# Chapter 4

## Exercise Concepts and Fitness Education

Kovar/Combs/Campbell/Napper-Owen/Worrell. *Elementary Classroom Teachers as Movement Educators.* 4th ed. New York:

# What Is Fitness Education?

- Fitness education is a component of movement education
- Fitness education emphasizes the importance of physical activity and physical fitness to a healthy and productive quality of life

Jumping rope is an excellent cardiovascular endurance activity and also its FUN.

# Fitness Education

- Fitness education includes the why and how of physical activity, physical fitness, and exercise
- Fitness education emphasizes the importance of NASPE Standards 3 and 4:
  3. Exhibits a physically active lifestyle
  4. Achieves and maintains a health-enhancing level of physical fitness.

# Health-related fitness

- Cardiorespiratory function
- Body composition
- Muscular strength and endurance
- Flexibility

# Skill-related fitness

- Speed
- Agility
- Strength
- Explosive power
- Coordination

# Wellness vs. Health

- **Health**
  - Physical, mental, and social well-being, not merely the absence of disease and infirmity
- **Wellness**
  - A holistic term encompassing emotional, spiritual, mental, social, and physical wellness

# Physical Fitness vs. Physical Activity

- **Physical Fitness**
  - Defined as a set of attributes that people have or achieve that relates to the ability to perform physical activity
- **Physical Activity**
  - Defined as any bodily movement produced by skeletal muscles which results in energy expenditure above the resting level

# Physical Activity vs. Exercise

- **Exercise**
  - Defined as physical activity that is planned, structured, repetitive, and purposive, in the sense that improvement or maintenance of physical fitness is an objective

# Physical Activity vs. Exercise

- **Adults: Exercise, Workout**
  - Goal = exercise at a moderate intensity for 20–30 minutes, 3–4 times per week
- **Children: Physically active, play**
  - Goal = accumulate 60 minutes or more of moderate to vigorous activity each day.

# Fitness Education Goals

- Provide opportunities for ample physical activity at school
- Encourage physical activity during non-school hours
- Promote physical activity in a way that students will exhibit a physically active lifestyle and maintain a health-enhancing level of physical fitness

**WALKING:  An excellent physical activity**

# Health Risk Factors

- Defined as certain factors that increase the risk of developing a chronic disease such as heart disease or diabetes

# Heart Disease

- Caused by the gradual accumulation of plaque in the arteries that deliver blood to the heart
- Plaque buildup causes a reduction in blood flow to the heart, causing pain
- Artery that becomes completely blocked can cause a heart attack

# Heart Disease Risk Factors

- High cholesterol
- Hypertension (high blood pressure)
- Smoking
- Obesity
- Inactivity (sedentary lifestyle)
- Diabetes

# Heart Disease Risk Factors

- **Modifiable**
  - Risk factors that can be improved through a healthier lifestyle
  - Include smoking, high cholesterol, high blood pressure, obesity, and inactivity
- **Non-modifiable**
  - Risk factors that cannot be changed
  - Include age, sex, race, and family history

# Heart Disease Risk Factors

- **High cholesterol**
  - HDL (good cholesterol) may be increased by physical activity
  - LDL (bad cholesterol) may be decreased by physical activity and proper nutrition

# Heart Disease Risk Factors

- **Hypertension (high blood pressure)**
  - May cause stroke as well as heart disease
  - May be reduced by exercise and proper nutrition

# Heart Disease Risk Factors

- **Smoking**
  - Causes lung cancer as well as heart disease
  - Has a synergistic effect on other risk factors (causes them to be worse)

# Heart Disease Risk Factors

- **Obesity/overweight**
  - Becoming a national epidemic
  - Often caused by lack of activity and poor nutrition
  - Daily physical activity can help prevent obesity and manage Type 1 and Type 2 diab etes.

# Heart Disease Risk Factors

- **Inactivity**
  - A sedentary lifestyle is an important contributor to the development of several chronic diseases
  - Activity/exercise reduces several of the heart disease risk factors

# Heart Disease Risk Factors

- **Diabetes**
  - Two main types
    - Type 1: Individual cannot produce insulin and must have an insulin source
    - Type 2: Individual is unable to produce enough insulin or properly use insulin
  - Poor diet, inactivity, and obesity are strong risk factors in the development of Type 2 diabetes
  - Type 2 diabetes is increasing in children

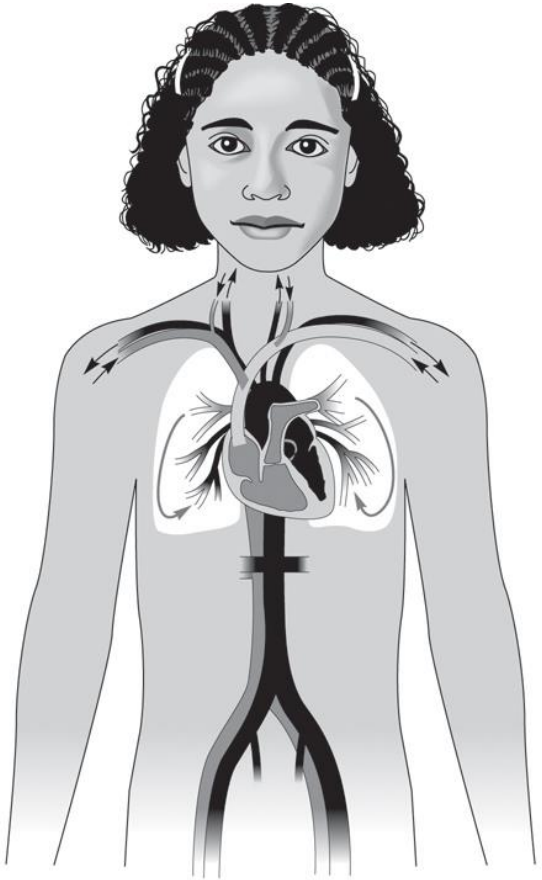
# The Human Body and Activity

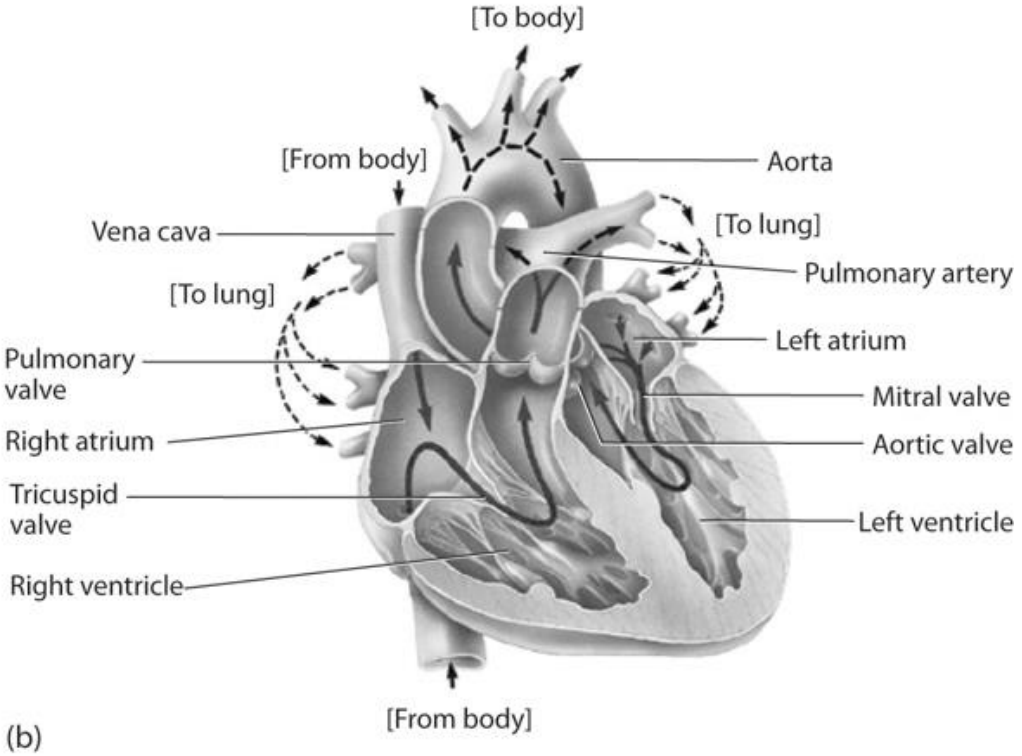
- The engine for activity—the cardiovascular system
- The apparatus for activity—the musculoskeletal system
- The vehicle for activity—the body's composition

# The Cardiovascular System

- **The heart—the pump**
  - The right side pumps blood to the lungs to pick up oxygen
  - The left side pumps oxygenated blood to the tissues of the body

# The Heart and Basic Circulation





# The Cardiovascular System

- **The lungs**
  - Take oxygen from the air we breathe and transfer it to the blood to be sent to the left side of the heart
  - Take carbon dioxide from the blood and exhale it into the atmosphere

# The Cardiovascular System

- **The heart valves**
  - Valves open and close in the heart to control the flow of blood
  - Heart sounds can be heard through a stethoscope as the valves open and close

# The Cardiovascular System

- **Heart Rate**
  - The number of times the heart beats per minute
  - Heart rates increase with exercise
  - The heart rates of individuals who are fit are generally lower than those who are unfit

# The Cardiovascular System

- **Perceiving exercise intensity**
  - Rate the difficulty of exercise or activity with respect to how hard you feel you are working
  - Scales run from 1 to 10 (or 1 to 5 for children) with 1 being very easy and 10 being very, very hard

# The Cardiovascular System

- **Aerobic vs. anaerobic exercise**
  - Aerobic—"with oxygen"
    - Moderate intensity exercise
    - Examples: walking, jogging, swimming
  - Anaerobic—"without oxygen"
    - High intensity or vigorous exercise
    - Examples: sprinting, basketball, soccer

# The Cardiovascular System

## Continuous vs. intermittent exercise

- Continuous activity is prolonged activity without rest breaks
  - Moderate and aerobic
  - Good for cardiovascular development
- Intermittent exercise includes shorter bouts with brief periods of rest
  - Still moderate and aerobic
  - Better tolerated by children improving their enjoyment of the activity

# The Cardiovascular System

- **MVPA**
  - Moderate to vigorous physical activity
  - Recommendation is that children attain 60 minutes or more each day (CDC, 2008)
  - Moderate
    - Intensity where heart and breathing rate are increased but the exercise is aerobic and easily tolerated
    - Generally continuous and can be sustained

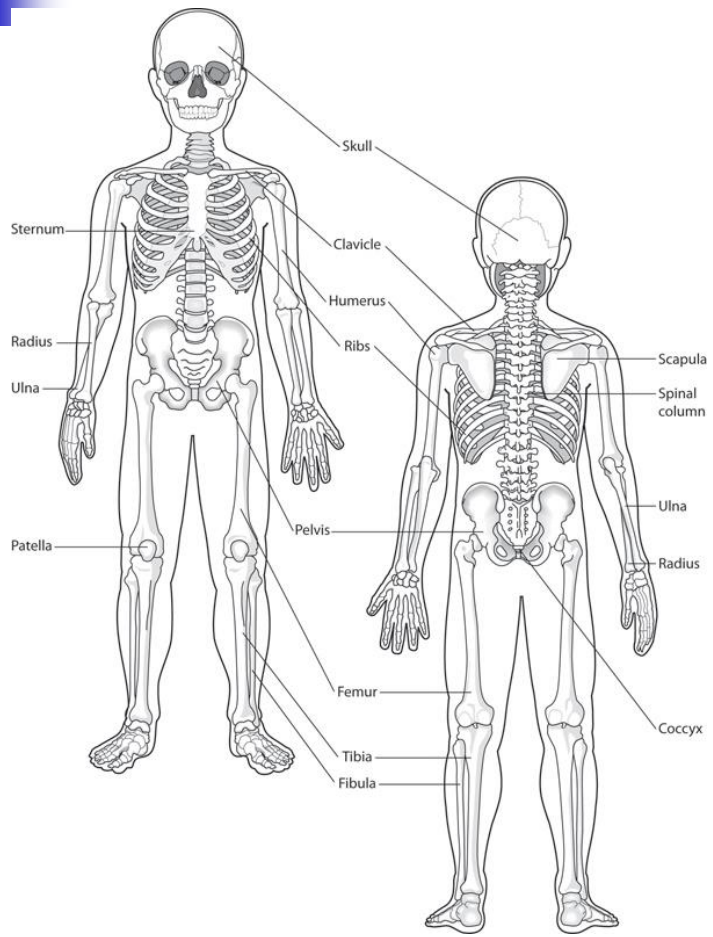
# The Cardiovascular System

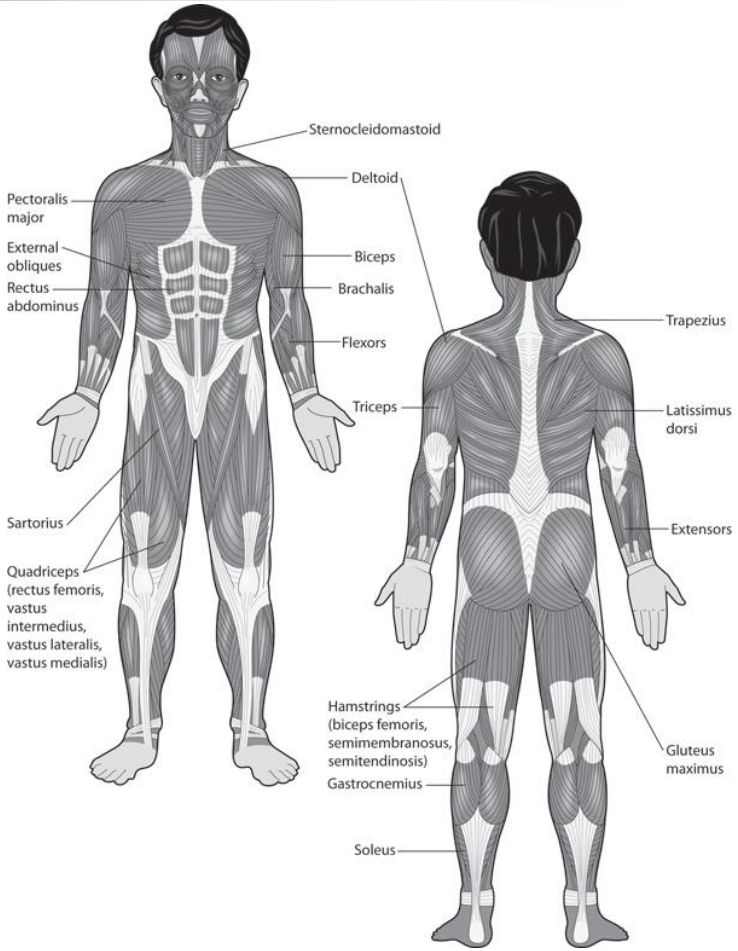
- **MVPA**
  - Vigorous
    - Heart rate increased more than the moderate exercise, breathing becomes fast and exercise may be anaerobic (without oxygen)
    - Generally cannot be sustained for very long
    - Provides excellent stimulus for the heart, lungs, muscles and vascular system to improve – thereby increasing fitness levels.

# The Musculoskeletal System

- **Musculoskeletal Fitness**
  - Muscular Strength
  - Muscular Endurance
  - Flexibility

# Major Bones and Muscles of the Human Body



# The Musculoskeletal System

- **Muscular Strength**
  - Defined as the ability to create a large amount of force at one time
  - Example:  pull-up, tug of war

# The Musculoskeletal System

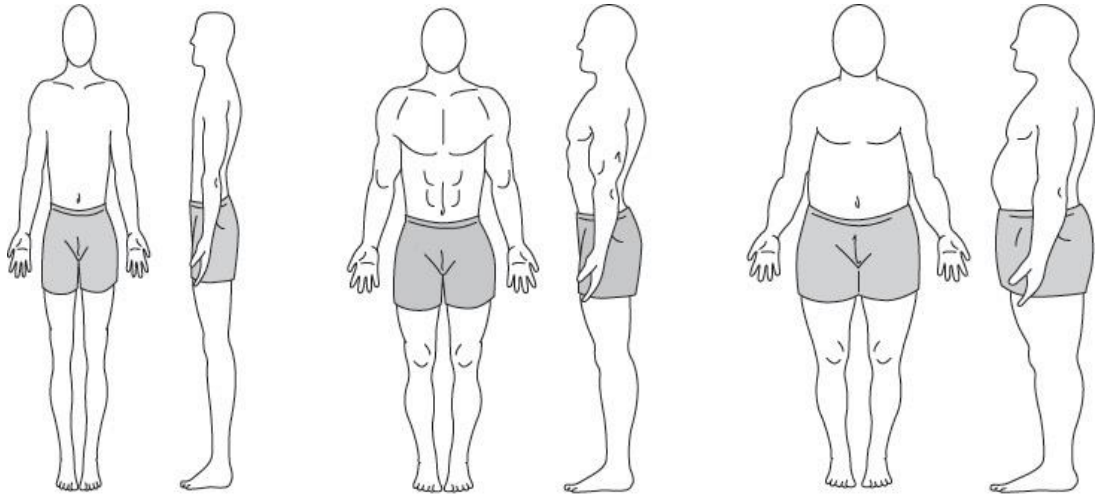
- **Muscular Endurance**
  - Defined as the ability to perform a contraction repeatedly
  - Example:  abdominal curl/crunch

# The Musculoskeletal System

- **Flexibility**
  - Defined as the ability of a limb or body part to move through its complete range of motion
  - Example:  stretching

# The Body's Composition

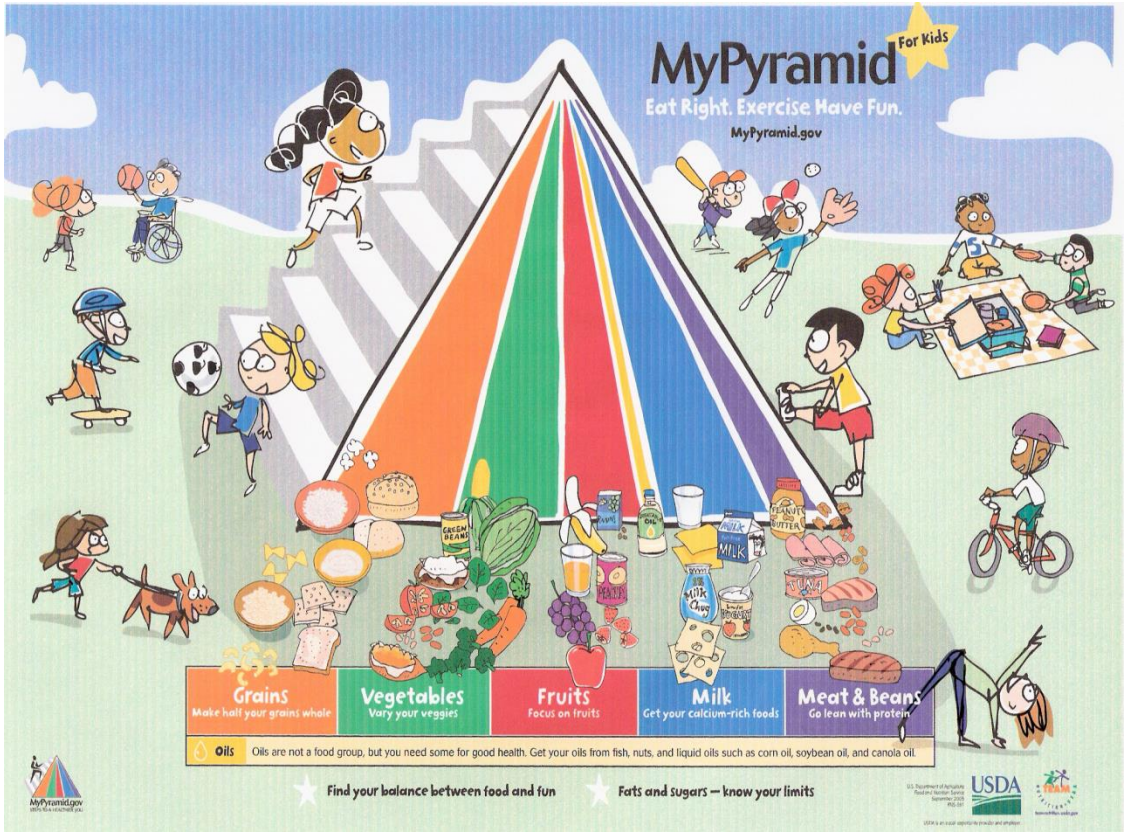
- Body types
  - Mesomorph:  muscular
  - Ectomorph:  thin, slight of build
  - Endomorph:  rounded body type, may be plump



# The Body's Composition

- Defined as the relationship of body fat to lean body weight
  - Lean body weight = weight of the nonfat components of the body, made up of muscle mass and bone
- Improving body composition
  - Exercise increases muscle mass and decreases body fat
  - Improved nutrition, reducing fat and refined sugars in the diet

USDA's MyPlate.com provides guidance for daily food choices; shown here is the kids pyramid. All available from www.mypyramid.gov



# Implementing Fitness Education

- Exercise principles for developing fitness
  - **Overload:** To improve fitness, you must do a little more work than you are accustomed to
  - **Specificity:** Exercise must be specific to the type of training that will be done
  - **Progression:** Gradually increasing the workload during a training session so that overtraining does not occur

# Implementing Fitness Education

## THE FITT PRINCIPLE

- Components of the FITT principle
  - **Frequency:** HOW OFTEN
  - **Intensity:** HOW HARD
  - **Time (Duration):** HOW LONG
  - **Type (Mode):** WHAT TYPE of EXERCISE

# Implementing Fitness Education

- Warm up and cool down
  - Warm up: Prepares the body for activity by increasing the heart rate which increases blood flow to the muscles
  - Cool down: Gradually decreasing the intensity of exercise

# Implementing Fitness Education

- Implementing fitness activities
  - Provide instruction in how to do even the simplest of activities
  - Present a variety of activities that encourage moderate to vigorous levels of physical activity
  - FUN is an important ingredient of fitness activities

# Implementing Fitness Education

- Implementing fitness activities
  - Games should be designed so that players are not "out" very long; students must be back "in" as soon as possible (example: limit waiting)
  - Games and activities must fit each child's developmental level and be appealing (example: heart rate games)

# Implementing Fitness Education

- Implementing fitness activities
  - Older children may develop exercise plans to increase fitness with emphasis on individual goals and self-regulation
  - Fitness testing, if required, should emphasize health-related goals as opposed to performance goals

# Implementing Fitness Education

- Implementing fitness activities
  - Emphasize the role that physical activity has in a child's life
  - Create and design opportunities for activity for the children (example: participation points)

# Role of the Classroom Teacher as a Fitness Educator

- The classroom teacher can play an important role in helping children remain healthy and fit
- The classroom teacher will ideally serve as a positive role model and express positive attitudes toward fitness and physical activity

# Role of the Classroom Teacher as a Fitness Educator

- The classroom teacher will engage their students in physical activity whenever possible during the school day so as to develop behaviors that encourage children to be active

# Chapter 4

## Exercise Concepts and Fitness Education