What Is Fitness?
• • Definition: A state of health characteristics, symptoms, and behaviors enabling a person to have the highest quality of life.
• • In other words your overall state of health.

Benefits of Being Fit:
• • 1. Exercise is Medicine.
  ● ● The significant health problems that can be at least partially controlled by exercise:
    ● ● Heart disease, hypertension, depression, high cholesterol, low back pain, osteoporosis poor circulation, diabetes, colon cancer.
  ● ● The statistics for Americans:
    ● ● 13.5 million people have heart disease.
    ● ● 1.5 million suffer a heart attack each year.
    ● ● 8 million have diabetes (type II).
    ● ● 95,000 new cases of colon cancer each year.
    ● ● 250,000 hip fractures each year
    ● ● 50 million people have high blood pressure.
    ● ● 121 million (2/3 of US pop.) are overweight.
    ● ● 60 million (1/3 of US pop.) are obese.

Benefits of Being Fit:
• • 2. Exercise is good for the body:
  ● ● Keeps joints moving.
  ● ● Keeps muscles strong.
  ● ● Keeps bones and cartilage strong.
  ● ● Increases energy levels.
  ● ● Helps to control weight.

Benefits of Being Fit:
• • 3. Exercise is good for the brain.
  ● ● A recent study of over 900,000 students in California (grades 5, 7 & 9) shows a direct relationship between academic achievement and fitness levels.
  ● ● Students who met minimum standards in three of six fitness tests showed the greatest gains in academic achievement.
  ● ● Improves psychological well-being.
  ● ● Improves self image.
  ● ● Boosts your mood.
  ● ● Lowers stress.
● Decreases depression.
● Reduces feelings of anxiety.

Benefits of Being Fit:

4. Improves daily life:
   ● “Adds life to your years, as well as years to your life.”
   ● Extends lifespan.
   ● Slows aging process.
   ● Maintains high levels of physiologic function.

Components of Fitness:

- Aerobic/cardiovascular endurance
- Muscular strength
- Muscular endurance
- Flexibility
- Body composition

Fitness Component #1:
Aerobic Endurance

Definition: the ability of your heart to pump oxygen-rich blood to muscles during exercise that is done for an extended amount of time.

Criteria:
   ● Must be done continuously for at least 20 minutes.
   ● Must increase your heart rate.

Benefits:
   ● Improves cardiovascular and respiratory systems (become more efficient).
   ● Decreases resting heart rate.
   ● Maintains caloric balance (burns excess calories).
   ● Decreases stress.
   ● Lowers blood pressure.

Examples:
   ● Running
   ● Biking
   ● Swimming
   ● Snowshoeing
   ● Rollerblading
   ● Aerobics class
   ● Basketball
Training Guidelines:
- To maintain current aerobic fitness level:
  - 3 times per week.
  - 20 minutes each time.
* To improve, you must do more.
- Must be working within your aerobic training zone as related to heart rate.

Aerobic exercise utilizes both the cardiovascular system and respiratory system
- Cardio is Greek for “heart”
- Vascular refers to “blood vessels”

Parts of the Cardiovascular System:
**CV-1: Heart**
- Acts as a pump to supply blood to the body’s systems.
- Blood contains oxygen, which your muscles need for exercise.
- There are two ways your heart can get more oxygen to the muscles:
  - Beat faster.
  - Send a greater amount of blood with each beat.
- Is very efficient: one half of its fuel is converted into energy (a car converts about one quarter of its fuel into energy).
- Is different than other muscles in the body – contracts automatically without using the brain.
- Heart Rate = the number of times your heart beats in one minute.
- Resting Heart Rate = your heart rate while completely at rest.
  - People with resting heart rates over 70 have a greater risk for heart attacks.
  - Regular aerobic exercise will decrease resting HR’s.
- Maximum Heart Rate = the fastest your heart can beat. It is found by taking 220 and subtracting your age. (Max HR = 220 – age)
- In order for exercise to be considered aerobic, you need to be exercising at 60-85% of your maximum heart rate.
  - (220 – age) x 85% = top end of Target Heart Range
  - (220 – age) x 60% = bottom end of Target Heart Range
- Anaerobic: working at higher than 85% of your maximum heart rate.

**Parts of the Cardiovascular System:**

**CV-2: Lungs**
- Your blood picks up oxygen in the lungs and carries it to the muscles.
- If your lungs are not healthy, your blood cannot pick up oxygen efficiently.
- Without enough oxygen, you will not be able to exercise vigorously for long periods of time.
- Meaning: bad lungs = poor aerobic fitness

- 48 million Americans smoke cigarettes.
- This single behavior will result in disability and premature death in half of those people.
- 440,000 premature deaths occur each year as a result of tobacco use.

**Parts of the Cardiovascular System:**

**CV-3: Arteries**
- Carries blood from the heart to other parts of the body.
- A strong heart and healthy lungs are not very helpful if the arteries are not clear and open.
- Deposits are caused from eating high-fat food containing cholesterol.
- Exercise can help decrease bad cholesterol levels in the blood, so they don’t get deposited in the arteries.

**Parts of the Cardiovascular System:**

**CV-4: Veins**
- Carry blood from the muscles (filled with waste products) back to the heart.
- One-way valves in the veins keep blood from flowing backward in the body.
- Regular exercise helps veins to squeeze more efficiently.
- A lack of exercise can weaken the valves, resulting in poor circulation.

**Fitness Component #2:**

**Muscular Strength**
- Definition: the maximum force that can be generated by a muscle.

- Criteria:
  - Must involve a maximal effort by the muscles.
  - Must be moving a very heavy resistance.

- Benefits of improving muscular strength:
  - Strong muscle fibers and tendons.
• Increases metabolism.
• Maintain good posture.
• Reduce fatigue.
• Prevent injuries.
• Prevent back problems.

• Examples:
  • Weight training moving a heavy weight with a low number of repetitions.
  • Shot put.
  • Lifting a car.

• Other Points:
  • Muscular strength is dependant on the size of the muscle group.
  
    • Meaning: the larger the muscle group, the more force it can generate and the stronger it is.

• Training Guidelines:
  • Can be improved by lifting weights, two to three times per week, per muscle group.
  • Body weight exercises can also be done (push ups, pull ups, dips).
  • Never work the same muscle groups two days in a row.

Fitness Component #3:
Muscular Endurance
• Definition: the ability of a muscle to repeat contractions against a less-than-maximal load.

• Criteria:
  • Must involve contracting muscles many times.
  • Must involve some type of light resistance

• Benefits of improving muscular endurance:
  (same as muscular strength)
  • Increases metabolism.
  • Maintain good posture.
  • Reduce fatigue.
  • Prevent injuries.
  • Prevent back problems.

• Note on improving strength: training muscle endurance will only improve strength in an un-trained person.

• Examples:
  • Weight training moving a light weight with a high number of repetitions.
Crunches/sit-ups.

- Training Guidelines:
  - Same as for muscle strength.
  - Light weight training 2-3 times per week, per muscle group.
  - Abdominal muscles may be trained up to 6 days per week.

- Cardiovascular endurance allows heart, lungs and blood vessels to work longer and more efficiently.

- Muscular endurance allows skeletal muscles to work longer and more efficiently.

Fitness Component #4: Flexibility

- Definition: A measure of a joint’s ability to move through a normal range of motion.

- Criteria:
  - Must involve muscles being stretched.

- Benefits of stretching:
  - Increases range of motion
  - Improves circulation.
  - Feels good – relaxes you.

- Old Benefits of stretching:
  - (Research shows these are no longer true)
  - Reduced risk of injury
  - Prevents and reduces muscle soreness
  - Increases speed
  - Improves athletic performance.
  - Improves body awareness.

- In reality, stretch can/will:
  - Decrease muscular power.
  - Decrease speed.
  - Decrease athletic performance.
  - Increase injury rate.

- Training Guidelines:
  - Old: Stretching exercises should be done at least one time per day.
  - New: Do not spend time stretching.
Fitness Component #5: Body Composition

- Definition: the relative amounts of muscle, bone, and fat in the body.

- Is divided into two categories: fat weight and lean body weight.

- Is expressed in a percentage.

- Example: 22% body fat.

- Meaning:
  - A person weighing 100 with a body fat percentage of 22% has 22 pounds of fat on their body, and 78 pounds of lean weight.

- How it can be changed:
  - Aerobic exercise – burns calories (decreases fat weight).
  - Weight training – increases the amount of muscle (lean body mass)
  - Regular exercise also increases your metabolism, so you burn more calories during the day.

- Dangers of being obese:
  - (30 pounds overweight by US Gov. & BMI)
  - (BF% - 32% for females, 25% for males)
  - Increase risk of heart disease.
  - Increased risk of diabetes
  - Increased risk of hypertension.
  - Increased stress on the body’s joints.

- More US statistics:
  - 60% of Americans do not get enough physical activity.
  - 25% of Americans are not active at all.
  - Diabetes rate for people 30-39 has increased by 70%.
  - Since 1980, the percentage of overweight children has doubled.

- Minnesota statistics:
  - 22.4% are obese in 2002 (up from 19.9% in 1999.
  - Rank: 25th fattest state
    - West Virginia: 27.6% - 1st
    - Colorado: 16.5% - 50th
    - National Average: 22.2%

- Minnesota statistics:
  (StarTribune Poll – Dec 2003)
• BMI: Body Mass Index.
• Compares Height & Weight.
• 26-29 is overweight.
• 30 & over is obese.
• Problem: Does not consider Body Comp.

• While body composition is a component of health related fitness, this is not a component that we will be assessing in our classes.

**Fitness Component #6 (sort of):**
Muscular Power

• Power = Strength X Speed

or

• Power = Force X Distance / Time

**Fitness Component #6 (sort of):**
Muscular Power

• How is it measured:
  ● Vertical Jump
  ● Shot Put
  ● Olympic Lifts (snatch or clean)
  ● By using force plates.

**Training Principles**

• Principle of Specificity:
  ● Specific exercises improve specific fitness components in specific body parts.

• Meaning: stretching will improve flexibility, but not your cardiovascular system; swimmers must train by swimming and not by playing golf.

• Principle of Overload:
  ● Your body’s systems will become stronger and function better if increased demands (overloads) are placed upon them.

• Meaning: you must increase your exercise (overload) over time if you want to improve.

**Training Principles**

• Principle of Progression:
  ● You must increase the exercise (and overload) gradually.
Training Principles
• • Threshold of Training: the minimum amount of overload necessary to improve fitness.
• • Target Ceiling: the most overload that you can safely apply. Going over your target ceiling leads to over-training.
• • Your training zone falls between your threshold and your ceiling

Training Principles
• • KEY POINT:
  ● ● These training principles must be applied in order to improve your fitness levels.

F.I.T.T. Formula
• • Frequency – How often (how many days per week).
• • Intensity – How hard (how much effort you put into the exercise).
• • Time – How long (length of time spent doing the exercise).
• • Type – What activity is it (the specific exercise you are doing).

Basic Anatomy
• • Bones: make up our skeletal system, provide a structure.
• • Muscle: cause and create motion.
• • Joint: where two bone come together, is where motion occurs.
• • Tendon: attaches a muscle to a bone.
• • Ligament: attaches one bone to another bone.