the body as they are the most easily broken down. They should supply 55% to 60% of daily calories carbohydrates contain 4 calories per gram. No more than 10% of your total calories should come from simple carbohydrates (sugars). The remaining carbohydrates should be complex carbohydrates (starch).

c. Glycogen

Carbohydrates can increase energy reserves (glycogen) in muscles and liver, thus prolonging the time before exhaustion during vigorous exercise.

2. Proteins

a. Functions

The main function of protein is the building and repair of tissue. It is an energy source only when fats and carbohydrates are not available.

Proteins and amino acids help maintain blood sugar during exercise. Because of its effect on blood sugar and metabolic regulation, the pre-game or pre-practice meal should contain some protein. In essence, the amino acids act like glucose releasing capsules.

b. Characteristics of proteins.

Proteins are made up of 20 different amino acids, 9 essential and 11 nonessential (that are produced by the body).

Proteins should make up 10-15% of daily calories. They contain four calories per gram.

3. Fats

a. Functions and characteristics

Fats belong to a class of compounds called lipids and supply energy and promote absorption of fat-soluble vitamins. They provide the primary fuel for prolonged endurance type exercise. Fats contain nine calories per gram. Avoid fatty foods before exercise, as they require three to four hours to digest.

b. Classes

Fats come in 3 general classes: saturated, polyunsaturated, and monounsaturated. Less than 30% of your daily calories should come from fat: less than 10% from saturated fat, less than 10% from polyunsaturated fat, and 10% or more from monounsaturated fat.

4. Vitamins

The bulk of the research on vitamin supplementation suggests, with a few possible exceptions, that anything more than a balanced diet and, perhaps, a one-a-day type pill is useless and a waste of your money. Overall, it appears that vitamin supplements improve performance only if there is a nutritional deficiency.

5. Minerals

Minerals regulate body processes, maintain body tissue, and aid in metabolism. A varied diet generally provides enough minerals for active people with the possible exception of iron for women. Women should also consume at least 1000 milligrams of calcium per day to protect against the onset of osteoporosis. Losses of sodium and potassium through perspiration are minimal during exercise and are usually replenished by a normal diet. Salt tablets are not necessary and may be detrimental.

Many active women can benefit from iron supplementation. As many as 80% of women endurance athletes may be iron deficient. This leads to a drop in iron stores in the bone marrow and, eventually, to iron deficient anemia. Iron

deficiency results in impaired performance and fatigue. Iron supplements are beneficial to iron deficient people and can have a marked effect on the endurance capacity and the ability to transport oxygen.

6. Water

Water is the medium for many chemical reactions in the body. It is essential to stay hydrated. Active people often need to consume four quarts of water per day. Aviators should stay hydrated to maintain proper blood volume thus maintaining proper blood pressure. When blood pressure is low there is an increase chance of G-lock.

B. Metabolism

1. Limitations

Proteins, carbohydrates, and fats each have limitations on how the body can process them. The hierarchy sequence is carbohydrates fats and protein.

This means proteins can be converted to carbohydrates and fats. Carbohydrates can be converted to fats and non-essential amino acids (proteins). Fats can be converted into non-essential amino acids (proteins).

2. Glycogen depletion

Glycogen depletion is associated with fatigue, and if normal glycogen levels are not restored, physical performance levels will be impaired. Eating a high-energy, high carbohydrate diet during periods of intense training or competition, and by consuming carbohydrate

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

beverages during and after training, will slow glycogen depletion. Also, using fats results in sparing muscle and liver glycogen stores. There are three ways to accomplish this:

- (1) Improve your ability to use fats through endurance training.
- (2) Mobilize fats early during exercise, i.e., caffeine use.
- (3) Provide alternative fuels for the muscles, so that glycogen and blood sugar are not used up as rapidly.

Carbohydrate drinks during exercise accomplish this. Gatorade and other sports drinks are examples of carbohydrate drinks. It is best to drink these during and within 30 minutes after exercise.

Negative effects of caffeine consumption outweigh benefits.

Note: These drinks are high in calories. Remember to add them to your daily caloric intake.

C. Cholesterol

Cholesterol is a white, waxy substance. There are two types of cholesterol, low density (**LDL**), and high density (**HDL**). **LDL** is manufactured by the liver to transport fats through the bloodstream. **HDL** is manufactured by the liver to scavenge excess LDL from the blood and return it to the liver for destruction. Excess **LDL** in the blood is a major risk factor for coronary heart disease (**CHD**). Most of the **LDL** in your blood is manufactured by your liver in response to a high fat diet. Dietary cholesterol is cholesterol consumed when animal products containing it are eaten. Cholesterol is not found in plant products.

LDL levels can be lowered by:

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

1. Reducing fat in the diet.
2. Reducing intake of foods containing cholesterol.
3. Substituting polyunsaturated and monounsaturated fats for saturated fats.
4. Increasing **HDL** levels.

HDL levels can be increased by exercise and modest consumption of alcohol. Some research indicates that high fiber diets may also help lower **LDL** levels.

5. Total cholesterol

Total cholesterol levels should be below 200mg. Over 240mg is considered high risk. Of the total, less than 130mg should be **LDL**. Over 160mg **LDL** is also considered high risk.

D. Coronary heart disease risk factors

Coronary heart disease resulting from deposits of fat is referred to as atherosclerosis. Research studies have revealed that atherosclerosis is a slow, progressive disease. It begins in childhood and manifests itself later in life. Nearly one out of every two deaths in the United States is due to diseases of the heart and blood vessels.

1. Primary risk factors
 - a. Cigarette smoking
 - b. Hyperlipidemia (high total cholesterol/**HDL** ratio)

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- c. Sedentary lifestyle
- d. Hypertension (high blood pressure)
- e. Age
- f. Diabetes
- g. Family history
- h. Obesity

2. Secondary risk factors

- a. Stress
- b. Elevated blood triglycerides

E. Caffeine

Caffeine can be found in coffee, tea, soft drinks, and chocolate. It has the following effects on the body:

- 1. Increase in blood sugar via adrenal stimulation.
- 2. Dilates coronary arteries.
- 3. Decreases delay in muscle fiber response to nerve stimulation.
- 4. Increased blood pressure and resting heart rate.
- 5. Increased urination (diuretic effect) decreasing blood volume/blood pressure.
- 6. Inhibits calcium uptake from the digestive track.

Some research has linked coffee intake to higher

LDL levels. Caffeine can moderately enhance athletic performance; however, it can lead to dehydration and loss of water-soluble vitamins & minerals.

F. Ergogenic Aids

Ergogenic Aids are nutritional, physical, psychological, mechanical or pharmacological factors designed to enhance human performance. Those chemicals ingested as food supplements can have numerous negative repercussions. Some of the more popular are anabolic steroids and over-the-counter ergogenics aids like Creatine Monohydrate and Chromium Picolinate. Many ergogenic aids have negative side effects:

1. Loss of water and associated water-soluble vitamins and electrolytes.
2. Liver dysfunction in attempt to eliminate toxic effects.
3. Kidney disorders in attempt to eliminate toxins from the blood stream.
4. Widespread depending on chemical or chemical combinations and their effect on human physiology.

G. Alcohol

Alcohol is a carbohydrate; however, the body can only metabolize alcohol into fat. Alcohol has 7 calories per gram. Heavy, chronic alcohol consumption causes the accumulation of fat deposits in the liver that leads to liver disease. Like caffeine, alcohol is a diuretic with the usual negative effects:

1. Loss of water-soluble vitamins and minerals.

2. Dehydration.

H. Weight loss

Exercise is an integral part of any weight loss program. Approximately 3500 calories are contained in one pound of stored fat. If, for example, food intake for one day is equivalent to 2200 calories and you burn up 2200 calories in your daily activity you will be in caloric balance, you will not gain or lose weight. However, if you burn an additional 300 calories a day through a vigorous exercise program, bringing your total daily expenditure to 2500 and at the same time still take in only 2200 calories, you will incur a deficit of 300 calories a day. If you were to continue this regimen for 35 days you would accumulate a total caloric deficit of 10500 calories which should equal a loss of three pounds of fat.

Maximum weight loss should not exceed two pounds a week or a 1000 calories per day deficit. This weight loss normally occurs in a step wise pattern, that is weight will decrease one day but may remain stable the next day or two before it decreases again. The first 10 pounds or more will be water loss, which happens fairly quickly. Often a plateau will be reached, but a healthy, balanced eating plan and exercise will continue the loss.

It is advisable to hold minimum daily caloric levels to at least 1200 calories for women and 1500 calories for men. Many popular diets suggest as few as 300 calories per day, which is extremely unhealthy. There have been serious heart problems and even death associated with very low calorie diets. Quick weight loss diets may help you lose weight initially, but you will probably gain it right back because your eating behaviors have not changed. Quick weight loss diets,

Pass out nutrition hand

formulas, and pills are not lifetime habits to be adhered to, but only temporary solutions to long term problems.

out.

I. Calorie Calculations

1. To calculate the approximate calories used in a day it is important to determine the Basal Metabolic Rate (**BMR**) first. **BMR** is the amount of calories expended during normal physiological process at complete rest in a 24 hour period of time.
2. **BMR** is determined in several ways with the simplest being to determine gross or lean body weight and simply place zero (0) at the end. For example a person weighing 200 pounds would have **BMR** of 2000 calories.
3. Daily Caloric Requirement (**DCR**) is determined by adding additional calories to **BMR**.
4. These additional calories are referred to as Average Daily Activity Level (**ADAL**). The more active an individual is the more calories are expended during a 24 hour period. **ADAL** range is .25 to 1.50 with a .25 representing sedentary life style and 1.5 representing collegiate endurance athlete. To calculate **DCR**, multiple **BMR** by a number in this range and add that number to **BMR**. This is an approximation of calories required for a 24 hour period of time.
5. Daily Caloric Intake (**DCI**) is the amount of calories consumed in foods and beverages daily. If **DCI** exceeds **DCR** for an extended period of time then excess calories will be converted to long term storage (Fat).

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

SUMMARY AND REVIEW

A. State Lesson Objectives

Turn to cover page for objectives.

B. Review Major Teaching Points

Briefly summarize.

APPLICATION

See presentation for application.

EVALUATION

Complete PRT.

ASSIGNMENT

None.

LESSON PLAN

January 2005

COURSE TITLE: Physical Training
Aviation Preflight
Indoctrination Course,
Q-9B-0020

CLASSIFICATION: Unclassified

LESSON TOPIC NUMBER: 7.3

LESSON TOPIC: Safety and Sports Medicine

ALLOTTED LESSON TIME: 1.0 Classroom

INSTRUCTIONAL SUPPORT:

1 Classroom Instructor

INSTRUCTIONAL REFERENCES:

1. Moran, Gary and George McGlynn.
Dynamics of Strength Training.
Dubuque: Brown, 1990
2. Marcinik, E.J. Command Fitness
Coordinator Exercise Leader Handbook.
Navy Publication, Not Dated
3. Dillinger, Bill and Bill Freeman.
The Competitive Runner's Training
Book. New York: MacMillan, 1984

TERMINAL OBJECTIVES:

Partially supported by this lesson topic:

- 7.0 Upon completion of this unit of instruction the student will demonstrate an understanding of physical training, health, and Navy/Marine Corps fitness standards; have passed a standard Navy PRT to NASC standards, and have gained a sense of appreciation for an aggressive competitive spirit and the team concept without injury to personnel or damage to equipment.

ENABLING OBJECTIVE:

Completely supported by this lesson topic:

- 7.10 Describe sport medicine principles and safety considerations of exercise.
- 7.11 Describe exercise physiology principles.
- 7.12 Identify exercise equipment.
- 7.13 Describe precautions that prevent injury.
- 7.14 Describe the causes, symptoms or common exercise-related injuries.

OUTLINE OF INSTRUCTION

INSTRUCTIONAL AIDS:

1. Chalkboard and equipment.

INSTRUCTOR ACTIVITY

- 7.15 Describe the first aid procedure and rehabilitation for common exercises-related injuries.

CRITERION TEST:

None.

HOMEWORK:

None.

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

INTRODUCTION

A. Establish Contact

Display name and Lesson Topic.

Take role and record absentees.

1. Introduce self, give rank, and current job.
2. Give background, schools, duty stations, etc.
3. State question and answer policy.
4. State training time out policy.

B. State Lesson Objectives

Turn to cover page of lesson topic guide and paraphrase objectives.

C. Establish Readiness

1. Motivating Statements

Establish importance and relevance of lesson material using personal experience or anecdote.

2. Lesson Overview

Briefly outline material to be covered.

a. Lesson Topic: Safety/Sports medicine

b. Major Teaching Points

(1) Exercise physiology principles

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

- (2) Exercise equipment
- (3) Precautions that prevent injury
- (4) Causes and symptoms of common exercise-related injuries
- (5) First aid procedures and rehabilitation

PRESENTATION

A. Exercise Physiology Principles

1. Fast/Slow twitch

Human muscles contain three types of muscle fibers: a slow-twitch Type I red fiber and two types of fast-twitch Type II white fibers. Each fiber type is structurally and chemically equipped to perform work for long or short periods of time. For example, fast-twitch fibers are preferentially used for short-term, high intensity exercises such as sprinting, while slow-twitch fibers are used during longer, less intensive exercise such as long-distance running.

Exercise cannot change the types or numbers of fibers in your muscles, because these characteristics (or traits) are inherited. However, the efficiency of both red and white muscle fibers can be increased through proper training methods. A specific type of exercise must be used to improve the efficiency of a given fiber type. For example, to increase the metabolic potential of fast-twitch fibers, high intensity exercise of few repetitions must be used. Conversely, exercises of longer duration with lower intensities increase the metabolic potential of slow-twitch fibers.

Fast-twitch fibers produce greater force than slow-twitch fiber. As a result individuals with a greater cross sectional area of fast-twitch

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fibers are capable of generating greater strength. Fast-twitch units, however, are quick to fatigue from very intense contractions which demand high rates of force development.

2. All or none

When stimulated by the nervous system a muscle fiber contracts fully, or it doesn't contract at all. This means that an individual fiber, once stimulated, contracts with all its force. We graduate the amount of force we produce by regulating the number of fibers we innervate or stimulate by the nervous system. To increase strength you try to innervate as many fibers as possible at one time, by lifting heavy loads with few repetitions. To increase endurance, lighter loads are used and fibers alternate their contractions to allow a rest and recovery period and thus a greater number of repetitions.

3. Recruitment

A Motor Unit is a nerve that stimulates a muscle to contract. The degree of muscle tension is dependent upon the number and frequency of motor units activated by the central nervous system. The more units recruited, the stronger the maximum contraction. Nerve impulses have to be properly synchronized in order to allow for unified contraction, which is essential for maximum force.

4. Adaptation

The human body has an amazing capacity to adjust to and benefit from the many physical demands placed upon it. For example, the body is capable of adapting to many kinds of stress and even increasing its efficiency as a result of stressful stimuli. In the case of fitness training, research indicates that repeated physical stress (intensive training) will lead to increases in our functional capacity (strength and endurance). The main purpose in strength training therefore is to stress the body through variety of exercises so that beneficial adaptations will occur. Training is only beneficial as long as it causes the body to adapt to the physical efforts. If the stress is too little, adaptation will not occur. If there is too much stress, then injury and deterioration will result.

a. Use and disuse

As a muscle is trained, it increases in size and functional ability; it is said to hypertrophy. If training decreases, the muscle begins to detrain, thus decreasing in size, and will lose its newly gained capacity; in other words it will atrophy.

b. Variation

You want to avoid getting into a training rut. You need to vary your training program to meet your needs. Having variety in

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training locales, workout sessions and training intensity will keep you mentally fresher, just as your body will be strengthened. Variation is also achieved with the hard/easy training pattern: a period of intense or "hard" training followed by a period of recovery or "easy" training. You will improve only for a short time and then get worse if you don't take a break from hard training. The recovery or rest periods are as important as the hard training periods, because the body is given a chance to adjust to the harder training.

c. Overload

In order for the muscle to increase its capability, a greater load than normal must be applied. In order for the adaptation to occur, a progressive increase in the amount of work must be performed. For strength increases this is an increase in resistance. For endurance increases this means an increase in repetitions and/or resistance. As an adaptation to this increased stress occurs, a greater stress must be imposed for further increases.

d. Exercise as a function of heart rate

The maximum heart rate (MHR) can be calculated by subtracting an individual's age from 220 ($MHR = 220 - \text{age}$). Target heart rate - a percentage of MHR that varies with different exercise programs.

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<u>Exercise program</u>	<u>Target Heart Rate</u>
Weight loss	40 - 50% of long periods of time
General training	60 - 75% sustained fitness level
High intensity	> 80% for maximum increase in fitness level

Taking the pulse - To get a "snapshot" look at the heart rate during exercise, the pulse should be taken immediately following the activity. Utilize the shortest period of time (6 or 10 seconds) as the heart can recover quickly. Multiply (times 6 or 10 respectively) to calculate the heart beats per minute.

B. Exercise Equipment

1. Shoes

One of the best measures to prevent foot and knee problems due to distance running is to wear shoes designed for running. Do not economize when it comes to buying running shoes. Additionally, the type of running shoe is important. These shoes should be training shoes, not racing flats. Many excellent running shoes are available. No one shoe can be perfect for all people. The foot strikes the ground approximately 1,500 times every mile, and the forces generated during the foot strike are considerable. For this reason, investing in a good pair of running shoes is a way to prevent injury. It is important that the

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shoe fit the sport. Running shoes are not made for the side to side action of a tennis match. Likewise, tennis shoes will not withstand the wear and tear of running, nor provide the protection necessary for the constant pounding that running transfers to your body.

Running shoes must have substantial cushioning, both in the heel and forefoot. The heel should be flared to provide stability, that is to prevent rocking from side to side. The forefoot should be flexible enough to allow your foot to flex naturally without rubbing the top of the foot. Make sure there is about $\frac{1}{2}$ inch clearance between the ends of your toes and the front of your shoes. Buy comfortable shoes. If they are too small or too big, they will cause blisters. Throw out your old shoes when they become worn, and buy new ones, approximately 500-600 miles is a good guide line. This may seem like an unnecessary expense, but it can save you the pain, inconvenience, and expense of injury.

2. Weight lifting gloves

To prevent blisters and callouses.

3. Water bottle

To keep you hydrated during your workouts.

4. Cool exercise attire

Try to wear clothes that are both light weight and loose in order to promote cooling.

OUTLINE OF INSTRUCTION

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C. Precautions that prevent injury

1. Warm-up and cool down

You must take the time (10% of total workout) to warm-up before intense exercise in order to decrease the possibility of injury. You should cool down slowly after the workout in order to help your muscles rid themselves of the lactic acid built up during the workout; this will help prevent muscle soreness.

2. Moderation

The key in preventing injuries is exercising in moderation. When you experience pain, decrease your activity level or stop exercising all together. Pay attention to unexplained soreness, lowered resistance to illness, depression, and chronic fatigue. Most sports injuries can be avoided with common sense.

3. Realistic goals

Define realistic goals at each step of your fitness program. Improvements will come, but they must be brought about slowly and steadily over period of time, 20% in 12 weeks. Attempting to rush this schedule is asking for trouble. If you increase your mileage in reasonable increments you are less likely to suffer an injury.

4. Exercises to avoid

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Several popular exercises are stressful to the lower back. Specifically they are:

- a. Straight leg sit-ups.
- b. Double leg-lifts.
- c. Outside hurdler's stretches.
- d. Full squats.
- e. Standing straight leg toe-touches.

Whenever the back muscles are used to stabilize the pelvis, as in the straight leg sit-ups and double leg-lifts, they are subject to stress. The outside hurdler's stretch compresses the vertebrae in the lower back. The outside hurdler's stretch is also very stressful to the knees. Full squats and standing straight leg toe touches cause the lower back to support too much weight.

- 5. Safety precaution
 - a. Hydrate
 - b. Use a spotter when lifting
 - c. Use collars on free weights
 - d. Maintain proper form
 - e. Don't hold your breath during exercise

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f. Don't workout if you are ill

6. Back injuries

There are basically two movements involving the back that can place it in jeopardy. The first movement involves bending at the waist and primarily results in the back muscles being overstretched, while the second movement involves excessive arching of the back and results in compression of the discs that lie between the vertebrae of the spine.

Contrary to what most people think, they do not need to strengthen the back as much as they need to stretch it out and make it more flexible. More back injuries are caused by overstretching (bending) than by muscle weakness. A flexible back minimizes the chance of a muscle pull when the muscle is stretched. Consequently, it is important to incorporate some stretching exercises for the back in your program. This becomes exceedingly critical as you age.

Most people have back pain at some time in their lives. Back pain can be prevented if these basic principles of lifting are followed:

- a. Keep the weight as close to your body as possible. The further out you hold a weight from your body, the more strain there is on your back.
- b. Do most of your lifting with your legs. The large muscles of the thighs and

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buttocks are much stronger than those of the back, which are better suited to maintain an erect posture.

- c. When picking up a weight from the ground, keep your back straight and your head level or up.
- d. Do not twist your body while lifting. Twisting places an uneven load on back muscles, which causes strain.
- e. Lift the weight smoothly, not with a jerking, rapid motion. Sudden motions place more stress on the spinal muscles and discs.
- f. Allow for adequate rest between lifts. Fatigue is a prime cause of back strain.
- g. Lift with your capacity. Don't lift beyond the limits of your strength.

D. Causes and symptoms of common exercise related injuries

1. Overtraining

The most common cause of injury for the beginner is doing too much too soon, resulting in overfatiguing the muscle, with an inadequate rest and rehabilitation interval. The muscles respond fairly rapidly to the increased demand placed upon them with a lifting program. Tendons and

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ligaments, however, take significantly longer to adapt to the added stress and will require a more progressive adaptation period to avoid injury.

The key to avoiding overtraining is to make sure you have adequate rest. The rest period is when the muscle recovers and when the gains in strength and endurance occur. You need to listen to your body and adapt the intensity and duration of your exercise program to the needs and ability of your body to recover.

One of the first signs of overtraining is mental staleness. If rest is insufficient in either quality or quantity, then often sickness such as colds or flu occurs. A common progression is:

- a. Staleness or slump.
- b. Sickness.
- c. Injury.

2. Common injuries

Injuries may also result from the overuse of and lack of rest for the muscles and tendons.

Injuries can be classified into several groups:

a. Blisters

Blisters are caused by friction, a surface of the shoe rubbing against the skin on the foot, a wrinkle in a wet sock or excessive use of feet. To assist in the prevention of

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blisters, lubricate the trouble spot with petroleum jelly and powder the feet before putting on shoes.

b. Strains and sprains

A strain is a tear in the muscle and or tendon. Strains can occur when the muscle is not warmed up properly, a twisting or jerking occurs during the lift, significant force is applied too rapidly, or when a previously injured muscle is returned to heavy exercise without adequate rehabilitation.

c. Shin splints

Pain around the front or either side of the lower leg is usually the sign of shin splints, which involve minor tears anywhere the muscle attaches the shin. Shin splints are the most frequent injury experienced by new walkers, joggers, and runners, but can be caused by being overweight, poor posture, improper shoes, or running on various surfaces.

d. Muscle soreness

Delayed soreness is usually felt 24-72 hours after exercise and will normally disappear within one to three days. This type of soreness is likely to occur at the beginning of a program or by increasing the intensity of the workout too quickly. Muscle soreness

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may vary from slight stiffness that disappears quickly to severe pain that reduces flexibility and interferes with mobility. A suggestion for relief of delayed soreness may be achieved by repeating the activity which caused the soreness at a much lower intensity.

Stretching is important for flexibility and injury prevention, however, post exercise stretching may have no effect in reducing muscle soreness.

e. Serious injuries

Tendonitis, bursitis, and dislocations are considered serious injuries, and should NOT be self treated. The Flight Surgeon knows the symptoms and treatment of injuries, and is the only one qualified to diagnose and treat and injuries.

3. First aid

a. See the Flight Surgeon

To avoid self medication and misdiagnosis, always see the Flight Surgeon if abnormal or excessive pain is experienced. Self medication and misdiagnosis could lead to permanent or recurring injuries.

b. P.R.I.C.E

These five procedures should be done

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immediately after an injury such as strains, sprains, shin splints, or muscle soreness. Using this regime will help relieve pain, control inflammation, and start the healing process.

Protect - the injury from further damage, by immobilizing the injury.

Rest - is essential to recovery. Your physician should be your guide. In less severe cases, however, complete rest may not be required. Within a few days of an injury the tissues begin to repair themselves. Proper rehabilitation exercises can aid in the repair by flushing away the injury produced by-products from the tissue and by bringing blood and nutrients to the area. Movement will help restore the functional ability of the muscle and allow for a quicker return to your sport. Allow the pain level and type of pain to be your guide. If the pain is sharp, throbbing and/or very severe then exercises or movement is not good. If, however, there is only minor pain, then movement may aid the healing process.

Ice - is important because it reduces the pain and swelling by constricting blood and lymph vessels. Ice should be placed on the injured area as soon as possible after the injury. Ice should be applied for about twenty minutes then let the area warm to room temperature. Range of motion exercises should be preformed after the area has warmed

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up. Ice should only be used within the first twenty-four hours.

Compression - Wrapping the injured part with an elastic bandage will compress the area and limit swelling. Be careful not to wrap the part too tightly as the blood supply will be cut off. If the part becomes numb and/or turns blue then the wrapping is too tight. The wrapping should remain on for twenty to thirty minutes then released for fifteen minutes to insure adequate circulation. This process may be repeated.

Elevation - Elevating the body part helps drain excess fluid from the area and along with compression can help limit muscular bleeding and swelling. It may be advisable to elevate the part while sleeping.

c. Heat

Heat such as hot baths, analgesic balm, and heating pads can be helpful in aiding healing but should not be used on injury until swelling is eliminated or significantly reduced. The rule of thumb is ice for twenty-four to forty-eight hours and then heat if the swelling has eliminated.

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

SUMMARY AND REVIEW

A. State Lesson Objectives

Turn to cover page for objectives.

B. Review major teaching points

Briefly summarize.

APPLICATION

See presentation for application.

EVALUATION

None.

ASSIGNMENT

None.

LESSON PLAN

January 2005

COURSE TITLE: Physical Training
Aviation Preflight
Indoctrination Course,
Q-9B-0020 (API)

CLASSIFICATION: Unclassified

LESSON TOPIC NUMBER: 7.4

LESSON TOPIC: Warm-up/Stretching/Cool down

ALLOTTED LESSON TIME: 1.0 Laboratory

INSTRUCTIONAL SUPPORT:

1 Laboratory instructor

INSTRUCTIONAL REFERENCES:

1. OPNAVINST 6110.1
2. Anderson, Bob, Stretching, Stretching Inc., 1990

INSTRUCTIONAL AIDS:

1. 4 NAVAVSCOLSCOM Form 6310/1 Revision 1-87

TERMINAL OBJECTIVES:

Partially supported by this lesson topic:

7.0 Upon completion of this unit of instruction the student will demonstrate an understanding of physical training, health, and Navy/Marine Corps fitness standards; have passed a standard Navy PRT to NASC standards; and have gained a sense of appreciation for an aggressive competitive spirit and the team concept without injury to personnel or damage to equipment.

ENABLING OBJECTIVE:

Completely supported by this lesson topic:

7.16 Complete warm-up/stretching/cool down exercises

CRITERION TEST: None.

HOMEWORK: None.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

INTRODUCTION

A. Establish Contact

Take roll, record absentees, light duty students, and collect all outstanding up-chits.

1. Introduce self, give rank, and current job.
2. Give background, schools, duty stations, etc.
3. State question and answer policy.
4. State training time out policy.
5. Describe nonverbal TTO signal.

A Hand and arm signal for Training Time Out will be utilized in the event it is not given verbally by forming a "T" with both hands. One hand will be held vertically and the other placed horizontally across the top forming a "T".

6. Ask for medical concerns:
 - a. Has anyone gone to the hospital/branch clinic for treatment within 24 hours, and are you taking any medications?
 - b. Has anyone taken over-the-counter medications within 24 hours?
 - c. Are there any potentially disqualifying illnesses/conditions for which you are currently being treated?

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

B. State Lesson Objectives

Turn to cover page of Lesson Topic Guide and state objectives.

C. Establish Readiness

1. Motivating Statements

Establish importance and relevance of lesson material using personal experience or anecdote.

2. Lesson Overview

a. Lesson Topic: Warm-up/Stretching/Cool down

Briefly outline material

(1) Perform Warm-up Exercises/Stretching

(2) Perform Cool Down Stretching

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

PRESENTATION

A. Warm-up Exercising/Stretching

Proper warm-up is important because it increases overall body temperature and prepares the muscles for exercise.

Have class fall in on workout mats. Lead class through warm-up routine. Warm-up may be conducted indoors or outdoors.

Dismiss class for 5-min. head call/water break.

1. Slow jogging or running in place - 1.5 minute duration (around basketball court or in place, etc).

Purpose: warm-up and conditioning

2. Four-count jumping jacks - 15 repetitions.

Instructor will count the cadence throughout all calisthenics. The students will sound off with the repetition.

Purpose: warm-up and conditioning

- a. From a standing position,
- b. Ready, stand with arms at side (begin)
- c. One, raise arms overhead relatively straight. Feet slightly wider than shoulder width and knees slightly bent. Knees should flex in both

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- positions,
- d. Two, return to the ready position
 - e. Three, same as one
 - f. Four, same as two = one repetition (count repetitions).
3. Four count bicycle crunches- 10 repetitions
- Purpose: warm up and conditioning
- a. Participants will get into position by laying on the ground on their back.
 - b. "Start Position" lying on back, with fingers touching head slightly behind the ears the head off the ground. Legs bent at a 90 degree angle.
 - c. Count one, raise the upper torso off the deck, twisting the torso toward the left. At the same time bring the left knee toward the head. Touch the right elbow to the left knee.
 - d. Count two, twist the torso to the right, and touch the left elbow to the right knee.
 - e. Count three, same as count one.
 - f. Count four, same as count two. This is one repetition of this exercise.
4. Bent knee push-ups 15 repetitions

Instructor counts the cadence. Students count the repetitions throughout the exercise.

Four count exercise.

Do not interlace fingers with hands behind the head when conducting crunches.

Instructor counts the cadence the students count the repetitions.

Students sound off with the repetition throughout the exercise.

Cadence can be four count, or an up down

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

Purpose: warm-up and conditioning

- a. Perform push-ups with knees on the floor

SAFETY PRECAUTION

- Stretch to your limits without straining
- Do not hold your breath while stretching.
- Do not bounce.

NOTE

Hold all stretches for 10-15 seconds.

When stretching slight tension should be felt, not pain. Stretch and hold the position targeting the desired muscle group to the point of tension, then relax the muscle. Continue to stretch the same muscle group until the desired range of motion is attained.

5. Side to side stretch

Purpose: Stretch the side of the body (Lattissimus Dorsi, External Obliques)

- a. From a standing position
- b. Stand with feet shoulder width apart. Extend the left arm straight up and grasp the left wrist with the right hand. Slowly lean to the right without bending forward at the waist.

count. "Down up" when returning to the up position this will be one repetition.

30 seconds is optimum

Demonstrate and lead class through stretching routine. Some individuals will need more time to develop adequate range of motion due to life style or injury.

c. Repeat in the opposite direction.

6. Tricep stretch

Purpose: stretch the back of the arm muscle
(Tricep Brachii)

a. From a standing position

b. Touch the left shoulder blade with the left hand and press gently backwards on the left elbow with the right hand.

c. Repeat for the right arm.

7. Chest stretch

Purpose: Static stretch for the anterior shoulder and chest muscles

a. From the standing position with arms extended to the side at shoulder level.

b. Keeping the thumbs pointed up, extend the arms backward.

c. Either have another person hold the stretch or use a pole for resistance

8. Posterior shoulder stretch

a. From a standing position

b. Reach the right arm straight out and across the chest

c. With left hand, grasp the right arm just above the elbow

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- d. Gently pull right arm across body
- e. Repeat other arm.

9. Trunk twist (seated)

Purpose: Dynamic stretch of the abdominals, including the obliques.

Stretch should be conducted with slow controlled movements.

- a. From the seated position with the arms bent at the elbows bent so both hands can be clasp together in front of the chest twist the upper torso to one side, and hold then slowly twist to the opposite side and hold.
- b. Hold position for 10-15 second on each side

10. Inside hurdler

Purpose: Stretch the back of the thigh (Hamstrings)

- a. From a seated position
- b. Sit with left leg extended and left toes pointing straight up. Bend the right leg until the sole of the right foot is touching the inside the left knee. Bend forward at the waist, taking the chest toward left knee.
- c. Repeat for the right leg.

11. Groin stretch

Purpose: Stretch the groin area

- a. From a seated position

- b. While sitting with the soles of the feet together and back straight, grasp both ankles and gently pull close to the body as possible. Relax the musculature of the inner thigh, allowing the weight of the knees to stretch the muscles. If more pressure is needed, use your elbows to supply a gentle pressure, downward on the knees.

12. Bud/s knee (ITB)

Purpose: Static stretch for the trunk and iliotibial Band.

- a. From a seated position
- b. Stretch left leg straight out or flat on the deck.
- c. Hook right foot over left leg, near the knee.
- d. Gently twist trunk to the right.
- e. Repeat with right leg.

13. Ankle rotation

Purpose: Dynamic stretch of the ankle

Slow controlled movements.

- a. From the seated position
- b. Bend the desired leg and bring the right ankle over the left thigh.
- c. Cradle the right leg with the right forearm above the left thigh.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- d. With the left hand grasp the sole of the right foot and slowly rotate the right ankle clockwise and then counter clockwise for a desired amount of rotations.
- e. Repeat with other ankle.

This action permits the synovial fluid filled bursa sac to lubricate the joint prior to physical activity.

14. Quadriceps stretch

Purpose: Static stretch of the Quadricep

- a. From a lying position on the stomach
- b. Bend the left leg and grasp the left ankle with the left hand. Pull the foot toward buttocks.
- c. Repeat, for the right leg.

15. Abdominal stretch

Purpose: Stretch the stomach (Rectus Abdominis)

- a. From a lying position on the stomach
- b. Push up on to elbows while leaving the hips on the deck, pulling up tall from the waist.

16. Lower back stretch (one or two legs)

Purpose: Static stretch of the lower back

- a. From a lying position on the back
- b. Lying on back, bend the knee , and bring the knee up to chest while placing hands behind the respective knee. Hold knee to chest with hands, relaxing back muscles.

- c. If using both knees, bring both knees to the chest clasping both hands across the top of the knees.

17. Calf stretch

Purpose: Stretch the calves (Gastrocnemius) and achilles tendons

- a. From a standing position, next to a wall or stationary object,
- b. Stand facing the wall approximately four feet away. Lean against the wall, bring the right leg forward while keeping the left leg extended and left heel flat on the deck,
- c. After calf stretch, bend the left knee and shift weight forward to stretch Achilles Tendon.
- d. Repeat for the right leg.

18. Achilles Tendon stretch

Purpose: Stretch the Achilles Tendon

- a. From a standing position with hands on hips
- b. Stand with feet shoulder width apart and step forward approx. 6 inches with one foot. Sit back over back heel and press the body forward, keeping back heel on the ground.
- c. Repeat for other foot.

B. Cool Down Stretching

SAFETY PRECAUTIONS

NOTE

Hold all stretches for 10-15 seconds.

1. Side to side stretch- same as warm-up.
2. Tricep stretch- same as warm-up.
3. Chest stretch- same as warm-up
4. Posterior shoulder stretch- same as warm-up.
5. Trunk twist(seated)- same as warm-up.
6. Inside hurdler- same as warm-up.
7. Groin stretch- same as warm-up.
8. Bubs/Knee stretch- same as warm-up
9. Ankle Rotation- same as warm-up
10. Quadriceps stretch- same as warm-up.
11. Abdominal stretch- same as warm-up.
12. Lower Back stretch- same as warm-up.
13. Calf stretch- same as warm-up.
14. Achilles Tendon stretch- same as warm-up.

APPLICATION

A. Perform Warm-up exercises and stretching
Presentation A. Warm-up

1. Slow jog 1.5 min or 3 times around BB court, etc.
2. Four count jumping jacks - 15
3. Four count bicycle crunches-10
4. Bent knee push-ups-15
5. Side to side stretch.
6. Tricep stretch
7. Chest stretch
8. Posterior shoulder stretch
9. Trunk twist(seated)
10. Inside hurler.
11. Groin stretch
12. Bud/s Knee stretch
13. Ankle Rotation
14. Quadriceps stretch
15. Abdominal stretch
16. Lower Back stretch
17. Calf stretch
18. Achilles Tendon stretch

B. Perform cool down stretching exercises.
Presentation B. Cool down.

1. Side to side stretch.
2. Tricep stretch
3. Chest stretch
4. Posterior shoulder stretch
5. Trunk twist(seated)
6. Inside hurler.
7. Groin stretch
8. Bud/s Knee stretch
9. Ankle Rotation

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

10. Quadriceps stretch
11. Abdominal stretch
12. Lower Back stretch
13. Calf stretch
14. Achilles Tendon stretch

SAFETY NOTE

Ask the Question. Did anyone injure himself or herself during this evolution? If so, follow the pre-mishap plan, if not, secure class.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

SUMMARY AND REVIEW

A. State Lesson Objectives

Turn to cover page and
paraphrase objectives.

B. Review major teaching points

EVALUATION:

None

ASSIGNMENT:

None

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

LESSON PLAN

January 2005

COURSE TITLE: Physical Training
Aviation Preflight
Indoctrination Course,
Q-9B-0020 (API)

CLASSIFICATION: Unclassified

LESSON TOPIC NUMBER: 7.5

LESSON TOPIC: Aviation Physical Readiness
Indoctrination Test

ALLOTTED LESSON TIME: 2.0 Laboratory

INSTRUCTIONAL SUPPORT:

1 Primary instructor
3 Safety observers

INSTRUCTIONAL REFERENCES:

1. OPNAVINST 6110.1
a. Standard Sheet (ENCL 5)
b. Push-ups (ENCL 5)
c. Curl-ups (ENCL 5)

INSTRUCTIONAL AIDS:

1. 4 NAVAVSCOLSCOM Form 6310/1
2. 2 Stop Watches
3. 60 Numbered jerseys
4. 6 Orange safety cones
5. Radio
6. Medical bag

TERMINAL OBJECTIVES:
Partially supported by this lesson topic:

7.0 Upon completion of this unit of instruction the student will demonstrate an understanding of physical training, health, and Navy/Marine Corps fitness standards; have passed a standard Navy PRT to NASC standards; and have gained a sense of appreciation for an aggressive competitive spirit and the team concept without injury to personnel or damage to equipment.

ENABLING OBJECTIVE:
Completely supported by this lesson topic:

7.17 Identify the Aviation Physical Readiness Indoctrination (APRI) Test Requirements.

7.18 Identify proper warm-up procedures.

7.19 Identify proper cool down procedures.

7.20 State the safety precautions during the (APRI) Test.

7.21 Perform warm-up exercises/stretching.

7.22 Complete the Aviation Physical Readiness Indoctrination (APRI) Test, per NASC standards, score of

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

"low good" or better in each section.

7.23 Perform cool down stretching

CRITERION TEST:

Student must complete APRI test in one session.

HOMEWORK: None

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

INTRODUCTION

A. Establish Contact

Take roll, record absentees, and light duty students, collect all outstanding up-chits.

1. Introduce self, give rank, and current job.
2. Give background, schools, duty stations, etc.
3. State question and answer policy.
4. State training time out policy.
5. Describe nonverbal TTO signal.

A nonverbal training time out may be signaled by placing a hand horizontally over a hand held vertically forming the letter "T".

6. Ask for medical concerns:
 - a. Has anyone gone to the hospital/branch clinic for treatment within 24 hours, and are you taking any medications?
 - b. Has anyone taken over-the-counter medications within 24 hours?
 - c. Are there any potentially disqualifying illnesses/conditions for which you are currently being treated?

B. State Lesson Objectives

Turn to cover page of Lesson Topic Guide and state objectives.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

C. Establish Readiness

1. Motivating Statements

Relate why physical fitness is important.

- a. Every student should strive to achieve and maintain the highest standard of physical readiness.
- b. Enhanced physical fitness enhances/increases mental alertness and survivability in extreme situations.
- c. Exercise is a vital part of an overall fitness program.
- d. Exercise should be part of a daily routine.

2. Lesson Overview

- a. Lesson Topic: Aviation Physical Readiness Indoctrination test
 - (1) Identify APRI Test Requirements
 - (2) State Safety Precautions During APRI Test
 - (3) Identify Warm-up Exercises/Stretching
 - (4) Identify Cool Down Stretching

Briefly outline material

PRESENTATION

A. Aviation Physical Readiness Indoctrination (APRI) test requirements.

1. The APRI test consists of curl-ups, pushups, and a qualification run on the 1.5 mile chip trail course, or Kane field track.

a. The minimum and maximum passing scores required to complete the APRI test for API are:

	<u>AGES</u>	<u>MIN</u>	<u>MIN</u>	<u>MAX SCORE</u>	
		<u>FOR</u>	<u>FOR</u>	<u>Male</u>	<u>Female</u>
		<u>MALE</u>	<u>FEMALE</u>		
Curl-ups	17-19	62	62	109	109
	20-24	58	58	105	105
	25-29	54	54	101	101
	30-34	51	51	98	98
	35-39	47	47	95	95
Push-up	17-19	51	24	92	51
	20-24	47	21	87	48
	25-29	44	19	84	46
	30-34	41	17	80	44
	35-39	37	14	76	43
1.5 mile run	17-19	11:00	13:30	8:15	9:29
	20-24	12:00	14:15	8:30	9:47
	25-29	12:53	14:53	8:55	10:17
	30-34	13:45	15:30	9:20	10:46
	35-39	14:08	15:53	9:25	10:51

Check age groups of class

Read age groups that are needed for the class

b. Failure to achieve an overall grade of good or better in any one category constitutes a failure of the entire test.

c. A passing score of low, good or better is

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- required.
2. Curl-ups Test (strength and muscular endurance test).
- a. Serves as a functional measure of abdominal muscle group endurance.
 - b. Good abdominal muscle conditioning is an important preventative measure to decrease lower back injury.
 - c. Students must do as many curl-ups as possible in 2 minutes.
 - d. Time will be called out at 1 minute, 1 minute 30 seconds, one minute 45 seconds.
 - e. Curl-ups
 - (1) Lying flat on the back with knees bent and heels close to the buttocks (approx. 10 inches).
 - (2) Legs, as stated above, will be held by a partner by the front of the feet only.
 - (3) Arms folded across the chest, hands flat across chest.
 - (4) Curl-up touching elbows to upper thighs, lie back touching shoulder blades to deck, keeping the above stated position at all times.
 - (5) Students may rest in the down position or in the up position (no locking the arms around the knees, must keep the stated position above at all times).

Demonstrate Curl-ups

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (6) If curl-ups are not performed as demonstrated, the student will be warned twice and then stopped. The test will end.

- 3. Push-ups (Upper body strength and muscular endurance).
 - a. Serves as a functional measure of upper body strength and endurance.
 - b. Good upper body strength is important to Naval Aviators for flight.
 - c. Students must do as many correct push-ups as possible in 2 minutes.
 - d. Time will be called out at 1 minute, 1 minute 30 seconds, 1 minute 45 seconds.
 - e. Push-ups
 - (1) Assume the front leaning position with hands approximately shoulder width apart and feet together.
 - (2) Arms, back, buttocks and legs must be straight from head to heels and must remain so throughout the test.
 - (3) Begin push-ups by bending the elbow and lowering the entire body until the top of the upper arms, shoulders and lower back are aligned and parallel to the deck.
 - (4) Return to the starting position by extending the elbows until the arms are straight.

Demonstrate Push-ups

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (5) Stopping and resting may be performed in the up position, maintaining the arms, back, buttocks and legs in the straight position.
 - (6) If push-ups are not performed as demonstrated, the student will be warned twice and then stopped. The test will end.
4. 1.5 mile aerobic and cardio-respiratory endurance test.
- a. Cardio-respiratory endurance is the ability to persist in physical activity which demands large amounts of oxygen.
 - b. The Aviation Survival Course is included in the total APRI measurement because of the importance of cardiovascular efficiency in relation to the demands of aviation, which require sustained mental and physical performance for extended periods of time.
 - c. Timer begins with "Ready, Go" to simultaneously signal the start for all personnel being tested and will begin behind the start line.
 - d. Watch for roots or other objects to avoid spraining ankles. If injured, notify instructor immediately. If unable to do so yourself, send another student to the nearest instructor for help.
 - e. Each student's time will be called out as they cross the finish line. Students must remember their times.
 - f. After completing the run, stay clear of the

finish line. Continue to walk around until cooled down.

B. Safety Precautions during the APRI test

1. Pain

- a. Stretching/Exercising, if you feel pain while performing any of the stretching or exercising, STOP and let the instructor know immediately.

NOTE

There is a big difference between feeling a stretch and pain

- b. Injury, if anybody gets injured during the class, the student is required to tell the primary instructor. The primary instructor will fill out a pain report.

2. Heat Stress and symptoms

- a. Heat Cramps, severe muscle cramps in the legs, calves and abdomen, faintness, dizziness.
- b. Heat Exhaustion, profuse sweating, pale, clammy skin, dilated pupils, faintness, dizziness, unconsciousness. With other symptoms.
- c. Heat Stroke, (Most serious) Flushed, hot, dry skin, constricted pupils, faintness, dizziness, unconsciousness (usually).

C. Warm up and stretching exercises

- 1. Slow jog 1.5 min or 3 easy laps around BB court
- 2. 15-4 count jumping jacks (warm-up exercise)
- 3. 15 bent knee push ups (warm-up exercise)

Technique - perform all exercises IAW LP 7.4. Instructor monitor class for correct form.

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

4. 10-4 count bicycle crunches (warm-up exercise)
5. Side to side stretch
6. Triceps stretch
7. Chest stretch
8. Posterior shoulder stretch
9. Trunk twist (seated)
10. Inside hurdler
11. Groin stretch
12. ITB/Knee stretch
13. Ankle rotation
14. Quadriceps stretch
15. Abdominal stretch
16. Lower back stretch
17. Calf stretch
18. Achilles Tendon Stretch

D. Perform cool down stretching

1. Side to side stretch
2. Triceps stretch
3. Chest stretch
4. Posterior shoulder stretch
5. Trunk twist (seated)
6. Inside hurdler
7. Groin stretch
8. ITB/Knee stretch
9. Ankle rotation
10. Quadriceps stretch
11. Abdominal stretch
12. Lower back stretch
13. Calf stretch
14. Achilles Tendon Stretch

NOTE - Go to application

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

SUMMARY

A. State Lesson Objectives

Turn to cover page and paraphrase objectives.

APPLICATION

A. Perform Warm-up exercises and stretching IAW LP 7.5
Presentation C

1. Slow jog 1.5 min or 3 times around BB court, etc.
2. Four count jumping jacks - 30
3. Four count bicycle crunches - 10
4. Bent knee push-ups - 15
5. Side to side stretch
6. Tricep stretch
7. Chest stretch
8. Posterior shoulder stretch
9. Trunk twist (seated)
10. Inside hurdler
11. Groin stretch
12. Buds / Knee stretch
13. Ankle Rotation
14. Quadriceps stretch
15. Abdominal stretch
16. Lower Back stretch
17. Calf stretch
18. Achilles Tendon stretch

B. Put class on a 5 minute head and water break. Meet back at the same place.

C. Repeat minimums and maximums for curl-ups.

Pg 7.5-5

D. Pair up students in straight rows.

NOTE

All instructor and safety observers will rove around the rows of students to ensure compliance with all instructions.

- E. First set of students, ready to start curl-ups, start IAW LP 7.5.
- F. Second set of students, ready to start curl-ups, start IAW LP 7.5.
- G. Record scores of both groups.
- H. Repeat minimums and maximums for push-ups.
- I. First set of students, ready to start push-ups, start IAW LP 7.5.
- J. Second set of students, ready to start push-ups, start IAW LP 7.5.
- K. Record scores of both groups.
- L. Put class on a 5 minute head and water break and tell them to meet you at the APIR test course starting line and stretch more, if needed.

Pg 7.5-5

NOTE

Make sure APRI test running course and numbered jerseys are ready (jerseys are optional).

- M. Hand out numbered jerseys.
- N. Explain APRI test running route and place safety observers around the running course. Three times around the marked Kane Field area, equals 1.5 miles. State run minimums.

Pg 7.5-5

NOTE

SAFETY hazards involved (roots, potholes, etc).

- O. All students stand behind the starting line. Start The test. When the last person crosses the start line, start at least 2 stop watches.
- P. Monitor for SAFETY and compliance.
- Q. As the students cross the finish line, record their jersey number and time.
- R. Counsel all whom fail and state to them what is going to happen.

NOTE

Taking in cool water can help prevent dehydration.

- S. Give class a 5 min head/water break and tell them to meet back in the gym on the mats.
- T. Perform cool down stretching exercises. IAW LP 7.5 Presentation D
 - 1. Side to side stretch
 - 2. Tricep stretch
 - 3. Chest stretch
 - 4. Posterior shoulder stretch
 - 5. Trunk twist(seated)
 - 6. Inside hurdler
 - 7. Groin stretch
 - 8. Buds / Knee stretch
 - 9. Ankle Rotation
 - 10. Quadriiceps stretch
 - 11. Abdominal stretch
 - 12. Lower Back stretch

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

13. Calf stretch
14. Achilles Tendon stretch

SAFETY NOTE

Ask the question. Did anyone injure themselves during this evolution? If so, follow the pre-mishap plan. If not, secure class.

U. Return to summary.

EVALUATION:

Complete APRI Test IAW NASC Standards

ASSIGNMENT:

None

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

Ages 17-19 MALE

Curl-up	Push-up	1.5 mile Run	500 Yard Swim	450-Meter Swim	Points
109	92	8:15	6:30	6:20	100
107	91	8:45	6:45	6:35	95
102	86	9:00	7:15	7:05	90
98	82	9:15	7:45	7:35	85
93	79	9:30	8:15	8:05	80
90	76	9:45	8:30	8:20	75
81	68	10:00	9:15	9:05	70
71	60	10:30	10:30	10:20	65
62	51	11:00	11:15	11:05	60
59	49	12:00	11:45	11:35	55
54	46	12:15	12:15	12:05	50
50	42	12:30	12:45	12:35	45

Ages 17-19 Female

Curl-up	Push-up	1.5 mile Run	500 Yard Swim	450-Meter Swim	Points
109	51	9:29	6:45	6:35	100
107	50	11:15	7:45	7:35	95
102	47	11:30	8:30	8:20	90
98	45	11:45	9:00	8:50	85
93	43	12:00	9:30	9:20	80
90	42	12:30	9:45	9:35	75
81	36	12:45	10:45	10:35	70
71	30	13:00	12:00	11:50	65
62	24	13:30	13:00	12:50	60
59	22	14:15	13:15	13:05	55
54	20	14:45	13:45	13:35	50
50	19	15:00	14:15	14:05	45

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

Ages 20-24 Male

Curl-up	Push-up	1.5 mile Run	500 Yard Swim	450-Meter Swim	Points
105	87	8:30	6:30	6:20	100
103	86	9:00	7:00	6:50	95
98	81	9:15	7:30	7:20	90
94	77	9:45	8:00	7:50	85
90	74	10:00	8:15	8:05	80
87	71	10:30	8:45	8:35	75
78	64	10:45	9:30	9:20	70
66	55	11:30	10:30	10:20	65
58	47	12:00	11:30	11:20	60
54	45	12:45	12:00	11:50	55
50	42	13:15	12:15	12:05	50
46	37	13:30	13:00	12:50	45

Ages 20-24 Female

Curl-up	Push-up	1.5 mile Run	500 Yard Swim	450-Meter Swim	Points
105	48	9:47	7:15	7:05	100
103	47	11:15	8:00	7:50	95
98	44	11:30	8:45	8:35	90
94	43	12:15	9:15	9:05	85
90	40	12:45	9:45	9:35	80
87	39	13:15	10:00	9:50	75
78	33	13:30	11:00	10:50	70
66	28	13:45	12:15	12:05	65
58	21	14:15	13:15	13:05	60
54	20	15:00	13:45	13:35	55
50	17	15:15	14:00	13:50	50
46	16	15:30	14:30	14:20	45

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

Ages 25-29 Male

Curl-up	Push-up	1.5 mile Run	500 Yard Swim	450-Meter swim	Points
101	84	8:55	6:38	6:28	100
100	82	9:23	7:08	6:58	95
95	77	9:38	7:38	7:28	90
91	73	10:15	8:08	7:58	85
87	69	10:30	8:23	8:13	80
84	67	10:52	8:53	8:43	75
75	60	11:23	9:38	9:28	70
62	51	12:15	10:38	10:28	65
54	44	12:53	11:38	11:28	60
50	41	13:23	12:08	11:58	55
47	38	13:45	12:23	12:13	50
43	34	14:00	13:08	12:58	45

Ages 25-29 Female

Curl-up	Push-up	1.5 mile Run	500 Yard Swim	450-Meter swim	Points
101	46	10:17	7:23	7:13	100
100	45	11:30	8:15	7:58	95
95	43	11:45	9:00	8:50	90
91	41	12:30	9:30	9:20	85
87	39	13:00	10:00	9:50	80
84	37	13:23	10:15	10:05	75
75	30	14:00	11:15	11:05	70
62	26	14:30	12:30	12:20	65
54	29	14:53	13:30	13:20	60
50	18	15:23	13:53	13:43	55
47	15	15:45	14:15	14:05	50
43	13	16:08	14:45	14:35	45

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

Ages 30-34 Male

Curl-up	Push-up	1.5 mile Run	500 Yard Swim	450-Meter Swim	Points
98	80	9:20	6:45	6:35	100
97	78	9:45	7:15	7:05	95
92	74	10:00	7:45	7:35	90
88	69	10:30	8:15	8:05	85
85	67	11:00	8:30	8:20	80
81	64	11:15	9:00	8:50	75
73	57	12:00	9:45	9:35	70
59	48	13:00	10:45	10:35	65
51	41	13:45	11:45	11:35	60
47	38	14:00	12:15	12:05	55
44	35	14:15	12:30	12:20	50
40	31	14:30	13:15	13:05	45

Ages 30-34 Female

Curl-up	Push-up	1.5 mile Run	500 Yard Swim	450-Meter Swim	Points
98	44	10:46	7:30	7:20	100
97	43	11:45	8:30	8:20	95
92	41	12:00	9:15	9:05	90
88	39	12:45	9:45	9:35	85
85	37	13:15	10:15	10:05	80
81	35	13:30	10:30	10:20	75
73	28	14:30	11:30	11:20	70
59	24	15:15	12:45	12:35	65
51	47	15:30	13:45	13:35	60
47	15	15:45	14:00	13:50	55
44	13	16:15	14:30	14:20	50
40	11	16:45	15:00	14:50	45

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

Ages 35-39 Male

Curl-up	Push-up	1.5 mile Run	500 Yard Swim	450-Meter Swim	Points
95	76	9:25	6:53	6:43	100
93	74	9:53	7:23	7:13	95
88	70	10:08	7:53	7:43	90
85	65	10:38	8:23	8:13	85
83	63	11:08	8:38	8:28	80
78	60	11:23	9:08	8:58	75
70	53	12:23	9:53	9:43	70
55	44	13:23	10:53	10:43	65
47	37	14:08	11:53	11:43	60
43	35	14:23	12:23	12:13	55
40	33	14:45	12:38	12:28	50
37	27	15:00	13:23	13:13	45

Ages 35-39 Female

Curl-up	Push-up	1.5 mile Run	500 Yard Swim	450-Meter Swim	Points
95	43	10:51	7:45	7:35	100
93	42	11:53	8:38	8:28	95
88	39	12:08	9:30	9:20	90
85	37	12:53	10:00	9:50	85
83	35	13:23	10:23	10:13	80
78	34	13:45	10:45	10:35	75
70	26	14:38	11:45	11:35	70
55	22	15:30	12:53	12:43	65
47	14	15:53	14:00	13:50	60
43	13	16:15	14:15	14:05	55
40	11	16:38	14:38	14:28	50
37	9	17:00	15:15	15:05	45

DISCUSSION POINTRELATED INSTRUCTOR ACTIVITY**Ages 40-44 Male**

Curl-up	Push-up	1.5 mile Run	500 Yard Swim	450-Meter Swim	Points
92	72	9:30	7:00	6:50	100
90	70	10:00	7:30	7:20	95
85	67	10:15	8:00	7:50	90
83	61	10:45	8:30	8:20	85
80	59	11:15	8:45	8:35	80
76	56	11:45	9:15	9:05	75
68	50	12:45	10:00	9:50	70
51	41	13:45	11:00	10:50	65
44	34	14:30	12:00	11:50	60
39	32	14:45	12:30	12:20	55
37	29	15:15	12:45	12:35	50
35	24	15:30	13:30	13:20	45

Ages 40-44 Female

Curl-up	Push-up	1.5 mile Run	500 Yard Swim	450-Meter Swim	Points
92	41	10:56	8:00	7:50	100
90	40	12:00	8:45	8:35	95
85	37	12:15	9:45	9:35	90
83	35	13:00	10:15	10:05	85
80	33	13:30	10:30	10:20	80
76	32	14:00	11:00	10:50	75
68	24	14:45	12:00	11:50	70
51	20	15:45	13:00	12:50	65
44	12	16:15	14:15	14:05	60
39	11	16:45	14:30	14:20	55
37	9	17:00	14:45	14:35	50
35	7	17:15	15:30	15:20	45

LESSON PLAN

January 2005

COURSE TITLE: Physical Training
Aviation Preflight
Indoctrination Course,
Q-9B-0020

CLASSIFICATION: Unclassified

LESSON TOPIC NUMBER: 7.6

LESSON TOPIC: Weight Training

ALLOTTED LESSON TIME: 1.0 Classroom
1.0 Laboratory

INSTRUCTIONAL SUPPORT:

1 Classroom instructor
1 Laboratory instructor

INSTRUCTIONAL REFERENCES:

1. OPNAVINST 6110.1G
2. Namrl-1334 Physical Fitness Training to Enhance Aircrew G Tolerance
3. Lesson Topic Guide 7.4
4. U.S. Army Physical Fitness Instructor Training Manual

TERMINAL OBJECTIVE:
Completely supported by this lesson
topic:

7.0 Upon completion of this unit of instruction the student will demonstrate an understanding and application of physical training, health, and Navy/Marine Corps fitness standards; have passed a standard Navy PRT to NASC and have gained a sense of appreciation for an aggressive competitive spirit and the team concept without injury to personnel or damage to equipment.

ENABLING OBJECTIVES:
Completely supported by this lesson
topic:

7.24 Demonstrate techniques for developing and maintaining a level of physical fitness directed at enhancing G-tolerance and overall muscular strength utilizing weight training equipment.

CRITERION TEST:

None.

HOMEWORK:

None.

INSTRUCTIONAL AIDS:

1. NASC Weight Training Form
(Chest/Shoulders/Triceps)
2. NASC Weight Training Form
(Back/Biceps)
3. NASC Weight Training Form
(Legs/Forearms/Abdomen/Oblique/Neck)
4. 4 NAVAVSCOLSCOM Form 6310/1
Revision 07-02

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

INTRODUCTION

Take role and record absentees and light duty students.

A. Establish Contact

1. Introduce self, give rank, current job.
2. State background, schools, duty stations, etc.
3. State question and answer policy.
4. State training time out policy.
5. Describe nonverbal TTO signal.

A Hand and arm signal for Training Time Out will be utilized in the event it is not given verbally by forming a "T" with both hands. One hand will be held vertically and the other placed horizontally across the top forming a "T".

6. Ask for medical concerns
 - a. Has anyone gone to the hospital/branch clinic for treatment within 24 hours, and are you taking any medications?
 - b. Has anyone taken over-the-counter medications within 24 hours?
 - c. Are there any potentially disqualifying illnesses/conditions for which you are currently being treated?

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

- d. Has anyone consumed alcohol in the past 12 hours?

B. State Lesson Objectives

Turn to cover page of Lesson Topic Guide and paraphrase objectives.

C. Establish Readiness

1. Motivating statements

In preparation for future combat roles, aviators must become competent and achieve high levels of readiness in a variety of military skills. Increases in muscular strength and muscular endurance will certainly improve their ability to function effectively in the combat environment. Achieving and maintaining high levels of strength, endurance and flexibility is a must if one wishes to win and survive both personally and as a unit during future conflicts.

Weight lifting takes on a new meaning when alternating from recreational or sports related lifting to "combat ready" professional training.

Military aviation requires aircrew who are physically fit. Lack of required strength in some situations can mean the difference between life and death, mission completion vice mission failure, or heroism instead of personal embarrassment. Examples of strength demands in military aviation include:

- Loss of power boost systems in aircraft make it necessary for manual override on ailerons, elevators, and rudder; requires arm and leg

strength.

- Dive bombing training, air combat maneuvering, gunnery and aerobatics require strong thigh and stomach muscles to counteract G-forces. Additionally, G-suits do come unplugged, tear, and rupture. Force required to hold 4-6 G's on fighter aircraft requires 40 to 50 pounds of pull using upper arm and shoulder muscles.
- A student in a split-S maneuver is exposed to 4 G's, requiring sufficient arm strength to withstand a 50 pound pull depending on airspeed. With no G-suit or power assisted controls (T-34), he/she needs leg, arm, and stomach strength.
- 18-23 G-for exertion on the body during ejection sequence requires strong back, shoulder and chest muscles.
- Opening shock of parachute subjects body to great stresses at speeds above 300 knots. Not all ejections are controlled, i.e. slow speed, straight and level.
- Catapult G-forces require quick recovery from stress.

The Naval Aerospace Medical Research Laboratory (NAMRL) conducted research which proves strength training greatly enhances G-tolerance.

Weight lifting increases G-tolerance, cockpit mobility, airborne situational awareness and muscular endurance needed during air combat maneuvering.

The human factor is the limiting factor in the aircrew/aircraft combination in relation to

pulling G's in tactical aircraft.

Strength training improves the appearance of the physique which enhances military bearing.

Weight lifting is one of the most popular forms of exercise in military gyms both on and off the ship.

Survival situations (Air/Land/Sea/POW) pose unknown strength requirements.

Weight lifting produces positive effects in all phases of squadron life. Examples include:

- Captain's Cup Sports Competition
- Moving personal cruise boxes on and off ship
- Earning respect from subordinates
- Wearing 50 lbs. Of gear for 8-12 hours/day

It is important for all aviators to maintain high levels of muscular strength and endurance.

Aviators vary in physical makeup. Many physiological differences exist between the sexes as discussed in the U.S. Army Instructor Training Manual. Differences like these must be taken into account when designing strength training programs to reach fitness goals. Physiological differences must be examined not to create dissention between our troops but to acknowledge areas where overall readiness may be improved. It is very important that females as well as males give the proper attention to the weight training syllabus.

Research is currently being conducted by Naval

Medical Research Laboratory that will establish gender-neutral minimum occupational standards required to perform fleet operational flying duties. Task specific performance requirements based on "worst case scenarios" for instantaneous strength, sustained strength/endurance, and aircraft emergency survival situations will be developed. Once developed, entry level testing will be conducted to identify individuals capable of meeting those requirements. A program will be designed to allow student aviators/flight officers to meet or exceed those standards. In the future, training and annual testing of fleet aircrew may occur to ensure that those in the cockpit meet the standard. Students should start preparing now!

2. Lesson overview

The purpose of this lesson topic is to introduce the student to weight training requirements, principles, programs and exercises and demonstrate proper weight lifting technique.

a. Lesson Topic: Weight Training

b. Major Teaching Points:

- (1) Human anatomy.
- (2) Weight lifting principles.
- (3) Program design.
- (4) Gym rules.
- (5) Weight lifting techniques

demonstration.

(6) Student workouts.

PRESENTATION

A. Human Anatomy

The human body has three types of muscles: skeletal, smooth and cardiac. Weight training develops the skeletal muscles by breaking them down and increasing their efficiency. The manner in which this takes place will be covered in detail in the Sports Medicine lecture.

The major muscle groups of the body include the pectorals, deltoids, trapezius, biceps, oblique, abdominal, quadriceps, rhomboids, triceps, latissimus dorsi, spinal erector, gluteus, hamstring and gastrocnemius.

B. Weight Lifting Principles

1. Exercise specificity. For optimal improvement, one should work the same muscles and respiratory parts that are used during actual performance. For example, the squat is the closest exercise to performing the anti-G straining maneuver (AGSM) since one uses most of the same muscles and pushes against a partially closed glottis.
2. Exercise intensity. For maximal benefits in strength, the load should be 80-90% of the maximum weight that can be lifted one time (one repetition maximum or 1 RM).
3. Exercise duration.

	<u>% Max WT</u>	<u>Reps</u>	<u>Sets</u>	<u>Rest</u>
Strength	80-90%	6-8	3-4	1.5-5.0
Endurance	65-75%	12-15	3-4	.5

NOTE: Rest periods is in minutes.

4. Rest Periods. Specific rest periods should be adhered to between sets and between exercises, depending on program goals. Duration of the rest period will affect the strength available for the next set and the overall physiological stress of the workout. One day per week should be set aside for passive rest.
5. Exercise frequency. A minimum of 48 hours should elapse between workouts training the same muscle group.
6. Warm-up and cool-down. Warm up muscles and get muscles/tendons used to going through the full range of motion before lifting heavy weights. Cool down emphasizing stretches for the muscles used during the exercise session.
7. Program assessment. For beginners, a slight decrease in strength may occur during the first couple of weeks. This is normal since the muscles are breaking down and sometimes sore. Don't give up. Later, strength should increase in a stair-step fashion until near maximum strength is obtained. During this phase, increases in strength are much smaller and less frequent. At this point, don't give up. Set more realistic goals like 5-10 lb. Increases every 6 months to a year.
8. Exercise timing. The demands of exercise on the cardiovascular and metabolic systems are such that 3+ hours should elapse before assuming

flight duties involving high-G.

9. Exercise order. Large muscles should be trained prior to working the smaller muscles. After the large muscles are trained, exercises may selected which isolate specific smaller muscles. For example, in order to train the pectoral muscles using the bench press, the pectorals, deltoids, and triceps are used. After working the pectorals, exercises may be chosen to isolate the deltoids and triceps without using the pectorals. If the deltoids and triceps are trained first, the pectorals can not be trained for maximum strength gains.
10. Exercise form. The form one uses when performing a particular exercise makes a tremendous difference in the effectiveness an exercise has in stimulating new muscle growth. For example, moving the hands down the bar an extra inch, lowering an elbow below horizontal, or lifting in a straight line vice an arc can vary the percentage of force acting on a particular muscle and in some cases shift the force to an entirely different muscle, thus decreasing or even eliminating expected strength gains. The more one knows about how a muscle works, the more profitable exercise sessions may become.
11. Applied force. Weights should be supported throughout the full exercise. Many lifters work the protagonist muscle but let gravity control the majority of the movement on the eccentric part of the lift. Work the antagonist muscles also.
12. Workout partner. A good workout partner motivates as well as ensures safety throughout the workout. Be particular in choosing a workout

partner, but have one.

13. Safety. Anytime weight is lifted above the head of heavy forces are placed on the spine, a weight belt should be used. Use spotters anytime lifting above the body with heavy weights.

C. Program Design

1. Specific goals should be defined prior to designing a fitness program. Goals could include the following: increase upper body strength, increase static or dynamic flexibility, increase power, improve cardiovascular fitness, develop lower body strength, lose weight, provide variety in training, or train specifically for upcoming competition, etc. Once a goal is defined, a program may be designed to meet or exceed it. For annual planning, defining new goals approximately every 12 weeks is sufficient to workouts interesting. For example, one may work upper body strength for 12 weeks, and choose to train for cardiovascular for the next 12 weeks.

2. For overall strength training, one method of arranging muscle groups to work different muscles during separate workouts is defined on the NASC Weight Lifting Forms. Student will complete these forms during future weight training classes. When choosing exercises, students should:
 - (a) Choose three exercises per body part.
(Exercises should be chosen to work all parts of the muscle. For example, when working the chest, an exercise should be chosen to work the middle pectorals, followed by isolation exercises to work the

upper and lower pectorals.)

- (b) For each exercise, perform one warm-up set with whatever weight may be lifted for 15-18 reps. This will warm up the muscles, tendons, and ligaments and move the muscle through the full range of motion.
- (c) Next, three sets should be performed to train the muscle. A weight should be chosen to perform 6-8 repetitions. For experienced weight lifters, a pyramid routine may be performed.
- (d) Workout partners will alternate so that while one is lifting, the partner can spot while catching his or her breath.
- (e) When all muscle groups have been trained, additional exercises may be chosen or the abdominal muscles may be worked until the instructor ends the class.

Have students go to gym. Demonstrate set-up procedures and correct form for each machine/exercise.

D. Gym Rules

- 1. Weights will be restacked upon the completion of each exercise unless another set of students is ready to use the weights.
- 2. Olympic weights will be removed from the bars when the exercise is completed. (One 45 lb. Plate or less may be left on each side of the bar.)
- 3. Weight belts will be worn as described above.
- 4. Weights will not be banged together or damaged through misuse.

5. Foul language will not be tolerated.
6. Personal radios and tape players are not allowed in the gym.
7. Towels will be used to clean/dry areas of common body contact as a sanitary precaution.

E. Weight Lifting Technique Demonstration

1. Bench press.
 - Lay on bench with head, shoulder blades and buttocks touching bench.
 - Grasp bar slightly wider than shoulder width apart.
 - Lower bar to pectoral muscle.
 - Push bar up and exhale just past sticking point (3/4th the way up).
 - Keep resistance on muscles. Locking arms at the top will shift resistance to the skeletal system.
2. Bent arm fly.
 - Rest dumbbells on thighs.
 - Lay flat on bench.
 - Raise dumbbells to extended position with palms facing each other.
 - Lower weights in an arc to position parallel to the shoulders.

- Raise weights in same arc to extended position.

- Flex pectoral muscles approach top of lift.

3. Incline bench press.

- Sit on incline bench and grasp bar wider than shoulder width.

- Lower bar to upper pectorals.

- Extend bar opposite gravity force.

Note: the direction is not perpendicular to chest but moves toward head.

- Do not arch back.

4. Incline dumbbell fly.

- Sit on incline bench and lift weights to thighs and then to extended position directly above shoulder.

- Lower weights in an arc until upper arm is slightly lower than parallel to the deck.

- Push weights back through the arc to the extended position contracting upper pectorals as weight approach the top.

5. Decline bench press.

- Lay on decline bench press with legs secured.

- Grasp bar wider than shoulder width apart. Lower bar to lower pectorals and return to

extended position. (Note: opposing gravity is not perpendicular to chest, but toward the hips.)

6. Decline dumbbell fly.

- Lay on decline bench. Raise dumbbells or have partner hand them to you.

- Extend arms out to starting position and push weights up through arc while contracting lower pectorals.

- Lower weight through arc to starting position.

7. Arm cross.

- Adjust seat to align shoulders under the overhead axes of movement arms.

- Sit in seat and fasten seat belt.

- Place legs on leg rest and relax lower body.

- Place forearms behind movement arm pads. Grasp handles lightly.

- Push with forearms trying to touch elbows together. Keep neck back, chin down, chest up, shoulders down, and back arched. Pause in finished position, then lower weight slowly to comfortable stretch.

8. Chest dip.

- Perform dip with body bent forward and elbows out. Keep force on pectoral muscles.

9. Push up.

- Perform military style push-up with wide hands and elbows parallel to shoulders.
10. Military press.
- Sit on bench with back straight. Grasp bar with wide grip and lower bar to shoulders.
 - Press bar straight up to extended position. Keep resistance on muscular system.
11. Overhead press.
- Same as military press except performed on Nautilus.
12. Upright row.
- Hold barbell in middle and raise to chin keeping weight close to body. With hands together, exercise works deltoids. With hands 4-6 inches apart, exercise works the trapezius.
13. Lateral deltoid fly.
- Grasp dumbbell with arms by side. Raise dumbbell laterally until parallel to shoulder, then lower. Keep palm-facing body.
14. Anterior deltoid fly.
- Place dumbbell on upper thigh with palm toward thigh. Raise dumbbell in front of body with palm facing down. Raising weight until parallel to shoulder. Keep shoulders square.
15. Posterior deltoid fly.
- Grasp weights and bend at waist. Raise

dumbbells with palms facing knee directly below chest toward the rear and rotate arms out until palms face ground. Then return to starting position.

16. Rowing torso.

- Sit with back towards weight stack. Use pads as necessary to stabilize upper body.
- Put arms between vertical roller pads and cross forearms.
- Bend arms in a rowing fashion as far back as possible. Pause, then return.
- Keep arms parallel to deck at all times.

17. Lateral raise.

- Set seat at height where shoulder joints are in line with axis of cams. Fasten seat belt.
- Pull elbows slightly to rear of you torso, inside movement arm pads. Grasp handles lightly.
- Press against movement arm pads. Raise arms a little above horizontal while simultaneously holding your shoulders down. Pause, then return to start position.

18. Lying French press.

- Lay on flat bench. Raise bar or have partner hand weight to you. With thumbs under bar, lower bar to forehead keeping upper arm stationary in vertical position. Return weight to extended position keeping upper arm stationary.

19. Triceps press down.
 - With thumbs on top of straight bar or V-shaped bar, press bar down extending triceps while keeping upper arm stationary.

20. Multi-triceps.
 - Position seat where elbows are slightly higher than shoulders when upper arms are resting on pad.
 - Position movement arm forward to sit in machine.
 - Place hands loosely on pads with palms facing each other.
 - Extend both arms to forward position. Retract one arm or both arms to start position and then push pad to return to extended position keeping elbow on pad lined up with side pads.

21. Triceps bench dip.
 - Position two benches so that heels may rest on one and while hands are on the other one close to buttocks.
 - Lower body slowly as low to stretch triceps, and then raise body to start position while contracting the triceps.

22. Triceps bar dip.
 - Lower and raise the body keeping the body erect.
 - May be performed on Gravitron or multi-

exercise machine.

23. Triceps push-up.

- Perform military style push up keeping elbows back.

24. Close grip bench.

- Perform same as Bench press except position hands on bar either shoulder width or less.

25. Triceps kick back.

- Grasp dumbbell and bend at waist. Keep upper arm parallel to the body and extend arm to a locked out position.

- Start with palm facing body and complete extension with palm facing up.

26. Dead lift.

- Grasp bar with wide grip, palms facing opposite direction. Keeping back as straight as possible, raise bar using legs.

- At top of lift, rotate shoulders up and back contracting upper back muscles. Pause; rotate shoulders up and forward returning bar to floor.

27. Shoulder shrug.

- Grasp bar with wide grip.

- Keeping arms extended, raise bar until trapezius muscle is fully contracted. Pause, then return bar to start position.

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

28. Upright row.
- Same as 12.
29. Gravitron.
- Select appropriate weight according to chart on machine.
 - Grasp one set of the handgrip bars and place knees in slots on pad.
 - Wide grip works latissimus dorsi. Middle grip works middle/lower trapezius and rhomboids. Inside grip works biceps. Lower handles work triceps or pectorals.
 - Lower and raise body using position to isolate muscle groups.
30. Close grip pull down.
- With body erect, grasp V-grip and pull down. Lean back until force is pulled along path working all of latissimus dorsi.
31. Scapula pull.
- In seated position, grasp bar above head with latissimus dorsi full extended.
 - Pull bar down contracting shoulders and shoulder blades.
 - Pause, the return bar to start position.
32. Pull up.
- Grasp pull up bar with hands wider than

shoulder width.

- Pull body to bar with bar behind the head. Do not hunch back at top but remain erect. Pause, and return to start position.

33. Lat pull down.

- In seated position, grasp bar with wide grip. Pull bar down to back of neck fully contracting latissimus dorsi.

34. Decline dumbbell row.

- With body bent at waist, extend arms fully until latissimus dorsi is fully stretched.
- Pull dumbbells up contracting latissimus dorsi until arm is bent at 90 degree angle.
- Ensure pull is straight up and rotate hands from a 45 degree angle to palms facing body.
- Pause, and slowly lower weight to start position.

35. One hand dumbbell row.

- Same form as decline dumbbell row (34) except using only one dumbbell.

36. One hand cable row.

- Seated, with knees slightly bent, reach to grab pulley fully extending latissimus dorsi.
- Pull handle while erecting torso to slightly beyond a vertical position. Elbow should end up adjacent to the oblique. Supinate hand during

pull. Pause, and return handle to start position.

37. Two hand cable row.

- Seated, with knees slightly bent, reach to grab cable bar with both hands fully extending latissimus dorsi.

- Pull cable bar toward bottom of rib cage. Pause, and return cable bar to start position.

38. Super pullover.

- Adjust seat so that shoulders are aligned with axis of rotation.

- Fasten seat belt and press on foot lever to move elbow pads forward.

- Place arms on the elbow pads of movement arm, and place hands on curved portion of crossbar. Keep hands open.

- Remove feet from pedal and slowly rotate elbows up and back.

- Rotate elbows until the bar touches midsection. Pause, keep neck muscles relaxed.

- Return slowly to stretched position and repeat.

- Exit machine by pressing foot pedal to support resistance while you remove elbows from the pads. Lower resistance with legs.

39. Rowing torso.

- Same as 16.
- 40. Bent over fly.
 - Sit on edge of bench in leaning position with back arched. Grasp dumbbells and raise them up slightly forward of line parallel to shoulders.
 - Pause, return weights to start position.
- 41. Roman chair.
 - Lay across platforms with waist on edge with partner holding ankles. With hands positioned on side of head raise body slightly above horizontal.
 - Pause, lower body to start position.
 - Keep back arched throughout exercise to keep resistance on spinal erectors.
- 42. Alt-side roman chair.
 - Same start as roman chair. Rotate body to raise alternating elbows up. Rotation should keep resistance on spinal erectors.
 - Pause, lower body to start position.
- 43. Good morning.
 - Using light weight, place barbell on back of neck. Use wide grip on bar and bend at waist keeping back arched until reaching 90 degree bend.
 - Raise body and return to start position.

44. Lower back.

- Sit in seat and fasten seat belt. Select weight and cross hands across chest.
- Keep hips stationary and rotate back contraction the spinal erectors.

45. Preacher curl.

- Position arms over preacher curl bench. Grasp EZ Curl Bar, dumbbells, or straight bar. Raise weight up contracting biceps. Lean into weight as weight is lifted to keep resistance on biceps.
- Pause, lower weight to start position.

46. Standing supinated dumbbell curl.

- Stand holding dumbbells by thigh. Supinate hands while raising dumbbells to shoulder level.
- Lower dumbbells to start position.
- Dumbbells may be raised one at a time.

47. Barbell curl.

- Stand holding barbell or dumbbell and raise weight to shoulder height. Supinate hand as weight is raised.
- Lower weight to start position.

48. Multi-biceps.

- Sit on seat and put elbows on padded support. Seat should be placed at a height that places elbows slightly higher than shoulders.

- Pull movement arms upward and put elbows on pad aligned with axis of rotation.
- Cup hands around handles keeping wrists rigid and lower resistance until arms are straight. Do not hunch shoulders.
- Pull movement arms upward and put elbows on pad aligned with axis of rotation.
- Cup hands around handles keeping wrists rigid and lower resistance until arms are straight. Do not hunch shoulders.
- Curl both arms simultaneously as far as possible. Pause, then lower resistance until arms are straight and repeat.

49. Squat.

- Position feet flat on deck and place bar across trapezius muscle. Bend knees and lower body until legs are bent at 90 degrees. Raise body to start position.
- Keep back straight at all times. Do not lean forward or backward.

50. Leg extension.

- Sit on seat. Lean forward and place shins behind roller pad. Ensure knees are aligned with axis of rotation. Position pad behind back if needed.
- Push movement arm forward and upward to reach full knee extension. Pause, and lower movement arm until weight stack barely touches.

51. Leg curl.

- Straddle movement arm, facing bench. Curl legs, pulling movement arm towards buttocks. Flex hips and pull toes toward knees as movement arm approaches vertical position.
- pause at full knee flexion, then lower until your knees are straight.

52. Side leg lifts.

- Stand holding on to support. Raise leg to side as high as possible with leg straight and foot parallel to deck.
- Lower leg to start position.

53. Duo squats.

- Sit on lower portion of seat. Lean back, placing neck between shoulder pads.
- Place both feet simultaneously on movement arm with heels placed at lower end of foot pads. Adjust seat as necessary.
- Straighten both legs simultaneously, keeping head and shoulders in secure position. Legs should stop just short of locking out. Allow one leg to bend and bring thigh onto chest. The other leg should not move. Push out smoothly with the bent leg until the cam completely unwinds, then allow the other leg to bend and then straighten. Continue in this alternating leg fashion.

54. Hip and back.

- Lay on pad and fasten seat belt. Position legs over movement arms and extend legs one at a time. Contract hamstring during extension and point toe as leg extends.
 - After extension, return leg into chest.
55. Single leg hamstring curl.
- Same form as leg curl (51) except leave one leg off bench.
56. Side leg lift.
- Lay on bench and raise leg keeping leg stiff and foot horizontal to deck.
 - Turn on other side and work other leg.
57. Rope hack squat.
- Place rope over vertical support. Hold on to rope with both hands and bend knees keeping back straight. Contract leg muscles and raise body back to start position.
58. Straight legged dead lift.
- With legs straight, lower barbell to ankles and return to start position.
 - Beginners should use very light weight.
59. Calf machine.
- Stand with pads on shoulders. Raise heels, pause and lower heels to full extension.

- Point toes in, straight, or out to isolate different parts of the calf.

60. Wrist curl.

- hold barbell with palms facing up. Curl wrist to fully contracted position.
- Lower barbell until wrist fully extends.

61. Reverse wrist curl.

- Hold barbell with palms facing down. Curl wrist backwards to fully contracted position.
- Lower barbell forward until wrist fully extends.

62. Hanging leg raise.

- Hang from bar and rotate legs in front of body. Bend at waist using lower abdomen to raise legs to 90 degrees.
- Lower legs to start position.

63. Hanging knee up.

- Hang from bar and curl knees into chest decreasing distance between bottom of rib cage and hip bone.
- Lower legs and repeat.

64. Abdominal crunches.

- Lay on back and place hands on head. Curl body up performing crunch on abdomen.

- Lower body to start position.
65. ¼ sit up.
- Lay on back with legs in air at 90 degrees. Curl up raising body toward ceiling.
 - Lower body to start position.
66. Knee rock back.
- Lay on back and curl knees into chest.
 - Return legs to start position.
67. Bent knee sit up.
- Lay on back with knees bent. Place hands across chest and raise body until both elbows touch thighs.
68. Abdominal machine.
- Sit in machine with pads across chest/shoulders. Curl body decreasing distance between bottom of rib cage and hip bone.
 - Return to start position.
69. Side bend.
- Stand with legs shoulder width apart. Reach along side and return to erect position by contracting opposing oblique.
 - Do not use weights.
70. Standing/seated twists.

- Either standing or in seated position, twist upper body quickly but in control to the left and right. Approximately 50 times to each direction defines one set.

71. 4-Way neck.

- Sit in machine facing pads. Adjust seat so that nose is even with blue bar.
- Perform all exercises from vertical into direction of lift. Never rotate neck through 180 degrees.
- Front: from vertical, place chin on chest.
- Sides: form vertical, rotate head toward side. Cross hands to keep opposite shoulder down.
- Back: from vertical, rotate head toward back.

F. Student Workouts

For all weight training classes after this lecture, divide students up into three groups.

Within the groups ensure each student has a workout partner when possible.

The following workout schedule will be followed:

GROUP 2

CHEST/SHOUDLERS/TRICEPS	1
BACK/BICEPS	2
LEGS/FOREARMS/ABDOMINAL/OBLIQUE	3

GROUP 3

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

BACK/BICEP 1
LEGS/FOREARMS/ABDOMINAL/OBLIQUE 2
CHEST/SHOULDERS/TRICEPS 3

GROUP 4

LEGS/FOREARMS/ABDOMINALS/OBLIQUE 1
CHEST/SHOULDERS/TRICEPS 2
BACK/BICEPS 3

GROUP 5

CHEST/SHOULDERS/TRICEPS 1
BACK/BICEPS 2
LEGS/FOREARMS/ABDOMINAL/OBLIQUE 3

GROUP 6

BACK/BICEPS 1
LEGS/FOREARMS/ABDOMINAL/OBLIQUE 2
CHEST/SHOULDERS/TRICEPS 3

GROUP 7

LEGS/FOREARMS/ABDOMINAL/OBLIQUE 1
CHEST/SHOULDERS/TRICEPS 2
BACK/BICEPS 3

GROUP 8

CHEST/SHOULDERS/TRICEPS 1
BACK/BICEPS 2
LEGS/FOREARMS/ABDOMINAL/OBLIQUE 3

GROUP 9

BACK/BICEPS 1

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

LEGS/FOREARMS/ABDOMINAL/OBLIQUE	2
CHEST/SHOULDERS/TRICEPS	3

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

SUMMARY AND REVIEW

A. State Lesson Objectives

Turn to cover page for objectives.

B. Review Major Teaching Points

Briefly summarize.

APPLICATION

See presentation for application.

EVALUATION

Complete PRT.

ASSIGNMENT

None.

LESSON PLAN

January 2005

COURSE TITLE: Physical Training
Aviation Preflight
Indoctrination Course,
Q-9B-0020

CLASSIFICATION: Unclassified

LESSON TOPIC NUMBER: 7.7

LESSON TOPIC: Team Sports

ALLOTTED LESSON TIME: 2.0 Laboratory

INSTRUCTIONAL SUPPORT:

2 Laboratory instructors

INSTRUCTIONAL REFERENCES:

1. Lesson Topic Guide 7.4

INSTRUCTIONAL AIDS:

1. 4 NAVAVSCOLSCOM Form 6310/1 Revision
(07-02)

TERMINAL OBJECTIVE:

Partially supported by this lesson topic:

7.0 Upon completion of this unit of instruction the student will demonstrate an understanding and application of physical training, health, and Navy/Marine Corps fitness standards; have passed a standard Navy PRT to NASC standards and have gained a sense of appreciation for an aggressive competitive spirit and the team concept without injury to personnel or damage to equipment.

ENABLING OBJECTIVES:

Completely supported by this lesson topic:

7.25 Participate in a team sports activity.

CRITERION TEST: None.

HOMEWORK: None.

OUTLINE OF INSTRUCTION

RELATED INSTRUCTOR ACTIVITY

INTRODUCTION

A. Establish Contact

Take roll, record absentees, and light duty students.

1. Introduce self, give rank, and current job.
2. Give background, schools, duty stations, etc.
3. State question and answer policy.
4. State training time out policy.
5. Describe nonverbal TTO signal.

A nonverbal training time out may be signaled by placing a hand horizontally over a hand held vertically - forming the letter "T".

6. Ask for medical concerns:
 - a. Has anyone gone to the hospital/branch clinic for treatment within 24 hours, and are you taking any medications?
 - b. Has anyone taken over-the-counter medications with 24 hours?
 - c. Are there any potentially disqualifying illnesses/conditions for which you are currently being treated?

OUTLINE OF INSTRUCTION

B. State Lesson Objectives

C. Establish Readiness

1. Motivating Statements

2. Lesson Overview

The purpose of this lesson topic is to foster the competitive spirit in students through a varsity-type sports program, as well as promote the cockpit skills of teamwork, crew coordination, and communication.

a. Lesson Topic: Team Sports

b. Major Teaching Points:

(1) Warm-up

(2) Team sports activity

(3) Stretching

RELATED INSTRUCTOR ACTIVITY

Turn to cover page of lesson topic guide and paraphrase objectives.

Relate why the team concept is important.

Briefly outline material to be covered.

OUTLINE OF INSTRUCTION

RELATED INSTRUCTOR ACTIVITY

PRESENTATION

A. Warm-up

Proper warm-up is important because it increases overall body temperature and prepares the muscles for exercise.

Lead class through warm-up routine IAW Lesson Topic Guide 7.4.

B. Team Sports Activity

1. The object of this period is to involve the class in team sports. It should be stressed that fun and safety are paramount.

Give class 5 min. for head call/water break and personal stretching.

2. Pick one of the sports listed below:

a.

b. Volleyball - can be played inside or outside.

The instructor may select the activity or allow the class to choose it.

c. Soccer - can be played on Kane field. Use the small goals located on the field or set up cones for goals.

Conduct the sport in accordance with the appropriate SOP.

d. Basketball - can be played in the gym. Use the main court for a small class or set up two cross-court games for a large class.

Divide the class into teams of appropriate size for the sport being played.

e. Field meet - can be done on Kane field. Select several events (i.e. 1.5 mile run, 100 yard dash, relay races, dizzy izzy, three legged race, broad jump, etc.)

Maintain class discipline. Ensure rules are fair to all

f. Ultimate frisbee - can be played on Kane field.

OUTLINE OF INSTRUCTION

g. Flag football - can be played on Kane field.

D. Cool-Down/Stretching

A proper cool-down stretching routine is important because it helps to safely return the heart rate to a resting state also reducing the level of residual lactic acid build-up in the muscles, and the onset of muscle soreness.

RELATED INSTRUCTOR ACTIVITY

students.
If the class is large rotate students in and out to allow maximum participation.

Think safety, even to the point of a conservative interpretation of the rules of the sport.

Allow the class to take periodic water breaks especially in the summer.

Lead class through stretching routine IAW Lesson Topic Guide 7.4.

OUTLINE OF INSTRUCTION

RELATED INSTRUCTOR ACTIVITY

SUMMARY AND REVIEW

A. State lesson objectives.

Turn to cover page for objective.

B. Review major teaching points.

Briefly Summarize

APPLICATION

See presentation for application.

EVALUATION

Complete PRT.

ASSIGNMENT

None.

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

LESSON TOPIC GUIDE

January 2005

COURSE TITLE: Physical Training
Aviation Preflight
Indoctrination (Expanded)
Course, Q-9B-0020

CLASSIFICATION: Unclassified

LESSON TOPIC NUMBER: 7.8

LESSON TOPIC: Cardiovascular Training

ALLOTTED LESSON TIME: 1.5 Laboratory

INSTRUCTIONAL MATERIALS:

INSTRUCTIONAL REFERENCES:

1. Physiology of Exercise - Morehouse and Miller
2. Health and Physical Readiness - NMPC NAVPERS 155563A
3. Legendary Abs II - Health For Life

INSTRUCTIONAL AIDS:

1. 4 NAVAVSCOLSCOM Form 6310/1 Revision 07-02
2. Amplifier
3. Remote microphone headset
4. Cassette/CD player to amplifier
5. Airboxing CD/Tape

TERMINAL OBJECTIVES:

Partially supported by this lesson topic:

- 7.0 Upon completion of this unit of instruction the student will demonstrate an understanding of physical training, health, and Navy/Marine Corps fitness standards; have passed a standard Navy PRT to NASC standards; and have gained a sense of appreciation for an aggressive competitive spirit and the team concept without injury to personnel or damage to equipment.

ENABLING OBJECTIVE:

Completely supported by this lesson topic:

- 7.26 Complete circuit training, cross country, or circuit stations within prescribed time guidelines.
- 7.27 Complete cardiovascular / muscular endurance workout options.

CRITERION TEST:

None.

HOMEWORK:

None.

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

INTRODUCTION

A. Establish Contact

Take role and record absentees and light duty students.

1. Introduce self, give rank, and current job.
2. Give background, schools, duty stations, etc.
3. State question and answer policy.
4. State Training Time Out policy.
5. Describe nonverbal TTO signal.
6. Ask for medical concerns:
 - a. Has anyone gone to the hospital/branch clinic for treatment in the past 24 hours?
 - b. Has anyone taken any medications in the last 24 hours?
 - c. Are there any potentially disqualifying illnesses/conditions for which you are currently being treated?
 - d. Has anyone consumed alcoholic beverages in

A nonverbal training time out may be signaled by placing a hand horizontally over a hand held vertically - forming the letter "T".

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

the last 12 hours?

B. State Lesson Objectives

Turn to cover page of lesson topic guide and paraphrase objectives.

C. Establish Readiness

1. Motivating Statements

Relate through personal experiences or examples how and why physical fitness is important.

Circuit training and running provide effective strength and cardiovascular endurance development.

2. Lesson Overview

The purpose of this lesson topic is to complete each circuit station/cardiovascular/muscular endurance workout, and the selected running distance.

At the instructor's discretion the class will participate in either circuit training or a two or three mile cross country run or a 3 mile group run. The Primary Instructor will lead and participate in all workouts.

a. Lesson Topic: Cross Country Running,
Group Run
Circuit Training,
Cardiovascular and Muscular
Endurance Workout

b. Major Teaching Points

- (1) Warm-Up/Stretching
- (2) Circuit training stations

OUTLINE OF INSTRUCTION

- (3) Cross country running course
- (4) Group Run
- (5) Cardiovascular/Muscular Endurance
workout options
- (6) Cool Down

INSTRUCTOR ACTIVITY

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

PRESENTATION

A. Warm-Up and stretching exercises.

Perform warm-up IAW LTG 7.4.

B. Circuit Training Option

1. There are fifteen (15) stations to complete. An alternate station can be used with a large class.
2. Each station is timed for 30 seconds, with the student doing as many repetitions as possible.
3. There is a 10 second break between stations. Students will run from station to station to maximize endurance training.

C. Circuit Training Stations

Walk the class from station to station, demonstrating each circuit exercise to be performed.

STATION 1

Rope Climb: The student shall ascend the rope using both hands and feet. A hand-over-hand method of climb should be used. The feet are employed by wrapping a leg around the rope along with pushing the feet together with the rope in between. After descending the rope, the student shall repeat the exercise.

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

STATION 2

Rope Skip: Grab the handles of the rope. Throw the rope over head and jump rope. Repeat at fast pace.

STATION 3

Sit-ups: The student will lie on his/her back with his/her arms crossed and hands on the shoulders; legs bent. The sit-up is performed by raising the upper body so that the elbows touch the thighs. Then return to the starting position.

STATION 4

Bicycle Crunches: Lie on back with fingers laced behind the head. Legs shall be straight and six inches off of the ground. Bring one knee towards the chest and the opposite elbow up to touch it then return to the starting position and repeat with the opposite leg and elbow. Repeat this until time is expired.

STATION 5

Obliques-right side: Lie on back with right hand positioned behind head. Legs shall be bent, and feet shall be 8-12 inches from buttocks. Left arm shall lie on the floor along your left side. Bring right elbow toward left knee, by contracting your right side of your abdomen. Return to starting position.

STATION 6

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

Obliques-left side: Lie on back with left hand positioned behind head. Legs shall be 8-12 inches from buttocks. Right arm shall lie on the floor along your right side. Bring your left elbow toward your right knee by contracting your left side of your abdomen. Return to starting position.

STATION 7

Crunches: Lie on back. Place feet 8-12 inches from your buttocks. Position both hands behind head. Raise your head and shoulders off the ground to about 30 degrees, and hold for about one second. Return to starting position.

NOTE: Do not pull with your hands, use your abdomen only.

STATION 8

Hand-walks: This exercise is performed on the parallel bars. The student will start at full arm extension on the bars and keeping the arms fully extended, travel from one end of the bar to the other. Jump down and repeat.

STATION 9

Jumping Jacks: Ensure hands touch over the top of the head. Feet can be moved sideways or fore and aft.

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

STATION 10

Curls: The student will alternately curl the dumbbell of their choice from full extension to the full flexed position.

STATION 11

Body Builders: Student will start in the standing position. Performing a deep knee bend, place both hands on the deck, simultaneously kicking feet out behind, assuming the push-up position. Perform a push up, return feet to a deep knee bend, then back to the start position.

STATION 12

Push-ups: Push-ups will be started with the palms of the hands and toes on the deck, back and arms straight. The body will be lowered (keeping the back straight) until elbows break a 90° angle and then returned to the starting position, with arms locked out.

STATION 13

Dips: Dips will be performed utilizing a bench and the platform at the north end of the gym. Start by sitting on the edge of the platform with the legs extended and resting on the bench. With the hands on the platform, lower the body as far as possible, then extend arms back to full extension.

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

STATION 14

Pull-ups: Pull-ups will be performed on the pull-up bars at the south end of the gym. Palms forward, full arm hang; pull-up until chin passes over the bar, then return to full arm hang position. Repeat. (No kicking of feet allowed).

D. Cross Country Running Option

1. The 1.5 mile cross country running course behind bldg. 3828 will be used for this evolution.
2. The instructor will select either a two or three mile distance depending on how long the class has been on board (Recommend two miles when in the first two weeks of training and three miles when further in training).
 - a. The 2 mile run will consist of the complete 1.5 mile course followed by an additional lap around the Kane Field loop.

The goal times are:

Men - 16 minutes
Women - 20 minutes

- b. The 3 mile will consist of 2 complete times around the 1.5 mile course.

The goal times are:

Men - 24 minutes

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

Women - 30 minutes

E. Group Run Option -

1. Group runs will consist of a uniformed Formation four columns in width the length will be dependant on the number of students in the class. The distance between runners will be approximately an arms length and 6 inches to maintain uniformity.
2. Run standards will be a 9 ½ to a 10 minute mile per hour pace. The run distance will not exceed 3 miles in length.
3. Run routes will adhere to NASPNCLAINST 5560.5W Enclosure 2 page 3 paragraph L.

Instructor requirement (3). Primary instructor will control the pace of run. Additional instructor will run at the rear of the formation in the event of fallouts he /she will collect stragglers and keep them in a formation for accountability and safety running at their own pace. The third instructor will follow a close distance behind with safety vehicle.

F. Cardiorespiratory / Muscular Endurance Workout options

1. Each exercise will be done for 30 seconds, with a 10 second rest period between each exercise. There is a two minute rest period between each set. Repeat as necessary.

All exercises performed IAW P-9E-1238 PTI course.

a. Exercises

- 1) Jumping Jacks
- 2) Knee bender (Supine or Seated)
- 3) Trunk twists (seated)
- 4) Oblique sit ups (right and left sides)
- 5) Lunges (Hands on hips, step forward and back to start position)
- 6) Bicycle crunches

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

- 7) Body builders (8-count)
- 8) Crunches
- 9) Run in place
- 10) 1/4 Sit ups
- 11) Push ups
- 12) Squats
- 13) Donkey Kicks

2. Sprints (indoor)

Divide basketball court into four equal sections by using the free throw lines and half court line. Each student shall run to each line consecutively, with a return trip to the start line before going to the next line. After all the lines are completed including the boundary line on the other side of the court, the student running shall tag the next member of their group to start. After every member of the group has completed the sprint, the groups/teams will be awarded 1st, 2nd, 3rd, and 4th place. The 2nd place group is awarded 10 push ups, 3rd place group is awarded 20 push ups, and the 4th place group is awarded 30 push ups. Repeat as necessary.

Divide students into four equal groups at East end of basketball court.

3. Fartlek Running

Start students on the first side of the square with a sprint. After they pass the second cone, the student shall jog to the next cone. After the cone is passed, the student shall walk to the next cone. After the cone is passed, the student shall jog to the start line. Repeat as necessary.

Set up four orange cones in the shape of a square, with approximately 30 yards apart. Muster students in Kane Field. Form the students in a group of

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

4. Upper body work-out

The upper body workout consists of the following exercises: pull ups, dips and push ups. Pull ups shall be performed with a forward grip only. The dips can be performed in two ways. The first method is to lean forward over your hands, this will work your pectoral muscles. The second method is to move straight up and down, this will work your triceps. While doing dips, you must move your upper arm so that it is parallel to the floor, and then return to your starting position. Using the pull up bars in the gym, have the students do one pull up. Once the pull up is complete, the student will then perform five dips on parallel bars. After the dips, the next exercise will be ten push ups. This will complete one cycle for the upper body work out. More cycles can be added; however, the pull ups will increase by one until the total of five is reached. Once five pull ups is achieved, the number will decrease back to one. Five dips, and ten push ups will be maintained through out the cycles.

two or three.

If parallel bar is unavailable, the dips may be omitted.

5. Abdomen Workout Option/Lower Body

The abdominal area is divided into two separate entities when doing exercises: upper, lower. When concentrating on the upper abs, they are done almost completely alone, but when working on the lower abs the upper abs also get a workout. The obliques also depend on the upper abs for

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

support. The recommended exercise order to work your abs is to start with your lower abs, then your obliques, and finally your upper abs.

Exercise order:

- a. Jumping Jacks, 20

 - b. 4-Count Lunges, 20
 - c. Seated Tucks, 20
 - d. Squat Jumps, 15
 - e. Obliques-right and left side, 20
 - f. 8 Count Body Builders, 15
 - g. 4 Count Bicycle crunches, 20
 - h. 4 Count Squats, 20
 - i. Crunches, 20
 - j. 4 Count Lunges, 20
 - k. 1/4 Sit-ups 20
6. Airboxing Introduction and Choreography
- a. Proper punching form is essential for safety.

NOTE: The number of repetitions may vary slightly due to overall fitness of students.

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

- b. Stand with knees slightly bent, feet should be positioned shoulder width apart.
- c. Ready defensive position: defensive stance with fists loosely clenched just below face, elbows and forearms protecting ribcage.
- d. Avoid hyperextension of the elbow and locking of knees.
- e. Throw the following punches with a loose fist, beginning and ending with ready position:
 - 1. Punch: arms extends in front (imagine punching opponent's eye)

Lead students through practice of alternating right/left punches.
 - 2. Jab: arm extends double time in front (imagine jabbing opponent's eye)

Lead students through practice of alternating right/left jabs.
 - 3. Cross: arm extends crossing slightly in front (imagine punching opponent's nose)

Lead students through practice of alternating right/left cross punches.
 - 4. Hook: arm remains slightly bent and

Position safety
observers around mats.

Do not lock out elbows.

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

extends in front (imagine punching side of opponent's jaw)

Lead students through practice of alternating right/left hooks.

5. Uppercut: punch comes from underneath (imagine punching opponent under the chin)

Lead students through practice of alternating right/left uppercuts.

6. Flurry: punch comes from underneath, alternating right and left uppercuts, double time (imagine a series of alternating uppercuts)

Keep head up during flurry punches.

Lead students through practice of flurry punches.

7. Speed bag: both hands in air level with face, imitate punching a speed bag.

Lead students through a practice of speed bag.

8. Combination: any combination of more than two different punches thrown in succession

Lead students through practice of a combination punch.

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

9. Demonstrate boxer shuffle step:
primary step to be used throughout
choreography of different punches.
Shift weight back and forth right to
left foot, weight on front portion of
foot.

Do not lock out knees.

After demonstration, have students
practice boxer shuffle step in ready
position.

f. Session One:

All exercises performed
IAW NASC PTI (P-9E-1238)

- (1) Shuffle, arms ready position
- (2) Alternate right/left punch
- (3) Shuffle
- (4) Alternate right/left jab
- (5) Shuffle
- (6) Right punch, right punch, left jab
(Right Combination jab)
- (7) Shuffle
- (8) Left punch, left punch, right jab
- (9) Shuffle, arms ready position
- (10) Repeat steps 4 through 9, substituting
cross punch for jab.

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

- (11) Repeat steps 4 through 9, substituting hook punch for jab.
- (12) Repeat steps 4 through 9, substituting uppercut for jab.
- (13) Shuffle, arms ready position
- (14) Side to side step, flurry
- (15) Simulate skipping rope
- (16) Simulate jumping rope
- (17) Cross country skier exercise
- (18) Speed bag
- (19) Jumping jack foot movement, arms simulate skipping rope
- (20) ½ jumping jack foot movement, arms simulate skipping rope
- (21) Repeat steps 14 thru 20
- (22) Walk in place
- (23) Side to side step, arms extended out to sides palms up

Keep feet moving, head up at all times.

Knees don't extend past toes. Don't bend leg beyond 90 degree angle. Keep back straight, head up.

Arms slightly bent at elbows, no bouncing leg movements.

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

- | | |
|--|--|
| (24) Side to side step, bend elbows make hand into fist, bring fist to shoulder; pump biceps | Muscular endurance, don't allow arms to drop. |
| (25) Side step, palms down, make small clockwise circles with hands, reverse motion of hands | Keep arms slightly bent. No bouncing leg movements while performing arm circles. |
| (26) Side step, shoulder press | |
| (27) Side step, press out to side | |
| (28) Speed bag, shuffle feet | |
| (29) Walk in place | |
| (30) Side to side step, flurry | |
| (31) Simulate skipping rope | |
| (32) Simulate jumping rope | |
| (33) Cross country skier exercise | |
| (34) Jumping jack foot movement, lateral arm raise movement | |
| (35) ½ jumping jack foot movement, lateral | |

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

- arm raise movement
 - (36) Perform boxer shuffle, any combination punch for a period of 60 seconds
 - (37) Perform boxer shuffle, any combination punch for a period of 60 seconds
 - (38) Side to side step, flurry
 - (39) Simulate skipping rope
 - (40) Simulate jumping rope
 - (41) Cross country skier exercise
 - (42) Jumping jack foot movement, lateral arm raise movement
 - (43) ½ jumping jack foot movement, lateral arm raise movement
 - (44) Perform boxer shuffle, any punch for a period of 30 seconds
 - (45) Perform boxer shuffle, any punch for a period of 30 seconds
 - (46) Walk in place
 - (47) Side to side step, flurry
 - (48) Walk in place, slowing down pace gradually
- Head up, keep feet moving.
- One to two minutes.

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

g. NOTE: The airboxing workout may be personalized by utilizing any of the following approved exercises in conjunction with the choreography listed above.

- (1) Jumping Jacks
- (2) ½ Jumping Jacks
- (3) simulate jumping rope
- (4) simulate skipping rope
- (5) Walk in place
- (6) Run in place
- (7) Side steps
- (8) Forward steps
- (9) Lunges
- (10) Squat
- (11) Cross country skier
- (12) Biceps curls
- (13) Arm circles (small)
(forward/backward)
- (14) Shoulder press (up)

NOTE: LUNGES, SQUATS, CROSS COUNTRY SKIERS: Knees do not extend past toes. Leg doesn't go beyond 90 degree angle, keep back straight and head up.

Keep arms slightly bent. No bouncing leg movements while performing arm circles.

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

- (15) Shoulder press (out to side)
- (16) Lateral arm raise, elbows bent

h. Session Two:

- (1) Perform pelvic tilt exercise. Laying on back arms supporting lower back, gently lift pelvis toward ceiling and lower, using abdomen muscles. 15 repetitions.
- (2) Perform bicycle crunches 15 repetitions.
- (3) Perform oblique crunches right side. 15-25 repetitions.
- (4) Perform oblique crunches left side. 15-25 repetitions.
- (5) Perform abdominal crunch exercise. 15-25 repetitions.
- (6) Relax for 30 seconds.
- (7) Perform two or three sets of session two at instructor's discretion and based on fitness level of the class.

Ensure the students keep the lower back on the deck by placing their hands underneath their buttocks while performing leg lifting exercises. This will add support to the lower back, and will prevent injury.

F. Perform cool down stretching exercises.

Performed IAW LTG 7.4

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

SUMMARY AND REVIEW

- A. State lesson objectives
- B. Review major teaching points.

Turn to cover page for objectives

Briefly summarize.

APPLICATION

See presentation for application.

EVALUATION

None.

ASSIGNMENT

None.

LESSON PLAN

January 2005

COURSE TITLE: Physical Training
Aviation Preflight
Indoctrination Course,
Q-9B-0020

CLASSIFICATION: Unclassified

LESSON TOPIC NUMBER: 7.8

LESSON TOPIC: Weight Training

ALLOTTED LESSON TIME: 1.0 Classroom
1.0 Laboratory

INSTRUCTIONAL SUPPORT:

1 Classroom instructor
1 Laboratory instructor

INSTRUCTIONAL REFERENCES:

1. OPNAVINST 6110.1G
2. Namrl-1334 Physical Fitness Training to Enhance Aircrew G Tolerance
3. Lesson Topic Guide 7.4
4. U.S. Army Physical Fitness Instructor Training Manual
5. Resistance Training Instruction Text
6. Cybex Instruction Placard

TERMINAL OBJECTIVE:
Completely supported by this lesson
topic:

7.0 Upon completion of this unit of instruction the student will demonstrate an understanding and application of physical training, health, and Navy/Marine Corps fitness standards; have passed a standard Navy PRT to NASC and have gained a sense of appreciation for an aggressive competitive spirit and the team concept without injury to personnel or damage to equipment.

ENABLING OBJECTIVES:
Completely supported by this lesson
topic:

7.46 Demonstrate techniques for developing and maintaining a level of physical fitness directed at enhancing G-tolerance and overall muscular strength utilizing weight-training equipment.

CRITERION TEST:

None.

HOMEWORK:

None.

INSTRUCTIONAL AIDS:

1. NASC Weight Training Form
(Chest/Shoulders/Triceps)
2. NASC Weight Training Form
(Back/Biceps)
3. NASC Weight Training Form
(Legs/Forearms/Abdomen/Oblique/Neck)
4. 4 NAVAVSCOLSCOM Form 6310/1
Revision 07-02

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

INTRODUCTION

Take role and record absentees and light duty students.

A. Establish Contact

1. Introduce self, give rank, current job.
2. State background, schools, duty stations, etc.
3. State question and answer policy.
4. State training time out policy.
5. Describe nonverbal TTO signal.

A Hand and arm signal for Training Time Out will be utilized in the event it is not given verbally by forming a "T" with both hands. One hand will be held vertically and the other placed horizontally across the top forming a "T".

6. Ask for medical concerns
 - a. Has anyone gone to the hospital/branch clinic for treatment within 24 hours, and are you taking any medications?
 - b. Has anyone taken over-the-counter medications within 24 hours?
 - c. Are there any potentially disqualifying illnesses/conditions for which you are currently being treated?

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

- d. Has anyone consumed alcohol in the past 12 hours?

B. State Lesson Objectives

Turn to cover page of Lesson Topic Guide and paraphrase objectives.

C. Establish Readiness

1. Motivating statements

In preparation for future combat roles, aviators must become competent and achieve high levels of readiness in a variety of military skills. Increases in muscular strength and muscular endurance will certainly improve their ability to function effectively in the combat environment. Achieving and maintaining high levels of strength, endurance and flexibility is a must if one wishes to win and survive both personally and as a unit during future conflicts.

Weight lifting takes on a new meaning when alternating from recreational or sports related lifting to "combat ready" professional training.

Military aviation requires aircrew who are physically fit. Lack of required strength in some situations can mean the difference between life and death, mission completion vice mission failure, or heroism instead of personal embarrassment. Examples of strength demands in military aviation include:

- Loss of power boost systems in aircraft make it necessary for manual override on ailerons, elevators, and rudder; requires arm and leg

strength.

- Dive bombing training, air combat maneuvering, gunnery and aerobatics require strong thigh and stomach muscles to counteract G-forces. Additionally, G-suits do come unplugged, tear, and rupture. Force required to hold 4-6 G's on fighter aircraft requires 40 to 50 pounds of pull using upper arm and shoulder muscles.

- A student in a split-S maneuver is exposed to 4 G's, requiring sufficient arm strength to withstand a 50 pound pull depending on airspeed. With no G-suit or power assisted controls (T-34), he/she needs leg, arm, and stomach strength.

- 18-23 G-for exertion on the body during ejection sequence requires strong back, shoulder and chest muscles.

- Opening shock of parachute subjects body to great stresses at speeds above 300 knots. Not all ejections are controlled, i.e. slow speed, straight and level.

- Catapult G-forces require quick recovery from stress.

The Naval Aerospace Medical Research Laboratory (NAMRL) conducted research which proves strength training greatly enhances G-tolerance.

Weight lifting increases G-tolerance, cockpit mobility, airborne situational awareness and muscular endurance needed during air combat maneuvering.

The human factor is the limiting factor in the aircrew/aircraft combination in relation to

pulling G's in tactical aircraft.

Strength training improves the appearance of the physique, which enhances military bearing.

Weight lifting is one of the most popular forms of exercise in military gyms both on and off the ship.

Survival situations (Air/Land/Sea/POW) pose unknown strength requirements.

Weight lifting produces positive effects in all phases of squadron life. Examples include:

- Captain's Cup Sports Competition
- Moving personal cruise boxes on and off ship
- Earning respect from subordinates
- Wearing 50 lbs. Of gear for 8-12 hours/day

It is important for all aviators to maintain high levels of muscular strength and endurance.

Aviators vary in physical makeup. Many physiological differences exist between the sexes as discussed in the U.S. Army Instructor Training Manual. Differences like these must be taken into account when designing strength training programs to reach fitness goals. Physiological differences must be examined not to create dissention between our troops but to acknowledge areas where overall readiness may be improved. It is very important that females as well as males give the proper attention to the weight training syllabus.

Research is currently being conducted by Naval

Medical Research Laboratory that will establish gender-neutral minimum occupational standards required to perform fleet operational flying duties. Task specific performance requirements based on "worst case scenarios" for instantaneous strength, sustained strength/endurance, and aircraft emergency survival situations will be developed. Once developed, entry level testing will be conducted to identify individuals capable of meeting those requirements. A program will be designed to allow student aviators/flight officers to meet or exceed those standards. In the future, training and annual testing of fleet aircrew may occur to ensure that those in the cockpit meet the standard. Students should start preparing now!

2. Lesson overview

The purpose of this lesson topic is to introduce the student to weight training requirements, principles, programs and exercises and demonstrate proper weight lifting technique.

a. Lesson Topic: Weight Training

b. Major Teaching Points:

- (1) Human anatomy.
- (2) Weight lifting principles.
- (3) Program design.
- (4) Gym rules.
- (5) Weight lifting techniques

demonstration.

(6) Student workouts.

PRESENTATION

A. Human Anatomy

The human body has three types of muscles: skeletal, smooth and cardiac. Weight training develops the skeletal muscles by breaking them down and increasing their efficiency. The manner in which this takes place will be covered in detail in the Sports Medicine lecture.

The major muscle groups of the body include the pectorals, deltoids, trapezius, biceps, oblique, abdominal, quadriceps, rhomboids, triceps, latissimus dorsi, spinal erector, gluteus, hamstring and gastrocnemius.

B. Weight Lifting Principles

1. Exercise specificity. For optimal improvement, one should work the same muscles and respiratory parts that are used during actual performance. For example, the squat is the closest exercise to performing the anti-G straining maneuver (AGSM) since one uses most of the same muscles and pushes against a partially closed glottis.
2. Exercise intensity. For maximal benefits in strength, the load should be 80-90% of the maximum weight that can be lifted one time (one repetition maximum or 1 RM).
3. Exercise duration.

	<u>% Max WT</u>	<u>Reps</u>	<u>Sets</u>	<u>Rest</u>
Strength	80-90%	6-8	3-4	1.5-5.0
Endurance	65-75%	12-15	3-4	.5

NOTE: Rest periods is in minutes.

4. Rest Periods. Specific rest periods should be adhered to between sets and between exercises, depending on program goals. Duration of the rest period will affect the strength available for the next set and the overall physiological stress of the workout. One day per week should be set aside for passive rest.
5. Exercise frequency. A minimum of 48 hours should elapse between workouts training the same muscle group.
6. Warm-up and cool-down. Warm up muscles and get muscles/tendons used to going through the full range of motion before lifting heavy weights. Cool down emphasizing stretches for the muscles used during the exercise session.
7. Program assessment. For beginners, a slight decrease in strength may occur during the first couple of weeks. This is normal since the muscles are breaking down and sometimes sore. Don't give up. Later, strength should increase in a stair-step fashion until near maximum strength is obtained. During this phase, increases in strength are much smaller and less frequent. At this point, don't give up. Set more realistic goals like 5-10 lb. Increases every 6 months to a year.
8. Exercise timing. The demands of exercise on the cardiovascular and metabolic systems are such that 3+ hours should elapse before assuming

flight duties involving high-G.

9. Exercise order. Large muscles should be trained prior to working the smaller muscles. After the large muscles are trained, exercises may selected which isolate specific smaller muscles. For example, in order to train the pectoral muscles using the bench press, the pectorals, deltoids, and triceps are used. After working the pectorals, exercises may be chosen to isolate the deltoids and triceps without using the pectorals. If the deltoids and triceps are trained first, the pectorals can not be trained for maximum strength gains.
10. Ready Position. Simply pull the shoulder blades back slightly and down. Lift the sternum slightly out and up and pull the chin slightly back and down, creating, or while maintaining, the natural arch in the lumbar and cervical regions of the spine. Picture a soldier standing at attention with his or her shoulders back and chest out.
11. Exercise form. The form one uses when performing a particular exercise makes a tremendous difference in the effectiveness an exercise has in stimulating new muscle growth. For example, moving the hands down the bar an extra inch, lowering an elbow below horizontal, or lifting in a straight line vice an arc can vary the percentage of force acting on a particular muscle and in some cases shift the force to an entirely different muscle, thus decreasing or even eliminating expected strength gains. The more one knows about how a muscle works, the more profitable exercise sessions may become.
12. Applied force. Weights should be supported throughout the full exercise. Many lifters work

the protagonist muscle but let gravity control the majority of the movement on the eccentric part of the lift. Work the antagonist muscles also.

13. Workout partner. A good workout partner motivates as well as ensures safety throughout the workout. Be particular in choosing a workout partner, but have one.
14. Safety. Anytime weight is lifted above the head of heavy forces are placed on the spine, a weight belt should be used. Use spotters anytime lifting above the body with heavy weights.

C. Program Design

1. Specific goals should be defined prior to designing a fitness program. Goals could include the following: increase upper body strength, increase static or dynamic flexibility, increase power, improve cardiovascular fitness, develop lower body strength, lose weight, provide variety in training, or train specifically for upcoming competition, etc. Once a goal is defined, a program may be designed to meet or exceed it. For annual planning, defining new goals approximately every 12 weeks is sufficient to workouts interesting. For example, one may work upper body strength for 12 weeks, and choose to train for cardiovascular for the next 12 weeks.
2. For overall strength training, one method of arranging muscle groups to work different muscles during separate workouts is defined on the NASC Weight Lifting Forms. Student will complete these forms during future weight training classes. When choosing exercises, students

should:

- (a) Choose three exercises per body part.
(Exercises should be chosen to work all parts of the muscle. For example, when working the chest, an exercise should be chosen to work the middle pectorals, followed by isolation exercises to work the upper and lower pectorals.)
- (b) For each exercise, perform one warm-up set with whatever weight may be lifted for 15-18 reps. This will warm up the muscles, tendons, and ligaments and move the muscle through the full range of motion.
- (c) Next, three sets should be performed to train the muscle. A weight should be chosen to perform 6-8 repetitions. For experienced weight lifters, a pyramid routine may be performed.
- (d) Workout partners will alternate so that while one is lifting, the partner can spot while catching his or her breath.
- (e) When all muscle groups have been trained, additional exercises may be chosen or the abdominal muscles may be worked until the instructor ends the class.

Have students go to gym.
Demonstrate set-up
procedures and correct
form for each
machine/exercise.

D. Gym Rules

- 1. Weights will be restacked upon the completion of each exercise unless another set of students is ready to use the weights.
- 2. Olympic weights will be removed from the bars

when the exercise is completed. (One 45 lb. Plate or less may be left on each side of the bar.)

3. Weight belts will be worn as described above.
4. Weights will not be banged together or damaged through misuse.
5. Foul language will not be tolerated.
6. Personal radios and tape players are not allowed in the gym.
7. Towels will be used to clean/dry areas of common body contact as a sanitary precaution.

E. Weight Lifting Technique Demonstration

1. Bench press

Lay on bench with head, shoulder blades and buttocks touching bench.

Grasp bar slightly wider than shoulder width apart.

Lower bar to pectoral muscle.

Push bar up and exhale just past sticking point (3/4th the way up).

Keep resistance on muscles. Locking arms at the top will shift resistance to the skeletal system.

2. Bent arm fly

Rest dumbbells on thighs.

Lay flat on bench.

Raise dumbbells to extended position with palms facing each other.

Lower weights in an arc to position parallel to the shoulders.

Raise weights in same arc to extended position.

Flex pectoral muscles approach top of lift.

3. Incline bench press

Sit on incline bench and grasp bar wider than shoulder width.

Lower bar to upper pectorals.

Extend bar opposite gravity force.

Note: the direction is not perpendicular to chest but moves toward head.

Do not arch back.

4. Incline dumbbell fly

Sit on incline bench and lift weights to thighs and then to extended position directly above shoulder.

Lower weights in an arc until upper arm is slightly lower than parallel to the deck.

Push weights back through the arc to the extended position contracting upper pectorals as weight approach the top.

5. Decline bench press

Lay on decline bench press with legs secured.

Grasp bar wider than shoulder width apart. Lower bar to lower pectorals and return to extended position. (Note: opposing gravity is not perpendicular to chest, but toward the hips.)

6. Decline dumbbell fly

Lay on decline bench. Raise dumbbells or have partner hand them to you.

Extend arms out to starting position and push weights up through arc while contracting lower pectorals.

Lower weight through arc to starting position.

7. Arm cross

Adjust seat to align shoulders under the overhead axes of movement arms.

Sit in seat and fasten seat belt.

Place legs on leg rest and relax lower body.

Place forearms behind movement arm pads. Grasp handles lightly.

Push with forearms trying to touch elbows together. Keep neck back, chin down, chest up, shoulders down, and back arched. Pause in finished position, then lower weight slowly to comfortable stretch.

8. Chest dip

Perform dip with body bent forward and elbows out. Keep force on pectoral muscles.

9. Push up

Perform military style push-up with wide hands and elbows parallel to shoulders.

10. Military press

Sit on bench with back straight. Grasp bar with wide grip and lower bar to shoulders.

Press bar straight up to extended position. Keep resistance on muscular system.

11. Overhead press

Same as military press except performed on Nautilus.

12. Upright row

Hold barbell in middle and raise to chin keeping weight close to body. With hands together, exercise works deltoids. With hands 4-6 inches apart, exercise works the trapezius.

13. Lateral deltoid fly

Grasp dumbbell with arms by side. Raise dumbbell laterally until parallel to shoulder, then lower. Keep palm facing body.

14. Anterior deltoid fly

Place dumbbell on upper thigh with palm toward thigh. Raise dumbbell in front of body with palm

facing down. Raising weight until parallel to shoulder. Keep shoulders square.

15. Posterior deltoid fly

Grasp weights and bend at waist. Raise dumbbells with palms facing knee directly below chest toward the rear and rotate arms out until palms face ground. Then return to starting position.

16. Rowing torso

Sit with back towards weight stack. Use pads as necessary to stabilize upper body.

Put arms between vertical roller pads and cross forearms.

Bend arms in a rowing fashion as far back as possible. Pause, then return.

Keep arms parallel to deck at all times.

17. Lateral raise

Set seat at height where shoulder joints are in line with axis of cams. Fasten seat belt.

Pull elbows slightly to rear of you torso, inside movement arm pads. Grasp handles lightly.

Press against movement arm pads. Raise arms a little above horizontal while simultaneously holding your shoulders down. Pause, then return to start position.

18. Lying French press

Lay on flat bench. Raise bar or have partner

hand weight to you. With thumbs under bar, lower bar to forehead keeping upper arm stationary in vertical position. Return weight to extended position keeping upper arm stationary.

19. Triceps press down

With thumbs on top of straight bar or V-shaped bar, press bar down extending triceps while keeping upper arm stationary.

20. Multi-triceps

Position seat where elbows are slightly higher than shoulders when upper arms are resting on pad.

Position movement arm forward to sit in machine.

Place hands loosely on pads with palms facing each other.

Extend both arms to forward position. Retract one arm or both arms to start position and then push pad to return to extended position keeping elbow on pad lined up with side pads.

21. Triceps bench dip

Position two benches so that heels may rest on one and while hands are on the other one close to buttocks.

Lower body slowly as low to stretch triceps, then raise body to start position while contracting the triceps.

22. Triceps bar dip

Lower and raise body keeping body erect.

May be performed on Gravitron or multi-exercise machine.

23. Triceps push-up

Perform military style push up keeping elbows back.

24. Close grip bench

Perform same as Bench press except position hands on bar either shoulder width or less.

25. Triceps kick back

Grasp dumbbell and bend at waist. Keep upper arm parallel to body and extend arm to locked out position.

Start with palm facing body and complete extension with palm facing up.

26. Dead lift

Grasp bar with wide grip, palms facing opposite direction. Keeping back as straight as possible, raise bar using legs.

At top of lift, rotate shoulders up and back contracting upper back muscles. Pause, rotate shoulders up and forward returning bar to floor.

27. Shoulder shrug

Grasp bar with wide grip.

Keeping arms extended, raise bar until trapezius

muscle is fully contracted. Pause, then return bar to start position.

28. Upright row

Same as 12.

29. Gravitron

Select appropriate weight according to chart on machine.

Grasp one set of the handgrip bars and place knees in slots on pad.

Wide grip works latissimus dorsi. Middle grip works middle/lower trapezius and rhomboids. Inside grip works biceps. Lower handles work triceps or pectorals.

Lower and raise body using position to isolate muscle groups.

30. Close grip pull down

With body erect, grasp V-grip and pull down. Lean back until force is pulled along path working all of latissimus dorsi.

31. Scapula pull

In seated position, grasp bar above head with latissimus dorsi full extended.

Pull bar down contracting shoulders and shoulder blades.

Pause, the return bar to start position.

32. Pull up

Grasp pull up bar with hands wider than shoulder width.

Pull body to bar with bar behind the head. Do not hunch back at top but remain erect. Pause, and return to start position.

33. Lat pull down

In seated position, grasp bar with wide grip. Pull bar down to back of neck fully contracting latissimus dorsi.

34. Decline dumbbell row

With body bent at waist, extend arms fully until latissimus dorsi is fully stretched.

Pull dumbbells up contracting latissimus dorsi until arm is bent at 90 degree angle.

Ensure pulley is straight up and rotate hands from a 45 degree angle to palms facing body.

Pause, and slowly lower weight to start position.

35. One hand dumbbell row

Same form as decline dumbbell row (34) except using only one dumbbell.

36. One hand cable row

Seated, with knees slightly bent, reach to grab pulley fully extending latissimus dorsi.

Pull handle while erecting torso to slightly

beyond a vertical position. Elbow should end up adjacent to the oblique. Supinate hand during pull. Pause, and return handle to start position.

37. Two hand cable row

Seated, with knees slightly bent, reach to grab cable bar with both hands fully extending latissimus dorsi.

Pull cable bar toward bottom of rib cage. Pause, and return cable bar to start position.

38. Super pullover

Adjust seat so that shoulders are aligned with axis of rotation.

Fasten seat belt and press on foot lever to move elbow pads forward.

Place arms on the elbow pads of movement arm, and place hands on curved portion of crossbar. Keep hands open.

Remove feet from pedal and slowly rotate elbows up and back.

Rotate elbows until the bar touches midsection. Pause, keep neck muscles relaxed.

Return slowly to stretched position and repeat.

Exit machine by pressing foot pedal to support resistance while you remove elbows from the pads. Lower resistance with legs.

39. Rowing torso

Same as 16.

40. Bent over fly

Sit on edge of bench in leaning position with back arched. Grasp dumbbells and raise them up slightly forward of line parallel to shoulders.

Pause, return weights to start position.

41. Roman chair

Lay across platforms with waist on edge with partner holding ankles. With hands positioned on side of head raise body slightly above horizontal.

Pause, lower body to start position.

Keep back arched throughout exercise to keep resistance on spinal erectors.

42. Alt-side roman chair

Same start as roman chair. Rotate body to raise alternating elbows up. Rotation should keep resistance on spinal erectors.

Pause, lower body to start position.

43. Good morning

Using light weight, place barbell on back of neck. Use wide grip on bar and bend at waist keeping back arched until reaching 90 degree bend.

Raise body and return to start position.

44. Lower back

Sit in seat and fasten seat belt. Select weight and cross hands across chest.

Keep hips stationary and rotate back contraction the spinal erectors.

45. Preacher curl

Position arms over preacher curl bench. Grasp EZ Curl Bar, dumbbells, or straight bar. Raise weight up contracting biceps. Lean into weight as weight is lifted to keep resistance on biceps.

Pause, lower weight to start position.

46. Standing supinated dumbbell curl.

Stand holding dumbbells by thigh. Supinate hands while raising dumbbells to shoulder level.

Lower dumbbells to start position.

Dumbbells may be raised one at a time.

47. Barbell curl

Stand holding barbell or dumbbell and raise weight to shoulder height. Supinate hand as weight is raised.

Lower weight to start position.

48. Multi-biceps

Sit on seat and put elbows on padded support. Seat should be placed at a height that places

elbows slightly higher than shoulders.

Pull movement arms upward and put elbows on pad aligned with axis of rotation.

Cup hands around handles keeping wrists rigid and lower resistance until arms are straight. Do not hunch shoulders.

Pull movement arms upward and put elbows on pad aligned with axis of rotation.

Cup hands around handles keeping wrists rigid and lower resistance until arms are straight. Do not hunch shoulders.

Curl both arms simultaneously as far as possible.

Pause, then lower resistance until arms are straight and repeat.

49. Squat

Position feet flat on deck and place bar across trapezius muscle. Bend knees and lower body until legs are bent at 90 degrees. Raise body to start position.

Keep back straight at all times. Do not lean forward or backward.

50. Leg extension

Sit on seat. Lean forward and place shins behind roller pad. Ensure knees are aligned with axis of rotation. Position pad behind back if needed.

Push movement arm forward and upward to reach full knee extension. Pause, and lower movement arm until weight stack barely touches.

51. Leg curl

Straddle movement arm, facing bench. Curl legs, pulling movement arm towards buttocks. Flex hips and pull toes toward knees as movement arm approaches vertical position.

pause at full knee flexion, then lower until your knees are straight.

52. Side leg lifts

Stand holding on to support. Raise leg to side as high as possible with leg straight and foot parallel to deck.

Lower leg to start position.

53. Duo squats

Sit on lower portion of seat. Lean back, placing neck between shoulder pads.

Place both feet simultaneously on movement arm with heels placed at lower end of foot pads. Adjust seat as necessary.

Straighten both legs simultaneously, keeping head and shoulders in secure position. Legs should stop just short of locking out. Allow one leg to bend and bring thigh onto chest. The other leg should not move. Push out smoothly with the bent leg until the cam completely unwinds, then allow the other leg to bend and then straighten. Continue in this alternating leg fashion.

54. Hip and back

Lay on pad and fasten seat belt. Position legs over movement arms and extend legs one at a time.

Contract hamstring during extension and point toe as leg extends.

After extension, return leg into chest.

55. Single leg hamstring curl

Same form as leg curl (51) except leave one leg off bench.

56. Side leg lift

Lay on bench and raise leg keeping leg stiff and foot horizontal to deck.

Turn on other side and work other leg.

57. Rope hack squat

Place rope over vertical support. Hold on to rope with both hands and bend knees keeping back straight. Contract leg muscles and raise body back to start position.

58. Straight legged dead lift

With legs straight, lower barbell to ankles and return to start position.

Beginners should use very light weight.

59. Calf machine

Stand with pads on shoulders. Raise heels, pause and lower heels to full extension.

Point toes in, straight, or out to isolate

different parts of the calf.

60. Wrist curl

Hold barbell with palms facing up. Curl wrist to fully contracted position.

Lower barbell until wrist fully extends.

61. Reverse wrist curl

Hold barbell with palms facing down. Curl wrist backwards to fully contracted position.

Lower barbell forward until wrist fully extends.

62. Hanging leg raise

Hang from bar and rotate legs in front of body. Bend at waist using lower abdomen to raise legs to 90 degrees.

Lower legs to start position.

63. Hanging knee up

Hang from bar and curl knees into chest decreasing distance between bottom of rib cage and hip bone.

Lower legs and repeat.

64. Abdominal crunches

Lay on back and place hands on head. Curl body up performing crunch on abdomen.

Lower body to start position.

65. ¼ sit up

Lay on back with legs in air at 90 degrees. Curl up raising body toward ceiling.

Lower body to start position.

66. Knee rock back

Lay on back and curl knees into chest.

Return legs to start position.

67. Bent knee sit up

Lay on back with knees bent. Place hands across chest and raise body until both elbows touch thighs.

68. Abdominal machine

Sit in machine with pads across chest/shoulders. Curl body decreasing distance between bottom of rib cage and hip bone.

Return to start position.

69. Side bend

Stand with legs shoulder width apart. Reach along side and return to erect position by contracting opposing oblique.

Do not use weights.

70. Standing/seated twists

Either standing or in seated position, twist upper body quickly but in control to the left and

right. Approximately 50 times to each direction defines one set.

71. 4-Way neck

Sit in machine facing pads. Adjust seat so that nose is even with blue bar.

Perform all exercises from vertical into direction of lift. Never rotate neck through 180 degrees.

Front: from vertical, place chin on chest.

Sides: form vertical, rotate head toward side. Cross hands to keep opposite shoulder down.

Back: from vertical, rotate head toward back.

72. Dual Axis Chest Press (Cybex)

Positioning. Adjust the seat height so that handles are at mid-chest. Adjust handle starting width to desired position using knob overhead. Adjust the handle position so that when grasped, upper arm is straight to side. Check the weight stack to insure appropriate resistance.

Movement. Grip the handles. Position elbows out to side, level with handles. Pinch the shoulder blades together. Press handles forward with a smooth controlled movement and return without resting. Maintain the shoulder blades pinched and elbows at handle level throughout each repetition.

Advance Movement. While pressing forward simultaneously move the handles toward each other. Return to original starting position.

73. Dual Axis Overhead Press

Positioning. Adjust handle width to desired position using width adjustment knob. Adjust the seat so handles are level with shoulders. Check the weight stack to insure appropriate resistance.

Movement. Grasp either set of handles. Let the handles move outward to the stop and then press straight up with a smooth and controlled movement. Control the return to the wide start position without resting.

Advance Movement. While pressing upward, simultaneously move the handles toward the center. Return to the wide starting position without resting.

74. Arm Curl Machine (Cybex)

Positioning. Adjust the seat height to allow the upper arm to rest on the pad. Position elbows in line with the pivot point with the upper arms parallel. Grip the handles and rotate to the desired position. Check the weight stack to insure appropriate resistance.

Movement. By lowering the shoulders, press the upper arms firmly into the pad and elevate the elbows very slightly. Slowly bend the arms as far as possible without raising the elbows further. Slowly return to start position without resting or changing the shoulder arm, or elbow position.

75. Nautilus Triceps Press

Squeeze seat adjustment lever to sit with elbows slightly above shoulders while grasping handles. Secure seat belt. Press handles downward until elbows are almost fully extended. Return slowly to starting position and repeat.

F. Student Workouts

For all weight training classes after this lecture, divide students up into three groups.

Within the groups ensure each student has a workout partner when possible.

The following workout schedule will be followed:

GROUP 2

CHEST/SHOUDLERS/TRICEPS	1
BACK/BICEPS	2
LEGS/FOREARMS/ABDOMINAL/OBLIQUE	3

GROUP 3

BACK/BICEP	1
LEGS/FOREARMS/ABDOMINAL/OBLIQUE	2
CHEST/SHOULDERS/TRICEPS	3

GROUP 4

LEGS/FOREARMS/ABDOMINALS/OBLIQUE	1
CHEST/SHOULDERS/TRICEPS	2
BACK/BICEPS	3

GROUP 5

CHEST/SHOULDERS/TRICEPS	1
BACK/BICEPS	2

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

LEGS/FOREARMS/ABDOMINAL/OBLIQUE 3

GROUP 6

BACK/BICEPS 1

LEGS/FOREARMS/ABDOMINAL/OBLIQUE 2

CHEST/SHOULDERS/TRICEPS 3

GROUP 7

LEGS/FOREARMS/ABDOMINAL/OBLIQUE 1

CHEST/SHOULDERS/TRICEPS 2

BACK/BICEPS 3

GROUP 8

CHEST/SHOULDERS/TRICEPS 1

BACK/BICEPS 2

LEGS/FOREARMS/ABDOMINAL/OBLIQUE 3

GROUP 9

BACK/BICEPS 1

LEGS/FOREARMS/ABDOMINAL/OBLIQUE 2

CHEST/SHOULDERS/TRICEPS 3

OUTLINE OF INSTRUCTION

INSTRUCTOR ACTIVITY

SUMMARY AND REVIEW

A. State Lesson Objectives

Turn to cover page for objectives.

B. Review Major Teaching Points

Briefly summarize.

APPLICATION

See presentation for application.

EVALUATION

Complete PRT.

ASSIGNMENT

None.

LESSON PLAN

January 2005

COURSE TITLE: Physical Training
Aviation Preflight
Indoctrination Course,
Q-9B-0020

CLASSIFICATION: Unclassified

LESSON TOPIC NUMBER: 7.9

LESSON TOPIC: Remedial Fitness

ALLOTTED LESSON TIME: 1.0 Laboratory

INSTRUCTIONAL SUPPORT:

1 Laboratory instructor for each location
1 Safety observer for each location

INSTRUCTIONAL REFERENCES:

1. OPNAVINST 6110.1
2. Lesson Topic Guide 7.4
3. Lesson Topic Guide 7.5

INSTRUCTIONAL AIDS:

1. 4 NAVAVSCOLSCOM Form 6310/1 Revision
07-02

TERMINAL OBJECTIVE:

Partially supported by this lesson topic:

- 7.0 Upon completion of this unit of instruction the student will demonstrate an understanding and application of physical training, health, and Navy/Marine Corps fitness standards; have passed a standard Navy PRT to NASC standards and have gained a sense of appreciation for an aggressive competitive spirit and the team concept without injury to personnel or damage to equipment.

ENABLING OBJECTIVES:

Completely supported by this lesson topic:

- 7.28 Complete the Aviation Physical Readiness Indoctrination test, achieve an overall score of "Low Good" or better in each section.

CRITERION TEST: None.

HOMEWORK: Remedial training as required.

OUTLINE OF INSTRUCTION

RELATED INSTRUCTOR ACTIVITY

INTRODUCTION

A. Establish Contact

Take roll, record absentees, and light duty students.

1. Introduce self, give rank, and current job.
2. Give background, schools, duty stations, etc.
3. State question and answer policy.
4. State training time out policy.
5. Ask for medical concerns:
 - a. Has anyone gone to the hospital/branch clinic for treatment within 24 hours, and are you taking any medications?
 - b. Has anyone taken over-the-counter medications with 24 hours?
 - c. Are there any potentially disqualifying illnesses/conditions for which you are currently being treated?

B. State Lesson Objectives

Turn to cover page of lesson topic guide and paraphrase objectives.

C. Establish Readiness

OUTLINE OF INSTRUCTION

RELATED INSTRUCTOR ACTIVITY

1. Motivating Statements

- a. Every student should strive to achieve and maintain the highest standard of physical readiness.
- b. Enhanced physical fitness increases mental alertness and survivability in extreme situations.
- c. Exercise is a vital part of an overall fitness program.
- d. Exercise should be a part of your daily routine.

Establish importance and relevance of lesson material using personal experience or anecdote.

2. Lesson Overview

- a. Lesson Topic: Aviation Physical Readiness Indoctrination test
- b. Major Teaching Points:
 - (1) Warm-up/stretching
 - (2) APRI test
 - (3) Cool down and stretching

Briefly outline material to be covered.

OUTLINE OF INSTRUCTION

RELATED INSTRUCTOR ACTIVITY

PRESENTATION

A. Warm-up/Stretching

Conduct IAW LTG 7.4
ensure correct exercise
form

B. Conduct Aviation Physical Readiness Indoctrination Test

Conduct IAW LTG 7.5

C. Cool down and stretching.

Conduct IAW LTG 7.4

OUTLINE OF INSTRUCTION

RELATED INSTRUCTOR ACTIVITY

SUMMARY AND REVIEW

A. State lesson objectives.

Turn to cover page for objective.

B. Review major teaching points.

Briefly Summarize

APPLICATION

None.

EVALUATION

Complete APRI test.

ASSIGNMENT

None.

LESSON PLAN

January 2005

COURSE TITLE: Physical Training
Aviation Preflight
Indoctrination Course,
Q-9B-0020

CLASSIFICATION: Unclassified

LESSON TOPIC NUMBER: 7.10

LESSON TOPIC: Lap Swim

ALLOTTED LESSON TIME: 1.0 Laboratory

INSTRUCTIONAL SUPPORT:

- 1 Laboratory instructor for each location
- 1 Safety observer for each location
- 1 In water life guard

INSTRUCTIONAL REFERENCES:

Intermediate Naval Water Survival Training
Program. Annex E.

INSTRUCTIONAL AIDS:

- 1. Two water polo goals
- 2. One ball
- 3. Six caps
- 4. One pool clock

TERMINAL OBJECTIVE:

Partially supported by this lesson topic:

- 7.0 Upon completion of this unit of instruction the student will demonstrate an understanding and application of physical training, health, and Navy/Marine Corps fitness standards; have passed a standard Navy PRT to NASC standards and have gained a sense of appreciation for an aggressive competitive spirit and the team concept without injury to personnel or damage to equipment.

ENABLING OBJECTIVES:

Completely supported by this lesson topic:

- 7.29 Demonstrate improved aerobic fitness, strength, aquatic familiarity, and swim skills

CRITERION TEST:

None.

HOMEWORK:

None.

OUTLINE OF INSTRUCTION

RELATED INSTRUCTOR ACTIVITY

INTRODUCTION

A. Establish Contact

Display name and lesson topic.

1. Introduce self, give rank, and current job.
2. Give background, schools, duty stations, etc.
3. State question and answer policy.
4. State training time out policy.
5. Ask for medical concerns:
 - a. Has anyone gone to medical within the last 24 hours?
 - b. Has anyone taken any medications in the last 24 hours?
 - c. Is there any reason or medical condition because of which you would not be able to participate in training today?

B. State Lesson Objectives

Turn to cover page of lesson topic guide and paraphrase objectives.

C. Establish Readiness

1. Motivating Statements

Establish importance and relevance of lesson material using personal experience or anecdote.

OUTLINE OF INSTRUCTION

RELATED INSTRUCTOR ACTIVITY

2. Lesson Overview

Briefly outline material
to be covered.

- a. Lesson Topic: Lap Swim/Water Polo
- b. Major Teaching Points:
 - (1) Warm-up
 - (2) Work-out
 - (3) Cool down

OUTLINE OF INSTRUCTION

RELATED INSTRUCTOR ACTIVITY

PRESENTATION

A. Warm-up

Increase body temperature, improve circulation, and reduce potential for injury. Swim 200-300 yards not timed using any stroke. Stress technique swimming, not speed.

Screen students to ensure that non-swimmers are not allowed to participate.

B. Work-out

Training, do one of the following:

Ensure that appropriate number of life guards are in place and all required safety equipment is available prior to starting swim.

1. Swim training

a. Strength, wave sprints

Divide students into waves.

- (1) One person per lane.
- (2) Any stroke all doing the same one.
- (3) Six waves (150 yds) then 2-3 minutes rest between wave sets. (Example: 6 waves of crawl, 2 minutes rest, 6 waves of breaststroke, 2 minutes rest, etc. up to 4 waves).
- (4) Allow five seconds between waves, which

Assign a stroke.

CAUTION: Watch for student fatigue.

OUTLINE OF INSTRUCTION

RELATED INSTRUCTOR ACTIVITY

gives 3-4 waves swimming at a time.

b. Endurance, lap swimming

- (1) Divide students into equal groups, consisting of eight people per group. One group per two lanes. Arrange groups by speed.
- (2) Circle the groups, up one lane and down another. Alternate direction of circles: clockwise, counter clockwise, clockwise, etc.
- (3) All swimmers swim the same stroke.
- (4) Swim some of the following sets for the duration of period minus five minutes:
 - (a) 5-7 * 100's on 2 to 3 min. interval (10-15 min.)
 - (b) 3-4 * 200's on 5 to 7 min. interval (15-21 min.)

Assign a stroke. Assign larger intervals to faster groups and smaller intervals to slower groups, so every person finishes about the same time and every one is working. Use a pool clock so swimmers can start their intervals.

OUTLINE OF INSTRUCTION

RELATED INSTRUCTOR ACTIVITY

- (c) 1-2 * 500's on 9 to 15 min. interval
(15-18 min.)

2. Water Polo

a. Equipment

- (1) Two goals
- (2) One ball
- (3) Seven caps

NOTE: Each goal is considered an instructor location.

b. Rules

- (1) Start quarters by having teams line up at opposite sides and sprint for the ball at the half way point at the pool edge.
- (2) Quarters are 7 min. long and are separated by 5 min. rest periods.
- (3) Teams consist of six players and a goal.
- (4) Fouls - 2 types
 - (a) Technical: turn ball over to other team and give a free throw.
 - 1) Player swims over opponent.
 - 2) Player puts ball under water.
 - 3) Player comes within 2 meters of

OUTLINE OF INSTRUCTION

RELATED INSTRUCTOR ACTIVITY

- other teams goal without ball being closer to goal.
- 4) Player reaches over opponent to get ball.
 - 5) Player touches side and has position of ball.
 - 6) Playing the ball.
- (b) Personnel: remove player for 30 seconds or until a goal is made.
- 1) Player grabs opponent.
 - 2) Player fouls a player with a free flow.
 - 3) Player plays the man, not the ball.
- (c) Call fouls with the whistle and give free throws at location of foul.
- (5) Goals are scored when center of ball breaks the plane of the face of the goal.
 - (6) Players can handle the ball with 2 hands (normally only the goalie can put 2 hands on the ball.)
 - (7) Players substitute out at goals and quarters.

OUTLINE OF INSTRUCTION

RELATED INSTRUCTOR ACTIVITY

- c. Safety: Call fouls and kick out players to control play, keep play clean, not rough.

C. Cool down

Swim 200 yards - allows muscles to get rid of the by-products of exercise, which inhibit muscular development.

OUTLINE OF INSTRUCTION

RELATED INSTRUCTOR ACTIVITY

SUMMARY AND REVIEW

A. State lesson objectives.

Turn to cover page for objective.

B. Review major teaching points.

Briefly Summarize

APPLICATION

None.

EVALUATION

Complete PRT.

ASSIGNMENT

None.